SignGram Blueprint

SignGram Blueprint

A Guide to Sign Language Grammar Writing

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Introduction: Letter to the grammar writer

The SignGram Blueprint is a tool designed to guide language specialists and linguists as they write a reference grammar of a sign language. This tool consists of two main components: the Checklist and the Manual.

The Checklist contains a list of linguistic constructions and phenomena that a sign language grammar should contain. Thus, it can be considered as a suggestion for the table of contents of the reference grammar to be written.

The Manual, on the other hand, guides the grammar writer in four ways, by providing:

(i) basic, background information on the linguistic constructions and phenomena listed in the Checklist;
(ii) guidelines on how to identify and analyze these grammar points;
(iii) suggestions for data elicitation techniques and materials; and
(iv) relevant bibliographic information that the grammar writer can consult during his/her research.

The Manual also contains a separate sub-component, the Glossary, which provides the definitions of certain linguistic terms used in the Manual.

In the following, we describe in more detail how the grammar writer can use the components of the Blueprint. However, before we move on to that, we would like to explain the context in which the Blueprint has been created, the reasons that lead us to think it is needed, and the choices we have made while writing it. We start by briefly discussing what grammar writing involves and then continue with describing the structure of the Blueprint in more detail.

Grammatical descriptions, why?

Sign language research has advanced rapidly over the past few decades, but it still faces an important stumbling block: the grammatical descriptions available for specific sign languages are incomplete and of varying reliability. Complete, thorough descriptions of sign languages are lacking, and this obviously has negative consequences – not only for the linguist studying a certain phenomenon (lack of knowledge about a certain undescribed aspect of the grammar might lead to a wrong characterization of a different, but related aspect), but also for a whole range of professionals who must rely on a comprehensive description of the language, such as sign language teachers of deaf children, trainers of sign language interpreters, teachers of sign language as a second language, clinicians involved in diagnosing language impairment and language pathologies, and speech therapists assessing language competence.

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Writing a grammar may serve very different goals, but no matter what type of grammar is intended, the content should be as accurate and comprehensive as possible. The SignGram Blueprint is an attempt at helping the grammar writer achieve this goal. However, the form of the final grammar will, of course, depend directly on the goal that the grammar writer has set. A reference grammar of a language, which intends to be exhaustive, is a very different product, both in terms of depth and presentation, from a didactic grammar meant as a support for language learning. Therefore, the Blueprint must be considered as a tool that the grammar writer needs to adapt to his or her needs.

It should be kept in mind that the Blueprint can also be useful to describe partial aspects of grammar, for instance in graduate thesis projects, and thus does not need to be implemented in its entirety. Nevertheless, when a basic grammatical description of a language is lacking, it is sometimes hard to describe phenomena in isolation. Therefore, cooperative work should be encouraged to produce comprehensive grammatical descriptions of sign languages, which are very much needed.

How to use the Blueprint

As mentioned above, the Blueprint has two main components: the Manual and the Checklist. The Manual has seven parts. A part covering the Socio-historical background is followed by six parts corresponding to the major components of grammatical knowledge: Lexicon, Phonology, Morphology, Syntax, Semantics, and Pragmatics. Each part starts with an introductory chapter explaining the function of the linguistic component under investigation (e.g. Morphology), the organization of the part, and suggestions on how to use it.

Subsequent chapters and major sections within each part also contain introductory subsections providing background information including definitions, classifications, and suggestions on how to overcome the methodological and analytical challenges the grammar writer might face. The remaining subsections in each chapter contain guidelines for identification and analysis of the grammar points. These are often followed by a section on Elicitation Materials. This section contains methodology and material suggestions for data elicitation. Each chapter ends with a list of bibliographic references of the literature that addresses these grammar points – be it from a general perspective of for a specific sign language.

The aim of the Manual is to guide the grammar writer in providing the descriptions of the grammar points listed in the Checklist. To make this tool user-friendly, we have striven to maintain a one-to-one correspondence between (sub-)headings in the Checklist and (sub-)headings in the Manual. The grammar writer can read the Manual as if it were an independent book or she/he can click on a heading in the Checklist to access the relevant information in the Manual. To demonstrate how the Manual may provide guidelines for the identification of a specific construction or phenomenon,

let us give an example. The Morphology Part of the Checklist contains the heading '2.1.2.1. Noun-verb pairs'. This corresponds to the heading '2.1.2.1. Noun-verb pairs' in the Morphology Part of the Manual. In this subsection of the Manual, it is explained that a 'noun-verb pairs' heading in a reference grammar might be useful, since a morphological process by which action verbs can be derived from object nouns (say the verb SIT from the noun CHAIR) is attested in many sign languages. Representative examples of this morphological process from actual sign languages are given, and tests that can be used to distinguish the noun from the related verb are suggested. Finally, this subsection of the Manual contains the most relevant bibliographical references that deal with this phenomenon.

The Checklist and the Manual are offered as a suggestion and as a guide, but of course, it is up to the grammar writer to decide whether the relevant subsection makes sense in the grammar of the sign language he or she is describing. For example, if the morphological process by which verbs are derived from nouns is absent in that sign language, this section might be safely skipped. But if the grammar writer aims at putting his or her grammatical description in a typological perspective, he or she might opt to refer to the absence of such a process by contraposition to the languages that are mentioned to have it in the Manual. When developing the actual grammar for a given sign language, the grammar writer might want to depart from the structure proposed in the Checklist for a variety of reasons, both practical and conceptual. In fact, at various points of the Manual explicit suggestions are made for an alternative organization of the grammar.

In general, we expect that while the most general headings should be relevant for all sign languages (say, '1.2. Interrogatives' in the Syntax Part of the Checklist and the Manual), more specific sub-headings might be relevant only for a subset of sign languages. For example, '1.2.3.6. Split between the *wh*-sign and its restriction' is needed only for those sign languages in which an interrogative sign corresponding to 'which' can be separated from its restriction, say a noun like 'book'.

Also, note that the different parts of the Checklist and the Manual such as Syntax and Morphology are internally structured with an independent numeration. We hope that the independence of each part will help the grammar writer who might be interested in describing just a single component, say only the morphology or the syntax of the sign language studied.

Since we hope the Blueprint will be used by a wide range of language specialists, we have made an effort to keep the language as accessible as possible, and have tried to avoid technical, linguistic jargon. We have worked under the assumption that the 'grammar writer', who is the main target user of the Blueprint, does not need to be a professional linguist, although we assume familiarity with basic linguistic notions and grammatical concepts specific to sign languages. We also assume that he or she is acquainted with one or more sign languages.

The Blueprint is a product of several authors. However, we made all possible efforts to harmonize the style. For example, a potential source of confusion can be

generated by the use of the term 'word' or 'sign' for the lexical unit of a sign language. As a rule of thumb, we used the term 'sign' except for linear order facts and some prosodic or morphological descriptions where the terms 'prosodic word', 'word order', and 'word-internal' will be used.

The Blueprint helps the reader with linguistic terminology in two ways: one is the Glossary. A number of linguistic terms in each section is automatically linked to the Glossary. The full list of glossary entries can also be found at the end of the Manual.

The other helpful tool is the cross-referencing between sections and parts of the Manual by means of hyperlinking. Typically, if there is a term/concept used in a section where it is mentioned but not described, a hyperlink connects it to the section where it is explained. In other cases, the section where one set of properties (for instance, syntactic properties) of a phenomenon is discussed is linked to another section where another set of properties (for instance, prosodic properties) are addressed. This will equip the grammar writer with a wider background knowledge on the topic and enable him/her to approach it from more than one angle if she/he intends to do so.

We mentioned that, in most cases, there is a one-to-one correspondence between the Checklist and the Manual. However, there are cases in which this correspondence does not hold. These cases are due to the fact that the Checklist contains only the list of linguistic features that should be described in a grammar. Therefore, the sections of the Manual that are more methodological in nature (typically, the introductory sections in chapters and major sections devoted to definitions, methodological and analytical challenges, elicitation materials, and references) do not have a correspondence in the Checklist. However, these methodological sections are numbered in a special way, so that they do not obstruct the parallel structures of the Checklist and the Manual.

The second area in which the one-to-one correspondence does not hold is due to a basic choice we made when we decided on the general design of the Blueprint. We believe that traditional grammars, even the most complete reference grammars available for better-studied spoken languages, tend to neglect the dimension of meaning. It is instructive in this regard to notice that in the average descriptive grammar, no comprehensive section is devoted to semantics and pragmatics; rather, the discussion of meaning aspects is usually distributed across sections describing formal aspects such as lexicon, morphology, or syntax.

We think that these traditional choices do not reflect recent linguistic achievements about the semantics and pragmatics of natural languages (spoken or signed). In addition, the traditional structure typically leads to a blending of formal and functional categories in the grammatical descriptions. One typical example is temporal categories. In many languages, the (formally unmarked) verbal present tense form is not only used to refer to the present but also to refer the future (and sometimes even to the past). Therefore, the grammatical category of tense must not be conflated with the semantic notion of tense. For this reason, we have devoted an entire part of the Blueprint to the elucidation of concepts related to meaning.

We present a couple of illustrative examples of why having fully developed Semantic and Pragmatics parts can be useful. The first still involves the 'tense' category. Some traditional grammars tend to conflate the discussion of tense and aspect, especially in languages in which the same morpheme express both a tense and an aspect specification. Unlike more traditional grammars, the Manual includes two sections in which these concepts are explained from a formal perspective and a meaning perspective. As the sections on tense and aspect are already present in the Morphology part (form) of the Checklist, in order to avoid a duplication, there is no Semantics part (meaning) in the Checklist, but the relevant semantic notions are displayed in the Semantics part of the Manual for the grammar writer as important background information for investigating their potential morphological realizations in the target language.

Similarly, a section called 'conditional clauses' is only present in the Syntax part of the Checklist describing possible formal aspects of such clauses. Nevertheless, the Manual contains a section in the Semantics part about the meaning of conditionals, since we think that a proper description of this construction cannot leave out the meaning dimension. However, other aspects of meaning, especially those related to pragmatic aspects of meaning such as discourse structure, figurative meaning, and communicative interaction, do have a counterpart in the Checklist, because it is justified to have them as free-standing sections in a descriptive grammar. Since all semantic concepts are also addressed from a formal perspective in the Lexicon, Morphology, and Syntax parts, the Checklist does not contain a part on Semantics. By contrast, the part on Pragmatics discusses aspects of meaning beyond the sentence level and is therefore included in the Checklist. With the general move to treat semantic and pragmatic aspects on an equal footing with other grammar components, we mean to boost description and analysis of semantic and pragmatic properties in signed languages, which have lagged behind until quite recently.

Methodological choices

We mentioned previously that we have adopted a plain, non-technical style, and that it is our hope that non-professional linguists will also be able to use the Blueprint. However, we must stress that this choice is not due to an anti-theoretical or anti-formalist attitude. On the contrary, the scientific directors of the Blueprint are all formal linguists who are convinced that no adequate empirical description is possible without the lens provided by modern linguistic theories. An a-theoretical description does not exist. What is considered a-theoretical is often a description that assumes commonsense, naïve conceptions, instead of more sophisticated notions from current linguistic theories that invariably help sharpen the empirical description. Therefore, the organization of the Checklist and the content of the Manual *is implicitly* theory-driven. Although the specific analyses that informed our choices are not at the center

of the stage, they can be retrieved by looking at the references that close each chapter of the Manual. This sometimes has a relative influence on the terminological choices made here (for instance, the term 'agreement verb' is used), but alternative denominations existing in the literature are also mentioned ('directional' or 'indicating verbs' for the example at hand).

A question that naturally arises when one projects a skeleton for sign language grammars is to what extent this should be similar to a grammar for spoken languages. The issue is tricky, even more so because no comprehensive reference grammar for any sign language exists yet. We have started from the assumption that sign languages are the products of the same language faculty that gave rise to spoken languages. So in principle, the main analytical categories that have been elaborated in the linguistic research on spoken language (for example, phonological features, verbal inflection, subordination, or implicature) and that have been fruitfully applied in spoken language research should be useful categories for sign languages as well. Thus, in those cases in which there is no sufficient information on how sign languages express a certain grammatical concept or construction, we referred to the findings on typologically diverse spoken languages, keeping in mind that if a certain linguistic phenomenon or construction has been observed in a group of spoken languages, it has the potential to be observed in the sign language studied.

Such transfer from the generalizations on spoken languages is undoubtedly useful; however, it is not sufficient. It is also very well known that the visuo-spatial modality does shape the way language is expressed, and new, modality-specific categories should at times be employed to describe sign language phenomena (for example, non-manual marking, classifier predicates, and role-shift). It is an open question whether these categories are really unique to the signed modality or correspond to mechanisms that are present in spoken languages, albeit in a less prominent form, thus having led to their exclusion from spoken language grammars. These types of questions are very important, but the Blueprint is not the place to find answers to them, since our goal is to offer adequate descriptive tools rather than to investigate the underlying issues. Thorough descriptive work on many more sign languages will hopefully contribute to (partially) answering those questions at some point by relying on more solid empirical ground. A separate issue concerns iconicity. The fact that some signs incorporate iconic features has consequences for the structure of the grammar at all levels. However, the effects of iconicity are not the same in the lexicon and in syntax, for instance. Thus, rather than having an independent section on iconicity, we decided to discuss its effects whenever they are immediately relevant for a specific aspect of the grammar or a grammatical phenomenon.

At first sight, the Checklist may look superficially similar to the table of contents of a reference grammar of a spoken language. However, we would like to stress that a category identified in spoken language may involve different exponents and linguistic processes in sign language. The Manual contains multiple examples of this where such differences are highlighted and explained in detail. For example, while compound is a

standard grammatical concept in morphology and is found in the Checklist, its application to sign languages raises some non-trivial questions. One is how to analyze compounds with multiple articulators that work in parallel and relatively independently from each other, for example, those in which one hand articulates (part of) one sign while the other one simultaneously articulates (part of) another sign.

As a final note on the Manual, we would like to point out that the current state of the art in sign language research has had some effect on the varying degree of detail across chapters and sections. Where necessary, we have tried to compensate for the existing gaps on the basis of the available linguistic information on spoken languages, as mentioned above. The grammar writer interested in further deepening his or her grammatical knowledge is encouraged to consult the selection of bibliographic pointers included at the ends of sections and chapters.

In some cases, original research has been conducted specifically for the preparation of the Blueprint, since the phenomenon to be described had not been explored at all for sign languages. In these cases, the original findings are the starting point for the relevant section. This is the case, for instance, in the section on imperatives in the Syntax part.

The Blueprint and the SignGram COST Action

The Blueprint is the main product of the SignGram COST Action (Action IS1006 "Unraveling the grammars of European sign languages: pathways to full citizenship of deaf signers and to the protection of their linguistic heritage", website: http://signgram.eu). COST is a European network of nationally funded research activities which aims to promote and finance cooperative scientific projects with a specific goal. The SignGram COST Action started in 2011 and ended in 2015; its main goal was the creation of the Blueprint. Researchers from 13 COST countries (Austria, Denmark, France, Germany, Greece, Iceland, Italy, Netherlands, Norway, Poland, Spain, Turkey, and the United Kingdom) and two COST International Partner Countries (Argentina and Australia) took part in the Action. COST funded the following scientific activities: the meetings in which the design of the Blueprint was discussed and decided, scientific missions between the partners, and summer schools for junior researchers who want to start working in the sign language field, as well as four editions of a conference that has become a major venue for sign language researchers (FEAST, Formal and Experimental Advances in Sign Language Theory). Another activity promoted by the SignGram Action is the creation of a repository of materials that have been used for the elicitation of signs or structures by researchers in Europe and beyond. The repository can be found at the following link:

https://corpus1.mpi.nl/ds/asv/;jsessionid=A0026AAA3C521F75EC5ADF8C93354297?0.

Finally, COST has made it possible for the Blueprint to be freely available to everyone as an open-access publication.

It is important to highlight that the new research project SIGN-HUB (2016–2020) funded by the Horizon2020 program of the European Commission has as one of its goals to implement the Blueprint to write on-line grammars of the following sign languages: DGS, LIS, LSE, LSC, NGT, and TİD. This will make it possible to have the grammatical descriptions directly online and available to everyone once they have been validated.

The social dimension of the Blueprint

When we started the *SignGram* COST Action, we were motivated by scientific questions, since we are linguists. However, as is often the case for linguists working on neglected and ostracized languages (and sign languages still belong to this category!), we also had in mind a social dimension. This is what we wrote in the application we submitted to COST in 2010:

> "Despite significant advances, linguistic knowledge of languages in the visuo-gestural modality is still sketchy and incomplete. This becomes an unsurmountable handicap when inclusive educational policies are proposed, as no reliable grammatical descriptions are available that could constitute the appropriate basis for curriculum development and teaching materials in bilingual-bicultural programmes, sign language (SL) teaching or SL interpreter training. As a result, the responsibility of describing the basic aspects of SLs for educational practices has been frequently left in the hands of teachers of the deaf, language therapists or SL teachers and interpreter trainers, who understandably often lack the required background. Only the best possible education in their SL, though, does guarantee personal development and full exercise of civil, linguistic and ultimately human rights for deaf signing individuals. This action aims to provide scientifically reliable tools in order to meet the broader societal challenge of ensuring equal rights for deaf signers across Europe, as expressed in several international legal initiatives (cf. Resolutions of the European Parliament in 1988 and 1998, Motion of the Council of Europe for the protection of sign languages 2001, UN Convention on the Rights of Persons with Disabilities 2006)."

At the end of the Action, we did create what we think is a scientifically reliable tool for writing grammars of sign languages. It is offered as a contribution to all those interested in setting out to accomplish this task. We hope that even when a grammar writer disagrees with some of our choices, this will be because the approach that we have adopted has advanced the discussion on how to study, describe, and ultimately reinforce the status of sign languages.

Notational conventions

Following common conventions, sign language examples are glossed in English SMALL CAPS. Glosses that appeared in a different language in the source reference have been translated to English. Moreover, the following notational conventions are used:

$_1$SIGN$_3$	Subscript numbers indicate points in the signing space used in verbal agreement and pronominalization. We use subscript '1' for a sign directed towards the body of the signer, '2' for a sign directed towards the addressee, and '3' for all other loci (can be subdivided into '3a', '3b', etc.).
INDEX$_3$ / IX$_3$	A pointing sign towards a locus in space; subscripts are used as explained above.
SIGN++	indicates reduplication of a sign to express grammatical features such as plural or aspect.
SIGN^SIGN	indicates the combination of two signs, be it the combination of two independent signs by compounding or a sign plus affix combination.
SIGN-SIGN	indicates that two words are needed to gloss a single sign.
S-I-G-N	represents a fingerspelled sign.

Lines above the glosses indicate the scope (i.e. onset and offset) of a particular non-manual marker, be it a lexical, a morphological, or a syntactic marker. Some of the abbreviations refer to the form of a non-manual marker while others refer to the function:

/xxx/	lexical marker: a mouth gesture or mouthing (silent articulation of a spoken word) associated with a sign; whenever possible, the phonetic form is given;
top	syntactic topic marker: raised eyebrows, head tilted slightly back;
wh	syntactic wh-question marker, often lowered eyebrows;
y/n	syntactic yes/no-question marker: raised eyebrows, forward head tilt;
neg	syntactic negation marker: side-to-side headshake;
re	raised eyebrows (e.g. topic, yes/no-question);
hs	headshake;
cd	chin down;
wr	wrinkled nose;
r	relative clause;
cond	conditional;
bf	body lean forward.

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Sign language acronyms

Throughout the Manual, the following abbreviations for sign languages are used (some of which are acronyms based on the name of the sign language used in the respective countries):

ABSL	Al Sayyid Bedouin Sign Language
AdaSL	Adamorobe Sign Language (Ghana)
ASL	American Sign Language
Auslan	Australian Sign Language
BSL	British Sign Language
CSL	Chinese Sign Language
DGS	German Sign Language (*Deutsche Gebärdensprache*)
DSGS	Swiss-German Sign Language (*Deutsch-Schweizerische Gebärdensprache*)
DTS	Danish Sign Language (*Dansk Tegnsprog*)
FinSL	Finnish Sign Language
GSL	Greek Sign Language
HKSL	Hong Kong Sign Language
HZJ	Croatian Sign Language (*Hrvatski Znakovni Jezik*)
IPSL	Indopakistani Sign Language
Inuit SL	Inuit Sign Language (Canada)
Irish SL	Irish Sign Language
Israeli SL	Israeli Sign Language
ÍTM	Icelandic Sign Language (*Íslenskt táknmál*)
KK	Sign Language of Desa Kolok, Bali (*Kata Kolok*)
KSL	Korean Sign Language
LIS	Italian Sign Language (*Lingua dei Segni Italiana*)
LIU	Jordanian Sign Language (*Lughat il-Ishaara il-Urdunia*)
LSA	Argentine Sign Language (*Lengua de Señas Argentina*)
Libras	Brazilian Sign Language (*Língua de Sinais Brasileira*)
LSC	Catalan Sign Language (*Llengua de Signes Catalana*)
LSCol	Colombian Sign Language (*Lengua de Señas Colombiana*)
LSE	Spanish Sign Language (*Lengua de Signos Española*)
LSF	French Sign Language (*Langue des Signes Française*)
LSQ	Quebec Sign Language (*Langue des Signes Québécoise*)
NGT	Sign Language of the Netherlands (*Nederlandse Gebarentaal*)
NicSL	Nicaraguan Sign Language
NS	Japanese Sign Language (*Nihon Syuwa*)
NSL	Norwegian Sign Language
NZSL	New Zealand Sign Language

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ÖGS	Austrian Sign Language (*Österreichische Gebärdensprache*)
RSL	Russian Sign Language
SSL	Swedish Sign Language
TİD	Turkish Sign Language (*Türk İşaret Dili*)
TSL	Taiwan Sign Language
USL	Uganda Sign Language
VGT	Flemish Sign Language (*Vlaamse Gebarentaal*)
YSL	Yolngu Sign Language (Northern Australia)

Structure of the SignGram COST Action IS1006

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SignGram Blueprint: Checklist

A Guide to Sign Language Grammar Writing – Checklist

Edited by
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SignGram Blueprint: Manual

A Guide to Sign Language Grammar Writing – Manual

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Part 1: **Socio-historical background**

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Chapter 0 Preliminary considerations

It is common for grammars to include an introductory chapter that offers a general introduction to the language under investigation as well as its users. We encourage the grammar writer to include this type of information for the sign language to be described. If a certain variant of the sign language is described, this should be made clear at the outset.

The structure of this part is fairly flexible. As can be seen from the table of contents, we suggest including information about (i) the history of the sign language, (ii) characteristics of the Deaf community, (iii) the status of the sign language, and (iv) previous linguistic work on the sign language. The last section in particular will have an impact on the content of subsequent parts, as we encourage the grammar writer to include findings from previous studies in the grammatical description of the sign language. Clearly, alternative structures are possible. The overview of previous linguistic work, for instance, could be provided under the "History" header, and Deaf culture and/or Deaf education could be discussed under dedicated first-level headers – to give just two examples. Also, depending on the available information, sub-headers could be added.

Note that we adopt the convention of writing *Deaf* with a capital *D* when it refers to issues related to a community that is characterized by the use of a sign language. In contrast, *deaf* with a small *d* refers to the medical condition of not being able to hear. It is up to the grammar writer to decide whether to stick to this convention in the grammar.

Chapter 1 History

The history of a language normally starts when a community of users recognizes its language as different from that used by other neighboring communities. The aim of this section is to compile, if possible in chronological order, all the relevant information about the coming into existence of a sign language as well as its historical development. When was the sign language first mentioned or documented? Can the origin be traced back to a specific educational setting? Are there early documents that depict signs or a manual alphabet? The main analytical challenge is likely posed by the scarcity of documentation, as sign languages are non-written languages that have been considered unworthy of systematic study for a long time. Still, it is possible that the sign language under study is mentioned in historical documents, but maybe not as "sign language" but rather as "hand talk", "manual language", "manual communication system", or "gesture".

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When compiling this information, the grammar writer should keep in mind that manual communication systems that are mentioned in historical sources are not necessarily related to the sign language which is now in use. There are, for instance, documents that describe the use of a signing system by Deaf people ("mutes") at the Ottoman court from the 15th to the 17th century (Miles 2000). It is, however, unclear whether present-day Turkish Sign Language (TİD) is related to, or has been influenced by, this signing system, which reportedly allowed for the expression of ideas of whatever complexity. This uncertainty notwithstanding, in a grammar of TİD, this information should certainly be included. Also, for some sign languages, film documents are available that date back to the early 20th century. In the case of ASL, for instance, these films turned out to be a valuable source for the linguistic study [Sociohistorical background – Chapter 4] of the language (Supalla 2001). If such documents exist, they should be mentioned here.

Note that this section is not meant to offer speculations about the evolution of sign language in general. Also, the focus of this section should be on the sign language. Aspects of the history of the Deaf community, the emergence of Deaf culture, and of the history of linguistic documentation may be mentioned where appropriate, but should be addressed in more detail in other sections. Consider, for instance, the case of Nicaraguan Sign Language, a sign language that recently emerged at a Deaf school in Managua, the capital of Nicaragua (Polich 2005). In this case, the history of the sign language is clearly related to Deaf education. Still, in this section, the discussion should focus on the fact that deaf homesigners from various villages first came together at the school in the late 1970s and that, given this contact, the sign language emerged, with structural complexity increasing from cohort to cohort. However, details of the educational setting and of linguistic documentation will be addressed in other sections.

We recommend that the grammar writer also include anecdotal evidence on the history of the sign language. For rural (or village) sign languages in particular, it will be informative to also address myths that exist concerning the origin of the language (see, for instance, Nyst (2007) for Adamorobe Sign Language, a village sign language from Ghana).

Moreover, in this section, the grammar writer will also illustrate historical relations with other sign languages (such as language families, historical influences from other sign languages, and current language contact with other sign languages). If available, the main macroscopic differences between the current sign language and its ancestor may be introduced here.

If sufficient information on the history of the sign language, or the existence of manual communication systems, is available, this chapter may have internal structure; for instance, "Origin of the sign language" (or "Myths concerning the origin of the sign language"), "Early documents", "Historical development", "External influences", etc.

Chapter 2 The sign language community

2.1 Community characteristics

A sign language community can be broadly defined as a group of people sharing the same sign language. This definition includes a variety of signers with different levels of fluency in the sign language and various degrees of integration into the local community – think, for instance, of native, early or late learners, deaf vs. hearing signers, children of deaf adults (CODAs), deaf people with cochlear implants, interpreters, etc. Note, however, that such a broad definition of signing community may generate conflicts once the situation of a specific local community is considered. In one case, a signer may be considered as part of the community irrespective of her/his hearing status or fluency in the sign language, while in another case, the same signer might be considered a "foreigner", that is, as external to the community. A potentially relevant factor of recent origin concerns whether a deaf person wears a cochlear implant, and how this is perceived by the community. In the present context, it may be of interest to consider how implanted deaf people are perceived by the community, for instance, whether this technology is perceived as a threat for the Deaf community, its language, and its culture [Socio-historical background – Section 2.3] (e.g. Cherney 1999).

To some extent, the nature of the community may depend on the social, political, and geographical context (Woll & Ladd 2003). Generally, sign language communities exist in a dominant group – minority group situation because signers constitute a minority within the hearing society. Also, with the notable exception of CODAs, they were traditionally fairly isolated from hearing members of the society as well as from neighboring Deaf communities, a fact that further contributes to the minority status. Thanks to technological advances, at least the latter type of contact, that is, contact between members of different communities, is now increasing, and cross-community links thus become more and more common.

Community characteristics may be quite different, however, in village communities where a local sign language has emerged – often due to an unusually high percentage of Deaf community members, resulting from a genetic predisposition and consanguineous marriage patterns (Nyst 2012). In at least some communities of this type, deafness is not (or at least less) stigmatized, and a considerable number of hearing members is also fluent in the sign language, a fact which obviously reduces the barrier between Deaf and hearing community members, thus leading to increased integration of the Deaf members.

Taken together, this section should (i) address the characteristics of the various community members as well as their level of integration into the sign language community, and (ii) describe the relation of the sign language community as a whole to the hearing community with which it is in contact. Note that in principle, this section could be combined with the next section on sign language users. In such a combined

section, the grammar writer could offer a typology of signers, possibly even devoting independent subsections to each type. For instance, a first distinction could be made between native and non-native signers, or alternatively, between deaf and hearing signers. While such an alternative structure would allow the grammar writer to address point (i) in a straightforward way, it is less clear how point (ii) could be included.

A final note concerns the history of the Deaf community. What we sketched so far concerns characteristics of the present-day community, but for many sign languages, it may also be worthwhile to address aspects of the community's history, in particular if it was characterized by periods of suppression or persecution (e.g. Deaf people during the fascist regime in Germany). Such details could either be included in the chapter on history [Socio-historical background – Chapter 1], in the present section, or in a separate section within Chapter 2. Note that in the present structure, aspects of community history that relate to educational settings will be addressed in the section on Deaf education [Socio-historical background – Section 2.4].

2.2 Sign language users

While the previous section sketches a general picture of the sign language community and characteristics of its users, the purpose of the present section is to provide the relevant demographic information to the extent available (see, for instance, Gras i Ferrer (2004) for LSE). In other words: this section should contain – possibly in the form of tables – concrete numbers concerning population statistics, such as: number of Deaf people (percentage of the entire population), number of hard-of-hearing people, number of signers (hearing and deaf). In Norway, for instance, there are 4–5,000 deaf individuals, but once we include in the count hearing signers like interpreters, teachers, and parents of deaf children, there are actually 16,500 users of Norwegian Sign Language. For all of these groups, subdivisions can be made based on gender or age group. Obviously, this is information that for many communities will be difficult to come by.

If possible, more specific information concerning the sign language community could be provided, such as: percentage of Deaf subjects with Deaf parents, number of Deaf people with a cochlear implant, number of deaf-blind people, number of second language learners, number of sign language interpreters, etc.

2.3 Deaf culture

It is generally assumed that – at least within some communities – Deaf people do not only constitute a linguistic minority, but also a cultural minority (Ladd 2003; Padden & Humphries 2005). In principle, a Deaf individual may at the same time be part of the national mainstream culture, but also of the national Deaf culture. It has even been

suggested that Deaf culture transcends national boundaries, that is, that due to shared life experiences, Deaf people from different cultural backgrounds share a culture.

Aspects of Deaf culture will be detailed in this section, no matter whether they are specific to the users of the sign language that will be described, or pertain to Deaf sign language users more generally. Generally, aspects of Deaf culture are closely related to issues of Deaf identity (Leigh 2008), and therefore the grammar writer may even decide to discuss these topics under a header "Deaf culture and Deaf identity" (remember that the grammar writer may choose to address Deaf culture in a separate chapter rather than in a section under the header "Sign language community"). At least three aspects should be addressed: cultural values and traditions, cultural expressions, and the existence of Deaf associations – this could even be done in dedicated subsections. For all three aspects, the grammar writer may wish to comment on their impact for Deaf identity.

Within many Deaf communities, certain cultural values and traditions are cherished (Rutherford 1988; Reagan 1995), such as the use of sign language, the exchange of information, certain greeting and parting rituals – to give just a few examples. Given that the Deaf community is rather small, it has, for example, been observed that it is common for two Deaf people who meet for the first time to inquire where the other went to school and to check whether they possibly have mutual acquaintances. Another cultural tradition that has received quite some attention are naming rituals, that is, how Deaf or hearing individuals get their name signs (e.g. Mindess 1990). The grammar writer should make an effort to identify these and other aspects that characterize Deaf culture of the local Deaf community.

As for cultural expressions, the grammar writer should report on the existence of Deaf poets and sign language poetry (Klima & Bellugi 1979), Deaf theatre (Peters 2006), and Deaf painters and writers, in particular if their artistic output reflects aspects of Deaf culture and Deaf identity (for the relation of sign language poetry and Deaf identity, see Sutton-Spence & de Quadros (2005)). Besides the focus on artistic output, it should be considered whether regular cultural events exist where Deaf and hearing people get together, such as events in the context of the World Deaf Day, theatre festivals, or "deaf discos" (e.g. "Sense" in the Netherlands). Deaf culture may also be reflected in Deaf humor, which often makes use of the iconic properties of sign language and focuses on awkward or funny situations resulting from deafness or the interaction of Deaf and hearing people (where often the hearing people are portrayed as those who don't understand) (Sutton-Spence & Napoli 2012). Characteristics of Deaf humor may therefore also be addressed in this section.

Finally, Deaf associations, local Deaf clubs, and other groups where Deaf people get together are an important component of Deaf culture, although their impact may, of course, go beyond cultural significance as they often offer more mundane, practical support for the Deaf community. Still, their activities generally create a sense of solidarity and cohesion and thus strengthen Deaf culture and identity. As for Deaf clubs, it has been observed that their importance is decreasing (Padden 2008), as

Deaf people now often choose other ways/places for interaction – thanks to technological advances and also increased self-confidence. An overview of such associations and groups should be provided (including important ones that do not exist anymore), together with the history of the most important organizations and their role in supporting, preserving, and disseminating sign language and Deaf culture. How are the various types of signers integrated in the different associations/groups? It may be particularly important to include groups that focus on specific topics (e.g. *Dovenshoah* 'Deaf Shoah' in Amsterdam: http://www.dovenshoah.nl/) or specific populations (e.g. homosexual Deaf people, deaf-blind people). It may even be informative to address when and to whom the first sign languages courses were offered, and where sign language classes are offered at present (but this could also be done in the section on language attitudes [Socio-historical background – Section 3.3]).

2.4 Deaf education

This section will be devoted to presenting how education of deaf children has been and is structured, with special attention to the role and importance of sign language in the education of deaf children. Given the fact that the vast majority of signers are not born into signing families, the primary social environment for language transmission (and sometimes language emergence, see the Nicaraguan case) are deaf schools. This makes the description of the education system and the different deaf schools crucial for the history of sign language and the Deaf community.

Consequently, the grammar writer will describe here how the education system for deaf children was organized in the past and is organized at present. What was and is the language policy at these schools? Options include: (i) strictly oral teaching methods (e.g. Samuel Heinicke in Germany in the 18th century); (ii) methods that combine natural signs with signs that represent words/morphemes (e.g. the method used by De L'Épée in Paris in the 18th century); (iii) bilingual (bicultural) programs that combine the use of sign language and spoken/written language. Crucial changes in the education system of the dominant community and their impact on the sign language are also discussed in this section – think, for instance, of the impact of the 1880 Milan congress (Lang 2003; Moores 2010).

The description of the school system may be guided by a distinction between residential and non-residential schools, or by educational methods. A map of the most important schools may be provided including information about:

- what type of children attended/attend the school (deaf only, deaf and hard of hearing, mixed classes including children with other disabilities, or mainstreaming);
- whether the school was mixed or for one gender only, whether it was religious or secular, or whether other segregating criteria played a role in restricting access to a school (e.g. schools for African-American pupils in the United States);
- whether the school was public or private.

The existence of Deaf schools, in particular boarding schools, is known to have had an important impact on the Deaf community in some countries. The concentration of pupil populations at individual schools may, for instance, give rise to sociolinguistic variation and dialects (see e.g. McCaskill et al. (2011) for Black ASL; LeMaster & Dwyer (1991) for gender variation in Irish SL). For example, in the Netherlands, a rather small country, lexical variation is clearly related to the existence of five schools for the Deaf. Findings concerning sociolinguistic variation [Socio-historical background – Section 4.4] will be addressed under the header "linguistic study", but still, the grammar writer could include here a brief discussion of the (historical) impact of the educational system on variation, possibly providing some illustrative examples of signs from the core lexicon [Lexicon – Section 1.1] that differ between schools.

As for the present situation, we suggest the grammar writer also address specific policies at individual schools, for instance, the use of forms of sign-supported speech, the combination of different communication forms within one classroom, the placement of children with cochlear implants (which may now constitute the majority), the use of interpreters, the availability of individual speech therapy, the availability of sign language courses for parents and/or staff members, etc.

Chapter 3 Status

The status of a language is commonly defined in terms of its official recognition by the relevant political institution. Most aspects of language planning are connected to the status of a language, that is, whether it is officially recognized as the language of a specific (minority) community. Connected to the status, but still different from it, is the prestige of the language. In the case of sign language, this can be addressed from the perspective of the signing community and from that of the non-signing community.

Although a specific sign language may not be officially recognized by law, it is possible that various institutions make reference to sign language and may require its use in specific situations both public (e.g. in court rooms) and private (e.g. during legal transactions like selling/buying a house). For instance, in a particular country, a sign language may be mentioned and recognized as a natural language by a disability law (e.g. declaring the right for interpreters in specific situations), but may at the same time not be officially recognized as a minority language in that country. This weakens the connection between status and official recognition, since public institutions require the use of a language (implicitly recognizing its status) that is nowhere else recognized. Notice that this situation is crucially different from cases in which the use of a foreign spoken language is required in official situations.

In this section, the grammar writer will address issues related to the status of the sign language. This does not only imply the official status of the sign language, as

reflected in the country's legislation, but also includes topics that are not governed by law, but rather are initiated by associations or reflect common policies. In addition, the section may report on language attitudes, that is, opinions concerning the status of the language at the population level. Note that the content of this section may look rather different in the case of rural sign languages, in particular if they are shared by the Deaf and hearing population.

3.1 Current legislation

Within this section, the grammar writer may wish to proceed from the status of sign language in the broader perspective of supranational institutions to their status in national institutions. In the case of European sign languages, for instance, the grammar writer may summarize the current status of the legislation at the level of the European Union, and then focus on whether and how European prescriptions/laws are concretely implemented in the specific country (for "linguistic human rights" of Deaf people, see e.g. Krausneker (2008)). In some cases, more local institutions are ultimately responsible of the recognition. It is important to note that legal recognition of a sign language does not necessarily imply official status of the sign language.

The grammar writer may also discuss whether the sign language is recognized (as a minority language) by a constitutional law, as for instance in Finland, or whether the sign language has legal status through some other law (e.g. as part of a set of tools to be used to treat deafness), as in France and Spain, for instance. In some countries, the sign language may be recognized by autonomous regional governments but not at the national level. How the Deaf community reacted to the recognition may also be reported in this section.

If the sign language is not recognized, the grammar writer may report on previous efforts and current perspectives, for instance, on whether there is a debate about recognition and whether there have been attempts to draw a law aiming at recognizing the sign language. In the Netherlands, for instance, the discussion about the official recognition of NGT has been going on since the late 1990s. One prerequisite for the legal recognition of NGT was the standardization of the basic lexicon. In 2002, this project was completed, but still, legal recognition has not yet been granted (Schermer 2003). Efforts like this should be mentioned in the present section, but standardization as an instrument of language policy will be addressed in more detail in the next section.

3.2 Language policy

This section will illustrate and discuss how concrete actions supporting the use and the spreading of sign language have been put forward by public and private institutions and organizations (for overviews, see Reagan (2001), Schermer (2012),

and Quer & Quadros (2015)). An important component of language policy (sometimes also called "language planning") is standardization. If there have been efforts of standardizing the sign language, this should be reported in this section. What institutions or subjects were involved? How was standardization approached and what (linguistic) decisions were taken? What was the outcome, and how was it received by the Deaf community? Standardization of a language falls under corpus planning which involves prescriptive interventions in the forms of a language. Moreover, corpus planning includes the codification of language, be it by means of dictionaries [Socio-historical background – Section 4.2] or grammatical descriptions [Socio-historical background – Section 4.1] (Schermer 2012).

Another type of language planning is status planning. Obviously, this includes the status of the sign language and its legal recognition, as discussed in the previous section. However, at a more practical level, the grammar writer is encouraged to also address whether the presence of sign language and sign language interpreters in the national media and at important political or social events is supported, as visibility of the sign language will also contribute to its status. In this context, it may also be informative to mention whether journals exist that are dedicated to Deaf issues (e.g. sign language, Deaf culture, social issues), such as e.g. the *American Annals of the Deaf* (since 1847), *Das Zeichen* in Germany, and *Woord & Gebaar* in the Netherlands.

Finally, policies concerning sign language acquisition should be addressed, that is, all efforts and strategies concerning the teaching and learning of sign languages (i.e. acquisition planning). Often national centers or Deaf associations are actively involved in such efforts, such as, for example, the Dutch Sign Center in the Netherlands. As pointed out by Schermer (2012: 904), "[a]cquisition planning is crucial for the development and survival of sign languages and should be taken more seriously by sign language users, researchers, and governments than has been done to date". Questions to be addressed include: Are deaf teachers present in schools where signing deaf children are enrolled? Where are sign language courses offered, and how are they structured? Where are teaching materials developed, and what are the institutions that are responsible for evaluating the quality of the materials? How are sign language interpreters trained (including whether interpreter training programs exist at universities)? Obviously, this discussion may have a link to the section on Deaf education [Socio-historical background – Section 2.4], as it may also address the availability of sign language courses at schools.

3.3 Language attitudes

This section pertains to the prestige of the sign language within a community (Burns et al. 2001; Hill 2015). Two different aspects can be addressed, namely (i) how Deaf signers see their language and (ii) how non-signers see the sign language – this could even be done in separate subsections.

The recognition of sign languages as natural languages, as well as their linguistic study, are of fairly recent origin. Given that sign languages have long been considered inferior communication systems and that the use of sign languages has often been forbidden in the past, it is likely that attitudes towards sign language differ between generations – in the Deaf and hearing population. As for the former group, the grammar writer will discuss possible differences among signers that might influence or limit the occasions of sign language use and how these are related to age, gender, fluency in the sign language, level of awareness, hearing status, etc. How magazines, websites, and other media that are produced by the Deaf community treat sign language issues can also be discussed in this section.

As for the second group, the non-signers, this section will be devoted to describing how non-signers perceive sign language. What is the prestige of sign language outside the signing community? On the one hand, the grammar writer may want to consider whether there are official positions by sign language supporting associations, and how the sign language is generally presented in the national media. If clearly present, the often biased medical perspective on deafness may also be included. On the other hand, the perception of the lay person, that is, people who have no first-hand experience with either sign language or deaf people, should be reported here. What are the common misconceptions? The grammar writer should be aware of the fact that the level of awareness and the knowledge about sign language in the surrounding hearing society varies from country to country.

Chapter 4 Linguistic study

This section is meant for providing an overview of previous linguistic, lexicographic, and sociolinguistic research on the sign language to be described. Obviously, the grammar writer should not go into too much detail – in particular in the section on grammatical description – as findings from previous studies on aspects of the language's grammar/lexicon should be included in the respective sections in subsequent parts.

4.1 Grammatical description

In this section, the grammar writer will provide an overview of previous studies on the phonological, morphological, syntactic, and pragmatic structure of the sign language. It should also be pointed out whether individual studies focused on a particular variant/dialect of the sign language. It is not the purpose of this section to evaluate or criticize previous findings – although the grammar writer could point out whether certain findings should be taken with a grain of salt (e.g. given the methodology used

or certain participant characteristics). If two studies investigated the same domain but offer conflicting findings, this should be made clear.

4.2 Lexicographic work

While detailed grammatical descriptions of individual sign languages are scarce, lexicographic works of varying size exist for a fair number of sign languages. The existing works should be described in this section. Note that we use the term "lexicographic work" in a broad sense here. The grammar writer is encouraged to also report on historical sources that may only contain drawings or photos of a small number of signs (e.g. pamphlets and journals; see Woll (1987) for BSL). Sometimes, lists of signs are provided in more general works documenting the history and/or use of a sign language (see, for instance, Mallery's (2001[1881]) monograph on Plains Indian Sign Language).

In addition, the grammar writer should describe more comprehensive dictionaries, be they in print or digital form. How many signs and what type of information does the dictionary contain? How are the lemmas organized (based on gloss in the spoken language or based on phonological characteristics of the sign)? Does the dictionary include example sentences that illustrate the context in which a particular sign may be used? Does it include a grammatical and/or historical sketch of the sign language? Are regional variants and/or standardized forms of signs included (Johnston 2003)? If the dictionary exists in book form, does it contain photos or drawings?

4.3 Corpora

In recent years, corpora of considerable size have been compiled for some sign languages (e.g. Auslan, NGT, Polish Sign Language). These corpora may contain different types of data, such as dialogues between signers (be they free conversations or discussions based on pre-specified topics) or retellings of stories or animated cartoons. Corpus data have been a rich source of data for linguistic and sociolinguistic studies.

If a corpus exists for the sign language under investigation (or maybe multiple corpora), then the grammar writer should provide details about it. The presentation should include information about the number of signers involved, participant characteristics (such as age, gender, region, family background), amount of data, and data types. Annotation strategies could also be described (e.g. Are left and right hand annotated separately? In how much detail are non-manuals annotated?), as well as whether the annotations are linked to a lexicon.

It should also be pointed out whether the corpus data were taken into account in writing the grammar.

4.4 Sociolinguistic variation

For various sign languages (e.g. ASL, Auslan, BSL), parameters of sociolinguistic variation have been investigated and described in some detail. Such descriptions may focus on diachronic and/or synchronic variation, and for both types of variation, they may address variation at the lexical, phonological, morphological, syntactic, and discourse level (for overviews, see Lucas et al. (2001), Schembri & Johnston (2012), and Bailey et al. (2015)). An important factor in sociolinguistic variation is Deaf education [Socio-historical background – Section 2.4]. In particular, the existence of different schools for the Deaf in a country has been found to be the source of, for instance, regional and gender variation. Other external factors that may trigger variation are age, ethnicity, and socio-economic and language background – and again, at least some of these may result from the schooling system.

Hence, in this section, the grammar writer should describe what is known about sociolinguistic variation in the sign language and, where applicable, make a link to the discussion of Deaf education. The description could be complemented by a few illustrative examples. While the examples to be included will likely reflect lexical variation, which is often the most obvious type of variation (e.g. signs for the same concept from different regions), the grammar writer should make clear whether the grammatical description to be offered represents a particular variant, or whether it also takes into account sociolinguistic variation (e.g. regional variation in word order). Note that phonological variation resulting from the linguistic context (e.g. assimilation) need not be addressed in this section, as it will probably be discussed in the section on phonological processes [Phonology – Section 3.1].

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Part 2: **Phonology**

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Chapter 0 Preliminary considerations

0.1 What is phonology?

This part deals with the various properties of the perceivable form of sign languages, and the related phonological representations and processes. While Stokoe, in the first analysis of the building blocks of ASL (1960), preferred to use modality-specific terms (namely "cherology" and "chereme" instead of "phonology" and "phoneme"), the term "phonology" is now commonly adopted for this domain of sign language grammar. Stokoe used alternative, sign language-specific terms in order to highlight the differences between sign and speech; after all *phono* refers to sound (while Greek *χείρ* means 'hand'). Modality differences certainly affect what the phonology of sign languages looks like, but we suggest that specific grammars do not deal explicitly with these differences, but rather focus on the similarities when it comes to phonological form. This is what this part of the Blueprint implicitly tries to do, and we therefore adopt the by now common strategy of using "phonology" in a modality-independent way, that is, as dealing with the smallest elements of language that can distinguish meaning but do themselves not carry meaning.

0.2 Organization of the Phonology Part

This part is divided into three chapters: (i) sublexical structure, dealing with the phonology below the level of the syllable (which in sign language tends to overlap with the word); (ii) prosody, dealing with the syllable and prosodic constituents above the word up to the utterance level; (iii) and finally phonological processes. Both at the lexical level and at the supra-lexical level, manual and non-manual features may play an important role. In the specific examples from individual sign languages we provide, the emphasis may implicitly lie on either one of them, but the grammar writer should keep an open eye to both manual and non-manual phenomena at all levels of phonological organization.

0.3 How to use the Phonology Part

The overall organization of this part reflects, on the one hand, the different units of phonological organization from the phonemic level up to the utterance level (this is done in Chapters 1 and 2). On the other hand, it also includes a separate chapter in which phonological processes are illustrated. The structure of this latter chapter also reflects the various levels of phonological organization, presenting the processes as affecting phonological units of increasing size. The grammar writer may decide to organize/distribute the content of this part differently, that is, in such a way that

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phonological processes are not discussed within a separate chapter, but rather as subsections of the relevant phonological levels. Phonemic processes, for instance, could be addressed at the end of the chapter on sublexical structure (Chapter 1), while a discussion of processes affecting the syllable might be included at the end of the syllable section (Section 2.1.1), etc. This way, the content of Chapter 3 would be redistributed as subsections of either Chapter 1 or Chapter 2.

Chapter 1 Sublexical structure

1.0 Definitions and challenges

1.0.1 What should go into this chapter and what should not?

The sublexical phonological structure contains all the formal aspects of signs (in terms of phonological features) without reference to their morphological or other functions. Descriptions of typical iconic meanings associated with certain phonological features (for instance, a certain handshape or location being used exclusively or predominantly iconically) can be included in the respective subsections; if this concerns handshapes from the manual alphabet or the counting system, they will be included in Section 1.1.3. Notes on language-specific phonetic features (exceptional or language-specific articulations, for instance) could be made within each of the subsections.

As most of the discussion of sublexical structure is devoted to manual articulations, the section on non-manuals comes all the way at the end. However, the grammar writer can consider presenting an overview of the relative role of manual and non-manual articulators at the beginning of Chapter 1 on sublexical structure, that is, before proceeding to the details of the manual components.

1.0.2 Methodological challenges

The key task for the grammar writer in this chapter is to describe only the phonological patterns observed in the language, and not all of the subtle phonetic distinctions. Phonological properties are those that recur systematically in many forms in the lexicon, in other words, that are *contrastive*. Their phonetic form (the precise articulation) will vary from context to context, depending on the signing speed, the neighboring sign forms, etc. It is important that the grammar focuses on what is constant across these variable forms: their phonological representation. On the basis of the comparison of phonological forms, the elements of the phonological grammar of the language can be extracted.

In the prototypical case, phonological forms can be illustrated with minimal pairs for each feature, but in languages with small lexicons, this strategy may at times prove difficult. It may be worthwhile to address this point in the introduction

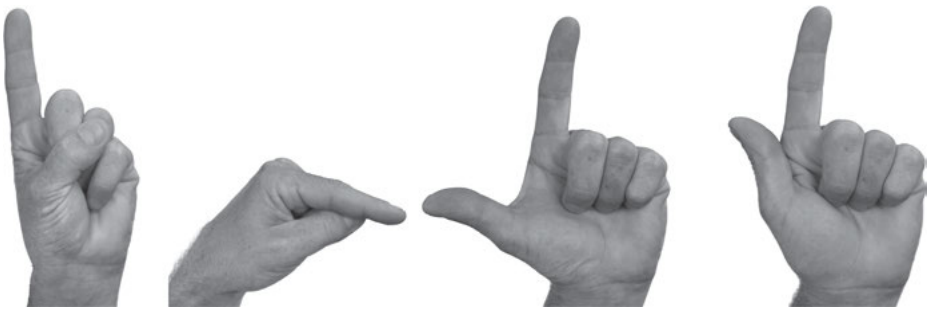
to the phonology part of the grammar, but the grammar writer should still attempt to provide minimal pairs in illustrating instances of phonological properties. Near-minimal pairs could be an alternative, with a short note explaining what the additional contrast in the pair is.

The distinction between phonological features that must be discussed and further phonetic distinctions that are not to be discussed is not an easy matter and depends on a detailed phonological analysis. For instance, looking at the orientation of signs in the language, one can take a phonetic point of view and say that virtually any palm and (extended) finger orientation occurs in the language. In that case, there is little to say in the section on orientation [Phonology – Section 1.1.2]. However, with additional effort, one can also attempt to abstract away from these phonetic forms by looking at the side of the articulator that faces the (final) location of the sign, which is called "relative orientation".

1.1 Active articulators

This section describes the lexical patterns that can be found with regard to hand configuration of the two primary active articulators, the two hands. Hand configuration is understood to comprise both handshape and orientation (Sandler 1989). Phonemic handshapes can be listed in Section 1.1.1, with notes about exceptional handshapes and/or the subclass of handshapes found in the manual alphabet and in number signs to be added in Section 1.1.3. If the description of the handshapes is made in terms of the features they are composed of (selected vs. unselected fingers and their configuration), this can be made explicit in Sections 1.1.1.1 and 1.1.1.2, respectively.

The terms "handshape" and "active articulator" are not completely synonymous, and depending on the perspective of the grammar writer, an explicit choice should be made for using either one versus the other or for using both. A handshape is a *phonetic* realization of a bundle of articulator features, a concrete realization that is always depicted in terms of the configuration of the whole hand. An example involving the ☝-hand is shown below.



Different realizations of the ☝-hand, from left to right: ☝-hand, index extended, thumb folded over fist; ☝-hand, index bent, thumb folded over fist; ☝-hand, index extended, thumb extended; ☝-hand, index extended, thumb parallel to index

The *phonological* concept of "active articulator" highlights that only a subset of the hand, such as a single selected finger, can be the phonologically specified active articulator (Crasborn 2001). In the example of the selected index finger, even the question of whether it is bent or extended at the proximal interphalangeal joint is a matter of phonetics (see second image above). The same holds for whether the thumb is extended or parallel to the index finger (third and fourth picture). That is to say, the position of the thumb or of the other fingers is predicted to be variable across different realizations (van der Kooij 1998). These specific generalizations hold for NGT and BSL (cf. Fenlon et al. 2013), and may be different for other sign languages. As most descriptive works make use of visualizations in the form of drawings or photographs, a specific handshape must be determined as the prototypical realization of the extended finger in this example. Ideally, the grammatical descriptions in this section also provide a more abstract analysis in terms of active articulator features, and the set of descriptive handshapes are likely to form part of dictionaries for the language.

1.1.1 Phonemic handshapes

A description of the phonemic handshapes used in the language is created on the basis of an analysis of the lexicon of the language. If applicable, handshapes that are only used for specific domains (such as initialized signs [Lexicon – Section 2.2.2.1]) can be grouped together. Otherwise a grouping by number of selected fingers is to be preferred. A further discussion of handshapes in terms of the two following subsections (Selected fingers and Finger configuration) is optional. Its inclusion will depend on the depth of the phonological analysis performed for the language.

1.1.1.1 Selected fingers

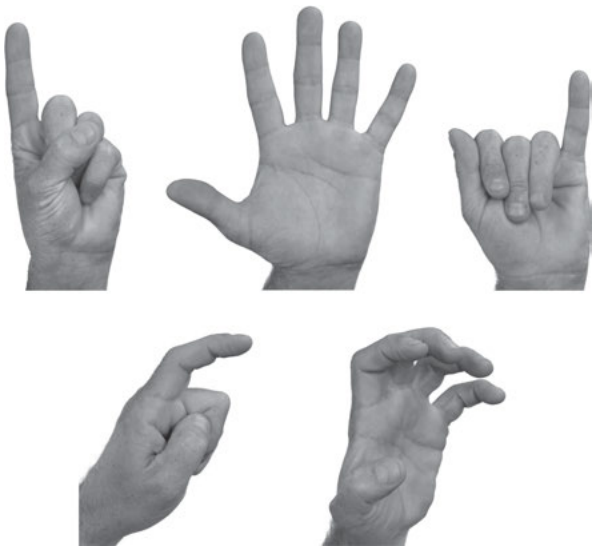
Aside from the list of handshapes, a list can be created of which (combinations of) selected finger(s) has been established to be active in the language. For instance, can all individual fingers act as a selected finger on their own, whether in extended or bent configuration? A tabular overview of selected finger combinations and the handshapes listed in Section 1.1.1 in which they occur will help the reader see more structure in the list of handshapes. Alternatively, such a table can also be used in 1.1.1 to order the presentation of handshapes.

It may be helpful to present to the reader how the identification of selected vs. unselected fingers is commonly done, that is, by looking at three criteria (Sandler 1989; Brentari 1998): (i) selected but not unselected fingers can be in a specific configuration; (ii) selected but not unselected fingers can have hand-internal movement; and (iii) it is typically the selected fingers that contact a location.

The unselected fingers in a handshape are typically in a predictable position, but this need not always be the case. If necessary, the configuration of (some of) the unselected fingers can also be described in this section. In the example of the ☝-handshape above, the thumb tends to be adducted or folded over the middle, ring, and pinkie fingers, so that it is "out of the way". If in the language there is a (non-distinctive) contrast between signs that have the thumb extended vs. folded away, while still having the index finger as the only selected finger, then this could be described.

1.1.1.2 Finger configuration

The possible configurations of different groups of selected fingers (sometimes referred to as "finger position") need to be characterized in this section. Which configurations (such as extended, curved, or clawed) are observed in the language, and which configurations are found for which (sets of) selected fingers? The below figure provides examples of handshapes with different fingers extended and in different configurations.

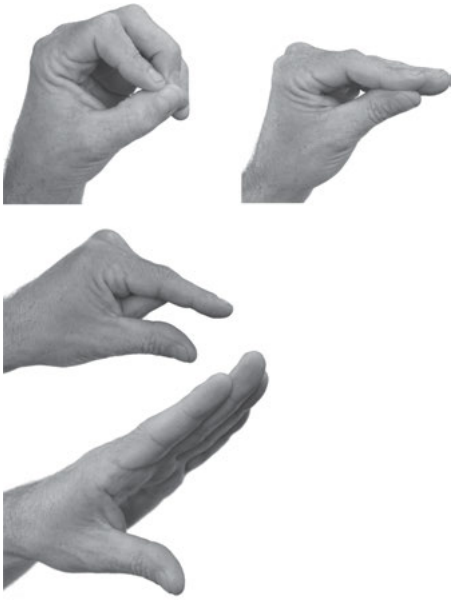


First row: index finger extended (1-hand), all fingers extended (5-hand), pinky extended (I-hand); second row: index finger curved, all fingers curved

If the language supports generalizations such as the one described for the index finger above, whereby bent configurations are the phonetic by-product of articulating extended fingers together with a certain combination of location and

orientation features (van der Kooij 2002), it would be useful to make this explicit in this section. That leaves open the option of including them here in the list of configuration features. Similarly, if the configuration "clawed' is only found in combination with tense movement, it could be explicitly excluded from the list of finger configurations but mentioned as an alternative articulation in a footnote, for instance.

In addition, the configuration in terms of an aperture relation between the thumb and (some of) the other fingers needs to be specified, as well as any possible restrictions on combinations of aperture features and other configuration features. The number of distinctions for the language at hand therefore needs to be established by the grammar writer. The below image illustrates handshapes with different aperture relations between thumb and other fingers.



First row: O-hand (closed, curved), Closed Beak-hand (closed); Second row: Q-hand (half open); Third row: Beak-hand (open)

Finally, any possible changes in finger configurations should be mentioned in the section on secondary movements [Phonology – Section 1.3.2] / secondary movements. For example, can all aperture relations be dynamic in nature, changing from open to closed or vice versa, or is this somehow restricted to certain selected fingers, for instance, or only to closing movements?

1.1.2 Orientation

The primary challenge for describing possible orientations observed in the lexicon of the language lies in choosing a consistent perspective with associated terminology. The orientation of signs can be characterized in different ways. In terms of *articulation*, the rotation of the forearm can be characterized by its extremes supine and prone, and anything in between (with neutral for the midway position). Alternatively, the orientation of the whole hand in terms of the direction in which the palm and fingers (imagining they were fully extended) can be specified for a sign; this is called *absolute orientation*. Finally, the *relative orientation* refers to the side of the hand that faces the location or the end point of the path movement in a sign.

The two NGT examples below illustrate the various possible positions.

	WHAT-IF	TO-THANK	(NGT)
Articulatory orientation	neutral	supine	
Absolute orientation – palm	contralateral	backward	
Absolute orientation – fingers	upward	upward	
Relative orientation	thumb side	palm side	

While each of these could be useful in characterizing the form of signs in a dictionary, both articulatory and absolute orientation are likely to be very hard to describe in terms of language-specific properties. Almost any possible (combination of) articulator and absolute orientation value(s) is likely to be found in the language, and the grammar will gain little insight into language-specific properties. By contrast, among the six possible values of the relative orientation – i.e. thumb (radial) side, pinky (ulnar) side, palm side, back of hand side, fingertip side, and wrist side – it could well be that one or more of the values is not found in any particular language. As in other parts of the grammar, if nothing specific can be said about orientation other than "a wide range of forms is observed", it is perhaps better to leave the section blank than to include a random list of example forms. Thus, this section as a whole is optional.

1.1.3 The manual alphabet and number signs

Phonological properties of manual alphabets and number signs (numerals [Lexicon – Section 3.10.1]) can be specifically highlighted if they are analyzed as the cause of exceptions to the phonological patterns described in the section on contrastive (phonemic) handshapes [Phonology – Section 1.1.1]. Sign languages commonly manifest exceptional handshapes that are specific to their use in fingerspelled words and in lexicalized signs derived from fingerspelling [Lexicon – Section 2.2.2]. Examples are the letter F and its use in the NGT signs FRENCH and FAMILY. In NGT, this handshape is characterized by an uncommon position of the selected fingers (not simply closed aperture between index and thumb, but a position of the thumb on the medial side of the flexed index finger – see leftmost image below).

#F FRENCH FAMILY (NGT)

Similarly, the number system in some sign languages has been identified as the location of exceptional handshapes. They should be listed in the grammar to the extent that they have been identified.

1.1.4 Other active articulators

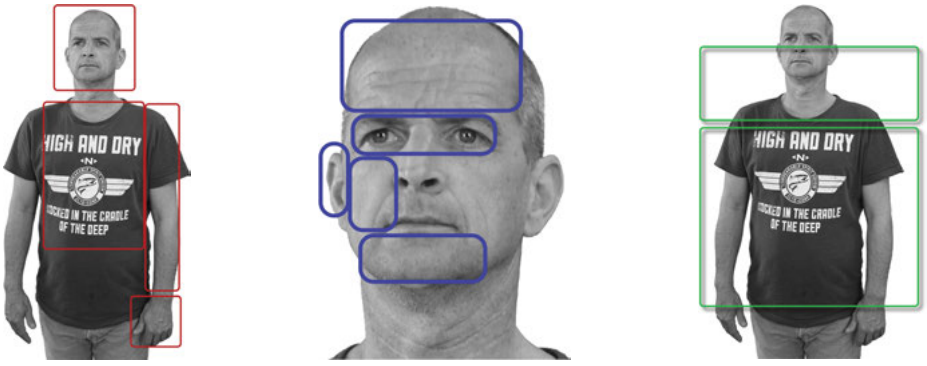
In some languages, the arms or legs are used as the active articulators in some signs, as in the AdaSL signs FOOTBALL and REFUSE (Nyst 2007). There may also be signs where none of the extremities are involved in the articulation. While this is common for bound morphemes such as adverbial mouth gestures [Lexicon – Section 3.5], it appears to be less common for free morphemes that are content words. An example is the NGT sign MENSTRUAL-PERIOD, where the tongue pushes the cheek outwards. Both types can be discussed in the section on non-manuals [Phonology – Section 1.5].

If the mouth or other non-manual articulators act as the only active articulator in a lexical item, this can be described in the present section.

1.2 Location

An inventory of locations on the body, the head, the arm, the non-dominant hand, and in the space in front of the signer can be presented as a simple list of phonologically distinctive locations clustered per major area. Research has indicated that sign languages tend to make more fine-grained location distinctions on the head (e.g. chin, side of mouth, cheek) than on the body, as the head is the area of highest visual acuity (signers usually look at each other's face while communicating), and the grammar writer may wish to address this fact in this section. In the light of findings for some sign languages such as NGT and VGT (van der Kooij 2002; Demey 2005) that certain locations only occur when they are iconically motivated, special attention should be devoted to the relative frequency of different locations and the possible exceptions that are motivated by form-meaning relationships.

Thus, in this section, an effort should be made to address (list) all phonologically distinctive locations. Yet minor locations (or settings) within the major body areas will likely make another appearance in the section on path movements [Phonology – Section 1.3.1]. For instance, a downwards movement on the chest is in some theories analyzed as a change in setting from 'high' to 'low', but it is more intuitive to discuss this under movement. A graphic visualization of the body and spatial locations and possibly location-internal distinctions can be useful for the reader, cf. the fictitious example below.



Body: head-trunk-shoulders-upper arm-hand (left image); Face: forehead-ears-eyes-cheek-chin (middle image); Space: high-low (right image)

Location distinctions in space that are not used in the lexicon but only in morpho-syntactic or gestural constructions are not to be discussed in this section, but can be referred to by section number.

1.3 Movement

The movement component of signs can be described in terms of primary or path movements and secondary or articulator-internal movements (Sandler 1996; Brentari 1998). The former involve movement of the whole hand (on the body or in space) while the latter consist of changes in orientation and/or hand configuration, as well as finger movements like finger wiggling. The terminology may be a bit confusing in that some signs have only a secondary movement. Some phonological models try to describe all movements as changes in one of the other parameters, such as changes in location and changes in finger configuration. This may indeed be an alternative way of structuring this section.

Besides providing a list of attested phonological movements, a key question that should be addressed in this section is which types of movements may combine in signs. Can all path movements combine with all secondary movements, and can all types of secondary movements combine with each other? This issue should be addressed in the subsection on secondary movement.

Some phonological models have used the syllable [Phonology – Section 2.1.1] / syllable concept as a central organizing template for movement in signs (Wilbur 1990; Corina 1996; van der Kooij & Crasborn 2008). If consistently applied, this movement section could also be organized along the lines of syllable structure and constraints on the syllable. If characterized as a syllable-level phenomenon, movement and movement combinations could thus be readdressed in the section on syllables.

The manner of movement typically affects the whole sign, and possible movement manners – such as tense vs. lax movement and quick vs. slow movement – can therefore best be described in this introductory section (but might make another appearance in the prosody [Phonology – Chapter 2] chapter)

Timing properties of movements such as alternating two-handed movements and movement repetition may either be specific to either path or secondary movements or apply to all movement components equally. Depending on their distribution, such features can either be discussed in this introductory section or in the two following subsections.

1.3.1 Path movements

Path movements or changes in location may be a simple change from start to end location, or may have a specific shape. Patterns and exceptions in the movement shape need to be discussed in this section. Typical shapes that occur in many sign languages are straight, circle, arc, spiral, and waves. For non-straight movements, it could further be specified whether the non-straight shapes may occur in all possible

different planes, or whether, for example, arc-shaped movements only occur in a plane parallel to the body.

1.3.2 Secondary movements

Secondary movements refer to changes in handshape and/or orientation. It has been observed for many sign languages (basically, all sign languages studied to date) that in a handshape change, only the finger configuration may change, and not the finger selection (this is sometimes referred to as the "Handshape Change Constraint"). Signs with changes in finger selection are exceptions that can be explained by their etymology, for example, by the fact that they are based on the fingerspelling system, as is true for the NGT sign BLUE (Dutch *blauw*) below, which consists of a sequence of a B- () and an L- () handshape.

BLUE (NGT)

Finger configuration changes can be subdivided into aperture changes, finger configuration changes proper (bending, clawing, extending), and other changes such as wiggling fingers.

Changes in orientation may be difficult to establish in terms of phonological contrast, as the phonetic orientation of the hand in space is likely to change a bit in every articulation. Many changes in absolute orientation can be considered as phonetic by-products of path movements. This can be the case in arc-shaped path movements as in NGT MORNING, but also in straight path movements as in NGT SAY (see pictures below; cf. Crasborn 2001). Like elsewhere in this chapter, this section should only describe those types of orientation change that can be considered phonological features of the lexicon. Rotations of the forearm (90 or 180 degrees) are rarely a by-product of other articulations, and are a recurrent phonological category in many sign languages (as in NGT DIFFICULT).

MORNING

SAY

DIFFICULT (NGT)

As mentioned above, this section should also include a discussion of possible and non-attested combinations of secondary movements with (i) path movements and (ii) other secondary movements.

1.4 Two-handed signs

There are different ways of describing the phonological patterns observed in two-handed signs. Many grammar writers will be familiar with Battison's (1978) classification of signs according to the two parameters of movement (one or both hands moving) and handshape (same or different). As a common observation on many sign languages, the grammar writer can examine to what extent Battison's (1978) Symmetry Condition and Dominance Condition apply to the sign language under investigation. According to the former, in signs with two moving hands, the handshapes must be identical and in a similar (identical or mirrored) orientation. According to the latter, if the handshapes of a two-handed sign are different, then one hand acts as the location of the other, moving, hand, and in addition, only a limited number of handshapes can act as a location. The grammar writer should specify what these handshapes are, and what the specific exceptions to the two conditions are (if any). Examples of different types of two-handed signs from LSE are presented below, where in each case the weak hand has the 𓂝-handshape (one of the handshapes that is allowed to occur both in symmetrical and in asymmetrical signs).

Later phonological analyses of most sign languages have suggested a distinction between symmetric signs and asymmetric signs that more elegantly captures the patterns that can be observed (van der Hulst 1996). The distinction between the two lies in the role of the non-dominant hand: does it function as an active articulator (a moving hand), or is it merely the place of articulation (the passive articulator, cf. spoken language phonetics)? If the language provides evidence for the latter distinction, it is to be preferred that this contrast be used in the grammar – as is done in the following two subsections. Alternatively, a language-specific typology can be created. The elegance of this alternative description lies in accounting for the fact that in

GOALKEEPER

IN-FAVOUR (LSE)

CENTER

DATABASE (LSE)

asymmetrical signs, there is no additional location specification: the weak hand is the only location in the sign. Symmetrical signs, by contrast, have an independent location specification. Note that in asymmetrical signs, the two handshapes may also be identical.

1.4.1 Symmetrical signs

For symmetrical signs, any phonotactic restrictions on the location, handshape, or orientation can be described here. For the movement, the types of alignment between the two hands in time needs to be discussed: are alternating movements possible or not, and are the alternating movements synchronous or do the two hands move one at a time?

1.4.2 Asymmetrical signs

For asymmetrical signs, the possible locations on the weak hand can be discussed in the section on location [Phonology – Section 1.2]. What is useful to spell out in this

section is the extent to which locations on the non-dominant hand can be exhaustively described by specifying only a *side* of the hand (such as palm side and finger tips), or whether the handshape on the non-dominant hand is also phonologically distinctive. For some sign languages, it has been suggested that a specification of handshapes is only needed for those signs that are actually morphologically complex, the handshape of the weak hand (possibly together with its orientation) forming a separate morpheme (Brennan (1990) on BSL; van der Kooij (2002) on NGT). In the latter case, it could be decided to discuss such forms only in the morphology chapter. For some other languages, like ASL in Battison's (1978) analysis, there is an exhaustive list of handshapes that can occur on the weak hand.

If the choice of handshape on the weak hand is a phonologically distinctive property of the lexicon of the language, then this needs to be made explicit in this section, possibly with additional discussion on the range of handshapes observed on the weak hand.

1.5 Non-manuals

Non-manuals are separated into mouth actions and other non-manuals. They are described in this section only insofar as they are part of the phonological description of lexical signs. Non-manuals that function as intonational elements are to be discussed in the chapter on prosody [Phonology – Chapter 2].

Mouth actions are in turn divided into those that are formed on the basis of spoken language words (whether reduced or not; in either case, they are called "mouthings"), and those that are not ("mouth gestures") (Boyes Braem & Sutton-Spence 2001).

In the prototypical case, a mouth action is a phonological feature of a manual sign, but if the language also features lexical elements that only consist of non-manual elements (as in the NGT example MENSTRUAL-PERIOD mentioned above), these also should be mentioned in this section.

1.5.1 Mouth gestures

Mouth gestures bear no synchronically relevant relationship to spoken language words, even though some might be diachronically derived from mouthings. A core issue to discuss for mouth gestures is the extent to which they pattern as phonological elements, recurring in different lexical items. In many sign languages, many mouth gestures would appear to occur only in single lexical items. For instance, the mouth gesture 'sh' (IPA [ʃ::]) in NGT only occurs with the lexical item BE-PRESENT. They could thus be argued to be more profitably described in the lexicon, only providing in this section an indication of the variety of forms and which of them do appear to act as phonological elements.

In terms of the form of the mouth gestures, there are no conventions, and the grammar writer is urged to make explicit descriptions in terms of articulation and provide videos of the form.

1.5.2 Mouthings

While it is clear from the definition that mouthings are (parts of) spoken language words, this section needs to discuss the extent to which it is common in the language to accompany signs with mouthings, and whether this is restricted to certain users or uses of the language. In the section dealing with the non-native lexicon [Lexicon – Chapter 2], the role of mouthings in the lexicon is further discussed.

Further, the extent to which manual forms can be combined with different mouthings can be discussed if this has been studied, including what the semantic relations between sign and mouthings are. For instance, it is relevant to distinguish cases where the mouthings distinguish manual forms that without the mouthings would be homonyms coming from unrelated semantic fields (like DOCTOR and BATTERY in NGT) from cases where the mouthings specify the semantics of a broader concept expressed by the manual form – as is true for the Dutch mouthings *broer* ('brother') and *zus* ('sister') accompanying the sign SIBLING in NGT.

In terms of representing the form of mouthings in the grammar, it is common to use the orthographic form of the language, at least for languages that use a roman script. One could also consider using an IPA transcription, although ideally a "viseme" transcription combined with a reference to the source word would be used.

1.5.3 Other non-manuals

Non-manuals that are not articulated solely by the mouth can be characterized in this section only to the extent to which they form part of lexical items. Little standardization has been observed in this domain, but a distinction that could be used is between those non-manual forms that are part of an affective display (whether universal or culture-specific), and those that appear to be specific to the language.

Non-manual features that are not part of a lexical item (nor constitute one themselves) should be addressed in the chapter on prosody [Phonology – Chapter 2].

Elicitation materials

Citation forms of lexical items are often harvested from dictionaries. Comparing such forms can lead to a first impression of the contrastive or restrictive use of phonological elements. Information about phonetic variation can be used to

corroborate these impressions. They can be obtained by (i) investigation of phonetic variation in sentence or discourse context, possibly complemented by (ii) eliciting multiple citation forms from multiple signers. To elicit citation forms, people have used both written word lists and pictures. In both cases, the semantics of the elicited sign is not self-evident, and need not map one-on-one to the spoken language word or the picture.

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Chapter 2 Prosody

2.0 Definitions and challenges

2.0.1 What is prosody?

Prosody is a cover term for properties like intonation, rhythm, stress, and prominence. It thus has to do with the phonological structure of utterances above the phonemic level and may encode both strictly grammatical functions like the force of an utterance (declarative, interrogative, or imperative [Semantics – Section 1.13]) and broader communication functions like irony, sarcasm, etc. While these functions are mainly instantiated by manipulating the tune of the utterance in spoken languages, they are mainly encoded by non-manual components (facial expressions and body positions) in sign languages, although the non-dominant hand and movement also play a non-marginal role.

The grammar writer may propose a spoken language example and a sign language example to highlight the contrast. To illustrate, examples from Italian and LIS are given below. In these two languages, declarative sentences are distinguished from polar (yes/no) questions only by their prosodic features. Simplifying a bit, a final falling (low tone) vs. raising (high tone) contour is used to contrast declarative and polar sentences in Italian (a/a'), while a neutral vs. raised eyebrow position produces the same contrast in LIS (b/b'). Ironic or sarcastic intent can be added to the LIS examples, if uttered with a quick smile or a grin; while appropriate manipulation of the prosodic tune would do the same work for the Italian examples.

	L		H	
a.	hai mangiato 'You ate.'	a'.	hai mangiato 'Have you eaten?'	(Italian)
			raised eyebrows	
b.	INDEX$_2$ EAT DONE 'You ate.'	b'.	INDEX$_2$ EAT DONE 'Have you eaten?'	(LIS)

Structurally, two major prosodic domains are distinguished, and this basic distinction is reflected in the structure of this chapter:

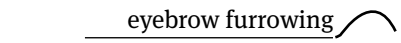
(i) the (sub-)lexical domain (syllable [Phonology – Section 2.1.1] and foot [Phonology – Section 2.1.2])

(ii) the domains above the lexical unit (prosodic word [Phonology – Section 2.2.1], different types of prosodic phrases)

2.0.2 Prosodic markers

In the introductory section to prosody, the grammar writer may decide over two possible classifications for prosodic markers, rather than just listing them. One classification is based on the active articulators and distinguishes manual vs. non-manual markers; the other is based on what is actually marked and distinguishes between boundary markers vs. domain markers. Eventually, both classifications can be adopted at once by distinguishing manual vs. non-manual markers first and then within each category further distinguishing between boundary markers and domain markers (or vice-versa).

Boundary markers (e.g. eye blinks, single head nods, etc.), also referred to as "punctual markers", are typically placed at one or both boundaries of a prosodic constituent. Domain markers (e.g. eye aperture, eyebrow position, body leans, etc.) normally spread over the entire prosodic domain they mark. Some markers, such as head nod for instance, can be used as both punctual and (when repeated) as domain markers. While the boundary markers are typically characterized by a categorical behavior (either they are present or absent), the domain markers may exhibit a more gradient pattern. For instance, non-manual markers in ASL wh-questions [Syntax – Section 1.2.3] / wh-questions display a gradient pattern. While the non-manual marker 'eyebrow furrowing' spreads over the entire clause, the peak of intensity is found on the wh-word, which in the below example appears in clause final position:



BOBBY BUY YESTERDAY WHAT

'What did Bobby buy yesterday?' (ASL, adapted from Bahan 1996: 75)

Turning to the classification based on the articulators, the main manual indicators of prosodic domains include: the movement component, the non-dominant hand in asymmetric two-handed sign [Phonology – Section 1.4], and hand switching. Movement is crucial in determining the rhythmic pattern, and the distribution and duration of pauses (holds) are the key indicators of major prosodic constituents like intonational phrases and utterance phrases. In this sense, movement is used as a boundary marker. The non-dominant hand may remain in place after a two-handed sign has been produced and spread across other signs. When used with prosodic functions only, the spreading domain of the non-dominant hand is normally limited to smaller prosodic constituents, like the phonological phrase, but when used with a semantic impact, as in buoys [Lexicon – Section 1.2.3] / buoys, it can even spread across multiple utterances. The grammar writer should then distinguish cases in which the non-dominant hand has prosodic functions from cases in which it functions as a primarily semantic tool. The maintenance of the non-dominant hand therefore constitutes a domain marker. Sometimes switching of the dominant hand

may indicate the presence of a prosodic boundary. The inventory of manual prosodic features is summarized here:

Inventory of manual prosodic features
(i) modulation of movement (rhythm, length, and tension)
(ii) spreading of non-dominant hand
(iii) hand switching

The term non-manual marker (NMM) covers all aspects of sign language production that are not tied to the manual component. This includes facial expressions, eye gaze, head and body movements, etc. A non-exhaustive inventory of NMMs is presented below. The grammar writer may use it as a tentative check-list to see which marker is active in the language to be described.

Inventory of NMMs
(i) facial expressions
    a. eyebrows
        – raised: normally associated to topic, if-clause, etc.
        – lowered: normally associated to wh-constructions and focus
        – degree of raising = intensity
    b. eye aperture
    c. eye gaze
    d. cheeks
    e. mouth
    f. lips
    g. chin position
(ii) mouthing and mouth gestures
(iii) head position
    a. nod
    b. rotation
    c. tilt
(iv) shoulder position
(v) body position

While spoken language phonology, especially in the sublexical domain, only marginally relays on simultaneity (McCarthy 1981; Selkirk 1982), the grammar of sign languages exploits this option to the opposite extreme. Layering is thus a crucial concept in the description of sign languages, at all levels of linguistic description (Wilbur 2000). At the sublexical level, layering is mainly manifested by manual components, although lexical non-manuals are also commonly used. Above the lexical unit, it is mostly non-manual components that are involved. The grammar writer may use this generalization to classify the various prosodic markers operating in the language. An NGT example illustrating the layering of different types of non-manual prosodic

markers is given below (non-manuals somewhat simplified in the gloss): eyebrow and head position mark two larger prosodic constituents, and immediately before the second one, spreading of a mouthing (Dutch *vergadering* 'meeting') from a noun onto an indexical sign marks a smaller prosodic constituent (a prosodic word).

2_2.0.2_1_NGT_YESTERDAY EVENING INDEX2 MEETING INDEX3A BE-PRESENT

school *morgen* *avond* *vergadering* *shhh*
raised eyebrows raised eyebrows + head forward
SCHOOL INDEX_{3b}, TOMORROW EVENING MEETING INDEX_{3b}, INDEX_2 BE-PRESENT_{3b} INDEX_2
'As for the meeting tomorrow evening at the school, will you be there?'

When looking at non-manual domain markers, the grammar writer should pay careful attention in the description of their alignment, especially in the case of multiple layering, since different NMMs may mark different prosodic domains, that is, one NMM may have a slightly larger spreading domain than the other one.

Crucially, it may frequently be the case that a prosodic function is expressed by a cluster of co-occurring markers (i.e. by layering). For instance, the interrogative intonation (which in the linguistic literature is sometimes simply glossed as 'q' or 'y/n') may well systematically involve a number of non-manual articulations (e.g. raised eyebrows, chin up, forward lean). In this case, it may be convenient to provide a summary table like the one below, in which the grammar writer indicates which function goes with which marker(s). This, however, is optional, as many of these specific prosodic functions align with syntactic functions and will therefore also be addressed in the respective chapters in the Syntax Part of the grammar.

Table Phonology-1: Example of a table that specifies which non-manual prosodic markers go with a specific grammatical function, in this case: a polar question

Prosodic function	Prosodic markers
Polar question	— raised eyebrows — chin up — forward lean

2.0.3 Methodological challenges

The domain of prosody reflects, maybe more than others, the relative youth of the field of sign language linguistics and the fact that most of what we know comes from one sign language only, namely ASL. Systematic works outside the domain of the prosodic word are still missing. This is reflected in a quite uneven development of the substructure of the table of contents and its manual counterparts.

One major methodological challenge is (in)consistency of prosodic markers within and across signers. In very few cases, researchers are able to determine which element is necessary and which element is sufficient to mark for some specific phenomenon/prosodic domain. This makes the form-to-function mapping an extremely delicate component of the grammar. The grammar writer should then mention whether the specific marker under discussion is a necessary and/or sufficient element for the specific phenomenon or domain.

2.0.4 Outline of the chapter

This chapter starts by defining two separate types of prosodic domains: domains at the lexical level [Phonology – Section 2.1] and domains above the lexical level [Phonology – Section 2.2]. The following section is devoted to intonation [Phonology – Section 2.3]. In the final section, interactions [Phonology – Section 2.4] with pragmatics (in the broad sense of the term) are discussed. Notice further that the two domains of prosody, sublexical and above the lexical unit, intersect in certain ways with two other modules of grammar, namely morphology (at the lexical level) and syntax (above the lexical unit). We suggest the grammar writer pinpoint which prosodic aspect correlates with which grammatical process (e.g. movement reduction and reduplication in plural formation or brow position for clause-type marking).

2.1 The lexical level

This section includes guidelines to describe prosodic constituency that pertains up to the lexical level. This includes the syllable [Phonology – Section 2.1.1] and possibly the foot [Phonology – Section 2.1.2]. The prosodic word is a constituent classified above the lexical level because it may include more than one lexical entry (e.g. pronoun clitics and some compounds [Morphology – Chapter 1]). Notice that the focus here is mainly on the core lexicon [Lexicon – Section 1.1] of sign language possibly excluding classifiers [Lexicon – Section 1.2.1].

2.1.1 Syllable

Traditionally, the syllable is defined as the prosodic level above the phonemic level and below the foot (the immediately higher prosodic level). Within this level, phonemes are organized according to prosodic features (e.g. the sonority hierarchy, etc.).

The sign language syllable is usually considered a sequential unit composed by at least a handshape, a location, and a movement. The number of syllables of a sign is

provided by the number of sequential movements. The LIS sign for BEAT includes two sequential movements and therefore should be counted as disyllabic.

BEAT (LIS)

2_2.1.1_1_LIS_beat_Video

In this section, the grammar writer may also want to stress the particular role played by the movement component in the structural organization of the syllable. Indeed, movements represent the nucleus of the sign language syllable, determine the syllable weight, and influence the higher levels of prosodic organization (Perlmutter 1992; van der Kooij & Crasborn 2008; Sandler 2008; Jantunen & Takkinen 2010). The grammar writer may decide whether to treat these topics within this section or separately by introducing additional sub-headers to this section.

As for syllable weight, simple movements count as light weight units, thus resulting in light syllables, while complex movements count as heavy weight units, thus resulting in heavy syllables. The grammar writer should provide an example of each syllable type. Syllables composed by one type of movement only are considered light syllables. The LIS sign for BEAT shown above contains two light syllables. Syllables composed by a complex movement (i.e. two simultaneous movements, typically a secondary movement, e.g. orientation or handshape change, co-occurring with a path movement) are considered heavy syllables. For instance, the sign for IMPORTANT in LIS contains one heavy syllable composed of a directional path movement overlapping with a handshape change.

2_2.1.1_2_LIS_important

In addition, different types of secondary movements may combine, such as an orientation change and a handshape change. However, it is important to note that not all combinations between movement types may be allowed within one language. It is possible that this is due to constraints operating at the syllabic level. If this is the case, then the grammar writer should list and describe the constraints in this section (eventually with a reference to the section on phonological movement

[Phonology – Section 1.3]). If these constraints depend on the relative prominence of the movements in a heavy syllable, then the grammar writer may also use the sonority hierarchy shown below to capture the generalization.

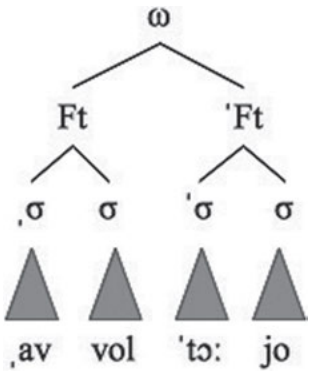
At the syllabic level, prominence is normally marked by manipulating the movement component or by looking at the pattern of handshape change. Movement prominence determines the degree of "sonority" of a syllable (i.e. the ability of a sign to be perceived at greater distance). Sonority is measured on the basis of the joint(s) used to articulate a single movement. The closer a joint is to the body of the signer, the higher its sonority. In this way, the joints involved in the movement of a sign can be lined up according to a scale of sonority, a sonority hierarchy (Brentari 1998).

Sonority hierarchy
shoulder > elbow > wrist > base joints > non-base joints

Low level of sonority: FEAR (LIS)
High level of sonority: SCOTLAND/DEBT (LIS)

2.1.2 Foot

Foot is defined as a prosodic unity above the syllable but below the word. It is the level at which stress patterns are organized by alternating strong and weak syllables within a foot. An example is the Italian word *avvoltoio* ('vulture'), consisting of four syllables (σ) organized in two feet (Ft), each of them containing a strong and a weak syllable, as shown below.



(Italian)

This area of prosodic structure is quite unexplored in sign language. The reason is probably that signs are most commonly monosyllabic in the sign languages that have undergone detailed phonological analysis so far (such as ASL, Israeli SL, and NGT).

This makes the emergence and the identification of an intermediate level between the syllable and the word unlikely. Therefore, depending on the status of prototypical signs in a language, this section may be relevant or not relevant. If the to-be-described sign language is more ASL-like (tendency for signs to be monosyllabic), the section will probably be irrelevant, and the grammar writer may decide not to include it in the grammar. If the sign language is more LIS-like (tendency for signs to be at least disyllabic), then this part of the prosodic organization becomes more relevant. The grammar writer may then consider the alternation between strong and weak syllables within a sign. A relevant question is whether stress patterns can be related to the syllabic level.

In principle, a careful description of the compatibility between multi-syllabic signs and heavy syllables should be illustrated. The existence of constraints on possible word-internal syllable sequences may be governed at this level of the prosodic structure. Specifically, the grammar writer may discuss which of the following patterns is attested in the language: light+heavy, heavy+light, and heavy+heavy (possibly non-repeated). An example of each is given below.

- light+heavy syllable alternation: SOUTH-AFRICA (LIS)
- heavy+light syllable alternation: GOOD-MORNING (LSF: potentially a compound)
- heavy+heavy syllable (repeated) alternation: DIRTY (LIS)
- heavy+heavy syllable (non-repeated) alternation: NO-VALUE (LIS: monomorphemic sign)

The alternation between strong and weak syllables determines prominence among word-internal adjacent syllables. This can be marked in sign languages by variation in the muscle tension during the articulation of the syllabic movement: the higher the tension the more stressed/prominent the syllable. If the grammar writer chooses not to include a section on the foot, then the description of what combination of syllable types is possible in the language should be moved to the section addressing the prosodic word [Phonology – Section 2.2.1].

2.2 Above the lexical level

This section includes guidelines to describe prosodic constituents that pertain to the lexical level and units of prosodic structure above the lexical level. This is the part of the grammar where the contribution of non-manual components is most relevant and where layering is most complex to describe.

One crucial aspect is how to correctly identify the various prosodic domains and how to describe them. The grammar writer may use a manual vs. non-manual classification for the relevant prosodic markers and then further specify their prosodic features distinguishing between domain markers and boundary markers. Alternatively,

a classification based on prosodic features (domain vs. boundary marker) can be made first and then the manual vs. non-manual distinction can be used to further characterize the phonological shape of the marker. Below, we adopt the former option, as the division between domain and boundary markers is relevant for all prosodic domains, while the same is less true for the division between manual and non-manual markers.

For each section, which corresponds to a specific prosodic unit, the grammar writer should describe the active markers by indicating type (domain vs. boundary marker), phonetic properties (manual vs. non-manual and further description if needed), distribution (e.g. total vs. partial spreading for domain marker, single edge vs. both edges for boundary markers), whether they are in complementary distribution or they instantiate layering and how prominence is marked. The grammar writer may decide to address each of these aspects in separate subsections.

The grammar writer may also introduce a table in which all the markers are summarized by their prosodic function, so that an overview of the prosodic structure of the language can be immediately accessible. An example of such table is given below. Each cell should contain the main phonetic features of each marker.

Table Phonology-2: Example of a table that provides an overview of manual and non-manual markers and their prosodic functions

	Domain marker		**Boundary marker**		**Comments**
	Manual	Non-manual	Manual	Non-manual	
Prosodic word					
Phonological phrase					
Intonational phrase					
Utterance phrase					

2.2.1 Prosodic word

The prosodic word is an intermediate prosodic constituent higher than the syllable (or foot, if relevant) but lower than the phonological phrase. Normally, it includes single signs, but it may also include more than one lexical sign, as in the case of cliticization and compounds [Morphology – Chapter 1]/ compounds.

Functional words tend to be phonologically weak and often cliticize onto lexical hosts in sign languages much like in spoken languages (cf. English *he's* or French

j'aime). A case often occurring in sign languages is cliticization of a (weak) pointing sign to a lexical host. Cliticization may induce specific phonological processes like handshape assimilation [Phonology – Section 3.1.1] and coalescence [Phonology – Section 3.1.2].

Compounds also constitute potential prosodic words. Lexical compounds tend to conform as a unit to well-formedness constraints of the core native lexicon [Lexicon – Section 1.1], but non-lexicalized compounds also may be subject to phonological constraints.

In addition to providing examples for each of these cases, the grammar writer should also provide the list of markers that are active at this level indicating whether these identify the prosodic domain or its boundaries, and whether these are manual or non-manual. For instance, the contrastive phonological components of a sign may serve as domain markers. Specifically, prosodic words may have a maximum of one contrastive value in each of the phonological components: handshape, place of articulation, movement, orientation, and non-manuals (Tang et al. 2010: 521). In the case of cliticization and compounds, phonological processes may reduce the effects of the violation of this constraint. To illustrate, handshape assimilation within a cliticized prosodic word reduces the number of contrastive handshapes within the prosodic word. These markers are typically manual markers, although lexical non-manual markers may also be involved in this type of constraints. As for non-manual markers, it has, for instance, been observed that spreading of the mouthing from a lexical sign onto an adjacent functional sign may be indicative of cliticization, as in the following NGT example, which features three instances of spreading of mouthing.

/doɐp/	/jɔŋən/	/wo:n/
VILLAGE INDEX	BOY PERSON	LIVE INDEX

'There was a boy who lived in a village.' (NGT, Crasborn et al. 2008: 59)

An example of a boundary marker optionally indicating the presence of prosodic words is provided by the pattern of final lengthening in HKSL. In this language, no lengthening is observed at the level of the prosodic word, while higher prosodic units like phonological phrases and intonational phrases are marked by weak and strong lengthening, respectively. This type of marking identifies the right-edge of the constituent (Tang et al. 2010).

Prominence at this level may reveal a differentiated pattern depending on the phonological shape of the sign. For instance, in NGT prominence in disyllabic signs depends on the type of movement. If the movement of the second syllable is a repetition of the movement of the first syllable, than prominence is on the first syllable. If the movement of the second syllable is different from that of first one, then prominence is marked on the second syllable (van der Kooij & Crasborn 2008; Crasborn, van der Kooij & Ros 2012).

2.2.2 Phonological phrase

The level where prosodic words are organized in larger units is the phonological phrase. An example of domain markers accompanying phonological phrases is provided by Israeli SL (Nespor & Sandler 1999). In this language, manual and non-manual markers can be used to identify the domain of a phonological phrase. The manual device is a phonological process called non-dominant hand spreading: the non-dominant hand of a two-handed sign is held in place at the end of the sign until the right edge of the phonological phrase, while the other hand keeps on articulating signs. The non-manual device consists of special facial expressions whose spreading domain is the phonological phrase. Various articulators may contribute to these expressions.

As far as domain boundaries are concerned, two possible situations can be encountered if the language under discussion uses more than one marker. Either the markers are in complementary distribution or they are layered. An example of boundary markers that are in complementary distribution is provided by right-edge markers in Israeli SL. These are: (i) small pause, (ii) increase in sign duration realized by a final hold, and (iii) movement iteration (Nespor & Sandler 1999). The grammar writer should also mention whether manual and non-manual markers are allowed to co-occur in the same phrase. A relevant example is provided by HKSL, where manual (weak final lengthening) and non-manual (eye-blinking) edge markers co-occur (Tang et al. 2010).

An example of how prominence is marked at this prosodic level is provided by Israeli SL, where non-dominant hand spreading indicates that prominence is given to the right-edge boundary of the prosodic constituent.

2.2.3 Intonational phrase

At the level of the intonational phrase, phonological phrases are organized into larger prosodic units. Intonational phrases are normally associated with several syntactic constructions: topicalizations [Syntax – Section 2.3.3.3], parentheticals, non-restrictive relative clauses [Syntax – Section 3.4.7.3], etc.

Intonational phrase markers tend to co-occur more easily than phonological phrase makers. Therefore, layering is expected to occur more easily at this level than others. A list of the most common intonational phrase boundary markers is given below. The grammar writer may use this list as a way to identify the relevant markers for the language being described.

Prosodic boundaries marking the intonational phrase

a. Right edge sign lengthening (roughly twice as long as within the intonational phrase)

b. Change in head position
c. Change in body position
d. Across-the-board change of all facial expressions
e. Eye blinking
f. Change in brow position

The following example from Israeli SL illustrates a case of prosodic layering at the level of intonational phrases. The discussion following the example illustrates how a similar example could be discussed in the grammar.

	$[[\text{BOOK-THERE}]_{p}$	$[\text{HE WRITE}]_{p}]_{I}$	$[[\text{INTERESTING}]_{p}]_{I}$
brows	up _____		down _____
eyes	squint _____		droop _____
mouth		'O' _____	down _____
head	tilt _____		
mouthing	'book' _____		'interesting' __
torso	lean _____		
hold	=		
reduplication	–1	× 3	× 4
speed			slow
size		big	big

(Israeli SL, Sandler 1999b: 206)

The sequence contains two intonational phrases, the first one is a topic including a relative clause and is composed of two phonological phrases; while the second intonational phrase only contains the matrix predicate. The position of eyebrows, head, and torso simultaneously changes at the edge of the first intonational phrase, illustrating a typical case of multi-layered domain marking (each marker spreads over the same prosodic domain). Repetitions and modification of sign size marks the edge of each intonational phrase showing that also boundary markers – in this case, manual boundary markers – may co-occur. The fact that both repetitions and size modification target the last sign of the first intonational phrase shows that these are right-edge markers. In principle, non-manual boundary markers (e.g. eye blink) might also play a role (Sze 2008; Herrmann 2010), but these are not included in the above example.

At the intonational phrase level, prominence can be marked in various ways. In Israeli SL, final lengthening (e.g. the presence of a right-edge marker) is interpreted as an instance of prominence. In ASL, prominence at the intonational phrase level is marked by a peak of velocity in the sign stream. Specifically, the right edge of intonational phrases tends to have the highest velocity peak.

2.2.4 Phonological utterance

A deep understanding of this level of prosodic organization is still missing for sign languages. On the one hand, it is the level where intonational phrases [Phonology – Section 2.2.3] are organized; on the other hand, it is the level that interfaces with other aspects of linguistic and non-linguistic communication (e.g. turn regulation [Phonology – Section 2.4.1]). While its edges can be matched with the locutory act, much less is known about phonological phenomena scoping inside this domain.

An example of how boundary markers are used at this level is provided by NGT, where handshape holds, syllable repetitions, strong movements, or insertion of a dummy element (e.g. a pointing sign or PALM-UP) may mark the right-edge of the phrase. These markers are in complementary distribution and are also used to mark prominence at the level of the phonological utterance (van der Kooij & Crasborn 2008; Crasborn, van der Kooij & Ros 2012).

2.3 Intonation

This section may be partially redundant, as it overlaps with material contained in the previous section, and also with information provided in sections within the Syntax Part. Still, the grammar writer is encouraged to include a section on intonation with cross-references to other sections in which the topic of intonational tunes (that may accompany specific syntactic constructions) are discussed.

Intonation is the association of one (or more) prosodic marker to a specific function, roughly comparable to tunes in spoken languages. These are basically groups of non-manual expressions (mainly facial expressions) that consistently mark for specific meanings. An example are the layered NMMs accompanying wh-questions in ASL, which can be considered a wh-intonation.

headshake
eyebrow furrowing
BOBBY BUY YESTERDAY WHAT
'What did Bobby buy yesterday?' (ASL, Bahan 1996: 75)

In other cases, multiple layers combine to produce more complex meaning and add semantic nuances to a tune. This is the case of conditionals in Israeli SL. In this sign language, *if*-clauses are usually marked by brow raise (as in many other sign languages); however, counterfactual conditionals combine the standard brow raise with lower-lid squint (Dachkovsky 2008).

The grammar writer should discuss the main tunes and their distribution in terms of spreading domain. A summary table like the following one can also be provided at the end of the section.

Table Phonology-3: Example of a table that provides an overview of different types of non-manual markers, their prosodic/grammatical function, and their spreading domain

	Type of marker	Spreading domain	Comments
Polar question			
Wh-question			
Relative clause			
If-clause			
Focus			
Topic			
...			

2.4 Interaction

2.4.1 Turn regulation

A variety of turn-taking signals have been identified in various sign languages, including many non-manual cues (Baker 1977; Groeber & Pochon-Berger 2014; Martinez 1995). However, given the many-to-many mapping of non-manuals to grammatical and information-structural functions, it is not always easy to straightforwardly establish that a certain non-manual signal (say, a head nod to mark the end of a turn) has a specific turn-regulating function.

A more principled problem that the grammar writer will be faced with is to decide whether these signals are in fact lexicalized and/or grammaticalized, and thus deserve a place in the grammar. An example is eye gaze, which has been argued to serve various functions, and for which it is often noted that gaze towards the interlocutor is a consistent signal associated with turn-yielding (Martinez 1995). Is this simply a consequence of the perceptual need to look at the interlocutor, or is it a prosodic cue that interacts with other parts of the language? This has not been straightforwardly established for any cue in any sign language, as far as we know. The decision to include this section in the grammar may therefore be based on the wish to deal with interactive functions of language more generally.

Additionally, the grammar writer should deliberate whether to include turn-regulation in the section on prosody – as suggested here – or to create a separate section that may include other forms (like lexical markers that are not specifically prosodic in nature) and will extend more broadly to the organization of discourse.

That being said, it is important to distinguish the *forms* that are observed to play a role from the *functions* that they perform. A function like turn-maintenance or continuation can be signaled by forms such as gazing away from the addressee and the continued presence of non-dominant hand holds across sentence boundaries. A function like turn-yielding or turn-ending can be marked by a long hold, that is, a prosodic

modification of the manual movement. These lengthening phenomena are typically prosodic in nature: they modify the lexical movement of the sign in specific sentence contexts or discourse contexts. In terms of non-manual features, aside from eye gaze, the use of non-manual question markers is likely to be relevant to turn-regulation (the prototypical question requiring an answer), whatever their exact form may be. Furthermore, it has been observed that head movements are also associated with turn-regulation, in the sense that head orientation may accompany gaze direction and thus reflect presence or absence of eye gaze towards the interlocutor.

Aside from these signer-side behaviors, there may be specific prosodic features on the side of the addressee that deserve separate mention, such as repeated movement and long holds of attention-getting particles like HEY. Again, it is necessary to make a careful decision whether or not to treat these phenomena as specifically prosodic, or to include them in a more general section on interaction or discourse (if at all).

2.4.2 Back-channeling

As for back-channeling, the same general considerations as discussed in the previous paragraph apply. If they are treated, it would be sensible to devote a separate section to them. Here, too, there is relatively little literature on sign languages that can help the grammar writer make the judgment that these signals are grammaticalized in the language to be described.

Elicitation materials

To the best of our knowledge, to date, no elicitation materials specifically targeting prosodic structure are available. Most of the studies either report translation tasks from written input (Nespor & Sandler 1999; van der Kooij & Crasborn 2008) or are based on corpus data (Crasborn, van der Kooij & Ros 2012). As mentioned in the methodological caveats at the beginning of this document, either strategy has its own pros and cons, especially when the distribution and spreading of NMMs are concerned. More controlled elicitation material has been used in Tang et al. (2010). Currently, this material is not available.

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Chapter 3 Phonological processes

3.0 Definitions and challenges

3.0.1 What is a phonological process?

A phonological process is the result of applying a set of constraints or rules manipulating the phonological shape of (underlying) input forms in order to obtain some output forms. Phonological processes may be the reflection of the competing pressure to maximize ease of articulation on the one hand and ease of perception on the other hand. These may yield language-specific phonological patterns. Another type of phonological process affecting the lexicon is the adaptation of the form of loan words from another (sign) language.

One special case of the latter are processes affecting loan signs [Lexicon – Chapter 2] / loan signs containing phonemic material in the original language that are not part of the phonemic inventory of the target language. Languages may adopt different strategies in order to accommodate this situation; one of these is adapting the form of the loan sign to the phonemic inventory of the target language. For instance, LIS does not have the 🖐-handshape in its phonemic inventory. Hence, in order to accommodate the borrowing of the sign WORKSHOP from ASL (left image), the 🖐-handshape is used (right image).

WORKSHOP (ASL)

WORKSHOP (LIS)

3.0.2 Caveats

Phonological processes are normally dependent on specific domains of application (phoneme, syllable, prosodic word, etc.) but can be further constrained by non-phonological factors such as morphological boundaries. This is particularly evident in spoken languages where morphology is mainly concatenative. However, in the case of sign language, the grammar writer should pay careful attention to the potential interactions between phonological processes and non-concatenative morphology.

The grammar writer should concentrate mainly on processes active in the synchronic grammar. Phonological processes whose outcomes are visible diachronically and which result in lexically specified allophonic alternation are not considered here (for an interesting overview of historical phonological changes in ASL, see Frishberg 1975). However, the grammar writer may eventually mention them in a separate subsection.

3.0.3 Outline of the chapter

Phonological processes are ordered with respect to the phonological component affected by the process itself rather than with respect to the main phonological domain of application. This strategy is chosen because specific processes are expected to be frequently observed across sign languages, while their phonological domains of application may vary from language to language. For instance, assimilation affecting the shape of phonemes is quite a widespread phenomenon in sign languages; however, whether this is bound to the prosodic word or other prosodic levels may be subject to language-specific variation. Therefore, we treat assimilation as a process affecting the phoneme, rather than a process applying within, say, the domain of the phonological word in a specific sign language. The grammar writer may choose a different perspective and decide to organize phonological processes according to other criteria. For instance, phonological processes could also be described at the end of each relevant prosodic domain (i.e. intrasyllabic processes may be presented at the end of the section where the syllable [Phonology – Section 2.1.1] is discussed, processes having the prosodic word as domain could be presented in the section on the prosodic word [Phonology – Section 2.2.1], etc.). If the grammar writer adopts this alternative partition, then this entire chapter – or a good part of it – may not appear in the final reference grammar.

3.1 Processes affecting the phonemic level

This section includes guidelines to describe phonological processes that affect the phonemic level. First, the definition of the process is given, then it is illustrated by means of examples.

3.1.1 Assimilation

Assimilation is a phonological process allowing one or more features of a phoneme to take the same value of another phoneme within a certain domain. The result is that the form undergoing the phonological change becomes more like a nearby form.

Assimilation can be partial (only some features are copied) or total (all features are copied). With respect to the source of assimilation, we can distinguish:

- Regressive assimilation if the source of assimilation is a following form;
- Progressive assimilation if the source of assimilation is a preceding form;
- Bidirectional assimilation if both a preceding and a following form are necessary to create the appropriate context.

Assimilation may target any of the phonological parameters of a sign. Here we present one example from handshape assimilation (also see Corina 1990). The grammar writer may decide to structure this section by including dedicated subsections in which assimilation is discussed per parameter.

An example of assimilation is provided by ☝-handshape signs in ASL (Lucas, Bayley & Valli 2001). Assimilation may target different features like [±hook], or the number of selected fingers. In this example, the case of finger selection is presented. Signs with a ☝ handshape may assimilate selected fingers and thumb extension from either preceding or following signs, resulting in full progressive or regressive assimilation, such that, for instance, a first person pronoun INDEX$_1$ (lexically specified for ☝-handshape) may be articulated with all fingers and thumb extended (🖐-handshape).

Analogously, other parameters may show either total or partial assimilation. The difference between assimilation and coarticulation (variable and gradient assimilation depending on aspects of the articulation like signing speed; Ormel et al. 2013) may at times be hard to make.

In some cases, assimilation may be highly constrained by the context in which it is found. If present, the grammar writer should treat these cases separately. An example of this type of assimilation is provided by assimilation in the context of cliticization in Israeli SL, that is, within a prosodic word [Phonology – Section 2.2.1]. In this context, handshape assimilation is always uni-directional: handshape features spread from the lexical host onto the pointing sign, no matter whether the host precedes or follows the clitic element. In the following example from Israeli SL, for instance, the first person pointing pronoun cliticizes onto the main verb READ. As a result of this process, the pointing sign assimilates the 🤟-handshape from the following sign, which is the handshape of the dominant hand ('dh') in the lexical sign READ.

INDEX$_1$(🤟) READ(dh:🤟) (Israeli SL, Sandler 1999b: 196)

3.1.2 Coalescence

Coalescence is the fusion of two phonetic units into a single one. An example is provided by pronoun cliticization in Israeli SL, where the dominant hand of a symmetrical two handed-sign may become the host of a pointing sign (Sandler 1999b). This is illustrated by the Israeli SL sign SHOP. In its citation form, the sign SHOP is realized as

a symmetrical two handed sign with two -handshapes, as shown in the left image below. As a symmetrical two handed sign, SHOP satisfies the phonological requirement for coalescence to appear.

SHOP SHOP-THERE

(Israeli SL, Sandler 2006: 198)

The right image shows how fusion is realized. At the beginning of the cliticized form SHOP-THERE, the sign SHOP is produced by the two hands in the same configuration (as in the citation form). During the transition between the two locations of the sign, i.e. during the downward movement, the dominant hand changes its shape producing the typical -handshape of pointing signs, thus realizing the fused form SHOP-THERE.

3.1.3 Movement reduction and extension

Movement reduction and extension are phonological processes resulting in signs with smaller or larger movements than the movement of the citation form. Notice that the dimension concerned here is not the temporal one. As a side effect of the modification, sign duration may be shorter or longer, although this is not necessary.

There are two ways in which such movement modification may happen: either the reduction/extension is produced at the same joint where movement is produced in the citation form, or the movement is produced at a different joint, resulting in distalization and proximalization. More generally, movement modifications of both types are commonly found in the whispering/shouting mode [Phonology – Section 3.4.2]. In some case, reduction and extension may be morphologically induced.

3.1.3.1 Without joint shift

One case of movement reduction that does not necessarily involve a switch of the articulatory joint is found in plural reduplication morphology in LIS. The sign CITY contains a relatively long path vertical movement realized at the elbow. In the plural form, the movement is still realized at the elbow joint but it is shorter than in the citation form (note that this phonological process is morphologically conditioned).

2_3.1.3.1_1a_LIS_city

CITY

2_3.1.3.1_1b_LIS_city++

CITY++ ('cities') (LIS)

One case of movement extension is found in pointing signs when the space is iconically used. Pointing toward specific loci carries additional meaning about the locations of the various participants in an event. In this environment, the standard length of a pointing sign may be extended to reach locations at the periphery of the signing space. The conditioning factor of this process is ultimately to be found in the semantic/pragmatic domain.

3.1.3.2 With joint shift

Signs whose movement is executed by the elbow, wrist, or finger joint in the citation form may exhibit a shift in the selected joint resulting in a more proximal or distal execution of the movement. A shift towards a joint that is further away (i.e. more distal) from the body is referred to as distalization; a shift towards a joint that is closer (i.e. more proximal) to the torso as proximalization. Distal versions result in reduced movements, while proximal versions involve extended movements.

One example of distalization from LIS is provided by the sign VOLLEYBALL. In the citation form, VOLLEYBALL is produced with a repeated movement realized at the elbow joint. However, distalization produces an allophonic version with movement features specified at the wrist joint, as shown in the examples below.

2_3.1.3.2_1a_LIS_volleyball

VOLLEYBALL (citation form)

2_3.1.3.2_1b_LIS_volleyball(distal)

VOLLEYBALL (distal form) (LIS)

An example of proximalization from LSF is provided by the sign AGREEMENT. In the citation form, AGREEMENT is produced with a single movement realized at the wrist joint (left video below). However, proximalization produces an allophonic version with movement features specified at the elbow joint (right video) (note that proximalization is also commonly observed in first language acquisition; cf. Meier et al. 2008).

2_3.1.3.2_2a_LSF_AGREEMENT (citation)

2_3.1.3.2_2b_LSF_ AGREEMENT(proximal)

AGREEMENT (citation form) AGREEMENT (proximal form) (LSF)

3.1.4 Weak hand drop

Two-handed signs may show articulatory reduction and be produced with the dominant hand only; this process of phonological deletion is referred to as Weak Hand Drop, or just Weak Drop (Battison 1974; van der Kooij 2001). An example from LSF is the sign AGREEMENT. In the citation form, the sign is two handed, while in the reduced form it is one-handed.

2_3.1.4_1a_LSF_AGREEMENT (citation)

2_3.1.4_1b_LSF_ AGREEMENT(weak-drop)

AGREEMENT (citation form) AGREEMENT (Weak Drop) (LSF)

Normally, this process is phonologically (and possibly lexically) constrained by the type of two-handed sign. Typically, two-handed signs with a symmetrical non-alternating movement allow weak hand drop more easily than signs with alternating movement. In addition, a feature like [contact] may have an influence. Generally, weak hand drop appears to be more constrained in unbalanced signs, that is, in two-handed signs in which only one hand moves, in particular, in cases in which both hands have different handshapes. Finally, it has been observed for NGT that not only phonological factors are at play, but also lexical (semantic) factors: even in fully symmetrical signs weak hand drop may be ruled out if use of the two hands is iconically or metaphorically motivated, as, for instance, in the NGT signs MEET and SAME (van der Kooij 2001). The grammar writer should describe all these constraints.

3.1.5 Handshape drop

In signs with handshape change, it is often the case that one of the two handshapes is the closed or open variant of the other. As the result of a morphological process, phonological readjustments may lead to drop one of the two handshapes. The handshape which is not dropped is considered as the most prominent. An example of this process is found in ASL. Signs like HATE and ASK both involve handshape change. When affixed with the [multiple] morpheme [Morphology – Section 3.1.2.2], the two signs behave differently: HATE retains the first handshape, while ASK retains the second one. The handshape retained in this environment is the most prominent of the two handshapes appearing in the citation form of the sign.

3.1.6 Nativization

When a phoneme of a borrowed sign does not belong to the phonemic inventory of the target language, adaptation processes may change the original shape of the sign in order to meet well-formedness requirements.

A case of adaptation in LIS is the sign WORKSHOP, which is borrowed from ASL. In the source language the sign is articulated with a -handshape (left video below), which is not part of the handshape inventory in LIS. In order to make the sign compatible with LIS phonology, signers produce the sign WORKSHOP with the native -handshape (right video). Interestingly, in this adaptation, the initialization that is observed in the ASL sign (the -handshape representing the letter 'W') is lost.

2_3.1.6_1_ASL_workshop

WORKSHOP (ASL)

2_3.1.6_2_LIS_workshop

WORKSHOP (LIS)

Another case of nativization quite common in sign languages is that of "letter dropping" and movement interpolation during fingerspelling [Lexicon – Section 2.2.2] / fingerspelling in the process of local lexicalization. An example is provided by the fingerspelling of the word *syntax* in ASL (Brentari 1998: 231). After nativization, the sign loses two handshapes (i.e. two letters) and includes a movement between the second and the third handshape, as shown in the examples below (the Ø symbol indicates movement interpolation):

a. S-Y-N-T-A-X (fully fingerspelled form)
b. S-Y-Ø-T-X (nativized form)

3.1.7 Metathesis

Metathesis is a process that alters the order of phonemes in a word/sign. In sign languages, the process may affect signs involving a change of location as a result of movement (e.g. signs with a repeated movement perpendicular to the body contrasting the high vs. low part of the torso, or the ipsilateral vs. contralateral part of the torso).

A clear example of metathesis is the case of DEAF in ASL (Lucas et al. 2001). In its citation form, the sign is articulated with a -handshape which first makes contact with the ear and then with the lateral part of the mouth. In the metathesized form, the order of the two contact points is reversed, that is, the index finger first touches the lateral part of the mouth and then the ear.

2_3.1.7_1_ASL_deaf metathesis

DEAF (after metathesis) (ASL)

3.2 Processes affecting the syllable

3.2.1 Epenthesis

Epenthesis is the insertion of phonemic material in order to repair ill-formed syllabic structures. For example, a consonant cluster formed by /s/ followed by a stop is not allowed in Spanish. An epenthetic mid-vowel /e/ is inserted in word-initial position to repair ill-formed words. This process is visible in the standard lexicon (e.g. *escuela* ('school') derived from the Latin *scola*) but also in loans (e.g. /estrɛs:/ imported from English 'stress'). In sign language, epenthesis can affect any of the parameters (movement, handshape, location, and orientation). We first present a typical case of movement epenthesis, then a less typical case of movement epenthesis, namely movement interpolation.

An example of typical movement epenthesis is that of the sign HEAD in LIS (Geraci 2009). In its underlying form, the sign does not contain any movement component (image below). However, due to sonority requirements on well-formed syllables in LIS, an epenthetic repeated short movement is introduced, as shown in the video below.

HEAD (underlying form) (LIS)

2_3.2.1_1b_LIS_head surface

HEAD (surface form) (LIS)

Epenthesis is blocked when the sonority requirement is otherwise satisfied. In LIS, this is the case in compound forms where the second member of the compound provides the movement for the entire sign (thus satisfying the sonority requirement).

Thus, movement epenthesis is not required when the sign HEAD appears as first part of the compound HEAD^POUND ('smart').

2_3.2.1_2_LIS_smart

HEAD^POUND ('smart') (LIS)

A *sui generis* movement epenthesis is represented by the transition between signs. It basically consists in the interpolation of a straight movement which is needed to displace the hand from the final location of a sign to the initial location of the following sign. During this interpolation movement, the hand normally changes handshape and orientation into that of the to-be-articulated sign.

3.2.2 Syllable reduction

Signs with a repeated movement which count as disyllabic may lose one syllable (i.e. loose one movement) in compounds [Morphology – Chapter 1]. This process is normally conditioned by articulation speed. The faster the signing, the more syllable reduction is likely to appear.

An example from LIS is provided by the verb WORK, which in its citation form contains a repeated short movement perpendicular to the horizontal plane (left video below). When compounded with the aspectual marker DONE, it may lose one movement (right video below).

2_3.2.2_1a_LIS_work done unred

2_3.2.2_1b_LIS_work done reduced

WORK^DONE (unreduced form) WORK^DONE (reduced form) (LIS)

Since the number of syllables is defined as the number of sequential movements in a sign, the reduced compound form has one syllable less than the unreduced one (for more examples, see the section on prosodic characteristics of compounds [Morphology – Section 1.4.2]).

3.2.3 Syllable reanalysis

Disyllabic signs with two movements and a transitional location change interspersed between the two movements may reanalyze the transitional movement as the only movement of the sign.

An example is provided by the LIS sign INSTITUTE. In the citation form, this sign has a short movement with contact with the torso in two different locations (high and low – see left video below). This location change may be reanalyzed as the only

movement of the sign. The consequence of this process is that the disyllabic citation form is reduced (interpolation is not considered as part of the sign) to a monosyllabic form (interpolation is the only movement of the sign and it is fully part of it – see right video below).

2_3.2.3_1a_LIS_institute_LATERAL-VIEW

2_3.2.3_1b_LIS_institute reanalyzed LATERAL VIEW

INSTITUTE (citation form) INSTITUTE (reanalyzed form) (LIS)

3.3 Processes affecting the prosodic word

The phonological processes that are known to affect the prosodic word are processes that go hand in hand with morphological (reduplication and compounding) and syntactic-prosodic (cliticization) processes. Consequently, there is a clear relation between the following subsections and other sections in the Blueprint. The grammar writer may therefore decide to be fairly brief about these processes in the present subsection and to refer the reader to the relevant grammar sections where these phenomena are discussed in more detail.

3.3.1 Reduplication

Reduplication is a morphological process with the main phonological consequence that some or all the components of a sign are copied into the reduplicate morpheme, providing phonological content to the morpheme itself. Thus, reduplication is a case of morphologically induced repetition (note that, by itself, the term "repetition" is usually reserved for lexical, inherent, repetition and prosodically induced repetition). An example of reduplication is provided by plural morphology in many sign languages. The LIS sign CITY, for instance, is a monosyllabic two-handed sign (see left video below) which gets reduplicated in the plural form (see right video; for another process related to reduplication see the section on Movement reduction and extension [Phonology – Section 3.1.3]).

2_3.3.1_1a_LIS_city

2_3.3.1_1b_LIS_city++

CITY CITY++ ('cities') (LIS)

Given its morphological nature, reduplication will also make an appearance in various subsections within the Morphology Part of the Blueprint (e.g. the sections on Aspect [Morphology – Section 3.3] and on Number [Morphology – Section 3.1.2]). In the present section, the grammar writer should focus on the phonological change(s) induced by reduplication.

3.3.2 Phonological effects of cliticization and compounding

Compounding [Morphology – Chapter 1] / compounding combines two stems in the lexicon, while cliticization combines two (or more) words in a syntactic string. Both types of processes may affect the prosodic word. For instance, cliticization may result in coalescence [Phonology – Section 3.1.2] / coalescence. Several phonological processes may be induced by compounding. The most common processes are provided in the list below, which may be used as a checklist.

a. Reduction or deletion of phonological material (Liddell & Johnson 1986).
b. Duration is shorter than that of equivalent phrases (Klima & Bellugi 1979: 213).
c. The transitional movement between the two signs is more fluid.
d. The transitional movement is reanalyzed as the sole movement of the compound (Sandler 1999b; Geraci 2009).

Reanalysis of transitional movement is typically found in stable compounds. A relevant example is the LIS compound meaning 'parents', which results from merging the signs for MOTHER and FATHER, as illustrated in the three videos below.

2_3.3.2_1a_LIS_mother

MOTHER

2_3.3.2_1b_LIS_father

FATHER (LIS)

2_3.3.2_1c_LIS_parents

FATHER^MOTHER ('parents') (LIS)

The citation form of both signs has a repeated path movement which disappears in the compound, where the more distal handshape change ( ) is found. The resulting sign meets all criteria of a well-formed lexical sign of LIS and its phonological shape is much "lighter" than that of the original signs. Indeed, PARENTS is a monosyllabic sign while each of its members, taken in isolation, would count as a disyllabic sign in its citation form. Given that compounds will be discussed in more detail in the Morphology Part, the grammar writer may decide to briefly summarize the most important changes here and to refer the reader to the section on phonological and prosodic characteristics of compounds [Morphology – Section 1.4.2].

3.4 Processes affecting higher prosodic units

3.4.1 Organization of the signing space

Depending on the quantity of signed material to be used in discourse, the dimension of the signing space may vary from utterance to utterance.

For instance, the dimension of the signing space normally employed to articulate simple declarative sentences is different from that needed to articulate more complex sentences involving subordination and coordination. In the example (a) below, the square indicates the signing space needed to produce a simple declarative sentence, while the square in (b) indicates the signing space used to produce the same sentence embedded under a verb of saying.

a. PIERO CONTRACT SIGN (LIS)

b. GIANNI SAY PIERO CONTRACT SIGN (LIS)

Another process imposing a marked organization of the signing space can be contrastive focus, where items are contrasted by putting them in separated and distant spatial locations.

3.4.2 Differences in "loudness": Whispering and shouting mode

Whispering mode may be realized in sign language by a general reduction of all parameters and a consequent reduction in the use of the signing space (Crasborn 2001). Conversely, increasing the "loudness" of the message (for instance, in order

to sign over a distance) may be realized by increasing the size of individual signs and the signing space. As whispering has the intent of hiding a message from someone else, whispering will only be used if the signer is in fact in the visual field of the audience that is not supposed to perceive the message. Only if there are language- or culture-specific constraints on the use or form of such functional and gradient phonetic changes, a separate section in the grammar would be merited. Alternatively, including a separate section on phonetic variability is also an option.

Elicitation materials

We are not aware of elicitation materials that would specifically address phonological processes. As in other domains, important information may be extracted from corpus data.

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Part 3: **Lexicon**

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Chapter 0 Preliminary considerations

0.1 What is the lexicon?

Broadly speaking, the lexicon is the collection of words that a speaker of a language knows, or in the case of sign languages, the collection of signs that a signer knows. The lexicon includes information about how words are pronounced (their form), what they refer to (their meaning), and also what functions they serve (their grammatical category or part of speech). The distinction between the lexeme (the conceptual representation of meaning), the word form (the phonological manifestation of the lexeme), and the grammatical word (a description of the morphosyntactic makeup of the word) provides different degrees of abstraction and offers a basic framework for thinking about how form, meaning, and function are instantiated phonologically and morphologically.

Generally, the lexicon is distinguished from knowledge of the rules, or grammar, of a given language. Traditionally, descriptive grammars do not include a dedicated section on the lexicon but rather focus on providing a thorough description of the rules of the language. However, sign languages present unique properties in the lexicon which are not found in spoken languages and which may be unfamiliar to researchers used to working with spoken languages who encounter a sign language for the first time. These properties are fundamental to understanding the language as a whole and also relevant to various aspects of the grammatical system proper. Consequently, this part of the Blueprint deals with the lexicon.

The first step when examining the lexicon is to establish what counts as a lexical item or sign. Splitting up a stretch of signing into individual signs is largely motivated by syntactic considerations: "a word is the largest chunk of a sentence which cannot be interrupted by the insertion of new material" (Cruse 2001: 140). Thus, exploring the ways in which signs may be combined and ordered as separate units is a useful diagnostic for identifying word boundaries. Here we are concerned with word forms as the phonological manifestation of lexemes, but other types of basic unit are used at different levels of analysis: for example, a prosodic word is a prosodic unit which considers the element's intonational properties and whose boundaries may not necessarily coincide with those of a word form (see Prosodic word [Phonology – Section 2.2.1]).

Distinguishing between words and individual (bound) morphemes can be an issue since a productive morpheme may show up in different settings and look like an independent sign. Again, the inability to insert intervening material (between the morpheme in question and its stem) and semantic/syntactic regularities in the neighboring material indicate that this morpheme is not a free morpheme. Similar problems may arise with compounds, and attention must be paid to the phonological form of the sign to decide whether it constitutes one word or two (see

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Phonological and prosodic characteristics of compounds [Morphology – Section 1.4], and also ASL examples in Sandler & Lillo-Martin (2006: 156f)). The predominance of non-concatenative morphology in sign languages means that many morphemes are assembled not sequentially but rather in a simultaneous or templatic manner. This may make it less likely to misidentify such morphemes as words, but the possibilities of simultaneous articulation at the sentence level may make it more difficult to distinguish between separate signs that are co-articulated (normally one on each hand). This issue is dealt with when we address simultaneous constructions and use of the non-dominant hand [Lexicon – Section 1.3.3].

Related to the issues of simultaneity and co-articulation is the matter of non-manuals. As described in the section on non-manuals [Phonology – Section 1.5], elements other than the hands may be an integral part of a sign's form. It is important to distinguish between lexical non-manuals, which serve a phonological role, and those which operate at the levels of morphology (see, for example, non-manual derivation [Morphology – Section 2.2] and agreement [Morphology – Section 3.1]), syntax (see the various sections dealing with non-manual marking in the Syntax Part [Syntax]), or discourse (see, for example, the sections dealing with non-manual marking for definiteness [Semantics – Section 2.1.2]), and thus do not form part of the lexical entry *per se*.

For sign languages, there are various ways to categorize the lexicon, the broadest being native [Lexicon – Chapter 1] versus non-native lexicon [Lexicon – Chapter 2]. While non-native forms are derived from or show influences from the words/signs of some other language, native forms belong to the language itself (or at least have been a part of the language long enough for the non-native origin to be obscure: the English word *beef*, for instance, is of French origin, but it is clearly native compared to the more recent borrowing *mangetout*). Obviously, this native/non-native distinction is also relevant to spoken languages, but is especially important for sign languages since they normally exist in very close contact with at least one spoken language. Furthermore, the use of fingerspelling systems (to represent the written form of spoken language words) opens up a means of borrowing that is channel-specific and unattested in spoken languages.

Deciding whether a given sign is part of the native lexicon of the language may be difficult, especially as very few sign languages have historical documentation which could indicate how established a lexical item is in the language. Experienced language users may have intuitions about whether or not a given sign is native, but folk etymologies are common, particularly in sign languages, for which apocryphal visual motivations are often conjured up to explain the origin of a sign. Borrowings or influence from the spoken language may be easier to identify, but a researcher who is proficient in the spoken language in contact with the sign language may be prone to overlook calques or borrowings. For borrowings from other sign languages, similarity in form and meaning does not necessarily indicate a shared origin: certain signs (such as pointing to the lips for the sign RED) may share similar or even

identical forms but this may be due to visual motivation rather than contact and borrowing between languages. For more details on identifying non-native forms, see Non-native lexicon [Lexicon – Chapter 2], and the methodological challenges described there.

0.2 Organization of the Lexicon Part

This part covers three broad areas: (i) the native lexicon, dealing with the characteristics of the lexicon in sign languages and distinguishing between the core lexicon and the non-core lexicon; (ii) the non-native lexicon, dealing with lexical items from other languages, both signed and spoken, and also from gestures; and (iii) parts of speech, dealing with the different word categories that appear in the lexicon. This structure is aimed at thinking about different aspects of the lexicon, but alternatives are possible: parts of speech, for example, could be incorporated into the native lexicon. More fundamentally, grammar writers need to decide whether or not to include any of this part in the final descriptive grammar they are producing. This issue is discussed in the following section.

0.3 How to use the Lexicon Part

This part is designed to point out to the grammar writer issues that will be relevant when studying a sign language, particularly when it comes to identifying the different elements that make up a given stretch of signed discourse. Traditionally, the lexicon is not usually dealt with in descriptive grammars, and many of the topics dealt with in this part are more akin to the work of the lexicographer and the task of compiling a dictionary of a given language. However, we decided to include this part on lexicon as it seemed necessary to provide information about the lexicon that is relevant to the structure and grammar of the language. As such, much of this part may be treated as observations and guidelines that should be kept in mind when analyzing a sign language, especially for grammar writers who are working with a sign language for the first time.

In this sense, grammar writers may choose not to include the sections in this part in the structure of their descriptive grammar but rather to use this section as a reference section to guide their work. Indeed, it is hard to envisage how certain sections could be fleshed out for a descriptive grammar of a specific sign language: the parts of speech section, for example, could provide examples of the different word classes but it would probably be more useful to hone in on specific issues, such as noun-verb alternations or the existence of different verb classes. Indeed, most of these issues are dealt with elsewhere in the Blueprint (such as the section on derivational markers [Morphology – Chapter 2] in the Morphology Part). Thus, this

part provides background information for the grammar writer that is not so relevant for the grammar reader and may not need to appear as a separate section. Alternatively, certain sections could be maintained, such as the section on the non-native lexicon, which could provide interesting connections with phonological processes [Phonology – Chapter 3]. It is up to the grammar writer to decide how much of the information presented here may be integrated into other sections of the grammar and what merits a specific section of its own.

Chapter 1 The native lexicon

1.0 Definitions and challenges

1.0.1 What is the native lexicon?

The native lexicon includes all signs developed within that language. A combination of formal and sociolinguistic criteria may be used to define native signs, which should conform to the phonological repertoire of the language, and their use should be agreed upon by a sufficient number of signers of the language. Thinking about the difference between the English words *beef* and *mangetout*, the latter fails to meet the test since it contains a phoneme /ʊ̃/, which is not in the phonemic repertoire of English. A word or sign may be considered native if it has formed part of the language long enough to obscure its non-native source. Essential to obscuring foreign origins is the process of nativization [Phonology – Section 3.1.6] / nativization, by which a word changes in form to conform to the phonology of the new host language. This is the case for *beef*, and a similar process may occur in the sign modality when a language adopts a foreign sign with a handshape, for instance, which does not exist in the native repertoire and then changes the handshape to one that does exist in the recipient language.

In order to study the native lexicon of a sign language, it is necessary to have a basic understanding of the language's phonology, and much of this work will be covered in the phonology [Phonology] Part of the grammar. For sign languages with a dictionary, this is a good place to start to analyze the phonological categories present in the language, as described in sublexical structure [Phonology – Chapter 1], and it also provides a readymade list of segmented lexical items. If no dictionary is available, recordings or observation of signing provides a way to collect signs, but it is important to work with native signers in order to make sure that individual lexical items are properly parsed. Bear in mind that writing a descriptive grammar of the type set out in this Blueprint does not entail creating a dictionary of the sign language. Compiling a dictionary is an equally worthy task, but one which requires considerable resources

and which comes with its own considerations and methodological issues. (See How to use this part [Lexicon – Section 0.3] for discussion of how much of this part should end up in the structure of a final descriptive grammar of a given language.)

Within the native lexicon, a further distinction may be drawn between the core lexicon [Lexicon – Section 1.1] and the non-core lexicon [Lexicon – Section 1.2], sometimes also characterized as the established or frozen lexicon versus the productive lexicon. This distinction is specific to sign languages, and relates to their spatial and gestural nature. The core lexicon refers to the lexicon proper: those word/sign forms which are a manifestation of a given lexeme. (This should not be confused with the term "core vocabulary" which is used to refer to a subset of the lexicon made up of basic vocabulary items which show specific properties, such as resilience to language contact.) Conversely, nearly all sign languages make use of mechanisms which involve the combination of phoneme-like units (handshapes, locations, movements, etc.) but the resulting form is not a "word" or lexical element. This is the case for classifier constructions [Lexicon – Section 1.2.1], pointing [Lexicon – Section 1.2.2], and simultaneous constructions [Lexicon – Section 1.3.3], all of which are explained in this section of the Blueprint.

A series of properties characterize and differentiate the core and non-core lexicon, based on phonological, morphosyntactic, and semantic criteria. Johnston & Schembri (1999) propose the following list for Auslan:

Table Lexicon-1: Properties that characterize signs in the core and the non-core lexicon (adapted from Table 1 in Johnston & Schembri (1999:136))

Core lexicon	Non-core lexicon
Phonologically restricted in parameters and structure (subject to phonological constraints, e.g. the dominance condition).	Makes use of a wider range of parameters and frequently violates phonological constraints.
Space is exploited as the phonological parameters of location of movement.	Space and movement are used topographically/ isomorphically.
Subunits are discrete and categorical; variation is allophonic.	Forms exhibit gradience: variations in form create changes in meaning.
Tend to be monomorphemic and monosyllabic.	Normally polymorphemic and may have no clear syllabic structure.
Meaning may be largely unrelated to form but is clear out of context.	The form is visually motivated by the meaning, which depends upon the discourse context.
The form of a given lexeme may show dialectal and cross-linguistic variation.	Less variation across dialects and even across languages.
May belong to any part of speech.	Frequently predicative in nature, although occasionally nominal.
Eye gaze normally directed at addressee.	Eye gaze often follows hand(s).
May be accompanied by spoken language based mouthing.	Any activity on the mouth is more likely to be a mouth gesture.

While this list was developed for a specific sign language, and some of the points may not hold for (or even be applicable to) other sign languages, the properties mentioned give a good idea of the division between an established, linguistically bound lexicon (the core) and a more visually-motivated, productive set of mechanisms which exploit the visual nature of sign languages. The non-core lexical level seems to involve or interact with gesture, and the role of gesture in sign languages has sparked a great deal of debate in the field of sign language research. Whatever the case, this non-core lexical level forms an important and prevalent part of sign languages which merits the attention of a descriptive grammar.

Any given stretch of spontaneous signing will normally contain a mixture of core lexical and non-core elements, and there may be no clear formal markers which distinguish between the two. Furthermore, there is some crossover between the two types of signing through lexicalization on the one hand (see lexicalization processes [Lexicon – Section 1.3.1]) and modification of core-lexical signs on the other (see the discussion of modification of core lexicon signs [Lexicon – Section 1.3.2] and simultaneous constructions and the use of the non-dominant hand [Lexicon – Section 1.3.3]), further blurring the distinction. The difference between core lexical items and non-core strategies depends upon a thorough understanding of the phonological constraints which exist in the language and awareness of the properties which characterize each part of the lexicon.

Furthermore, the use of non-core strategies is acerbated by the fact that, as minority languages with restricted domains of use, most sign languages lack a fully developed vocabulary in many semantic fields. The need to create neologisms to express certain concepts often gives rise to compounds by combining core lexical items, but also by combining core and non-core items, especially size-and-shape-specifiers (SASS), as described in sequential compounds [Morphology – Section 1.1.1.3]. Once more, both the form of the resulting sign and the constraints it obeys give an indication as to whether or not the sign is a single lexical item.

1.0.2 Methodological challenges

When working with the lexicon (be that the native or the non-native lexicon), the general methodological considerations for sign language research must be kept in mind. The danger of being led astray by the use of glosses is especially relevant since the use of a written word to represent a sign encourages the temptation to treat the sign as equivalent to the spoken language word. Needless to say, different languages code concepts in their own way, and there is rarely a one-to-one correspondence between the vocabularies of different languages. The way in which non-core productive lexicon is glossed may reflect underlying assumptions about the lexical status of those signs which the grammar writer should at least be aware of.

The possibilities of simultaneity afforded by the visual channel can also complicate the issue of isolating individual signs: co-articulation may involve a combination of core lexical elements, may consist of non-core lexicon, or may be a mixture of both. As always when working with a sign language, paying attention to non-manual activity can be critical to understanding the intricacies of a phenomenon, and the lexicon is no exception.

Finally, the presence of variation in sign languages makes it essential to find regularities in the data in order to describe the system. In the lexicon, especially the core lexicon, variation may be rife. Documentation of such variation is best left to lexicographers. For a descriptive grammar, the variation displayed by the language may be turned into a useful resource to discover the phonological constraints and properties of the lexicon.

1.1 Core lexicon

The core lexicon contains the established lexicon and is typically what forms the basis of the vocabulary provided in dictionaries. These are "listed in the signer's mental lexicon as single meaningful units and are thus equivalent to free morphemes in a language such as English" (Johnston & Schembri 2007: 159). Although the signs in the core lexicon may show a greater or lesser degree of iconicity and visual motivation, their sublexical structure [Phonology– Chapter 1] draws from the phonological inventory available in the language. The signs meaning 'car' in LSE, Auslan, and LSColombiana may have varying degrees of transparency, but each makes use of a handshape, location, movement, orientation, etc., available in the respective sign language.

a.

LSE
(Gutiérrez-Sigut et al. 2015)

b.

Auslan (Victoria dialect)
(Johnson 1998: 285)

c.

LSCol
(INSOR 2006: 310)

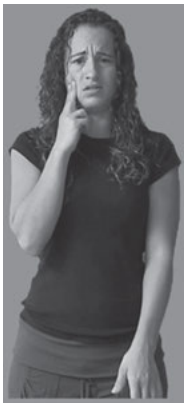
The sign CAR in three different sign languages.

Signs in the core lexicon can be classified by various means. From the point of view of the manual articulators, a sign may be one- or two-handed. Within the two-handed signs, symmetrical signs can be distinguished from asymmetrical signs (for details see two-handed signs [Phonology – Section 1.4]). This distinction is important as each type of sign is subject to different phonological constraints (Battison 1978; Brentari 1998). The Symmetry Condition applies to symmetrical signs and states that if both hands move independently, then both hands must have the same handshape, the same location, the same (or symmetrical) orientation, and the same (or alternating) movement. The Dominance Constraint applies to asymmetrical signs and states that if the hands have different handshapes, then one hand articulates the movement while the other is passive and has a handshape that belongs to a restricted set.

Another distinction for signs in the core lexicon is whether they are simple or compound. Compounds are single words composed of two or more base words (see the chapter on compounding [Morphology – Chapter 1]) and as such have a more complex internal structure than simple signs. Although reduction and assimilation processes may reduce the phonological complexity of compounds, making them look very similar to simple signs, they continue to be polymorphemic and thus are not subject to constraints which operate at the level of the morpheme.

A final distinction to be made for signs in the core lexicon is the level of phonological specification. Many signs are fully specified, that is, all the features in the phonological matrix (such as handshape, movement, and location) have a specific value. A change in one of the specified features will most likely give rise to a change in meaning, forming a minimal pair of signs. The LSE signs SILLY and FEAR, for instance, are both fully specified and differ only in the handshape (leaving non-manual features aside for the moment).

SILLY



FEAR

Fully specified signs which form a minimal pair in LSE. (Images taken from the LSE-Sign data base – see Gutierrez-Sigut et al. 2015 for a description.)

Other signs, on the other hand, are incompletely specified in the sense that one or various of the sublexical features does not have an assigned value. This is the case of agreement verbs (see subsection in the section on verbs [Lexicon – Section 3.2.2]), which are normally specified for handshape, movement and orientation, but not for the location slots in their phonological matrix (these slots are specified when the verb agrees with its arguments).

The specification of a sign is relevant to the notion of citation form. Core lexical items have a clear citation form, intuitively the form one would expect to find in a dictionary for that sign. In the case of fully specified signs, the citation form is provided by the complete specification of all the sublexical units of the signs. For incompletely specified signs, the underspecified features are "missing" and so the default specifications are used. With agreement verbs, for instance, default locations associated with a first person subject and a neutral or default location in the signing space are inserted into the empty slots so that the phonological matrix is complete and the citation, or default, form can be articulated.

The signs of the core lexicon are characterized by a set of properties, as set out in the table in the section "What is the native lexicon?" [Lexicon – Section 1.0.1]. It should be stressed that these properties are based on one specific sign language (Auslan), though many have been reported for other languages as well (such as ASL, BSL, LSE). When working on a specific sign language, it is essential to ascertain which properties hold and which do not, in order to create a language-specific set of diagnostics for delimiting the core lexicon.

The properties can be grouped as pertaining to the (morpho-phonological) form, to the meaning of the sign, or to the interaction between the two. The phonological properties mainly refer to restrictions on the form of the signs. Signs from the core lexicon are made up of sublexical units [Phonology – Chapter 1] (handshape, movement, location, etc.) that are categorically defined in the phonology of the language as a restricted set of options. A sign language makes use of a set of contrastive handshapes [Phonology – Section 1.1.1], and these are the ones that appear in the core lexicon. Equally, the movements and locations present in core lexicon signs belong to a restricted set of options, which may be defined in terms of specific values, such as [arc] or [restrained] for movement [Phonology – Section 1.3], and [head] or [contralateral] for location [Phonology – Section 1.2]. The discrete nature of these phonological units means that space is used in an arbitrary, abstract manner: particularly, movement and location are not isomorphic representations of real space (which usually is the case for non-core strategies). Certain changes in the form of a sign represent allophonic variation with no change in meaning: the LSE sign FEAR is articulated in its citation form with the -handshape, as shown above, but may also be articulated with a slightly different handshape with flexion of the base joint of the fingers, with no change in meaning. However, if the change crosses the categorical boundary between different values for a sublexical unit, the meaning of the sign changes radically, as can be seen in the minimal pair SILLY/FEAR above.

Additionally, continuing at the level of sublexical units, core signs are often accompanied by lexical non-manual components, in particular mouthings derived from spoken language words. The extent to which a given sign language uses mouthings is variable, so this criterion may or may not be useful for identifying core lexical items. In the realm of non-manuals, but not at the lexical level, a common observation is that eye-gaze during core-lexical items tends to be directed at the addressee and not at the hands themselves (conversely, for non-core signs, eye-gaze follows the hands).

Beyond the constraints on the individual sublexical units which make up core lexicon signs, there are also structural constraints. At the beginning of this section, we saw that two-handed signs are subject to the constraints of Symmetry and Dominance, which limit the possibilities for each hand. In addition, there are constraints which operate at a different level of structure. At the morpheme level, the Selected Finger Constraint and the Place Constraint limit the specification for selected fingers [Phonology – Section 1.1.1.1] and location [Phonology – Section 1.2] to one per morpheme. At the syllable [Phonology – Section 2.1.1] level, the Hand Configuration Constraint limits the number of finger configurations [Phonology – Section 1.1.1.2] or orientations within a syllable to two. Furthermore, the timing of these features is aligned with the syllable edge (just as lexically specified non-manual movements are).

Given that most core lexical signs tend to be monomorphemic and monosyllabic, the above constraints mean that such a sign may have only one location and one set of selected fingers, which may change position (and orientation) just once from the beginning to the end of the sign. Note that this is not the case for signs with more than one morpheme or syllable, such as compounds. However, taking into account the morphemic and syllabic structure of a sign may provide an idea of what changes are permitted according to the structural constraints described above.

Turning to the meaning of core lexical signs, such signs have a clear, stable meaning that is apparent from the citation form of the sign. The meaning of the sign does not depend to a large degree on the discourse context, contrary to what occurs with non-core lexicon, although clearly context can provide further levels of meaning and disambiguation (thus, in English, the *head* on my shoulders is different from the *head* of a procession). Importantly, the relationship between meaning and form in core lexical signs is often assumed to be arbitrary and non-componential: the sublexical units which make up the sign (generally) have no given meaning which contributes to the meaning of the sign. Although specific phonological values may have associated meanings, especially for the location feature (the forehead is associated with cognitive functions such as thinking or remembering; the mouth is associated with communicative functions such as saying or asking), the meaning of the sign should be unpredictable or more specific than any underlying componential meaning.

Finally, core lexicon signs may show variation within a sign language with more than one possible form for the same meaning. Even more notably, core lexicon signs show marked differences across different sign languages, as would be expected when comparing vocabularies cross-linguistically (compare the different signs CAR from different sign languages shown at the beginning of this section).

These properties contrast with those of the non-core lexicon, as described in the next section.

1.2 Non-core lexicon

Complementary to the core lexicon [Lexicon – Section 1.1], any sign language lexicon also includes elements inherent to the visual nature of sign languages that exploit the spatial properties of the three-dimensional space for the realization of concepts. These elements do not display the same morpho-phonological characteristics or arbitrary meaning of items of the core lexicon. Such types of entries include classifier constructions [Lexicon – Section 1.2.1], pointing [Lexicon – Section 1.2.2], buoys [Lexicon – Section 1.2.3], and simultaneous constructions [Lexicon – Section 1.3.3].

In the context of the distinction between core and non-core lexicon, these non-core elements are characterized primarily by the fact that they use the signing space in an isomorphic and non-categorical manner to provide spatial descriptions and/or by the violation of the phonological constraints present in the core lexicon. These basic characteristics give rise to a series of properties of the non-core lexicon, summarized in the table comparing core and non-core lexicon in the section "What is the native lexicon?" [Lexicon – Section 1.0.1]. The isomorphic use of space, especially in the case of classifier constructions and pointing, means that these forms are visually motivated, and as a result, small changes in form may have corresponding changes in meaning, and sublexical units (handshape, location, orientation, etc.) may be gradient rather than categorical in nature. The visual motivation also breaks – or at least weakens – the arbitrary form-meaning relationship found in the core lexicon; the general meaning of these elements can be more transparent (e.g. 'a flat round object'), and yet the specific meaning is more dependent on discourse context ('a clock', 'a coin', 'a biscuit'). The iconicity inherent in these signs also makes their forms more stable and less variable, both within a given sign language, and across different sign languages. This contrasts with the ample variation in form for the core lexicon.

While classifier constructions, pointing, buoys, and simultaneous constructions may, on the surface, look like core lexicon signs, they are structurally more complex. Indeed, buoys and simultaneous constructions may be considered discourse-level phenomena, and they are included here to point out to the grammar writer that what looks like a simple sign can actually be well beyond the lexicon. The seeming simplicity of these forms is betrayed by the fact that they do not conform to the phonological constraints of the core lexicon, especially with respect to the limitations on the number of locations and handshapes possible in a given sign (see the different constraints described for the core lexicon [Lexicon – Section 1.1]). Furthermore, the form is often accompanied by specific non-manual elements: eye gaze will follow the hands in non-core signs, and an accompanying mouth movement is more likely to be a mouth gesture than a mouthing. Since the movement of the sign may be iconically motivated, it can be difficult to ascertain the syllabic structure of these non-core

elements (whereas the core lexicon has a strong monosyllabic preference). At the same time, such non-core signs tend to be polymorphemic in nature (in contrast to the largely monomorphemic core lexicon), and this complexity is reflected in the fact that they are frequently predicative in nature.

This list of properties of non-core lexical items gives a set of guidelines to the grammar writer for distinguishing between the core lexicon and more complex, productive mechanisms which have been observed in most sign languages studied to date. No single property can be used as a necessary or sufficient condition for classifying a given sign, and certain features may be more or less relevant in a specific sign language. It is up to the grammar writer to ascertain which features are significant for the sign language being described, and our aim here is to point out these productive mechanisms that are peripheral to the core lexicon.

1.2.1 Classifier constructions

Broadly, classifier constructions are used to give spatial and motion descriptions of objects. For a full description of classifier types and forms, see the chapter on classifiers [Morphology – Chapter 5]. The following example from DGS shows typical use of a classifier construction to provide a spatial description of two objects, providing the position and orientation of the objects relative to each other and relative to some point of view.

(Scene described.)

dom: MAN BROWN HAT CL(man)$_{right}$

n-dom: TREE CL(tree)$_{left}$--------hold----------

'The man with the brown hat is to the right of (and facing) the tree on the left.'

A classifier construction in DGS (Perniss 2007: 78)

In using (signing) space to provide spatial descriptions, classifier constructions create a continuous, isomorphic mapping of the referents which offers an extremely productive means to convey information about (relative) location and movement. However, classifier constructions are not mere pantomime, and are subject to clear restrictions both in form and structure. Classifier handshapes are drawn from a closed set and differ from one sign language to another; equally, the use of movement is not completely unrestricted and rules govern the use of different movement types. In this sense, the form of classifier constructions combines the arbitrary with the visually motivated. In terms of structure, classifier constructions interact with argument structure and certain types of classifiers are used for specific types of verbs. A classifier may refer to the subject of an intransitive clause or the object of a transitive clause, and this conditions the handshape employed. For example, in a sentence like 'The book fell onto the table' a flat B-hand configuration ( ) may be used, whereas for 'She picked up the book', a grasping handshape ( ) can be used to depict the book. (See the section on argument structure alternations [Syntax – Section 2.1.1.5] in the Syntax Part for full examples.)

The classifier system makes use of basic sub-lexical units (handshapes, movements, locations, etc.) but combines them in ways which go beyond the basic core lexicon, creating structures which may be morphologically and semantically rich. Classifier constructions provide a highly efficient and economic means of conveying spatial descriptions. Although alternative mechanisms exist within the core lexicon for expressing locative information, the result is often uneconomic and obscure, and most sign languages studied resort to some sort of classifier construction to express spatial information (Zwitserlood 2012).

1.2.2 Pointing

Pointing is very common in sign language discourse and is undoubtedly the type of manual activity that looks most like the sort of gesture that non-signers commonly use to indicate deictically or demonstratively. However, pointing in sign languages fulfills a wide range of functions, and has been associated with various linguistic elements, including pronouns [Lexicon – Section 3.7], determiners [Lexicon – Section 3.6], demonstratives [Syntax – Section 4.1.2], locative adverbials [Syntax – Section 6.4.2.3], and agreement markers [Lexicon – Section 3.3.4].

Distinguishing between these different functions may involve paying attention not only to the syntactic contexts in which a given point may (or may not) occur, but also looking carefully at the form of the sign. Differences in handshape and orientation may set apart different types of point; additionally, movement, in terms of direction, length, repetition and quality (tensed or lax, for example), may also give an indication that a point is of one type or another (Pfau 2011).

In addition to manual points, directional indicating may also be carried out by non-manual means, such as eye gaze, head tilts, or even lip pointing. These non-manual markers may take on the same grammatical functions as manual pointing.

For the grammar writer, it is important to be aware that a given instance of pointing may serve one of a multitude of functions. In some cases, the point may be similar to a co-speech gesture but the fact that it is produced by the same articulators as the signed discourse obviously makes it much harder to classify.

1.2.3 Buoys

In certain discourse contexts, sign languages often employ a specific strategy to keep track of the referents: buoys (Liddell 2003; see the section on buoys in the Pragmatics Part [Pragmatics – Section 2.2.3] for further information). This involves keeping the non-dominant hand in a stationary configuration while the dominant hand continues to sign. This means that the two hands are not subject to the constraints that normally operate for lexical signs, since using a buoy involves doing two different things with each hand at the same time.

A common type of buoy construction is a list buoy, which occurs in situations with a small set of referents (normally between two and ten) belonging to the same class and which involves using the non-dominant hand to distinguish each referent. For example, when talking about her siblings, a signer may associate each sibling with a different finger on the non-dominant hand. While the description for a given sibling is provided, the corresponding configuration of the non-dominant hand (roughly equivalent to 'first', 'second', 'third', and so on) is held in place to indicate which sibling is being talked about.

The use of the non-dominant hand in buoy structures makes it possible for backgrounded information to remain present during the rest of the discourse, and allows for the simultaneous presentation of different linguistic elements. This mixture of elements may be made up of different core lexical elements (or may include other non-core elements, such as classifiers) but is not subject to the same constraints as a single item from the core lexicon.

1.3 Interaction between core and non-core lexicon

The distinction we have made between core and non-core lexicon is a real and important characteristic of the lexicon of sign languages. However, these two types of lexicon do not represent completely separate, independent parts of the language system. Firstly, the two systems are in constant use and appear side by side in any stretch of signed discourse. A given sign language sentence will typically alternate between core and non-core lexicon and, as described in simultaneous constructions

and use of the non-dominant hand [Lexicon – Section 1.3.3], both types may occur simultaneously. (See the DGS classifier construction in the section on classifier constructions [Lexicon – Section 1.2.1] for an example of a sequential and simultaneous mixture of core and non-core lexicon.) Although certain registers or styles may tend to use one type of lexicon more than another (for example, formal registers may include more core lexicon whereas poetic registers tend to make greater use of the expressive possibilities of non-core lexicon), signed discourse will inevitably exploit both types.

More fundamentally, the distinction between core and non-core lexicon is not clear-cut since there is interaction which blurs the boundary between each type. This interaction is two-way: non-core lexicon may undergo a process of lexicalization to join the core lexicon, and items from the core lexicon may be modified such that they behave more like non-core lexicon. The following sections examine each of these phenomena in turn.

1.3.1 Lexicalization processes

Lexicalization is the process by which a new lexical form is created such that its formal and semantic properties cannot be fully derived from the constituent elements. The new lexical item emerges to encode a specific meaning, normally because there was previously no single item to express that concept. The new word/sign may be created through various processes, such as compounding, conversion, and derivational affixation. Respectively, these processes combine other lexical items (e.g. *watermark*) or modify an existing lexical item by changing its grammatical category (e.g. *text* as a verb, meaning to send somebody a text message) or by adding affixes (e.g. *disambiguation*), and additionally, new lexical items may also be created *ad novo* (e.g. *google*).

In the case of sign languages, the lexicalization process may draw not only from existing (core) lexical items but also from the non-core lexicon. Generally, classifiers [Morphology – Chapter 5] appear to undergo lexicalization very readily, and many lexical items may have their origins in some sort of classifier form. Pointing may also enter the lexicon, although the transparent and gestural appearance of pointing often makes it difficult to be sure that a form involving pointing has lexicalized. Finally, lexicalized buoys rarely show up, although some core lexical items appear to be derived from the buoy mechanism.

In compound formation [Morphology – Chapter 1], classifiers may be one (or more) of the elements which make up the compound. A common sequential compounding process in sign languages is the combination of a (nominal) lexical item with a Size-and-Shape-Specifier / Size-and-Shape-Specifier [Morphology – Section 5.2], as can be seen in the LSE compound meaning ‘bullet’.

GUN^SASS(small object) (LSE)

Different types of classifier constructions may also occur in simultaneous compounds, as in the combination of a handling classifier (normally used to represent a writing implement) and a size and shape classifier (to represent a flat rectangular object) in the LSE sign BLACKBOARD:

Dominant hand:	CL(writing implement)	
Non-dominant hand:	CL(flat rectangular object)	(LSE)

For more information, see the section on simultaneous compounds in the Morphology Part [Morphology – Section 1.1.2], and the section on simultaneous constructions and use of the non-dominant hand in this part [Lexicon – Section 1.3.3].

Conversion [Morphology – Section 2.0.2], the process by which an item undergoes no change in form but appears in a new word class, is also a common means by which non-core items may enter into the core lexicon. (Strictly speaking, conversion involves a transformation from one word class to another, but in the case of non-core lexicon, it is often unclear what word class a given item has in the first place. Nevertheless, the preservation of form provides motivation to treat this as a case of conversion.) Classifier constructions may be lexicalized to encode a stable, specific meaning, as is the case for WHITE-COFFEE in LSE, which is derived from a classifier construction with the more general meaning of 'pour two liquids into the same place at the same time' (image taken from the LSE-Sign data base – see Gutierrez-Sigut et al. 2015 for a description):

WHITE-COFFEE (LSE)

Pointing may also be lexicalized. This most commonly happens in the case of deictic pointing on the body, for signs such as NOSE, EAR, or ELBOW, for which the location is specified by the body part in question. Pointing into space may be also lexicalized for locational meanings (for many sign languages, the sign GOD involves pointing

upwards) or temporal meanings (in LSE, the sign TODAY is a downward point very similar to what one would expect for 'here').

Buoys / buoys [Pragmatics – Section 2.2.3.] may undergo lexicalization, and often form part of a lexicalization process such as compounding. One possible example of a form which is (almost) identical to a buoy is the LSE sign SURNAME, which involves tapping the thumb with the middle finger. Used in a buoy construction, this form (typically on the non-dominant hand) would mean 'the second of two things'.

Derivational affixation [Morphology – Chapter 2.1] is normally associated with the sequential morphological process of adding prefixes or suffixes to a given form; this type of process is not generally common in sign languages. However, simultaneous derivational processes [Morphology – Section 2.1.2] are possible, along the lines of the template morphology characteristic of Semitic languages, in which the base form itself is modified (rather than added to). This type of simultaneous morphological process is much more common in sign languages, and is frequently attested in the distinction between verb and noun pairs, which differ in the movement of the sign (see the section on common nouns [Lexicon – Section 3.1.1]). As far as lexicalization of non-core elements by means of derivational processes is concerned, the picture is unclear: derivational processes which have been described apply to core lexical items (see derivation [Morphology – Chapter 2]). If a non-core item displays such derivational morphology, it may well be because it has already entered into the core lexicon through some other process.

Although a better understanding of derivational processes in sign languages is needed before we can identify more mechanisms which transform non-core lexicon into core lexicon, there are clearly some core lexicon items which derive in some sense from non-core mechanisms. This can be seen with lexical signs that make use of the frameworks exploited by the non-core lexicon. In the case of pointing, the concept of time may be expressed by means of an underlying spatial map: thus, in several sign languages, the signs TOMORROW and YESTERDAY are identical in form except for the direction of the movement (forwards and backwards, respectively – see section on time lines [Morphology – Section 3.2.1]). The buoy system associates separate referents with different fingers of the non-dominant hand, and this is reflected in various quantifier signs such as HOW-MANY (in various sign languages). Buoy structures often establish ordered lists, and an analogy of this can be seen in the BSL sign LAST, which involves the dominant hand contacting the extended little finger of the non-dominant hand.

In summary, various scenarios for the lexicalization of non-core elements are possible. For instance, a usual path for their assimilation may begin with their compliance with phonological requirements, initially through combining with another core lexical sign or an assimilated mouthing to form a compound sign. Alternatively, non-core lexical signs may stand alone in a phrase after deletion of their expected lexical precedent, and ultimately substitute for it; that is, they lexicalize.

An important feature of lexicalization is that the new item gains autonomy at the expense of the component parts, whose individual meanings are less important for the meaning of the resulting item. This semantic transformation occurs with non-core elements that have undergone lexicalization, as the new core lexical item has a specific (and stable) meaning which is more limited than the more general meaning of the original non-core item ('white coffee' versus 'two liquids poured into the same place'; 'god' versus 'something up there'; 'surname' versus 'the second of two things', etc.). Consequently, lexicalized signs can stand on their own, and their meaning remains clear, whereas the underlying non-core form would depend on the context for its meaning.

However, the transformation from non-core to core also involves restrictions on the form of the sign and of the relationship between form and meaning. The core lexicon is subject to restrictions on form that do not apply to non-core lexicon (see the table in What is the native lexicon? [Lexicon – Section 1.0.1] for an overview of the differences between core and non-core lexicon).

Thus, the lexicalization process coerces classifiers, buoys, and pointing to conform to the morpho-phonological requirements of the specific language, and the outcome is usually a monosyllabic sign with a simple movement and direction path in its base form. For instance, core lexicon signs are subject to the Symmetry and Dominance Conditions [Lexicon – Section 1.1]. In the example of the lexicalized classifier construction WHITE-COFFEE in LSE, the underlying classifier construction could be modified to show how more of one liquid is poured in, or the order in which the liquids are added; however, the core lexical sign as a bimanual sign is subject to the Symmetry Condition, and both hands move at the same time in a symmetrical fashion.

Furthermore, for lexicalized signs that form part of the core lexicon, the relation between form and semantics may also become more opaque and arbitrary, with less visual motivation, and the isomorphic mapping between the sign form and actual space can be lost or severely degraded. Thus the classifier structure for pouring two liquids into one place is strongly iconic and may convey spatial information directly (such as the height from which the liquids are poured), whereas the lexicalized sign WHITE-COFFEE is somewhat arbitrarily derived from a constrained form of the underlying classifier structure.

The process of lexicalization constrains both the form and meaning of an item. In the following section, we look at the reverse process, in which core lexical items break these restrictions to exploit non-core mechanisms.

1.3.2 Modification of core lexicon signs

Just as a sign may move from the productive, gradient dimension of non-core lexicon into the more arbitrary and categorical core lexicon, the reverse process, a sort of delexicalization, may also occur. This transformation typically involves the signing

space taking on topographic meaning, so that the location/orientation of the sign is isomorphic with the location/orientation of the referent.

Typically core-lexical signs which are most likely to delexicalize are those whose origins lie in non-core lexicon, especially classifier structures. So, for example, a sign like FILM, based on the classifier for a video camera, could modify its location in order to describe the angle of the shot and/or its movement to express the motion of the camera. For two-handed signs based on classifier constructions, such as the LSE sign BLACKBOARD (see example in lexicalization processes [Lexicon – Section 1.3.1]), the relative position of each hand may be modified to include information about the size of the referent ('a large blackboard') or the relative position of the elements that make up the referent ('write at the top of a blackboard'). In addition to the productive modification of the location and movement features during delexicalization, the configuration of a sign may also change in a motivated manner. For example, the LSE sign TREE shown below may be modified from its citation form by bending the fingers in order to express the idea of withered or gnarled branches (image taken from the LSE-Sign database – see Gutierrez-Sigut et al. (2015) for a description).

TREE (LSE)

The delexicalization process involves the activation of the isomorphic space which characterizes the non-core lexicon, but in the context of core lexicon items. Signs which are derived from non-core mechanisms lend themselves well to "returning" to this visually motivated dimension. Although other core lexicon signs may also undergo this delexicalization, generally the process is restricted to signs whose phonological form will allow such meaningful modifications, namely signs which are not articulated on the body and so can be moved around the signing space. The transformation

of core lexicon signs is an important mechanism for expressing nuanced information (both spatial and – through metaphorical extension – in other conceptual domains), and is put to great use in poetic and narrative genres.

For the grammar writer, delexicalization means that signs that have been identified as core lexicon may show more variation in form than expected. Identifying what non-core mechanisms are at play in the sign language being described and when they are at work will help to isolate the citation form of core lexicon items and thus to characterize the phonological constraints that apply.

1.3.3 Simultaneous constructions and use of the non-dominant hand

The availability of two manual articulators in sign languages opens up the possibility of many sorts of simultaneous structures. Here we are concerned with the lexicon, and though simultaneous constructions are generally beyond the lexicon and operate at the level of syntax or discourse, a simultaneous structure may become a specific lexical item through the process of lexicalization or simultaneous compounding, as described in lexicalization processes [Lexicon – Section 1.3.1]. The components that make up these lexicalized simultaneous structures are frequently classifier constructions, but may also be buoys or core-lexicon items. The following are LSE examples of lexicalized simultaneous constructions with classifier components:

INSOMNIA [non-dominant hand represents flat surface of the bed; dominant hand represents person tossing and turning]
COMPUTER [non-dominant hand represents computer screen; dominant hand represents hand typing at keyboard] (LSE)

Simultaneous constructions are dealt with elsewhere in the Blueprint (see, for example, the simultaneous expression of various adverbial clauses [Syntax – Section 3.5] and simultaneous manual articulation [Syntax – Section 4.1.1.2] within the noun phrase), but we mention them here to point out to the grammar writer that what may look like a simple bimanual sign may in fact be a simultaneous construction operating well beyond the scope of the lexicon. In this sense, simultaneous constructions allow core-lexicon items to become more productive, in a similar way to what happens when they delexicalize by adopting non-core mechanisms.

The use of the non-dominant hand in simultaneous constructions, particularly with classifiers or points that are used to background a given referent, bears parallels with the use of buoys, which also appear on the non-dominant hand in simultaneous constructions. Again, these structures involve the layering of not only lexicon but also discourse and information structure and should not be confused with simple lexical items.

Elicitation materials

For eliciting lexical items, word and picture lists have been used. While many word lists exist from the field of spoken language research (such as the Swadesh lists), it may be more worthwhile to choose a list that has been adapted and used with other sign languages, in order to allow cross-linguistic comparison. (The Swadesh lists have been adapted for sign languages: see Woodward 1978, 1991, 1993; Hendriks 2008.) The lexicon elicitation list for the ECHO project has been used with several European sign languages, and both the list and the results are freely available on the project website (http://sign-lang.ruhosting.nl/echo/). For elicitation work with sign language users who are not proficient in the written language, it is more appropriate to use picture stimuli. Various picture stimuli are freely available, such as the Roisson & Pourtois object set (based on a classic set of pictures for which extensive normative data exists) (http://www.nefy.ucl.ac.be/facecatlab/stimuli.htm). For other picture sets, this compilation is a good place to look: http://www.cogsci.nl/stimulus-sets. Obviously, all word/picture sets should be adapted to be culturally appropriate for the language users participating in the elicitation sessions.

Elicitation techniques using word lists or pictures to collect lexical items may produce established core lexical signs but also non-core elements, especially classifier constructions. In some cases, these items may be lexicalized, in which case the forms will be subject to certain constraints (see core lexicon [Lexicon – Section 1.1] and lexicalization processes [Lexicon – Section 1.3.1]). Although one might also expect a lexicalized form to present greater uniformity across different informants, the core lexicon displays the same high degree of variation found throughout most sign languages (in most dimensions: geographic dialect, age, gender, etc.).

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Chapter 2 The non-native lexicon

2.0 Definitions and challenges

2.0.1 What is the non-native lexicon?

The native lexicon [Lexicon – Chapter 1] of a language, whether it is signed or spoken, consists of forms that have developed naturally through the usage of that language among native speakers, by employing the morpho-phonological resources of the language, and independent of any external influence. Besides that, all natural languages contain forms that are borrowed as a result of the contact between a language and the surrounding languages, individual contacts, or linguistic engineering (deliberate attempts of individuals or administrative institutions to introduce new (foreign) words).

The majority of sign languages are in contact with surrounding spoken languages including the dominant spoken language of the region that they are used in. Thus, the lexicon of sign languages is likely to contain forms that are borrowed from a spoken language. In addition, contact with other sign languages results in borrowing forms from other sign languages. Consequently, the non-native lexicon of a sign language consists of items that are either borrowed from (surrounding) spoken languages or other sign languages.

2.0.2 How to decide whether a particular form is borrowed

Any item in a language that can be traced to a form in another language (the donor language) counts as a borrowing (or a loan word/loan form). Some items, such as those containing fingerspelling [Lexicon – Section 2.2.2] / fingerspelling or mouthing [Lexicon – Section 2.2.3] / mouthing, are easy to identify as borrowed from spoken languages. However, beyond these two phenomena, it may not always be easy to identify the origin of a particular sign. Sometimes a form may resemble a form in another language, but may nevertheless be native in origin and may have the same or a similar form for other reasons (see also the section on loan compounds

[Morphology – Section 1.2]). Iconicity, for instance, is a factor that is fundamental to the expression of linguistic items in sign languages. Crucially, the iconic potential of sign languages may lead to phonological similarities across sign languages that do not result from borrowing. Therefore, when describing the non-native lexicon, it might be safer to stick to prototypical borrowings (fingerspelled forms and mouthings), unless the origin of a particular form is known for sure.

Taken together, there are various types of borrowed forms, and the grammar writer has to decide which of these exist in the sign language under question. The borrowed forms may or may not conform to the morpho-phonological structure of the native lexicon (see next section for discussion), and may not be traceable to a source. Thus, it is up to the grammar writer whether or not to indicate a form as borrowed when its origins are either not clear, or when the form fully complies with the phonological and morphological structure of the language.

2.0.3 Morpho-phonological marking of borrowed forms

Some borrowed forms have the same morpho-phonological properties as native forms. Thus, although traceable to a foreign origin, they may be morpho-phonologically indistinguishable from native items. But in some languages, borrowing has its morpho-phonological markings. To give an example from a spoken language, in Japanese, Chinese loan morphemes never have more than two syllables (Haspelmath & Simms 2010: 122). In ASL, non-native forms tend to allow more types of morphological affixation than native forms (Brentari & Padden 2001). Thus, in order to understand whether a particular item is borrowed, one has to have a good understanding about the morpho-phonological properties of the sign language in question.

2.0.4 When should a borrowed form be considered part of the lexicon?

Lexicalization is the process whereby a particular item is used in a new way to denote an entity, action, or state of affairs, as a result of which that item enters the lexicon of the language. Brinton & Traugott (2005: 96) define lexicalization as "the change whereby in certain linguistic contexts speakers use a syntactic construction or word formation as a new contentful form with formal and semantic properties that are not completely derivable or predictable from the constituents of the construction".

Borrowed or native, it is not always easy to determine whether a form is productively used and recognized by native language users, and whether it is recurrent in the language or rather a one-off usage (hapax legomenon or nonce form), created on the spur of the moment and thus never entering the lexicon of the language. In order for this to be understood, corpus studies have to be conducted, but the general view

is that unless a form is used and recognized consistently in corpora, it should not be considered to be part of the lexicon.

Code-switching is another process that aggravates the identification of a form as being part of the lexicon or not. Forms from other languages that are used in code-switching may also be cases of hapax legomena.

2.0.5 Methodological challenges

As already mentioned above, the identification of borrowed forms is faced with a number of methodological challenges. First of all, the grammar writer should be very cautious about including forms in a list of borrowed items that are clearly iconic – although there may be iconic forms that are borrowed (as has been claimed, for instance, for the ASL sign TREE found in other sign languages).

Iconicity may also complicate the identification of initialized forms (see initialization [Lexicon – Section 2.2.2.1]. In particular, a sign may have a handshape that is iconically motivated but which coincidentally corresponds to the handshape from the manual alphabet representing the first letter of the corresponding word from the spoken language (e.g. the ASL sign CUP has a C/ -handshape and the NGT sign VORK ('fork') has a V/ -handshape). In addition, a sign may simply have a highly frequent handshape corresponding to the first letter of the word. Imagine, for instance, the sign SIT being signed with a S/ -handshape. The grammar writer may want to be as conservative as possible when determining the status of a sign as being initialized.

There is also a methodological issue concerning mouthing [Lexicon – Section 2.2.3]. Caution should be taken as to whether a particular movement or configuration of the mouth should indeed be classified as a mouthing (i.e. whether it mimics (part of) the word corresponding to a particular concept in the spoken language) or rather a mouth gesture. It is known that mouthings may be reduced to the extent that they resemble a mouth gesture (Bergman & Wallin 2001).

2.1 Borrowings from other sign languages

The most typical lexemes borrowed from other sign languages are proper nouns [Lexicon – Section 3.1.2], in particular, toponyms (i.e., names of geographical locations, countries, towns, villages, rivers, mountains, etc.) and name signs of (famous) people. These terms are usually (but not always) the lexemes used in the sign language of the country where the respective location is found or the person lives, for example, most European sign languages use the sign for UGANDA borrowed from USL. Also, the ASL name sign for Barack Obama has been borrowed in other sign languages.

Fingerspelling may also be borrowed from other sign languages. For example, there are borrowed fingerspellings from ASL and Australasian Signed English used in Auslan (Johnston & Schembri 2007).

2.2 Borrowings from (neighboring) spoken language

There are various types of loan forms in sign languages, some typical (e.g. calques) and others less typical.

2.2.1 Calques/loan translations

Calques are loan items where a complex form is translated into the sign language part-by-part. These are usually forms made up of two stems, that is, they are typically compounds [Morphology – Chapter 1] / compounds. It is possible that other morphological items may be borrowed as calques but, to our knowledge, these are not attested in the literature.

The borrowed forms may be endocentric [Morphology – Section 1.1.1.1.1] or exocentric [Morphology – Section 1.1.1.1.2] compounds. An example of an endocentric compound borrowed from English can be found in Auslan: SUPPORT^GROUP (Johnston & Schembri 2007). An exocentric compound borrowed from the Turkish expression *kap+kaç* 'snatch+run.away' is seen in TİD: SNATCH^RUN.AWAY 'snatch-and-run thief'.

In addition, idiomatic expressions might be borrowed, but again, this topic has only received very little attention to date.

2.2.2 Lexicalization of fingerspelling

Fingerspelling refers to the usage of the orthography of the spoken language (a letter/letters from the spoken language) to express a concept, and is a common form of borrowing from a spoken language (see the section on the manual alphabet [Phonology – Section 1.1.3]; the grammar writer may wish to repeat the manual alphabet here for the reader's convenience). Fingerspelling may be used in different ways:

(i) One-by-one fingerspelling: This is the spelling of the whole word. This type of fingerspelling is sometimes used when expressing a concept (especially, but not exclusively, proper nouns) for which there is no corresponding sign (e.g. D-A-V-I-D). There is no need to discuss fully fingerspelled forms in the grammar, but see (iv).

(ii) Initialization [Lexicon– Section 2.2.2.1]: The handshape associated with the first letter of the corresponding spoken language word forms part of the sign, e.g. 'W' in the sign WATER in ASL and 'V' in the sign VEGETARIAN in NGT and other sign languages.

(iii) Single manual letter signs (SMLS): The handshape associated with the first letter of the corresponding spoken language word is used, possibly with repetition of the movement, e.g. 'D' ('daughter') in BSL.
(iv) Multiple-letter signs [Lexicon – Section 2.2.2.2]: In these signs, more than one letter from the corresponding spoken word is used. There are various subtypes, which differ in the number of letters represented and in their phonological integration.
(v) Fingerspelling + sign: These are cases where a fingerspelled form is used before, after or simultaneously with a sign; e.g. the TİD sign K^SPRINKLE ('cumin' from Turkish ***k**imyon*); such examples are discussed in the section on compounds with fingerspelled components [Morphology – Section 1.3], but the grammar writer may wish to (also) include a brief discussion of such cases in this section.

In addition to the above, fingerspelled items may be used as nonce forms in a particular communicative setting to refer to an entity that does not have a lexicalized sign (a lexeme). Imagine a situation, for instance, in which signers talk about Chardonnay wine. At first mention, the form would be fully fingerspelled, but subsequently, the signer will probably choose to reduce it C-H (or maybe C-Y). Use of this form, however, is limited to this particular discourse context and is therefore sometimes referred to as "local lexicalization".

It is pointed out in Meir (2012: 102) that initialization in sign languages with a single-handed spelling system (a system where each letter is formed by one hand) is much more common than in languages where fingerspelling involves two hands, such as BSL, Auslan, and NZSL. This is due to the complexity of these systems, that is, the complexity of two-handed signs incorporating movement and location (see Cormier, Schembri & Tyrone 2008). However, languages with two-handed alphabets do lexicalize fingerspelling, in the guise of single- or multiple-letter signs. In any case, sign languages vary greatly in their usage of fingerspelling (see e.g. Machabée 1995 for LSQ; Ó'Baoill & Matthews 2002 for Irish SL; Brentari & Padden 2001 for ASL; Sutton-Spence 1998 for BSL; Taşçı 2012 for TİD; see Carmel 2004 for an overview of different manual alphabets). Sign languages in contact with spoken languages that use non-alphabetic writing systems also have mechanisms for depicting the written form, such as the character signs that exist in Taiwanese Sign Language (Ann 1998) and handshape-movement combinations that represent syllables in Ethiopian Sign Language (Duarte 2010).

2.2.2.1 Initialization

The term "initialization" is used in different ways in the literature. Some researchers use the term only when an existing sign adopts a handshape from the manual alphabet, while others apply the term more broadly to refer to all signs in which the handshape represents the first letter of the corresponding spoken word. In the following,

we will use the term in the broader sense. The grammar writer, however, may wish to distinguish between the two types in the grammar.

In the first type, in which the handshape of a base sign is substituted by a handshape from the manual alphabet, the fingerspelled letter in a sense assimilates/incorporates features of the base sign to yield a meaning that is semantically related to that of the base sign. Consider the following examples from NGT (left image) and TİD (right image).

WINE (NGT): the sign has all of the features of the base sign DRINK, except for the handshape, which represents 'W' (🤟).

PSYCHOLOGY (TİD): the sign has all of the features of the base sign THINK, except for the handshape, which represents 'P' (Taşçı 2012: 60–61).

Note that there may be cases in which it is impossible to clearly identify a base sign. For example, in ASL, the handshapes corresponding to the letters 'B', 'Y', and 'G', when combined with a particular location and movement mean 'blue', 'yellow', and 'green', respectively (Brentari & Padden 2001). In these cases, a generic sign (which may be underspecified for handshape) adopts a letter handshape and thus fingerspelling is used for semantic differentiation. Similarly, for the NGT sign VEGETARIAN, it is difficult to identify a base sign. The sign is articulated with a V/🤞-handshape at the chin. Clearly, the location is iconically motivated, as the sign is articulated close to the mouth, but there is no particular base sign from the same semantic field that shares with VEGETARIAN all the features other than the handshape.

The grammar writer should be aware of the fact that the types of initialization attested in a sign language may depend on the type of fingerspelling used. In lexicalization of fingerspelling [Lexicon – Section 2.2.2], we already pointed out that initialization is less frequent in two-handed fingerspelling systems. Another case of initialization are single manual letter signs. In these signs, a handshape representing

a letter is articulated in neutral signing space, often with some movement. This kind of initialization is commonly observed in two-handed systems.

The TİD system is special, as it features one-handed and two-handed letters, and all one-handed letters are articulated by the non-dominant hand. Interestingly, when a letter forms part of a sign, we observe hand reversal, that is, the letter is articulated by the dominant hand. For example, the letter 'L' in TİD is articulated by the non-dominant hand, but the word LYCEE ('high school') is a single manual letter sign using the letter 'L' and is articulated by the dominant hand (Kubuş 2008: 52; Taşçı 2012: 42). Hand reversal (affecting only one-handed letters) is a tendency and is not without exceptions; however, where it occurs, it may be considered the phonological marker of borrowed forms.

2.2.2.2 Multiple-letter signs

This group contains various subtypes. In the following, we present these in the form of a list, but the grammar writer may wish to introduce corresponding separate subsections.

Acronyms and abbreviations. The difference between acronyms and abbreviations (alphabetism) is that the former are pronounced like words (e.g. NATO (/neɪtəʊ/) in English) while in the latter, each letter is pronounced separately (e.g. USA (/juːeseɪ/) in English). It is unknown whether this difference is somehow reflected in sign language, for instance by means of different prosodic patterns. Below we do not make this distinction, but the grammar writer is cautioned to be aware of this possibility.

Frequently, in a fingerspelled form, certain letters are reduced or deleted. For instance, in Auslan B-W-C-K is used for Brunswick. Other examples include C-O ('company') and A-D-V ('advertisement') in Auslan, J-L ('July') in NGT, and B-B ('baked beans') in ASL and BSL. The examples illustrate that there are various options for the selection of letters. Crucially, this reduction is not tied to a particular discourse situation (as is the case of local lexicalization); rather, it is consistently used and should thus be considered fully lexicalized.

In addition, sign languages may, of course, make use of two- or multi-letter abbreviations that are the same as in spoken language (e.g. T-V or U-N-E-S-C-O).

Simultaneous forms. In some interesting cases, letters are partially or even fully simultaneously signed. As for the latter, they are rare because it is articulatorily difficult to simultaneously represent letters. The following two examples illustrate the phenomenon.

- The sign meaning *lui* ('lazy') in NGT: thumb and index form the 'L', index and middle fingers form the 'U', pinky forms the 'I'.
- The sign meaning *roi* ('king') in LSQ: index and middle fingers form the 'R', thumb and ring finger form the 'O', pinky forms the 'I' (Miller 2001: 157).

ROI ('king') (LSQ)

Given the availability of two manual articulators, letters may also be expressed simultaneously on the two hands, sometimes in combination with a movement. In the ASL sign TOTAL-COMMUNICATION, for instance, the dominant hand assumes a -handshape while the non-dominant hand has a -handshape. As the alternating movement and the place of articulation (in front of the mouth) are the same as in the sign COMMUNICATION (an initialized sign with -handshape on both hands), TOTAL-COMMUNICATION is, in a sense, at the same time initialized (one initial on each hand) and a simultaneous multiple-letter sign.

Nativized fingerspelled loans. Certain fingerspelled words may undergo a process of reduction (deletion of certain letters), and/or a combination of simultaneous and sequential elements. Examples include the following:

- The sign meaning *WC* in NGT: thumb, index, and middle fingers form the 'W', they repeatedly bend to resemble the 'C' (see left image below).
- The sign meaning *blauw* ('blue') in NGT: the sign is sequential in the sense that the B/-handshape changes into the L/-handshape; this change is accompanied by an orientation change of the palm that corresponds to the orientation change that characterizes 'U'.
- The sign meaning *Van* (name of a town in Turkey) in TİD: the sign begins with a combination of the letters 'V' and 'A', followed by 'N' (see right image below).

WC (NGT)

VAN (TİD)

The grammar writer is encouraged to look for similar forms, as there may be many different ways to simultaneously combine letters.

2.2.3 Mouthing

The term mouthing refers to mouth patterns that are derived from spoken languages, i.e. the (silent) articulation of (a part of) of a word from the spoken language simultaneously with the sign (other terms that have been used in the literature are "spoken component" and "word pictures").

Sign languages vary in the extent to which mouthing is used. For example, ASL is considered to have less mouthing than European sign languages (Sandler & Lillo-Martin 2006). Still, it seems likely that at least some mouthings are used in almost every sign language. When describing and analyzing mouthings, the biggest challenge is to determine whether a particular mouthing is part of (the lexical description of) a sign or whether it is rather used inconsistently within and across signers (see Bank (2015) for NGT). Indeed, there is an ongoing debate about this issue in the literature (see articles in Boyes Braem & Sutton-Spence 2001). It is up to the grammar writer to decide whether she/he wants to enter this discussion or whether she/he rather wants to present an overview of the attested options, possibly in combination with a discussion of selected cases in which a (full or reduced) mouthing is consistently used, that is, appears to be obligatory and can thus be considered a phonological building block of the sign (see the section on mouthings [Phonology – Section 1.5.2] in the Phonology Part).

2.2.3.1 Full forms

Some mouthings involve the full form of a spoken word. Full mouthings may be redundant in that they do not add any meaning to the manual sign (which thus would also be understandable without the mouthing), or they may disambiguate the meaning of manual homonyms or polysemes. For both types, in the sign languages studied to date, signs accompanied by mouthings are nouns in the majority of cases (Adam 2012).

As for redundant cases, the DGS sign FLOWER might, for instance, be accompanied by the mouthing of the German word /blu:mə/ ('flower'). This mouthing would be redundant, as the sign is not ambiguous – it has no other obvious meaning but 'flower'. Still, there might be situations, in which a signer wishes to refer to a specific flower for which no dedicated sign exists, e.g. a geranium. In this case, the signer might use the sign FLOWER in combination with the German mouthing /gera:njə/, and the mouthing would thus be disambiguating rather than redundant. Similarly, in SSL, the sign HOUSE can mean 'foundation' when accompanied by the appropriate mouthing.

Clearer examples of disambiguating mouthings include cases in which the sign by itself has a very general meaning. In NGT, for instance, there is a sign that could be glossed as SMALL-OBJECT. Depending on the accompanying mouthing, the sign may assume meanings like 'pea', 'pearl', and 'detail'.

While nouns are most commonly accompanied by mouthings, other lexical elements, and even functional elements, may also be accompanied by mouthings. In TİD, for example, the verb SAY is usually accompanied by the mouthing /de/ (the stem of the corresponding Turkish verb) in reported utterances. If other word classes appear sufficiently frequently with mouthings, the grammar writer may wish to distinguish between different word classes within this section.

2.2.3.2 Reduced forms

Often mouthings are reduced. When only part of the spoken word is retained, this is usually the first part of the word, often the first syllable. This is true, for instance, for the NGT sign MOTHER, which may be accompanied by the mouthing /mu:/, the first syllable of the corresponding Dutch word *moeder* ('mother'). Reductions may be motivated by the fact that non-manual activity tends to be synchronized with manual movements (one movement, one syllable; e.g. the NGT sign MOTHER has one movement), but there are also exceptions to this. For the sake of synchronization, reduction occasionally goes hand in hand with reduplication. The NGT sign HOLIDAY, for instance, which is lexically specified for two short movements, is often accompanied by the mouthing /fafa/, the reduplicated first syllable of the Dutch word *vakantie* ('holiday').

As a final note, we wish to point out that it may at times be difficult to distinguish reduced mouthings from mouth gestures [Phonology – Section 1.5.1].

2.2.3.3 Mouthing and fingerspelling

In some sign languages, mouthing can accompany, and potentially disambiguate, fingerspelling (e.g. Auslan, Johnston & Schembri 2007). In TİD, the combination of fingerspelled K with the mouthing /mee/, for instance, yields the meaning 'lamb': K is the first letter of the Turkish word *kuzu* ('lamb') while /mee/ is the onomatopoetic form for bleating in Turkish. If cases like these exist, the grammar writer may want to add such a section.

2.2.4 Other marginal types of borrowing

Below, we provide a non-exhaustive list of further borrowing phenomena that may or may not exist in the sign language under investigation. This list is meant as an invitation to the grammar writer to explore further idiosyncratic cases of borrowing, some of which may not even have been previously described.

"Word pictures" on the hand or on the face.
In these, the handshapes by themselves, or in combination with a body part, mimic the way a written word (from the spoken language) looks. An example is the sign for WC in TİD, which consists of flexed thumb and index finger without contact, representing the 'C', plus the rest of the fingers extended, which resembles the 'W' (Kubuş 2008).

Borrowings based on the phonological similarity of forms in the donor language.
If two forms are homophonous in the spoken language, they might be translated by a single form into the sign language. Kendon (1988: 195) reports that in Warlpiri Sign Language, a secondary sign language of Central Australia, the sign for 'shoulder' is the same as the sign for 'medical sister' (tapping the ipsilateral shoulder with middle finger) because in spoken Warlpiri, the word *jija* also has both these meanings.

This type of borrowing thus results in forms which look alike despite being semantically unrelated. The similarity might be based on the written forms, or on lipreading. An example of the latter motivation is the sign for MATCHSTICK and CYPRUS in TİD; phonologically the two corresponding Turkish words, *kibrit* ('matchstick') and *Kıbrıs* ('Cyprus') are not that close, but the mouth configurations observed in lipreading are very similar (Demir 2010: 6).

Rare, idiosyncratic forms of borrowing.
We end this section with a form for which it is not even clear whether the term borrowing is suitable. Nevertheless, we add it here to once again alert the grammar writer to the possible presence of rare items. In TİD when oralism was the standard teaching in schools for the deaf, to produce the nasal [m] the students were asked to put their index finger on the nose of the instructor (for nasality). This then became a representation for the letter 'M' in a few forms where the corresponding Turkish word begins with 'm'. Today, in some registers, it is part of the sign DIRECTOR, which is *müdür* in Turkish.

2.3 Borrowings from conventionalized gestures

In all languages, spoken or signed, speech is sometimes accompanied, simultaneously or sequentially, by gestures (co-speech gestures). Co-speech gestures may be articulated manually or non-manually. In spoken languages, manual and non-manual gestures are for the most part, but not exclusively, articulated simultaneously with the vocal utterance (e.g. 'palm-up' gesture or shoulder shrug). In contrast, in sign languages, only non-manual gestures commonly occur simultaneously with a string of signs, as signs and manual gestures employ the same articulators. Many such gestures are cross-cultural, but some are language-specific (Kita 2009). In this section, we do not discuss gestures as such, but highlight those that have become conventionalized, that is, have become part of the vocabulary of a sign language,

be it as a content word (through lexicalization) or a functional item (through grammaticalization). These forms, by virtue of originally belonging to the gestural system, are thus part of the borrowed vocabulary. For more information about identifying a specific form as a gesture in a sign language, rather than a lexicalized part of the vocabulary see Özyürek (2012) and Janzen (2012).

An important distinction when classifying gestures concerns the origin of gestures: gestures may be language- or culture-specific, or they may belong to the set of gestures shared by (almost) all languages irrespective of modality. Crucially, both types of gestures may assume lexical and/or grammatical functions in a sign language.

2.3.1 Lexical functions

To the best of our knowledge, all gestures identified to date that entered the lexicon of a sign language with a lexical function are manual gestures. An example is the TİD sign GOOD/NICE. This sign, which is articulated with a Baby-O ( ) handshape is borrowed from the Turkish gesture. The corresponding Turkish gesture also means 'good/nice', but in TİD, the sign is used compositionally and is integrated into the structure of the phrase. Other examples are 'good' ('thumbs up' gesture) and 'tasty' in NGT, which have been borrowed from Dutch co-speech gestures and have been lexicalized as the signs GOOD and TASTY. In these cases, we are thus dealing with the lexicalization of so-called "emblematic gestures".

Gestures that are less culture-specific in nature may also assume a lexical function. The clearest example is the deictic (pointing) gesture, which is commonly used for deixis (see also the section on pointing [Lexicon – Section 1.2.2]). In many sign languages, pointing signs are used to refer to body parts (e.g. pointing to ear for EAR) or for colors (e.g. pointing to lips for RED). As the use of such gestures in a sign language may be abundant, it is up to the grammar writer to decide how many examples she/he wishes to include in this section. A general note on the possibility of using pointing signs with lexical meaning may be sufficient.

2.3.2 Grammatical functions

In sign language, manual and non-manual gestures may be used to fulfill grammatical functions, that is, they may grammaticalize (Wilcox 2007). As for manual gestures, consider again the pointing [Lexicon – Section 1.2.2] gesture, which, across sign languages, is used in various pronominal functions: personal pronoun, demonstrative pronoun, locative pronoun, etc. (Meier & Lillo-Martin 2013). Clearly, a discussion of such uses can be brief, as they may also be discussed in detail in the section on pronouns [Lexicon – Section 3.7]. Another example is the 'palm-up' gesture (Open Hand Supine; Kendon 2004), which has been found to fulfill various functions across sign

languages: on the one hand, discourse functions such as turn-signal and discourse particle [Lexicon – Section 3.11.3]; on the other hand, grammatical functions such as question particle [Lexicon – Section 3.11.2], and conjunction [Lexicon – Section 3.9] (see Van Loon, Pfau & Steinbach (2014) and references therein).

Illustrative examples of non-manual gestures fulfilling a grammatical function are culture-specific head movements signaling negation [Syntax – Section 1.5] in sign languages. Most common across sign languages are a side-to-side headshake and backward head tilt. For such cases, it will be important to demonstrate that the non-manual marker indeed behaves like a grammatical element (e.g. obligatoriness, grammatically constrained distribution).

Note finally that some gestures are first lexicalized as a sign and then grammaticalized. This kind of two-step process has been argued to underlie the development of certain ASL modals (Wilcox & Wilcox 1995). The ASL modal CAN, for instance, has grammaticalized from the Old French Sign Language (Old LSF) lexical sign STRONG, which in turn can be traced back to a gesture referring to upper body strength. Similarly, it has been claimed that in Kata Kolok, the 'thumbs up' gesture has lexicalized as the sign GOOD, which in turn grammaticalized into a marker of possession. Should such cases exist in the sign language under consideration, then the grammar writer may want to include the discussion of the first step (gesture to lexical element) in the previous section (lexical functions [Lexicon – Section 2.3.1] and that of the second step (lexical element to grammatical marker) in this section.

Elicitation materials

There is no reason to assume that borrowed forms should be elicited in a different way than native items. Therefore, the elicitation materials that apply to all lexical items can be used for borrowings as well.

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Chapter 3 Parts of speech

3.0 Definitions and challenges

3.0.1 What are parts of speech?

Parts of speech can be detected in any language and refer to different categories of lexical items based on syntactic or morphological behavior. Typical parts of speech are nouns or verbs. In the lexicon, there is a distinction between functional words or closed-class elements (usually without a concrete meaning, generally quite short, and rather frequent) and lexical/content words or open class elements (with specific meaning, usually longer, but lower frequency). Nouns, verbs, adjectives, and usually adverbials are lexical words while pronouns, adpositions, conjunctions, numerals, quantifiers, and interjections are functional words and members of a closed class. The notion 'closed class' implies that it is generally possible to enumerate all such words in a given language in an exhaustive list. As in other languages, new words resulting from sign language word formation processes are first and foremost lexical words such as nouns, adjectives, and verbs/predicates. Although some basic categories (such as noun and verb) exist across all languages, there is some variation in the parts of speech present in each language.

In sign languages, different parts of speech can be found in the core lexicon [Lexicon – Chapter 1] and across the native/non-native distinction. A typical word/sign that would be classified as a noun would be a part of the core lexicon (e.g. HOUSE) but in some sign languages, a noun may be a non-native lexeme (e.g. a fingerspelled name such as M-A-R-Y or a fingerspelled sign [Lexicon – Section 2.2.2.2] such as BANK in ASL and Æ-X-L-I ('tumor') in ÍTM).

Differentiating between different parts of speech is notoriously difficult for sign languages, and identifying the part of speech that a given sign belongs to is not always straightforward. A noun, for instance, is semantically easy to identify if it is related to a specific object/entity in the world. Most verbs, however, usually have a nominal counterpart with the same phonological form, and it is not always easy to make a distinction between a verb and a noun with the same semantic basis in sign languages (e.g. RING-DOORBELL and DOORBELL in LSE). Obviously, this is related to the question of what may serve as a predicate [Syntax – Section 2.1.1].

A further important aspect of parts of speech in sign languages is the fact that – apart from manual elements – we find non-manual realizations for certain categories of parts of speech. Some adjectives exhibit a manual form (e.g. BIG), but may also be realized non-manually when modifying a noun. Specific non-manuals such as *puffed cheeks* can be simultaneously layered on the sign HOUSE to mean 'a big house'. The same is the case for manual and non-manual adverbials.

Many elements listed as a category of parts of speech in sign languages may have no manual realization at all. This happens with adpositions [Lexicon – Section 3.8] in sign languages, in particular spatial adpositions, which in some cases can be expressed by a manual sign. More frequently, however, the relational information usually conveyed by an independent spatial adposition is expressed by means of relative locations in the signing space. Thus, there may be sign languages that have either manual signs as adpositions, or only spatial modification, or a combination of both.

3.0.2 Methodological challenges

When investigating parts of speech in a specific sign language, the distinction between the different categories is not always clear-cut. Thus, methodologically, it is important to bear in mind that the phonological form of a sign does not necessarily tell you something about the status of the sign. Semantics may tell you about classical common nouns such as HOUSE, but a sign glossed as CYCLE may theoretically be a noun ('bicycle') or verb ('to cycle') in certain cases.

Furthermore, as always when working with a sign language, great care must be taken to avoid undue influence from glosses and translations into the spoken language. A given sign may appear to be a different part of speech depending on the translation given to it (e.g. 'My leg **hurts**', 'I've got a **pain** in my leg', 'The treatment is really **painful**'). The part of speech must be identified based on the language-internal properties of the sign, namely its syntactic (where the sign can appear in the sentence and what other signs it can or cannot combine with) and morphological properties (what inflections or modifications the sign can undergo). As we shall see in the section on common nouns [Lexicon – Section 3.1.1], various indications may help to distinguish between nouns and verbs, for instance, sentence structure, accompanying non-manual features, and inflectional marking (such as aspectual and adverbial for verbs, and plurality for nouns).

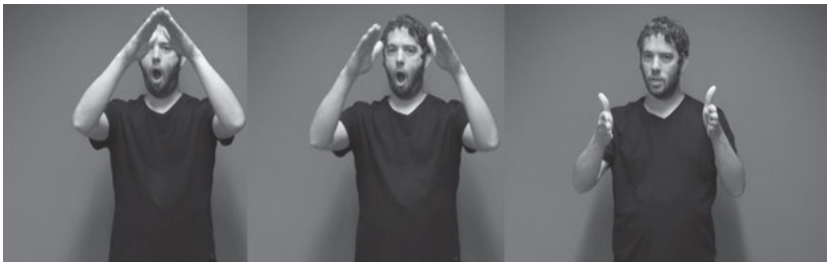
Nevertheless, there are many grey areas: the grammar writer should bear in mind, for example, that aspectual marking may appear on verbs but also on predicative adjectives; plural marking may appear on nouns but also on nominalized adjectives; and quantifiers may appear with nouns but also with verbs as adverbials. Thus, providing a list for each category of parts of speech should be treated with care.

3.1 Nouns

Semantically, a noun is a part of speech that usually denotes a person, place, entity, animal, idea/concept, etc. Formally, nouns often combine with articles and adjectives, forming a noun phrase. Nouns in sign languages – at least some of them – may inflect for number, but rarely for case and gender. In the following, we distinguish two types of nouns, common nouns and proper nouns, and we address name signs in the context of the latter group.

3.1.1 Common nouns

Common nouns are nouns that describe classes of entities, which can be concrete or abstract. The following examples are representative of common nouns, DGS HOUSE and ÍTM STUDENT being concrete, DGS IDEA being abstract.



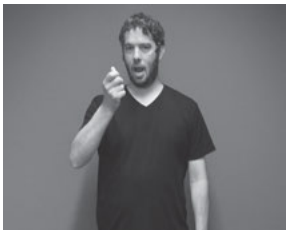
HOUSE (DGS)

IDEA (DGS)

STUDENT (ÍTM)

Remember from the discussion in the introduction that distinguishing between different parts of speech is often difficult in sign languages. Of the three examples given above, the first two can be clearly classified as nouns, as they are never used as verbs. As for the third example, the two sign languages differ: while the sign for STUDENT may also mean 'to study' in DGS, in ÍTM, this sign is specifically nominal and different from the verb 'to study'.

As an additional categorization, within the group of common nouns, we can distinguish countable nouns from non-countable nouns – also known as count nouns and mass nouns. In contrast to count nouns (like the three nouns above), mass nouns cannot combine with numerals (and certain quantifiers) or be pluralized [Morphology – Section 4.1]. Consider, for instance, English mass nouns like *money* and *rice*, which have no plural form and which combine with the quantifier *much*, while count nouns generally take the quantifier *many*. The following examples from DGS are representative of mass nouns.



MONEY

SAND (DGS)

Nouns in sign languages can also be used in a predicative function. Most sign languages studied to date do not exhibit copula verbs, so it is not always easy to detect clausal constructions, as shown in the following DGS example, where TEACHER functions as a nominal predicate.

POSS_1 NEIGHBOR IX_3 TEACHER
'My neighbor is a teacher.' (DGS)

While nouns are semantically easy to identify if they are related to a specific object/entity in the world, most verbs usually have a nominal counterpart with the same (or a very similar) phonological form, and it is therefore not always easy to make a distinction between a verb and a noun with the same semantic basis in sign languages. The following two examples illustrate this challenge.

AIRPLANE/FLY ('airplane/fly')
CHAIR/SIT ('chair/sit') (DGS)

The noun *airplane* and the verb *fly* in DGS (and many other sign languages) are usually produced by an identical phonological form; in DGS, this is the -handshape which moves in an arc-movement across the signing space. The nominal or verbal function of the sign can only be detected in distributional terms, that is, its place of occurrence within the sentence. Thus, either the syntactic and semantic context, or in some cases also the mouthing, clarifies the difference. In contrast, in ÍTM, the same pair AIRPLANE/FLY is distinguished by a different path movement and a different mouth pattern. Thus, sign languages may vary in their way of differentiating between verbs and nouns (see section on noun-verb pairs [Morphology – Section 2.1.2.1] for further discussion).

The most important way to identify parts of speech is by looking at sentence structure. The basic sentence structure in verb-final languages, for instance, gives a strong indication of which element has a predicative status (usually verbs, but possibly also nouns or adjectives) and conversely which elements are subjects or objects (usually nouns). Furthermore, (reduced) mouthings [Phonology – Section 1.5.2] more often appear on nouns (and adjectives) than on verbs. Verbs are often accompanied by specific mouth gestures [Phonology – Section 1.5.1] or show no mouth movements at all. In addition, aspectual marking [Morphology – Section 3.3] (e.g. reduplication) and adverbial marking [Lexicon – Section 3.5] (e.g. mouth gestures, facial non-manuals) may help to make a decision in favor of a verb. Plural marking and quantification by means of numerals is indicative of (countable) nouns. In some sign languages, movement is added to the verbal sign as opposed to a reduced movement on the noun (e.g. SMOOTHING-IRON vs. IRONING in ASL).

Given the idea of ID glosses (a unique label given to each sign, a fundamental part of corpus annotation) and the fact that a single sign may very often have different functions (i.e. homonymy is more frequent than in spoken languages), it is disputable whether we should distinguish between different parts of speech at all. The general question of whether we find one or two (or more) lexical entries for such signs, as in the examples above, further adds to this debate. Thus, categorizing a given element as a noun (rather than as a verb) should be treated with care. In any case, to the extent possible, the grammar writer should provide a few representative examples of the different types of common nouns and also attempt to provide evidence for the classification.

3.1.2 Proper nouns and name signs

As opposed to common nouns, proper nouns describe specific entities rather than classes of entities. These can be country names, names of unique objects such as planets or famous monuments, people's names, brand names, etc. For toponyms (place names, such as countries and cities), a sign language may have its own indigenous sign, which may be a native core lexicon [Lexicon – Section 1.1] sign, as in the first two examples below, or may have a degree of non-nativeness [Lexicon – Chapter 2] involving fingerspelling based on the written form of the place name, as in the third example.

3_3.1.2_1_DTS_ROME

ROME (DTS)

3_3.1.2_2_LSF_LA-TOUR-EIFFEL

LA-TOUR-EIFFEL (LSF)

M-C ('Manchester') (BSL, Fenlon et al. 2014)

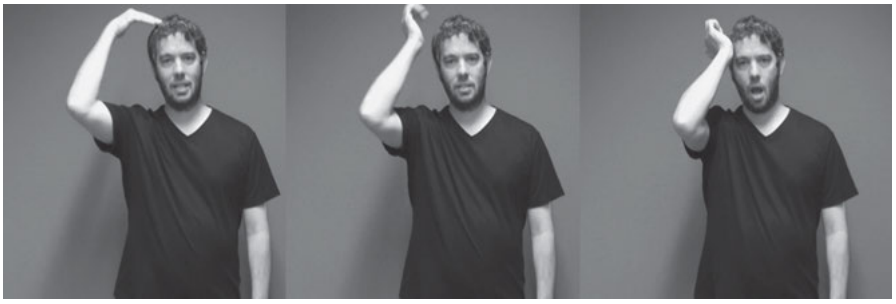
As noted in the section on borrowings from other sign languages [Lexicon – Section 2.1], there has been a recent tendency for sign languages to adopt the place sign from the sign language local to that place: for example, the BSL sign for SPAIN used to be a visually motivated imitation of a flamenco dancer with castanets but has since become the less iconic sign used in LSE. There has also been a further tendency to modify toponymic signs that may be seen as politically incorrect. For example, many European sign languages have a sign for INDIA which involves pointing at the centre of the forehead; in BSL, a newer sign has appeared which traces the shape of the Indian subcontinent. Sign language users' attitudes towards an acceptance of such borrowings and changes may vary, and some signers may have strong opinions in either direction.

Name signs are a type of proper nouns. On the one hand, there are name signs for famous people (e.g. Barack Obama), and just like toponyms, these are

commonly borrowed from the sign language of the country where the famous person lives. On the other hand, there is also the cultural tradition of creating name signs for sign language users and people they interact with (Mindess 1990; Paales 2010) – simply because using a sign is quicker and less cumbersome than fingerspelling a name. Within sign language communities, there are various strategies for creating personal sign names, and the grammar writer is encouraged to discuss strategies common to the sign language in this section. One is a form of metonymy, which uses the physical properties of a person's appearance (e.g. curly hair, big nose), properties of their character (e.g. blushes easily), or typical actions or behaviors (e.g. loves hiking) to denote the person. The name sign usually follows general word formation rules of the respective sign language and is more or less unique within a specific group of people. Here, name signs are glossed with the respective name in small caps to distinguish them from fingerspelled names (e.g. C-H-R-I-S-T-I-A-N). It is important to note that a name sign usually does not refer to all individuals carrying the name (e.g. to all Julias), but rather to one specific individual. If the sign language to be described behaves differently in this respect, this would certainly be worth mentioning.

3_3.1.2_4_ÍTM_JÚLÍA

JÚLÍA (sign name) (ÍTM)



CHRISTIAN (sign name) (DGS)

Another common strategy for creating name signs is to use the handshape of the initial letter of the written name, often adding a specific movement or location, a form of initialization [Lexicon – Section 2.2.2.1]. For instance, the sign for a specific Júlía in Iceland consists of the handshape 'J' moving in an arc in neutral space (like the letter J). Some name signs may incorporate two letters, such as the person's initials. Alternatively, names may be entirely fingerspelled, often resulting in a reduced form of the type mentioned in multiple-letter signs [Lexicon – Section 2.2.2.2].

3.2 Verbs

Ever since the seminal work by Padden (1988 [1983]) on the verbal system of ASL, sign language verbs are commonly divided into three macro-categories:

1. Plain verbs [Lexicon – Section 3.2.1], i.e. verbs that cannot be spatially modified to show manual agreement (but they can usually inflect for aspect [Morphology – Section 3.3]);
2. Agreement verbs [Lexicon – Section 3.2.2] (also called "directional" or "indicating" verbs), i.e. verbs the movement and/or orientation of which can be modified to target loci associated with the subject and/or (indirect) object, thereby expressing agreement with these arguments;
3. Spatial verbs [Lexicon – Section 3.2.3], i.e. verbs that can be spatially modified to target the loci associated with locative arguments.

As for the internal structure of this section, we adopt this three-way distinction. It should be noted, however, that there have been suggestions in the literature to give up the distinction between the two types of verbs that can be spatially modified, that is, agreement and spatial verbs. It is up to the grammar writer to decide how to structure this section, and also which terminology to use (e.g. "agreement verb" vs. "indicating verb"). Obviously, decisions taken here will have repercussions on the section on agreement in the Morphology Part [Morphology – Section 3.1]. It is important that terminology is used consistently throughout the Blueprint.

The goal of this section is not to provide exhaustive lists for the different verb types. Rather, the grammar writer should examine the existence of the different types, provide representative examples, and – if possible – identify patterns. It may be the case, for instance, that verbs belonging to one group show recurring phonological or semantic features. It is also worth noting that when identifying verb types, scholars often focus on transitive (and ditransitive) verbs, but intransitive verbs may also be of the agreeing or plain type. Investigating the different verb types is interesting in light of the fact that some sign languages – in particular, some shared sign languages – appear to not make this three-way distinction. In Kata Kolok, a shared sign language of Bali, for instance, verbs cannot be spatially modified (with the possible exception of the verb GIVE). If this is the case in the sign language under investigation, it should certainly be reported here.

Note that auxiliaries should not be discussed in the present section but in a separate section on lexical expressions of inflectional categories [Lexicon – Section 3.3].

3.2.1 Plain verbs

The class of plain verbs is negatively defined as the class of verbs that cannot be spatially modified to agree with one or two of their arguments. In many cases, this constraint results from the phonological specification of the sign: body-anchored

signs cannot be detached from the body location to move between loci associated with arguments. This is true in many sign languages for transitive verbs like LOVE (contact with chest) and UNDERSTAND (signed on or close to the forehead). Note that lack of path movement is not sufficient for classifying a verb as a plain verb; some verbs can express agreement with an object by means of the orientation of the hand. Plain verbs may also be intransitive, as is true in many sign languages for verbs like CRY and LAUGH (which, again, are commonly body-anchored). The grammar writer should investigate the existence of transitive and intransitive plain verbs and should attempt to identify in how far phonological features determine class membership. If, for instance, plain verbs can be identified that are not body-anchored and involve path movement, this should certainly be pointed out.

3.2.2 Agreement verbs

In contrast to plain verbs, agreement verbs can be spatially modified to mark their arguments. The prototypical case are verbs that express (concrete or abstract) transfer and involve path movement. It is commonly assumed that such verbs are not lexically specified for the beginning and the end point of the movement. The path movement can then be modified such that the beginning point coincides with the locus associated with the subject argument and the end point with the locus associated with the object argument (Lillo-Martin & Meier 2011; for more details, see the section on agreement in the Morphology Part [Morphology – Section 3.1]). The following are examples of transitive agreement verbs from two sign languages. The LSE verb EXPLAIN in (a) starts at the locus in neutral signing space associated with Rita and moves towards the signer's body, thereby expressing agreement with a third person subject and a first person object. In contrast, the BSL verb HELP in (b) agrees with third person subject and object by moving between two loci in the signing space.

a. $\text{RITA}_{x}\ {}_{x}\text{EXPLAIN}_{1}$
'Rita explained [it] to me.' (LSE)

b. $\text{OLIVER}_{x}\ {}_{x}\text{HELP}_{y}\ \text{CHRIS}_{y}$
'Oliver helped Chris.' (BSL)

In addition, a verb without path movement may agree with an object by means of the orientation of the fingers or the palm. As mentioned before, scholars often focus on (di)transitive verbs when describing sign language agreement, but it may well be the case that some intransitive verbs can also be spatially modified. In the following NGT example, the boy is localized, and the verb GROW is then articulated at this locus in signing space.

$\text{BOY INDEX}_{3}\ {}_{3}\text{GROW}$
'The boy grew up (= got taller).' (NGT)

Finally, for a number of sign languages, verbs have been identified that map the grammatical categories subject/object differently on the beginning and end slot of the movement; these are the so-called "backward verbs". In NGT, for instance, the verb INVITE moves from the locus associated with the object towards the locus associated with the subject.

If only a rather limited set of agreement verbs exists in the language, then the grammar writer could attempt to provide an exhaustive list. However, as before, the main goal of this section is not to provide a list but rather to scrutinize the availability of different types of agreement verbs (transitive, intransitive, backward) and to offer illustrative examples. Crucially, the realization (i.e. phonological instantiation) of agreement will not be discussed in this section but in the section on agreement [Morphology – Section 3.1] in the Morphology Part.

3.2.3 Spatial verbs

Spatial verbs, like agreement verbs, may be spatially modified to mark their arguments. In contrast to agreement verbs, however, the referents marked by spatial verbs do not prototypically participate in the argument structure of the verb since they are locative. Some authors assume that spatial verbs in sign languages take locative arguments, and as such, they can be argued to show agreement with their arguments (in the same way that agreement verbs do). The following are examples of spatial verbs. In example (a), the verb expresses movement of an object from one location to another, but the beginning and end point of the movement do not coincide with loci associated with a subject or an object. In (b), the beginning of the movement coincides with the locus established for the shelf, which again is neither a subject nor an object (note, however, that in both examples, the handshape may reflect shape properties of the manipulated or moving object [Morphology – Section 5.1]).

a. INDEX_1 BOOK $_x\text{MOVE}_y$
'I moved the book from here to there.' (LSE)

b. SHELF_x, BOOK $_x$FALL-DOWN
'The book fell down from the shelf.' (LSC)

3.3 Lexical expressions of inflectional categories

The elements we discuss in this section are signs that co-occur with lexical verbs and that, in a sense, support the lexical verb by carrying or expressing certain morpho-syntactic features, most importantly tense, aspect, modality, or agreement. These are elements that would usually be referred to as "auxiliaries" or "auxiliary verbs", but here we refrain from using these labels, as at least for some of the elements to be discussed, it is not certain whether they are indeed verbal in nature. However, if the

verbal status of the relevant elements can be determined with some certainty for a specific sign language, then the grammar writer may prefer to adapt the header of this section accordingly. In this case, s/he might even prefer to include this section as a whole within the previous section on verbs (but maintaining the internal structure of the present section).

As for the suggested subsections, it has to be pointed out that while aspectual markers [Lexicon – Section 3.3.2] and modality markers [Lexicon – Section 3.3.3] appear to be common across sign languages, agreement markers [Lexicon – Section 3.3.4] and especially tense markers [Lexicon – Section 3.3.1] are less common (for overviews, see also Pfau et al. (2012) for tense, aspect, and modality markers, and Sapountzaki (2012) for agreement markers). The first three categories to be discussed – tense, aspect, and modality – are known to closely interact; they are therefore commonly subsumed under the acronym "TAM-markers". It is up to the grammar writer to decide whether s/he wants to add an additional structural layer by distinguishing TAM-markers as a group (Section 3.3.1, with internal structure) from agreement markers (Section 3.3.2).

3.3.1 Tense markers

In sign languages, tense is generally not marked on verbs, that is, there is no tense inflection (for exceptions, see the section on tense in the Morphology Part [Morphology – Section 3.2]). Rather, information about tense is generally provided by temporal adverbials [Lexicon – Section 3.5.2]. Tense markers are a third option for specifying tense information; however, to date such markers have only been described for ASL (Aarons et al. 1995; Neidle et al. 2000).

Neidle et al. point out that tense markers (which they call "lexical tense markers") may be very similar in form to temporal adverbials but that they differ from adverbials with respect to their distribution and their articulation. First, while temporal adverbials can occur in various positions within the clause in ASL (e.g. sentence-initially and sentence-finally), tense markers have a highly restricted syntactic distribution. In fact, they can only appear in the position between the subject and the verb, as shown in example (a) below for the lexical tense marker FUTURE$_{tns}$. The grammatical status of tense markers is corroborated by the observation that they take the same position as modal verbs, and that they cannot co-occur with modals – in contrast to temporal adverbials. Neidle et al. further show that tense markers cannot occur in infinitival clauses, as shown in example (b) – again in contrast to temporal adverbials which can be used in such environments.

a. JOHN FUTURE$_{tns}$ BUY HOUSE
'John will buy a house.'

b. * JOHN PREFER FUTURE$_{tns}$ GO MOVIE
'John prefers to go to a movie.' (ASL, Neidle et al. 2000: 79f)

Furthermore, Neidle et al. argue that tense markers cannot vary in their articulation; in particular, they have a fixed pathlength. In contrast, the path movement of adverbials to which the lexical tense markers are related (e.g. FUTURE$_{adv}$) can be modified to provide information about distance in time. Taken together, the observations made by Neidle et al. – restricted sentential position, ban on use in infinitival contexts, and non-modifiability – could serve as tests to determine whether comparable markers exist in the sign language under investigation.

3.3.2 Aspect markers

Free aspect markers appear to be rather common across sign languages (for aspectual inflection, see the section on aspect in the Morphology Part [Morphology – Section 3.3]. Just like the tense markers discussed in the previous section may be related to temporal adverbials, aspect markers may be related to lexical verbs (e.g. FINISH) or adverbials (e.g. ALREADY). Two aspectual meanings for which free markers have been described for various sign languages are the completive and the perfective – two meanings that are not always easily distinguished.

Fischer & Gough (1999 [1972]) have described the use of the aspect marker FINISH in ASL. The first example below illustrates use of FINISH as a lexical verb. Example (b) is quite similar, but now FINISH occupies the position preceding the main verb. In this position, it takes on a grammatical meaning, namely that of completive aspect. Finally, in example (c), FINISH serves as a marker of perfective aspect. In this use, it may appear in initial, second, or final position.

a. YOU FINISH EAT, WE GO SHOPPING
'When you('ve) finish(ed) eating, we'll go shopping.'
b. YOU EAT FINISH, WE GO SHOPPING
'After you eat, we'll go shopping.' (ASL, Fischer & Gough 1999: 68f)
c. FINISH EAT YOU?
'Have you eaten?' (ASL, Isenhath 1990: 203)

The fact that subtle aspectual distinctions have to be carefully investigated is revealed by the observation that Israeli SL employs two different markers for the two aspectual meanings (Meir 1999). For marking perfective aspect, Israeli SL signers use the sign ALREADY, the source of which is an adverb. Perfective constructions strongly imply that an action is terminated, and in most cases, this may also imply completion of the action; this, however, is by no means a prerequisite. The sentence in (a) below, for instance, could very well be uttered in a context where I got tired of writing the letter and therefore did not finish it (note that the ASL sign FINISH could not appear in a similar context). For marking completion, Israeli SL makes use of a sign which is also glossed as FINISH. Meir points out that, given its frequent occurrence in past tense contexts, it might be tempting to analyze ALREADY as a temporal adverbial or tense

marker. She shows, however, that ALREADY can be used in present tense and future tense contexts, the latter being shown in (b).

a. INDEX$_1$ ALREADY WRITE LETTER SISTER MY
'I have written a letter to my sister (but have not finished it).'
b. WEEK FOLLOWING THEY ALREADY MARRIED
'Next week they will already be married.' (Israeli SL, Meir 1999: 51, 47)

With respect to completive/perfective markers, it may be worth investigating whether they have negative counterparts (e.g. a dedicated negative completive marker NOT-YET). In Israeli SL, for instance, the negative counterpart of ALREADY is a sign glossed as ZERO (e.g. INDEX$_1$ EAT ZERO 'I haven't eaten yet'). These signs can be included in this section, but they will probably make another appearance in the sections dealing with irregular negation in the Morphology Part [Morphology – Section 3.5.2] and the Syntax Part [Syntax – Section 1.5.1.1.2].

Even though the markers described so far may be the most common ones, the grammar writer should be aware that additional, less common markers may exist in the sign language under investigation. Some of these, like the NGT free durative marker THROUGH are true aspectual elements (e.g. INDEX$_1$ WORK THROUGH 'I worked for a long time'), while others are adverbials [Lexicon – Section 3.5] that carry aspectual meaning, for example, DGS USUALLY for habitual aspect, NGT REPEAT for iterative aspect, and DGS NEARLY and FINALLY for certain conative interpretations. Even though these elements are not true aspectual markers, the grammar writer may wish to mention them in this section and provide examples that illustrate their use. If the sign language distinguishes free markers for various aspectual categories, then the grammar writer may wish to add internal structure to this section.

3.3.3 Modality markers

Modality as a grammatical category is defined as a semantic category that conveys the attitude of a speaker or signer towards the validity of the content of a proposition (remember that in the context of sign languages, the term "modality" also refers to the channel of signal transmission). In addition, the manner of an event or state that is described by a sentence is specified. Note that what we refer to as "modality markers" is commonly referred to as "modal verbs" in the literature, but as before, in sign languages, the verbal status of some of these elements may yet have to be determined. As for the internal structure of this section, we adopt the common distinction between deontic and epistemic modality (see also the discussions of modality in the Morphology Part [Morphology – Section 3.4] and in the Semantics Part [Semantics – Chapter 4]).

3.3.3.1 Deontic modality

Deontic modality covers modal meanings such as obligation/necessity (*must*), recommendation (*should*), ability (*can*), permission (*can*, *may*), and intention/volition (*want*), thus referring to the speaker's attitude towards the necessity or possibility of an act or event. Sign languages commonly express deontic modality by means of modal verbs/auxiliaries, adverbs, nouns, and adjectives. Lexical items that have been described for many sign languages include the following.

CAN ('can')	(ASL)
MUST ('must')	(DGS)
MAY ('may')	(DGS)

For obligation and possibility in ASL, Wilcox & Shaffer (2006) distinguish between participant-external and participant-internal uses of modality markers (e.g. obligation: *We had to line up* vs. *I have to have strawberries*; possibility: *We were allowed to sign* vs. *I can lift 100 pounds*). The grammar writer may wish to also address this distinction, as it may turn out that different markers are used for these meanings. Furthermore, Wilcox & Shaffer (2006: 230) address differences between weak and strong modals and note that "weak forms exhibit a soft, reduplicated movement, while the strong forms are produced with a single forceful stroke". Moreover, in ASL, strong forms also tend to be accompanied by non-manual markers such as brow furrow and head nod (e.g. MUST vs. SHOULD, CAN vs. POSSIBLE).

Similar to what we described above for aspectual markers, irregular negative forms have often been described for modality markers (e.g. Shaffer (2002) for ASL; Pfau & Quer (2007) for DGS and LSC). The negative forms may be irregular in that they involve cliticization of a negative particle [Lexicon – Section 3.11.1] or a suppletive form. In DGS, for instance, the negative forms of the modals CAN, MUST, MAY, and NEED involve an alpha-shaped movement pattern that is added to the base form of the modal. Again, such specific negative forms should be mentioned in this section, but will be discussed further in the sections dealing with irregular negation in the Morphology [Morphology – Section 3.5.2] and the Syntax Part [Syntax – Section 1.5.1.1.2].

In addition, it has been argued for some sign languages that deontic modality may also be expressed by nouns (e.g. OBLIGATION) and adjectives (e.g. POSSIBLE). The use of such elements should also be described here.

Syntactically, modality markers may appear in different positions vis-à-vis the verb, but word order patterns should not be described in the present section (see the section on word order in the Syntax Part [Syntax – Section 2.3.1.3]. Taken together, in the present section, the grammar writer should provide a list of available modality markers and attempt to describe the, sometime subtle, meaning nuances (including the role of non-manual markers). In addition, it may be worthwhile to also address (or speculate about) possible grammaticalization processes, as modality markers often grammaticalize from lexical signs (or even co-speech gesture; Wilcox & Wilcox 1995). For ASL, for instance, it has been argued that the deontic modal CAN can be traced

back to the Old French Sign Language (Old LSF) sign STRONG, while the modal MUST is diachronically derived from the sign OWE (and both lexical signs are in turn based on French co-speech gestures). While the main aim of the grammar is, of course, to present the synchronic grammar of the sign language, including such diachronic information – if available – may certainly be of interest for the readership.

3.3.3.2 Epistemic modality

Epistemic modality is concerned with the speaker's attitude towards the actual proposition, judging the truth of the sentence and evaluating the probability of the event expressed in the utterance. Thus, epistemic modality addresses what is known and believed and indicates how much certainty or evidence a speaker has for his utterance. It is an estimation of the likelihood that a certain state of affairs or an event is true/false, has been true/false, or will be true/false in a certain possible situation.

What may complicate the investigation of epistemic modality, and the identification of dedicated markers, is the fact that modal markers may have both deontic and epistemic readings. This is true, for instance, for the English modal verb *must*, as illustrated by the following examples.

a. John didn't show up for work. He **must** be sick
   → epistemic modality: assumption
   (*Given that he's not present, and knowing him, I assume he is sick.*)
b. John didn't show up for work. He **must** be fired.
   → deontic modality: necessity
   (*Given that he's not present, it is a necessary consequence for him to be fired.*)

Wilcox & Shaffer (2006) observe that in ASL, certain deontic modals, like SHOULD and POSSIBLE, can also be used to express epistemic meaning. The following example illustrates this for SHOULD. Note that the modal is accompanied by non-manual markers: brow furrow and head nod. The authors also note that the articulation of SHOULD is weaker and reduplicated. As a result, the sign indicates the speaker's positive commitment to the truth of the proposition (they further observe that the sentential position is different, as these modals typically appear in clause-final position, but remember that word order is not addressed in this section).

	top	bf+hn
LIBRARY HAVE DEAF LIFE		SHOULD

'The library should have Deaf Life / I'm sure the library has Deaf Life.'

(ASL, Wilcox & Shaffer 2006: 226)

Other signs that can express epistemic modality in ASL are FEEL, SEEM, and OBVIOUS (Wilcox & Wilcox 1995). Again, when used epistemically, these signs are commonly accompanied by brow furrow and/or head nod. Also, the sign FUTURE that we

discussed in the section on tense markers [Lexicon – Section 3.3.1] can take on an epistemic meaning when accompanied by these non-manual markers, as shown in the following example.

bf+hn
[...] RECEIVE MONEY FUTURE
'[...] I'm sure I'll rake in the money.' (ASL, Wilcox & Shaffer 2006: 228)

Across sign languages, epistemic modality may also be expressed by sentence adverbials such as MAYBE or PROBABLY. The grammar writer is encouraged to investigate this possibility and, if it is attested, to include cross-reference to the section on sentence adverbials [Lexicon – Section 3.5.2]. In any case, the available data suggest that a thorough analysis of non-manual markers is particularly important in the context of epistemic modality. Remember that this concerns non-manual markers that accompany manual modality markers; non-manuals that can function as modality markers by themselves, and that attach to lexical verbs or spread over (parts of) the clause, will be addressed in the section on modality inflection [Morphology – Section 3.4].

Finally, grammaticalization scenarios may also be relevant for epistemic modality markers, as adjectives and nouns may take on this grammatical function; e.g. in ASL: noun MIRROR > modal SEEM and adjective BRIGHT > modal OBVIOUS (Wilcox & Wilcox 1995).

3.3.4 Agreement markers

In the section on verbs [Lexicon – Section 3.2], we pointed out that many sign languages have been found to distinguish plain (non-agreeing) and agreement verbs. Interestingly, some sign languages have developed a strategy to express agreement in the context of plain verbs, namely dedicated agreement markers. These markers are semantically empty or weak signs, which, similar to agreement verbs, can express the agreement relation by means of movement and orientation features (see the section on agreement inflection [Morphology – Section 3.1] for details). In this sense, they support the lexical verb, and they have therefore also been labeled "agreement auxiliaries". Sign languages differ from each other with respect to whether or not they have such markers at their disposal, and if yes, how many of them. For instance, while ASL and BSL do not employ agreement markers, NGT has been found to have one and TSL three. If more than one marker exists in the sign language under investigation, then the grammar writer may wish to introduce subsections within this section.

In the literature, different types of agreement markers have been distinguished, based on inflectional patterns, properties of their arguments, semantic contribution, and their source (grammaticalization chain) (Steinbach & Pfau 2007; Sapountzaki 2012). For illustration, consider the DGS auxiliary PAM (person agreement marker;

Rathmann 2000). In example (a), PAM combines with the plain verb LIKE, but it may also be used with adjectival predicates like PROUD. PAM does not carry any meaning by itself; it is only introduced to express agreement with the subject and object. It does not usually combine with inanimate arguments (e.g. *I like the book*). As for inflectional patterns, it can in principle express all person combinations (e.g. *I like you*, *You like me*, *She likes you*, etc.), but there may be articulatory constraints on its use. For instance, if the subject is localized at the contralateral side of the signing space, and the object at the ipsilateral side, performing the movement (with fingertips oriented towards the object) is rather cumbersome. In this case, subject agreement may be dropped or the signer may choose to apply dominance reversal. Note further that in DGS, aspectual inflection [Morphology – Section 3.3] / aspectual inflection cannot be realized on PAM; thus, in this respect, PAM behaves differently from prototypical auxiliaries. Finally, it has been found that PAM occasionally combines with (uninflected or inflected) agreement verbs.

a. MOTHER IX_{3a} NEIGHBOR NEW IX_{3b} LIKE $_{3a}PAM_{3b}$
'(My) mother likes the new neighbor.'
(DGS, Steinbach & Pfau 2007: 322)

/da/
b. EXAM $_{3}AUX\text{-}DA_{1}$ NERVOUS
'The exam makes me nervous.' (LSC, Quer & Frigola 2006)

Now consider the LSC example in (b) which contains the agreement marker glossed as AUX-DA (based on the accompanying mouthing related to the Catalan verb *dar* 'give'). This marker differs from DGS PAM in important respects: (i) AUX-DA does not only serve as a carrier of agreement but expresses the additional meaning of causative result; (ii) it only combines with psychological predicates; (iii) it has a strong tendency to occur with a first person argument, and it excludes agreement between third person subject and object; and (iv) it can take inanimate subject arguments, such as EXAM in (b).

Both the DGS and LSC agreement markers have been argued to have grammaticalized from lexical signs: PAM from the noun PERSON and AUX-DA (as the mouthing suggests) from the verb GIVE. However, the most common source for such markers are actually concatenated pronouns; such markers consist of a ☝-hand that connects two points in space, pointing first towards the subject locus and then performing a smooth movement towards the object locus. Other sources that have been reported in the sign language literature are the verbs GO-TO (NGT), SEE (TSL), and MEET (TSL).

Taken together, once it has been established that the sign language has one or more agreement markers, the grammar writer should investigate the following questions per marker:

- Is the agreement marker void of semantics, or does it express an additional meaning besides agreement (e.g. causation)?
- Is use of the marker restricted to certain verbs? Can it also occur with adjectival predicates?

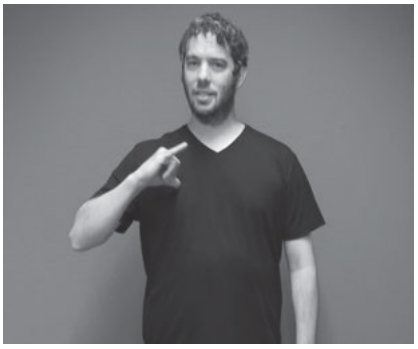
- Does the marker combine with plain verbs only, or can it also co-occur with agreement verbs? In the latter case, does the agreement verb then appear in an uninflected form, or can the auxiliary also combine with an inflected agreement verb?
- Can the marker express all person combinations?
- Can the marker inflect for aspect (e.g. by means of reduplication)?
- Can the marker combine with animate and inanimate arguments?
- If the source can be identified with some certainty, is the marker grammaticalized from a lexical sign (verb/noun) or from concatenated pronouns?

3.4 Adjectives

Adjectives describe parts of speech that usually qualify and specify a nominal element. They can combine with a noun within a noun phrase; in this case, they are called "attributive" (e.g. *a huge house*). In addition, adjectives can be used predicatively (e.g. *The house is huge*). The English examples illustrate that English makes use of a copula and that the form of the adjective is the same in attributive and predicative function. However, it may still be the case that a certain adjective can only be used in one of the functions (e.g. *former*, as in *the former president*, cannot be used predicatively). Usually, but not in all languages, adjectives constitute an open-class word category (see also the related section in the Syntax part [Syntax – Section 4.5.0.1].

3.4.1 Attributive adjectives

The following examples are representatives of attributive adjectives.



INTERESTING (DGS)
(e.g. 'interesting book')

NICE (NGT)
(e.g. 'nice movie')

ANGRY (ÍTM)
(e.g. 'angry person')

Formally, in all three sign languages, the same sign may be used as an adjective or an adverbial [Lexicon – Section 3.5]. Most adjectives in sign languages exhibit a manual form, but some adjectival meanings may also be realized by non-manual markers that combine simultaneously with the noun they modify. Specific non-manuals such as *puffed cheeks* – glossed as '( )' in the below example – for instance, can be simultaneously layered on nominal signs like HOUSE to yield the meaning 'a big house' (note that in the accompanying image, the sign is also manually modified).

( )
HOUSE ('big house') (DGS)

As for manual attributive adjectives, it will suffice to provide some clear examples – for instance, some that are body-anchored and some that are articulated in neutral signing space. In addition, the grammar writer may wish to include in the discussion the so-called "Size-and-Shape-Specifiers" (SASS) that are often subsumed under the

morphological category classifier. Size-and-Shape-Specifiers [Morphology – Section 5.2] are signs that specify the shape of a referent by outlining (part of) its shape; e.g. TABLE $\text{SASS}_{\text{round}}$ 'a round table'. The translation suggests that in this example, the SASS fulfils an adjectival function.

The range of non-manual adjectives is probably rather limited, and is likely to include meanings like 'big', 'small', 'fat', and 'thin'. Therefore, for these, the grammar writer may attempt to provide an exhaustive list. Note that the relevant non-manual markers may actually be part of the phonological specification of the corresponding manual adjectives (e.g. the sign BIG articulated with puffed cheeks) – if this is the case, it should be mentioned. In addition, it may be worth investigating whether non-manual adjectives combine freely with nouns. It may, for instance, turn out that they combine more freely with nouns that are signed in the signing space than with body-anchored nouns (e.g. 'big house' versus 'big nose' in DGS).

3.4.2 Predicative adjectives

It seems that, across sign languages, predicative adjectives are very similar, or even identical, in form to attributive adjectives. Consequently, given that the sign languages investigated to date do not offer clear evidence for the availability of a copula, a string like BOOK INTERESTING might either mean 'interesting book' or 'the book is interesting' (see also the discussion on methodological challenges [Syntax – Section 4.5.0.2] in the Syntax Part. If this is indeed the case, then the grammar writer may decide to do without the internal structure of this section.

However, in some sign languages, there may be syntactic or morphosyntactic cues to distinguish the two types of adjectives. For instance, if attributive adjectives generally precede the noun they modify, then word order may distinguish between attributive (e.g. INTERESTING BOOK) and predicative (e.g. BOOK INTERESTING) uses. But even in a language with post-nominal attributive adjectives, the syntax may provide clues, as is illustrated in the DGS pair below (noun phrases between brackets). Similarly, a localizing INDEX intervening between the noun and the adjective (e.g. GIRL INDEX_3 NICE) may suggest that the adjective is used predicatively ('The girl is nice').

a. [BOOK INTERESTING] INDEX_1 READ
'I read an interesting book.'
b. [BOOK INDEX_1 READ] INTERESTING
'The book I read is interesting.' (DGS)

Moreover, it has been shown for a number of sign languages that some predicative adjectives behave similar to verbs in that they allow aspectual inflection (e.g. 'repeatedly or characteristically x'). However, this will likely not apply to all adjectives, as modification of adjectives which refer to permanent characteristics is ruled out for semantic reasons: e.g. 'I'm frequently ill' versus *'I'm frequently tall' (Klima & Bellugi

1979). While the grammar writer may mention such clues here, s/he should keep in mind that the present section is about adjectives as parts of speech, not about word order or aspect [Morphology – Section 3.3]. Syntactic characteristics of non-verbal predication [Syntax – Section 2.1.4] and the order of the adjective with respect to the noun within the NP [Syntax – Section 4.5] are addressed in the Syntax Part.

3.5 Adverbials

Just like adjectives, adverbials (or adverbs) are modifying elements. While (attributive) adjectives modify nouns, adverbials modify sentences, verbs, adjectives, or other adverbials, as illustrated in the following examples (adverbials in boldface). Occasionally, one and the same adverbial may modify different types of constituents (e.g. *very quick – very quickly*).

a. **Coincidentally**, he met his teacher on the plane. (sentence)
b. I **strongly** recommend that you read this book. (verb/VP)
c. This is a **rather** surprising development. (adjective)
d. He edited the chapter **very** meticulously. (adverbial)

In the literature, different, rather fine-grained, classifications have been suggested for adverbials (see e.g. Parsons 1990). One possible classification considers the semantic contribution of adverbials and thus distinguishes between, for instance, manner (e.g. *quickly*), time (e.g. *recently*, *tomorrow*), frequency (e.g. *frequently*), and degree (e.g. *probably*, *maybe*) adverbials (for details, see the section on classes of adverbs [Syntax – Section 6.4] in the Syntax Part). In the following, however, we adopt a simplified two-fold classification which is based on the constituent that the adverbial modifies: the verb (or verb phrase) on the one hand and the sentence on the other hand. That is, we leave aside the types illustrated in (c) and (d) above. Obviously, the grammar writer is free to include these types in separate subsections and/or to structure this section differently, for instance, according to semantic contribution. Also, the discussion below will reveal that in sign languages, certain adverbial meanings can be realized manually and non-manually. Actually, the types we are leaving aside – i.e. adverbials modifying adjectives or other adverbials – appear to be commonly expressed by non-manual markers. Hence, this section might also be internally structured along these lines.

In some languages, adverbials are overtly marked as such by derivational affixes. In English, for instance, the suffix *-ly* systematically distinguishes between adjectives (*a happy girl*) and adverbials (*she sang happily*), while the same job is done in French by the suffix *-ment* (*une fille hereuse – elle chantait heuresement*). But even in English, there are exceptions; consider e.g. *a fast car* versus *he drove fast* (**fastly*). It appears that in the sign languages investigated to date, no (systematic) morphological distinction is made between adjectives and adverbs, but obviously, this is something the grammar writer should scrutinize.

3.5.1 Verb-oriented adverbials

"Classical" verb-oriented adverbials (or VP-adverbials) modify the event expressed by the verb or verb phrase (see also the section on VP-adverbs [Syntax – Section 6.4.2] in the Syntax Part); they often occur within or adjacent to the verb phrase (e.g. *He painted the house quickly*; see the section on the positions of adverbials in the section on clause structure [Syntax – Section 2.3.1.6] in the Syntax Part). Besides adverbials that express a quality or manner, this group also contains adverbials that express a degree (e.g. *enough*, *rather*), frequency (e.g. *often*), or aspectual information (e.g. *frequently*, *usually*), as well as negative adverbials like *never*. Note that some of these are clearly adverbial, as they cannot combine with nouns (e.g. **a rather decision*). The examples below illustrate that elements with a similar function exist in NGT. Note, however, that in example (a), the element that functions as adverbial is not glossed as QUICKLY, as its phonological form does not distinguish it from the corresponding adjective.

a. INDEX$_3$ BOOK QUICK READ
   'He read the book quickly.'
b. CHILD INDEX$_3$ ENOUGH SLEEP
   'The child has slept enough.' (NGT)

Note that aspectual adverbial meanings are commonly realized by manual modulations of the verb sign, most importantly movement modification and reduplication (see the section on aspectual inflection [Morphology – Section 3.3] in the Morphology Part). Similar to what we described above for adjectives, some adverbial meanings can be realized by means of non-manual markers that are articulated simultaneously with the verb. It appears that, for the most part, these markers are expressed on the mouth, their labels commonly related to the characteristic mouth configuration. For ASL, for instance, Liddell (1980) reports the non-manual adverbials glossed as 'mm' and 'th'. In the former, the lips are kept together and pushed out a little bit; it expresses that a particular action has been done in a relaxed manner, as is true for the fishing in example (a). The latter is characterized by a slight head tilt and protrusion of the tongue through the lips; it contributes the meaning of lack of control and inattention, as illustrated in example (b).

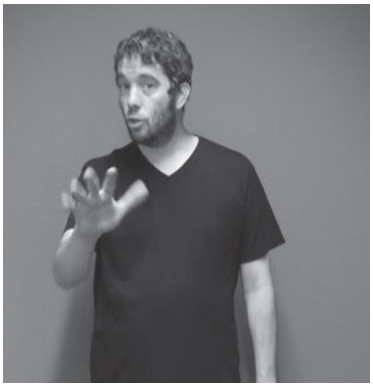
a. MAN FISH$_{[\text{continuous}]}$ (mm)
   'The man was fishing with relaxation and enjoyment.'
b. INDEX$_1$ GO-ACROSS. WRONG, ACCIDENT (th)
   'I crossed (the street) carelessly. Whoops! There was an accident.'
   (ASL, Liddell 1980: 42, 50)

As with non-manual adjectives, the set of non-manual adverbials is expected to be limited. The grammar writer should therefore strive to provide an exhaustive list

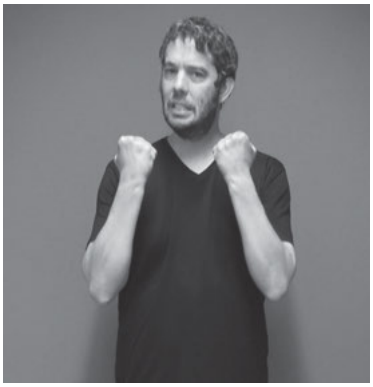
complemented by a description of the formational properties of the markers (see also the section on non-manual adverbs [Syntax – Section 6.3] in the Syntax Part.

3.5.2 Sentence adverbials

Sentence adverbials (or sentential adverbials), as the name suggests, affect the whole sentence and modify the proposition with respect to mood or the speaker's attitude. In English, these adverbials have a tendency to appear sentence-initially (e.g. *fortunately*, *perhaps*, *finally*). The following two examples from DGS are representative of manual sentential adverbials in a sign language.



PROBABLY



SURELY (DGS)

Some of the sentence adverbials are subsumed under the label "modal adverbials", as they contribute deontic or epistemic modal meaning, for instance, by conveying the attitude of the speaker/signer towards the content of the sentence (e.g. *probably*, which expresses epistemic modality).

Just like verb-oriented adverbials, certain sentence-adverbial meanings can be expressed non-manually. As for their scope, the corresponding non-manual features usually spread across the entire clause (in contrast, to the non-manual verb-oriented adverbials which are usually confined to the verb). Also, it is common for specific adverbial meanings to be realized by both manual and non-manual elements, as in the following DGS example (the non-manual marker that we simply gloss as 'probably' consists of a specific lip configuration, possibly in combination with a slight to-and-fro movement of the head).

probably

PROBABLY POSS_1 GRANDPA IX_3 LATE ARRIVE
'My grandpa will probably arrive late.' (DGS)

Here, we also subsume temporal adverbials under sentence adverbials (see the section on temporal adverbs [Syntax – Section 6.4.2.1] in the Syntax Part. This category includes adverbials like *yesterday*, *soon*, and *later*. It should be pointed out, however, that according to some authors, temporal adverbials cut across the two categories (Parsons 1990). If the grammar writer adopts the internal structure suggested here, it is up to her/him to decide where to treat these adverbials. If the section on adverbials is structured according to the semantic contribution of the adverbials (see the introduction to this section), then there will be a separate subsection on temporal adverbials. See also the section on sentential adverbs [Syntax – Section 6.4.1] in the Syntax Part.

3.6 Determiners

By "determiner", we refer to a class of elements whose function is to provide information on referentiality (i.e. the relation between the noun and what the noun refers to). In grammar handbooks, determiners are often labeled "articles" (English *the/a*), and demonstratives (e.g. English *this/that*) are commonly subsumed under determiners. Traditionally, determiners are categorized into two groups: definite [Lexicon – Section 3.6.1] and indefinite [Lexicon – Section 3.6.2] determiners (see also the section on determiners [Syntax – Section 4.1] in the Syntax Part).

On the one hand, definite determiners (in English, prototypically *the*, but also demonstratives like *this*) are used when the speaker presupposes that the interlocutor can identify the referent(s) of the nominal expression. Definite determiners can be used for three different purposes (Lyons 1999): (i) to refer back to something or someone that has been previously mentioned in the discourse (e.g. 'The cat was feeling hungry', with the cat already introduced in the discourse); (ii) to refer to something or someone that is easily identifiable in the extra-linguistic context (e.g. 'Could you pass me the pen?', with the pen visible to the interlocutors); (iii) to refer to a referent that is unique in its genre (e.g. 'the Earth', or 'the driver' when talking about a bus trip).

On the other hand, indefinite determiners (prototypically *a/an*) are used when the speaker presupposes that the interlocutor cannot identify the referent(s) of the nominal expression. Indefinite determiners are used to introduce new information, specifically new referents, into the discourse (e.g. 'Yesterday I saw a cat', where the cat is a first-mention entity). See the section on definiteness [Semantics – Section 2.1.2] in the Semantics Part for more on this distinction.

In sign language linguistics, definite determiners are frequently identified as pointing [Lexicon – Section 1.2.2] signs, also referred to as "indexes" (e.g. Zimmer & Patschke (1990) for ASL). What the grammar writer should pay particular attention to is the linguistic function associated to indexes. As a matter of fact, in many sign languages, pointing signs are polyfunctional elements that can be used for various grammatical functions, not only as determiners, but also as demonstratives, personal

pronouns, and locatives. Therefore, there may be some confounders making it hard to pinpoint real determiners. Still, it might be the case that indexes functioning as determiners can be distinguished from the others by characteristics such as movement (single, repeated, tense), hand orientation (palm oriented down or sidewards), or even eye gaze (Pfau 2011). The following list of properties may help the grammar writer in pinpointing indexes functioning as determiners (see Neidle & Nash 2012).

(i) Isolation

Within the noun phrase [Syntax – Chapter 4], determiners cannot be used in isolation. In other words, if the determiner does not co-occur with a noun, the output is ungrammatical, as shown for English and Italian in (a). Also, a determiner cannot appear in isolation as an answer to a question, as is illustrated in (b) (note that the Italian examples are translations of the English ones). The examples reveal that this test only works for "basic" determiners (like English *the*, Italian *il*), but not for demonstratives, as demonstratives can also function as demonstrative pronouns [Lexicon – Section 3.7.1].

a. I saw *the / this / him (English)
   Ho visto *il / questo / lui (Italian)
b. Q: What did you see? A: *the / this / him (English)
   Q: Che cosa hai visto? A: *il / questo / lui (Italian)

In some sign languages, there might be a slight phonological difference (e.g. hand orientation) between a pointing sign functioning as determiner and a pointing sign functioning as a demonstrative [Lexicon – Section 3.7.1] or personal pronoun [Lexicon – Section 3.7.2]. This test could be used to distinguish them: in isolation contexts, determiners are not acceptable, whereas demonstratives and pronouns are acceptable.

(ii) Plural forms

Determiners, demonstratives, and personal pronouns can include number information. In sign languages, to indicate plurality, they may be articulated as pointing signs accompanied by a circular or an arc-like movement in the neutral space. Conversely, locatives [Lexicon – Section 3.7.1] do not show this pattern. The test on plural forms may be used to distinguish determiners from locatives.

Noun phrases in ASL can include two co-occurring pointing signs, one in prenominal position and the other in postnominal position. The following examples show that the prenominal index can be articulated with an arc-like movement (a), but the postnominal one cannot (b).

a. $\text{IX}_{\text{PL-ARC}}$ MAN IX KNOW PRESIDENT
   'Those men over there know the president' (ASL, MacLaughlin 1997: 117)
b. * IX MAN $\text{IX}_{\text{PL-ARC}}$ KNOW PRESIDENT

These examples provide evidence for claiming that the prenominal pointing sign is a determiner while the postnominal pointing sign is a locative (MacLaughlin 1997).

(iii) Articulatory restrictions
Determiners are articulated by moving the pointing sign in neutral space along a fixed path [Phonology – Section 1.3.1] length. This particular type of movement cannot undergo path variation (a). Conversely, pointing signs functioning as locatives can be directed to a point closer to the signer or towards a point farther away in space in order to iconically show proximity and distance (b).

a. * $\text{IX}_{[+\text{DISTAL}]}$ MAN IX_{i} KNOW PRESIDENT
b. IX_{i} MAN $\text{IX}_{[+\text{DISTAL}]}$ KNOW PRESIDENT
'The/that man over there knows the president'

(ASL, Neidle & Nash 2012: 270)

3.6.1 Definite determiners

Definite determiners are typically realized by means of a pointing sign directed to the spatial location associated with the referent(s). A sequence like HOUSE INDEX_{3} could thus be interpreted as 'the house'. While the ☝-handshape is most commonly used for pointing, other handshapes are also possible, such as an open hand and a handshape with thumb extended (Neidle & Nash 2012). Fenlon, Schembri, Rentelis & Cormier (2013) show that in BSL, the category of determiners is particularly subject to handshape variation. The grammar writer should consider the immediate phonological environment in order to detect possible assimilation [Phonology – Section 3.1.1] patterns.

We already pointed out that demonstratives are a type of definite determiner, and that they may be phonologically very similar, if not identical, to other definite determiners. In fact, depending on the sign language, the sequence HOUSE INDEX_{3} could also mean 'that house' (or even 'house there'; see the section on locative and demonstrative pronouns [Lexicon – Section 3.7.1]). We encourage the grammar writer to look for phonological features – be they manual or non-manual – that distinguish different uses of pointing signs within the noun phrase.

The non-manual markers that may accompany definite determiners are: eye gaze, head tilt, raised eyebrows, and slightly raised chin. Eye gaze and head tilt are usually directed toward the location to which the index points. See also the corresponding section [Syntax – 4.1.1.3] and the section on articles expressed by non-manual marking only [Syntax – Section 4.1.1.4] in the Syntax Part.

3.6.2 Indefinite determiners

Indefinite determiners usually differ from their definite counterparts [Lexicon – Section 3.6.1] in that the pointing sign is directed upward and moves toward a broader

area, rather than a specific point in space. In ASL and in LIS, indefinite determiners require a tremoring motion (MacLaughlin 1997; Bertone 2009). Things are different in HKSL, where the indefinite determiner and the cardinal ONE are articulated similarly. Some older signers avoid homophony by producing the cardinal ONE with a slight rotation of the forearm.

The non-manual markers that may accompany indefinite determiners are: furrowed eyebrows, wrinkled nose, lowered mouth corners, and raised shoulders. In sign languages, these non-manuals are generally used to denote uncertainty. See also the corresponding section [Syntax – 4.1.1.3] and the section on articles expressed by non-manual marking only [Syntax – Section 4.1.1.4] in the Syntax Part.

Indefinite nominal expressions can fall into two categories, namely specific or non-specific (see specificity [Pragmatics – Section 1.4] for more information). The former is associated with a particular referent that is known by the sender, but not by the addressee. The latter is associated with an unspecified referent that is unknown to both the sender and the addressee. The distinction between specific indefinites and non-specific indefinites may be conveyed in different ways. In ASL, specific indefinites are marked by eye gaze directed toward the spatial location of the referent (a), whereas non-specific indefinites involve roving eyes toward an upward location (b).

a. SOMETHING/ONE WOMAN$_i$ ARRIVE (eg$_i$)
'Some/a (specific) woman arrives.' (ASL, Bahan 1996: 274)

b. SOMETHING/ONE WOMAN$_i$ ARRIVE (wandering eyes)
'Some/a woman arrives.' (ASL, Bahan 1996: 273)

In LSC, the distinction between specific and non-specific is conveyed by spatial location. Specificity is marked in the lower part of the frontal plane (a), whereas non-specificity is marked in the upper part (b).

a. IX$_1$ CAT WANT BUY (eg:contralateral)
'I want to buy a cat (specific).' (LSC, Barberà 2012: 259)

b. CAT IX$_{3PL:ipsi-up}$ IX$_1$ WANT BUY (eg:ipsi-up)
'I want to buy a cat (non-specific).' (LSC, Barberà 2012: 261)

Taken together, the grammar writer should investigate whether indefinite determiners (if attested at all) as a group differ formationally from definite determiners, and moreover, whether in the former group, specificity may be marked by non-manual features.

3.7 Pronouns

Sign languages use sign space to refer to present and non-present referents by pointing towards the actual referent or towards abstract locations that have been established earlier in the discourse. Pointing may be done manually (with the index finger, the thumb, the entire hand, or possibly some other hand configuration), non-manually (with eye gaze, head nod, or body orientation), or some combination of these. Further discussion on pointing [Lexicon – Section 1.2.2] is given in the section on the non-core lexicon. The grammar writer should be aware of the fact that, in addition to pronominal reference, pointing may serve a variety of functions in a given sign language. Furthermore, other elements have been identified as possible candidates for pronouns. One group is classifiers [Morphology – Chapter 5], which stand in for and allow anaphoric reference to a discourse entity, as a proform does (Zwitserlood & van Gijn 2006). Another strategy is related to role shift and the use of the body (orientation) to refer to and distinguish between different referents (Kegl 2003). Finally, some researchers have claimed that sign languages make frequent use of null pronouns (Lillo-Martin 1986).

Pronominal signs can be represented in various ways in the glosses (INDEX, IND, IX, POINT, PT, ...). For simplification, it is possible to use pronouns from the spoken language, such as YOU, I, SHE, WE, ME, HIS, etc. Another strategy would be to give pronouns with different grammatical functions different labels in the gloss (e.g. INDEX(dem) for demonstrative pronoun, INDEX(pers.sg) for personal pronoun singular, INDEX(pers.pl), etc.), and a further strategy would be to describe the handshape of the sign in the gloss. The strategy followed here, and throughout the Blueprint, is to gloss a pointing sign as INDEX (or IX) and provide information on movement, grammatical categories, etc. in subscripts, such as INDEX_1 ('I'), INDEX_{3pl} ('they'), and so on. If the sign has a different handshape from the pointing sign, a different gloss is chosen, such as POSS for possessive pronouns. This is just a suggestion, but the grammar writer should adopt a consistent glossing practice that best suits the goals of the grammar being written. Whatever conventions the grammar writer adopts, it is essential to make these explicit and to explain exactly what the glossing reflects (and to point out any assumptions or limitations that the glossing system may impose).

3.7.1 Locative and demonstrative pronouns

Across sign languages, locative pronouns are expressed by pointing [Lexicon – Section 1.2.2] signs, and in some notational conventions, small letters are used as subscripts, such as INDEX_a and INDEX_b. Locative pronouns generally point to a locus – be it a previously established spatial point or an actual (absolute) location. They refer

to the place that is associated with that locus and mean 'there' in that case. Locative pronouns meaning 'here' usually point to a spatial point close to the signer's body.

a. GIRL LIVE INDEX$_a$
   'The girl lives there.'
b. COME INDEX/HERE
   'Come here (to me).' (ÍTM)

Temporal and locative indexicals expressed by pointing often have lexical glosses, such as TODAY and HERE. Sometimes, the gloss THERE is used, as well.

Demonstratives have already been addressed in the section on determiners [Lexicon – Section 3.6.1]. However, demonstratives can also be used as substitutes for noun phrases (e.g. 'I want this (one), and not that (one)'), and in this case, they are referred to as "demonstrative pronouns". In sign languages, demonstrative pronouns are very often phonologically identical to personal pronouns [Lexicon – Section 3.7.2]. However, this need not always be the case; yet, the phonological differences may be rather subtle. In at least some sign languages, the demonstrative pronoun is reduplicated and signed faster and in a tenser way (Pfau 2011). Also, ASL has been reported to have a distinct demonstrative pronoun THAT (Cormier 2012: 238).

3.7.2 Personal pronouns

A personal pronoun stands for a noun or a noun phrase (see also the discussion of pronouns [Syntax – Section 2.1.2.2] in the Syntax Part). It can be deictic, referring to a person or thing that is present in the situation, or anaphoric referring to something already established in the discourse. In most sign languages, personal pronouns take the form of pointing [Lexicon – Section 1.2.2] signs, but they can also be expressed non-manually, by head tilt and/or eye gaze. The pointing signs are directed towards present referents, like the signer or the addressee, or to locations (loci) that have previously been established in the discourse for absent referents. The following are examples of personal pronouns in ÍTM:

INDEX$_1$ ('I/me')

INDEX$_{2/3}$ ('you/him/her/it') (ÍTM)

3_3.7.2_3_ÍTM_INDEX-1PL

INDEX_{1PL} ('we') (ÍTM)

First person pronouns are directed inwards, in most sign languages towards the signer's chest (with which they may make contact). There are exceptions to this, such as in NS, where a first person pronoun can be directed towards the signer's nose (McBurney 2002: 342).

Second and third person pronouns are directed outwards from the signer, at chest-level, toward the location of referents that are present (deictically) or, when referents are absent, toward a point (or locus) already established for that referent in the signing space (anaphorically). As with the first person pronouns, there are exceptions to this: for example, in Kata Kolok, a shared sign language used in a village on Bali, there is a preference for the use of pointing to the fingers of the non-dominant hand (similar to what happens in some buoy [Lexicon – Section 1.2.3] structures), rather than spatial locations (Marsaja 2008).

Personal pronouns can express different grammatical categories such as person [Lexicon – Section 3.7.2.1], number [Lexicon – Section 3.7.2.2], clusivity [Lexicon – Section 3.7.2.3], case [Lexicon – Section 3.7.2.4], gender [Lexicon – Section 3.7.2.5], honorific status [Lexicon – Section 3.7.2.6], and logophoricity [Lexicon – Section 3.7.2.7].

3.7.2.1 Person

The issue of whether or not sign languages encode the person feature has been heavily debated in the literature. The various claims vary from a three-person distinction similar to what is found (almost) universally in spoken languages, to a reduced two-person system, and even that sign languages do not encode person at all and show no person distinctions. Moreover, some accounts suggests that pronominal pointing involves gestural use of space.

The prevalent view in the field is that there is a two-way distinction between first and non-first person. Various researchers have defended this restricted first versus non-first person distinction (Meier (1990) for ASL; Engberg-Pedersen (1993) for DTS). The main arguments for the difference between first/non-first relate to the special status and form of the first person pronouns: (i) the form of first person pronouns is constant and stable, as well as being different compared to all other pronouns; (ii) the first person form behaves differently to other pronouns under role shift; and (iii) first person plural pronouns are not compositional in form whereas other pronouns are.

Alternatively, a three-way person distinction is upheld by some researchers who claim that the difference between second and third person is marked by accompanying non-manual features, especially eye gaze (Alibašić Ciciliani & Wilbur (2006) for HZJ; Berenz (2002) for Libras). On this view, the second person pronoun points to the addressee and eye gaze is also directed toward the addressee; in contrast, the

third person pronoun points to a locus but the eye gaze is typically directed at the addressee, that is, in a direction that does not align with that of the pointing of the hand. This non-manual marking may extend to other articulators: the head and the body orientation of the signer may also have the same direction as the eye gaze.

Finally, other authors have suggested that some sign languages may not encode person distinctions at all, and that this distinction does not form part of the grammar (related to the fact that the referent marking system is so highly indexical) (Lillo-Martin & Klima (1990) for ASL; Costello (2015) for LSE). Costello (2015) shows that the arguments for distinguishing between first and non-first person pronouns (in ASL and DTS) do not hold for LSE. Thus, although the debate is often couched in terms of the person system of sign languages in general, it is fundamental to look at the properties of each specific language.

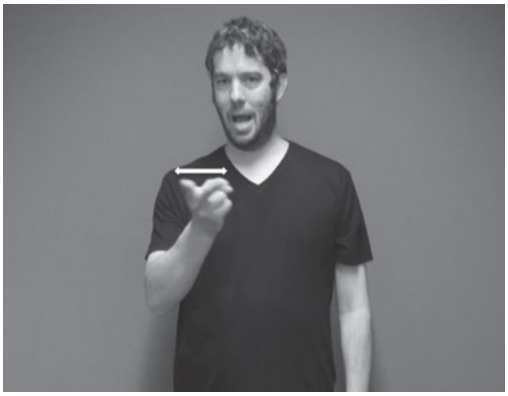
The distinction between different person values is based on differences in phonological form (and also referential behavior) of the pronouns for different referents. The grammar writer is encouraged to look carefully at the pronominal forms in the sign language under study to find distinctive properties that could justify a two- or three-way categorization.

Note finally that some scholars assume that the loci that are pointed at by pronouns do not encode grammatical (morpho-syntactic) features at all, but rather are motivated by gestural use of space – similar to what we find in co-speech gesture (Liddell 2003; Cormier, Schembri & Woll 2013). Under this view, pronominal pointing fuses linguistic and gestural properties. It is up to the grammar writer to decide which theoretical view s/he wants to adhere to. Obviously, the choice may have an impact on the header of this section, which will probably not be "Person" if the gestural perspective is followed. The same is true if the grammar writer adopts an account according to which the person feature does not play a role in the grammar of sign languages, but rather another, modality-specific feature. The choice of theoretical perspective notwithstanding, the other headers within this section can probably be maintained, as they refer to features (realized by movement and/or handshape changes) that are independent of the linguistic vs. gestural treatment of pronominal pointing signs.

3.7.2.2 Number

Sign languages generally distinguish singular, dual, and plural forms for pronouns. In the singular form of a pronoun, the index finger usually points directly at the locus associated with the referent. The dual form functions very much in the same way as the singular form, by pointing to the referents' loci in space, but with a different handshape. The number of the extended fingers may correspond to the number of the referents. A common handshape for the dual form is a V-handshape ( ) or a K-handshape ( ), in both of which the index finger and the middle finger are extended. Another known handshape is an L-handshape, , where the index finger and the

thumb are extended. The pronoun oscillates back and forth between the loci of its referents, as shown in the two examples from DGS and ÍTM below.



3_3.7.2.2_2_ÍTM_TWO-OF-US

TWO-OF-US ('two of us', DGS)

TWO-OF-US ('two of us', ÍTM)

In some sign languages, the extension of the fingers can be used to indicate up to nine referents (Steinbach 2012: 121; see also the discussion on numeral incorporation of cardinal numbers [Lexicon – Section 3.10.1.1] and numeral incorporation [Syntax – Section 4.3.4] in the nominal domain). McBurney (2002), however, points out that, at least in ASL, the dual is different from the other (incorporated) forms in that (i) the handshape (☟) is different from that of the cardinal numeral TWO, and (ii) use of the dual form is obligatory while the other forms are optional. These differences are something that the grammar writer may wish to address, as they imply different grammatical status of the dual (fully grammaticalized) vs. the other forms (incorporated).

Plural forms of pronouns involve a modification of the pointing signs. There are normally two different plural forms: a collective form, where the pronoun is realized with an arc-shaped or sweeping movement across the locations associated with the referents; and a distributive form where the pointing is successively directed towards multiple locations lying along an arc (compare the discussion of number markers on verbs [Morphology – Section 3.1.2] in the Morphology Part).

3_3.7.2.2_3_ÍTM_INDEX-ARC-SWEEPING

3_3.7.2.2_4_ÍTM_INDEX-SHORT-POINTING-IN-AN-ARC

$\text{INDEX}_{\text{ARC-SWEEPING}}$ ('you/they', collective form)

$\text{INDEX}_{\text{SHORT-POINTING-IN-AN-ARC}}$ ('you/they', distributive form) (ÍTM)

3.7.2.3 Clusivity

In many sign languages, pronouns can be either inclusive or exclusive. When a first person plural pronoun, meaning 'we', is inclusive, the addressee is included in the

group of referents; when it is exclusive, the addressee is not one of the referents. In BSL and ASL (Cormier 2012: 233), the inclusive forms are produced at the center of the signer's chest by making a circular or a sweeping movement at that location. By changing the location of the signs, the forms can be made exclusive. The exclusive forms are produced slightly to one side (making the same type of movement as before), as illustrated below for ITM. The exclusive pronouns may exclude any referent salient for the discourse, not just the addressee.

3_3.7.2.3_1_ÍTM_INDEX-1PL-LOCATION-AT-CHEST

3_3.7.2.3_2_ÍTM_INDEX-1PL-LOCATION-AT-LEFT-SIDE

INDEX$_{\text{1PL-LOCATION-AT-CHEST}}$ ('we all', inclusive)

INDEX$_{\text{1PL-LOCATION-AT-LEFT-SIDE}}$ ('we all', exclusive) (ÍTM)

TWO-OF-US$_{\text{LOCATION-AT-CHEST}}$ ('we two', inclusive)

TWO-OF-US$_{\text{LOCATION-AT-LEFT-SIDE}}$ ('we two', exclusive) (ÍTM)

3.7.2.4 Case

It is uncommon for sign language pronouns to mark case (with the exception of the possessive [Lexicon – Section 3.7.3]). Alibašić Ciciliani & Wilbur (2006), for instance, investigated the possibility that handshapes or mouthings [Phonology – Section 1.5.2] / mouthings distinguish different cases in HZJ, but found no clear evidence for such marking. An exception seems to be Israeli SL, which has been claimed to have a case-marked pronoun grammaticalized from the noun PERSON (Meir 2003). Otherwise, there is little evidence of explicit case marking in sign languages, and grammatical relations between arguments tend to be marked either on the verb or by word order.

3.7.2.5 Gender

It is uncommon for sign language pronouns to be marked for gender. However, gender marking has been described for NS and TSL (Fischer 1996; Smith 1990), both for pronouns and classifier predicates. In these sign languages, gender can be marked by a change in handshape (for male, for female) and is limited to human referents. However, the marking is not obligatory, and therefore may not be a case of grammatical gender marking but rather an optional morphological process that marks

semantic gender (McBurney 2002). If the grammar writer finds evidence of different pronominal forms for different genders, it is important to ascertain to what extent this marking is semantically driven (by biological gender of animate referents, for example) and, more importantly, how obligatory such marking is.

It is worth noting that some accounts that treat classifiers [Morphology – Section 5] as pronominal forms consider the different handshape classes as a type of gender marking, along the lines of classes in the rich multiple gender systems displayed by Bantu languages (Zwitserlood 2003).

3.7.2.6 Honorific pronouns

In many sign languages, pronouns have an honorific form. This form is marked by directing the pronoun to a spatially higher location (higher than in an unmarked form of the pronoun), indicating some kind of honorific status of the referent (based on the metaphor POWER IS UP). Other alternations for respect forms include a change in handshape (using the -hand rather than the normal extended index finger) or introducing the non-dominant hand to "shield" the dominant hand (e.g. Berenz (2002) for Libras). The use of one form or the other may depend upon the physical presence of the referent in the communicative setting. As with other grammatical categories that may be marked by personal pronouns, the grammar writer should determine how obligatory this marking is.

3.7.2.7 Logophoric pronouns

Some languages make use of a specific set of pronouns in the context of indirect discourse to mark co-referentiality with the individual whose point of view is being described. Thus, in the case of reported speech, a language like Ewe (spoken in West Africa) has a specific logophoric pronoun, *yè*, to refer to the main clause subject (a), and a normal third-person pronoun, *e*, to refer to any other individual (b). (In the examples, the change in subscript denotes that the referents are distinct.)

a. Kofi be yè-dzo
   'Kofi$_i$ said that he$_i$ left.'
b. Kofi be e-dzo
   'Kofi$_i$ said that he$_j$ left.' (Ewe, Clements 1975: 142)

Sign languages do not appear to have a specific set of logophoric pronouns, but parallels have been drawn between the use of role shift [Syntax – Section 3.3.3], which has many properties of indirect discourse, and logophoric pronouns. Lillo-Martin (1995) suggests that the first person pronoun (that is, the signer pointing at herself) is a logophoric pronoun in the context of role shift. Ultimately, the classification of such pronouns will depend on the treatment that the grammar writer gives to role shift (see Lillo-Martin (2012) for further discussion).

3.7.3 Possessive pronouns

Possessive pronouns may be differentiated into two main types. The first type is a proform for the possessor (e.g. English *my*, *her*, *your*) which still requires a noun for the thing possessed ('my ruler', 'her pen'). These forms are not, strictly speaking, pronouns since they do not replace a noun, and act as adjectives or determiners (depending on the language). Consequently, they are often referred to as adjectival possessive pronouns. In contrast, a substantival possessive pronoun is a proform for both the possessor and the thing possessed (e.g. English *mine*, *hers*, *yours*). Such pronouns may act as an argument ('Mine is bent', 'I prefer yours') or as a predicate ('This pen is hers'). The two types are sometimes referred to as dependent/independent or weak/strong possessive pronouns. For more on adjectival possessive pronouns see attributive possessive pronouns [Syntax – Section 4.2.1.1] in the Syntax Part.

Some sign languages do not have a specific form for possessive pronouns and make use of personal pronouns [Lexicon – Section 3.7.2] (that is, a ☝-hand) to express possession. However, specific forms for possessive pronouns have been described for various sign languages. Most commonly, these are directional elements that differ from personal pronouns in handshape (and orientation): thus in many sign languages (e.g. ASL, DGS, ÍTM), the handshape in possessive pronouns is B, 🖐, and the palm of the hand is directed toward the (possessor) referent. (Other handshapes have been attested for other sign languages.)

POSS$_1$ ('mine') POSS$_{2/3}$ ('yours/his/hers') (ÍTM)

3_3.7.3_3_ÍTM_POSS-1PL (ÍTM)

POSS$_{1PL}$ ('ours')

Furthermore, some sign languages may distinguish between adjectival and substantival possessive pronouns: in BSL, for example, the substantival form is marked with the ☝-handshape. If different handshapes appear for possessive pronouns, it is important for the grammar writer to look at the context and distribution of the forms in order to establish the function of each. It is possible that the sign language in question does not uphold the adjectival/substantival distinction and may differentiate, for example, between predicative and other uses. Equally, other factors may condition

the form of the possessive pronoun: in BSL, for instance, the index handshape can only be used for inalienable possession (Cormier 2012: 233).

3.7.4 Reflexive and reciprocal pronouns

A reflexive pronoun is used when the object in a sentence (direct or indirect) refers to the same person or thing as the subject of the sentence (e.g. *I scratch myself*). A reflexive pronoun exists in various sign languages (e.g. ASL, BSL, NGT, RSL), often glossed as SELF. The form of the sign differs from language to language; in some cases, the pronoun can be modified spatially, in the same way that personal pronouns [Lexicon – Section 3.7.2] can (i.e. directed toward a locus associated with a referent), while in other cases, the sign is fixed in form. Frequently, the reflexive pronoun is optional, and in the case of RSL, a personal pronoun may be used for reflexive meaning, as illustrated by the following two examples.

BOY INDEX$_3$ PAINT SELF
BOY INDEX$_3$ PAINT INDEX$_3$
'The boy paints himself.' (RSL, Kimmelman 2009: 22)

These pronouns often function as emphatic pronouns in the same way that reflexive pronouns in English can, as shown in the translation of the following ASL example.

SISTER SELF TELEPHONE OFFICE
'My sister will call the office herself.' (ASL)

A reciprocal relation expresses a meaning similar to a reflexive relation since co-referentiality is involved. However, reciprocity requires a plural referent so that each individual is at the same time agent and undergoer of the action (e.g. *They visit each other*). Generally, in sign languages, reciprocal relations are expressed by reciprocal markers [Morphology – Section 3.1.3] on the verb. As such, it is common for sign languages not to have a specific reciprocal pronoun. Nevertheless, such reciprocal pronouns have been described for some sign languages, such as ASL and BSL, and the forms tend to share formational features with the reflexive pronoun.

JOHN MARY EACH-OTHER WISH MERRY CHRISTMAS
'John and Mary wished each other merry Christmas.' (BSL)

3.7.5 Interrogative pronouns

Interrogative pronouns are proforms that are used in wh-questions [Syntax – Section 1.2.3]. They can be found in all sign languages studied to date, but their numbers vary

between sign languages (Zeshan 2004). BSL has at least six interrogative pronouns, ÍTM seems to have 13, but IPSL only has a single interrogative sign. Thus, there is a continuum from simple wh-word paradigms to highly complex paradigms. Examples of interrogative ÍTM pronouns are the following:

WHO

WHAT (ÍTM)

Actually, IPSL is an interesting case, as it has been argued that the interrogative sign (glossed as G-WH for 'general wh-sign') is not an interrogative pronoun but rather a question particle [Lexicon – Section 3.11.2]; this sign may combine with certain nouns to yield more specific meanings (e.g. FACE^G-WH 'who', PLACE^G-WH 'where'; cf. Aboh, Pfau & Zeshan 2005). If the sign language under investigation patterns with IPSL in this respect, then the grammar writer would have to decide where to discuss the interrogative sign – here or in the section on question particles. If the status of the sign is uncertain, then it should be mentioned in both sections.

Sign languages with larger interrogative pronoun inventories may also feature examples of compound interrogative pronouns, such as those from ÍTM and DGS illustrated below.

3_3.7.5_3_ÍTM_HOW-CHARACTERISTIC

HOW^CHARACTERISTIC
('what kind', ÍTM)

3_3.7.5_4_DGS_WHO-PAM

WHO^PAM
('whom', DGS)

In many sign languages, the same signs are used for interrogatives as for indefinites. Examples of this are the BSL signs for SOMEONE and WHO, which are identical in form.

3.7.6 Relative pronouns

Sign languages use a variety of strategies to mark relative clauses [Syntax – Section 3.4], including word order, manual, and non-manual markers. One option is to use a

relative pronoun, and pronouns with such a function have been described for various sign languages. ASL, for example, uses a sign glossed as THAT as a relative pronoun (or "relative conjunction"; Liddell 1980). DGS has two relative pronouns, one for human referents (e.g. *the man who* ...) and another for non-human referents (e.g. *the book which* ...); both can be localized in space (Pfau & Steinbach 2005). As occurs with spoken languages, the same form may be used as a relative pronoun and a demonstrative pronoun [Lexicon – Section 3.7.1]. In contrast, other sign languages do not appear to have a sign that functions as a relative pronoun, and instead use other strategies to indicate the relative clause.

3.7.7 Indefinite pronouns

Across spoken languages, indefinite pronouns often have forms similar to the nouns meaning 'person' or 'thing', or to the numeral 'one', and this is also the case for sign languages. There may be different indefinite pronouns for human and non-human referents, like the English *someone* and *something*. Indeed, in many sign languages, the human indefinite pronoun may be similar in form to the numeral ONE, often with an additional movement or a marked location in the signing space.

In some sign languages, the indefinite pronoun SOMEONE bears a relation to the interrogative pronoun [Lexicon – Section 3.7.5] WHO. In BSL, the indefinite and interrogative pronouns are identical in form; in LSC, WHO forms part of the indefinite pronoun.

WHO^SOME
WHO^INDEX$_{3pl}$
'someone' (LSC)

Compound signs are also attested for other sign languages: in DGS and NGT, the indefinite pronoun consists of ONE^PERSON.

3.8 Adpositions

3.8.1 Manual adpositions

Adpositions generally mark relational information between two elements, and such relations are usually expressed in sign languages by the use of sign space, especially if they are spatial in nature (e.g. *on*, *in*, *next to*). In some sign languages, there are, however, at least some manual signs for certain adpositions that can be glossed as such, as the following examples from LSE and DGS show.

UNTIL ('until')

WITHOUT ('without') (LSE)

OVER ('over') (DGS)

Note that the use of a sign language adposition may be very different and possibly more restricted than that of the nearest equivalent in the spoken language. For the given sign language, the grammar writer should check whether these elements are prepositions or postpositions.

3.8.2 Adpositions and spatial relations

In sign languages, relational information that is usually expressed by adpositions in spoken languages can be conveyed via various means involving the sign space – in particular when it comes to spatial relations. In general, spatial adpositions may be incorporated in spatial verbs and classifier constructions, that is, the movement of the verb is modified to indicate the spatial locations of and relations between objects. This strategy is illustrated by the two DGS examples below.

3_3.8.2_2_DGS_JUMP-OVER

STAND$_{under}$ ('stand under') JUMP$_{over}$ ('jump over') (DGS)

3.9 Conjunctions

Conjunctions are parts of speech connecting two or more elements of speech such as words, phrases, and clauses. Languages use a variety of mechanisms to connect constituents, and here we look at three types of conjunctions: coordinating [Lexicon – Section 3.9.1], subordinating [Lexicon – Section 3.9.2], and correlative [Lexicon – Section 3.9.3]. For more information on how clauses are conjoined, see coordination and subordination [Syntax – Section 3] in the Syntax Part (for overview, see also Tang & Lau (2012) and Pfau & Steinbach (2016); for BSL connectives, see Waters & Sutton-Spence (2005)).

3.9.1 Coordinating conjunctions

Coordinating conjunctions such as *and*, *or*, *but*, and *so* paratactically join lexical elements or clauses. In sign languages, there may be manual signs for some conjunctions, but this does not necessarily need to be the case. Established sign languages very often realize coordination via prosodic marking such as rhythmic pauses, a change in body posture, and/or other non-manual expressions. Many sign languages do not show overt manual elements for 'and', for instance, as can be seen in the following examples (see Davidson (2013) for ASL). In contrast, use of a conjunction BUT appears to be more common across sign languages.

EMMA APPLE BANANA GRAPE LOVE
'Emma loves apples, bananas, and grapes.' (DGS)

EMMA FRIEDA LOVE ÖRN SVERRIR LOVE
'Emma loves Frieda and Örn loves Sverrir.' (ÍTM)

It is important to describe not only single words, but also test complex sentences to gain insight in the realization of coordinate structures in naturally signed discourse. There may be manual items from manually coded speech systems that are usually not used in native signing, for instance (e.g. the sign PLUS used for 'and'). For more information on coordination at the clausal level, see coordination of clauses [Syntax – Section 3.1].

3.9.2 Subordinating conjunctions

Subordinating conjunctions usually introduce embedded clauses or conjoin main and embedded clauses. Typical examples in English are *because*, *since*, *though*, *where*, *that*, *if*, etc. Similarly to coordinating conjunctions [Lexicon – Section 3.9.1], sign languages may have certain manual elements that are used as subordinators,

but frequently realize embedding by means of non-manual markers and prosodic structure. Based on the sign languages investigated to date – and these are only a few – the pattern that emerges is that (i) sign languages do not employ conjunctions that introduce complement clauses (complementizers like English *that*); (ii) sign languages generally have some conjunctions that introduce different types of adverbial clauses (comparable to English *if*, *because*, *so that*); and (iii) some types of adverbial subordinate clauses, such as e.g. temporal clauses and conditional clauses, can be marked by a non-manual only (even though a manual conjunction may optionally be used in addition). The two images below are examples of manual subordinate conjunctions in LSC and DGS, respectively, while the video illustrates non-manual marking of a conditional clause in DGS.

IF ('if', LSC)

WHEN ('when/if', DGS)

3_3.9.2_3_DGS_TODAY SUN RISE, IX-1PL SWIM

raised eyebrows	head nod
TODAY SUN SHINE	IX_{1PL} SWIM

'If the sun shines today, we go swimming.' (DGS)

Like in spoken languages, subordination conjunctions are commonly grammaticalized elements. Compare the grammaticalization of 'be+cause' in English with the sign BECAUSE in DGS, which grammaticalized from the noun REASON illustrated in the video below. When used as a conjunction, the movement of the sign is commonly reduced.

3_3.9.2_4_DGS_BECAUSE2

REASON (DGS)

For more information on clausal subordination, see subordination [Syntax – Section 3.2].

3.9.3 Correlative conjunctions

Correlative conjunctions consist of at least two items that assign a correlative relation to two equal grammatical units. Thus, these pairs establish parallel constructions that conjoin similar words or phrases. Examples in English are *(n)either ... (n)or*, *not only ... but*, *whether ... or*, *the more ... the more*, etc. In sign languages, there are certain manual equivalents to those pairs, which, however, do not necessarily include all spoken language items (see example (a) below, where BUT is not overtly realized).

a. NOT ONLY BEER, ALSO SALAD
'not only beer, but also salad'

b. IX_1 CINEMA GO THEATER GO $\text{PALM-UP}_{\text{RH}}$ $\text{PALM-UP}_{\text{LH}}$
'I either go to the cinema or to the theater.' (DGS)

In some sign languages, the sign PALM-UP (which is related to a common co-speech gesture; see the discussion in the section on borrowing of gestures [Lexicon – Section 2.3]) may be used in correlative constructions such as *either ... or*, using one hand on the ipsilateral side of the sign space and the other hand on the contrasting side of the sign space, as illustrated in example (b). Syntactically, the correlative construction follows the two elements that are connected. More important, however, is the fact that non-manual markers such as body leans very often indicate the specific relation between the elements. In case of *either... or*, for instance, a contrasting sideward body lean on each unit is sufficient to express the correlative conjunction.

3.10 Numerals and quantifiers

Numerals and quantifiers identify the number or amount of the set denoted by the noun that they modify. Strictly speaking, a numeral is a type of quantifier in that it specifies the exact number, but we adopt the widespread practice of distinguishing between numerals on the one hand, and (non-numeric) quantifiers that give a relative or indefinite indication of quantity on the other.

3.10.1 Numerals

Generally speaking, the term "numeral" used in the nominal domain indicates an item specifying the number of entities referred to. Numerals are either words such as *one*, *ten*, *twenty-two* that are used to count and denominate numbers (cardinal numbers) or number words that relate to a specific ordering (ordinal numbers), such as *first*, *second*, etc.

At a closer inspection, numerals can be classified according to three main categories: cardinal, ordinal, and distributive numerals. Cardinals are used to count entities and answer the question 'How many?' (e.g. 'three suitcases'). In contrast, ordinals are used to rank entities according to a certain order and provide an answer to the question 'Which in order?' (e.g. 'the third suitcase'). Finally, distributive numerals specify how a certain quantity is distributed over some entities and can be used to answer the question 'How many each?'. The distributive use is illustrated by the following Georgian example.

sam-sami čanta
three-DIST.ABS suitcase.ABS
'three suitcases each' (Georgian, Gil 1988: 1044)

Usually, ordinals and distributives are derived from cardinals since they combine a numerical quantity with another type of information (i.e. order and distribution). Not all languages have a distinct word class for ordinals and distributives (Dryer & Haspelmath 2013).

3.10.1.1 Cardinal numerals

For cardinal numerals in sign languages, the two manual articulators offer a direct option of counting from 1 to 10 by the use of fingers, making 10 the common base for most sign languages (decimal system). Thus, sign languages obviously draw on gestural means in their counting systems. However, sign languages are known to have quite different number systems even for counting from 1 to 10, and these systems may at times be quite different from how hearing subjects count using their hands. In DGS, signers count by separately extending one finger after the other on the dominant hand, starting with the thumb, and maintaining five extended fingers on the non-dominant hand when counting from 6-10 with the dominant hand again (two-handed number system). In ASL, however, the numbers from 1 to 10 are all expressed by one hand alone (one-handed number system). The number system of a sign language may involve handshapes that are rare, or even unattested in other lexical signs (note that the handshapes of numerals 1 to 5 or 1 to 10, depending on the type of counting system, will also be listed in the section on number signs [Phonology – Section 1.1.3] in the Phonology Part).

Strategies for forming higher numbers should also be explained. For numerals from 11 to 19, as well as for decimals 20, 30, etc., sign languages commonly combine number handshapes with specific movement patterns (e.g. circular movement, side-to-side movement); in this case, the movement simultaneously represents the numeric base 10. Just as in some spoken languages, the numbers 11 and 12 may show exceptional patterns. Higher numbers may be compositionally formed, as in DGS, or produced by juxtaposition of digits (digital strategy), as in ASL, as shown in the following examples.

FIVE-TWENTY ('twenty-five') (DGS)
ONE-ZERO-FIVE ('one hundred and five') (ASL)

As can be seen from the DGS example above, inversion may also be attested in certain sign languages (possibly due to influence from the spoken language, as is true for DGS and NGT). Some sign languages have been found to employ typologically unusual patterns in their numeral system, like a base-20 system (vigesimal system), subtractive numerals, and the like (Zeshan et al. 2013). Hence, the grammar writer should describe the numeral system, the simultaneous and sequential combinatorial possibilities, and point out typologically common and unusual patterns. Signs for higher numbers like 100, 1000, and one million, if attested, should also be included. It should also be noted that the articulation of numerals is known to be subject to dialectal variation (e.g. McKee, McKee & Major (2011) for NZSL). The position of numerals [Syntax – Section 4.3.1] vis-à-vis the noun will be described in the Syntax Part.

In the domain of numerals, sign languages have the unique opportunity to incorporate specific numerals into pronouns and temporal expressions. Examples of the former are 2-OF-US ('the two of us'), 3-OF-YOU ('the three of you'), etc. Numerals may also be incorporated into temporal expressions such as YEAR in DGS, which is usually signed with a -handshape, but in the case of 'one-year', 'two-years', etc., the number sign is combined with the specific movement of the sign YEAR (see left video below). The same process is available for signs like WEEK (see right video) or HOUR, for instance.

3_3.10.1.1_2_DGS_1-YEAR, 2-YEAR, 3-YEAR

1-YEAR, 2-YEAR, 3-YEAR...
('one year', 'two years', 'three years', etc.)

3_3.10.1.1_1_DGS_1-WEEK, 2 WEEK

1-WEEK, 2-WEEK, 3-WEEK
('one week', 'two weeks', 'three week', etc.)

Due to the physical properties of the hands, the upper limit for numeral incorporation is usually 10. Even though these cases are attested (more frequently for temporal expressions than for pronouns), sign languages more commonly apply numeral incorporation up to 5 and not beyond (also see the section on numeral incorporation [Syntax – Section 4.3.4] in the Syntax Part).

3.10.1.2 Ordinal numerals

Ordinal numerals are often derived from cardinals [Lexicon – Section 3.10.1.1]. The handshape of the cardinal numeral is usually maintained, while changes in orientation and movement may occur. In many sign languages, ordinal (ordering) numbers have a specific extra movement, indicating the difference between, for example, ONE and FIRST.

Ordinals differ from cardinals in that they do not constitute an open set of elements. Generally, they do not extend beyond TENTH. For example, in FinSL, ordinals from 10 onwards make use of a strategy based on written language that consists of combining the cardinal with the sign DOT.

TWENTY^DOT
'20th' (FinSL, Takkinen, Jantunen & Seilola 2016: 152)

Very often list buoys [Lexicon – Section 1.2.3] are used to keep track of ordinal numbering in signed discourse.

3.10.1.3 Distributive numerals

In sign languages, the distributive reading is usually expressed through reduplication of a cardinal numeral [Lexicon – Section 3.10.1.1] in the signing space. Each reduplication is produced at a distinct location, similar to the distributive plural for number marking on pronouns [Lexicon – Section 3.7.2.2]. That is, the sign languages investigated to date do not employ dedicated lexical signs for distributive numerals but rather make use of morpho-syntactic spatial strategies to express the distributive meaning. For illustration, we provide two examples from RSL.

topic
MAN INDEX BUY BEER ONE$_{DISTR}$
'Each man bought a beer.'

INDEX$_{DISTR}$ EACH ONE$_{DISTR}$ SUITCASE TWO$_{DISTR}$
'Each of them had two suitcases.' (RSL, Kimmelman 2015: 13,22)

3.10.2 Quantifiers

A quantifier is an expression that identifies the number or amount of the set denoted by the noun it modifies. The following are some of the quantifiers attested in English: *no*, *some*, *both*, *few*, *a few*, *several*, *enough*, *many*, *most*, *each*, *every*, *all*. Sign languages also have quantifiers, as illustrated by the following LSC example.

br
STUDENT MAJORITY EXAM PASS
'Most students passed the exam.' (LSC, Quer 2012: 188)

Quantifiers are typically classified together with determiners [Lexicon – Section 3.6] / determiners or nominal modifiers, but quantification may also be achieved with other elements such as adverbials [Lexicon – Section 3.5] or auxiliaries. In the present section, the grammar writer should provide a list of attested quantifiers (including negative quantifiers like *no*), possibly supplemented by examples illustrating their use. See quantifiers [Syntax – Section 4.4] in the Syntax Part for more on quantifiers and quantification [Semantics – Chapter 10] for information about the different ways in which quantification may be expressed.

3.11 Particles

Particles are functional words that do not inflect and typically encode grammatical categories or discourse functions. This section looks at negative particles [Lexicon – Section 3.11.1], question particles [Lexicon – Section 3.11.2], and discourse particles [Lexicon – Section 3.11.3]. However, the grammar writer may decide to add further particle types, such as focus particles (such as English *even*, *also*, and *only*) or modal particles, if these are attested in the sign language under investigation (see Herrmann (2013) for discussion of these types of particles).

3.11.1 Negative particles

Many languages use a particle meaning 'not' to negate an affirmative sentence, such as *no* in Spanish or *niet* in Dutch.

Cayetana toca la trompeta. / Cayetana **no** toca la trompeta. (Spanish)
'Cayetana plays the trumpet.' / 'Cayetana doesn't play the trumpet.'
Ik zie Hans. / Ik zie Hans **niet**. (Dutch)
'I see Hans.' / 'I don't see Hans.'

All sign languages described to date have at their disposal one or more negative particles for expressing clause negation. Across sign languages, use of a basic 'not' particle appears to be the most common strategy, next to non-manual negation (which, in some sign languages, may negate a clause by itself). For illustration, see the LSE example below, which involves a clause-final particle (accompanied by a headshake).

hs
JUANITA MEAT EAT NOT
'Juanita doesn't eat meat.' (LSE)

The interaction between the manual particle and the non-manual marking (normally a headshake, but this may vary cross-culturally; see non-manual markers of negation [Morphology – Section 3.5.1.2]) is different from language to language. In this section, the grammar writer should only list and describe the attested manual particles. The relative importance given to the manual and the non-manual component, the position of the particle, and the possible spreading of the non-manual marking with respect to the manual signs will be addressed in the section on negatives [Syntax – Section 1.5] in the Syntax Part.

Some sign languages have negative particles which carry additional semantics, e.g. emphatic negatives ('absolutely not'), contrastive negatives, or negative imperatives ('don't!') (Zeshan 2006). Such specialized particles should be included here. Other negative elements which combine negation with another inflectional category

(e.g. aspect, modality) will be treated elsewhere in the grammar, namely in the respective subsections within lexical expressions of inflectional categories [Lexicon – Section 3.3]. Also, they may make another appearance in the section on negative inflection [Morphology – Section 3.5]. Still, the grammar writer may decide to mention such negative elements here and refer the reader to the relevant parts of the grammar.

3.11.2 Question particles

Question particles normally mark polar interrogatives [Syntax – Section 1.2.1] but may also occur with content interrogatives [Syntax – Section 1.2.3]. They usually appear in a sentence-initial or -final position and may be grammaticalized from a more complex syntactic structure or a pragmatic interrogative marker such as 'I ask you'. The *est-ce que* form in French (literally 'is it that …') may be regarded as a question particle:

Est-ce que tu veux le voir?
'Do you want to see it?' (French)

Since polar interrogatives are most frequently marked by non-manual markers, question particles in sign languages tend to be optional (in contrast to spoken languages, where question particles, if they are used, tend to be obligatory). An example of a question particle is found in Japanese Sign Language:

y/n
IX$_3$ TRUE Q-PART
'Is that true?' / 'Really?' (NS, adapted from Morgan 2006: 99)

Genuine interrogative particles tend to occur in the same prosodic unit as the rest of the interrogative. If there is an intervening prosodic break, the interrogative marker may actually function as a question tag or a request for confirmation, such as *innit?* in a sentence like 'You're from Harrogate, innit?' (attested in some non-standard dialects of British English). An example of a question tag is found in the following LSE polar interrogative:

y/n
IX$_3$ LIVE BILBAO YES-NO
'Do you live in Bilbao?' / 'You live in Bilbao, don't you?' (LSE)

Question particles also need to be distinguished from pragmatic means of asking a question by means of a verb like 'ask' or a strategy based on written language such as tracing the shape of a question mark. However, both of these strategies may grammaticalize into a question particle, and the same is true for the 'palm-up' gesture (which has already been mentioned in the context of borrowing of gestures [Lexicon – Section 2.3.2] and correlative conjunctions [Lexicon – Section 3.9.3] and will make another appearance in the next section on discourse particles

[Lexicon – Section 3.11.3]). The grammar writer should look for evidence of semantic bleaching, inflectional rigidity, and syntactic distribution (especially word order) to justify treating an element as a grammaticalized question particle. See interrogative particles [Syntax – Section 1.2.1.3] in the polar interrogatives section and interrogative particles [Syntax – Section 1.2.3.9] in the content interrogatives section of the Syntax Part for more information.

3.11.3 Discourse particles

Certain particles do not add to the meaning of a sentence but affect its communicative intent. These particles serve a pragmatic function and help to organize and connect the different elements of the discourse, or to express the signer's attitude. For example, in English, the adverbial *well* can be used as a discourse particle to heighten the speaker's attitude, and *like* can be used to diminish the effect of exaggerated language, as the following examples show:

Well, what a cheek!
She was, like, totally wasted.

A common element across sign languages that is often translated as 'well' or 'so' is the palm-up gesture (holding one or both hands open with the palms facing upwards), and this seems to operate as a discourse marker in many sign languages. (As mentioned previously, the palm-up gesture appears to serve various functions (McKee & Wallingford 2011; Van Loon, Pfau & Steinbach 2014); therefore, the grammar writer should be careful about classifying all instances of palm-up as a single element.) Such particles that express the speaker's attitude are often treated as interjections [Lexicon – Section 3.12] and other examples are given in that section.

The structuring and organization of discourse [Pragmatics – Chapter 5] in sign languages is often achieved by the use of space [Pragmatics – Chapter 10], but there are also manual elements that qualify as discourse particles. Some particles serve to structure the discourse produced by the signer, whereas others control the discourse between interlocutors. Of the first kind, various sign languages, such as NGT or LSE, mark a change in discourse topic [Pragmatics – Section 4.2] by means of a sign that involves moving both hands (-handshape) from the contralateral to ipsilateral side as if pushing something out of the signing space. The second type includes the use of finger-wiggles to maintain a turn in a conversation [Pragmatics – Section 10.2], similar to the use of vocalic sounds in spoken languages such as *ah* or *er* to indicate that the turn-holder is thinking of what to say and does not want to be interrupted.

The grammar writer should bear in mind that these discourse particles may be derived from items that normally have a lexical meaning but – possibly due to metaphorical extension – may be used for purely pragmatic purposes. Identifying such

discourse particles and distinguishing them from lexical counterparts can give a clearer picture of what forms an integral part of a clause and what does not.

3.12 Interjections

Interjections are exclamative words or phrases that express the speaker's emotions, sentiments or judgments, such as English *well*, *oh my god*, or *yeah*. Furthermore, English *uh* and *ahem* or German *äh* and *ach* are pause fillers and are usually also called interjections. The linguistic definition of interjections from spoken languages often includes the notion that interjections express exclamative sounds, which poses some challenges to define the respective expressions in sign languages. In general, an open mouth may be seen as an equivalent to a sound-related interjection indicating surprise such as *oh* or *ah*. In addition, there are sign language-specific interjections such as WOW in DGS, where, in addition to a specific mouth pattern, the fist-hand-shape quickly moves from side to side in sign space.

WOW ('wow') (DGS/ÍTM)
AH-sign (multiple translations depending on the facial expressions) (Irish SL)

The so-called "finger-wiggling" to hold on to a turn in a conversation is a relatively frequent gesture, attested in many sign languages, that can be considered an interjection. However, such elements may also be treated as discourse particles [Lexicon – Section 3.11.3]. Interjections can also be similar in form to gestures used with an interjective function by non-signers.

Since interjections express emotions or sentiments, and because such information is frequently transmitted through non-manual (especially facial) markers, interjections in sign language often involve a rich mixture of manual and non-manual material. These signs have been referred to as "multi-channel signs" and are characterized by the fact that they are difficult to translate simply into spoken language, with glosses such as THAT'S-A-BIT-EMBARRASSING or I'M-ALL-FOR-IT. However, this relative untranslatability is typical of interjections, and does not give these signs any particularly unique status with respect to their spoken language counterparts.

Elicitation materials

Rather than attempt to elicit different parts of speech individually, in a word by word fashion, it is recommended that the grammar writer tries to analyze these different grammatical categories in the context of sentences or discourse. For this reason, the grammar writer is directed to the relevant sections of the Syntax [Syntax Part] Part for recommendations of elicitation materials and techniques.

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Chapter 0 Preliminary considerations

This introduction is meant as a guide to morphological structure, which is the word formation component of grammar. Our purpose is to introduce the relevant terms that will be used throughout this chapter, and to give a general introduction to the field of morphology.

0.1 What is morphology?

The term "morphology" is used in many different ways in the literature; it may refer to the internal structure of words, the subcomponent of linguistics that studies the structure of words, the component in which words are created, or to affixes and the features associated with affixes. We use the term in the first sense, that is, to refer to the internal structure of words (also known as "the morphological structure of words").

Although the term 'word' is central to morphology, we use it in an informal sense and not as a technical term. Firstly, the difficulty of describing 'word' is widely recognized, as there are different types of words (orthographic word, prosodic word [Phonology – Section 2.2.1] / prosodic word, grammatical word); nevertheless, there is an intuitive sense in which 'word' can be used. For instance, we can say that the sentence *John loves eating apples* is made up of four words. Just as sentences are made up of such smaller parts, words too are made up of parts. For example, the word *books* is made up of two parts ('book-s'), a root and an affix, and the word *kingdoms* is made up of three parts ('king-dom-s'), a root and two affixes.

It is useful to know that morphology is based on the systematic correspondence of form and function. These two are separate concepts. Taking the example *books*, the element '-s' has a particular form (*s*), which indicates (encodes) the function of plurality. It is written as *s*, and pronounced as [s]. However, plurality can be expressed in different ways in English, some due to phonological reasons (*bears* [z], *peaches* [əz], others for lexical reasons (e.g. *oxen* [ən], *sheep* – no overt form). Since all of these indicate the same function, i.e. plurality, they comprise a single morpheme, the smallest unit that has a meaning (here, plurality). This particular morpheme is a set that contains the forms [s], [z], [əz], [ən], and Ø (no overt form) – a set of five allomorphs. The forms *book*, *bear*, *peach*, etc. are also morphemes, as they cannot be further broken down into meaningful parts.

Besides the notions already introduced, other notions referring to the building blocks of words that figure prominently in the area of morphology, and that will be used in the following, are lexeme, stem, and clitic.

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0.2 Organization of the Morphology Part

This part adopts the widely accepted distinction of three types of word formation: compounding, derivation, and inflection. These word formation strategies are very common across languages, and differ from each other with respect to what types of elements (see previous section [Morphology – Section 0.1]) are combined. The basic properties of these three types of word formation are summarized here for the grammar writer's convenience.

- *Compounding* [Morphology – Chapter 1]: Under compounding, two stems are combined to create a new word. Often the stems involved are free morphemes, but this is not always the case. Compounding is taken to be a type of word formation that takes place in the lexicon.
- *Derivation* [Morphology – Chapter 2]: Just like compounding, derivation is considered a type of lexical word formation; in contrast to compounding, however, derivation involves a single stem and (usually) some additional material smaller than a stem (e.g. an affix). A derivational affix can change the category of the stem (e.g. *sing* (verb) → *sing-er* (noun)). A derivational process may be semantically irregular (e.g. English *runner*, which may refer to a long carpet).
- *Inflection (verbal inflection* [Morphology – Chapter 3] – *nominal inflection* [Morphology – Chapter 4]*)*: Inflectional word formation is relevant to and dependent on syntax (it is therefore also referred to as "morphosyntax"); it comprises grammatical modifications like case, agreement, tense, and aspect, among others. Just like derivation, inflection usually involves the combination of a stem and an affix; yet, it can never change the category of the stem (e.g. *paint* (verb) → *paint-ed* (verb)). Inflection is semantically regular.

Moreover, in the final chapter of this part, we will address an additional type of word formation that is not easily subsumed under the three types listed above, but which also affects verbal stems: word formation involving classifiers [Morphology – Chapter 5] / classifiers.

0.3 How to use the Morphology Part

Since processes that have been characterized as derivational are not always easily distinguished from compounding on the one hand, and from inflection on the other hand, it may be advisable for the grammar writer to study the introductions to the chapters on compounding, derivation, and verbal inflection together, so as to get an idea of the challenges that come with the classification of morphological processes in sign languages.

It is also worth noting that a number of aspects that are addressed in this part of the Blueprint also make an appearance in other parts. This is not surprising, as

morphology has clear relations to other areas, most importantly, the lexicon and syntax. To give two illustrative examples: First, negation is discussed in two sections within this part, as it may be derivational and inflectional. However, negation is also a syntactic process, as, in the case of a free particle, the word order of the clause may be affected – it is therefore also addressed in the Syntax Part of the Blueprint. Moreover, negative particles that exist in a sign language will be listed in the Lexicon Part. Second, various morphosyntactic phenomena – most importantly, tense, aspect, modality, and agreement – may be realized on the verb as inflections, or by free grammatical markers (e.g. auxiliaries). The former are discussed in this part under Verbal inflection [Morphology – Chapter 3], the latter are addressed in the Lexicon Part under Lexical expressions of grammatical categories [Lexicon – Section 3.3].

Chapter 1 Compounding

1.0 Definitions and challenges

1.0.1 What is a compound?

Compounding is one of the most productive word formation processes and one that is widespread especially in new languages. Compounds are morphological constructions that are made up of two (and sometimes more) juxtaposed units and which syntactically and semantically behave like a single unit (word/lexical item). The fact that the morphemes that participate in compound formation are stems distinguishes compounding from affixation. These stems are often, but not always, freely occurring elements, and they may be complete or reduced. Specific to sign languages, fingerspelled [Lexicon – Section 2.2.2] / fingerspelled letters may combine with stems in compound formation. The components of a compound in sign languages are expressed by manual articulators. As further detailed below, the parts of a compound may each have a different categorial status and may interact in various ways to yield the complex meaning of the compound.

Identifying compounds in a spoken language is not always straightforward, as in the written form of a spoken language the parts that form the compound may be written as one word (e.g. German *Apfelkuchen*), as two words (e.g. English *apple pie*), or may be hyphenated (e.g. English *know-all*). Moreover, in identifying a particular form as a compound, it is also necessary to distinguish that form from:

(i) a word
(ii) a phrase
(iii) a blend and a clipping

(i) *Compounds versus words*:
Simultaneous compounds may be deceptively similar to words, due to the reduction in their form. Clear clues are the violation of the handshape change constraint [Phonology – Section 1.3.2] (Sandler 1989) and the symmetry condition [Phonology – Section 1.4] (Battison 1978). If these occur and the sign is a lexical item, then this is an indication of compounding.

(ii) *Compounds versus phrases*:
Some compounds share with phrases the property of having syntactic heads and non-heads (modifiers and complements). However, compounds and phrases are different on many counts: (i) modification of the parts is possible in phrases but not in compounds; (ii) separability of the constituents by other constituents is possible in phrases but not in compounds; (iii) obligatory genericity of the non-head of a compound; (iv) changes in the movement of both of the components in compounds; (v) unification of the handshapes in compounds; (vi) different stress patterns; and (vii) differences in rhythm (see Klima & Bellugi 1979).

(iii) *Compounds versus blends/clippings*:
Just like compounds, blends and clippings are also formed by the combination of more than one stem. The difference between compounds and blends/clippings in spoken languages is that the latter involve phonologically reduced stems. Blends, on the one hand, are cut from the inner edges of the juncture point between two stems (e.g. *smog* (*smoke*+*fog*) and *brunch* (*breakfast*+*lunch*)), and what remains as the output form is the phonological material at the outer edges of the two input stems. In clippings, on the other hand, the initial parts of two stems are retained while the rest is clipped (e.g. *sitcom* (*situation*+*comedy*) and *Interpol* (*international*+*police*)). In contrast to both, spoken language compounds contain the full form of both the stems.

There are various other differences between these construction types: (i) compounds can have heads, blends and clippings do not; (ii) compounds usually have a different stress pattern than words (compound stress), whereas blends have word stress; (iii) compounding is/can be productive, whereas blends and clippings are idiosyncratic (see Bat-El (2006) for details).

1.0.2 Types of compounds

In both spoken and sign languages, different types of compounds have to be distinguished, depending on the semantic and/or syntactic contribution of their parts. Some structural aspects of compounds are modality-independent while others are modality-specific. Here we only provide a brief overview of the relevant distinctions, as the various types will be discussed in more detail in subsequent sections.

A distinction that is central to the following discussion is the distinction between native compounds [Morphology – Section 1.1] and loan compounds [Morphology – Section 1.2]. The latter also include compounds involving fingerspelling, as fingerspelling by definition represents borrowing from a spoken language. While the distinction between native and loan compounds is in principle modality-independent, borrowing of structures from the surrounding spoken language appears to be very common across sign languages. The use of fingerspelling as a component of compounds is, of course, modality-specific.

Within both groups, sequential compounds have to be distinguished from simultaneous compounds. The former type is characterized by the sequential juxtaposition of two (or more) free morphemes. The existence of the latter type, i.e. the potential simultaneity of the components, is clearly a modality-specific property of sign language compounds, as only the visual modality allows for the simultaneous articulation of two stems, thanks to the availability of two manual articulators. Some constraints and issues relating to simultaneity are explored in the section on simultaneous and semi-simultaneous compounds [Morphology – Section 1.1.2].

A structural aspect of compounds that is modality-independent is headedness. For example, *apple pie* is a headed compound – an apple pie is a type of pie – whereas *know-all* is neither a type of *know*ing nor a type of *all*, which makes this compound headless. Typically, in headed compounds, one of the parts functions as a modifier or as a complement.

Another aspect is the syntactic category of the components of a compound. The fact that in compounds elements of different syntactic categories may be combined is also modality-independent. The input categories of compounds are usually nouns, adjectives, and verbs, and the output categories are nouns, adjectives, verbs, and adverbs. Across spoken languages, most compounds appear to be nouns, but obviously, the categorial status of input and output categories may vary from language to language.

1.0.3 Methodological challenges

When investigating compounds in a particular sign language, it is important to keep in mind that phonological properties – reduction and assimilation processes as well as the potential simultaneity – may make the identification of compounds difficult. We discuss these factors in more detail below, but it should be emphasized at the outset that, given these properties, what looks like a simplex sign may in fact have originated from a morphologically complex structure.

A famous example for this kind of diachronic change is the ASL sign for 'home', which, in fact, is usually glossed as such: HOME. Originally, however, the sign derives from the compound SLEEP^EAT. In isolation, the sign SLEEP is signed with a -hand next to the side of the head (cheek and ear), palm oriented toward the head; also, the

head usually tilts slightly towards the palm. EAT is signed in front of the mouth with a flat 𓂋-hand, fingertips oriented towards the mouth, and a repeated movement. In the compound, as signed today, only the handshape of EAT is retained and the hand performs a single movement from the cheek just below the ear towards the corner of the mouth or the chin, fingertips oriented towards the head throughout. Without knowing the history of the sign, it would probably be impossible to reconstruct the underlying components.

Consequently, given the notorious scarcity of historical sign language data, strong claims about the absence of a certain type in a particular sign language should be made with caution.

1.1 Native compounds

Native compounds are those that are formed independently of the compounds existing in the surrounding spoken language. Within the group of native compounds, we distinguish sequential and simultaneous compounds; there are semantic and syntactic differences within each group.

There are various views on the internal structure of compounds and consequently, compounds are divided into different groups by different researchers. As a result, the same term may be used by different authors for different divisions; see Lieber & Štekauer (2010) and Scalise & Vogel (2011), and references therein. A classification motivated by sign language compounds is proposed in Vercellotti & Mortensen (2012). Some researchers use the term "syntactic compounding" for productive forms, and "root compounding" for lexicalized forms. The categorization we use here is merely one practical way of dividing compounds into their subgroups. Needless to say, others can also be used.

1.1.1 Sequential compounds

In sequential compounds, one component is signed after the other one. In some sequential compounds, the full form of each sign is retained, while in others characteristic phonological reduction or assimilation [Phonology – Section 3.1] / assimilation processes apply in one or both of the stems that form the compound (see the section on semi-simultaneous compounds [Morphology – Section 1.1.2.2]).

1.1.1.1 Semantic structure

From the point of view of the semantic structure of compounds, some are transparent in meaning, whereas in others, the parts do not give an indication about the meaning of the compound. The former are referred to as "endocentric", the latter as

"exocentric" compounds (and this is not to be confused with the syntactic notions "headed" and "non-headed" which we define in the next section).

1.1.1.1.1 Endocentric compounds

In endocentric compounds, the meaning is predictable from the parts. In other words, these compounds are semantically compositional. Similar to phrases, this group is productive and the forms are not necessarily lexicalized. In many sign languages, this is probably the most common form of creating neologisms or of expanding the lexicon. The following examples are representative of endocentric compounds; the second and the third are illustrated by videos below.

FOOD^PLACE ('kitchen') (TİD)
MONK^BOSS ('abbot') (DGS, Leuninger 2001: 186)
SLEEP^DRESS ('pyjamas') (ASL, Klima & Bellugi 1979: 208)

4_1.1.1.1.1_1_DGS_MONK^BOSS

MONK^BOSS ('abbot', DGS)

4_1.1.1.2.1_1_ASL_SLEEP^DRESS

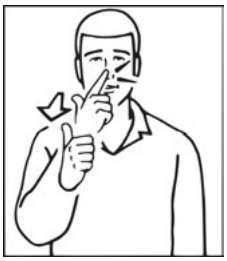
SLEEP^DRESS ('pyjamas', ASL)

In the examples, a kitchen is a place for making food, an abbot is the boss (head) of a group of monks, and pyjamas are a type of dress worn for sleeping.

1.1.1.1.2 Exocentric compounds

In contrast, in exocentric compounds, the meaning is not predictable from the parts, as illustrated by the following examples. The first one, from Auslan, is shown in the image below.

NOSE^GOOD ('lucky') (Auslan, Johnston & Schembri 2007: 133)
TOOTH^YELLOW ('rat') (SSL, Wallin 1983: 64)
RED^SECRET ('strawberry') (ASL, Klima & Bellugi 1979: 214)
GOD^WAIT ('advent') (DGS, Leuninger 2001: 185)



NOSE^GOOD ('lucky') (Auslan)

Obviously, a rat is not a type of tooth (and neither is it a type of yellow) and strawberries are not a type of secret (although they are red). Similarly, the concept 'lucky' may refer to something positive (good) but is not transparently related to nose.

Some compounds appear to be midway between endocentric and exocentric. The DGS example GOD^WAIT ('advent') may be such a case. While advent does not literally imply waiting for God, this meaning may still be semi-predictable. The grammar writer should decide how to present such cases.

Note that instead of the terms "endocentric" and "exocentric', the terms "semantically predictable" and "semantically unpredictable" may be preferred. This might be a better solution, as the terms exocentric and endocentric are sometimes used for what we classify as subordinate [Morphology – Section 1.1.1.2.1] and coordinate [Morphology – Section 1.1.1.2.2] compounds. Some researchers make a three-way distinction, cutting across semantic and syntactic criteria as: endocentric, exocentric, and coordinate.

1.1.1.2 Syntactic structure

A second important distinction concerns the syntactic structure of compounds. Irrespective of whether its meaning is predictable or not (that is, whether it is endocentric or exocentric), a compound can be headed or non-headed/double-headed. In other words, the components of a compound can be in a relationship where one is subordinate to the other (being a modifier or a complement: subordinate compounds), or they may be structurally symmetrical (coordinate compounds). Examples for the first type are *red wine* (endocentric) and *red herring* (exocentric), where *red* is an adjective modifying the following noun. Examples of the second type are *north-west*, *Alsace-Lorraine*, and *singer-songwriter* (semantically predictable), and *bittersweet* (semantically unpredictable).

1.1.1.2.1 Subordinate compounds

Subordinate compounds ("headed compounds") have an internal categorical head, which, however, does not (necessarily) overlap with the semantic head of the compound. For example, the exocentric ASL compound RED^SECRET ('strawberry') above has a head, which is SECRET, and which is modified by RED. However, the meaning is not transparent. Other subordinate sign language compounds are the following from ASL and TİD:

4_1.1.1.2.1_1_ASL_SLEEP^DRESS

SLEEP^DRESS ('pyjamas')

(ASL, Klima & Bellugi 1979: 208)

DOCTOR^PLACE ('hospital') (TİD)

SAY^BAD ('swear') (TİD)

1.1.1.2.2 Coordinate compounds

In coordinate(d) compounds – also called "co-compounds" or "dvandva compounds" – two (or more) components stand in a structurally symmetrical relationship. In one type, the components of the compound are different entities that are members of a higher category (i.e. a hypernym). In the ASL compound meaning 'vehicle', for instance, the signs for three sub-types of vehicles are combined. In this case, there would in principle be more options while in the NGT compound FATHER^MOTHER ('parents'), which is illustrated by two images below, the combination is exhaustive.

CAR^PLANE^TRAIN ('vehicle') (ASL)

In principle, a coordinate compound might also be characterized by the fact that both components refer to the same entity (as in the English compounds *singer-songwriter* and *hunter-gatherer*). That is, a vehicle is either a car or a plane or a bus, and a parent is either a father or a mother, but a singer-songwriter is a singer *and* a songwriter.

FATHER^MOTHER ('parents') (NGT)

We are only able to present the following hypothetical example for this type of coordinate compound.

CAR^BUS ('minibus', hypothetical)

In yet another type, the two components, which again stand in a structurally equal relationship, are nevertheless unrelated to each other. These compounds are mostly semantically unpredictable. Two examples from TİD are given below. The second one, which is illustrated by two images showing the beginning and end point of the sign, is also attested in various other sign languages.

THINK^PUT ('remember') (TİD)

EAR^MOUTH ('deaf') (TİD)

1.1.1.3 Compounds involving SASS

We treat compounds involving a Size-and-Shape-Specifier [Morphology – Section 5.2] / Size-and-Shape-Specifier (SASS) separately, as in these compounds, it is not always

clear what the head is; it might be that at least some of these are actually double-headed compounds. In this type, a lexical stem combines with a SASS. The examples discussed in the literature suggest that in compounds of this type, the SASS usually follows the lexical sign, as in the following examples from TİD and NGT. The NGT example is illustrated by six images (the first two show the sign SWIM, the other four the SASS).

D-V-D^SASS$_{round}$ ('DVD') (TİD)

SWIM^SASS$_{square}$ ('swimming pool') (NGT)

Of course, SASS may also modify nouns in general, thereby fulfilling the function of an adjective [Lexicon – Section 3.4] / adjective which specifies the shape of an object (as e.g. MIRROR SASS$_{round}$), but examples like those provided above are clearly lexicalized, as SWIM^SASS$_{square}$ refers to swimming pools in general, irrespective of their shape.

In the case of DVD, since these only come in a round shape, the SASS is semantically superfluous (almost like speaking about a 'round circle'), and it is not the modifier of D-V-D.

1.1.2 Simultaneous and semi-simultaneous compounds

It is not always easy to assign the compounded forms of sign languages to a particular class, as compounding is not the only word formation process involving two stems.

In Section 1.0. "Definitions and challenges", we already pointed out that blends and clippings are also formed by the combination of more than one stem.

These distinctions sometimes get blurred in the description of compounded forms even in spoken languages on which the definitions are drawn; when it comes to sign languages, the distinction is even harder to make. An overwhelming number of simultaneous compounds contain reduced stems and as a result, they might be considered blends from a phonological point of view, although syntactically they may contain heads. When it comes to sequential compounds, even the majority of these include reduced stems, as repetition within a stem is generally omitted when two stems are combined. Interestingly, some sign language researchers even use the term "blend" for a subgroup of what is described here as simultaneous compounds (see e.g. Klima & Bellugi 1979: 330).

It is thus necessary to apply the relevant criteria to compounded forms and evaluate the results for the sign language in question. In the following sections, we distinguish between simultaneous compounds, which have no equivalent in spoken languages, and semi-simultaneous compounds, which resemble blends.

1.1.2.1 Simultaneous compounds

In simultaneous compounds, the two components of the compound are expressed simultaneously on the two manual articulators, that is, all compounds of this type are two-handed, with one hand articulating (part of) one sign while the other hand simultaneously articulates (part of) another sign. Types differ with respect to the recoverability of the input forms as full stems, but most of these compounds involve reduced forms.

In full forms of simultaneous compounds, the two signs that make up the compound retain their phonological form. By definition, this implies that both signs are one-handed and that in the compound, one of the signs is shifted to the non-dominant hand. As we were not able to find clear examples of this type, we present a hypothetical example for the sake of illustration. In the compound below meaning 'blind', the sign SEE is articulated by the dominant hand and the sign ZERO by the non-dominant hand; the lexical forms of both these signs are one-handed.

SEE(h1)^ZERO(h2) ('blind', hypothetical)

Note that it may be tempting to analyze two-handed lexicalized classifier constructions as simultaneous compounds involving full forms. Consider, for instance, the NGT signs TEA and WRITE. In both signs, the dominant hand is a handle classifier [Morphology – Section 5.1.3] indicating the manipulation of a small or thin object (dipping a tea bag and holding a pen, respectively) while the non-dominant hand is a static entity classifier [Morphology – Section 5.1.1] (a -hand depicting a cylindrical object, the tea cup, and a -hand depicting a flat object, the sheet of paper). All components involved ($\text{DIP}_{\text{small.object}}$ and CUP, HOLD_{pen} and SHEET) could

in principle be one-handed signs, and the resulting complex forms could thus be argued to be full-form simultaneous compounds. The grammar writer may wish to mention these cases and/or refer the reader to the relevant section in the Lexicon Part.

As for simultaneous compounds including full forms, one should be also aware of the fact that there may be unusual forms, such as FACEBOOK, which, in some sign languages, involves the sign BOOK articulated in front of the face. Here, 'face' is not a sign, it is a signifier, in other words, a case of "language mention". There might be other cases – even in phrases – in which a body part is not a sign but rather refers to just a body part. The grammar writer may want to include such cases in the grammar, as they are intriguing from a typological perspective, but it should be made clear that they are special cases, as they do not involve the combination of two lexical signs.

Across sign languages, reduced forms appear to be much more common. In such compounds, one or both of the input signs are two-handed but in order to be expressed simultaneously with the other sign, one of the hands in the input sign(s) is deleted. One example is the BSL sign meaning 'minicom'. Another one is the NGT compound SATURDAY(h1)^SUNDAY(h2) ('weekend') illustrated below. Both input signs are symmetrical two-handed signs that are articulated in neutral signing space: SATURDAY is articulated with two -hands making contact, SUNDAY with two -hands making contact. In the compound, one hand has an -handshape, the other a -handshape, and both hands contact each other, as shown in the second image (it does not matter which hand takes on which handshape).

PHONE(h1)^TYPE(h2) ('minicom') (BSL, Brennan 1990)

SATURDAY(h1)^SUNDAY(h2) ('weekend') (NGT)

The grammar writer should be careful about whether the two hands in these reduced simultaneous compounds necessarily share a location.

A special type of simultaneous compounding is numeral incorporation [Syntax – Section 4.3.4] / numeral incorporation (Ktejik 2013; Liddell 1997). Numeral incorporation generally results in a one-handed sign which fuses phonological components of two independent signs. As the name implies, one of the two base signs is a numeral, while the other is often a time term (day, week, etc.), a currency (e.g. dollar), or a pronoun. In its base form, the NGT sign WEEK is articulated with a -hand that performs a straight downward movement in neutral signing space; this handshape may be replaced by a numeral handshape, e.g. the -hand for 'two', resulting in the sign TWO-WEEK.

1.1.2.2 Semi-simultaneous compounds

"Semi-simultaneous" refers to a continuum. In some cases, the two components – albeit reduced – are still clearly sequentially organized while in others, the forms become unrecognizable. In other words, the signs, which are actually combined sequentially, undergo phonological reduction and assimilation [Phonology – Section 3.1.1] / assimilation to the extent that one or both input forms are not independently distinguishable as meaningful stems any more (remember, for instance, the ASL example SLEEP^EAT ('home') discussed in the section "Methodological challenges" [Morphology – Section 1.0.3]). This type should thus be considered in light of the discussion of phonological and prosodic properties [Morphology – Section 1.4] of compounds. In fact, the grammar writer might even decide to be very brief about semi-simultaneous compounds, shifting the discussion of examples to the section on phonological and prosodic characteristics of compounds.

Another example of a semi-simultaneous compound involving movement reduction and handshape assimilation is the DGS compound GOD^WAIT ('advent'), mentioned before. GOD is signed with a -hand fairly high in the signing space with a slight upward movement; WAIT involves a -hand making repeated contact close to the ipsilateral shoulder. In the compound, the -hand moves from the position in the signing space towards the shoulder and makes contact once; that is, we observe (i) loss of movement in the first part, (ii) loss of repetition in the second part, and (iii) progressive handshape assimilation. The ASL compound SLEEP^EAT ('home') is illustrated by means of a video below.

GOD^WAIT ('advent') (DGS, Leuninger 2001: 185)
THINK^MARRY ('believe') (ASL, Liddell & Johnson 1986: 490)

4_1.1.2.2_1_ASL_SLEEP^EAT

SLEEP^EAT ('home') (ASL)

1.2 Loan compounds

Sign languages are always in contact with the surrounding spoken languages and this is reflected in the use of mouthings, the use and lexicalization of fingerspelling, and, last but not least, in the borrowing of compound structures (see also the section on calques [Lexicon – Section 2.2.1] / calques in the Lexicon Part).

Loan compounds mirror the makeup of compounds found in the surrounding spoken language; they come in two types: faithful loans (also referred to as "1-to-1 loans") and modified loans. There is a possibility that all loan compounds are sequential, and, that if a compound is simultaneous, it is native. We do not have the resources to test this, but the grammar writer should be aware of this possibility.

Let us point out that compounds which are made up of forms that are combined in a predictable and productive way (e.g. APPLE^PIE, TEA^CUP) are not included in the discussion below because they should not be thought of as borrowings. In other words, the fact that the sign language compound resembles a compound of the spoken language may simply reflect a universal tendency in compound formation, and not a translation of the parts.

1.2.1 Faithful loans

In faithful loans, the structure of the compound mirrors that of a compound attested in the spoken language in a one-to-one fashion. For instance, the NGT compound BLOOD^NOSE ('nosebleed') mirrors the structure of the Dutch compound *bloedneus* (see images below). A clear case of a faithful loan is the Inuit SL compound EYEBROW^BELLY, an exocentric compound meaning 'white man' (the index finger moves from the eyebrow to the belly, making contact at both locations). In Inuktitut, the surrounding spoken language, the same compound is used (*qallu-naaq*).

BLOOD^NOSE ('nosebleed') (NGT)

EYEBROW^BELLY ('white man') (Inuit SL, Schuit 2013: 152)

1.2.2 Modified loans

Occasionally, within the borrowed compound, the order of signs may be reversed in order to comply with phonological tendencies (ease of articulation). Generally, the reversal allows for a smoother integration of the components within one movement contour. We refer to these cases as "modified loans". For instance, the German word for sunflower is *Sonnenblume*, which has the same sequential structure as its English equivalent. In DGS, however, the order of the two parts is reversed, the reason being that FLOWER is articulated with an upward movement in front of the signer's body while SUN has its place of articulation above the signer's head. Thanks to the reversal, there is no need to start high (SUN), move down to the initial location of FLOWER, and then move up again.

FLOWER^SUN ('sun flower') (DGS)

Similarly, in the NGT compound POST^LAMP ('lamp post'), the element that comes second in the corresponding Dutch compound is signed first in the NGT compound in order to allow for a smooth transition to the second part (LAMP) which is signed higher in space. In the illustration below, the first two images show the beginning and end point of POST while the rightmost image depicts the sign LAMP.

POST^LAMP ('lamp post') (NGT)

In principle, modified loans could also have the form of simultaneous compounds. In this case, (parts of) the signs corresponding to the two words that make up the

compound would be signed simultaneously in the way described in the section on simultaneous compounds [Morphology – Section 1.1.2.1]. However, we were not able to find an example of this type of modified loan.

1.3 Compounds with fingerspelled components

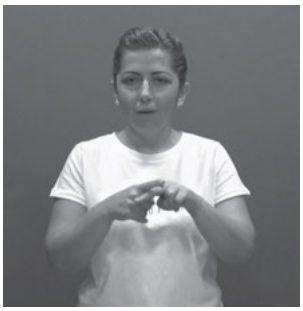
In these compounds, one component is fingerspelled, i.e. taken from the manual alphabet. The fingerspelled component may contain one or more fingerspelled letters. These compounds can be sequential or simultaneous.

1.3.1 Sequential

In the sequential cases, the fingerspelled component may precede or follow the stem. Some compounds in this group are more native-like, while others are more loan-like.

1.3.1.1 Native-like

Native-like compounds with a fingerspelled component are original to the sign language, that is, their form does not correspond to the form of the same concept in the spoken language. In TİD, for instance, the fingerspelled letters A-L – the first two letters of the loan word *alarm* ('alarm') in Turkish – may combine with the sign SOUND to yield the meaning 'alarm', as shown below. (Note that the corresponding Turkish word is not a compound.)



A-L^SOUND ('alarm') (TİD)

1.3.1.2 Loan-like

In contrast, in sequential loan-like compounds including fingerspelled components, the internal structure and components are copied from the spoken language. In ASL,

for instance, the compound meaning 'dead-end' consists of two components, just like the English original. These are sequentially combined in the same way as in English, but the second component is represented by a fingerspelled word. The same is true for the compound meaning 'bellboy', but here the fingerspelled word precedes the sign.

DEAD^E-N-D ('deadend street') (ASL, Padden 1998: 53)
B-E-L-L^BOY ('bellboy') (ASL, Padden 1998: 54)

1.3.2 Simultaneous

In simultaneous compounds involving fingerspelling, a fingerspelled letter and a classifier are expressed simultaneously. For instance, the TİD form meaning 'playstation' consists of the letter P on the dominant hand and a classifier on the non-dominant hand (left image below) (and optionally a second independent sign, shown in the right picture below).

P^CL ('playstation') (TİD)

Such two-handed signs distinguish simultaneous compounds involving fingerspelling from very similar forms that are cases involving initialization [Lexicon – Section 2.2.2.1]. In initialization, the handshape of the sign is the alphabet handshape for the first letter of the corresponding word from the surrounding spoken language; this handshape either replaces the handshape of a lexical item (e.g. in NGT, the sign DRINK signed with a 𝒱-hand for 'wine') or combines with an underspecified root (e.g. the ASL signs TEAM, SOCIETY, FAMILY, ASSOCIATION, which share location and movement but are all signed with the handshape corresponding to the first letter of the English word; cf. Fernald & Napoli (2000), who refer to such groups of signs as "lexical families").

1.4 Phonological and prosodic characteristics

It is common for the components of sign language compounds to undergo characteristic assimilation [Phonology – Section 3.1.1] / assimilation and reduction processes. These changes may affect all phonological parameters (handshape, location, movement, and orientation) as well as handedness patterns. In the following sections, we discuss the most important phenomena in more detail. Clearly, as far as examples are concerned, this section will overlap with the previous sections, as all semantic and syntactic types of compounds may be characterized by phonological and prosodic changes.

1.4.1 Phonological characteristics

Occasionally, the order in which the components appear in a sign language compound is reversed in comparison to the spoken language compound from which it is borrowed. Frequently, this reversal is motivated by a tendency for a smooth, uninterrupted movement contour. In the NGT compound POST^LAMP ('lamp post'), not only the order of components is reversed, but the first component POST also has an upward instead of a downward movement. Hence, we are dealing with a phonological change which is due to the fact that the second component LAMP is signed higher in the signing space. Thus, thanks to the reversal, no transitional movement is required between POST and LAMP. Similar changes are also observed in native compounds, such as, for instance, DGS MONK^BOSS ('abbot'). The lexical form of BOSS has an upward movement in front of the torso (-hand). However, given that the first part of the compound, MONK, is signed with a -hand performing a circular movement around the head, BOSS receives a downward movement in the compound, thus allowing for a continuous movement.

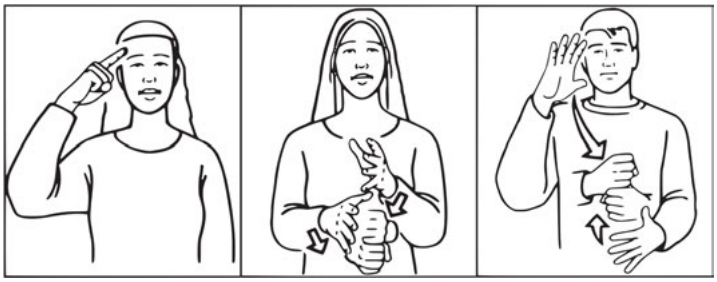
POST^LAMP ('lamp post') (NGT)
MONK^BOSS ('abbot') (DGS, Leuninger 2001: 186)

Besides movement alterations, handshape alterations are also frequently observed. These may involve partial or complete handshape assimilation which may be regressive (affecting the first component of the compound) or progressive (affecting the second component). As an example, consider the Auslan compound SEE^MAYBE ('check'). The first sign SEE has a -hand in its citation form, while the second part MAYBE is articulated with a -hand. In the compound, the thumb and the pinky are already extended in the first component, resulting in a handshape with extended thumb, index, and pinky (-hand). That is, we are dealing with partial regressive handshape assimilation. Another example, the DGS compound GOD^WAIT ('advent') has already been described above; this compound involves complete progressive handshape assimilation.

SEE^MAYBE ('check') (Auslan, Johnston & Schembri 2007: 131)
GOD^WAIT ('advent') (DGS, Leuninger 2001: 185)

Other interesting phonological changes are attested in sign language compounds in which one of the two components – usually the second one – is two-handed (Sandler 1993). In this case, one often observes "weak hand spread"; that is, the non-dominant hand of the second component is already in place while the first (one-handed) sign is articulated. In the Auslan compound THINK^HOLD ('believe'), this is the 𝖡-hand, which is held in neutral signing space while the dominant hand articulates THINK at the temple (note that in this example, we also observe total regressive handshape assimilation: THINK is signed with a 𝖡-hand instead of a 𝖠-hand). Similarly, in the ASL compound BLACK^NAME ('bad reputation'), the weak hand of NAME (a 𝖠-hand) is already positioned in neutral signing space while the dominant hand articulates BLACK.

THINK^HOLD ('believe') (Auslan, Johnston & Schembri 2007: 132)
BLACK^NAME ('bad reputation') (ASL, Klima & Bellugi 1979: 218)



THINK^HOLD ('believe') (Auslan)

4_1.4.2_1_ASL_BLACK^NAME

BLACK^NAME ('bad reputation') (ASL)

Another change affecting handedness turns the first component, which is one-handed, into a symmetrical two-handed sign in case the second component is also a symmetrical two-handed sign. An example of this phenomenon is the ASL compound SLEEP^DRESS ('pyjamas'). SLEEP is one-handed and signed with a 𝖡-hand in front of the face; DRESS is two-handed and articulated with two 𝖡-hands in front of the trunk. Both signs have a downward movement. In the compound, SLEEP becomes two-handed and the two movements are fused into one.

SLEEP^DRESS ('pyjamas') (ASL, Klima & Bellugi 1979: 208)

1.4.2 Prosodic characteristics

Prosody [Phonology – Chapter 2] / prosody is a cover term for stress, rhythm, and intonation. It has been found that in many sign languages, it is very common for

compounds to undergo specific prosodic changes. For example, with respect to rhythm, one or both parts of the compound often lose inherent repetition, such that the compound is shorter than the two signs stringed together in a phrase. For instance, as independent signs, both the ASL signs RED and SECRET involve repetition, whereas in the compound RED^SECRET ('strawberry'), each member only retains a single movement. In the DGS compound GOD^WAIT ('advent') and the ASL compound BLACK^NAME ('bad reputation'), the respective second parts lose their inherent repetition.

RED^SECRET ('strawberry') (ASL, Klima & Bellugi 1979: 214)
GOD^WAIT ('advent') (DGS, Leuninger 2001: 185)
BLACK^NAME ('bad reputation') (ASL, Klima & Bellugi 1979: 218)

In addition, two movements may be fused into one such that the compound consists of only one syllable [Phonology – Section 2.1.1] / syllable. We have already observed this type of change in the ASL compound SLEEP^DRESS ('pyjamas') discussed above, where both input signs involve a downward movement. Similarly, in the ASL compound NUDE^ZOOM-OFF ('streaker'), both input signs have a single forward movement, which are fused and appear as a single syllable in the compound. Obviously, fusion of movement may depend on phonological changes affecting movement, as explained in the previous section.

SLEEP^DRESS ('pyjamas') (ASL; Klima & Bellugi 1979: 208)
NUDE^ZOOM-OFF ('streaker') (ASL, Klima & Bellugi 1979: 199)

Elicitation materials

To the best of our knowledge, to date, there is no elicitation material that is designed for the main purpose of eliciting compounds. In fact, it is not clear what such elicitation material should look like. Obviously, one way to proceed would be to use picture stimuli including objects that are likely to be expressed by compounds, but this assumed likelihood will always be based on patterns existing in the spoken language; in other words, native compounds are likely to be missed using such a procedure.

Some methods that have already been used for testing whether a compound exists: If a particular sign language already has a dictionary, then checking the signs it contains with native speakers by asking them about the forms is a method that has general validity (Vercellotti & Mortensen 2012). Another method for languages with dictionaries might be for one informant to describe an object that is expressed through compounding (without using any of the words in the compound), and for the other to guess the form, and to see whether the result is a compound. Checking if new objects can be named through compounding has also been used (Meir et al. 2010).

Another method might be to combine arbitrary stems in order to see if compounds consisting of those stems exist.

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Chapter 2 Derivation

2.0 Definitions and challenges

2.0.1 What is derivation?

Derivation is the formation of a new lexeme from another lexeme. In the literature, the term “derivation” is commonly used to refer only to processes of derivational affixation, that is, the combination of a stem with an affix. The stem that is involved is often,

but not always, a freely occurring lexical element (compare e.g. *national-ism* and *fasc-ism*), which, however, may undergo certain phonological changes in the process. Derivational affixes – in contrast to inflectional affixes – are capable of changing the category of a word (e.g. from verb to noun).

In this chapter, we only talk about derivational markers, affixes which create lexemes from other lexemes. We sometimes use the terms derivation and derivational affixation interchangeably. However, the grammar writer should keep in mind that affixation is not the only available strategy. For instance, some forms of compounding [Morphology – Chapter 1] / compounding may fulfil the function of derivation, and in some languages, reduplication is used to derive a lexeme from another lexeme.

2.0.2 How is derivation marked?

Across spoken languages, the most common strategy of derivational marking is affixation. In most cases, the affix is either a prefix (as the English negative prefix *in-* in *in-tolerant*) or a suffix (as the English nominalizing suffix *-er* in *play-er*), but other types of affixes are attested, e.g. infixes and circumfixes. As mentioned above, derivational affixes may change the word category (as in *play-er*), but this is not always the case; that is, derivational markers do not have to be category-changing (cf. *in-tolerant*). It is a characteristic of English that mainly suffixes may change the category of a word, as the category-determining head of the word is on the right (the same holds for English compounds). However, other languages may behave differently in this respect. Moreover, various derivational affixes may be combined, as in *nation-al-ism* and *in-san-ity*. In the first case, an adjective is derived from a noun and subsequently, another noun is derived from this adjective. The word-internal structure can thus be represented as follows:

$$[\,[\,[\,\textit{nation}\,]_{N}\,\textit{–al}\,]_{A}\,\textit{–ism}\,]_{N} \qquad \text{(English)}$$

As for the example *in-san-ity*, two scenarios are possible: either suffixation (which derives a noun from an adjective here) precedes prefixation (which is category-preserving in this case), or vice versa.

However, affixation is not the only derivational strategy. First, derivation may be marked by modifying the stem (stem modification), for instance, by a change in consonant or vowel quality (ablaut/apophony and umlaut are two processes that affect vowels). This is true for the English verb-noun pair *sing* –*song* as well as for the Dutch pair *help-en* – *hulp* ('help-INF – help_{N}'). To make things more complex, regular affixational derivation may go hand in hand with a stem modification, as in the following German examples. The first example illustrates that *-e* is a nominalizing suffix in German. In the second and third example, suffixation is accompanied by a modification of the stem vowel, ablaut in the second example and umlaut in the third. Note that in the first two examples, the input to the derivational process is a verb while in the third one, it is an adjective.

glaub-en ('believe-INF') → *Glaub-e* ('believe-N' = belief/faith)
helf-en ('help-INF') → ***Hi**lf-e* ('help-N')
rot ('red') → ***Röt**-e* ('red-N' = redness) (German)

A combination of affixation and stem modification is also attested in English, e.g. in the nominalization *destruct-tion* (from the verb *destroy*). In this case, the stem-internal change is more dramatic, as it does not only affect the stem vowel but also the (final) consonant. Sometimes the changes may be so severe that the relationship between the members of the pair is not transparent anymore. Consider, for instance, the following verb-noun pair from German.

zieh-en ('pull-INF') → *Zug* ('train, drag, move, draft') (German)

Probably, only someone who knows about the history of German will know that the verb and the noun are related. In such cases, one would probably not want to posit a derivational rule that relates the two words. Rather, they would be treated as a case of (partial or full) suppletion and would thus be listed separately in the lexicon.

Finally, derivational processes may occasionally be realized by means of reduplication, that is, by the repetition of (a part of) a stem. Thus, in this case, we are not dealing with a derivational marker with a fixed form. Rather, the form of the marker depends on the form of the stem. Two examples are given below; the first one involves total reduplication of a stem (noun → adjective), the second one reduplication of a part of the stem (verb → noun).

kandu ('blood') → *kandukandu* ('red')
(Kayardild, Evans 1995, in Rubino 2005: 21)
giak ('send') → *gigiak* ('messenger')
(Tigak, Beaumont 1979, in Rubino 2005: 21)

In the above examples, including the reduplication case, derivation involves segmental material. Besides that, derivation may also be marked by suprasegmental changes, that is, by change of tone or stress pattern. In Chinese, a tone language, the former type of change is attested in some verb-noun pairs; in the example below, the stem vowel of the verb carries a low tone, while the corresponding noun has a high tone. In English, too, suprasegmental changes are attested, as is illustrated by the examples in the second line: the verbs carry stress on the second syllable, while the nouns carry stress on the first syllable.

còng ('to follow') → *cóng* ('follower, persecutor') (Chinese)
to permít → *the pérmit* / *to convért* → *the cónvert* (English)

Finally, it is important to realize that occasionally, word category changes are not overtly marked at all; consider e.g. the English noun-verb pairs *(the) paint – (to) paint* and *(the) love – (to) love*. Obviously, it is only in context that the grammatical category can be determined. This kind of derivation is referred to as zero derivation or conversion.

2.0.3 Methodological challenges

The discussion above already suggests a couple of potential challenges that a researcher investigating derivation in a sign language may face. First, a derivational process may not be marked at all. Second, a change signaling a derivational process may be very subtle. In fact, noun-verb pairs in sign languages (in particular, ASL) were long thought to be formationally identical exactly for the latter reason: the systematic changes that do exist are rather subtle and are thus easily overlooked.

Another common challenge is that a (hearing) researcher may be biased by processes that are attested in the spoken language. As for this potential bias, two facts have to be acknowledged. First, two lexemes that are related in the spoken language may not be related at all in the sign language. For instance, the English noun-verb pair *(the) fish – (to) fish* represents a case of conversion. In a sign language, however, it is very likely for the corresponding two lexemes not to show any formal relationship, that is, not to be derivationally related. Secondly, a complex word form may be misinterpreted as a case of affixation simply because the corresponding form in the spoken language is clearly derived by a derivational affix. Let us illustrate this point with an example. In NGT, nouns can be derived from verbs by means of the sign PERSON, as in the following two examples.

BAKE → BAKE^PERSON ('baker') (NGT)
DANCE → DANCE^PERSON ('dancer') (NGT)

In Dutch, just as in English, this process corresponds to an *-er* nominalization, that is, a process that is clearly affixal. It has therefore been suggested that PERSON is a nominalizing (agentive) suffix. Such a conclusion, however, may be premature. After all, PERSON is a noun that can also appear by itself, that is, it is not a bound morpheme. It is well-known that derivational affixes may diachronically derive from free lexemes in a process of grammaticalization, but it is far from clear that PERSON has undergone such a diachronic change. It thus seems more likely that what we are dealing with is an instance of compounding and that an analysis of such cases as affixation has been influenced by a parallelism with the spoken language pattern. The most reliable way to determine whether a form is an affix or a stem takes into account that stems (i) usually occur on their own and, related to this, (ii) are prosodically separate items. Affixes cannot stand alone and are integrated into the prosodic pattern of the word (a property which also separates them from clitics). In other words, taking English as comparison, an example like BAKE^PERSON might correspond to *baker-man* in form, rather than to *baker* (note that PERSON in NGT also attaches to nouns, as e.g. SPORT^PERSON ('sportsman') and ART^PERSON ('artist').

Another serious challenge in the identification of systematic derivational processes is the fact that sometimes one and the same process may be signaled by various phonological changes – alone or in combination. That is, the changes may be far from systematic and may differ between and even within signers, as has been shown for

noun-verb pairs in RSL by Kimmelman (2009). The grammar writer will have to decide whether s/he wants to include (apparent) derivational patterns that occur only rarely in the data, apply to only very few lexemes (maybe only a single one), or show a lot of variation across and/or within signers. A possible strategy would be to include such cases and explicitly mark them as exceptional (pending further research).

Derivational forms, in addition, may be irregular; that is, they may not apply to a whole class, unlike most cases of inflection [Morphology – Chapter 3] / inflection. For instance, the suffix *-al* in English does not apply to all verbs (cf. *arrival*, *postal*, but not **comal*, **mailal*).

2.1 Manual markers of derivation

As with compounds [Morphology – Chapter 1], an important basic distinction is that between manually realized and non-manually realized derivational processes. As for the former, they may be realized by the addition of segmental material; that is, sequentially by means of affixation, or by the change of segmental material, that is, simultaneously by means of stem modification. In contrast, to the best of our knowledge, non-manual derivation is always simultaneous.

2.1.1 Sequential derivation

To date, only very few unambiguous examples of sequential derivational processes have been identified in sign languages. It has thus been suggested that (i) sign languages have a general preference for simultaneous morphology and (ii) that many sign languages may be too young to have already developed sequential derivational markers (from free lexemes) (Aronoff et al. 2005). In the following sections, we describe three processes that have been identified in the literature. However, the grammar writer should be aware that in the sign language under investigation, other processes may exist that have not previously been described. Moreover, as we will see shortly, at least the first two examples discussed are ambiguous with respect to the word formation process. Despite the unclear status of these examples, we include them so that the grammar writer gets an idea what to look for.

2.1.1.1 Agentive

An agentive marker derives an agentive noun from a verb or another (non-agentive) noun. In the introduction to this chapter, we already discussed the English agentive suffix *-er*, which attaches mostly to verbs (e.g. *player*, *painter*), and we problematized the fact that corresponding processes in sign language may not be affixal but rather instances of compounding.

Still, it has been suggested for ASL that it employs an agentive suffix, which Aronoff et al. (2005) gloss as AGENTIVE. They point out that this agentive suffix has indeed been derived from the independent sign PERSON. Still, they consider it a suffix, as it does not have the same distribution as English *-er*. For instance, in ASL AGENTIVE may combine with the verb OPERATE, while English uses the non-derived noun *surgeon* instead. That is, the ASL suffix developed its own pattern of distribution. While this difference is certainly interesting, it furnishes only weak evidence for analyzing AGENTIVE as an affix (after all, OPERATE^PERSON might also be a native compound). Moreover, Aronoff et al. observe that, when combined, the lexical sign and AGENTIVE may undergo various reduction and assimilation [Phonology – Section 3.1.1] processes, but remember that such processes are not necessarily indicative of derivation as they also commonly characterize compounding (see section on semi-simultaneous compounds [Morphology – Section 1.1.2.2]). Combination of AGENTIVE with the sign TEACH is illustrated by the video below.

OPERATE^AGENTIVE ('surgeon') (ASL, Aronoff et al. 2005: 330)

4_2.1.1.1_1_ASL_TEACH^AGENTIVE

TEACH^AGENTIVE ('teacher') (ASL, Aronoff et al. 2005: 313)

What these examples illuminate once again is that the grammar writer should approach the issue of derivational affixation versus compounding with caution. Beyond identifying a certain word-formation process, it may be important to also scrutinize the constraints on its application. Should the evidence not allow for an unambiguous classification of an element (e.g. PERSON vs. AGENTIVE), the grammar writer may still want to mention it as a possible candidate for a derivational affix, adding a note that further research is necessary to determine the status of the element and thus the word formation process.

2.1.1.2 Negative

Cases of derivational negation that have been described in the literature pose methodological challenges similar to those described for the agentive. In this section, we briefly describe two examples that may serve as a starting point for the grammar writer to search for elements with a similar function in the sign language under consideration. Aronoff et al. (2005) and Meir (2004) describe negative suffixes for ASL and Israeli SL. The Israeli SL suffix, which is glossed as NOT-EXIST, can attach to adjectives and nouns and invariably gives an adjective as a result – from a semantic point of view, it essentially functions like the English suffix *-less*. Meir (2004) points out that the suffix has two allomorphs, a one-handed one that attaches to one-handed stems (e.g. INTERESTING), and a two-handed one that attaches to two-handed stems (e.g. IMPORTANT). It is the third example, SHAME^NOT-EXIST, which suggests that we

are indeed dealing with derivation, and not with inflection, as the suffix changes the word class.

INTERESTING^NOT-EXIST ('of no interest')	(Israeli SL, Meir 2004: 115)
IMPORTANT^NOT-EXIST ('of no import')	(Israeli SL, Meir 2004: 115)
SHAME^NOT-EXIST ('shameless')	(Israeli SL, Meir 2004: 115)

As before, the suffix can be traced back to an independent sign, the negative existential NOT-EXIST. Aronoff et al. point out that some of the suffixed words have an idiosyncratic meaning and that this type of "semantic drift" is characteristic of derivational affixes; they provide the example of SURPRISE^NOT-EXIST, which does not mean 'without surprise' but rather has a meaning closer to the English expression *big deal*. Still, the grammar writer should be cautious when discussing such cases, as change of word class, non-transparent semantics, and assimilation of handedness are also characteristic of compounds, as has been discussed in the previous chapter.

Some East Asian sign languages employ a "negative handshape" that is characterized by pinky extension and that may attach to lexical signs yielding a negative meaning. In HKSL, the -hand means BAD/WRONG when used as a stand-alone sign. Some of the derivations involving this sign are transparent – e.g. LUCKY/LUCKY^BAD ('unlucky') – while others are less transparent or even opaque, e.g. MOUTH^BAD ('dumb') and EYE^BAD ('blind') (Tang (2006); also cf. Yang & Fischer (2002) for CSL). However, as in the NOT-EXIST case, the alleged suffix exists as a free element in the language, and the phenomenon might therefore be an instance of compounding rather than derivation.

It is important to note that combinations of a sign with a negative element are also discussed in the section "Verbal inflection" (section on Negation [Morphology – Section 3.5]). All of the cases discussed there involve predicates, for the most part, negative counterparts of modals and some other verbs. Just like distinguishing derivational negation from compounding, distinguishing derivational negation from inflectional negation may not always be straightforward. Clearly, when the word formation process has the potential of changing the word category (as is true for all of the processes discussed above), it cannot be inflectional. However, as pointed out previously, the opposite is not true, as derivational processes do not necessarily change the word category. In other words, the fact that the processes to be discussed under "Inflection" are non-category changing does not exclude the possibility that they are derivational.

2.1.1.3 Attenuative

"Attenuation" is a general term that refers to the reduction in the strength of a signal. In the realm of linguistics, the term "attenuative" is used for markers that make a concept more vague or less strong. In English, for instance, this meaning can be expressed by the affix *-ish*: something that is *blue-ish* is still blue but less clearly (or less prototypically) so. In Hebrew, the same meaning is expressed by partial

reduplication (e.g. *yerak~rak-im* – green~ATT-M.PL = 'greenish ones'). In the context of sign languages, this process is interesting, as it (i) may be marked sequentially or simultaneously (see below), and (ii) is in fact the only clear case of sequential derivation that we were able to identify.

The example comes from USL, where certain adjectives (most commonly color signs) can combine with a -handshape, palm oriented outwards, and slightly shaking from left to right (Lutalo-Kiingi 2014). Crucially, the affix cannot occur by itself; that is, in contrast to the potential affixes discussed in the previous two sections, it is not grammaticalized from a free element. In addition to the affix, simultaneous non-manual marking is also involved, as tongue protrusion accompanies both the adjective and the affix.

2.1.2 Simultaneous derivation

Derivation may also be realized simultaneously (i.e. stem-modification). For the most part, the simultaneous derivational processes that have been identified to date involve characteristic movement [Phonology – Section 1.3] changes, sometimes in combination with reduplication, but other phonological parameters may also play a role. Again, we will only describe three types of processes that have been identified in previous research and encourage the grammar writer to look for other processes (which may not have been described yet for other sign languages; cf. also Padden & Perlmutter (1987) for the formation of characteristic adjectives in ASL).

2.1.2.1 Noun-verb pairs

A process that has been described for various sign languages is the derivation of action verbs from object nouns (Supalla & Newport (1978) for ASL; Johnston (2001) for Auslan; Hunger (2006) for ÖGS; Kimmelman (2009) for RSL). All studies identify characteristic movement changes, but the systematicity and frequency with which these processes apply seem to vary from sign language to sign language.

In their seminal study on ASL, Supalla & Newport (1978) found that generally, the verb in a pair has a single and more lax movement, while in the corresponding noun, the movement is shorter, restrained, and repeated. Among the examples they provide are the pairs SIT – CHAIR and PLANE – FLY-BY-PLANE; the former example is illustrated below. In other words: in these pairs, a stem-internal change (movement reduction) goes hand in hand with reduplication. All examples discussed by Supalla & Newport involve concrete object-denoting nouns, but recently, Abner (in press) added to the picture the fact that, at least in ASL, the process may also apply to verbs to yield abstract result-denoting nouns (e.g. ACCEPT – ACCEPTANCE, JOIN – PARTICIPATION).

4_2.1.2.1_1_ASL_SIT 4_2.1.2.1_2_ASL_CHAIR

SIT CHAIR (ASL)

As for object nouns, Johnston (2001) made a similar observation for Auslan but points out that in this sign language, the clearest examples involve signs referring to actions that are inherently reversible. For instance, there are two verbs OPEN-DRAWER and SHUT-DRAWER with opposing movements, and in the corresponding noun DRAWER, the two movements are combined, resulting in repeated bi-directional movement.

Hunger (2006) identified 15 noun-verb pairs in ÖGS and measured their duration. She found that in general, the duration of verbs (in terms of number of frames) is twice as long as the duration of nouns – where longer duration can be the result of slower movement, larger movement, and/or reduplication. Interestingly, this pattern was also observed in verbs that are not inherently durational (e.g. LOCK).

Kimmelman (2009) describes various ways in which nouns and verbs in a pair may be formationally distinguished in RSL. His list of patterns contains movement changes (size or number of movements), overlapping with what has been described for ASL and Auslan, but also changes in orientation or handshape. However, he also notes a striking lack of systematicity across and even within signers (a point mentioned for many sign languages).

As mentioned previously, it will be up to the grammar writer to decide how to approach the issue of variation. One way to proceed might be to only include patterns that appear with some frequency/regularity (which obviously raises the question of how 'some' should be defined in this case). Another strategy would be to list all the observed patterns, no matter how frequently they appear in the data, and to also draw the reader's attention to the attested variation and the potential idiosyncracy of individual patterns.

2.1.2.2 Attenuative

We already introduced the attenuative in the context of sequential derivation. For ASL, Padden & Perlmutter (1987) discuss a semantically similar word formation process (first described by Bellugi (1980)) that is realized simultaneously, that is, by movement change and reduplication. While the basic adjectives may vary in movement, the attenuative forms all have repeated tense movement (trilled movement). Examples include QUIET – QUIETISH, BLUE – BLUISH, OLD – OLDISH.

2.2 Non-manual markers of derivation

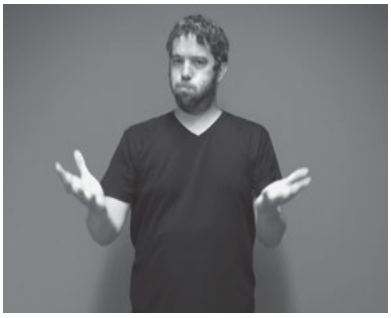
Non-manual markers that signal derivational processes generally involve the lower face, that is, the cheeks or the mouth (Wilbur 2000). As previously, the examples we discuss are non-exhaustive, but should inspire the grammar writer to look for

other derivational processes that are non-manually marked. It is important to note that certain adverbial meanings can also be expressed non-manually by lower face markers that accompany predicates; however, these will be treated in the section on adverbials [Lexicon – Section 3.5].

2.2.1 Diminutive and augmentative

Diminutive and augmentative markers simultaneously combine with nouns to yield the meaning 'small x' (diminutive) or 'big x' (augmentative); that is, they are not category-changing. Both markers involve (at least) specific configurations of the cheeks: sucked in cheeks (and pursed lips) for the diminutive, blown cheeks for the augmentative. In the literature, these non-manual morphemes are sometimes represented by the symbols ')(' for the diminutive and '( )' for the augmentative, and this is how we represent them in the following examples. The augmentative is illustrated by an image involving the DGS sign BALL.

)(
BALL ('small ball')



()
BALL ('big ball') (DGS)

While we focus on the cheeks in this example, the grammar writer should be aware that other non-manual markers might also play a role, for instance, eyebrow position. Moreover, it should be noted that the noun sign with which the non-manual combines may undergo additional manual changes; that is, it may be executed smaller or larger. If non-manual markers and manual modifications are systematically combined, then it is likely that we are dealing with an instance of extended exponence; that is, a case where two (or more) markers are combined to express a single meaning. Also, if these markers are attested in the sign language under study, it may be worth checking whether there are semantic and/or phonological constraints on their combination

with nouns, for instance, whether they can be combined with concrete and abstract nouns, nouns referring to inanimate and animate referents, and/or whether there are phonological constraints (such that e.g. the non-manual morpheme can only combine with nouns signed in neutral signing space). All potential constraints should be mentioned in the grammar.

Finally, when describing these processes, the grammar writer may wish to check whether manual adjectives like SMALL and BIG are generally accompanied by the same markers. If this is the case, then it might suggest that the respective non-manuals are lexically specified for these adjectives (see the section on phonological non-manuals [Phonology – Section 1.5]), but may function as morphemes when the manual part of the sign is dropped.

2.2.2 Intensive

Research has shown that in some sign languages adjectives may be modified for the intensive ('very x') by means of non-manual markers. For USL, for instance, Lutalo-Kiingi describes various markers, which may also combine. One of these markers is a squint ('sq'), which in example (a) combines with a mouth gesture glossed as '<o>'. Besides a squint, a brow raise ('br') may also fulfil an intensifying function, as shown in example (b). If the sign language to be described features some of these intensifying non-manual markers, then the grammar writer may also investigate whether they are in free variation, or whether certain markers co-occur with certain adjectives, that is, whether they constitute non-manual allomorphs.

a. EUROPE COLD
sq
<o>
'Europe is very cold.' (USL, Lutalo-Kiingi 2014: 80)

b. ENGLAND SNOW BEAUTIFUL
br
'In England, the snow is very beautiful.' (USL, Lutalo-Kiingi 2014: 81)

2.2.3 Proximity

For some sign languages, proximity can be marked by tongue protrusion; that is, the tip of the tongue is visible between the lips, often at the corner of the mouth (Lewin & Schembri 2011). The proximity that is expressed can be temporal or spatial. As for the former, the non-manual may, for instance, modify the sign BEFORE (which is signed on the time line [Morphology – Section 3.2.1] perpendicular to the body), yielding a

meaning like 'just a second ago', or the sign SOON to give the meaning 'very soon' (in this use, it is reminiscent of other intensive markers). As for the spatial meaning, tongue protrusion may combine with signs such as AROUND-THE-CORNER, adding the meaning of spatial proximity as in 'just around the corner'.

2.2.4 Noun-verb pairs: mouthings

The use of mouthings [Phonology – Section 1.5.2] as phonological (i.e. lexically specified) parts of signs has been introduced in the Phonology Part. Besides this use, it has been argued that in some sign languages, mouthings may distinguish nouns from verbs. A pattern that has commonly been described is that the noun of a noun-verb pair is accompanied by a mouthing while the verb is not (it, may, however, be accompanied by a mouth gesture [Phonology – Section 1.5.1]; see, for instance, Schermer (1990) and Bank (2014) for NGT, and articles in Boyes Braem & Sutton-Spence (2001) for various sign languages). For example, the noun BIKE would be accompanied by the mouthing /baik/ while the manually very similar (if not identical) verb BIKE is not. Yet, to date no sign language has been described that would systematically and consistently distinguish nouns from verbs by means of mouthings. Rather, what has been described is a tendency, and there is usually considerable variation across and even within signers.

Yet, if such a tendency is observed in the sign language, it might be worth mentioning the phenomenon in the grammar and provide some examples in which the tendency is particularly strong. After all, in these cases, the mouthing might constitute a simultaneous derivational marker the use of which is to some extent optional.

Elicitation materials

As for noun-verb pairs, various authors (ever since the seminal study of Supalla & Newport (1978)) have used pictures to elicit signs; for instance, one picture showing the object (e.g. a broom), the other showing a person using the object. Clearly, the use of static pictures has its limitations, since at times, the picture may be ambiguous. In addition, it may be difficult to isolate the verb from aspect, and isolate the noun from predication. A picture of a plane in the air, for instance, might elicit the noun AIRPLANE or THIS-IS-A-PLANE, and the corresponding verb might mean FLY-BY-PLANE or IS-FLYING-BY-PLANE. Still, the pairs (only glosses, no pictures) provided by Supalla & Newport in the Appendix to their article might be a good start.

Kimmelman (2009) used short video clips instead of pictures, and in the Appendix to his article, he also provides a list of the pairs used.

Other derivational markers, such as the agentive and the diminutive/augmentative may also be elicited by pictures (for instance, depicting professions or size contrasts), but for some, the use of picture stimuli may be less straightforward.

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Chapter 3 Verbal inflection

3.0 Definitions and challenges

3.0.1 What is inflection?

While compounding [Morphology – Chapter 1] and derivation [Morphology – Chapter 2] are usually considered lexical word formation processes, inflectional word formation is relevant to and dependent on syntax. Given this characteristic, it is also referred to as "morphosyntax": word formation in syntax. Furthermore, inflectional morphology is taken to realize (spell out) certain morphosyntactic features, the most common of which are person, number, tense, aspect, gender, and case. While the realization of some of these features clearly depends on the sentence context (e.g. the realization of person and number features on verbs), others are context-dependent in a broader (and more abstract) sense (e.g. tense inflection on verbs). Just like derivation, inflection usually involves the combination of a stem and an affix; yet, in contrast to derivation, it can never change the category of the stem (e.g. *paint* → *paint-ed*). Moreover, inflection is semantically regular.

For the sign language researcher, it may be a challenging task to disentangle which of the established morphosyntactic features are modality-independent, and also whether there are possibly features that are only relevant for either spoken or sign languages. There is, for instance, an ongoing debate about the role of the feature person in sign languages (Meier 1990; Liddell 2003; Lillo-Martin & Meier 2011), and there are proposals that sign languages employ modality-specific location (Zwitserlood & Van Gijn 2006) or identity (Costello 2015) features. It is important to note that the following explanations do not attempt to do justice to these complex controversies.

3.0.2 How is inflection marked?

Just like derivation, inflection is most commonly marked by affixation. Still, similar to derivation, other types of phono-morphological changes are attested. As these have already been addressed in the chapter on derivation [Morphology – Chapter 2], we will only briefly repeat the most important types here.

- *Stem modification*: A morphological process may be realized by a phonological modification of the stem rather than by the combination of morphemes. Various phonological processes occur in spoken languages: (i) change in a stem vowel, such as shortening, lengthening, umlaut, ablaut (e.g. English *sing* – *sang* – *sung*; German *Mutter* ('mother') – *Mütter* ('mother.PL')); (ii) change in a stem consonant, such as palatalization, nasalization; and (iii) tone change (i.e. a suprasegmental

change). A single inflectional process may be realized by affixation in combination with modification of the stem (e.g. German *Haus* ('house') – *Häuser* ('house.PL')).
- *Suppletion/base allomorphy*: These forms belong to the same lexeme but do not show any phonological similarity (e.g. English *go/went*, *be/was/am*; Turkish *var/yok* ('exist'/'exist.NEG')). In a sense, suppletion is the extreme case of stem modification; cases in which there is at least some phonological overlap are referred to as "partial suppletion" (e.g. English *are/were*).
- *Reduplication*: The inflectional process is realized by repeating (part of) a stem. In contrast to stem modification and suppletion, the process is sequential, but it does not involve an affix with a fixed form. In spoken languages, reduplication is commonly used to express plurality and certain types of aspect.
- *Conversion*: The inflectional process is not phonologically marked at all (also called "zero affixation"); e.g. German plural *Segel* ('sail') – *Segel* ('sail.PL').

3.0.3 Methodological challenges

In the previous chapters, we pointed out that the distinction of derivation and compounding may be challenging at times. The same is true for the distinction of inflectional from derivational processes. We already mentioned that negation, for instance, may be a derivational or inflectional process in sign languages. Obviously, if a process is capable of changing the category of a word, then we are dealing with derivation. Other methodological challenges that hold for inflection, just like for derivation, are: (i) the phonological change signaling an inflectional process may be very subtle; (ii) there may be variation across and within signers with respect to the application of a specific process; and (iii) certain inflectional categories may be zero-marked.

An additional challenge that is relevant to inflectional word formation is the distinction between affixation and cliticization. Given that both affixes and clitics are bound morphemes, the distinction between affixation and cliticization is one of the most problematic distinctions in morphology, and possibly even more so in sign language morphology. A coherent and systematic grouping of properties may be difficult, and the grammar writer should also note that a functional element may be a clitic in one language and an affix in another. Some researchers prefer to see the distinction as a cline, rather than a dichotomy. Nevertheless, in the table below, we list the most salient distinctions that have been proposed for spoken languages (Zwicky & Pullum 1983).

The criteria listed in the table have been set out to explain sequential morphology characteristic of spoken languages, and thus the task of deciding whether a sequentially expressed bound form is an affix or clitic may be rather straightforward. In sign languages, however, the task may be made more difficult by the fact that they have a tendency to employ simultaneous (in particular, non-manual) morphology. Still, the below criteria can be applied to sign languages, with small modifications necessitated by the visual channel.

Table Morphology-1: Criteria for distinguishing affixes from clitics in spoken languages (based on Zwicky & Pullum 1983)

Criterion	Affix	Clitic
Selection of stem	Selective in terms of the category of the stem (e.g. past tense *-ed* only selects verbs)	Less selective, can attach to stems of different categories (e.g. *-ve* (from *have*) can attach to pronouns and auxiliaries)
Irregularities	More likely to behave irregularly and idiosyncratically (e.g. *-ed* does not attach to all verbs)	Unlikely to behave irregularly and idiosyncratically
Semantic idiosyncracies	More characteristic of affixes (e.g. a particular affix might only be used with animate referents)	Unexpected
Attachment properties	Cannot attach to stems that contain clitics	Can attach to stems containing other clitics or affixes
Connection with free forms	Can usually not be traced back to free forms	Are more easily traced back to free forms, or have corresponding free forms (e.g. *have* → *-ve*)

When it comes to simultaneous non-manual morphology, the task starts with observing a bound form which is expressed non-manually, co-occurs with a manual sign, and is a morpho-syntactic category (e.g. negation, number). The table below illustrates how the distinguishing properties of affixes and clitics introduced in the previous table could be applied to such forms.

Table Morphology-2: Distinguishing properties of affixes and clitics applied to sign languages

Criterion	Applied to simultaneous non-manual morphology
Selection of stem	Does a non-manual marker X co-occur with the same category (expressed by a manual sign) each time it occurs, or with different syntactic categories? In the former case, it is likely to be an affix.
Irregularities	If a particular morpho-syntactic category (e.g. negation) is expressed by different forms X, Y, Z … (e.g. if it assimilates to its stem and has allomorphs), it is likely to be an affix.
Semantic idiosyncracies	If a non-manual marker X is only attested with a certain group of stems that share a semantic property, then X is likely to be an affix.
Attachment properties	This criterion may be difficult (if not impossible) to apply to simultaneously expressed bound forms, as it is difficult to determine whether a certain marker attaches before/after another one.
Connection with free forms	If a non-manual marker can occur independently (without accompanying a manual sign) and shares phonological features with its bound counterpart, then this non-manual marker is likely to be a clitic (caveat: across sign languages, it appears very uncommon for non-manual markers not to be co-articulated with a manual sign).

3.1 Agreement

3.1.0 Definitions and challenges

3.1.0.1 What is agreement?

Agreement or concord is a morphological phenomenon of dependency according to which part of the shape of a word depends on properties of other words to which it relates. Ultimately, this is the result of a process of feature sharing, whereby the shape of a word is modulated on the basis of some features of the word it depends on. As Steele (1978: 610) states in her often cited definition of agreement: "The term agreement commonly refers to some systematic covariance between a semantic or formal property of one element and a formal property of another."

In the clausal domain, the prototypical case of agreement in spoken languages is that between a verb and its subject. The example below illustrates the pattern of verb-subject agreement in the present tense of Italian.

Agreement pattern in Italian verbs (first conjugation present tense) (Italian)

a.	(io)	am-o	d.	(noi)	am-iamo
	(I)	love-1SG		(we)	love-1PL
b.	(tu)	am-i	e.	(voi)	am-ate
	(you)	love-2SG		(you)	love-2PL
c.	(egli)	am-a	f.	(essi)	amano
	(he)	love-3SG		(they)	love-3PL

The verb *amare* ('to love') agrees with its subject both in person and number features. Italian marks for a three-way (1, 2, 3) person distinction, a two-way (singular and plural) number distinction, and no particular syncretism is found in the present tense; therefore six different suffixes are found. In the literature, Italian-like systems, which mark every person-number distinction differently, are often referred to as "rich agreement" systems. Other systems mark fewer distinctions; English is an extreme case, as only a single person-number combination, third-person singular, is marked. Systems of this type are sometimes referred to as "poor agreement" systems. Finally, some languages do not mark agreement on verbs at all (e.g. Chinese), and these are commonly referred to as "null agreement" languages.

Another important typological observation is that in many languages, verb agreement is not confined to subject-verb agreement. Rather, verbs may also agree with an object (most commonly the direct object, but sometimes also other grammatical roles). This is illustrated by the examples below from Itelmen, a language spoken on the peninsula Kamchatka (Eastern Russia). In these examples, the verb *əlčqu* ('to see') agrees with its subject (by means of a prefix) and object (by means of a suffix). Generally, languages that display object agreement also display subject agreement, while, obviously, the reverse is not true.

a. t'-əlčqu-ɣin
1SG-see-2SG.OBJ
'I saw you.'

b. n-əlčqu-z-um
3PL-see-PRES-1SG.OBJ
'They see me.'
(Itelmen, Bobaljik & Wurmbrand 2002)

Besides the clausal domain, in many languages agreement is also attested within the nominal domain. In this case, agreement may be found between a noun and its modifiers, as in the following Italian examples, where the definite article and the adjective agree with the noun in gender and number features.

Agreement within the Italian noun phrase (Italian)

a.	il	ragazz-o	italian-o
	the.SG.M	kid-SG.M	Italian-SG.M
b.	le	ragazz-e	italian-e
	the.PL.F	kid-PL.F	Italian-PL.F

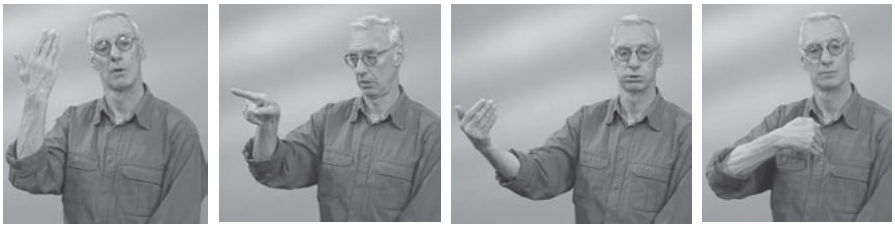
3.1.0.2 Terminology

Before turning to a general overview of how agreement may be marked in sign languages, it is important to point out that the issue of agreement is hotly debated in the field of sign language linguistics. Actually, even use of the term "agreement" is controversial. For instance, some scholars argue that the number of loci in signing space, which – as we shall see – are crucial for the realization of agreement, is infinite; in other words, the potential agreement markers cannot be listed in the lexicon. We shall not enter the theoretical debate (see Lillo-Martin & Meier (2011) and Mathur & Rathmann (2012) for recent overviews, and Wilbur (2013) for discussion), but we wish to stress that it is up to the grammar writer to decide what terminology s/he wants to use. For the sake of simplicity, we use the terms "agreement" and "agreement verb" in the following, but other terms that have been suggested in the literature are "directional verb" or "indicating verb" (Liddell 2000, 2003).

3.1.0.3 Marking agreement in sign languages

What makes agreement in sign languages typologically peculiar is the fact that only a subset of verbs can be modified in the way that we are going to describe in this section. Ever since the seminal work by Padden (1988), sign linguists generally distinguish three verb types: plain verbs, agreement verbs, and spatial verbs. Actually, it appears that across sign languages, most verbs have a fixed form and cannot be modified to mark agreement; these non-modifiable verbs are referred to as "plain verbs" [Lexicon – Section 3.2.1]. In contrast, agreement verbs and spatial verbs can be modified. On agreement verbs [Lexicon – Section 3.2.2], agreement is most commonly marked by a manual modification of the sign (be it a lexical verb or an agreement auxiliary

[Lexicon – Section 3.3.4]), typically a modification of the direction of movement and/or the orientation of the hand. Changes in the direction of movement result from the fact that the movement starts at the location associated with the subject and ends at the location associated with the object. Moreover, in certain verbs, the relevant part of the hand – the palm or the fingertips – are oriented towards the object. Verbs can agree with one or two arguments by (i) movement and orientation, (ii) movement only, or (iii) orientation only. Option (i) is illustrated by the following example from NGT. The third person referent BROTHER has previously been localized at location 3a. The verb VISIT then moves from this location towards the signer's chest (location 1); at the same time, the fingertips are oriented towards the signer.



EVENING INDEX$_{3a}$ $_{3a}$VISIT$_{1}$

'In the evening, he (my brother) will visit me.' (NGT, NGC 2002)

In addition to the manual realization of agreement, it has been argued for some sign languages (most notably ASL; see Bahan et al. 2000) that agreement can also be expressed non-manually by means of head tilt (towards the locus associated with the subject) and eye gaze (towards the locus associated with the object). This option is shown in the ASL example below, which involves the plain verb LOVE. According to the researchers, in this example, the head tilts slightly towards the locus associated with the subject (locus 'i'), while the eye gaze is oriented towards the locus associated with the object (locus 'j'). Note further that the authors claim that head tilt (marking subject agreement) starts slightly earlier than eye gaze (marking object agreement). Moreover, they note that non-manual agreement is also attested with intransitive verbs (e.g. JOHN BATHE); in this case, agreement may be realized by head tilt, eye gaze, or both.

head tilt$_{i}$
eye gaze$_{j}$
INDEX$_{i}$ LOVE MOTHER$_{j}$
'He/she loves mother.' (ASL, Bahan et al. 2000: 11, slightly adapted)

Finally, there is the group of spatial verbs [Lexicon – Section 3.2.3]. These verbs can be spatially modified, too, but the modification is not determined by the grammatical roles subject and object (i.e. by the loci of the subject/object arguments), but rather by locative arguments. Think, for instance, of examples like 'He put the glass on the table' or 'She moved the pen from the center to the side of the desk'. In the first case,

the end location of the signed verb would likely coincide with the goal location; in the latter case, the beginning and end locations would coincide with the source and the goal location, respectively. While both these examples involve transfer of an object, spatial verbs can also express static location, as in 'The book lies on the table'. Note that in most sign languages studied to date, spatial verbs commonly involve classifier [Morphology – Section 5.1] / classifier handshapes that reflect shape properties of the manipulated or located object.

3.1.0.4 Methodological challenges

There are various factors that may make the identification of agreement verbs in a sign language difficult. First of all, there is the issue of optionality. A verb that may potentially agree with its subject and object may lack either one or even both of the agreement markers (i.e. the specification(s) for the respective locus/loci). If only one of the markers is missing, then this is typically the subject marker. That is, in the sentence 'You visit him', movement of the NGT verb VISIT illustrated above might start in front of the signer's chest (beginning point of the citation form) and move towards the location associated with the object. Moreover, corpus studies have revealed that occasionally, an agreement verb may appear entirely uninflected, that is, in its citation form (e.g. De Beuzeville et al. (2009) for Auslan). Clearly, this is different from spoken languages where omission of the correct agreement morphology would usually result in ungrammaticality.

Second, there may be verb-specific gaps in the agreement paradigm. Certain verbs may only show agreement for certain subject-object combinations, possibly due to articulatory factors. For instance, depending on the orientation of the hand, it may be difficult for a sign to move from the contralateral towards the ipsilateral side of the signing space, simply because it involves an awkward bending of the wrist. In such a case, the subject marker on the verb may be omitted in the way sketched in the previous paragraph (Costello 2015).

A special case are verbs that involve a movement from a body part, such as the verb SAY in many sign languages, which has a beginning point close to the signer's mouth. Often, such a specification for a body part may not be changed, which again results in the fact that such verbs can only show object agreement. Some researchers have argued that in these verbs, the body represents the subject (Meir et al. 2007).

Taken together, the challenge for the grammar writer is that s/he will have to identify possible agreement gaps and omissions in order to come to an understanding of the agreement system of the sign language under investigation.

3.1.1 Person and locative markers

In the section on verbs [Lexicon – Section 3.2] in the Lexicon Part, the grammar writer will address the existence of different verb types in the sign language (possibly

with verb lists). In the present section, the grammar writer should focus on describing how agreement is marked on various types of verbs in the sign language under investigation, that is, how it is phonologically realized. Below, we suggest addressing subject, object, and locative markers separately, as this structure mirrors how different paradigms would likely be presented in a spoken language grammar. Remember from the introduction that subject and object markers characterize agreement verbs while locative markers characterize spatial verbs. However, the grammar writer may decide to proceed in a different way, given the modality-specific property that most of the agreement markers in sign languages do not have a fixed phonological form that could be listed in a way like the Italian markers we presented at the beginning of this section.

Researchers have observed that the only person that has a fixed form, and displays some sign language-specific properties, is the first person. Some scholars therefore suggest that sign languages do not distinguish between first, second, and third person, but rather between first and non-first person (Meier 1990). The grammar writer might therefore decide to include subsections on "first person markers" and "non-first person markers" instead of "subject markers" and "object markers", or even to present the patterns without internal structure. Also, if non-manual markers turn out to play a systematic role in agreement marking, the grammar writer may wish to introduce headers for "manual" and "non-manual markers". Also, the writer should investigate in this context whether there are semantic constraints on what types of arguments agreement verbs can agree with. For some sign languages, it has been observed that agreement is restricted to [+human] arguments – this possibility should be investigated for subject and object markers.

Finally, recent studies suggest that the distinction between agreement verbs and spatial verbs should be abandoned, as agreement with person or locative features is often indistinguishable at the surface (de Quadros & Quer 2008). Also, one and the same verb may sometimes behave as an agreement verb but at other times like a spatial verb (e.g. BRING). To some extent, it is thus up to the grammar writer to decide how to internally organize this section.

3.1.1.1 Subject markers

In this section, the grammar writer should describe how subject agreement is marked in the language – either distinguishing three persons or following the first versus non-first distinction. It may make sense to distinguish transitive verbs from intransitive verbs in this section. As transitive agreement verbs are generally considered the prototypical manifestation of agreement verbs, we will consider them first.

Generally, for transitive agreement verbs that involve path movement [Phonology – Section 1.3.1] / path movement, the subject marker will be the beginning of the movement, or, to put it differently, the first location slot in a location-movement-location sequence. The grammar writer should describe which loci can be used for first,

second, and third person in transitive verbs. For first person, this will likely be a location close to or on the signer's body – as mentioned before, this will probably be the only person form that can be assigned a fixed phonological form. Still, distinctions on the vertical axis may be of importance, as some verbs begin their path movement in their citation form in front of the chest (e.g. GIVE) while others begin in front of the mouth/chin (e.g. ASK) or eyes (e.g. SEE). Less can be said about second and third person, as these can be marked by every locus in signing space. Second person will be a location close to the addressee, but obviously, the position of the addressee in a discourse setting is not fixed, and consequently, the second person subject marker does not have a fixed form either. The same holds for the third person subject marker, which will be a position close to a present third person referent, or an arbitrary position created for a non-present referent. Still, it might, for instance, turn out that non-present third person subjects are always marked by a locus at the ipsilateral side of the signing space – and if this is the case, it should also be described.

Possible gaps that result from the phonological specification of verb signs can also be addressed in this section. As mentioned previously, such gaps may occur when a sign is specified for a beginning point on or close to the signer's body, since in this case, non-first subject agreement may be blocked. In such cases, it may be particularly interesting to investigate whether the sign language has developed a strategy to still mark a non-first subject with such verbs, as has been described for LSE, for instance (Costello 2015). In LSE, a verb that is lexically specified for an initial location on the body (e.g. WARN) is capable of expressing subject agreement in a sentence like 'She warns you' by moving from the specified location on the body towards the locus associated with the subject and then towards the addressee locus.

In addition, gaps may result from articulatory constraints. For instance, depending on the orientation of the fingers or palm, moving the hand from the contralateral to the ipsilateral side of the signing space may require an awkward bending at the wrist. It appears that sign languages employ different strategies to avoid such a situation. While ASL would simply drop subject agreement in this case, NGT would more likely resort to using the non-dominant hand instead (a so-called "dominance reversal").

Moreover, if a non-manual marker is found to be relevant (e.g. head tilt towards subject locus), it should also be described. For obvious reasons, head tilt is unlikely to mark first person agreement, and gaps like these should be made explicit. The grammar writer should keep in mind that it is possible that verbs that cannot agree manually (i.e. verbs that would usually be considered plain verbs) do show non-manual subject agreement. Alternatively, it might be the case that non-manual agreement is only observed with verbs that also agree manually (see also below [Morphology – Section 3.1.1.2] for object markers).

A well-known complication concerning transitive agreement verbs are the so-called "backwards verbs". In these verbs, the mapping of subject and object onto the beginning and end point of the path movement is reversed, that is, the subject

marker occupies the final location slot in a location-movement-location sequence. In many sign languages, this is true, for instance, for verbs like INVITE and TAKE-FROM. That is, in a sentence like 'I invite you', the movement would start at the location of the addressee and end close to the signer's chest. Some scholars have therefore argued that movement in agreement verbs does not actually proceed from subject to object but from Source to Goal (Meir 2002) – if, for instance, I invite someone, then the invitee is the source of the action and I am the goal. Given that the group of backwards verbs is usually small in a sign language, the grammar writer could either list the relevant verbs here or refer back to the section on agreement verbs [Lexicon – Section 3.2.2] in the Lexicon Part.

As pointed out previously, when sign language linguists talk about agreement verbs, they usually mean transitive (and ditransitive) verbs. However, intransitive verbs may also show subject agreement, and once again, this may be realized manually or non-manually. Costello (2015: 127) refers to this type of agreement as "single argument agreement" and specifies that "in single argument agreement the verb is not directional but localizable: the verb is articulated at the locus associated with the argument. As such, the spatial mechanism employed by the verb only ever allows for one argument to be marked, and only a single agreement slot exists". That is, in these cases, the locus itself is the agreement marker, not the beginning point of the movement, as is illustrated by the following LSE example. In this example, the (reduplicated) sign DIE is articulated at the locus that has been established for SHEEP. Note that Costello also points out that first person agreement is barred in single argument agreement, probably for articulatory reasons.

INDEX$_x$ SHEEP ALL$_x$ DIE++$_x$
'The sheep all died.' (LSE, Costello 2015: 186)

3.1.1.2 Object markers

As for agreement by path movement, not much has to be added with respect to object markers. Except for backwards verbs, the object marker will be the end point of the movement, and as before, only the first person object marker has a fixed form (i.e. a location close to or on the signer's body). However, what should also be addressed in this section is the fact that orientation can also mark object agreement in some verbs (as was shown above for the NGT verb VISIT), and is actually the only marker of agreement in other verbs, namely verbs that do not have path movement but can express agreement by means of the orientation of the palm or the fingertips.

Similarly to what we described for subject markers, the possibility of non-manual agreement should be explored. Remember that for ASL, researchers have claimed that object agreement can be marked non-manually by means of eye gaze. However, there is an interesting controversy: While Bahan et al. (2000) claim that eye gaze agreement can occur with all verbs – no matter whether they agree manually or not

– Thompson et al. (2006) found in an eye-tracking study that eye gaze agreement only occurs with verbs that also agree manually. They therefore describe the combination of manual and non-manual object marking as a circumfix. Investigating the different possibilities for the sign language under investigation is certainly worthwhile.

Finally, single argument agreement, as defined in the previous section, can also apply to an object argument. Actually, the LSE example we presented a few lines up continues with the clause in (a), in which the (reduplicated) verb DEVOUR is articulated at the same locus as the verb DIE.

a. WOLF DEVOUR++$_x$
'The wolf devoured them.' (LSE, Costello 2015: 186)

b. WOMAN WANT$_x$ WANT$_y$ WANT$_z$
'The women$_{i,j,k}$ are each wanting.'
'The woman wants this$_i$, and this$_j$, and this$_k$.' (ASL, Padden 1990: 121)

Padden (1990) provides the interesting ASL example in (b), in which the verb WANT is realized at three distinct loci in the signing space. This example also exemplifies single argument agreement, but it is ambiguous between subject and object agreement, as the translations indicate. If such ambiguities exist in the sign language that is described, they should certainly be pointed out.

3.1.1.3 Locative markers

Just like subject and object markers on agreement verbs, locative markers on spatial verbs can be realized by the beginning and end point of a path movement. If both are relevant for a verb, then the beginning point will usually coincide with the Source location and the end point with the Goal location, for example, 'She moved the book from the left side to the right side of the shelf' or 'The boy walked from the school to the house'. Occasionally, only one of the location slots may be relevant, for example, 'He put the glass on the table' (only Goal location relevant) or 'I took the book from the shelf' (only Source location relevant).

While the previous examples involve transfer of an object/entity from and/or towards a location, locative markers are also attested on verbs that express a static location. Such verbs (sometimes glossed as BE-LOCATED) usually combine a location, a short movement towards this location (which is semantically empty but is required for phonetic reasons), and a classifier [Morphology – Section 5.1] / classifier handshape (Pfau & Aboh 2012). Note that the orientation of the hand may also contribute meaning, for example, 'The boy is standing on the bed' versus 'The boy is lying on the bed'. However, in the present section, only the realization of locative markers should be described. As in principle every location in the signing space or on the body can be a locative marker, it will probably suffice to point out that such markers exist in the language and provide a couple of examples that illustrate the use of such markers

on different types of verbs. In addition, it could be discussed whether (and illustrated how) two entities can be simultaneously localized by means of the two hands. If one hand serves as the Ground (e.g. a flat hand representing a surface in a sentence like 'The cup is on the table'), then only the moving hand realizes a predicate that carries a locative marker. However, occasionally both hands represent entities that are located with respect to each other (e.g. a car and a bike next to each other), and in this case, when there is no clear Figure-Ground-relationship, it can be argued that both hands carry a locative marker.

There is one sign language-specific complication concerning the description of locative markers. Some sign languages have been shown to not employ abstract loci that are introduced for non-present referents (e.g. by means of pointing signs), but to only make use of absolute (real-world) locations. In such a sign language, it would be impossible to point towards an empty locus in the signing space to refer to a non-present referent; yet a signer could point, for example, towards the house in which this referent is living. In some sign languages that employ absolute locations, verbs can never be spatially modified to agree with these locations (see de Vos (2012) for Kata Kolok, a village sign language of Bali); if this is the case, then the language does not employ subject, object, or locative markers on verbs, and the present section would thus be empty. However, in other sign languages, verbs can be modified, but only to target absolute locations (see Bauer (2014) for Yolngu SL). In this case, all agreement markers on verbs can in principle be interpreted as locative markers, and it is up to the grammar writer to decide where to discuss these modifications. Finally, at least Inuit SL has been shown to allow for both abstract and absolute locations on verbs (Schuit 2013), and in this case, it would probably make sense to discuss the markers under subject/object markers and locative markers, respectively.

3.1.2 Number markers

Across spoken languages, the most common number distinction found on verbs is the distinction between singular and plural (as in the Italian examples at the outset of this section [Morphology – Section 3.1.0.1]). However, languages may allow for more fine-grained distinctions, and this also seems to hold for many sign languages. A four-way distinction that is often mentioned in the literature is the one between the singular, dual, multiple, and exhaustive form (Klima & Bellugi 1979; Steinbach 2012). As in most spoken languages, the singular remains unmarked, and it may therefore be unnecessary to discuss this feature. Generally, only verbs that allow for the types of spatial modification discussed in the previous section allow for number inflection, but if the grammar writer comes across exceptions to this generalization, this should be mentioned.

3.1.2.1 Dual

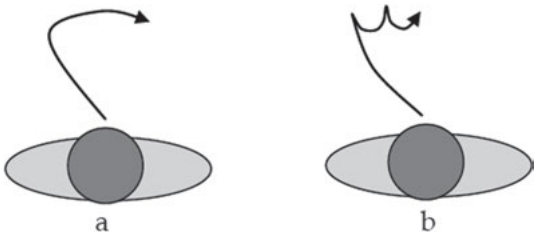
The dual signals that two entities are involved. In sign languages, this may be expressed in two ways. Either the verb is repeated once, or – in the case of one-handed signs – the non-dominant hand is added. Consider, for instance, the realization of a sentence like 'I give an object to the two of you'. There are actually three options to realize the dual in this case: (i) the sign GIVE moves first from a location in front of the signer's body towards addressee 1 and then from the same beginning location towards addressee 2; (ii) the dominant hand moves from a location in front of the signer's body towards addressee 1 while the non-dominant hand simultaneously moves from the same beginning location towards addressee 2; or (iii) the dominant hand moves from a location in front of the signer's body towards addressee 1, and subsequently the non-dominant hand moves from the same beginning location towards addressee 2. It is very likely that for two-handed verbs, only option (i) will be available. The grammar writer is encouraged to investigate which realizations are attested and also whether they possibly go hand in hand with slightly different meanings (which, however, may go beyond agreement marking proper).

3.1.2.2 Multiple

The form that is referred to as "multiple" (or "collective") comes close to what one would usually call a "plural". It is generally realized as an arc movement. Using again the verb GIVE as illustration, a sentence like 'I give an object to them' would be realized by moving the verb from a location in front of the signer's body in a straight line towards a location on the contralateral side of the signing space and then in an arc towards a location on the ipsilateral side of the signing space (in continuous signing, the straight and the arc movement are likely fused into one continuous movement).

3.1.2.3 Exhaustive

Finally, researchers have described a number value that is referred to as "exhaustive" or "distributive". This form also expresses a plural meaning, but it individuates members of a set; for the verb GIVE, this could be translated as 'I give to each of them'. Again, the verb would start at a location close to the signer's body and move towards a location on the contralateral side of the signing space. But subsequently, while moving towards the ipsilateral side, the forward movement of the base form is reduplicated (although the reduplicants are likely to have a reduced movement). See the figure below for schematic representations of the multiple (a) and the exhaustive (b) form (Costello 2015: 183). Note that with one-handed verbs, the exhaustive may also involve the addition of the non-dominant hand; the hands are then likely to move in alternation.



The multiple (a) and exhaustive (b) plural number forms in LSE. (LSE)

Table Morphology-3: The potential full paradigm of verbal inflection for person and number in LSE. The table shows the various possible combinations of verbal inflection for first/non-first person and singular/plural categories for typical agreeing verbs. Where both subject and object are non-first person, they are not co-referential. 1P = first person; XP = non-first person; SG = singular; PL = plural (multiple)

			OBJECT			
			1P		XP	
			SG	PL	SG	PL
SUBJECT	1P	SG			1	2
		PL			3	4
	XP	SG	5	6	7	8
		PL	9	10	11	12

Table Morphology-4: The attested paradigm for prototypical agreeing verbs in LSE (grey = not attested)

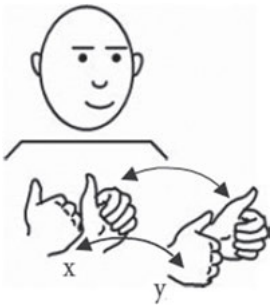
			OBJECT			
			1P		XP	
			SG	PL	SG	PL
SUBJECT	1P	SG			✓	✓
		PL			×	×
	XP	SG	✓	✓	✓	✓
		PL	✓	✓	×	×

For all forms, the grammar writer should investigate whether they can mark subject and object number. All of the examples discussed in the preceding text involve a first person singular subject and a non-singular object, but obviously, the subject may also be specified for number (e.g. 'The two of us give to him', 'They give to me', etc.). What complicates matters is that phonetic/articulatory factors may cause agreement gaps, that is, not all possible person-number combinations may be attested; see Mathur & Rathmann (2001) for ASL, where first person plural object forms (e.g. 'give us') are blocked. The grammar writer could even include a separate section in which possible person-number combinations (for subject and object marking) are inventoried. Above, we include two tables from Costello (2015: 207f)) that illustrate a possible procedure. The first table presents the potential full paradigm for first/non-first person categories in LSE (looking only at combinations of the singular and the multiple) and sketches by means of arrows what they would look like (when both the subject and the object are non-first person, they are not co-referential). The second table shows which combinations are actually attested in LSE (the 'x' in the shaded cells indicating the combinations that are blocked).

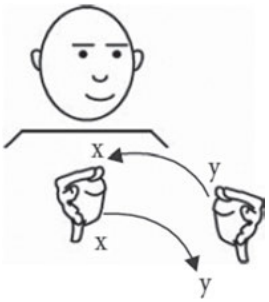
3.1.3 Reciprocal markers

If the sign language has a reciprocal pronoun, this pronoun will have been introduced in the Lexicon Part, in the section on reflexive and reciprocal pronouns [Lexicon – Section 3.7.4]. Besides this, however, it is possible that reciprocity can also be marked on verbs, similar to what has been found for many spoken languages (e.g. Turkish). At least in some sign languages, various verbal strategies exist, and the choice of strategy has been shown to depend (i) on the verb class and (ii) on phonological factors. If this turns out to be the case in the sign language under investigation, the strategies should be described.

For the sake of illustration, consider the DGS patterns (Pfau & Steinbach 2003). In DGS, the first crucial distinction is the one between plain verbs and agreement verbs. With all plain verbs, the reciprocal meaning ('to x each other') is realized by zero marking, that is, the object slot of a transitive verb is empty (e.g. WE-TWO HATE is interpreted as 'We two hate each other'; cf. English *They kissed*). In contrast, in agreement verbs, the movement of the verb can be reversed to express the reciprocal meaning (Pfau & Steinbach refer to this strategy as "backward reduplication"); that is, the verb moves in one uninterrupted movement contour from the subject to the object locus and then back to the subject locus. Furthermore, phonological factors come into play, namely the distinction between one-handed and two-handed verbs. While the backward reduplication is realized sequentially with two-handed agreement verbs, it can be realized simultaneously with one-handed agreement verbs, i.e. one hand moves from the subject to the object locus while the other hand simultaneously performs the reverse movement from object to subject locus. The two options are illustrated in the figure below for the two-handed verb HELP (a) and the one-handed verb GIVE. In the left figure, both hands move in parallel from locus x to locus y and then back to x.



a. $\text{HELP}_{x \rightarrow y \rightarrow x}$
'help each other'



b. $\text{GIVE}_{x \rightarrow y/y \rightarrow x}$
'give to each other'

(DGS, Pfau & Steinbach 2003: 13, 18)

Obviously, other sign languages may behave differently in this respect. For instance, it may be the case that reciprocity is never marked on the lexical verb, but rather by means of agreement auxiliaries [Lexicon – Section 3.3.4], pointing signs, or bi-clausal structures. Of these, only the first can be considered an instance of verbal inflection. If no inflectional strategy is attested, this section will be empty or will contain brief mention of the fact that reciprocity is realized by non-inflectional strategies in the sign language.

Elicitation materials

In previous studies, the availability of spatially modifiable verbs (agreement verbs and spatial verbs) has often been tested by means of short video clips or pictures in which participants interact with each other (e.g. a woman giving an object to a man) or objects are manipulated or located in space (note that similar materials have been used to elicit classifier handshapes). Obviously, it is easier to depict actions expressing concrete transfer (like giving/taking, possibly also visiting) in such clips than actions involving abstract transfer (like helping, asking, trusting). A possible way to overcome this problem might be to combine a picture with a written verb (in its base form); e.g. the picture could show a child who fell and a man approaching it, combined with the verb stem "help". As for additional animated video clips, De Vos (2012) used, for instance, *Canary Row* clips (better known as "Tweety and Sylvester cartoon") as well as cartoons from the German television show *Die Sendung mit der Maus*, in which a mouse and an elephant (that is smaller than the mouse) interact. In addition, Costello (2015) had signers retell Aesop fables (that have also been used in the ECHO sign language corpus project). An obvious shortcoming of this data type is that it is based on written language. A way to mitigate the influence of the written language is to provide the fables beforehand and then not having them available during

the recording session; that is, the signers have to retell the content from memory. For reciprocal constructions, the stimulus set developed by Evans et al. (2004) can be used.

Elicited data can be supplemented by spontaneous conversations on a range of topics and by controlled interviews. As for the former, corpus data have been found to offer important insights. However, it has to be pointed out that verbs that can in principle be spatially modified are not always modified in spontaneous data (e.g. De Beuzeville et al. (2009) for Auslan). Consequently, based on corpus data, the size of the set of agreement/directional verbs may be underestimated. Controlled interviews provide an opportunity to explicitly target the structures that the researcher is interested in. Also, grammaticality judgements may turn out to be informative, for instance, when attempting to identify gaps in the agreement paradigm. In this case, signers would be presented with a pre-recorded inflected version of a verb (in a sentence context) and would have to indicate whether the specific form is acceptable.

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3.2 Tense

3.2.0 Definitions and challenges

3.2.0.1 What is tense?

Time indication is one of the features that makes languages unique as a communication system, as it allows users to talk about people, things, or events that are not immediately visible or presently occurring (see also the chapter on tense in the Semantics Part [Semantics – Chapter 1]).

In terms of grammar, tense is "a coding convention that indicates the temporal relation between speech time and reference time" (Klein 1994). Theoretically, time in language can be divided into *situation-external time*, marked by tense, and *situation-internal time*, marked by aspect [Morphology – Section 3.3]. Tense, in turn, is divided into three broad categories, that is, present tense ('They enjoy this book'), past tense ('They enjoyed this book'), and future tense ('They will enjoy this book'). In practice, however, temporal and aspectual meanings in a given language may often overlap (Bybee, Perkins & Pagliuca 1994; Dahl 1985; Klein 1994). For example, in an English sentence such as 'He walked', the verb is in simple past tense, as indicated by the suffix *-ed*, and no aspectual information is provided. In contrast, in the sentence 'He was walking', temporal reference is past, as indicated by the past tense auxiliary *was*, but in addition, the suffix *-ing* provides aspectual information, namely continuous or progressive aspect. As for the typology of tense marking, it is worth noting that languages may make more fine-grained tense distinctions, distinguishing, for instance, immediate past and remote past by means of dedicated morphemes.

Defined above as situation-external, tense places a situation, event, or action at a point in time with reference to the moment of speaking. Tense is a deictic category and takes scope over the whole proposition (Chomsky 1968). Across spoken languages, tense is commonly expressed by bound or free time indicator morphemes, such as the English suffix *-ed* to indicate past tense or the adverbial *tomorrow* to indicate future tense (as in *Tomorrow I have a meeting*, where future tense is only marked by the adverbial). In this section of the grammar, only bound tense morphemes will be considered, while time adverbials will be addressed under parts-of-speech in the section on sentence adverbials [Lexicon – Section 3.5.2]. In addition, the section on tense inflection also includes a discussion of time lines, as these are clearly related to tense marking.

3.2.0.2 Methodological challenges

Just as in many spoken languages, in most sign languages studied to date, tense is not marked on the verb at all (Cogen 1977; Sandler & Lillo-Martin 2006), but rather by other means, most importantly, time adverbials and tense markers [Lexicon – Section 3.3.1]. Still, given that potential tense inflection has been described for at least two

sign languages (ASL and LIS), we encourage the grammar writer to look for – possibly subtle – manual and non-manual markers systematically accompanying verbs. Yet, it might well turn out that no tense inflection is attested in the sign language under investigation.

In addition, as mentioned previously, it is not always easy to tease apart tense and aspectual marking. For ASL, for instance, it has been observed that a head nod may mark perfect tense (Grose 2003), but perfect is usually considered a type of aspect. Clearly, attributing a grammatical meaning to a particular marker may pose a methodological challenge.

3.2.1 Time lines

In many cultures around the world, the concept of time is mapped metaphorically on the concept of space, and this conceptual mapping is reflected in language (Lakoff & Johnson 1980). Time may, for instance, be metaphorically perceived as a line, such that the past is perceived as behind the speaker's body (consider, for example, English phrases such as 'Let's leave the past behind' or 'This happened back in the fifties'), whereas the future is conceptualized as lying ahead of the speaker (as in 'I am looking forward to the party' or 'We don't know what lies ahead') – this mapping is attested in most European cultures and many other cultures from around the world. However, it is not the only option. In other cultures, such as various Native American cultures, exactly the opposite mapping is employed: events from the past are perceived as known/visible, and are thus conceptualized as lying in front of the speaker, while future events are perceived as unknown/invisible, and are therefore conceptualized at a position behind the speaker.

Basically all sign languages researched to date are reported to make use of "time lines" and generally, these time lines reflect the ones that are used in the broader culture. Time lines are visually realized in the signing space and serve as a time-indicating grammatical mechanism. Time lines, or more specifically, positions on time lines, will be treated here as abstract morphemes that can combine with other categories: verbs, but also time adverbials and other tense markers. These positions indicate reference time in relation to the signer's body, or to a position just in front of the signer's body.

The time line most commonly used across sign languages runs along the horizontal plane from a point in front of the signer to a point behind the signer, with the present moment corresponding to a point at the signer's chest. Hence, moving from the back to the front of the signer, we can locate far past, past, near past, present, near future, future, and far future, respectively. It is important to note that fine-grained distinctions on the time line may play a role in the expression of time adverbials, but are unlikely to be marked as inflectional categories on verbs, where only broad distinctions may be marked (see next section [Morphology – Section 3.2.2]), if any.

The use of time lines has been investigated in detail for BSL (Brennan 1983), NGT (Schermer & Koolhof 1990), LSA (Massone 1994), and LSFB (Sinte 2013), and it has been found that in some sign languages, other time lines besides the one described above are available. For instance, a time line may be located in front of the body, either horizontally (e.g. to express duration in time or a sequence of days) or vertically (e.g. to express growth); see, for instance, Schermer & Koolhof (1990) and Massone (1994) for illustration and discussion of such alternative time lines.

The grammar writer should identify any time lines available in the sign language and describe how they are used (for instance, for which semantic domain). It might, however, turn out that the sign language does not possess any time-line mechanism – as has been reported, for instance, for Kata Kolok, a village sign language from Bali (Marsaja 2008).

3.2.2 Tense inflection

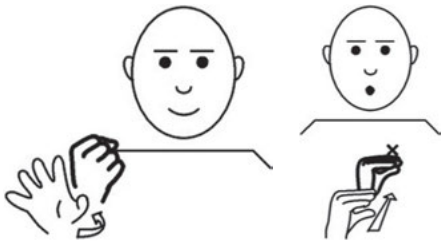
To date, tense inflection on the verb has only been reported for two sign languages, ASL (Jacobowitz & Stokoe 1988) and LIS (Zucchi 2009). However, it might well be the case that tense inflection is more common across sign languages, but has been overlooked because it involves very subtle phonological changes.

Jacobowitz & Stokoe (1988) claim that in some ASL verbs, tense may be marked by a manual change involving extension or flexion of one or more joints. Specifically, "extension (of the hand) at the wrist, (of the forearm) at the elbow, or (of the upper arm) at the shoulder", or a combination thereof, will denote future tense, while "flexion at the wrist, elbow, or shoulder with no other change in the performance of an ASL verb" will denote past tense (Jacobowitz & Stokoe 1988: 337). They argue that these changes, which result in a slight displacement on the vertical plane (extension of joints: upward; flexion of joints: downward), are systematically observed in about two dozen ASL verbs (e.g. COME and GO).

Zucchi (2009) observes a systematic non-manual change in LIS verbs. The relevant non-manual marker is shoulder position: if shoulders are tilted backward, then the action took place before the time of utterance (past tense); if shoulders are straight, then the clause receives a present tense interpretation; and if shoulders are tilted forward, then the action is assumed to take place after the time of utterance (future tense). Clearly, this non-manual change can be related to the time line described in the previous section. Zucchi further observes that non-manual tense inflection is absent in sentences containing past or future time adverbs, a pattern that is clearly different from the one attested in Italian and English. In fact, the co-occurrence of a time adverb and non-manual inflection within a clause leads to ungrammaticality.

Finally, in this section, the grammar writer should also list and describe exceptional (suppletive) forms, if they exist. Sutton-Spence & Woll (1999) point out that in some BSL dialects, certain verbs differ depending on whether they are used in a past

or present tense context. To give one example: the sign WIN is articulated on the ipsilateral side of the signing space, and involves a handshape change from an open hand to a fist combined with an underarm rotation, while in the sign WON, a flat handshape (in which the fingers contact the thumb) makes contact with the contralateral side of the chest; see the figures below – that is, there is no phonological overlap between the two forms (comparable to English *go – went*).



WIN WON

(BSL, based on Sutton-Spence & Woll 1999: 116)

In NGT, the past tense form of the verb HAPPEN shares with the present tense form place of articulation (neutral signing space) and handshape (two 1-hands) but differs in movement: in the present tense form, the circular movement executed by both hands is forward, in the past tense form backward (i.e. towards the signer's body). In a sense, the directionality is consistent with the timeline, but a similar change is not found in any other NGT verb.

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3.3 Aspect

3.3.0 Definitions and challenges

3.3.0.1 What is aspect?

Aspect is generally considered a grammatical category that is deeply intertwined with the categories of tense and modality, and therefore, tense, aspect, and modality markers (TAM-markers) are often dealt with in close combination. Grammatical aspect expresses the relation between the speaker and the internal temporal organization of actions, events, states, and processes. It thus concerns the way temporal structures of events are perceived. In contrast, tense expresses the temporal relation between the utterance time and the event time itself. Usually, two types of aspect are described: grammatical aspect, also called *viewpoint aspect* (Smith 1997), which involves inflectional or derivational linguistic devices; and lexical aspect, also called *situation aspect*, *inner aspect*, or *Aktionsart*, where aspect is encoded as inherent features and characteristics of lexical items (such as predicates, e.g. state, activity, accomplishment, achievement; cf. Pustejovsky 1991). This section only considers grammatical (viewpoint) aspect. However, given that there are suggestions in the literature that lexical (situation) aspect, in terms of event structure [Semantics – Chapter 3] / event structure, may also involve dedicated morphemes in sign languages (e.g. Wilbur 2008, 2010), the grammar writer may wish to add a section on lexical aspect. In this case, a level should be added to the table of contents, as headers 3.3.1 and 3.3.2 would be "Grammatical aspect" and "Lexical aspect", respectively.

Let us just add a few words about lexical aspect/event structure, such that the grammar writer knows what to look for. In a nutshell, lexical aspect refers to aspectual properties that are inherent to a predicate. For instance, telic predicates, which describe events with a clear endpoint (e.g. *arrive*, *hit*), have to be distinguished from

atelic ones, which describe an unbounded event (e.g. *smoke*, *sleep*). Without going into much detail, it has been suggested that telic predicates in sign languages typically involve a clear endpoint in their phonological specification, be it a hold or contact with a body part, while atelic predicates are typically characterized by repeated movement without a clear phonological endpoint. An example for the former is the LIS verb MARRY (see left video below), and for the latter the LIS verb DISCUSS (see right video below). It has therefore been argued that the relevant phonological features function as morphemes determining the event structure of a predicate (e.g. the feature [contact] functioning as a telic morpheme). If such features are indeed found to systematically distinguish different event types in the sign language to be described, it may make sense to include a separate section on event structure.

4_3.3.0.1_1_LIS_TELIC_MARRY 4_3.3.0.1_2_LIS_ATELIC_DISCUSS (LIS)

MARRY DISCUSS

Sign languages have been found to show a considerable amount of similarities in their realization of TAM-markers. For instance, sign languages do not usually express tense by means of verbal inflection, that is, they generally lack tense marking on the verb. Rather, they employ tense markers [Lexicon – Section 3.3.1] and time adverbials [Lexicon – Section 3.5.2] to express tense. With regard to aspect, however, sign languages have been found to exhibit a rich system of morphological marking. Aspectual information is systematically encoded by (i) means of verbal inflection (most importantly, modulations affecting manner and frequency of movement, as first noted by Klima & Bellugi (1979)), and (ii) free morphemes such as adverbials or auxiliaries [Lexicon – Section 3.3.2].

This section provides information about how sign languages may express the different types of verbal aspect subsumed under the two broad notions *imperfective* and *perfective* (following Comrie 1976). Verbal inflection for aspect, such as movement manipulations, repetition, and lengthening are non-concatenative morphological processes and indeed, simultaneity plays an important role in aspectual marking in sign languages. This section provides an overview of the most common bound aspectual morphemes, their meaning, and their phonological realization.

3.3.0.2 Methodological challenges

This section follows traditional distinctions of aspectual categories and provides examples for common categories such as *habitual*, *progressive*, and *iterative*, for instance. Given the overarching binary structure distinguishing *imperfective* from *perfective*, this section mirrors the structure of the chapter on aspect [Semantics – Chapter 2] in the Semantics Part and similarly subsumes the different aspectual categories under these two classes. In addition, the Semantics Part also comprises information on event structure and lexical aspect.

However the grammar writer is free to adopt either a hierarchically flatter structure (abolishing the distinction between imperfective and perfective) or a more fine-grained sub-categorization. Studies on aspect in sign languages have actually come up with different classifications and various numbers of aspect types: from 15 different types of aspect modulations in Klima & Bellugi (1979) to the distinction of 6 aspectual morphemes in Rathmann (2005). This section addresses inflectional aspect marking for *habitual*, *continuative/durative*, *conative*, *iterative*, *inceptive/inchoative*, and *completive*. The grammar writer should be aware of the fact that this is not an exhaustive list. Liddell (1984), for instance, discusses the *unrealized inceptive*, which may be analyzed as a particular form of a conative and which may constitute a modality-specific form of aspectual marking in sign languages (see Rathmann 2005). As a further example of unclear cases, the so-called *incessive* – a fast recurrence of some typical properties – is included under the *iterative* by Rathmann (2005), but subsumed under the *habitual* by Wilbur (1987).

As mentioned above, another terminological issue should be kept in mind, as Smith (1997) distinguishes between *situation aspect* (i.e. lexical aspect showing intrinsic temporal features of the situation) and *viewpoint aspect* (i.e. grammatical aspect showing how the situation is displayed by the speaker).

With regard to the close relation between tense and aspect, the grammar writer should note that there are signs, such as ASL or DGS FINISH, which may function as temporal markers, but can also be used to mark completive aspect (cf. Janzen 1995; Fischer & Gough 1999; Happ & Vorköper 2006; Herrmann 2013). Although this example concerns a free aspectual marker [Lexicon – Section 3.3.2], not aspectual inflection, the grammar writer should be aware of the interaction between tense and aspect and closely inspect the markers to see which category is encoded by specific signs and/or modifications.

3.3.1 Imperfective

The notion *imperfective aspect* implies that an event or activity is not completed, that is, either ongoing, repeated, or habitual, generally irrespective of the event time (past, present, future). This section lists morpho-phonological verbal markings that indicate an event as imperfective and discusses habitual (3.3.1.1), continuative/durative (3.3.1.2), and conative (3.3.1.3) aspects.

3.3.1.1 Habitual

Habitual aspect concerns regular or usual behavior and indicates the continuity of the repeated events. There is a general tendency for this event to happen (e.g. 'I usually go shopping on Saturday.'). Phonologically, the habitual is expressed by reduplication of the verb stem in many sign languages. In addition, to distinguish the habitual from the iterative, the movement repetitions are said to be smaller and faster (Rathmann

2005) – at least in some sign languages. Thus, the pauses in between the movements are quite short.

4_3.3.1.1_1_DGS_SATURDAY IX-1 SHOPPING GO++

SATURDAY IX_1 SHOPPING GO++ (fast and small repetition)
'I usually go shopping on Saturday.' (DGS)

Note that recent findings indicate that there may well be some variation across sign languages in this area, as research on NGT observes a complex combination of manual modulations and non-manual markings, such as gaze aversion and mouth patterns (cf. Hoiting & Slobin 2001).

3.3.1.2 Continuative/durative

The morpheme expressing continuative aspect, also labeled *durative*, indicates that the event takes place over a long and uninterrupted time interval (e.g. 'I trained for the competition all day long.'). An example of continuative aspect is the English progressive aspect [Semantics – Section 2.1.3], marked by the suffix *-ing*, which implies that an event is ongoing and evolving (e.g. 'He is clean**ing** the bathroom'). As a common marker for continuative in most sign languages, slow reduplications involving arc movements are described (cf. Pfau, Steinbach & Woll 2012). This results in the lengthening of the verbal root and often in a circular movement.

STUDY+$_{arc}$+$_{arc}$ ('study for a long time') (ASL)
LOOK-h ('look for a long time') (BSL)

It is important to note that, depending on the phonological form of the verb, there may be different markings for this aspect within the same sign language. BSL verbs that lack path movements, such as LOOK, for instance, receive an extended final hold (glossed as 'h' in the above example) to semantically encode a durative temporal interval (Sutton-Spence & Woll 1999). It might again be useful to also study the non-manual features accompanying the inflected verbs, as research on non-manuals in relation to aspectual marking is rare. Researchers have noted that continuative aspect often includes specific mouth patterns such as pursed lips, puffed cheeks, and blowing of air (see Hoiting & Slobin 2001). For TİD, Dikyuva (2011) describes a specific non-manual marker for continuative aspect that is labeled 'lele' and that involves a repeated and rapid flicking of a slightly protruded tongue. If such non-manual markers are found to systematically occur in the sign language under investigation, they should be included in this section.

3.3.1.3 Conative

Conative aspect signals that someone is trying to do something with the implication that the event is about to occur, usually not yet finished, thus imperfective, and that

in most cases the activity won't be finished in the future. In the literature, the term "conative" is sometimes used as a cover term for various related aspect types, such as the *unrealized inceptive*, the *delayed inceptive*, and the *unaccomplished aspect* (Rathmann 2005). The *unrealized inceptive*, meaning that someone was about to do something but then did not (e.g. 'I was about to send an e-mail when the doorbell rang'), is realized (in ASL) by interrupting the movement and holding the phonological configuration of the sign (i.e., handshape, location) (see Liddell 1984). Thus, the sign is not completely articulated, but rather frozen before the endpoint of the sign is reached. The *delayed inceptive*, on the other hand, implies the 'delay of the completion of x', that is, that someone 'finally' or 'at last' did something (e.g. 'I finally wrote the letter'). As for phonological marking, again for ASL, it includes a trilled movement (articulated either by fingers or the tongue) throughout the path movement, and then the sign syllable [Phonology – Section 2.1.1] is completed after the interruption with a specific mouth pattern at the end.

There are semantic and phonological constraints on the verbs which can undergo this kind of aspectual modification. The verb, for instance, needs to have explicit or implicit telic [Semantics – Section 3.1] / telic meaning. Examples are verbs like RUN-OUT-OFF, UNDERSTAND, ADMIT. In contrast, with verbs such as THINK or FEEL, this aspectual marking is not possible (cf. Brentari 1998: 196). The unaccomplished form postulated by Jones (1978; in Wilbur 1987) has a meaning contribution that can be paraphrased as 'unfinished in present' with regard to an event. Jones distinguishes different types of movement modulations that can realize the unaccomplished aspect, and lists MEET, SNEEZE, and FLY, as examples of verbs that can undergo this change.

It is up to the grammar writer to decide, based on the patterns attested in the sign language that is described, whether these three subcategories indeed exist as separate aspectual classes or whether they should be unified under the notion *conative*. Note that the discussion of the unrealized inceptive may also be subsumed under perfective inceptive aspect [Morphology – Section 3.3.2.2].

3.3.2 Perfective

The notion *perfective aspect* implies that an event or activity is externally seen as a whole unit without internal composition, yet in some sense as closed and completed. Even though this aspectual category closely interacts with tense, it should not be confused with the terminology "the perfect". This section provides an overview of morphophonological verbal markings that indicate an event as perfective; we address iterative aspect (3.3.2.1), inceptive/inchoative aspect (3.3.2.2), and completive aspect (3.3.2.3).

3.3.2.1 Iterative

Iterative aspect implies that an activity or event is repeated, within a certain period of time. Even though the iterative involves a continuous repetition of single events, the events are separate and countable, thus it is in some sense a subtype of perfective aspect. English paraphrases of the meaning contribution could be 'again and again' or 'repeatedly' (e.g. 'She went to the cinema several times / again and again'). The fact that the repetition of events is countable and temporarily bound distinguishes the iterative from the habitual [Morphology – Section 3.3.1.1]. Still, its close relationship with the habitual – as both involve repetition of events – lead some researchers to subsume it under the category of imperfective aspect.

The realization of iterative aspect has been found to be typologically quite consistent across many sign languages: it is usually expressed by fast repetition of the verbal root at the same spatial location of the signing space (e.g. Bergman & Dahl (1994) for SSL; Sutton-Spence & Woll (1999) for BSL; Zeshan (2000) for IPSL; Meir & Sandler (2008) for Israeli SL). In some cases, researchers note that the usual number of repetitions is three times. Inherent repetition of a sign is usually retained in iterative aspect reduplication. By contrast, in continuative aspect, the reduplication is slower and continuous. This also applies to non-manual markings that are lexically specified, such as mouth patterns (see Meir & Sandler 2008).

3.3.2.2 Inceptive/inchoative

This type of aspect marks the starting point of an action or state. We briefly address the inceptive and inchoative as two slightly different perfective aspect forms. Inceptive aspect denotes the beginning of an action (a), whereas inchoative aspect denotes the beginning of a state (b). In the case of a very quick/abrupt start of an action, the term *ingressive* is used.

a. I am starting to sing.
b. The sun started to shine.

With regard to inchoative aspect, some spoken languages feature verb classes that are inherently marked for inchoative aspect, usually with specific affixes, such as German *er-röten* ('to blush'; lit. 'to become red'). For sign languages, however, only a few studies are available to date. Recently, Dikyuva (2011) identified a non-manual marker, which he glosses as 'ee', that functions as an inceptive/inchoative aspect marker in TİD; this marker consists of an intense mouth pattern (gritting the teeth, pulling back the corners of the mouth). Again, it may be fruitful to more closely study these aspectual categories and to investigate potential movement modifications on the verb in combination with non-manual markings.

The unrealized inceptive, as the term suggests, has also been discussed under the notion of inceptive aspect, but the issue whether or not it rather belongs to the conative aspect [Morphology – Section 3.3.1.3] category is still under debate.

3.3.2.3 Completive

The completive marks an action as completed (e.g. 'I have done/completed/finished my homework'). Across sign languages, completive aspect is commonly marked by free morphemes [Lexicon – Section 3.3.2] such as FINISH or READY. Inflectional marking of completive aspect on the verbal root appears to be rare. Nevertheless, for TİD, it has been noted that some verbs may undergo a certain morphological change to indicate completive aspect, namely an accentuated movement combined with a head nod or body lean forward (Zeshan 2003). As for non-manual marking, Dikyuva & Zeshan (2008) further identify a tongue protrusion marker labeled 'bn' and argue that it may also be used to indicate completive aspect in TİD (but see Karabüklü (in progress) for a different analysis). This marker appears more frequently on action verbs than on stative verbs, but more research is needed.

What makes the identification and description of completive markers difficult – be they manual or non-manual – is the fact that in the literature, one and the same marker is sometimes described as marking the perfective and the completive. Grose (2003), for instance, argues for ASL that a head nod on the verb or in clause final position may be the only marker for perfectivity and thus indicates completive aspect. For DGS, researchers have observed that a head nod may accompany certain perception and psych verbs, such as SEE, LEARN, SMELL, REMEMBER, in order to mark perfective aspect (Happ & Vorköper 2006: 294–296).

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3.4 Modality

3.4.0 Definitions and challenges

3.4.0.1 What is modality?

It is important to start this section with a terminological note. The grammar writer should be aware that the term "modality" is ambiguous and that this may lead to misunderstandings, especially between spoken and sign language researchers. On the one hand, the term is used to describe a specific grammatical phenomenon that involves the use of modal verbs, mood markers, adverbials, etc. On the other hand, mostly in sign language research, the term "modality" is understood as referring to the different ways of signal production and perception in sign languages versus spoken languages, that is, the visual-manual (or visual-gestural) modality of sign languages as opposed to the oral-auditory modality of spoken languages. However, both spoken and sign languages do, of course, exhibit linguistic means to express the grammatical category of modality. This section provides information about how sign languages may express deontic and epistemic modality on the verb.

Modality is defined as a grammatical category that, in a nutshell, specifies the possibility (a) or necessity (b) of an event to occur (deontic modality), or conveys the attitude of a speaker or signer towards the validity of the content of a proposition (epistemic modality) (c).

a. You **can** borrow my car (= You are allowed to borrow my car).
b. You **have to** return my car by tomorrow evening.
c. He **should** be home by now (= I assume he is home).

Modality can be instantiated by various grammatical means which commonly interact with contextual information:
(i) morphological means such as verbal inflection; verbal mood, as one of the most common ways to encode certain modal notions, for instance, is commonly marked on verbs;
(ii) lexical means such as sentence adverbs [Lexicon – Section 3.5.2] / sentence adverbs (e.g. *hopefully, maybe*), modal verbs [Lexicon – Section 3.3.3] / modal verbs (e.g. *can, must, may*), and modal particles;
(iii) syntactic means, for example, the German infinitival construction with *haben* ('to have').
(iv) prosodic means, such as intonational pitch variations and intonation contours.

Obviously, these various means are not mutually exclusive and very often overlap and co-occur.

3.4.0.2 Deontic and epistemic modality

As already briefly mentioned above, traditionally two types of modality [Semantics – Chapter 4] are distinguished: (i) *deontic modality*, which refers to obligations, recommendations, permissions, and intentions; and (ii) *epistemic modality* (sometimes called "evidential modality"), which refers to probabilities and predictions, based on what is known or believed. Other, more fine-grained, distinctions have been suggested in the literature on spoken languages (see Palmer (2001) for a typological perspective). However, the general broad division between deontic and epistemic modality is adopted by most researchers and is the most common starting point for grammar writers and their descriptions of modality in different languages. Nevertheless, the grammar writer may wish to adopt a more fine-grained distinction depending on the facts of the language.

3.4.0.3 Methodological challenges

The grammar writer should note that sign languages may express modality by various of the above-mentioned means, such as independent lexical items (e.g. modal verbs [Lexicon – Section 3.3.3], adverbs, specific particles) and non-manual markers on the verb or the entire sentence. The paradigm is not necessarily complete, and the grammar writer should investigate carefully the potential overlap of certain expressions in terms of deontic and epistemic readings. In fact, in many spoken languages, certain modal verbs may have both deontic and epistemic readings, too, as illustrated by the following examples.

a. John muss zu Hause sein. (German)
   John must at home be
b. John must be at home.

For both examples:
(i) Deontic reading: 'It was required for John to be at home.'
(ii) Epistemic reading: 'It is possible and there is evidence that John is at home.'

In sign languages, however, it seems to be the case that epistemic readings of modal verbs are rare, or at least quite marked, and that signers tend to interpret modal verbs as deontic markers only. Deontic modality in ASL, for instance, is expressed by modals such as MUST, SHOULD, and CAN. Ambiguity of some modals with regard to deontic and epistemic interpretations has been described for ASL (see Wilcox 1996: 481, 488 for MUST and MAYBE). However, for the most part, MUST and SHOULD cannot receive epistemic readings. The rather exceptional cases of epistemic readings in ASL, however, suggest a grammaticalization from deontic to epistemic uses of modals in ASL (see Wilcox 1996: 490; Wilcox & Wilcox 1995: 145).

It is important to be aware of the fact that direct translations of modals are not always straightforward or even available. In DGS, for instance, the signs MUST and SHALL are used if a third person provides the command or suggestion for the respective activity. The translation of 'I *have to* go shopping. My fridge is empty.' into DGS, on the other hand, does not necessarily include the sign MUSS ('must'). Rather, the translation involves a sign glossed as HINNEHM ('accept/acquiesce'), specific non-manuals, and a modification of the verb's movement (see Happ & Vorköper 2006: 364). Furthermore, it has been reported for a variety of Libras that signs that are equivalent to various Portuguese modals do exist, but that the number of modal verbs is smaller in Libras (see Ferreira-Brito 1990). This shows again that there is no one-to-one relation between modals in spoken and in signed languages and that not all of the modality notions are expressed manually in sign languages.

The challenges described here concern modal verbs, but it is quite possible that the grammar writer will encounter similar complexities – that is, ambiguities and translation mismatches – when describing inflectional marking of modality.

3.4.1 Deontic modality

As mentioned previously, deontic modality [Semantics – Chapter 4] usually concerns obligations (*must*), recommendations (*should*), permissions (*can*), and intentions (*want*), and thereby refers to the speaker's attitude towards the necessity or permissibility of an act or event. In sign languages, deontic modality is usually expressed through manual signs, such as modal verbs [Lexicon – Section 3.3.3].

Still, Lackner (2013), in her detailed description of modality in ÖGS, emphasizes the importance of various non-manual markers, such as head and body movements,

for the expression of modality. For deontic modality, she observes that the non-manuals usually spread across the verb phrase. Many non-manual sentence adverbs, however, accompany the whole sentence in sign languages, and it may therefore be interesting to compare utterances with and without modal contexts. In general, however, deontic modality is rarely expressed by non-manual features alone – in contrast to epistemic modality (see next section [Morphology – Section 3.4.2]).

Lackner (2013) also stresses that methodologically, it is important to analyze signed narration when investigating the expression of modality, as elicited sentences usually only reveal manual means of expression instead of non-manual marking.

3.4.2 Epistemic modality

Epistemic modality is concerned with the speaker's attitude towards the actual proposition, judging the truth of the sentence and referring to the probability that the state of affairs or event described by the utterance is true/false, has been true/false, or will be true/false. Thus, epistemic modality addresses what is known or believed and indicates how much certainty or evidence a speaker has for his utterance. As above, this section only deals with verbal (and clausal) modifications indicating epistemic modality in sign languages, while lexical expressions of modality [Lexicon – Section 3.3.3] are addressed in the Lexicon Part.

In the following ASL example, the signer signals that he is certain about the event encoded in the utterance by using a combination of the non-manuals head nod, squint, and eyebrows squeezed together (which are glossed as 'wh+q'). Thus, the epistemic modality is expressed by a non-manual modification of the verb.

Context: two people enter a meeting in a basement room early in the morning.
It is cloudy and cold. At lunch:
A: Do you think it's raining outside?
   wh+q
B: RAIN
   'Surely it's raining.' (ASL, adapted from Wilcox & Wilcox 1995: 147)

Modal particles, as attested in some spoken languages such as German and Dutch, appear not to have manual equivalents in the sign languages studied to date; rather the modal meaning conveyed through modal particles is instantiated by combinations of non-manual features in sign languages (Herrmann 2013). Compare the following example from German, in which the modal particle (MOD-PART) conveys the epistemic meaning 'probably', with the DGS example, in which the same meaning is expressed non-manually (the modality non-manual marker abbreviated as 'mod' involves a specific mouth pattern and slow headnods).

Er	ist	*wohl*	schon	zu	Hause.
he	is	MOD-PRT	already	at	home

'He probably is already at home.' (German)

mod
IX$_3$ AT-HOME
'He probably is already at home.' (DGS)

The non-manuals that convey the degree of the signer's confidence and commitment towards his proposition can be compared to intonation [Phonology – Section 2.3] / intonation. Intonational contours in spoken languages may also function as indicators of epistemic modality. Many sentence adverbs [Lexicon – Section 3.5.2] indicating epistemic modality (e.g. an adverb meaning 'probably') have manual and non-manual equivalents in sign languages. The relevant non-manuals may either accompany manual modals or modify the entire sentence (see Wilcox & Wilcox (1995: 148) for ASL; Herrmann (2013) for DGS). For instance, the non-manuals indicating 'probably' in DGS scope over the entire proposition and include affirmative head nods, a specific mouth pattern, and squinted eyes – these non-manuals may express the epistemic meaning even in the absence of the manual adverbial. For ÖGS, Lackner (2013: 353) discusses one non-manual possibility marker in the form of a sideward head tilt and/or a sideward body lean; the resulting meaning can be paraphrased as 'maybe' because it expresses the potentiality/possibility of an unrealized event. Most importantly, non-manuals that scope over the sentence may indicate gradual differences along the continuum of probability and improbability.

The non-manual markers that may express epistemic modality by themselves – no matter whether they accompany only the predicate or spread over (part of) the sentence – should be described in this section, even if it is not entirely certain whether they indeed constitute morphemes that attach to verbs.

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3.5 Negation

3.5.0 Definitions and challenges

3.5.0.1 General definitions

By means of negation, the polarity of a clause is changed from positive to negative. Negation can, for instance, indicate that an attribution is not true (e.g. *John is not smart*) or that an event has not occurred (e.g. *He did not sign the contract*). In all languages, speakers use some dedicated strategy to negate either words or sentences, while the positive counterpart usually remains unmarked. In other words: while a negative element is required to signal negation, a positive clause does not require the use of a dedicated positive marker.

In studies on sign languages, negation has received a considerable amount of attention and has been studied in more detail than many other phenomena (Quer 2012). Zeshan (2004, 2006b) conducted a typological comparative study, using a broad sample of sign languages. These studies revealed that negation in sign languages can be marked by manual or non-manual means, often in combination. Manual signs encode negative meanings and can be of various types. Non-manual negation (mostly, but not exclusively, the use of a headshake) is very common across sign languages and is also capable of conveying negative meaning.

Throughout the Blueprint (and by implication, the grammar), negation makes an appearance in various parts. In the section on negatives in the Syntax Part [Syntax – Section 1.5], we address negation as a syntactic strategy (as in the English examples

in the first paragraph), including issues such as word order and scope of the non-manual marker. It is important to note that sentential negation may involve free elements (such as English *not*) or bound elements (such as the Turkish negative suffix *-mi* in e.g. *bil-mi-yor-um* (know-NEG-TNS-1SG = 'I don't know')). The free elements are presented in the section on negative particles [Lexicon – Section 3.11.1]. In the section "Derivation" in the Morphology Part, we address negative derivation [Morphology – Section 2.1.1.2]; that is, the use of affixes with negative meaning that may potentially change the word category (as in English *powerless*). Derivational negation does not negate the entire sentence but only the meaning of the constituent it attaches to (see also *unhappy*) – although the line is not always easy to draw.

In the present section, we are concerned with negation as an inflectional category. This implies that (i) the negative marker is a bound element, (ii) it cannot change the word category, and (iii) it expresses sentential negation. The Turkish suffix mentioned above is of this type. In Turkish, this suffix can attach to all verbs (and also other non-verbal predicates). While sentential negation by means of free-standing manual and/or non-manual markers is attested in all sign languages, inflectional negation (just like derivational negation) appears to be severely limited and usually restricted to a small set of verbs (Zeshan 2004, 2006b).

3.5.0.2 Methodological challenges

In the section on negative derivation, we already pointed out that it may, at times, be difficult to distinguish derivational from inflectional processes, in particular if the derivational process does not change the category. Similarly, it may be challenging to distinguish inflection from cliticization (as in English *can't*, *don't*, *shouldn't*).

Another challenge is posed by the fact that in virtually all sign languages for which a potential negative inflection process has been identified, this process only applies to a very limited number of verbs. The question therefore is: if the process only applies to, say, one or two verbs, should it be considered an inflectional process? Or, to put it differently, how productive does the process have to be in order to qualify as an inflectional process?

As for these challenges, we encourage the grammar writer to proceed as follows: first, even if it cannot be determined with certainty whether the process is inflection or cliticization, it should be included in this section, especially if it applies to various hosts in the same way. Second, and related to the first point, we suggest to also mention processes that are of very limited productivity, as these may not be addressed elsewhere in the grammar. An exception might be the negation of modal verbs. For these, the grammar writer might decide to include them here and/or in the section on modal verbs [Lexicon – Section 3.3.3] in the Lexicon Part.

Note that in the following sections, we distinguish regular and irregular negation strategies. However, depending on the phenomena attested in the sign language to be described, it might also make sense to distinguish manual markers from non-manual

markers and to include the distinction between regular and irregular negation under manual markers.

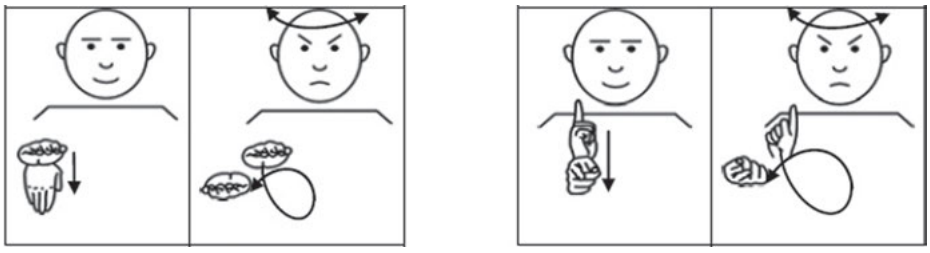
3.5.1 Regular negation

Under regular inflectional negation, the grammar writer should discuss processes in which the stem with which the negative marker combines can still be identified (see the Turkish example and the English cliticized forms above – in all cases, the verb that is negated is easily identified).

It should be pointed out that some of the processes we describe here under "regular negation" have been subsumed by other authors under the label "irregular negatives" (e.g. Quer 2012). This choice of label is motivated by the fact that the manual negation strategies discussed in the next section are irregular when compared to the general strategy of clause negation in the sign language. For instance, in DGS, clausal negation usually involves the clause-final particle NOT (e.g. INDEX_1 READ NOT, 'I don't read'), and therefore, negation of a modal verb by means of a movement modification (as discussed in section 3.5.1.1) could be considered irregular. Yet, as an inflectional process that applies to a number of verbs, the movement modification is fully regular – and we therefore treat it as such. Only inflectional processes that are fully idiosyncratic will be treated as irregular negation.

3.5.1.1 Manual markers

In many sign languages, there are signs, mostly modal verbs, that incorporate negation in a (more or less) regular way (e.g. Shaffer (2002) for ASL; Pfau & Quer (2007) for DGS and LSC). As pointed out previously, it may at times be difficult to determine whether the negative element is a true inflectional affix or a clitic. If it is phonologically similar to an existing free negative element, then the cliticization scenario may be more likely. For illustration, consider the following DGS examples.



MAY MAY^NOT MUST MUST^NOT

(DGS, Pfau & Quer 2007: 147)

Both modal verbs MAY and MUST in the examples above (as well as CAN and NEED) are negated by a movement change (α-shaped movement); this movement is not transparently related to the form of the negative particle NOT (a 𝅘𝅥-hand performing a sideward movement towards the ipsilateral side in front of the signer's body), and the process may therefore constitute a true inflectional process, which applies to a small number of verbs, rather than an instance of cliticization. The pairs MAY – MAY^NOT and MUST – MUST^NOT are further illustrated by videos below.

4_3.5.1.1_2_DGS_MAY - MAY^NOT

MAY – MAY^NOT

4_3.5.1.1_3_DGS_MUST - MUST^NOT

MUST – MUST^NOT (DGS)

Often, however, the negative marker is more transparently related to an independent negative sign. This is true, for instance, in the following example from TİD, where the negative sign exists independently. However, when combined with a verb, as e.g. KNOW, its movement is reduced, its location is displaced towards that of the verb, and it thus sort of fuses with the verb. Yet, the negative component can still be identified. Cases like this are likely to be the result of cliticization. Still, the grammar writer may wish to address such cases in this section, especially if the process only applies to a limited number of verbs that can be listed in the grammar.

KNOW^NOT ('know not') (TİD, Zeshan 2004: 46)

The manual negative morpheme that combines with a verb can also be simultaneous in nature. HKSL and some other East Asian sign languages, for instance, feature a "negative handshape", the 𝅘𝅥-handshape. This handshape is found in some signs with negative meaning (e.g. BAD, DIRTY; cf. Yang & Fischer (2002) for CSL), but it can also be used to change the meaning of a verb from positive to negative (Zeshan 2006b: 51). The negative handshape can be added sequentially to monomorphemic signs, but it may also replace the handshape of the underlying verb, as e.g. in the HKSL verb KNOW^BAD ('don't know'; the underlying verb has a 𝅘𝅥-handshape).

KNOW^BAD ('don't know') (HKSL, Tang 2006: 223)

Taken together, the grammar writer should search for movement, orientation, and handshape changes that may – sequentially or simultaneously – combine with verbs to negate them, even if these changes only apply to a limited number of verbs. If possible, the verbs to which the process applies should be listed. If the process only applies to modal verbs, then it could be described in this section and/or in the section on lexical markers of modality [Lexicon – Section 3.3.3].

3.5.1.2 Non-manual markers

In virtually all sign languages studied to date, negation is not only expressed by manual markers but also by non-manual markers. In fact, in many sign languages, it is common to negate a clause by a non-manual marker only. The most common negative non-manual is a headshake; in addition, in some geographical areas, a backward head tilt is also attested. These head movements may be accompanied by negative facial expressions (e.g. squinted eyes, lowered eyebrows, frowning, nose wrinkling; Zeshan 2004: 12f), but it seems uncommon that facial expressions can negate a clause by themselves. The interplay of manual and non-manual negative markers will be subject to further discussion in the section on negatives in the Syntax Part [Syntax – Section 1.5]. Here, we will only be concerned with the possibility of a non-manual marker functioning as a (simultaneous) inflectional affix.

Consider the headshake, which in many sign languages can negate a clause by itself, as shown in the following LSC example, in which the headshake ('hs') accompanies only the verb.

hs
SANTI MEAT EAT
'Santi does not eat meat.' (LSC, Quer 2012: 318)

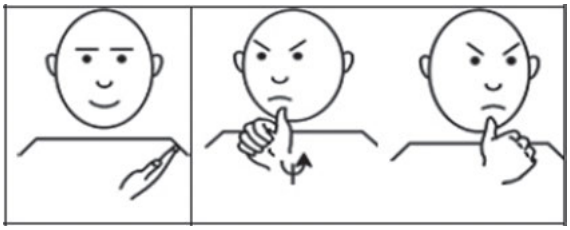
Assume that in a sign language, the headshake always only accompanies the verb. One would then have good reason to suggest that it indeed functions as a simultaneous inflectional affix. However, to the best of our knowledge, to date no such sign language has been described. Rather, it appears that the headshake commonly spreads onto adjacent signs, for instance onto the object in the above example. Some researchers have suggested that the headshake might still be considered an affix, which, however, is capable of spreading – just like tone in some spoken languages (Pfau 2008, 2015). It is up to the grammar writer to decide whether s/he wants to include such cases in this section. Note finally that researchers have found that in some sign languages the headshake or head tilt only accompanies the manual negative sign. Given that in these sign languages the manual negator does not exist without the non-manual – in contrast to the verb EAT in the LSC example above – it seems very unlikely that the non-manual functions as an affix in these cases. Rather, it is probably lexically specified for the manual negator.

3.5.2 Irregular negation

In sign languages, as in spoken languages, the negative form of certain verbs can be entirely different from their positive counterpart, such that no distinct negative element can be identified; in this case, we are dealing with negative suppletion. In Turkish, for instance, the negative form of the verb *var* ('to exist') is *yok* ('to not exist'), even though Turkish has two negative markers, one for verbal stems, the other for non-verbal stems. However, none of these two markers is identifiable in *yok*, which is thus idiosyncratic.

Although, strictly speaking, negative suppletion is not a morphological process, the grammar writer should include suppletive forms here, even though some of them may also make an appearance in another part of the grammar. The grammar writer should be aware that negative suppletion is not very common in sign languages and is usually limited to a few signs in an individual language (Zeshan 2006b: 49). LSE, for instance, features only a single case of negative suppletion, which is the negative existential (i.e. a case comparable to the Turkish example above). Yet, there are sign languages which have more than five suppletive negatives (Zeshan 2006b: 50).

For illustration, consider the following examples from DGS and ÍTM; the DGS example involves a modal verb, while in ÍTM, negative suppletion is attested for the lexical verb KNOW, as illustrated by the two videos below which show the positive sign and its negative counterpart. Actually, across sign languages, negative suppletion is most common for modal verbs and existentials.



WANT WANT-NOT (DGS, Pfau & Quer 2007: 147)

4_3.5.2_2_ITM_KNOW 4_3.5.2_3_ITM_KNOW^NOT

KNOW ('to know') KNOW-NOT ('to not know') (ÍTM)

Clearly, in both examples, there is no or little phonological overlap between the positive sign and its negative counterpart. In ÍTM, the negative sign KNOW-NOT shares with its positive counterpart the location, but both the handshape and movement are different. However, neither the handshape nor the movement of KNOW-NOT are found to mark negation in any other ÍTM verb.

The grammar writer should be aware of the fact that when an irregular negative is available in the sign language, it usually blocks the combination of the non-negative predicate with an independent manual negator or with a non-manual marker that otherwise can express sentential negation [Syntax – Section 1.5] on its own – that is, the DGS modal verb WANT can neither be negated by a combination with the negative particle NOT nor by a simultaneous headshake. This generalization, however, is not without exceptions.

Elicitation materials

If a dictionary exists, it is likely that at least some of the exceptional (cliticized or suppletive) forms can be found in the dictionary. The typological studies compiled in Zeshan (2006a) make use of a questionnaire that is also contained in the volume. Pictures can be combined with questions in order to elicit negative statements (e.g. showing a picture on which a woman buys apples and asking 'Does the woman buy flowers?'). The grammar writer should keep in mind, however, that this strategy is likely to elicit constituent negation or replies like 'No, she buys apples'. See also the notes concerning elicitation materials in the section on negation in the Syntax Part [Syntax – "Elicitation materials" in Section 1.5]. For signs that are in semantic opposition (e.g. GOOD – BAD, CLEAN – DIRTY), a signer could be shown the positive member of the pair and asked to produce the negative counterpart. This way, one might be able to discover negative handshapes, for instance. Finally, corpus data can be used, if

available. On the basis of corpus data, one might, for instance, come to know whether it is possible for a headshake to co-occur with only a predicate in a clause. Especially in the absence of a manual negator, this might suggest that the headshake functions as a non-manual (featural) affix.

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Chapter 4 Nominal inflection

4.0 Definitions and challenges

4.0.1 What is nominal inflection?

Just like verbs, nouns may undergo systematic form changes depending on certain morphosyntactic features, with form changes realized by affixation and/or stem-internal modification. Across spoken languages, the most common features that trigger such changes are number, case, and gender features.

Crucially, in the present chapter, the grammar writer will only address changes that are marked on the noun itself, not changes that affect other elements within the noun phrase, such as adjectives and determiners. In addition, in many languages, inherent features have to be distinguished from contextual features. Inherent features are features specified for nouns in the lexicon, which, however, are not overtly marked on the noun (e.g. gender in many languages). In contrast, contextual features are not specified in the lexicon but are contextually determined, that is, within a sentence or discourse context (e.g. number and case marking).

The following example from German may serve to illustrate the interaction of inherent and contextual features on the one hand, and of marking on the noun versus marking on other elements within the noun phrase on the other hand. The noun *Haus* ('house') carries an inherent gender feature [neuter], which is marked within the noun phrase on the definite determiner. When pluralized (i.e. marked for number), the noun itself undergoes two changes: it takes the suffix *-er* and it is subject to a stem-internal change (umlaut). At the same time, the plural is also marked on other elements within the noun phrase, namely the determiner and the adjective – this is an instance of number agreement within the noun phrase. If German was the language to be described, then only the plural marking on the noun (*Häuser*) would be addressed within the present chapter.

das	schöne	Haus	→	die	schön-en	Häus-er	
DET.N	beautiful	house(N)		DET.PL	beautiful-PL	house-PL	
'the beautiful house'				'the beautiful houses'			(German)

This does not imply that gender would never be relevant to a discussion of nominal inflection. In fact, there are languages that mark gender (or more broadly, noun class) overtly on nouns by means of affixes. A discussion of this type of marking would be appropriate in the context of nominal inflection, even if it is only a strong tendency rather than a strict rule (as, for instance, in the case of Spanish nouns ending on *-a* (feminine) vs. *-o* (masculine)). At present, however, we are not aware of a sign language that would apply such an operation (some East Asian sign languages have been shown to employ handshapes that mark gender, but it is not clear whether these handshapes are systematically used in the way described here).

Obviously, in addition to the features mentioned above, there are other, less common, features that may be marked on nouns in a given language, such as proximity or visibility. Again, at present, we are not aware of a sign language that would mark such features. However, thanks to the availability of three-dimensional signing space, sign languages commonly mark location features on nouns, whether it is on an individual noun ('object is located at locus x') or on multiple nouns in relation to each other ('objects are in relation y to each other'), and this modality-specific property should be addressed in this chapter.

4.0.2 Methodological challenges

There are at least two potential methodological challenges in the domain of nominal inflection. First, if an element marking a specific feature is identified, it may not always be obvious whether it is an affix or a free-standing element. Imagine a sign language that employs gender markers (male/female) that systematically combine with nouns referring to humans that are not inherently specified for gender (e.g. PERSON, FRIEND, TEACHER, etc.). If these markers consistently appear adjacent to the noun, it may be difficult to decide whether they are bound or free elements. Even if the latter seems to be the case, however, such elements should be included in the part on nominal inflection, as the relevant markers neither represent inherent features of nouns nor do they combine with another element within the noun phrase. In other words: in this particular case, the grammar writer would have a good reason to add a subsection on gender. The same line of reasoning would apply to other potential inflectional markers.

Second, as will be detailed further in the section on localization and distribution [Morphology – Section 4.2], there is a clear connection between number and distribution marking. That is, objects can only be distributed or localized with respect to each other if there is more than one object. It may therefore be difficult at times to disentangle these two properties: does a certain modification reflect number marking, distribution, or both? In case of uncertainty, the grammar writer may wish to discuss a certain marker within both subsections. This potential challenge is also related to the issue of Elicitation Materials, as a picture showing a multitude of objects will necessarily depict them in a certain configuration, and consequently, the elicited sign(s) is/are likely to reflect this configuration.

4.1 Number

In this section, the grammar writer will discuss all strategies of nominal plural marking that apply to noun signs [Lexicon – Section 3.1]. There are various ways to address this issue, and the strategy we adopt – that is, a distinction between

manual and non-manual marking – is only one option. In fact, it may well be the case that the sign language to be described does not mark number at all on nouns – or marks it only on very few nouns (see Zeshan (2000) for IPSL, where apparently only the noun CHILD is consistently marked for plural). In this case, the grammar writer may decide to point out the lack of productive plural marking and simply list the nouns that can be marked, along with the plural marking strategies that apply.

4.1.1 Manual marking

We choose a shallow structure, providing only a list of strategies that have been identified in the literature. However, the grammar writer may wish to add additional structure. This may be useful, for instance, if it turns out that the choice of strategy depends on phonological properties of the base noun; that is, if we are dealing with phonologically triggered allomorphy (as has been described for DGS by Pfau & Steinbach (2005, 2006)). Also, a distinction could be made between sequential marking (reduplication) and simultaneous marking (by using the non-dominant hand). Note finally, that in a language that has different manual plural marking strategies, zero marking may be one of them (as e.g. in English *sheep – sheep*).

A plural marking strategy that has been described for many sign languages is reduplication (Pfau & Steinbach 2006). Interestingly, at least in some sign languages, reduplication comes in different shapes. The first one is simple reduplication, where the movement of the sign is simply repeated. This strategy is observed in the DGS noun BOOK, as shown in the left video below.

4_4.1.1_1b_DGS_BOOK – BOOKS

4_4.1.1_2b_DGS_CHILD – CHILDREN

BOOK – BOOK++	CHILD – CHILD++
('book – books')	('child – children') (DGS)

Another type of reduplication is sidewards reduplication, whereby the noun, when repeated, is slightly displaced towards one side of signing space. For DGS, Pfau & Steinbach observe that this strategy applies to signs that are not signed in central signing space in front of the body, but rather on the lateral side of the signing space, as for example the noun CHILD (as in the right video above). Crucially, this realization does not have a semantic effect beyond pluralization; in particular, it does not imply that the children are located next to each other (it could, for instance, be used in a sentence like 'I like children').

A third type of reduplication is simultaneous reduplication by the non-dominant hand (Pizzuto & Corazza 1996). The attested patterns may be quite complex, as simultaneous reduplication may go hand in hand with simple or sidewards reduplication,

and the movement executed by the two hands may be symmetrical or alternating. Wilbur (1987), for instance, notes that in ASL, if a noun is made with one hand at a location on the face, its plural can be realized by repeating the sign alternately with both hands. Simultaneous reduplication may even affect signs that are underlyingly two-handed. Skant et al. (2002) mention that in ÖGS, the plural of a two-handed sign like HIGH-RISE-BUILDING, in which both hands perform a parallel upwards movement, can be expressed by the two hands performing a repeated alternating movement.

Reduplication generally refers to the repetition of (a part of) a stem (e.g. the hypothetical *ba* → *baba* or *bat* → *babat*). However, in nominal plurals in sign language, it is not uncommon for the stem to be repeated more than once, and there may be variation in the number of repetitions (without this variation having semantic consequences). For DGS, Pfau & Steinbach (2006) observed that the most common pattern was triplication (i.e. *ba* → *bababa*), as shown in the videos above. The grammar writer may wish to add a note on the attested variation and the most common pattern. Additionally, in both types of reduplication, simple and sidewards, it may be the case that the noun undergoes phonological changes. There are (at least) two options: (i) the noun's movement is first slightly reduced and then reduplicated; (ii) the first articulation retains its movement but the repeated instance(s) is/are reduced.

Finally, researchers have observed that, even in a sign language that does allow for (different types of) reduplication, it is not necessarily the case that all nouns undergo this process. That is, some nouns are (at least manually) zero-marked, and this option should be included in the grammar. Moreover, if the grammar writer is able to identify phonological factors that block the application of reduplication, then these factors should be described. In DGS, for instance, complex movement and body-anchoredness have been found to block reduplication (Pfau & Steinbach 2006). Consequently, the plural forms of BICYCLE (which has repeated, alternating movement) and PAIR-OF-GLASSES are zero-marked, as shown in the videos below. Note that in NGT, at least some body-anchored nouns can be reduplicated (e.g. the phonologically identical PAIR-OF-GLASSES; Nijhof & Zwitserlood 1999).

4_4.1.1_3b_DGS_BIKE 4_4.1.1_4b_DGS_PAIR-OF-GLASSES

BICYCLE	PAIR-OF-GLASSES	
(intended: 'bicycles')	(intended: 'pairs of glasses')	(DGS)

In the discussion of pluralization, the grammar writer may wish to pay attention to the question whether there is a principled distinction between nouns referring to concrete entities (all of the above) versus abstract entities. For instance, can noun signs like DREAM or THOUGHT be reduplicated? Note that answering this question will be made difficult by the fact that in many sign languages, it will not even be clear whether the signs are nouns or verbs.

Finally, it is, of course, possible that other manual pluralization strategies exist in the sign language under investigation. A noun sign might, for instance, be moved sidewards without reduplication (see Engberg-Pedersen (1993) for Danish SL).

4.1.2 Non-manual marking

The non-manual markers that we describe here may occur by themselves, but they may also combine with the manual strategies described in the previous section. The grammar writer is therefore encouraged to also address the combinatory possibilities. We describe two types of non-manual markers that have been observed to play a role in plural marking: mouthings and head nods. If various types of non-manual marking exist in the sign language, then it might make sense to devote a separate subsection to each type.

In many sign languages, nouns are commonly accompanied by mouthings [Phonology – Section 1.5.2] / mouthings (Boyes Braem & Sutton-Spence 2001). Mouthings may differ depending on whether the sign refers to a single entity or multiple entities. We illustrate some of the attested patterns with examples from Norwegian Sign Language (NSL; Halvorsen et al. 2014). Exceptionally, here we gloss the signs in Norwegian, as the mouthing mirrors the Norwegian word.

The first option is for the mouthing to be lengthened (by lengthening the vowel of the noun). This is observed with the sign GARN ('skein'); in this particular case, the movement is also repeated (as indicated by '++'), and the mouthing extends over the reduplicated form.

/garn/	/gaaaaarn/	
GARN	GARN++	
'skein'	'skein(PL)'	(NSL, Halvorsen et al. 2014)

In the following example, the plural form of PERSON ('person'), which is marked by sideward reduplication (as in the DGS example CHILD above), takes a completely different mouthing, namely *folk*, which means 'people'.

/person/	/folk/	
PERSON	PERSON++	
'person'	'persons/people'	(NSL, Halvorsen et al. 2014)

The NSL noun GUTT ('boy') is a body-anchored noun (articulated at the forehead) and can therefore not be reduplicated. In its plural form, the noun is accompanied by the plural form of the Norwegian noun, marked by the suffix *-er*. That is, in this case, the plural is only marked by the (inflected) mouthing. Halvorsen et al. observe that a plural mouthing may also combine with a reduplicated sign (e.g. in the sign JENTE 'girl').

/gutt/	/gutter/	
GUTT	GUTT	
'boy'	'boys'	(NSL, Halvorsen et al. 2014)

Finally, an interesting pattern described by Halvorsen et al. involves the combination of the non-reduplicated noun sign TIME ('hour') with a mouthed quantifier, in the case below, the quantifier *mange* ('many'). It seems that the resulting complex form is not a "plain" plural. Therefore, such cases, although they can certainly be mentioned in the section on number marking, should rather be discussed in more detail in the section on quantifiers within the noun phrase [Syntax – Section 4.4].

/time/	/mange/	
TIME	TIME	
'hour'	'many hours'	(NSL, Halvorsen et al. 2014)

For LIS, an additional non-manual means of plural marking has been described, which can be used with many body-anchored nouns (which cannot be reduplicated). In the inflected form, "the signer moves his head (at least three times) from left to right, and marks each of these displacements with a head-nod" (Pizzuto & Corazza 1996: 182). However, Pizzuto & Corazza also point out that this non-manual inflection is not obligatory and usually expresses an additional emphatic meaning.

4.2 Localization and distribution

Noun signs, most likely signs that are articulated in neutral signing space, may also be localized in space. Here we distinguish two types of localization.

In the first case, a one- or two-handed singular noun is articulated at a location in the signing space that is not the location of the citation form of the noun. For instance, the symmetrical two-handed noun HOUSE, which in many sign languages would be articulated in a central location in front of the signer (midsaggitally) in its citation form can be displaced towards the ipsi- or contralateral side of the signing space, thereby simultaneously expressing an additional locative meaning ('the house at location x'). Later in the discourse, the location thus introduced can be referred to by means of a pronominal or demonstrative pointing sign or by an agreement or spatial verb (e.g. 'go to the house at location x'). Note that alternative strategies of localizing a noun, namely the use of a locative pointing sign or a classifier adjacent to the noun, should not be discussed in this section, as these are noun phrase internal processes and not instances of nominal inflection.

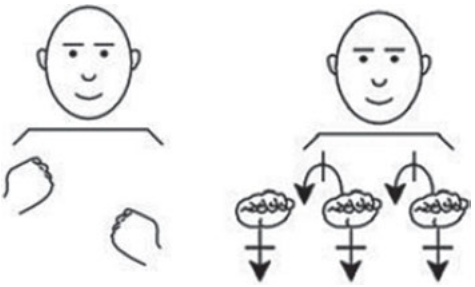
The second type, spatial distribution of a noun, basically combines pluralization and localization. Consider again the noun HOUSE. This noun could also be sequentially repeated at various locations in the signing space, as shown in the video below,

yielding a meaning like ‘houses located next to each other’. As for spatial distribution, it might also be worth considering whether one-handed signs can be distributed by using both hands – whether simultaneously or by the two hands in alternation.

4_4.2_1b_DGS_HOUSE-next to each other

$\text{HOUSE}_{\text{left}}$ $\text{HOUSE}_{\text{middle}}$ $\text{HOUSE}_{\text{right}}$
‘houses next to each other’ (DGS)

As with localization, spatial distribution can also be expressed by alternative strategies, most importantly, by the use of pointing signs or classifiers. The latter strategy is illustrated for the sign CAR in the below figure. In this example, an entity classifier [Morphology – Section 5.1.1] is employed to localize the nominal referent CAR. Again, these strategies should not be discussed in this section, as they do not affect the noun itself.



‘cars next to each other’ (DGS, Pfau & Steinbach 2006: 163)

For both of the phenomena discussed here, the grammar writer is encouraged to include a note in the grammar on whether localization/distribution of a noun is blocked by certain phonological properties of nouns. It is, for instance, likely that body-anchored nouns cannot be detached from their specified location in order to be articulated in neutral signing space. But other features might also block localization. It might, for instance, turn out that signs with complex alternating movement cannot be localized, even if they are articulated in neutral space in their citation form (like the sign BICYCLE depicted in the previous section).

Elicitation materials

It seems pretty straightforward to elicit the plural form of nouns by means of picture stimuli; for instance, by first presenting a picture of a book (to elicit the base form), and then presenting a picture depicting multiple books (a strategy used, for example,

by Nijhof & Zwitserlood (1999) and Zwitserlood et al. (2012)). However, as already mentioned, there is an important caveat: a picture showing multiple objects will necessarily depict them in a certain configuration, and consequently, the elicited reaction is likely to reflect this configuration. Multiple books, for instance, will either be lying or standing next to each other or lie on top of each other. In other words, such stimuli may be inadequate for eliciting number, but they are appropriate for eliciting localization and distribution.

In order to elicit "pure" plurals, one would need contexts that do not involve spatial localization (e.g. 'My brother loves books', 'Our bikes were stolen'), but such contexts are not easily depicted on pictures. Obviously, the same challenge applies to abstract nouns (e.g. 'idea', 'conflict'). Thus, eliciting the plural of such nouns (or determining the non-existence of a plural form) may require written sentences – clearly a disfavored elicitation strategy – and/or discussions with informants. In addition, corpus data, if available, may be informative.

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Chapter 5 Classifiers

5.0 Definitions and challenges

5.0.1 What are classifiers?

Classifiers are morphological categories that denote entities (both animate and inanimate) by depicting some salient iconic aspect of these entities by manual articulation, in particular, handshape (see the discussion of classifiers in the Semantics Part [Semantics – Chapter 7]). They occur in combination with verbs (or rather verb stems) expressing motion and location. The relevant property that determines the form of the classifier may be the three-dimensional depiction of the shape of an object (e.g. the hand representing a round item by assuming that shape), a two- or three-dimensional depiction of the outline of an object (e.g. the index finger tracing the outline of a mirror), or the depiction of an object's movement while it is handled or manipulated by a hand (e.g. while using a particular tool). Classifiers are part of the non-core lexicon [Lexicon – Section 1.2] of sign languages and are found – albeit to varying degrees and with various lexical differences – in every sign language studied to date.

5.0.2 Phonological and morpho-syntactic characteristics of classifiers

Classifiers in sign languages generally occur in combination with verbs, and only with verbs of motion or location (Zwitserlood 2003). They are used with predicates indicating a referent's motion through space, a change of posture, and the location or existence of a referent somewhere in the signing space. They also indicate a referent by the handshape that is involved in handling that referent (e.g. the handshape depicting the shape of the hand while holding a book). Classifiers combine with verb stems that are unspecified for handshape. Morphologically, they can thus be considered as bound morphemes; they have to combine with another item, and forms that contain classifiers are thus polymorphemic.

Phonologically, the resulting form, the verbal complex made up of a classifier and a verb, is usually monosyllabic [Phonology – Section 2.1.1]. Classifiers may involve an orientation feature, but they lack movement features (the movement features seen in classifier constructions represent a feature of the verb). Only a subgroup of classifiers, Size-and-Shape Specifiers, involve movement, not to represent the motion or location of an entity, but rather to represent the existence and the size and shape of that entity.

Semantically, classifiers [Semantics – Chapter 7] are underspecified, in that they refer to an iconic property of a particular entity by referring to a property of the class of similar entities, thus they are pronominal items (proforms).

5.0.3 Terminology and classification

The term "classifier" has originally been used for morphemes in spoken languages that distinguish classes of nouns from each other (on a par with the inflectional notion of grammatical gender; e.g. Allen (1977), see also Aikhenvald (2000) for an overview). For the sake of illustration, we provide one example from Caddo (Southeastern US). Caddo employs predicate classifiers which attach to the verb stem and which classify the object according to certain physical/shape properties. As is evident from the example, it is only the classifier (CL) that disambiguates the meaning.

a. Kapí: **kan**-čâ:ni'ah
   coffee CL_{liquid}-buy.PAST
   'He bought (liquid) coffee.'
b. Kapí: **dân:**-čâ:ni'ah
   coffee CL_{powder}-buy.PAST
   'He bought (ground) coffee.' (Caddo, Mithun 1986: 386)

The term "classifier" was first introduced into sign linguistics by Frishberg (1975). The term is generally used in the literature to refer to classifier handshapes, while the predicates these handshapes combine with are referred to as "classifier predicates/verbs". However, various other terms for verb-classifier combinations have been used in the literature, including "depicting verbs" (Liddell 2003), spatial-locative predicates, polymorphemic predicates/verbs of motion/location, polysynthetic signs, polycomponential verbs, and productive signs (Schembri 2003). This multitude of terms is also due to the fact that the exact nature of classifiers is still debated among sign linguists, with analyses ranging from gestural to inflectional elements. In the following, we will stick to the terms "classifier" and "classifier predicate", but the grammar writer is, of course, free to adopt other terminology. Independent of the terminology chosen, it is suggested to treat classifiers separately in the grammar, rather than including them as a subsection within any of the previous chapters (compounding, derivation, inflection) – especially given the lack of consensus in the literature concerning their status.

Beyond these terminological and analytical issues, different types of classifications have been suggested by different researchers, the most detailed one being the one by Supalla (1986, 1990) (see Schembri (2003) and Zwitserlood (2012) for overviews). Below we present four types of classifiers that are known to occur in almost every sign language, and we use terms that are fairly common in the literature: entity classifiers, bodypart classifiers, handle classifiers, and Size-and-Shape Specifiers. However, the grammar writer may wish to adopt another classification or other terms.

5.0.4 Comparison with classifiers in spoken languages

The elements that are commonly referred to as "classifier" in sign language linguistics share some properties with classifiers in spoken languages (see Zwitserlood (2012) for discussion). In particular, both refer to classes of objects, based on certain semantic characteristics. For example, a particular Bantu language (a language group that typically has a large number of classifiers) may have a classifier for nouns denoting sharp objects, another one for bony entities, and another one for flat objects, etc. Another similarity is that classifiers in spoken languages are generally bound morphemes (see the Caddo example above), just like classifiers in sign languages.

These similarities notwithstanding, however, not all scholars agree that the two phenomena are sufficiently similar to justify a comparison, and by implication, the use of the same label (e.g. Schembri 2003). For instance, classifiers in spoken languages are often used as concord (i.e. they also appear on adjectives, determiners, etc.), while classifiers in sign languages group nouns in terms of certain iconic (visual) characteristics. Also, in sign languages, it is not uncommon for a classifier to refer to different *kinds* of entities in different contexts (for instance, a ☝-handshape referring to a person or a pen). This also explains why some authors prefer to use a different label for predicates that may undergo a handshape change based on one of their arguments (as described above).

5.0.5 Methodological challenges

The form of a particular classifier may be variable since classifiers [Lexicon – Section 1.2.1] are part of the non-core lexicon. As classifiers are based on the iconic similarity of the shape of an entity or action, their shape may vary from one context to another, albeit within certain limits. There are also differences in lexicalization and grammaticalization depending on the age of the sign language (Aronoff et al. 2003). A related issue which makes the analysis difficult is that a classifier may be identical to (a) a lexeme and (b) a gesture. For example, the lexeme for 'knife' may be used as a classifier for all cutting objects, and within the same sentence, the same form may be used as a classifier or as a lexicalized expression. Similarly, a classifier and a gesture may have the same form. Thus the grammar writer has to determine whether a particular form is truly a classifier. However, since classifiers may not be obligatory, their syntactic distribution is not easy to determine.

Secondly, the class of entities denoted by a classifier may not be strictly definable. A particular entity may be associated with a particular classifier on the fly. Thirdly, the grammatical category of a classifier may not be straightforward. Some researchers consider classifiers as (inflectional) agreement markers, others as valency changers. Next, there is variability in the choice of classifier, concomitant with their inclusion in the non-core lexicon.

Assignment of classifiers to a specific type may pose an additional methodological challenge. Some scholars, for instance, include whole body classifiers, which are articulated by the whole (upper) body rather than the hand(s), in the group of entity classifiers. It may at times be difficult to draw a line between whole body and bodypart classifiers. Similarly, there is overlap between static Size-and-Shape Specifiers, which represent the outline of the whole of the referent, and whole entity classifiers (e.g. a -handshape representing a button on a shirt). Handle classifiers, similarly, may show overlap with the other groups.

The distinction between different types of classifiers is based on their syntactic functions and not on their semantics (see the discussion of classifiers in the Semantics Part [Semantics – Chapter 7]). A particular entity (e.g. a book) can be expressed by an entity classifier (flat hand) in the sentence 'There are books in the bookcase', while the same entity can be expressed by a handling classifier in the sentence 'I took a book from the shelf'. Moreover, in most sign languages, signers can use different classifiers to focus or defocus different parts of the same entity. The grammar writer should be aware of such overlaps and differences and decide on each particular case after analyzing all the classifiers in the language.

Finally, it is important to point out that Size-and-Shape-Specifiers as a group behave differently from the other classifier types, as they do not combine with predicates but rather function (in most cases) as nominal modifiers that resemble adjectives. The grammar writer might therefore decide to treat Size-and-Shape-Specifiers not as a morphological phenomenon but rather as a lexical category and thus include them in the section on adjectives [Lexicon – Section 3.4].

5.1 Predicate classifiers

5.1.1 Entity classifiers

Entity classifiers (or whole entity classifiers) may refer to inanimate or animate objects. Some examples of whole entity classifier handshapes that are common across sign languages are the -handshape (for objects with smooth flat surfaces, e.g. a sheet of paper or a book), the -handshape (for long and/or thick cylindrical objects, e.g. a cup or a tree), and the -handshape (for long, thin objects, e.g. a pen or a person). They occur in verbs that express a motion of a referent, its localization in space, or its existence in space, and are combined with the phonological motion feature of the verb. When the predicate expresses the location of an entity, it usually includes a short movement towards a plane, as, for instance, in the example below, where the relevant plane is the horizontal plane representing the table. The -handshape represents a glass (which is not explicitly mentioned in this example).

TABLE MILK BE-LOCATED (NGT)

'A glass of milk is on (top of) the table.'

When the predicate expresses the movement of an entity, then there is usually a wider choice of movement shapes (e.g. straight, zigzag, circle) that can be executed on various planes. In the following example, movement of the 🤏-handshape (representing a car) proceeds on an angular plane. (Note that in the gloss, we choose to represent the classifier predicate as MOVE-UP, combined with a morpheme for the classifier handshape. However, in the literature, various strategies are used for glossing such predicates. The glosses below do not include the information that the palm of the hand is oriented downward.)

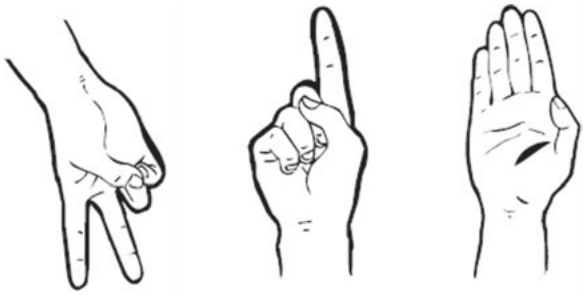
HILL CAR MOVE-UP-CL:🤏
'A car moves/drives up a hill.' (NGT)

In both types of verbs, the classifiers represent the referent directly; in a sense, the handshape *is* the referent. Whole entity classifiers combine with intransitive verbs; these verbs have a single internal argument that receives the thematic role patient (the glass and the car, respectively, in the examples above), thus they are unaccusative [Syntax – Section 2.1.1.2] / unaccusative verbs.

The grammar writer should strive to inventory the classifier handshapes that combine with verbs of location and motion in the sign language. It is likely that most of the handshapes identified may combine with both types of verbs – but this is not necessarily the case. Providing an inventory of attested entity classifiers is informative, as it has been shown that sign languages differ from each other with respect to the number and forms used. For instance, Zwitserlood (2003) identified 15 entity classifiers for NGT, while Bauer (2014) found only three entity classifiers in Yolngu SL, and these were quite specific, referring to legged entities, a didgeridoo (*yidaki*), and boats (note that the first one will actually be classified as a bodypart classifier below). We suggest that the grammar writer present the entity classifiers in the form of a handshape chart. As an inspiration, we provide an excerpt of a table from Zwitserlood (2003), as well as a figure showing the Yolngu SL entity classifiers identified by Bauer (2014). Note that Zwitserlood also specifies the classes of objects a classifier handshape may refer to, and the grammar writer may wish to adopt a similar strategy.

Table Morphology-5: A selection of handshapes used in entity classifiers in NGT (Zwitserlood 2003: 138)

EC	**flat and wide entities**: books, sheets of paper, walls, table tops, cars, bicycles, trains, helicopters, flying saucers, CD-ROM discs, circles, squares
EC	**long and narrow entities**: poles, pens, knives, toothbrushes, branches, trees **animate entities:** humans, animals
EC	**3D round entities**: balls, apples, tomatoes, stones
EC	**(3D) entities:** squares, circles



legged entity yidaki boat (YSL, Bauer 2014: 197)

Finally, it is worth noting that Nyst (2007) found that Adamorobe SL does not make use of entity classifiers at all – except for a few cases in which a classifier is used to indicate the location of an entity on the signer's body. Movement predicates, however, never combine with entity classifier handshapes. Rather, AdaSL employs what she calls "generic directionals", movement predicates with unmarked, lax handshapes that do not reflect any shape characteristics of the moving entity.

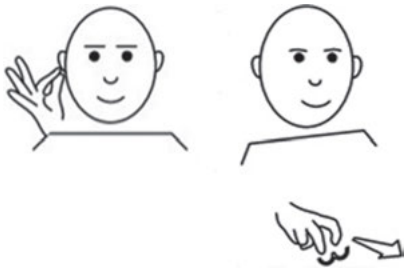
5.1.2 Bodypart classifiers

The Yolngu SL chart in the previous section illustrates that bodypart classifiers (also referred to as limb/body part classifiers) are sometimes subsumed under entity

classifiers. While it is true that they also refer to entities, they don't refer to entities as a whole but rather to parts of a human or animal body, mostly limbs, expressed, for instance, by a -handshape or a hooked -handshape for legs or two -handshapes for feet. Just like entity classifiers, bodypart classifiers may express the location or movement of entities, as shown in the examples below.

CHAIR CAT BE-LOCATED (NGT)

'A cat is sitting on a chair.'



WOMAN WALK (DGS)

'The woman walks.'

Other bodypart classifiers may refer to the head of an animate being (e.g. the -handshape in the verb BOW), to the mouth, or even to the eyelids. In the following ASL example, the - or -handshape represents at the same time the head and the horns of the cow, and it shows how the body part is moving (bowing).

COW HORNS+BOW

'The cow bowed its head.' (ASL, Grose et al. 2007: 1275)

Note that bodypart classifiers sometimes function like entity classifiers. In the 'cat'-example above, for instance, the bodypart classifier represents the whole cat, despite the fact that only her legs are represented by the handshape. In this sense, it functions pretty much like the -handshape in the 'glass'-example in the section on

entity classifiers. Still, the (iconic) feature represented by the handshape is clearly different in both types of classifiers.

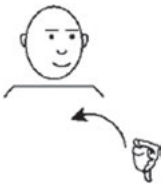
In addition, researchers have argued that the morphosyntactic properties of bodypart classifiers are different from those of entity classifiers. Just like entity classifiers, they combine with intransitive predicates (e.g. WALK, SIT, BOW), but these predicates are unergative [Syntax – Section 2.1.1.2] / unergative, that is, they have a single external argument to which the thematic role agent is assigned (Benedicto & Brentari (2004); but see Grose et al. (2007) for an alternative view), and it therefore makes sense to present them separately from the entity classifiers. Still, the grammar writer may wish to present these two classifier types within one section of the grammar, given that they differ as a group from the handle classifiers discussed in the next section.

As in the previous section, the grammar should include a table or figure charting the attested bodypart classifiers.

5.1.3 Handle classifiers

Handle (or handling) classifiers occur with verbs that involve the holding or the manipulated motion of a referent. In contrast to entity [Morphology – Section 5.1.1] and bodypart classifiers [Morphology – Section 5.1.2], they represent the entity they refer to indirectly, as they represent only the part of the object that is handled, for example, the stem of a flower, the handle of a basket, or the handle of a knife. In other words, they encode an iconic aspect associated with an action involving the theme of a verb, but they do not reflect the characteristics of the theme per se. Sometimes the theme is simply an object that is being held or transferred (e.g. given to someone). However, the theme may also exert force or may have some other effect on another object; in this case, scholars sometimes speak of "instrument" classifiers (e.g. handling a hammer, key, or toothbrush). Still, the classifier handshape reflects how the instrument is handled, and in this sense, instrument classifiers are a subtype of handle classifiers. It is up to the grammar writer to decide whether s/he wants to discuss instrument classifiers separately – within this section or in a separate section. This might make sense, for instance, if it turns out that some handshapes are used only as instrument classifiers.

Obviously, one and the same object may fulfill both functions. A hammer, for instance, can be given to someone or be used as an instrument – and in both cases, the predicate would combine with the -handshape. Other attested handle classifiers include the -handshape for cylindrical objects and the -handshape for long and thin objects (e.g. a flower or pen), as in the example below, where the classifier actually indicates that the cup is picked up by the handle.



'(Someone) picks up a teacup (by the handle).' (NGT, Zwitserlood 2003: 100)

Since handle classifiers reflect properties of a theme argument, and since handling or manipulating an object always implies an agent, it follows that handle classifiers, in contrast to entity and bodypart classifiers, combine with transitive [Syntax – Section 2.1.1.1] / transitive verbs (Benedicto et al. 2007).

Depending on the size of the handled object, handle classifiers may be one- or two-handed. Some of the examples mentioned above make clear that one and the same object may be reflected by different handshapes depending on whether it appears in an intransitive or transitive clause, that is, whether it triggers the use of an entity/bodypart or handle classifier. For instance, a pen would be represented by a -handshape in sentence (a), but by a -handshape in sentence (b). (An exception to this, in many sign languages, is the classifier handshape for cylindrical objects, which is identical for entity and handle classifiers.)

a. TABLE PEN BE-LOCATED-CL: → entity CL
'A pen is lying on the table.' (NGT)

b. FRIEND INDEX$_3$ PEN $_1$GIVE$_3$-CL: → handle CL
'I give my friend a pen.' (NGT)

As in the previous sections, this section of the grammar should include an overview of the attested handle classifiers (with the subtype instrument classifiers being included in this chart or presented separately). Below we present an excerpt from a table provided by Zwitserlood (2003).

Table Morphology-6: A selection of handshapes used in handle classifiers in NGT (Zwitserlood 2003: 139)

	HC	**3D round/cylindrical entities**: glasses, mugs, apples, balls, poles, circles, trees **small/flat entities (compared to shape of manipulator)**: clothes, feet, books
	HC	**small/thin entities**: pins, pens, handkerchiefs, buttons, cups (by handle)
	HC	**flat entities**: piles of paper, towels, books

5.2 Size-and-Shape Specifiers

As the name says, Size-and-Shape-Specifiers (SASS) express the size and shape of entities. SASS come in two types: static SASS and tracing SASS.

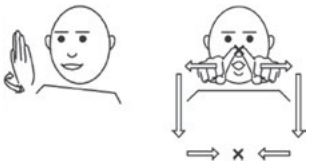
Static SASS are handshapes that indicate classes of objects with a particular shape. Often the handshape reflects (part of) the outline of the object, as in examples (a) and (b) below, but in principle, it may also be the surface of the hand that reflects the size and the shape of the object, as in (c).

a. b. c.

'square object' 'small round object' 'wide flat object' (NGT)

As already pointed out under "Methodological challenges" [Morphology – Section 5.0.5], static SASS are very similar to entity classifiers. This is particularly evident for the handshape (c), which, in many sign languages, is considered to be the entity classifier for flat objects (e.g. books, cars). The only difference between the static SASS in (a) and (b) and most entity classifiers is that the SASS represent an entity by means of its outline – but the same is actually true for the entity classifier for cylindrical objects discussed above. Consequently, some scholars do indeed subsume static SASS under entity classifiers (e.g. Zwitserlood 2003). The grammar writer may decide to follow this line of reasoning and include static SASS in the section on entity classifiers.

Things are different for the second type, the tracing SASS, as these involve a movement component by which the outline of the object is traced. As also pointed out in the section "Methodological challenges", one important property that sets these apart from entity, bodypart, and handle classifiers is that they do not combine with verbs to form morphologically complex predicates. Rather they accompany nouns within a noun phrase and thus function more like adjectives (also, they may combine with a noun within a compound [Morphology – Section 1.1.1.3]; e.g. SWIM $SASS_{square}$ 'swimming pool'). In addition, they can, in principle, be of any shape. Consider the following example for illustration.



MIRROR $SASS_{square}$ (LIS, Baker & Pfau 2016: 104)

'a square mirror'

If the sign language under investigation does have SASS, then it will probably be unnecessary (if not impossible) to provide a list of all the SASS attested. It may, however, be worth investigating whether the sign language allows for different handshapes in order to specify the depth of the object the outline of which is traced. For instance, when tracing a rectangular shape, the signer might use a -handshape to indicate a 2-dimensional object (e.g. a sheet of paper) or a -handshape to indicate a 3-dimensional object (e.g. a box).

Remember, however, that this whole section might not appear if the grammar writer decides to address static SASS under entity classifiers and tracing SASS within the section on adjectives [Lexicon – Section 3.4] in the Lexicon Part. The header "Predicate classifiers" will then become unnecessary, and the sections on entity, bodypart, and handle classifiers will get second-level headers.

Elicitation materials

In order to elicit different types of classifiers, researchers have used pictures, picture stories, and short video clips (e.g. cartoons). Zwitserlood (2003), for instance, used pictures of static and moving entities, including non-existent entities (e.g. a three-legged alien, a flying dog, etc.) to elicit entity classifiers. Various objects that are known to be depicted by classifiers in sign languages (round objects, instruments, entities of various shapes) as well as human and animal figurines (e.g. made by legos; see Perniss 2007) can be placed in various locations, moved around, etc. Informants can be asked to describe the location and movement of these objects. Descriptions of different people wearing different garments and having different physical attributes may generate SASS. Pictures of novel objects that can only be identified by visual description, likewise, can generate SASS. Films containing such objects can be shown to informants who can then be asked to describe what they have seen in the film. These can include people handling different objects and interacting with each other (as, for instance, the German TV *Sendung mit der Maus* cartoons used by Perniss (2007)). The picture story *Frog, where are you* as well as the famous animated *Canary Row* cartoons have been used with various sign languages to elicit classifiers.

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Chapter 0 Preliminary considerations

0.1 What is syntax?

Languages have a component that is responsible for the combination of simple items, such as words or signs, into more complex entities, namely phrases, clauses, and sentences. This combinatorial component of language is called syntax.

Syntax is responsible for how sentences are constructed. Human languages, including of course sign languages, have a recursive hierarchical syntactic organization, by which words and signs are combined to form phrases, which can also be combined to form more complex entities, clauses, which in turn can combine to form sentences.

Sequences of words/signs that conform to the rules of syntax are said to be well-formed or grammatical, and those that violate the syntactic rules are therefore ill-formed or ungrammatical. Conventionally, ungrammatical sentences are signalled by an asterisk preceding the string, as in the following example in LIS.

a. PROFESSOR TEACH NOT
b. *PROFESSOR NOT TEACH (LIS)

As is made clear by the ungrammaticality of (b), part of what syntax does is order words/signs: in LIS, as shown by the example, negation follows the verb and does not precede it, and this is described as a rule of syntax. Many sign languages, LIS included, are known to have a relatively free word order, but constraints like the one illustrated above can always be found, showing that order is indeed a relevant dimension even in those languages.

But word/sign **order** is not the only dimension that is relevant for syntax.

Another crucial syntactic dimension is **agreement**, i.e. the relation by which one constituent shares some properties with some other constituent in the same environment. For example, many verbs in many sign (and spoken) languages can agree with their arguments. In the LIS example above, the orientation of the sign for TEACH can be modified to include the location in space associated to the teacher and/or his/her student.

Both order and agreement are known to be **structure dependent**: syntax does not order and put in relation single words/signs, but rather hierarchically organized constituents.

This part is devoted to outline the various domains of syntactic structure, describing for each of them the principles of their internal organization in terms of order, agreement and other dependency phenomena.

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0.2 Organization of the syntax part

We have chosen to organize the Syntax part in a very traditional way, by first introducing sentence types, then presenting the various aspects of clause structure, and then describing coordination and the various types of subordination. Finally, we devote three chapters to the internal structure of noun phrases, adjectival phrases, and adverbial phrases.

The terminology that we use in most cases is not theory oriented and not particularly technical. Instead, we have used linguistic terms that are as much as possible shared among linguists working on language description, no matter whether this happens from a theoretical, a purely descriptive, or a typological point of view. This is why, for example, in the chapter dedicated to clause structure we did not include any section devoted to the CP (Complementizer Phrase) area, the IP (Inflectional Phrase) area, or the VP (Verb Phrase) area (all concepts defined in the generative grammar framework). The starting point is argument structure, its modifications, its relation to grammatical structure and how this defines word order.

The part might appear as non-uniform in many cases, and this might be due to a number of reasons.

In some cases, the aspect to be described has received much attention both in spoken language linguistics and in sign language linguistics, and there is a lot to start from and a lot to be said in order to guide the grammar writer in his/her description of the relevant aspect of the grammar. This is true, for example, for the section on interrogatives, which is very detailed. At the other extreme, very little is known about exclamatives in sign and spoken languages, and the Manual only contains very general recommendations and descriptive categories that mainly come from research on spoken languages.

In some cases we were able to fill in the gaps and to progress in our understanding of the phenomenon to be described even when no explicit literature was available, and we included original findings as the starting point for the relevant section. This is the case of the imperative section (1.3), an area of sign language grammar about which very little had been published before we launched a specific research project to gather information and provide the guidelines for grammar writers. The same is true for passives (2.1.3.2), where specific research was implemented by a SignGram team. But it was not possible to do this in all cases, and some sections contain generic guidelines not specifically oriented towards sign language linguistics but general recommendations concerning non manual markers, simultaneity, and other modality specific features. Again, exclamatives (1.4) is a good example of an outline section more meant as an incentive for research and descriptive work than as a full-fledged blueprint of a chapter.

0.3 How to use the syntax part

Although we strived to make the discussion of each topic as self-contained as possible, the Syntax part is not an isolated piece of work, and should not be read or used as such. It interacts crucially and fruitfully with the other parts of the Blueprint.

The exact division of labour in particular with the Semantics part has been in many cases difficult and controversial. In all the difficult cases, we opted for the simplest solution: we only briefly mentioned semantic aspects when they were necessary in order to define and delimitate the syntactic phenomenon, and only restricted the treatment to aspects concerning word order and in general grammatical facts. An example of this difficult divide is Section 3.5 on adverbial clauses: each type of adverbial clause needs some semantic information in order to be defined, which we kept to the minimum in this section, and developed in the Semantics part. This entails that the syntax of many phenomena really needs to be completed and integrated with the semantics of the same construction, and we strongly recommend the grammar writer to implement this integration by systematically using the hyperlinks that we provided in this work.

The same interaction and necessary integration holds with the Lexicon and the Morphology parts, although to a lesser degree: in many cases, some syntactically relevant elements are only described here in their syntactic behaviour, while their actual and concrete realization is given and discussed in the Lexicon and/or the Morphology parts. An example of this situation is *wh*-elements, which are described in their syntactic dimension, akin to word order and relation to non-manual markings and their syntactic extension (1.2.3), but are listed and described in the Lexicon part.

Finally, there are phenomena that really belong to all parts of the grammar and could not possibly be assigned to one component without missing some very important aspect. This is in particular the case of negation, which is clearly a syntactic phenomenon in that it has its own distributional and order dimension (described in Section 1.5), but is of course a crucial dimension of the semantics of proposition; it is expressed through morpho-lexical means and might affect prosody and other phonological aspects. In these admittedly few cases, we opted for redundancy, and the reader will find a relevant section in each of the parts of the Blueprint.

Chapter 1 Sentence types

1.0 Introduction

A sentence is a unit in which words are grammatically linked to make a statement or to describe something (typically via a declarative sentence), to express a command (typically via an imperative sentence), to elicit information from an addressee (typically via an interrogative sentence), or to convey surprise (typically via an exclamative sentence). Sentences can be classified according to two main dimensions: their type (declaratives, imperatives, interrogatives, and exclamatives) and their internal complexity. A sentence is simple when it consists of a single independent clause (‘Mohammed arrived on time’), while it is complex when it consists of a main and a subordinate clause (‘I think that Mohammed arrived on time’) or of two (or more) coordinate clauses (‘Mohammed arrived on time, and Sarah arrived late’).

In principle the number of subordinated clauses is unlimited ('John said that I think that Mohammed claimed that Kazuko is convinced that you arrived on time') although in practice there are limitations of the sentence length due to cognitive limitations (for example, working memory).

The dimension of sentence types and of complexity intersects. For example declaratives and interrogatives can be subordinated ('I think that Cheng arrived,' 'I wonder who arrived'). However, typically imperatives cannot be subordinated.

The typical sentence contains at least a predicative nucleus consisting of a subject and of a predicate (for example, in 'John is smart' the property of being smart is predicated of John, and in 'Mary thinks that John is smart' the property of thinking that John is smart is predicated of Mary). However there can be elliptical sentences with a minimal structure. For example, consider the question-answer pair 'Who arrived late? Fatima.' In this case, the single word utterance 'Fatima' can be considered a sentence as long as it is interpreted as the elliptical version of 'Fatima arrived late.' In this chapter the sentence type dimension is explored.

The most prominent categorization of sentences is according to their function: declarative, interrogative, imperative, and exclamative.

1.1 Declaratives

1.1.0 Definitions and challenges

Declaratives are probably the most common type of sentence in any given language. Declarative sentences are used to express statements, to make something known, to explain, or to describe. This means that declaratives are the dominant type of sentences in human communication. Prosodic features are usually neutral unless a specific part of the sentence is stressed for emphasis. In written documents, especially in essays and reports, most of the text consists of declaratives. Hence, when we support an idea or have a discussion or debate our arguments are mostly based on declarative sentences.

The simplest formula to construct a declarative is to use two constituents, a subject and a predicate. This is illustrated below, in English and ASL.

Maria likes cats.
JOHN LIKE CHOCOLATE
'John likes chocolate.' (ASL, Neidle et al. 2000: 81)

Declaratives can be simple sentences as above or more complex constructions with more than one coordinated [Syntax – Section 3.1] / coordinated declarative sentence as in the following English and ASL examples.

Maria likes cats but hates dogs.
We will meet at the bar and then we will go to the theater.

$_{1}$PERSUADE$_{3}$, BUT CHANGE MIND
'I persuaded her to do it but then I/she/he changed my mind.'
(ASL, Sandler & Lillo-Martin 2006: 300)

In terms of meaning, declaratives are subdivided into affirmatives and negatives [Syntax – Section 1.5] / negatives. An affirmative or positive sentence is used to express the validity or truth of a basic assertion while a negative sentence expresses its falsity. This quality of meaning is often referred to as polarity. Positive and negative sentences are illustrated below, in English and ASL.

Maria likes cats.
Maria doesn't like cats.

JOHN BUY HOUSE
'John is buying a house.' (ASL, Neidle et al. 2000: 81)

neg
JOHN NOT BUY HOUSE
'John is not buying a house.' (ASL, Neidle et al. 2000: 44)

Sign languages make use of declaratives just like spoken languages. However, the grammar writer will not easily find studies, journal papers, articles, or book chapters specially devoted to declaratives. As already discussed, declaratives are the most common type of sentences. Therefore, declaratives are the unmarked or most neutral type of sentence in comparison to the other three types. As such, declaratives are the compass for examining various grammatical structures. For instance, basic word order is usually determined by the word order of declarative sentences (Bussmann 1996). Furthermore, declaratives are a point of reference for defining the other three sentence types: interrogative [Syntax – Section 1.2] / interrogative, imperative [Syntax – Section 1.3] / imperative, and exclamative [Syntax – Section 1.4] / exclamative. Any analysis of these three sentence types must explain how they differ from declaratives. Moreover, declaratives feature in various analyses of coordination [Syntax – Section 3.1] / coordination, subordination [Syntax – Section 3.2] / subordination, and negatives [Syntax – Section 1.5] / negatives.

References

Main sources on declaratives in sign languages:

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1.2 Interrogatives

1.2.0 Definitions and challenges

1.2.0.1 Defining an interrogative

The term interrogative refers to a grammatical form that is specialized to elicit information from the addressee (as in the direct interrogative 'What have you done?') or to report a doubt or a similar attitude towards a certain propositional content (as in the indirect interrogative 'I wonder what you did'). Typically, interrogation is expressed by a full sentence, but sometimes a part of the interrogative sentence is unexpressed ('Any problem?' meaning 'Do you have any problem?'). Interrogatives are one of the four recognized sentence types, the other three major types being declaratives [Syntax –Section 1.1], exclamatives [Syntax – Section 1.4], and imperatives [Syntax – Section 1.3].

A potential confounding factor is that sometimes an interrogative can be used to express a command ('Could you pass me the salt, please?') and, conversely, an imperative can be used to elicit information from the addressee ('Tell me the name of the president'). Still, languages develop grammaticalized forms that are *typically* associated with interrogation and these forms are the topic of the present chapter in which we abstract away from the specific uses that these forms can have.

1.2.0.2 Types of interrogatives

It is possible to distinguish between polar interrogatives, alternative interrogatives, and content interrogatives.

Polar interrogatives are sometimes called yes/no interrogatives because they ask whether a certain state of affairs holds or not, so they are naturally answered by 'yes' or 'no'. A direct polar interrogative in English is 'Are you sick?', while an indirect polar interrogative in English is the embedded clause in 'I wonder whether you are sick.'

Alternative interrogatives are so called because they present two or more options for the reply. A direct alternative interrogative in English is 'Do you want coffee or tea?', while an indirect alternative interrogative is 'He asked me whether I preferred coffee or tea.'

Content interrogatives elicit a more elaborate answer than 'yes' or 'no' because they are used to ask the addressee to fill in some specific missing information. In many languages, they contain a specialized set of interrogative words or phrases that have a common morphological marking (*what*, *which*, *who*, *why*, *when*, etc.). Since in English this marking is the morpheme *wh-*, content interrogatives are sometimes called *wh*-interrogatives. The term *wh*-sign will be used for signs which roughly correspond to *wh*-words.

A direct content interrogative in English is 'What do you want?', while an indirect content interrogative is 'He asked me what I wanted.'

It is worth stressing that indirect interrogatives are typically embedded in declarative sentences, so the markers for interrogatives (for example, some of the non-manual markers, *wh*-signs, and interrogative particles) are expected to occur only in the embedded clause and not in the entire sentence. Furthermore, the distribution of *wh*-signs in direct interrogatives and indirect interrogatives may not be the same in a language.

1.2.0.3 Methodological challenges

In some languages interrogative words have systematic non-interrogative uses. This the case with *wh*-words in English, which have at least two well established uses in non-interrogatives, namely in relative clauses / relative clauses [Syntax – Section 3.4] ('the man who you met') and in exclamatives [Syntax – Section 1. 4] ('What a nice dress!'). The use of the same morphology for interrogatives and relatives appears to be an idiosyncratic property of Indo-European languages (and very few other languages). Since sign languages are not typologically related to Indo-European languages, there is no expectation that interrogative signs are used in relative clauses in sign languages. In fact, relativization is not expressed by interrogative signs in the sign languages for which a description of relative clauses is available.

Little is known about exclamatives in sign languages. However, since it is cross-linguistically common to find languages in which exclamatives resemble content interrogatives (Michaelis 2001), it would not be too surprising to find an interrogative sign with an exclamative meaning.

The grammar writer should be aware of the existence of rhetorical interrogatives, which are used more to assert something than to elicit a reply. Rhetorical interrogatives can be used if what is asserted is thought to be obvious or at least shared information in the context of utterance. Examples are 'Who would support cannibalism?' to express the meaning that nobody would support it, or 'Who does not like chocolate?' to assert that almost everybody likes chocolate. Although rhetorical interrogatives may not have a form distinct from the form of true interrogatives, they may have different intonation patterns. Similarly, sign languages may mark rhetorical interrogatives with special non-manual marking. A slightly different case of interrogatives that are not used to elicit information is so-called echo questions, as in 'You did WHAT yesterday?!!': echo questions are typically uttered to express surprise in reaction to a claim by the adressee, or to ask him/her to repeat the part of the previous utterance that causes surprise. Typically, echo questions have both syntactic and prosodic peculiarities.

A final caveat is that the influence of the dominant spoken language might complicate the picture of interrogatives. For example, it is not uncommon to find a sign language in which *wh*-signs are allowed either on the left or the right edge of the clause and the dominant spoken language allows *wh*-words only on the left edge. In these cases, it is conceivable that the possibility of having a *wh*-sign on the left edge of the clause is due to the influence of the spoken language. Although it is not easy

to resolve this issue, there are ways to investigate it. For example, the neutral order of a complex wh-phrase in LSC is noun/*wh*-sign (BOOK WHICH), although the canonical order in Catalan (WHICH BOOK) is also attested. In particular, the Catalan order is possible when the *wh*-phrase is in the left periphery of the clause, the normal position of *wh*-phrases in Catalan. However, when the *wh*-phrase occupies a right peripheral position of the clause (an option that is not available in Catalan) the order noun/*wh*-sign becomes mandatory. This can be taken as indirect evidence that the order with the *wh*-phrase in the left periphery is indeed a borrowing from Catalan. Similar ways to disentangle the issue of syntactic borrowing from the spoken languages can be envisaged.

1.2.0.4 Non-manual marking

When investigating interrogatives, the grammar writer should be aware of the fact that non-manual markers play an important role in interrogatives in sign languages. In many sign languages, the presence versus absence of non-manual markers is the only way to distinguish between declarative and interrogative utterances. Examples of non-manual markers in interrogatives include facial expressions such as eye contact with the addressee, eyebrow raise or lowering, change in head and body orientation, head nod, and head shake. For example, in HKSL, the sentence below without a brow raise would be the declarative sentence 'He will go to watch movies.'

y/n
IX$_3$ GO WATCH^MOVIE
'Will he go watch movies?' (HKSL, Tang 2006: 201)

Researchers have observed that sign languages may employ different non-manual markers for different types of interrogatives. Even for one type of interrogative, usually more than one non-manual marker is observed. The sequence of manual signs a non-manual marker co-occurs with is called the spreading domain of the non-manual marker. The spreading domain of a non-manual marker may be the entire utterance or a smaller constituent. If various *wh* non-manual markers occur in the same interrogative clause, their spreading domains may differ: while one non-manual marker may spread over the entire utterance, another may spread over the predicate and yet another may co-occur only with the interrogative word (in content interrogatives).

Furthermore, each non-manual marker may have a different (prosodic, syntactic, semantic or pragmatic) function.

Finally, non-manual markers may also change depending on the pragmatic conditions within which the interrogative is used; for instance, it has been reported for Israeli SL (Meir 2004: 104) that even though polar interrogatives are usually uttered with raised brows, open eyes, and head and body tilted forward, these may change depending on the intention of the signer. 'Do you have a car?' uttered, for instance, at the end of a social event may actually mean 'Can I have a ride with you?'. In such cases, the

polar interrogatives in Israeli SL is uttered with furrowed brows, a non-manual marker similar to those observed in content interrogatives. Similiarly, pragmatic factors may determine the type of non-manual marker that occurs in a content interrogative as well. For example, it has also been reported for Israeli SL that the facial expression associated with content interrogatives (furrowed brow) is replaced with a different expression if the interrogative does not require an answer but involves reproach (as in 'Why did you just walk out of my store with that shirt without paying?') (Meir & Sandler 2008). Thus, the grammar writer should be aware of the influence of pragmatic conditions on the use of non-manuals in interrogatives.

Interrogatives may also contain constituents that function as topics [Pragmatics – Section 4.2] / topic, i.e. constituents that link the current utterance to the previous discourse. In many sign languages, topics are marked non-manually, and when they occur in interrogatives, they are excluded from the spreading domain of an interrogative non-manual marker. The following ASL sentence (taken from the corpus of the National Center for Sign Laguage and Gesture Resources, available on-line at http://secrets.rutgers.edu/dai/queryPages/) is an example where the *wh* non-manual marking occurs over the entire sentence but for the topicalized constituent, over which the topic non-manual marking occurs.

5_1.2.0.4_1_ASL_who vegetable prefer potato PU

wh	top	wh
WHO	VEGETABLE	PREFER POTATO PALM-UP

'As for vegetables, who prefers potatoes?'

(ASL, adapted from Neidle & Vogler 2012)

1.2.1 Polar interrogatives

Polar interrogatives (or 'yes/no interrogatives') may differ from declaratives by (i) the presence of certain non-manual markers, (ii) word order differences, and (iii) the presence of interrogative particles.

1.2.1.1 Non-manual markers in polar interrogatives

Non-manual markers for polar interrogatives tend to be similar across signed languages. The following markers have been identified for the languages studied so far:

- eyebrow raise
- eyes wide open
- eye contact with the addressee
- head forward position
- forward body posture
- head nod

Sign languages usually employ a combination of non-manual markers, their spreading domains may differ, and each non-manual marker may have different functions.

1.2.1.2 Word order changes between declaratives and polar interrogatives

Some languages mark the difference between polar interrogatives and declaratives by a word order change. For instance, the English examples 'You will go' and 'Will you go?' are distinguished by the position of the auxiliary. The grammar writer should have this possibility in mind, although it does not appear to be common in the sign languages studied up to now.

1.2.1.3 Interrogative particles

An interrogative particle is a sign whose main function is to indicate that an utterance is an interrogative. Interrogative particles may be optional or obligatory, and a language may have more than one such particle. The signs for interrogative particles may derive from lexical signs that have lost the original meaning, they may derive from the interrogative mark used in orthography, or they can be traced back to a tag used in the spoken language.

Genuine interrogative particles may occur in the same prosodic unit as the rest of the interrogative. If there is an intervening break, what seems to be the interrogative particle may be a question tag such as 'right?' in a sentence like 'You never go home, right?'. An example of interrogative particle is found in the following HKSL polar interrogative:

y/n
IX$_{2\text{-}1}$ FLY BEIJING GOOD-BAD
'Will you and I fly to Beijing?' (HKSL, Tang 2006: 206)

Interrogative particles should also be distinguished from pragmatic interrogative introducers such as 'ask' or 'I ask you.'

The grammar writer should identify what signs can be used as interrogative particles or tags, if they are specific to polar interrogatives, the extent to which they are obligatory or optional, and if they occur with a specific non-manual marking. Yet another issue to be investigated is their position. From what is known (Zeshan 2004), interrogative particles typically occur either sentence-initially or sentence-finally (preferred position) or in both of these positions. Ideally, all of these issues should be investigated in matrix and embedded polar interrogatives.

1.2.2 Alternative interrogatives

In alternative interrogatives, the signer presents more than one (usually two) alternatives to his/her addressee and asks the addressee to choose one. For example, 'Would

you like to stay at home or go to the park?'. Even though in English and many other languages an alternative interrogative has the form of a polar interrogative with the disjunction marker 'or', the person asking this interrogative does not expect 'yes' or 'no' as an answer. The grammar writer may focus on the distribution of non-manual markers, ask whether they are the same as those found in polar interrogatives, and investigate their spreading domain, that is, which manual signs co-occur with them.

Other issues to be investigated include the use of disjunctive particles, interrogative particles, and word order differences between polar and alternative interrogatives. Ideally, all of these issues should be investigated in matrix and embedded alternative interrogatives.

1.2.3 Content interrogatives

1.2.3.1 Non-manual markers in content interrogatives

While non-manual markers used in polar interrogatives are similar across sign languages, there seems to be more variation with non-manual markers in content interrogatives. Brow furrow has been observed to be quite common. However, there are also sign languages with different markings. For example, in HZJ and ÖGS, the main feature of *wh*-NMM is 'chin up', which may be accompanied by a head thrust forward (see Sarac et al. 2007) and in TİD the main feature is 'head backward' accompanied with head shake (see Göksel & Kelepir 2013).

Researchers have observed that in structures with embedded content interrogatives some of the non-manual markers found in direct interrogatives may occur but others may not.

The grammar writer should list all non-manual markers that can be used in content interrogatives, identifying the domain over which they can occur and, if possible, describing the prosodic, syntactic, semantic/pragmatic factors that determine their distribution. Any difference between matrix and embedded content interrogatives should be identified.

1.2.3.2 List of *wh*-signs

A sign language may contain a paradigm of *wh*-signs with meanings such as the following: *who*, *what*, *which*, *where*, *why*, *when*, *how,* and *how many/much*. It has been observed that sign languages differ in terms of the variety of meanings they express with different manual signs. While some languages have only one *wh*-sign, others have a more extensive paradigm. Researchers have also observed that languages may have a general *wh*-sign with a basic meaning such as 'what'. Three groups of sign languages have been identified with respect to the *wh*-sign paradigms they have.

In the first group, there is only one *wh*-sign that covers the entire range of interrogative meanings and must be combined with non-interrogative signs to express

specific meanings (e.g. IPSL, see Aboh, Pfau, & Zeshan 2006). For instance, TIME+ INTERROGATIVE expresses the meaning 'when', and FACE + INTERROGATIVE expresses the meaning 'who'.

In the second group of languages, there is a general interrogative sign, which covers part of the interrogative word paradigm, but there are also many other *wh*-signs. For instance, Libras has special signs for the meanings 'how', 'why', and 'how many', whereas a general *wh*-sign is used for the other meanings (see Quadros 2006).

The third group of languages, including ASL (see Neidle et al. 2000, Petronio and Lillo-Martin 1997) and LIS (see Cecchetto et al. 2009), have an extensive paradigm of *wh*-signs.

It is not uncommon for time distinctions to be expressed with a combination of a *wh*-sign and a non-manual marker or another manual sign. For instance, the distinction between 'when in the past' versus 'when in the future' may be expressed with a combination of the manual sign for 'when' and the non-manual markers for past versus future tense. Combinations such as INTERROGATIVE + DAY / TIME / HOUR are also used to express meanings such as 'on which day', 'at what time', and 'how long/ how many hours' (Libras, see Quadros 2006).

Possessive meanings, such as 'whose', may be expressed with a *wh*-sign plus a possessive pronoun or a combination of WHO and PERSON.

1.2.3.3 Content interrogatives without *wh*-signs

Content interrogatives without *wh*-signs are commonly observed. In such interrogatives, the utterance is marked as an interrogative either by the presence of interrogative non-manual marking or by mouthing.

wh
COLOR LIKE
'What color do you like?' (NS, Fischer & Osugi 1998)

Wh-signs are usually left out when the specific interrogative meaning can be recovered from the context.

1.2.3.4 Non-interrogative uses of *wh*-signs

A number of sign (and spoken) languages employ the same set of words to express interrogative and non-interrogative meanings. The most common non-interrogative meaning of wh-words or signs is indefinite, that is, the same word or sign can, for instance, be interpreted as 'who' or 'someone'. Another possibility is to have the same set of signs for meaning pairs such as 'manner' and 'how' or 'because/ reason' and 'why'. Usually, these signs are disambiguated by the use of non-manual markers.

1.2.3.5 Position of *wh*-signs

The position of *wh*-signs in interrogative clauses has been investigated in several sign languages and three positions have been attested cross-linguistically: sentence-initial, sentence-final, and *in situ*.

The *wh*-phrase (possibly formed only by the *wh*-sign) plays a grammatical function in the interrogative sentence, e.g. subject, direct object, indirect object, or adverbial modifier. There are languages, both spoken and signed, in which the *wh*-phrase sits in the position that corresponds to its grammatical function. This is the position that that phrase would occupy in a declarative sentence with a neutral word order [Syntax – Section 2.3]. For example, if the *wh*-phrase is a subject it occupies the canonical position for the subject, and if it is a direct object it is found where direct objects occur. The *wh*-phrases that stay in this position are called *in situ wh*-phrases.

In many spoken and sign languages, *wh*-phrases must occupy a dedicated sentence-initial or sentence-final position. A *wh*-phrase moves there from the position that corresponds to its grammatical function by virtue of being interrogative. Many spoken languages, including English, illustrate the sentence-initial option. For example, a direct object normally follows the verb in English but it sits in a clause-initial position both in direct and indirect interrogatives, as in 'What did you buy?' and 'I wonder what you bought.' The *in situ* position may be sentence-initial, as in the English sentence 'Who arrived late?'. Thus, in order to distinguish between sentence-initial languages and *in situ* languages, one needs to look at *wh*-phrases whose *in situ* position is not sentence-initial.

In several sign languages *wh*-signs systematically occur in the sentence-final position. One example is LIS, where the neutral order in a declarative sentence is SOV as in (a). In (a), the verb is followed by an aspectual marker, DONE, which indicates that the event is concluded. However, in the corresponding interrogative sentence in (b), the subject *wh*-sign occurs in a dedicated sentence-final position.

a. GIANNI HOUSE BUY DONE
'Gianni bought a house.' (LIS, Cecchetto et al. 2009: 282)

wh
b. HOUSE BUILD DONE WHO
'Who built the house?' (LIS, Cecchetto et al. 2009: 282)

Just like the sentence-initial position, the sentence-final position may also be the *in situ* position. Hence, to establish the sentence-final position as the position of *wh*-signs, the grammar writer must examine *wh*-signs whose *in situ* position is not sentence-final.

Researchers have observed that the distribution of wh-signs in an indirect content interrogative is not necessarily identical to the distribution of wh-signs in direct content interrogatives. Thus, these should be checked independently in both types of constructions.

When more than one positional option is available for wh-signs in direct interrogatives in a sign language, there might be factors that favor or even force one of these options. For example, heavy *wh*-phrases with a rich descriptive content ('Which of those horrible black trousers') might stay *in situ*, while light ones ('what') might have to move. The pragmatic or semantic factors that favor or force the movement option over the *in situ* option should be investigated language by language.

It has been noted that some sign languages disfavor interrogatives in which the *wh*-sign is very far from the position that corresponds to its grammatical function. For example, something like 'Who does John think that Mary loves?' would be less acceptable than 'Who thinks that Mary loves John?' because in the former the *wh*-sign is an argument of the embedded verb while in the latter it is an argument of the main verb. Sign languages might use alternative strategies to avoid the most difficult configurations, like leaving the *wh*-sign *in situ* or using multiple sentences ('John thinks that Mary loves someone. Who is this person?').

When the *wh*-sign moves, it might compete for the sentence-initial or sentence- final positions with other constituents that must also be placed in that position. For example, topics in many languages may appear in a sentence-initial position in order to create a link with the preceding discourse, as in the following ASL sentence.

top	wh
COFFEE	WHERE BUY

'As for the coffee, where did you buy it?'

(ASL, adapted from Petronio & Lillo-Martin 1997: 49)

When this happens, the *wh*-phrase is not in the very initial position of the sentence, since the topic [Pragmatics – Section 4.2] / topic phrase precedes it. Still, the *wh*-phrase is not *in situ*, since its non-*wh* counterpart would be in a position following the verb BUY. The fact is that the dedicated position for topics precedes the dedicated position for *wh*-phrases in that language, so the *wh*-phrase does not come first, although it has moved.

A similar problem may arise in the right periphery of the clause, for example with pronouns [Lexicon – Section 3.7]. In particular, pronominal expressions that double either the subject or the object may appear in the very last position in the sentence in some sign languages. If this happens in an interrogative clause, the pronominal expression may follow the *wh*-sign. Even in this case, it would be a mistake to analyze the *wh*-sign as if it were *in situ*, even if it is not the last sign in linear terms.

If an interrogative particle is found in content interrogatives and it occupies a sentence-initial or a sentence-final position, the interrogative particle and the *wh*-phrase may also compete for the same position and the relative order between them should be investigated.

Finally, there are cases in which another constituent in addition to the *wh*-sign is dislocated to the right edge of the sentence, for example a negative quantifier (LIS)

or a relative clause (LSC). In these cases, there is a competition for the clause-final position. In LIS and LSC, the *wh*-sign is in the very last position of the clause, but this should be investigated language by language.

1.2.3.6 Split between the *wh*-sign and its restriction

A *wh*-sign and its restriction (namely, the noun or the noun phrase that the *wh*-sign may modify) may split. This phenomenon is not found in English (see '*Which did you buy book?') but it is attested in several spoken and sign languages. LIS exemplifies this phenomenon.

wh
BOY$_i$ BOOK STEAL WHICH$_i$ (LIS, Cecchetto et al. 2009: 285)
'Which boy stole the book?'

We expect this phenomenon to be somehow constrained, though. A natural expectation is that, if splitting takes place, then the *wh*-sign moves to the sentence-final or sentence-initial position while the restriction is left *in situ*. We do not expect the opposite to be possible, since the positions in the left or right periphery are dedicated to signs that are inherently interrogative. However, structures can be found where the restriction appears in the left periphery as a topic, whereas the *wh*-sign has moved. Finally, pragmatic or semantic factors might favor or force splitting, but this should be investigated language by language.

1.2.3.7 Doubling of the *wh*-sign

It is also common in sign languages that a content interrogative contains two copies of the same *wh*-sign. The positions of these two copies vary from language to language. This phenomenon has been described in ASL, Libras, LIS, HZJ, ÖGS, NGT, and TİD. The following example is from Nunes & Quadros (2008), who discuss doubling in detail.

5_1.2.3.7_1_ASL_JOHN_SEE_WHO_YESTERDAY_WHO

wh wh
JOHN SEE WHO YESTERDAY WHO
'Who did John see yesterday?' (ASL, Nunes & Quadros 2006)

In a language where leaving the wh-sign *in situ* is preferred, doubled constructions may involve one copy of the wh-sign *in situ* position and another copy in a sentence peripheral position (see TİD, Göksel & Kelepir 2013, Hakgüder 2015).

Typically, if the *wh*-sign has a restriction and forms a complex *wh*-phrase with it, one of the copies may not contain the restriction. It has generally been observed that if one of the copies is *in situ*, then the *in situ* copy contains the restriction while the

sentence peripheral copy only has the *wh*-sign. In the TİD example below the *in situ* wh-phrase is WORK WHAT 'what (kind of) work' but the sentence-final copy is only WHAT.

wh
PERSON WORK WHAT DO WHAT
'What (kind of) work does that person do?' (TİD, Göksel & Kelepir 2013: 14)

In some sign languages doubling is not possible in indirect interrogatives. The following is an ungrammatical example from ASL that illustrates this.

hn
*I KNOW WHO WIN WHO
Intended: 'I know who won.' (ASL, Petronio & Lillo-Martin 1997: 42)

The same restriction has been observed in other languages such as TİD (Hakgüder 2015); however, the possibility of doubling in indirect interrogatives has been reported for some other languages such as LSB (Nunes & Quadros 2006: 11).

Thus, the possibility of doubling should be checked independently in both direct and indirect interrogatives.

1.2.3.8 Multiple *wh*-signs in interrogatives

The doubling of a particular *wh*-sign should not be confused with another phenomenon, the presence of more than one *wh*-sign in a single interrogative when the addressee may be asked to provide multiple pieces of information. One example from English is 'Where did you buy what?' whose answer would be a statement such as 'I bought the vegetables at the grocery store and the meat at the butcher.' ASL is one of the few sign languages that has been studied for multiple *wh*-interrogatives and researchers have observed that prosodic breaks, represented with commas in the examples below, are obligatory and these interrogatives may have focus non-manual marking in addition to *wh*-non-manual marking. It has been argued that the distribution of each of these non-manual markings affects the interpretation. For instance, in (a) below, where the two *wh*-signs have different non-manual markings, the signer expects two different answers such as 'I ate oatmeal, and I ate it because it makes me feel healthy; caviar, because it makes me feel wealthy; mynock, because it makes me feel wise...' In (b), on the other hand, where both of the *wh*-signs have focus non-manual marking, the signer expects one answer such as 'I ate a donut, and I ate because I am horribly unself-disciplined.'

a. wh foc
YOU EAT, WHAT, WHY
'What foods did you eat for what reasons?'

b. wh foc foc
YOU EAT, WHAT, WHY
'What foods did you eat, and why did you eat at all?'

(ASL, adapted from Churng 2011: 10)

1.2.3.9 Interrogative particles

Content interrogatives may contain interrogative particles, but this is less common than with polar interrogatives. The questions raised for interrogative particles in polar interrogatives apply here as well.

The grammar writer should identify what signs can be used as interrogative particles, if they are specific to content interrogatives, the extent to which they are obligatory or optional, and if they occur with a specific non-manual marking. Another issue to investigate is their position, which is expected to be sentence-final or sentence-initial. There may be different interrogative particles for matrix and embedded content interrogatives.

It may not be straightforward to distinguish interrogative particles from *wh*-signs, especially because they may have a similar morphological realization but the particle may have a phonologically reduced form. For example, ASL is reported to have an interrogative particle which is very similar to the sign WHAT (Conlin, Hagstrom & Neidle 2003).

Elicitation materials

Although interrogatives occur frequently in spontaneous production, an in-depth study may require a substantial body of evidence for each interrogative type under investigation. This may not be easy to find in a corpus containing only free conversation. If a general description of the phenomenon is already available, a linguist investigating the grammar of interrogatives may ask for grammaticality judgments or ask the signer to produce a target sentence. This has the advantage that the linguist can focus on the fine-grained aspects for which a detailed investigation is needed. However, it may also be risky. For example, intonation in spoken languages and non-manual marking in sign languages can be omitted in the artificial situations in which the sentence to be judged as grammatical or ungrammatical is later produced by the signer.

For these reasons, it may also be useful to employ specific techniques to elicit interrogatives in semi-naturalistic settings. Eliciting direct interrogatives by involving signers in special games is relatively easy. It is more difficult to elicit indirect interrogatives.

The twenty-question game is particularly suitable for eliciting polar interrogatives. In this game, one player, the *answerer*, chooses an object, a person, or a story but does not reveal this to the others. All the other players are *questioners*. They take turns asking an interrogative which can be answered only by 'Yes' or 'No'.

Eliciting content interrogatives requires the use of materials designed for this task. Göksel and Kelepir (2013) asked the participants to play the game *What is it?/ Who is it?*, where one participant chooses a well-known individual or an object, but does not tell the other participant who or what it is, and the other participant tries to guess the identity of the individual or the object by asking content interrogatives such as 'Where does s(he) live?', 'What does s(he) do?' etc.

Another elicitation technique was used in the LIS Corpus project (see Geraci et al. 2011). All participants performed the task in pairs: a scene depicting a car accident was presented in a picture to one member of the pair. The other member could not see the picture but had to fill a form and recover the information needed by asking the partner. By selecting a type of material that is mostly visual and a form that is familiar to signers, the exchange was kept as natural as possible, even during a semi-structured elicitation procedure. The material was intended to elicit various types of content interrogatives and corresponding answers ('Where?' – 'In Paris' or 'At the corner', 'When?' – 'At 9,30 p.m.', 'How many cars?', 'Who was driving?', etc.).

The researchers working on LIS report a difference between the car accident situation and a different variant of the same task in which the interviewee pretended to be a patient reporting to the emergency room at the hospital, while the interviewer pretended to be a doctor admitting the patient. In this task the 'patient' is given a series of pictures describing the events that led to hospitalization, while the 'doctor' is given a form to fill with information about the patient. While the car accident story worked quite well, since it elicited many question-answer pairs, the emergency room story elicited a reduced number of interrogatives, since the 'patient' typically elaborated over the plot given in the pictures to offer a more complete narration based on his/her experience. Researchers working on LIS speculated that the source of the difference between the two elicitation tasks is that a car accident is an instantaneous event, while events leading to hospitalizations unfold in time, so they trigger an individual elaboration by the signer. Hence, it might be a good idea to use pictorial material describing an event that takes place instantaneously and is fully depicted in the picture rather than an articulated story.

A different type of task to elicit interrogatives is collaborative games in which two deaf consultants ask a third player questions to find out who did something by pretending to be in a crime scene.

Finally, another good way to obtain spontaneous interrogatives is to ask deaf signers to play a game unknown to them and to give them incomplete or ambiguous instructions. In this situation, they will start asking questions to the linguist to understand how the game works exactly and, as they don't think that they are already in the elicitation part since the game has not started yet, the exchange may be very rich and natural.

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1.3 Imperatives

1.3.0 Definitions and challenges

1.3.0.1 What is an imperative?

An imperative is a grammatical form that is specialized to elicit a behavior from the addressee. Imperatives are one of the four well-recognized sentence types. The other three major types are declaratives [Syntax – Section 1.1], which are used to make an assertion; exclamatives [Syntax – Section 1.4], which are used to express surprise; and questions [Syntax – Section 1.2], which are used to obtain information.

A potential confounding factor is that sometimes a question can be used to express a command ('Could you pass me the salt, please?') and, conversely, an imperative can be used to elicit information from the addressee ('Tell me the name of the president.'). Still, languages develop grammaticalized forms that are *typically* associated with imperatives and these forms are the topic of the present section in which we abstract away from the specific uses that these forms may have.

1.3.0.2 Functions of the imperative

Despite its name (imperative, from *impero* 'to command'), the imperative is not used only for commands. In most languages, the same form that is used to give orders is also used for other functions, which may not be obviously related. Typical uses of imperatives include at least:

a. invitations
b. suggestions/advice
c. permission
d. instructions
e. recommendations

1.3.0.3 Orders with no imperative

It is important to bear in mind that imperative sentences are not the only way to express a command in a given language. In English, for example, you can give an order with a simple declarative (a), with a yes/no question / yes/no question [Syntax – Section 1.2.1] (b) or with a deontic modal (c), such as *should* or *must*:

a. You are going to wash your hand!
b. Could you wash your hands(, please)?
c. You should wash your hands.

The imperative can be distinguished from deontic modal constructions in a very simple and cross-linguistically valid way: while modal constructions, which are propositional, can be true or false, imperative sentences cannot. Consider the following pair:

a. Wash your hands!
b. You should wash your hands

While you can say that (b) is true (or false), this simply does not apply to (a).

1.3.0.4 Simultaneous or concatenative morphology in imperatives

Since sign languages can be used to elicit a behavior from the addressee as in commands and in the other uses just listed, we expect them to develop grammaticalized forms associated with these conversational uses. Hence, it is reasonable to look for grammatical forms specialized for imperatives, both in their order use and in their other uses.

Still, the form that these imperatives take in sign languages might be quite different from the form we are used to in more studied spoken languages. For example, given the inherent multidimensionality of sign languages, imperative morphology might be expressed simultaneously with the lexical signs. This means that instead

of finding a specific ending marking the verb as in English, non-manual marking can be the manifestation of imperative morphology. This is not surprising, since non-manual-marking can be seen as the equivalent of intonation and in many spoken languages intonation distinguishes declaratives from imperatives. Moreover, given the way inflection appears to be expressed in most sign languages, we might expect imperatives to be signaled by a separate manual sign, rather than through a simple modification of the verbal sign. It is also possible that more than one manual sign, and more than one non-manual marker are available, possibly distinguishing the various uses of the imperative just mentioned.

1.3.1 Subtypes of imperatives

As previously mentioned, imperatives do not fall into a single class but may be thought of as a sentence type that may take on different pragmatic interpretations and syntactic forms as described in the following sections.

1.3.1.1 Orders

The most obvious subtype of imperatives includes positive and negative orders. Orders express the will of the speaker for someone to do or not do something as in the English sentence 'Eat properly!' or 'Don't pull that rope!'. An example of a sentence expressing an order in LIS is offered below.

5_1.3.1.1 1__LIS_STOP PLAY STOP EAT PALM-UP

furrowed brows
STOP PLAY STOP EAT PALM-UP (LIS)
'Stop playing, stop. Eat!'

1.3.1.2 Invitations

Imperatives may also take the form of an invitation when someone is warmly encouraged to do something, as in the English sentence 'Have a piece of cake.' As opposed to orders, invitations are expressions of politeness. An example of a LIS sentence expressing an invitation is provided below.

5_1.3.1.2_1_LIS_IX-j_TAKE_IX-k_PALM-UPIX-j

furrowed brows
$_2$TAKE$_3$ PALM-UP$_2$
'Take it.' (LIS)

1.3.1.3 Suggestions/advice

Suggestions and advice also fall into the wider category of imperatives whose main goal is to advise the addressee on what is best for him/her to do in order to get a better result or to improve his/her situation. A suggestion/advice in English is illustrated by the sentence 'Buy healthy food for your kids!' and by the LIS sentence below.

5_1.3.1.3_1_LIS_BUY_PALM-UP_(pause)_POWDER_CONVENIENT

furrowed brows
BUY PALM-UP (pause) POWDER CONVENIENT
'Buy it. The powder one is convenient.' (LIS)

1.3.1.4 Permissions

This subvariety of imperatives expresses an authorization, and may be a reply to a request, as in 'May I take your pen?' –'Yes, take it!'. An example of a LIS sentence expressing permission is provided below.

5_1.3.1.4_1_LIS_IX-k_TAKE_IX-j_PALM-UP_(pause)_PEN

furrowed brows
$_{2}$TAKE$_{3}$ PALM-UP (pause) PEN
'Take it! The pen.' (LIS)

1.3.1.5 Instructions

Another subtype of imperative sentences is produced when the speaker gives instructions guiding his/her interlocutor on how to carry out a specific action such as building, cooking, reaching a destination, or any other performance. An English example of an imperative expressing instructions is 'Take the first street on the left,' while the example below illustrates a LIS sentence.

5_1.3.1.5_1_LIS_BOX_TAPE-CL_(PAUSE)_CUT

squinted eyes
BOX TAPE-CL (pause) CUT
'Cut the box's tape.' (LIS)

1.3.1.6 Recommendations

The imperative form may also be employed to express a recommendation to do or not to do something, either expressing the speaker's desire for a future situation, as in 'Don't stay away too long!', or the speaker's concern for a possible unfortunate future

event damaging the interlocutor, as in 'Be careful when you cross the street!'. Below is an example of this subtype of imperatives in LIS.

5_1.3.1.6_1_LIS_CL-DRIVE-MOTORBIKE-FAST_NOT_CL-DRIVE-MOTORBIKE_RIGHT_KNOW_CL_RIGHT

furrowed brows

CL-DRIVE-MOTORBIKE-FAST NOT CL-DRIVE-MOTORBIKE RIGHT KNOW CL RIGHT
'Don't go fast with your motorbike, drive at the right speed!' (LIS)

1.3.2 Imperative markers

1.3.2.1 Manual signs

Some spoken languages have been reported to mark the different subvarieties of imperatives with specific syntactic morphemes. This is the case for example of Badiotto (Poletto and Zanuttini 2003), a dialect spoken in Northeastern Italy, where different particles can specify the subtype of an imperative sentence: the particle *mo* is used to give orders, as exemplified in (a) below, while the particle *ma* is used to give advice or permission, as in (b).

a. Arjigneme *mo* cà le bagn!
clean.IMP-me mo yet the shoes
'Polish my shoes!'or 'You still have to polish my shoes!'
(Badiotto, Poletto & Zanuttini 2003: 179)

b. Tèt *ma* n dé de vacanza!
take.IMP-you ma a day of vacation
'Take a day off for vacation!' (Badiotto, Poletto & Zanuttini 2003: 178)

The grammar writer should verify the presence of specific morpho-syntactic manual markings expressing the imperative modality and/or the various subtypes of imperatives [Syntax – Section 1.3.1] and verify whether these specific markers are obligatory or whether they are an alternative to a more general imperative marker.

A manual sign attested in some sign languages like LIS and NGT is the sign conventionally glossed PALM-UP (PU) and produced with both hands open and with the palms facing upwards.

1.3.2.2 Non-manual markers

Imperative sentences in spoken languages are quite often marked with peculiar intonational contours. As non-manual markers [Phonology – Section 1.5] in sign languages have been claimed to be the counterpart of intonation, it is very likely that the imperative mood is signaled in sign languages through specific non-manual markers. The analysis of specific non-manual markers in imperative sentences, as well as their

obligatoriness or optionality, is therefore crucial in describing how imperatives are formed in the target sign language.

Sign languages usually employ a combination of different non-manual markers, including eye contact, body orientation, facial expressions, and head movements. A set of different non-manual markers may be used to mark imperative sentences. A detailed analysis of the non-manuals in imperatives should include the description of their co-occurrence as well as of their potential difference connected to the type of imperatives produced. As with manual signs, specific non-manual markers may mark and distinguish the various types of imperatives listed in section 1.3.1.

The spreading domain of non-manual markers refers to their extension over the manual signs they co-occur with. Non-manual markers tend to spread over the syntactic domain of which they are a direct expression. Spreading of the non-manual markers in imperative sentences should be investigated.

1.3.3 Imperatives and verb classes

In spoken languages, imperatives are typically associated with reduced morphology (Zhang 1990; Mauck 2005). In English, for example, the simple verb root is an imperative (e.g. *go*). The grammar writer should verify whether the various verb classes differ in some way when used in an imperative clause. In particular, the grammar writer should examine agreement verbs [Lexicon – Section 3.2.2] carefully, since we might expect them to display a loss or a modification of their agreement morphology. With other verb classes, the grammar writer should pay attention to possible modifications in width, direction, and timing of the movement of the sign.

1.3.4 Word order in imperatives

The literature on spoken languages reports a marked word order in imperative sentences, such as subject-verb inversion, negation-verb inversion, and object-verb inversion. In Romance languages such as Italian, for example, while object clitics usually precede the verb in declarative sentences (a), they follow it in imperatives (b).

a. Lo leggi.
   it read.2SG
   '(You) read it.' (Italian)
b. Leggi-lo!
   read.IMP-it
   'Read it!' (Italian)

Possible word order changes throughout the different subtypes of imperatives should be detected and described.

Another option, which is reported to be very productive in the syntax of sign languages, is the doubling of constituents. A careful investigation should verify whether doubling of constituents is optional or obligatory in the production of the different subtypes of imperatives

1.3.5 Attention callers

Since imperatives are means for eliciting a specific behavior of the addressee, we expect that imperative clauses are frequently preceded or accompanied by various forms of attention callers. The grammar writer should investigate whether this sign or class of signs is grammaticalized as part of the imperative sentence, and whether there are systematic correlations between specific subtypes of imperatives and (types of) attention callers.

1.3.6 Negation in imperatives

In many languages, imperatives cannot be negated. In order to express a negative order, languages rely on some other resources that act as a surrogate. Typically, languages resort to the infinitive, as in (b) (Italian), or the subjunctive, as in (d) (Spanish).

a. Vai al mare!
   go.IMP to-the sea (Italian)
b. Non andare al mare!
   not go.INF to-the sea (Italian)
c. Ve al mar!
   go.IMP to-the sea (Spanish)
d. No vayas al mar.
   NEG you go-SUBJ to-the sea
   'Go/Don't go to the sea!' (Spanish)

Evidence from other languages shows that imperatives are negated differently from declaratives. In English imperatives, for example, the copula is negated with *do*-support ('Don't be loud!'), an ungrammatical option in English declaratives ('*He don't be loud/He isn't loud').

Negation [Syntax – Section 1.5] is, therefore, an interesting domain to investigate when describing the imperative sentence type.

1.3.6.1 Manual negation

The first issue the grammar writer should describe is whether the imperative predicate can be negated. If it can, it should be further examined what manual sign for negation is employed.

The manual sign for negation might be subject to morphological changes in one or more of its parameters; it might change from a free to a bound morpheme; or it might be substituted by a completely new sign. Negative manual signs, as well as their position in the sentence, might differ depending on the subtype of imperative produced.

Negative imperatives might involve changes in the word order of the sentence. Any change in word order should be described.

1.3.6.2 Non-manual negation

Since negation involves the obligatory presence of specific non-manual markings in most sign languages, negative imperatives should also be described along this dimension. One relevant change, possibly affecting negative imperatives, might involve the presence of different non-manual markings or the use of a different set of non-manuals to mark different subtypes of imperatives.

Changes in the manual signs of negation might also involve changes in the negative non-manual markings. This is often due to the strong association between a negative manual sign and a specific non-manual marking accompanying it.

1.3.7 Subjects in imperatives

Imperatives in spoken languages tend to allow null subjects, even in those languages in which null subjects are usually disallowed. In some languages, only null subjects are possible in imperative clauses, while other languages also allow overt subjects.

The only possible interpretation for null subjects in imperative sentences is a second person interpretation. Overt subjects, in the languages that allow them, are also very restricted: imperatives have a second person pronoun subject, a bare noun phrase (proper name or bare noun), or a quantificational subject, which binds a second person element (as in 'Everyone eat your food'), contrary to what happens in declaratives and interrogatives (as in 'Everyone eats their food').

1.3.7.1 Null and/or overt subjects

The first question to ask is whether imperatives allow for null and/or over subjects, and to check this across the various subtypes of imperatives.

1.3.7.2 The person of the subject

A second step involves identifying the (null or overt) subject. The person feature of both null subjects and (if allowed) overt subjects should be checked, in particular whether only second person (singular and plural) subjects are possible, or whether other persons are also allowed.

1.3.7.3 Anaphoric properties

Imperative subjects in spoken languages display a very peculiar behavior: when allowed, quantificational subjects ('Everyone eat your food!'), proper names ('John bring your book!'), and bare nouns ('Children always tie your shoes!') in imperative sentences can refer to a second person pronoun (while this possibility is sharply excluded in other sentence types). This possibility should be checked in the target sign language as well.

1.3.8 Embedding imperatives

A very robust property of imperatives cross-linguistically is their resistance to embedding. Typically, when an order needs to be embedded under a root predicate, languages resort to some other way of expressing it, such as deontic constructions [Semantics – Section 4.2] or exhortative constructions [Syntax – Section 1.3.10]. The grammar writer should verify whether simple imperative clauses can be embedded, and whether this involves any modification in manual signs, word order, or non-manual markers.

1.3.9 Special constructions: Imperative and Declarative (IaD)

Imperative and Declarative (IaD) (Iatridou 2008) is a very peculiar construction where an imperative is used in conjunction with a declarative clause, without it implying any suggested order or even permission. This construction is illustrated below for English:

Go on like this and you will fail.

In this example, the imperative does not convey any order or suggestion but rather is very similar to a conditional clause ('If you go on like this, you will fail.'). Since this use of the imperative is systematic across languages, and has even been claimed to be a proper test for true imperatives, it is important to establish whether the same construction that is used in more central types of imperatives, and in particular the manual sign(s) that are used then, can also be found in this particular construction. This is the case in LIS. In the example below, the imperative sign PU is used in a IaD construction.

5_1.3.9_1_LIS_LAUGH_PU_GO_OUT

te

LAUGH PALM-UP GO OUT

'Keep laughing and you go out!' (LIS)

The sentence-initial clause of the LIS sentence above is marked by specific NMM roughly composed of tensed eyes ('te') and cheeks and repeated head

nodding. The non-manuals marking this sentence, together with the sign PU, are responsible for the peculiar interpretation of the sentence as an IaD, thus making it minimally different from the sentence below. This example, a conditional sentence, lacks the sign PU and is marked by the typical non-manuals of conditional clauses in LIS.

5_1.3.9_2_LIS_LAUGH_GO_OUT

cond
LAUGH GO OUT
'If you laugh, you will go out.' (LIS)

The grammar writer should be aware of the possibility of this peculiar construction robustly associated with the use of imperatives, and verify whether it is attested in the relevant sign language.

1.3.10 Exhortative constructions

Given that imperatives are typically restricted to the addressee, languages use other constructions to express an order or an exhortation involving other participants, that is, first and third persons. Exhortative constructions across languages might either involve a grammaticalized modal (such as *let* in English: 'Let's go!'), or some specific (subjunctive, optative) mood.

The grammar writer should describe the exhortative construction(s) displayed by the target language and pay special attention to manual and non-manual signs, the realization of the subject, and the possibility of embedding.

Elicitation materials

Although imperatives occur quite frequently in spontaneous production, an in-depth analysis may require a substantial body of evidence for each imperative type investigated. This evidence may not be easy to find in a corpus containing only free conversation. If a general description of the phenomenon is already available, a researcher investigating the grammar of imperatives may ask the signer for grammaticality judgments or to produce a target sentence. This method has the advantage that the linguist can focus on the fine-grained aspects for which a detailed investigation is needed. However, it may be risky. For example, intonation in spoken languages and non-manual-marking in sign languages can be omitted in the artificial situations in which the sentence to be judged as grammatical or ungrammatical is later produced by the signer. Moreover, given the variety of uses attested for imperatives, it might be advisable to control the context of utterance

of each imperative form so the exact function of the specific form is observed. For these reasons, it may also be useful to use elicitation techniques that lead to the production of imperatives in a semi-naturalistic setting. Some possible options are described below.

As the various types of imperatives are very sensitive to the discourse context, it is essential that each subvariety is introduced by an appropriate eliciting context. A good elicitation strategy involves designing variety-specific contexts of elicitation presented by a deaf signer in the target sign language, and eventually accompanied by explicative pictures. The interaction of two informants during the elicitation process can be very useful to gather metalinguistic insights into the language phenomena.

In the following examples, possible contexts likely to elicit the various types of imperatives are briefly presented.

1. *Orders*
   Suggested contexts:
   a. Evidence of an approaching or possible danger. The informant is asked to order someone to do or not to do something;
   b. The consultant is involved in a hierarchical relationship (boss-employee kind of relationship) where he has the social authority to give orders.
2. *Invitations*
   Suggested context:
   The consultant is asked to politely invite someone to help himself with something.
3. *Suggestions/advice*
   Suggested context:
   The consultant is required to provide a suggestion or advice in the form of something which should be done in order to improve a situation.
4. *Permissions*
   Suggested context:
   The consultant is asked to provide a positive reply to a request of permission to do something.
5. *Instructions*
   Suggested context:
   The consultant is giving instructions for directions, on cooking recipes, on how to build something, etc.
6. *Recommendations*
   Suggested contexts:
   a. The consultant is required to provide a recommendation from a parent's, lover's, friend's point of view.
   b. The consultant plays the role of a fairy tale character traditionally giving recommendations to another character (as in Little Red Riding Hood when her mother says: 'Don't talk to anyone! Go straight to Granny's house!')

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1.4 Exclamatives

1.4.0 Definitions and challenges

1.4.0.1 What is an exclamative?

By exclamative we mean a grammatical form that is specialized to convey surprise, denoting that all or some part of the content of a clause is unexpected. In other words, the unexpectedness either concerns the entire clause, or one constituent of the clause. In the first case, illustrated for English, (a) shows , a total exclamative; (b) shows a partial exclamative.

a. John has arrived!
b. What a beautiful day!

Exclamatives are one of the four well recognized sentence types. The other three major types are declaratives [Syntax – Section 1.1], which are used to make an assertion; interrogatives [Syntax – Section 1.2], which are used to obtain information; and imperatives [Syntax – Section 1.3], which are typically used to elicit a certain behavior from the addressee.

A potential confounding factor is that any sentence type can be used to express surprise provided that it is uttered with the correct intonation, and there is a great deal of ambiguity in many cases. In English, for example, both a declarative (a) and an interrogative (b) can be uttered with an exclamative intonation and convey surprise.

a. He's so nasty! (declarative)
b. Isn't he the nastiest man on earth?! (interrogative)

Still, most languages develop grammaticalized forms that are *typically* associated with exclamatives and these forms are the topic of the present section. English displays clear examples of unambiguous exclamatives, as exemplified below.

a. What a nasty boy he is! (cf. *What a nasty boy is he?)
b. How very tall she is! (cf. *How very tall is she?)

The two clauses above display an initial wh-constituent [Syntax – Section 1.2.3.] / wh-constituent, like interrogatives, but they differ from interrogatives in that i) they do not feature subject-auxiliary inversion, and ii) the *wh*-phrase contains an extra element that is not possible in interrogatives: 'a' in (a) and 'very' in (b).

According to Zanuttini and Portner (2003), exclamatives can be defined as the sentence type associated to the following properties:
1. exclamatives contain a wh-structure;
2. exclamatives are factive, namely their truth is presupposed.

On the basis of these properties, they propose a set of three tests that can unambiguously tease real exclamatives apart from other sentence types used with an exclamative force. These tests are:
– factivity
– scalar implicatures
– question/answer pair

Let us briefly illustrate them. The grammar writer can use these tests to determine the actual range of constructions to be described as exclamatives in the language under study.

1.4.0.2 Testing exclamatives: factivity

The factivity of exclamatives, namely the fact that their truth is presupposed, is shown by two facts. First, they can only be embedded under factive predicates, as seen below.

Mary knows/*thinks/*wonders how very nasty he is.

Second, when they are embedded under a verb like 'know' or 'realize' in the present tense and with a first person subject, this verb cannot be negated.

*I don't know/realize how very nasty he is.

1.4.0.3 Testing exclamatives: scalar implicatures

Exclamatives convey that something is surprising or noteworthy in some way. Thus, they introduce the implicature that the proposition they denote lies at the extreme end of some contextually given scale that cannot be denied. This is shown by the awkwardness of the continuation below, which is perceived to be a contradiction.

??How very nasty he is! – though he's not extremely nasty.

1.4.0.4 Testing exclamatives: question/answer pairs

The third property distinguishing exclamatives from interrogatives and declaratives is their inability to function in question/answer pairs. Unlike interrogatives, exclamatives may not be used to ask questions.

A: How tall is she? B: two meters.
A: How very tall she is! *Two meters.

Unlike declaratives, exclamatives cannot be used as answers.

A: How tall is her child? B: *How very tall she is!

These criteria can be used to tease real exclamatives apart from other sentence types used with an exclamative force. Going back to the unclear examples (a) and (b), we can show that they fail all the tests just given.

a. Isn't he the nastiest man on earth?
b. He's so nasty!

The rethorical question in (a) can be answered: thus it is not a proper exclamative.

Isn't he the nastiest man? No, he's not.

The declarative exclamative in (b), on the other hand, can be embedded under a non-factive predicate, as below, so it is not a real exclamative.

I think he's so nasty, I don't KNOW he's so nasty

1.4.0.5 An unexplored field

Very little is known about exclamatives in sign languages. Hence, the grammar writer should carefully follow this blueprint, keeping in mind that most of the categorizations and caveats that are suggested come from crosslinguistic investigations conducted only on spoken languages. He/she should be ready to adapt the chapter to the signed modality by modality-specific marking of the exclamative sentence type he/she might observe.

1.4.1 Total exclamatives

Total exclamatives are also called yes/no exclamatives, capitalizing on the formal resemblance that they exhibit with yes/no questions [Syntax – Section 1.2.1.] in many languages. In both cases the illocutionary effect related to the sentence type is associated with the content of the entire event: in the case of exclamatives, this is a connotation of surprise or unexpectedness.

1.4.1.1 Non-manual marking

In spoken languages, total exclamatives can be marked only through prosody, while the syntax is that of a declarative.

He finally arrived!

Similarly, in the few sign languages where the construction has been observed to some degree, an exclamative force can be conveyed solely by the use of a 'surprise' non-manual marking, typically consisting of raised eyebrows (Auslan, Israeli SL, LIS), or wide eyes. The grammar writer should verify whether this is also possible in the language to be described, keeping in mind the possible confounds discussed in the General definitions section [Syntax – Section 1.4.0.]: any sentence type can be used with an exclamative prosody, but this does not make them proper exclamatives. The tests proposed in that section should be particularly useful in this context.

1.4.1.2 Manual signs

Typically, total exclamatives utilize a position in the complementizer area that is not associated with yes/no questions. This is shown by the fact that in many languages, grammaticalized forms of exclamatives include some introducer even in root clauses that can not occur in other sentence types. This is illustrated in the examples below from Italian and English. In both cases, the exclamative is introduced by an interjection followed by an 'if' word.

a. Accidenti, se sa nuotare!
   INTERJECTION if can.3SG swim
   'Boy, if he can swim!' (Italian)
b. Boy, if syntax isn't fun! (Zanuttini & Portner 2013)

The grammar writer should verify whether any manual sign is associated with grammaticized total exclamatives in the sign language under investigation. Notice that in the two examples above the use of the complementizer 'if' requires the presence of an interjection ('boy!', 'accidenti').

As a note of caution, remember that in many sign languages the complementizer might be at the right edge of the clause. Thus, it is quite possible that the manual marker for the exclamative is clause-final rather than clause-initial as in the examples above. In Japanese, for example, the particles associated with exclamatives (*nodaroo*) always come last, just like all the clause-typing complementizers.

1.4.2 Partial exclamatives

Partial exclamatives are typically very similar to *wh*-questions. In many languages, they display a *wh*-element that sits in the typical position it occupies in

interrogatives. In languages like English, where *wh*-elements are moved to the left, the *wh*-elements in exclamatives also appear in the left periphery.

a. What do you think?
b. What a nice guy he is!
c. How tall is he?
d. How very tall he his!

In languages like Japanese that leave *wh*-elements in situ in wh-questions, *wh*-exclamatives also involve *wh*-in-situ.

a. John-wa nante kasiko-i -no-da (-roo)
   John-TOP WH intelligent-FIN-FOC-MOOD
   'How very intelligent John is!' (Japanese)
b. John-wa nante ookina piza-o tabeta-no-da-roo
   John-TOP WH big pizza-ACC ate-FIN-FOC-MOOD
   'What a big pizza John ate!' (Japanese)

This correlation suggests that the same syntactic operation is involved in the two sentence types. The grammar writer should verify whether *wh*-exclamatives are attested in the language to be described, and occupy the same position as they do in interrogatives.

1.4.2.1 Non-manual signs

Typically, prosody alone can disambiguate a *wh*-exclamative from a *wh*-question in many languages. This is the case for example in Italian:

a. Quanto è grande!
   how be.3SG tall
   'How tall he is!' (Italian)
b. Quanto è grande?
   how be.3SG tall
   'How tall is he?' (Italian)

The grammar writer should investigate whether a similar minimal pair is possible in the language under description, and examine in detail what non-manual markings are responsible for the exclamative reading. It should also be verified whether non-manual markings are different in yes/no interrogatives and partial interrogatives.

1.4.2.2 *Wh*-signs

Usually, the paradigm of *wh*-elements available in exclamatives does not overlap with that of interrogative *wh*-elements. In Japanese, for example, only a specialized

wh-element *nante* is possible in exclamatives. In English, only *what* and *how* can form a *wh*-exclamative, at least in root clauses.

a. *Who I love!
b. *When I leave!
c. *Why he left!

Moreover, the *wh*-elements that are allowed both in exclamatives and questions do not always display the same distribution in the two sentence types. In English, for example, *what a* is possible in exclamatives, but not in questions.

a. What a nice girl she is!
b. *What a nice girl is she?

As another example, French *que* can modify an adjective in exclamatives, but not in questions.

a. Qu'il est haut!
   what-he be.3SG tall
   'How tall he is!' (French)
b. *Qu'il est haut?
   what-he be.3SG tall
   (Intended: 'How tall is he?') (French)

The grammar writer should verify which *wh*-elements are possible in *wh*-exclamatives and whether they display any distributional peculiarity.

Wh-exclamatives can also be marked by some particles akin to complementizers, in addition to the *wh*-element. In Japanese, for example, exclamatives are marked by a special marker *nodaroo* that clearly disambiguates exclamatives from interrogatives.

John-wa nante kasiko-i -no-da(-roo)
John-TOP WH intelligent-PRS-FIN-FOC-MOOD
'How very intelligent John is!'

1.4.2.3 Other structures

In many languages, it is also possible to construct a partial exclamative without resorting to a *wh*-construction. In that case, the exclamative may exhibit a structure that makes it very similar to a relative clause [Syntax – Section 3.4] / relative clause. An example is given in English below.

The things that he would do for his children!

The grammar writer should verify whether this option is realized in the language under investigation, taking into account that relativization strategies vary widely from language to language.

1.4.3 Negation in exclamatives

Exclamatives appear to have a special relation with negation [Syntax – Section 1.5] / negation. In many languages, it is indeed possible to form an exclamative from what appears to be a different sentence type by adding a negative word (provided the prosody is right). This is true both in total exclamatives and partial exclamatives, as illustrated by the following examples from Italian.

a. Non si è mangiato tutto!
   NEG REFL be.3SG eat.PTCP all
   'He ate it all!' (Italian)
b. Quanto non abbiamo camminato!
   how.much NEG have.1PL walk.PTCP
   'What a walk we made!' (Italian)

An interesting property of negation in exclamatives like the examples above is that it does not negate the event. The grammar writer should verify whether negation plays some special role in exclamatives in the language to be described.

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1.5 Negatives

1.5.0 Definitions and challenges

1.5.0.1 What is negation?

Every natural language possesses some way to express clausal negation. Natural languages have a multitude of markers such as particles, negative words and affixes in order to express standard or non-standard negation. Although most languages share common aspects regarding the use of particular negative markers, the variety that languages exhibit in the use of these negative markers is quite extensive. This variety is due to the number of negative markers as well as the syntactic status and the position of these markers in clauses. Different negative markers have different effects,

syntactic, semantic and pragmatic. In addition, negation varies in the way it interacts with the various sentence types such as declaratives, interrogatives, imperatives, and exclamatives.

1.5.0.2 Scope of negation and types of negation

The notion of the scope of negation is important. The term scope refers to the actual parts of the sentence that are affected by negation. On the basis of scope, we can distinguish between sentential/clausal negation and constituent/local negation. In sentential/clausal negation the negative marker takes scope over the whole clause (as in 'John didn't finish his paper'), whereas in constituent/local negation the scope is confined to a particular constituent of the clause (as in 'John finished his paper not long ago').

1.5.0.3 Sentential negation

In this section, the grammar writer should describe how the sign language under investigation expresses sentential negation, since sentential or 'standard' negation is the basic means that languages have for negating a declarative clause (Payne 1985). Standard negation is a denial of the truth of a clause or sentence.

Languages employ four strategies for the expression of negation (Payne 1985; Zannutini 2001):

a) a negative marker that has the properties of a verb taking a sentential complement;
   Na´e ´kai [ke ´alu ´a Siale]
   ASP NEG ASP go ABSOLUTE Charlie
   'Charlie didn't go.' (Tongan, Zanuttini 2001: 513)

b) a negative marker that has the properties of a finite auxiliary;
   Bi ə-ə-w dukuwun-ma duku-ra
   I NEG-PST-1SG letter-OBJ write-PART
   'I didn't write a letter.' (Evenki, Zanuttini 2001: 513)

c) a negative affix (prefix, suffix or infix) of the verb;
   Gel-me-yecek.
   come-NEG-FUT
   '(S)he will not come.' (Turkish, van Schaaik 1994: 38)

d) a negative marker in the form of a particle that is usually associated with the verb in pre- or postverbal position. This is the most frequent strategy for spoken European and sign languages.
   a. John **doesn't** eat chocolate. (English)
   b. Jean **ne** mange **pas** de chocolat. (French)
   c. Hans isst **nicht** die schokolade. (German)

5_1.5.0.3_1_LSC_SANTI_MEAT_EAT_NOT

hs
d. SANTI MEAT EAT NOT
'Santi doesn't eat meat.' (LSC, Quer 2012: 318)

hs
e. PAOLO CONTRACT SIGN NON
'Paolo didn't sign the contract.' (LIS, Quer 2012: 318)

hs
f. MOTHER FLOWER BUY NOT
'Mother does not buy a flower.' (DGS, Pfau 2002: 273)

Sign language examples clearly show that sentential negation in sign languages relies both on manual negative markers and non-manual markers such as headshake. How these manual signs and non-manual markers are co-articulated varies among sign languages. In some sign languages, a non-manual marker is sufficient to encode negation even without a manual sign; in other sign languages, the presence of a manual marker is required in addition to the non-manual marker.

1.5.1 Manual marking of negation

Similarly to spoken languages, lexical marking on negation in sign languages refers to the actual signs that are used in negative structures. These signs can be negative particles [Lexicon – Section 3.11.1] having the meaning 'no' or 'not'; negative quantifiers or adverbs having the meaning of 'nothing', 'no one', 'never' etc. and irregular negatives such as 'want-not', 'know-not' etc.

1.5.1.1 Manual negative elements

Manual negative elements [Morphology – Section 3.5.1.1] have already been discussed elsewhere in this manual.

1.5.1.1.1 Negative particles

Uninflected negative particles seem to be the most common negative marker that sign languages use to form standard sentential negation. For many sign languages, the negative particle is realized by a particular sign formed by the index finger handshape (G handshape), the palm facing outward and a slight side-to-side movement of the hand.

Negative particles simply negate the truth of a proposition. However, they may carry some additional pragmatic meaning. In IPSL for example, the negative particle (NEG-CONTR) conveys presupposition (Zeshan 2003):a–b. Similarly, TİD makes use of a negative particle (NO-NO) with contrastive interpretation (Zeshan 2006). In these cases, the presupposition may be implicit or explicit.

a. VILLAGE GOOD CITY NEG-CONTR
'Villages are nice but cities are not.' (IPSL, Zeshan 2003: 193)

b. WORRY NEG-CONTR
'There is no problem (contrary to what has been said/has been implied).'
(IPSL, Zeshan 2003: 193)

neg
c. INDEX_1 FRIEND ALL RESTAURANT PLAY / INDEX_1 INDEX_1 NO-NO
'My friends are all into dining out and entertainment, but I am not.'
(TİD, Zeshan 2006: 156)

In addition, some sign languages make use of specific negation signs in order to express emphasis like 'not at all' or 'absolutely not'. FinSL makes use of such a negative marker with emphatic meaning (Savolainen 2006).

INDEX_1 COME NOT
'I am definitely not coming.' (FinSL, Savolainen 2006: 296)

1.5.1.1.2 Irregular negatives

Irregular negatives [Morphology – Section 3.5.2] can also be labeled negation incorporation (signs that incorporate negation). They refer to a group of predicates that incorporate negation either in a transparent way or opaquely in suppletive forms (Quer 2012). Opaque irregular negatives correspond to existing non-negated signs that have no obvious morphological relation to their counterparts. Transparent irregular negatives, on the other hand, refer to cases where a negative morpheme has been added to a lexical sign, either by simultaneous or sequential morphology.

The majority of these signs derive from predicates expressing cognition ('not know', 'not understand'), emotion or volition ('not like', 'not want'), modals ('cannot', 'need not', 'not understand'), possession/existence ('not have', 'not get') or evaluative judgment ('not right', 'not possible').

An additional group of negatives integrates the grammatical notion of tense/aspect. These negatives express future, as in SSL and HKSL, perfect as in SSL, Israeli SL and HKSL, or past as in Israeli SL.

neg
a. TOMORROW FUT-NEG WORK IX_1
'I won't work tomorrow.' (SSL, Bergman 1995: 89)

neg
b. KENNY PARTICIPATE RESEARCH NOT-YET
'Kenny has not yet participated in the research.' (HKSL, Tang 2006: 219)

c. IX_3 SLEEP NEG-PAST
'He didn't sleep at all.' (Israeli SL, Meir 2004: 114)

In addition, Israeli SL has a negation including tense/aspect and also an emphatic meaning.

a. IX$_1$ EAT MEAT NEVER$_{PAST}$ IX$_1$
'I have never eaten meat.' (Israeli SL, Meir 2004: 110)

b. AGAIN IX$_1$ GO THERE NEVER$_{FUTURE}$
'I will never go there again.' (Israeli SL, Meir 2004: 110)

Aspectual negation is often expressed in sign languages by negative completion markers such as NOT-YET. Negative completion markers usually contrast with a positive completion marker (Zeshan 2006). Thus, Israeli SL has a perfect aspect marker glossed as ALREADY which cannot co-occur with a negative marker. In negation a negative completion marker (NEG-COMPL) is used.

IX$_1$ EAT NEG-COMPL
'I haven't eaten yet.' (Israeli SL, Meir 2004: 109)

Negative imperatives often display some form of irregular negation.

1.5.1.1.3 Negative determiners and adverbials

Negative determiners and adverbial negatives have been reported in all sign languages where a description of negation is available (Quer 2012). Negative determiners are also called negative pronouns or negative quantifiers. These signs are usually glossed as NO, NONE, NO ONE, NOTHING, NOBODY, ZERO, etc.

neg
CONTRACT SIGN NOBODY
'Nobody signed the contract.' (LIS, Geraci 2005: 221)

The best known negative adverbials are NEVER and NOT-YET. The syntactic position of negative adverbial may vary across and within sign languages. For example, in ASL the interpretation of the clause as perfect or modal depends on the preverbal or postverbal position of the adverb (Wood 1999).

a. BOB NEVER EAT FISH
'Bob has never eaten fish.' (ASL, Wood 1999: 31)

b. BOB EAT FISH NEVER
'Bob won't eat fish.' (ASL, Wood 1999: 32)

However, as example (b) shows, the grammar writer should be aware that signs glossed as NOTHING, ZERO and NEVER can also have a simple negative function. Thus, the sign NOTHING in Ugandan SL may be a simple clause negator, a negative existential, and a negative quantifier whereas the sign ZERO can function both as a negative existential and a negative quantifier (Zeshan 2006). Similarly, the sign NEVER in Israeli SL can carry an aspectual/modal reading depending on the position of the sign within the clause (pre- or postverbal position).

The grammar writer should keep in mind these various negative signs and describe in detail their position relative to the predicate and their interaction with non-manual markers of negation.

1.5.1.2 Syntax of negative clauses

In order to understand the syntax of negation it is very important to have some background on the neutral word order of the language to be described.

1.5.1.2.1 Position of negative elements

The first thing to verify is the position that a given negative marker with sentential scope must have within a clause. This position can be pre- or postverbal. For the majority of studied sign languages, the postverbal position is preferred. This position usually coincides with the clause final position (Zeshan 2004).

hs
BOOK IX$_{I}$ TAKE NOT
'I don't/didn't take a book/books.' (IPSL, Zeshan 2004: 39)

The most widely known sign language with a preverbal negative marker is ASL.

neg
JOHN NOT BUY HOUSE
'John is not buying a house.' (ASL, Neidle et al 2002: 39)

Irregular nergatives [Morphology – Section 3.5.2] and negative adverbials are also found in pre- or postverbal position as was shown in the relevant subsection.

1.5.1.2.2 Doubling

Negative doubling is an interesting phenomenon. Negative markers are doubled in structures of emphatic negation (Quer 2012).

neg
NO DRAW HURRY NO
'Don't draw in a hurry'. (CSL, Yang & Fisher 2002: 181)

1.5.1.2.3 Negative concord

Negative concord is a phenomenon where two negations in a sentence are interpreted as a single negation. To illustrate, Italian is a negative concord language, which obligatorily marks negation twice in a sentence like the following:

Gianni	non	ha	incontrato	nessuno.
Gianni	NEG	have.3SG	meet.PTCP	no one

'Gianni met nobody.' (Italian)

There is a limited body of research about negative concord in sign languages and few scattered examples are attested in sign languages such as Libras, CSL, TİD, and VGT (Quer 2012). Negative concord has been divided into two types: i) negative concord between a non-manual and a manual component, and ii) negative concord between two different manual components (Pfau & Quer 2002: 4). These cases are illustrated for LSC in (a) and (b) respectively.

a. IX$_1$ FUMAR NO-RES
neg
'I haven't smoked (at all).' (LSC)

b. IX$_1$ FUMAR NO-RES MAI
neg
I smoke NEG never
'I have never smoked (at all).' (LSC)

The limited data available suggests that most sign languages exhibit the first type of negative concord whereas the second type is much less frequent.

The grammar writer should clearly distinguish between doubling and negative concord. In doubling, the same negative element is repeated/reduplicated within the negative clause, whereas in negative concord two different negative elements co-occur within the clause.

1.5.2 Non-lexical marking of negation

Non-manual marking of negation is universal among sign languages since it has been reported in all sign languages where data is available. However, sign languages vary as to how these types of markers combine and to what extent they are able to convey sentential negation (Quer 2012). The literature reports two main sets of non-manual markers of negation: head movements and facial expressions. For some sign languages, non-manual marking includes mouth gestures and body postures (Zeshan 2004). An inventory will make it easier for the grammar writer to trace non-lexical markers.

1.5.2.1 Head movements

Head movements constitute the main group of non-manual markers of negation. Head movements of negation are: headshake, headturn and head tilt. The most frequent is headshake, which has been reported in all sign languages studied to date (Zeshan 2004). The use, the status within the clause, and the spreading properties of the headshake vary across sign languages. For most sign languages, the headshake must be co-articulated with some manual sign. For example in LSC, the headshake is articulated over the negative particle and may optionally spread over the predicate and additionally the direct object, as represented in (a). When no negative

manual sign is present, the headshake spreads over the predicate and it may spread to the direct object, as shown in (b).

[[ ]] hs
a. SANTI MEAT EAT NOT (LSC, Pfau & Quer 2010: 388)

[ ] hs
b. SANTI MEAT EAT (LSC, Pfau & Quer 2010: 388)

However, there are sign languages like NS where head movement cannot negate the clause without a manual sign.

hs
*WORK FINISH (NS, Zeshan 2004: 18)

On the other hand, the distribution of the headshake in CSL depends on the presence of a manual sign: the headshake co-articulated with the predicate is not sufficient to negate the sentence (a). In the absence of a manual negation, the headshake has to be articulated after the predicate in a free-standing position, unassociated with a manual sign.

hs
a. * UNDERSTAND
(Intended: 'I don't understand.') (CSL, Yang & Fisher 2002: 175)

hs
b. UNDERSTAND
'I don't understand.' (CSL, Yang & Fisher 2002: 175)

In general, the free-standing position of the headshake has been reported in other sign languages as well. This typically occurs in negative answers to real or rhetorical questions, as in (a) (NZSL), or in tags, as in (b) (VGT).

rhet-q hs
a. WORTH GO CONFERENCE
'Is it worth going to the conference? I don't think so.'
(NZSL, McKee 2006: 84)

hs+y/n
b. CAN ALSO SATURDAY MORNING
'It is also possible on Saturday morning, isn't it?'
(VGT, van Herreweghe & Vernmeerbergen 2006: 328)

The grammar writer must be aware that a headshake does not necessarily have a negative meaning. For example, a slow headshake might indicate a strong positive feeling or an extreme degree, as in the following example.

slow hs
IX_3 BEAUTIFUL IX_3
'How beautiful that is!' (NZSL, Zeshan 2004: 20)

Headshakes with a non-negative value also occur in interrogatives for emphasis (LSQ) or as markers of insecurity or politeness (NSL) (Zeshan 2004).

Headturn as a negative marker can be interpreted as a reduced form of headshake. It has been reported in BSL, Irish SL, Greek SL, Flemish SL, LSQ, CSL, and Russian SL (Zeshan 2004).

The third type of negative head movement is a backward tilt of the head. It has been reported in three sign languages of the Eastern Mediterranean: GSL, LIU and TİD. Similarly to headshake, head tilt is mostly co-articulated with a manual sign.

5_1.5.2.1_1_TİD_INDEX-I_SPEAK_KNOW^NOT

ht

IX_1 SPEAK KNOW^NOT

'I can't speak.' (TİD, Zeshan 2004: 25)

However, the headtilt can spread over the predicate or sometimes over the whole sentence for emphatic reasons. Free-standing position of the headtilt has also been reported.

ht

IX_1 AGAIN HELP IX_3

'There is no way for me to help him again.' (GSL, Antzakas 2006: 266)

Be aware that an affirmative use of the head tilt has been reported for LIS (Geraci 2005). In LIS, the head tilt (reported as head nod) is used to mark affirmative responses to questions or for emphasis.

5_1.5.2.1_2_LIS_ARRIVE_SOMEONE

ht

ARRIVE SOMEONE

'Someone did arrive.' (LIS, Geraci 2005: 266)

1.5.2.2 Facial expressions

Facial expressions related to negation include the following:

- frowning, eyebrows lowered
- narrowed or squinted eyes
- nose wrinkling
- spreading of lips
- pursed lips
- mouth corners down

These facial expressions are widespread cross-linguistically (Zeshan 2004). Although facial expressions are believed to be affective features that are optional and more

variable than head movements, there are strikingly few cases where negative facial expressions function as the sole negators in a sentence.

For instance, puffed cheeks function as the only clausal negator in TİD (Zeshan 2004). Similarly, in LSB, negation can be conveyed by the negative facial expression (lowered corners of the mouth or O-like mouth gesture) only (Quer 2012), but not by headshake alone.

neg
IX_1 $_1\text{SEE}_a$ JOÃO_a IX_1 (NOT)
'I didn't see João.' (LSB, Quer 2012: 327)

1.5.2.3 Body posture

There is limited research on body posture related to negation. A back lean of the body is associated with various verbs like DENY, AVOID, DON'T-WANT and DISAGREE in ASL and NGT. In different settings, a backwards lean of the body carries the notion of non-involvement, exclusion and negation/denial. An upward movement of the shoulder (shrug) is considered a variant of the backward lean of the body (Wilbur & Patschke 1998).

1.5.2.4 Spreading domain

Spreading patterns of negative non-manuals vary across sign languages. Summarizing the spreading options illustrated in the examples quoted so far in this section, the following cases emerge:

- head movement spreads over the manual negative sign only;
- head movement spreads over the manual negative sign and the verb;
- head movement spreads over the manual negative sign and the predicate (verb+object);
- head movement spreads over the verb in the absence of a manual negator;
- head movement spreads over the predicate (verb+object) in the absence of manual negator;
- head movement spreads over the whole sentence;
- head movement spreads after the sentence in the absence of a manual negator.

All these variations are controlled by specific syntactic rules that apply to a particular sign language. However, only some evidence is available on the role of syntax in the spreading properties of head movement.

Spreading patterns can be subject to structural restrictions. For example, if a topic or an adverbial clause precedes the negative clause, the topic non-manual blocks the negative non-manual from spreading over the whole sentence. This can be seen in the following ASL example, adapted from the Boston ASL Corpus (Neidle & Metaxas 2015, available online: www.bu.edu/av/asllrp/NM/ File 50 U 6).

5_1.5.2.4_1_ASL_MARY-IX-NOT-VEGETABLE-NO

topic neg
MARY IX_3 NOT VEGETABLES NO
'As for Mary, she doesn't like vegetables.'

Spreading patterns can also be affected by anticipation. Anticipatory movements are attested in ASL and they occur just prior to the articulation of the negative particle (Bahan 1996).

As for facial expressions, their status is unclear in most sign languages (Zeshan 2004). In general, they are considered optional features in contrast to head movements. However, this is not the case for all sign languages, since Libras has negative structures where the negative facial expression is the sole element marking negation by itself.

The grammar writer should be aware that most of the research describes the spreading domain as the scope of non-manual features. However, the term scope is used in the analysis of negation for syntactic and semantic purposes. Syntactic and semantic scope and the scope (spreading) of negative non-manuals are two different terms related to different levels of analysis.

Elicitation materials

Negatives often occur in everyday language production. However, an in-depth analysis requires a considerable body of data for each type of negation. This may be possible to achieve by analyzing a corpus containing only free conversations. However, this may hide a risk. Free conversations include both formal and non-formal structures of negatives. Therefore, the grammar writer may not be able to fully investigate specific structures of negatives, whereas structures such as emphatic negation may be misleading for the analysis. For this reason, it might be useful to develop materials for specific language structure elicitation. Comic books or comic strips, pictures and pictures series, cartoons, and silent movies are suitable materials for elicitation. Of course, the whole process should be video-recorded so that the grammar writer will be able to trace back the data. We recommend that the grammar writer or the person providing the material to the signing consultant during the video recording should be also on camera. This is important for avoiding information gaps whenever the grammar writer needs to reexamine recorded material.

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Chapter 2 Clause structure

2.0 Definitions and challenges

2.0.1 Definition of constituent

In order to describe the internal structure of the clause, the grammar writer is advised that he/she should identify the constituents inside the clause. Informally speaking, a constituent is a natural structural unit within a clause. For example, there is an intuitive sense in which the words 'the keys on the table' form a natural unit in the clause 'the keys on the table belong to John', while the words 'table belong to' are not a unit in this clause. Of course, the grammar writer needs precise methods to segment a clause into the constituents it consists of, since the intuition about what counts as a natural unit is not always a reliable guide. For these reasons, a series of tests to identify constituents have been developed. In this section we discuss whether these tests can be applied to sign languages and whether sign language-specific tests can and need be built (e.g. test that built on non-manuals). While the actual grammar of a given sign language may or may not contain a list of constituency tests, depending on various factors including the level of expertise of the expected audience, knowledge of constituency tests is certainly useful for the grammar writer, as they are techniques to fragment the clause into main categories like noun phrase, verb phrase, etc.

An important clarification is that the concept of constituent is always relative to a given clause since the very same group of words can form a constituent in one clause, but not in another one. To anticipate, one popular constituency test is the pro-form test, namely a group of words can be taken to form a constituent if it can be replaced by a pro-form (typically, a pronoun [Lexicon – Section 3.7). With this in mind, notice that 'old pictures' is a constituent in the clause 'Old pictures are valuable', as witnessed by the fact that 'old pictures' can be replaced by a pronoun ('*they* are valuable') but 'old pictures' is *not* a constituent in the clause 'Old pictures of J.F.K. are

valuable' since it cannot be replaced by a pronoun ('**they* of J.F.K. are valuable'). Here the relevant constituent is the noun phrase 'old pictures of J.F.K.'.

Another caveat is that a constituency test can single out a single word as a constituent, as for the word 'John' in 'John is over there', which can be replaced by a pronoun ('*He* is over there'). So, a constituent can be as small as a word. Conversely, an entire clause can be identified as a constituent. This can be shown by the fact that an embedded clause can be replaced by a pronoun ('I did not say that John is over there' → 'I did not say *that*').

A final caveat is that there can be cases where two constituency tests do not fully match, typically because one test cannot be applied to the relevant clause for various complicating factors. In general, if one test identifies a set of words as a constituent this is considered enough evidence for the constituency of that group of words. In the following subsections, we discuss the following constituency tests in more detail:

- Displacement test
- Pro-form substitution test
- Coordination test
- Non-manual marking test
- Ellipsis test

2.0.2 Displacement test

A first diagnostic for constituency is the following: a group of words/signs can be considered a constituent if it can appear in a different position from where it occurs in a sentence with a neutral information structure [Pragmatics – Section 4]. For example, we can conclude that the noun phrase 'that book' in English is a constituent in the sentence '*That book*, I want to read! (not this one)' because this noun phrase has been moved to a sentence initial position where it receives contrastive focus [Pragmatics – Section 4.1].

The reasons why a constituent can be displaced may vary; focalization is just one example. Wh-phrase / Wh-phrases [Syntax – Section 1.2.3] may also be displaced in dedicated clause-initial or clause-final positions, so they are constituents in the clause. Categories that introduce a topic [Pragmatics – Section 4.2] are another example, as they typically appear in a dedicated position (typically sentence-initial). In (a) a noun phrase [Syntax – Chapter 4] INTERPRETER^SIGN-LANGUAGE is topicalized, while in (b) (Aarons 1994:172) the entire embedded clause is topicalized.

a. INTERPRETER^SIGN-LANGUAGE, GOVERNMENT PAY-THEM NOT-HAVE
'The sign language interpreters, the government does not pay (them).'
(HKSL, Sze 2011: 137)

topic neg
b. JOHN MUST LIPREAD MOTHER, TEACHER NOT REQUIRE
'About John having to lipread Mother, the teacher does not require (it).'
(ASL, Aarons 1994: 172)

Other categories, including the verb phrase and the prepositional phrase, may be topicalized or focalized, as in the English sentences '*Fired by his boss*, John indeed was' or '*With a spoon* you need to eat your soup!'. So, in principle the displacement test is a powerful instrument to identify constituents. However, there are various complications. One problem is that, while it can be relatively easy to decide what order is associated to a neutral informational structure in rigid word order [Syntax – Section 2.3] languages like English, it is more difficult to do so in flexible word order [Syntax – Section 2.3] languages. One way to cope with this problem in sign languages builds on the fact that categories that are displaced typically co-occur with a specific non-manual marking that is not required when they appear in situ.

Another potential problem is that sometimes constituents that are naturally displaced together can also split. The splitting option is attested in *wh*-movement constructions in various sign languages. For example, (a) below shows that the noun phrase BOOK WHICH is a constituent in LIS, as it is displaced as a whole, but (b) shows that the *wh*-sign and the noun BOY do not need to move together but can split.

which
a. PAOLO STEAL BOOK_i WHICH_i
'Which book did Paolo steal?' (LIS, Cecchetto et al. 2009: 285)

which
b. BOY_i BOOK STEAL WHICH_i
'Which boy stole the book?' (LIS, Cecchetto et al. 2009: 285)

2.0.3 Pro-form substitution test

According to another diagnostic for constituency, if a group of words/signs can be replaced by a pro-form, then it is a constituent. Well-known cases of pro-form are pronominal-like expressions, which can replace a noun phrase (*it*, *(s)he* etc.), a prepositional phrase (*there*) or a whole clause (*that*).

The application of this diagnostic to sign language is straightforward in simple cases like the example below, where an INDEX [Lexicon – Section 1.2.2 / Pragmatics – Section 2.1] refers to the individual denoted by the noun phrases PAST PRESIDENT or NOW PRESIDENT. This is confirmed by the fact that the INDEX points to the same locus where the noun phrase is articulated.

IX$_1$ KNOW PAST PRESIDENT IX$_a$ IX$_1$ KNOW NOW PRESIDENT IX$_b$. IX$_b$ SMART BUT IX$_a$ NOT SMART.
'I know the former President and I know the current President. He [= the current President] is smart but he [=the former President] is not smart.'
(ASL, adapted from Schlenker 2011: 350)

However, there are cases where an INDEX refers to ontological categories that may not have a one-to-one association with a specific syntactic constituent. For example, Schlenker (2013) claims that IX$_a$ and IX$_b$ in the example below refer to the situations where it will rain (or it will snow), rather than referring directly to the antecedent of the conditional (the sign points to the locus where the antecedent is articulated, though).

[IF RAIN TOMORROW]$_a$ WILL WARM. [IF SNOW TOMORROW]$_b$ WILL COLD.
re re
IX$_b$ IX$_1$ HAPPY. IX$_a$ IX$_1$ NOT HAPPY
'If it rains tomorrow it will be warm, but if it snows but if it snows tomorrow it will be cold. Then [= if it snows] I'll be happy. Then [= if it rains] I won't be happy.'
(ASL, Schlenker 2013: 215–216)

In fact, in spoken languages pronouns [Lexicon – Section 3.7 / Pragmatics – Section 2.1] can also refer to an entity that is salient in the discourse but does not have a one-to-one mapping with a syntactic constituent. In the example below, the pronoun may refer to any combination of Mary, Jane, and Peter, although these noun phrases are not coordinated, so they do not form a *syntactic* constituent.

a. Mary$_1$ introduced Jane$_2$ to Peter$_3$. Then they$_{1+2+3}$ left
b. Mary$_1$ introduced Jane$_2$ to Peter$_3$. Then they$_{1+2}$ left
c. Mary$_1$ introduced Jane$_2$ to Peter$_3$. Then they$_{2+3}$ left
d. Mary$_1$ introduced Jane$_2$ to Peter$_3$. Then they$_{1+3}$ left

For this reason, the grammar writer may want to avoid plural pronouns and he/she should be aware that pointing signs may refer to entities that have only an indirect relation with syntactic constituents.

2.0.4 Coordination test

A third diagnostic for constituency is coordination [Syntax – Section 3.1]; namely if two categories can be coordinated, then they are two constituents of the same type. Although it is not always straightforward to apply this test to sign languages, because coordination can be done via non-manual markings, which must be previously

identified, the coordination test in principle allows the identification of categories like noun phrases, verb phrases, clauses, adverbials, etc.

2.0.5 Non-manual marking test

At least in some cases, non-manual marking is an effective way to identify constituents. For example, categories that are marked as topic or focus are likely cases of constituents inside the clause. In principle, lexically based non-manual marking (like the facial expression commonly associated to the signs for 'thin' or 'fat') might be an indication of constituency, if the lexical non-manual marking extend to the noun modified by the adjective [Syntax – Chapter 6]. The extension of the lexical non-manual marking is an aspect that might change cross-linguistically, though.

In addition to the problem of disentangling grammatical from affective non-manual marking, another potential challenge arises, namely in cases in which non-manual marking indicates phonological rather than syntactic constituents (Sandler 2012). As the correspondence between phonological and syntactic categories is not perfect, this is a proviso that should be kept in mind.

A different concern specifically applies to *wh*-non-manual marking [Syntax – 1.2.3.1]. The *wh*-sign is always marked by a lexical non-manual marking. However, at least in sign languages like LIS, *wh*-non-manual marking may spread over a bigger portion of the clause and, when it does, it has been claimed not to signal constituents but to play a different grammatical function (Cecchetto et al. 2009).

2.0.6 Ellipsis test

In many spoken languages a category can go unpronounced if a suitable antecedent is present that provides the content for the missing category. A category that can go unpronounced forms a constituent. For sake of explicitness, we indicate the elliptical category by striking it out. In English, categories that go unpronounced include the verb phrase (cf. 'John has already left while I have not ~~already left~~') or the clause out of which a *wh*-phrase has moved (cf. 'John bought something but I don't know what ~~John bought~~').

In other languages, ellipsis [Syntax – Section 2.5] of a subpart of the noun phrase is observed, as shown by the Dutch example below.

Zij heeft een zwarte auto, maar ik heb een groene ~~auto.~~
She has a black car, but I have a green (Dutch, Sleeman: 1996: 13)

Although work on ellipsis in sign languages is still limited, it suggests that ellipsis might be a useful hint to identify constituents inside the clause.

2.1 The syntactic realization of argument structure

2.1.0 Definitions and challenges

2.1.0.1 Argument structure and transitivity

Verbs (and other predicates like adjectives and nouns) combine with a certain number of dependents or participants in order to express a complete predication to refer to a particular event or situation. Dependents that obligatorily co-appear with a predicate are known as *arguments*. The argument-taking property of a predicate constitutes the *argument structure* of that predicate (or valency). Traditionally, the argument structure of a verb has been considered to be derivable from its lexical semantics, which determines the number of arguments (one, two or three) and the type of thematic roles / thematic roles [Semantics – Section 6.1] it has to assign to its participants. It is, though, a prototypical semantic property that necessarily interfaces with syntax (how those arguments are mapped onto syntactic structure) and morphology (how verb morphology encodes argument-structure properties).

Take, for instance, the verb *put* in the following English sentence: the three arguments receive the roles of agent, theme and goal, respectively, and all of them must be realized for the sentence to be grammatical.

*(David) put *(the pullover) *(on the shelf).
David = agent
the pullover = theme
on the shelf = goal

However, sometimes obligatoriness is not a sufficient criterion to determine the argument status of a participant, as the next sentence shows. Syntactically, *at school* may be optional, but semantically it must be (contextually) understood that David arrived somewhere, which derives from the fact that the verb 'arrive' has two semantic arguments and the second one bears a goal thematic role.

David arrived (at school).

By contrast, *loudly* and *in his room* are both syntactically and semantically optional in the next sentence since they are not required by the predicate (the former is a modifier of the predicate and the latter expresses the location where the event takes place). These constituents are called *adjuncts*, because they do not belong to the argument structure of the predicate.

David laughed (loudly) (in his room).

Single-argument predicates are called *intransitives*, since they only require a subject argument; *transitives* are those whose two arguments realize a subject and a direct

object; *ditransitives* feature three arguments, namely subject, direct object and indirect object. Typical examples of these three classes in English are respectively:

a. David sighed. (intransitive)
b. David bought a lollipop. (transitive)
c. David gave the lollipop to his friend. (ditransitive)

However, this characterization is not fully adequate. An important qualification is that intransitive predicates can further be subclassified as either unergative or unaccusative [Syntax – Section 2.1.1.2.]

Determining the argument structure of a predicate is not always an easy task. A basic difficulty arises with implicit arguments, as the case of *arrive* mentioned above illustrates: implicit arguments are semantically obligatory, but syntactically optional. Additionally, two types of factors need to be taken into account when examining argument structures for lexical predicates. On the one hand, the specific morphological and syntactic characteristics of the language under study are crucial when examining argument structure, because they affect the overt realization of arguments. One such characteristic is argument omission, which refers to the fact that arguments (typically subjects, but also objects) can remain covert under certain syntactic or contextual conditions. On the other hand, there are grammatical operations that can affect the realization of the argument structure of a predicate and alter its valency either by reducing it or by increasing it. The most representative cases of this type of operations are passivization / passivization [Syntax – Section 2.1.3.2] and causativization / causativization [Syntax – 2.1.3.1], respectively, which will be discussed below.

Next to these argument-structure changing operations, other systematic regularities have been identified in related pairs of the same predicates within a language, and such regularities recur crosslinguistically. Such correlations for predicate types have been known as argument structure alternations. A well-known argument structure alternation is the one between transitive and unaccusative, as exemplified here for English:

a. The girl broke the glass. (transitive)
b. The glass broke. (unaccusative)

2.1.0.2 Methodological challenges

We would like to draw the attention of the grammar writer to an issue regarding a typological distinction between languages in terms of how they treat different arguments of a predicate, since this may be relevant to the typological status of sign languages and their syntax.

The distinction we would like to discuss is between the so-called Nominative-Accusative languages versus Ergative languages. A typical example of the N-A

languages is English. In English, the subject of a transitive verb such as 'find' and the subject of an intransitive verb such as 'arrive' have the same morphological marker, namely, nominative case. The nominative form of the third person pronoun is 'he', as shown in (a) and (b) below. The object of a transitive verb, on the other hand, is inflected with a different marker, namely, accusative. The accusative of the third person pronoun is 'him', as shown in (c).

a. *He* found her.
b. *He* arrived home late.
c. The police found *him*.

In Ergative languages, on the other hand, the object of a transitive verb and the subject of an unaccusative verb are treated similarly, receiving the same morphological marker. In the Basque examples below, *Martin* is the subject of the unaccusative verb *come* and *child* is the object of the transitive verb *send*, and they are both in absolutive case, which is phonologically null in Basque. The subject of the transitive verb *send*, *Martin*, in (b), however, is marked with a different case, namely, ergative.

a. *Martin* ethorri da.
   Martin-abs came Aux
   'Martin came.'
b. *Martin*-ek *haurra* igorri du.
   Martin-erg child-abs sent Aux
   'Martin sent the child.'

(Basque, adapted from Comrie 1978: 329–336)

Thus, roughly, we can say that Nominative-Accusative languages mark the grammatical function 'subject' morphologically, regardless of its thematic role (agent or patient/theme), and Ergative languages distinguish agents and patients/themes morphologically.

Ergative languages do not always display uniform behavior. We can not go into the details here, but there are two issues that should be noted: (i) some languages are called split-ergativity languages since this ergative behavior is observed in some constructions but not the others, (ii) while some languages show morphological ergativity as illustrated with the Basque examples above, others also show syntactic ergativity. In this latter type of language the theme/patient arguments of predicates pattern together with respect to certain syntactic phenomena such as coordination and relativization [Syntax – Section 3.4] / relativization [Semantics – Section 14.3]. What is crucial to note for our purposes is that for a language to be considered ergative, it does not have to have overt case morphology.

It is often assumed that sign languages do not have case morphology. So, it is not possible to identify ergativity in sign languages based on the distribution of case morphology. However, some researchers have argued that

backward agreement / backward agreement [Morphology – Section 3.1] in sign languages is reminiscent of ergativity since as a result of the reversal of the path movement, the agent is marked like the theme/patient of a forward agreement verb and the theme/patient is marked like the agent of a forward agreement verb (Pfau, Salzmann & Steinbach 2011). Based on various tests involving coordination / coordination [Syntax – Section 3.1] and gapping constructions, Sevinç (2006) also argues that TİD shows syntactic ergativity properties.

Thus, the grammar writer should be aware of the possibility that the sign language under investigation (or all sign languages) may typologically belong to the family of ergative languages, and this may have consequences for its syntax.

2.1.1 Types of predicates

2.1.1.1 Transitive and ditransitive predicates

Transitive predicates are those selecting two arguments, an internal and an external one. The prototypical roles for the two arguments are agent and theme/patient, respectively. Ditransitive predicates select for three arguments: source, theme and goal/recipient, realized as subject, direct object and indirect object, respectively. They often express some notion of transfer, such as 'give' or 'telephone', and, in sign languages, may show overt agreement [Lexicon- Section 3.2.2], whereby subject agreement encodes the agent/source argument and object agreement encodes the goal/recipient argument.

top top
BOOK DAVID IX$_3$ IX$_{1\,1}$GIVE$_3$ ALREADY
'I already gave the book to David.' (LSC)

In this example, the internal theme argument BOOK is not expressed through agreement morphology on the verb (source and goal location of the path movement, and or orientation of the palm/hand). However, hand configuration determined by the theme argument (sometimes identified as handling classifier / handling classifier [Morphology – Section 5.1.3]) can be considered as a sort of agreement as well, or else as an instance of noun incorporation.

2.1.1.2 Intransitive predicates: unergative and unaccusative

Importantly, within the class of intransitive verbs, two classes can be distinguished: unergative verbs and unaccusative verbs.

Unergative verbs have a subject that has the properties of an external argument. Its thematic role is typically that of an agent. Many activity verbs like *dance*, *talk* or *laugh* fall under the class of unergatives.

TEACHER LAUGH
'The teacher laughed.' (LSC)

By contrast, unaccusative verbs are predicates that have a subject that has properties of an internal argument. Its thematic role is that of theme, and it is typically non-agentive:

WOMAN FALL. POLICE CAR CL:car 'pass by'
'The woman fell. A police car passed by.' (LSC)

This holds both for lexical verbs of motion and for classifier constructions expressing movement.

Although some verbs, like *die* or *dance*, are expected to be unaccusative or unergative in all languages due to their semantics, other verbs fluctuate between one class and another from language to language. Therefore language-particular tests to tease apart unaccusative and unergative verbs are useful. These tests build on the fact that the property of being unaccusative or unergative systematically correlates with some syntactic properties. New tests might be needed for the language to be described. This is particularly true for sign languages since tests for unaccusativity/unergativity were first elaborated for spoken languages and only recently have sign language-specific tests been identified.

Some tests that set apart unaccusatives and unergatives include the following:

(a) In some Romance languages (Catalan, French, Italian), the partitive clitic *ne/en* accompanies both objects and subjects of unaccusative verbs, but not subjects of unergative verbs, as exemplified here for Catalan:
   a. N'he comprat moltes.
      PART-have.1SG buy.PRTC many.FEM.PL
      'I bought many (of them).'
   b. N'han arribat moltes.
      PART-have.3PL arrive.PRTC many.FEM.PL
      'Many (of them) arrived.'
   c. (*N')han xisclat moltes.
      have.3PL scream.PRTC many.FEM.PL
      'Many (of them) screamed.' (Catalan)

(b) In Romance and Germanic varieties that use two auxiliaries [Morphology – Section 3.3] ('be' and 'have') for perfective tenses, *be* appears with unaccusative verbs and *have* is used with unergatives, as exemplified here for Dutch:
   a. David is gevallen.
      David be.3SG fall.PTCP
      'Davis has fallen.'
   b. David heeft gebeld.
      David have.3SG call.PTCP
      'Davis has called.' (Dutch)

(c) In ASL the sign for negation NOTHING has been found to target only internal arguments, namely direct objects and subjects of unaccusatives.

(d) In ASL, unergative predicates (but not unaccusative predicates) can combine with the adverb WILLINGLY and with the negative imperative FINISH!. This test taps on the agentivity of the single argument of the predicate: the subject of an unergative verb is an agent, therefore it is possible for this agent to do something willingly and to stop doing it. This is not possible for the subject of unaccusative verbs, that is not an agent ('?? John arrives willingly' or '?? Stop arriving').
(e) Another sign-language specific test involves the distributive morpheme [Morphology – Section 3.1.2.3]. In LIS this morpheme is expressed by a repetition of the verbal root and is always interpreted on the internal argument (the theme) in a transitive construction. For example, the following sentence means that the professor is examining each of them, not that each professor is examining someone.

5_2.1.1.2_1_LIS_professor examine[distr]

PROFESSOR EXAMINE[distr]
'The professor is examining each of them.'

(LIS, adapted from Mazzoni 2012: 164)

The distributive morpheme is acceptable with unaccusative verbs like *rise* but not acceptable with unergative verbs like *cry*:

5_2.1.1.2_2_LIS_cake rise[distr]

a. CAKE RISE[distr]
'Every cakes is rising.'
b. *CHILD CRY[distr]
Intended meaning: 'Every child is crying.'

(LIS, adapted from Mazzoni 2012: 164)

2.1.1.3 Psychological predicates

Psychological predicates are those expressing a psychological state. They are known to constitute a heterogeneous class with regards to the syntactic realization of arguments. Given the complexity of the syntactic realization of arguments in this class, it is especially important to pay attention to all the grammatical means the language might have available to mark syntactic functions (agreement, agreement auxiliaries, etc.).

Depending on the type of psychological predicate, the experiencer can be realized as a subject or as an object. This basic property allows the distinction between subject experiencer predicates and object experiencer predicates, as in the following English sentences, exemplifying each class, respectively.

Peter hates broccoli. (Subject experiencer)
The news surprised me. (Object experiencer)

The following sentence is a case of subject experiencer predicate in ASL.

MARY HATE SUE
'Mary hates Sue.' (ASL)

Next to stative psychological predicates we also find causative ones, where an agent intentionally induces the psychological state of the experiencer. Sign languages tend to lexicalize stative and causative psychological predicates as separate lexical entries, as in FEAR (stative) versus SCARE (causative). Some sign languages like LSC and GSL construct psychological predications by means of a causative auxiliary and a sign expressing the psychological state, as in the following GSL sentence:

5_2.1.1.3_1_GSL_ix2 2give-aux3 burden end

IX_{2} $_{2}$GIVE-AUX$_{3}$ BURDEN END!
'Stop being a trouble/nuisance to him/her!' (GSL)

2.1.1.4 Meteorological predicates

A rather special class of predicates is weather-verbs, which either never take an overt argument, as in Portuguese (i), or simply take a dummy or expletive-like one, as in French (ii):

a. Neva.
   snow.3SG
   'It is snowing.' (Portuguese)
b. Il pleut.
   pro.3SG RAIN.3SG
   'It is raining.' (French)

2.1.1.5 Argument structure alternations

Argument structure alternations have been identified in both spoken and sign languages. For example, the same verbal roots may appear in a transitive or in an unaccusative frame. This is an example from English.

a. I changed my life.
b. My life changed.

A similar alternation has been found in ASL and is further documented in other sign languages like LIS, LSA, LSC, and NGT. The relevant studies focus on classifier constructions, but are extendible to lexical predicates. Classifier constructions are deemed to belong to different argument structure classes according to the handshape used: handling classifiers [Morphology – Section 5.1.3] form transitive predicates; whole entity classifiers [Morphology – Section 5.1.1] form unaccusative predicates;

and body part classifiers [Morphology – Section 5.1.2] form unergative predicates. The main types of attested argument structure alternation are the following:
(i) transitive/unaccusative alternation: handling CL/whole entity CL
(ii) unergative/unaccusative alternation: body part CL/whole entity CL

These alternations are illustrated here for ASL. The following sentences illustrate the transitive/intransitive alternation.

a. BOOK CL:handling: 'grab flat object'+MOVE
'S/he took the (standing) book and laid it down on its side.'
b. BOOK CL:whole-entity: 'flat object'+MOVE
'The (standing) book fell down on its side.'
(ASL, Benedicto & Brentari 2004: 752)

The following sentences illustrates the unergative/unaccusative alternation:

a. ROSIE CL:bodypart 'head'+BOW
'Rosie bowed.'
b. ROSIE CL:whole-entity 'upright human'+BOW
'Rosie bowed.' (ASL, Benedicto & Brentari 2004: 763)

The grammar writer should verify which kind of alternation is possible in the language under investigation, and describe it.

2.1.2 Argument realization

Arguments are canonically realized as noun phrases (NPs), but we also find a whole array of other possible realizations, such as prepositional phrases (PPs) or clauses (finite or non-finite). Determining the whole range of possible argument encoding is a language-particular goal that requires knowledge about specific grammatical properties of the language. Sign languages, for instance, have been shown to possess very few prepositions and virtually no overt case marking, which forces the grammar writer to look for other grammatical clues to diagnose the argument selection properties of a predicate.

2.1.2.1 Overt NPs

The most canonical realization of an argument is an NP. Typically, an NP appears in its argument position in an unmarked word order (i.e. with a neutral information structure [Pragmatics – Section 4]), as in the ASL example (a) and in the DGS example (b):

a. JOHN EAT APPLE (ASL)
b. JOHN APPLE EAT (DGS)
'John ate an apple.'

However, overt NPs appear in non-argument position as a result of syntactic modification often induced by discourse factors, such as topic [Pragmatics – Section 4.2] / topic or focus [Pragmatics – Section 4.1] / focus fronting. In these cases it is very important to examine the non-manual markers that are coarticulated with the argument appearing in a non-argumental position:

top
JOHN TEACHER LIKE
'John, the teacher likes.' (LSC)

The grammar writer should take into account that sometimes one and the same argument can occur as a discontinuous constituent, that is, parts of it appear in non-adjacent positions in the sentence. This is typical for quantified constituents or complex wh-phrases [Syntax – Section 1.2.3] / wh-phrase, as in the following LSC examples:

a. top
BOOK IX_1 LIKE ALL
'I like all books.' (LSC)

b. top wh
BOOK IX_2 LIKE^MORE WHICH
'Which book do you prefer?' (LSC)

2.1.2.2 Pronouns

Pronouns constitute another canonical expression of arguments, just as full NPs. In this category we find personal pronouns [Lexicon – Section 3.7.2], but also demonstrative pronouns [Syntax – Section 4.1.2], reflexive pronouns [Lexicon – Section 3.7.4], etc.

a. top
JOHN IX_1 LIKE
'John, I like.' (LSC)

b. IX_1 PREFER IX_a
'I prefer this one.' (LSC)

2.1.2.3 Verb agreement

Verb agreement [Morphology – Section 3.1] is a strong clue to determine the argument structure of a predicate because it will only involve syntactic arguments, never an adjunct. Under 'verb agreement' two types of inflections that are normally treated separately need to be taken into account: person agreement (with animate participants) and locative or spatial agreement (with arguments of location and movement predicates encoding goal, source, path or location). In addition, non-manual agreement marking has been identified for a sign language like ASL.

2.1.2.3.1 Manual verb agreement

Person agreement predicates are often characterized as ditransitives expressing some notion of transfer, such as GIVE or TELEPHONE, whereby subject agreement encodes the agent/source argument and object agreement encodes the goal/recipient argument.

5_2.1.2.3.1_1_LSC_book david ix3 ix1 1give3 already

top	top	top	top	
BOOK	DAVID	IX_3	IX_1	$_1GIVE_3$ ALREADY

'I already gave the book to David.' (LSC)

Note that in this type of case the internal theme argument is not expressed through agreement morphology on the verb. However, hand configuration determined by the theme argument (sometimes identified as handling classifier [Morphology – Section 5.1.3]) can be considered as a sort of agreement as well, or else as an instance of noun incorporation. Such marking of the theme on the verb is not incompatible with the appearance of the corresponding overt NP/DP in the same clause.

Nevertheless, not all person agreement verbs are ditransitives: some of them are clear transitives where the second agreement marker agrees with the internal argument realized as a direct object, as in LSC SUMMON, for example.

It is important to keep in mind that subject agreement marking has been described as optional in most sign languages. The consequence of this is that object agreement is the one that surfaces obligatorily with agreement verb, even if the verb has an external argument.

There might be other circumstances that induce the absence of overt marking of agreement on agreement verbs, such as certain types of quantified arguments (negative, non-specific, generic), as exemplified here for LSB. In this case the uninflected citation form of the verb occurs.

IX_1 NOT MEET NOTHING
'I didn't meet anyone.' (LSB)

Another case where the verb appears uninflected is when it co-occurs with an agreement auxiliary. Some sign languages have a specialized verbal auxiliary form that encodes subject and object marking. It mainly appears with plain verbs, which cannot carry inflection for subject and object arguments, but it can also accompany inflected agreement verbs with an emphatic interpretation. Moreover, in LSC, for instance, the agreement auxiliary appears naturally with inflected backwards agreement [Lexicon – Section 3.2.2] verbs (note that the path of the auxiliary goes from the subject locus to the object locus).

IX_{3a} IX_{3b} $_{3a}AUX_{3b}$ $_{3b}$UNDERSTAND$_{3a}$ NOT
'She doesn't understand him.' (LSC)

Spatial predicates are the other group of predicates that show manual agreement by means of path movement (motion verbs) or localization at a point (locative verbs). With motion verbs, the initial and final points of the path agree with the locations of the source and goal arguments that define the path, as in the following LSC examples:

5_2.1.2.3.1_2_LSC_washington ixa bristol ixb amove-homeb

a. WASHINGTON IX_a BRISTOL IX_b $_a$MOVE-HOME$_b$
'He moved from Washington to Bristol.'

5_2.1.2.3.1_3_LSC_arrive early

b. $ARRIVE_a$ EARLY
'She arrived (there) early.' (LSC)

Non-movement spatial verbs that have a location argument simply agree by localizing the sign in the relevant location or orienting towards it:

$STAY_a$ YEAR^TWO
'He stayed there for two years.' (LSC)

2.1.2.3.2 Non-manual verb agreement

A second way to mark agreement has been identified for ASL, namely non-manual agreement. This type of agreement co-appears with both inflected person agreement verbs such as BLAME and plain verbs such as LOVE. The two non-manual articulations involved are head tilt towards the location of the subject argument and eye gaze towards the location of the object. With intransitive predicates, both articulations can mark subject agreement.

head tilt-3a
eye gaze-3b
a. ANN_{3a} $_{3a}$$BLAME_{3b}$ $MARY_{3b}$
'Ann blames Mary.'

head tilt-3a
eye gaze-3b
b. $JOHN_{3a}$ LOVE $MARY_{3b}$
'John loves Mary.' (ASL)

2.1.2.4 Classifier handshape

A classifier handshape [Morphology – Chapter 5] / classifier handshape [Pragmatics – Section 2.2.2] can show agreement with the direct object of a ditransitive verb. The phenomenon is particularly pervasive in classifier constructions, where

it can stand for some visually salient property of the cross-referenced argument, as in the following example.

CAR CL:vehicle: 'at location a' MAN CL:upright-human 'move to a'
'A man approached the car.' (LSC)

2.1.2.5 Argument clauses

Arguments can also be realized by an argument clause [Syntax – Section 3.3] / argument clause [Semantics – Section 14.1] in sign languages, both as subjects and objects. The following sentence is is an NGT example of an object dependent clause:

5_2.1.2.5_1_NGT_ix1 know ix2 2come1

IX_1 KNOW $IX_{2\ 2}COME_1$
'I know you are coming (to see me).' (NGT)

The following is an example of an LSC sentence where a subordinate clause serves as a subject

5_2.1.2.5_2_LSC_important ix2 2tell1

IMPORTANT $IX_{2\ 2}TELL_1$
'It is important that you tell me.' (LSC)

2.1.3 Argument structure change

2.1.3.1 Extension of argument structures

The basic argument structure of a verb can sometimes be extended with the addition of an extra argument expressing a non-obligatory thematic role. This normally requires some explicit morpho-syntactic marking. A good example of this is offered by the specialized person agreement markers [Morphology – Section 3.1.1] (PAM) in DGS glossed as PAM-ÜBER (PAM-ABOUT) and PAM-FÜR (PAM-FOR), exemplified in the following sentences: in (a) the argument structure is extended with a subject matter and in (b) with a beneficiary.

5_2.1.3.1_1_DGS_ix1 pam-über2 can chat

a. IX_1 PAM-$ÜBER_2$ CAN CHAT
'We could chat about you.'

5_2.1.3.1_2_DGS_ix1 can pam-für2 book buy

b. IX_1 CAN PAM-$FÜR_2$ BOOK BUY
'We can buy a book for you.' (DGS)

Causativization is another case of argument extension, where a complex event has a causer and a caused event. The causative event can be encoded lexically or else be expressed analytically with a periphrasis involving a verb of causation like MAKE, DO or CHANGE. As an instance of lexical causatives, handling classifiers can incorporate the change of state, as in the following HKSL sentence.

FATHER ROD CL:handling: 'break'
'Father broke the rod by snapping it.' (HKSL)

However, the resultant state can sometimes require explicit expression by an additional overt predicate in HKSL.

FEMALE PAPER CL:handling: 'tear' CL: size-and-shape: 'long, thin object'
'A female shreds a piece of paper.' (HKSL)

The analytical expression of a causative predication involves the use of an overt causative predicate with its own external argument. It can take stative or eventive complements expressing the caused eventuality. This is illustrated for DTS.

5_2.1.3.1_3_DSL_ix make/do ix1 angry

IX MAKE/DO IX_1 ANGRY
'This makes me angry.' (DSL)

Some sign languages such as LSC and GSL resort to specialized causative auxiliaries to express a change of (psychological) state, as the following LSC example illustrates.

ARRIVE $_3$AUX-CAUS$_1$ HAPPY
'His arrival makes me happy.' (LSC)

Yet another case of argument extension is applicative. The applicative operation either creates a new argument that is added to the original argument structure of the verb, or it changes the argument structure promoting an indirect object (typically a locative) to the direct object position. The latter case can be illustrated with German, where the verbal prefix *be-* can turn an indirect object into a direct object. The original direct object can be omitted or expressed as an oblique argument (a prepositional phrase). Example (a) is the applicative construction corresponding to (b).

a. IKEA liefert dem Nachbar-n Möbel
   IKEA delivers the neighbour-DAT furniture
   'IKEA delivers furniture to the neighbour.'
b. IKEA be-liefert den Nachbar-n (mit Möbeln)
   IKEA appl-delivers the neighbour-ACC (with furniture)
   'IKEA delivers furniture to the neighbour.' (German, Haspelmath & Sims 2010: 242)

Sign languages are known to have very few prepositions, so we might expect that locatives, instrumentals and the like, which are typically expressed with

prepositional phrases in languages like English, might be expressed through some kind of applicative construction.

Kegl (1990) has argued this holds in ASL in what she calls indeed applicative constructions: in the example below, the locative argument is realized as a direct object, and a locative morpheme is incorporated into the verb form, in a way that is highly reminiscent of the facts just described in German.

(CAR) CL (3) + MOVE_i STORE_i
'The car went to the store.' (ASL)

An applicative may also add an object argument that was not in the argument structure of the verb, which will then be typically interpreted as either a benefactive or a malefactive, or again as a locative, or an instrumental. For example, Chamorro has a benefactive applicative, illustrated in (b).

a. Ha hatsa i acho'.
   he. ERG lift ABS stone
   'He lifted the stone.'
b. Ha hatsa-yi si Pedro ni acho'.
   he-ERG lift-APPL ABS Pedro OBL stone
   'He lifted the stone for Pedro.' (Chamorro, Topping 1973: 253)

Similarly, the personal agreement auxiliary (PAM) in DGS can add an extra argument to intransitive verbs, and thus appears to behave like an applicative morpheme. Two examples are given below.

a. IX_1 LAUGH $_1\text{PAM}_2$
   'I laugh at you.'
b. IX_1 LETTER WRITE $_1\text{PAM}_2$
   'I write a letter to you.' (DGS, Steinbach 2011: 215)

2.1.3.2 Passive

2.1.3.2.0 Definitions and challenges

The argument structure of a predicate can be reduced in certain constructions. The most well-known case of argument reduction is the *passive*, where the agent argument is demoted and the theme/patient is promoted to the subject position ('They stole the painting' → 'The painting was stolen'). The active/passive contrast falls under the grammatical category of voice.

2.1.3.2.0.1 Passive constructions

Typically, a construction is considered to be a passive construction when the patient (or theme) argument [Semantics – Section 6.1] of a transitive [Syntax – Section 2.1.1.1]

or a ditransitive [Syntax – Section 2.1.1.1] / ditransitive verb is in the subject position, the agent argument is absent or expressed optionally, and the verb or the verb phrase is marked in a special way. Passivization is considered to be a sub-type of lexical or clausal change that involves a reduction in the number of arguments of the verb, that is, by means of making only the non-agent arguments obligatory.

2.1.3.2.0.2 Characteristic properties of typical passive constructions

Passive is usually considered to be morpho-syntactically and pragmatically more marked than active. The intuition behind this is that a speaker chooses to convey a message with a passive construction, rather than active, to foreground the patient argument of the verb and to background the agent.

a. The critics praised John.
b. John was praised (by the critics).

Notice that in the passive sentence above, *John* is the foreground and the agent *the critics* may be dropped or expressed by an oblique prepositional phrase.

In terms of the morpho-syntactic properties of the theme and the agent arguments in passive constructions, at least in some languages, the patient displays properties of subjecthood; thus, it occupies the typical subject position and carries the case morphology of subjects of that language. In English, for instance, subjects of both active and passive sentences occupy the subject position and are marked with nominative case regardless of their semantic role (theme versus agent), as shown in the following examples:

a.	She called her father	(subject (agent) of active sentence in the nominative)
b.	She was called by her father	(subject (patient) of passive sentence in the nominative)
c.	Her father called her	(object (patient) of active sentence in the accusative)

Languages express passive by marking the verb or the verb phrase in a special way. In English, for instance, the verb is in its past participial form and it is accompanied by the auxiliary *be*:

The vase was broken by the man.

Other languages inflect the verb with a special passive morpheme. In the Turkish examples below, the semantic role of the subject *çocuk* ('child') is understood by the presence and absence of the passive morpheme *–il* on the verbal stem:

a. Çocuk sev-di.
child love-past
'The child loved.'

b. Çocuk sev-il-di.
child love-passive-past
'The child was loved.' (Turkish)

Some languages allow agent phrases to be expressed optionally in passive constructions, however, in some others agents cannot be expressed at all. So, the impossibility of expressing the agents should not be taken as an indication that the construction under investigation is not passive. In fact, it seems that speakers of most of the world's languages tend to prefer passive constructions without agents (Keenan & Dryer 2007).

Moreover, languages differ in the types of verbs that can be passivized. In some, only active and transitive (and ditransitive) verbs can be passivized, but there are also languages such as German, Dutch and Turkish where stative and/or intransitive verbs are also passivized. The following example is from German where the intransitive verb *tanz-* ('dance') is passivized and the agent is understood to be impersonal.

Gestern wurde getanzt.
yesterday became danced
'Yesterday there was dancing.' (German, Keenan & Dryer 2007: 346, ex. (44))

Finally, if a language has passive constructions with transitive verbs, it usually allows passivization of ditransitives. Those languages differ in terms of which argument(s) they can passivize, though, for example, whether both the patient and the recipient argument or only one of them can be promoted to subject. The following English examples show that both of these non-agent arguments can be passivized in this language (note the nominative marking on the subject). By contrast, in German only the patient can be passivized as is illustrated in (c) and (d).

a. She was given to the animal shelter. *patient*
b. She was given the cat. *recipient*
c. Der Roman wurde dem Mann gegeben. *patient*
The novel-NOM became the man-DAT given
'The novel was given to the man.'
d. *Der Mann wurde den Roman gegeben. *recipient*
The man-NOM became the novel-ACC given
Intended reading: 'The man was given the novel.'

Another typological fact to keep in mind is that passive verbs may exhibit different agreement paradigms than active verbs (Keenan & Dryer 2007). For instance, in a language where active verbs carry subject agreement markers, passive verbs may fail to agree with the subject. In another language, agreement markers may differ depending on whether the verb is in its active or passive form. Finally, it is also possible to come across languages where the theme argument is clearly in the subject position but the verb expresses the features of the theme argument through object-agreement (and not subject-agreement).

Recall that in some languages passive is expressed through a combination of an auxiliary with the participial form of the verb. Typologically, there are four types of passive auxiliaries that have been identified: (i) verbs of being or becoming, as in English; (ii) verbs of reception (e.g. *receive*, *get* or *eat*); (iii) verbs of motion (e.g. *go* and *come*), and (iv) verbs of experiencing (e.g. *suffer*, *touch*, *experience*) (Keenan & Dryer 2007).

2.1.3.2.0.3 Passiveless languages

Researchers have argued that some languages do not have passive constructions at all but may express an event without identifying the agent by constructing active sentences with impersonal subjects with a meaning similar to 'Someone broke the vase' / 'They broke the vase' to express 'The vase was broken'. In the Kru example below the subject is third person plural pronominal, however, it does not refer to a specific, known group of people:

a. Tò pō˛ slā ná
   Toe build house DEF
   'Toe built the house.'
b. I pō slā ná
   3PL build house DEF
   'They built the house.' = 'The house was built.'
   (Kru: Keenan & Dryer 2007, citing personal communication with John Singler)

2.1.3.2.0.4 Methodological challenges

Many languages of the world have constructions that resemble passive constructions in some respects, but differ from them in others, thus, making the identification of the construction as passive or not quite challenging. Recall that one of the identifying properties of passives cross-linguistically is special morphology of the verb / verb phrase (an affix or the participial form of the verb with an auxiliary). In languages with scarce straightforward inflectional marking, the challenge is naturally bigger.

One construction that resembles passives is called 'middle'. In middle-constructions, the theme is in the subject position, similar to passives, but the agent is not implied, in contrast with passives.

a. The ship was sunk.
b. The ship sank. (Keenan & Dryer 2007: 352, ex. (61))

In the passive sentence 'The ship was sunk' the agent is implied, however, in the middle sentence 'The ship sank' the agent is not implied. The ship may have sunk due to a storm and a hole in its body. In the middle sentence the predicate is unaccusative [Syntax – Section 2.1.1.2].

It is *not* possible to add an agent phrase to middle constructions. Consider the contrast in the following:

a. The ship was sunk by the enemy.
b. *The ship sank by the enemy.

Moreover, in some languages the same morphology may be employed for middles, passives and reflexives. In the following Spanish examples, the reflexive *se* occurs in both the middle, as in (a) and the passive, as in (b):

a. Se quemó el dulce
   REFL burn.PAST.3SG the jam
   'The jam burned.' (or 'The jam was burned.')
b. Se complieron las promesas
   REFL fulfil.PAST.3PL the promises
   'The promises were fulfilled.' (Spanish, Keenan & Dryer 2007: 353, ex. (64))

An alternative to passive has been reported from languages where the verb is marked with a pronominal morpheme unspecified or indefinite for person. The following Iroquoian example illustrates this with the prefix *ukw-*.

úhka? ok wa?-ukw-alahs∧tho-?
PRT PRT FACTUAL-UNSPEC.SUBJ:1.OBJ-kick-PUNCT
'Somebody kicked me.'

(Iroquoian: Keenan & Dryer 2007, citing personal communication with Karin Michelson)

2.1.3.2.0.5 Passive in sign languages

Whether or not sign languages that have been studied so far have passive constructions has been a controversial topic in the literature. This is because, in contrast to some well-known spoken languages, but similar to others, in sign languages there is no clear case of passive morphology. In languages without such special passive morphology, it is challenging to differentiate between active, passive and other passive-like constructions.

The clauses that have been in the focus of discussion lack the following more commonly attested morpho-syntactic properties of passive constructions:

(i) special passive morphology;
(ii) obligatory change in word order (promoting the patient to the subject position and optionally expressing the agent in an oblique phrase such as a *by*-phrase as in English), since the sign languages studied so far typically have flexible word order;
(iii) change in case morphology on the noun phrases expressing the agent and the non-agent arguments (since the sign languages that have been studied so far do not show overt case marking; it is not possible, for instance, to determine the subjecthood of the noun phrase with the patient role based on case morphology).

This said, the grammar writer should always keep in mind that morphemes in sign languages do not always have to be realized linearly and manually, but can also be expressed simultaneously and non-manually. As always, a grammar writer of a sign language should look beyond what is known about better-studied spoken languages.

Due to lack of obvious morphological and syntactic clues for the presence of passive constructions, the discussion in the literature focuses rather on semantic and pragmatic properties, which resemble the properties of canonical passive constructions in the world's languages. Some of the morpho-semantic properties that these constructions do display are summarized in the following:

(i) with agreement verbs, the locus of the agent, though required, is semantically empty, not referential;
(ii) the signer depicts the event from the patient's perspective, thus, assumes the role of the patient. Therefore, with agreement verbs, the movement of the verb is toward the signer's body;
(iii) the movement in the articulation of the verb is constrained and minimal;
(iv) with handle classifiers, morphological reduction is observed.

The following is an example of such constructions, 'rs' stands for role-shift [Pragmatics – Chapter 6] / [Syntax – Section 3.3.3] role shift.

5_2.1.3.2.0.5_1_ASL_POLICEMAN 3-HIT-1

rs:police
POLICEMAN 3-HIT-1
'The policeman got hit.' (ASL, Kegl 1990: 166)

Functionally this sentence is similar to a passive sentence in that the patient argument is foreground and the agent is left unexpressed. However, whether these sentences can be considered the sign language counterpart of passive is still very controversial.

2.1.3.3 Reflexivity

Still another way to modify the argument structure of a predicate is thorough reflexivity [Lexicon – 3.7.4]. A reflexivity relation is the one that typically establishes coreference between two arguments of the same predicate. This is realized by the use of anaphoric expressions such as reflexive pronouns often glossed as SELF, but also by plain pronouns, as in RSL. An example of a reflexive pronoun in ASL is the following.

j-o-h-n- HURT SELF
'John hurt himself.' (ASL)

Note that signs marking reflexivity are also often used as emphatic markers.

2.1.3.4 Reciprocity

A reciprocal relation [Lexicon – 3.7.4] arises when a plural argument is coreferential with another one in the same predication and the individuals referred to are basically both agents and undergoers of the action, or more generally, realize both ends of the predicative relation (Langendoen 1978; Pfau & Steinbach 2003). Reciprocity has been shown to be marked in different ways in sign languages, depending on the morphophonological properties of the language and the lexical predicate at play (simultaneous versus sequential duplication and conversion of the predicate, repetition of agreement auxiliary, zero marking, or overt marking with signs like TOGETHER).

Note that some predicates might be inherently reciprocal, such as DISCUSS or MEET in LSC, which can be also reflected in the morphophonology of the verb (bimanual with reciprocal orientation).

5_2.1.3.4 _1_LSC_ ix^three discuss always

IX^THREE DISCUSS ALWAYS
'Those three are always discussing (with each other).' (LSC)

2.1.4 Non-verbal predication

2.1.4.1 Copular constructions

In addition to verb phrases, adjectival phrases [Syntax – Chapter 5] adjectival phrases [Lexicon 3.4] can also be predicates. In the following example of non-verbal predication the property '(being) tall' is predicated of the argument 'John', much like the property 'snoring' is predicated of John in a case of verbal predication like 'John snores'.

John is tall

In some languages, like English, non-verbal predicates are typically introduced by a copula, but the presence of a copula should be not taken to be a necessary condition for (or a reliable indication of) the presence of non-verbal predication. First, even languages that normally require a copula in non-verbal predicates, do not always do that. For example, in the following sentence the property of '(being a) good teacher' is predicated of 'John' but no copula is present.

I consider John a good teacher

Second, and most importantly for the grammar writer, many languages do not have, or at least do not systematically use, a copula to express non-verbal predication. For example, Russian does not have a copula in the present tense, as the following example indicates.

Ivan vysokij
Ivan tall
'Ivan is tall.' (Russian, Geist 2007: 83)

In languages which have a copula, its use ranges from cases of adjectival predication like 'John is tall' to cases of predication like the following one:

John is at school

Although one can say that the property '(being) at school' is predicated of John, these types of copular sentences are sometimes called locative sentences to stress their peculiarities, for example the fact that the post-copular category is a prepositional phrase.

A case of copular use whose predicative status is controversial is illustrated by the following sentence, which is sometimes called specificational.

The winner is John

It seems that in uttering this sentence the speaker specifies who the winner is instead of ascribing a property to the winner. The issue of distinguishing between a truly predicational and a specificational reading is not trivial. There are cases in which the very same copular sentence is ambiguous between these two readings.

His supper is food for the dog (den Dikken 2006: 17)

In the predicational reading the sentence means 'his supper serves as food for the dog' while in the specificational reading the sentence means 'he eats food for the dog for his supper'. The grammar writer should be aware of this distinction because in principle a sign language might use different forms for predicational and specificational readings.

The available evidence indicates that in most sign languages non-verbal predication does not require a copular sign, as the following LSE example shows:

MY JACKET WHITE
'My jacket is white.' (LSE, Herrero Blanco & Salazar García 2005: 288)

However, the lack of copula identification might be due to the limited number of studies that have addressed this issue in sign languages. Furthermore, in at least one sign language, namely FinSL, a sign that is functionally similar to the copula has been identified. This is glossed as PI, based on the mouth gesture associated with the sign.

A-N-I-S PI SPICE PLANT
'Anis is an aromatic herb.' (FinSL, adapted from Jantunen 2007: 122)

The order of the noun phrases can be switched, suggesting that PI is an independent sign and is not part of one of the two noun phrases (Jantunen 2007).

FRANCE OWN HEAD CITY PI PARIS
PARIS PI FRANCE OWN HEAD CITY
'Paris is the capital of France.' (FinSL, adapted from Jantunen 2007: 132)

PI is reported to be optional but in its absence a proper modification of non-manual markers is required, suggesting that a combination of manual and non-manual strategies marks non-verbal predication in FinSL. So, the grammar writer should not assume that a copula is necessarily absent in the language he/she is describing or that it needs to be expressed by a manual sign.

2.1.4.2 Secondary predication

Another case of non-verbal predication is secondary predication. A secondary predicate is an expression that attributes a property to the subject (or to another argument of the verb) but is not the main predicate of the clause. In all the following sentences, the secondary predicate is in boldface, while the primary predicate (a verb phrase which contains the secondary predicate) is in italics.

a. The boys *arrived home* ***exhausted***
b. I *consider her a* ***genius***
c. He *painted her house* ***blue***
d. His *decision left me* ***skeptical***
e. John *was walking* ***naked***

Unfortunately systematic studies of secondary predication in sign languages are lacking, so the grammar writer cannot start from expectations on how other sign languages express this configuration.

2.1.5 Existentials and possessives

2.1.5.0 Definitions and challenges

As the name suggests, existentials are sentences that assert the existence of some entity, e.g. *a dog*, as in the following example from English. Note that this example displays two functional elements that are absent from most sign languages of the world, an expletive (*there*) and a copula (*is*).

There is a dog in my garden

Existentials are related to possessives [Lexicon – Section 3.7.3] / possessives [Semantics – Chapter 11]. For example, the following existential sentence expresses the meaning that the museum possesses ancient paintings.

There are ancient paintings in the museum

Furthermore, the link between existentials and possessives is clearer in other (spoken as well as signed) languages of the world. For example, in most of the 27 sign languages included in the survey reported in Zeshan & Perniss (2008) the same

sign (glossed as HAVE in ASL) may occur in predicative possession and existential constructions:

HAVE MEDICINE
'There is medicine.' (ASL, Chen Pichler & Hochgesang 2008: 226)
FATHER HAVE OTHER FAMILY
'(My) father has another family.' (ASL, Chen Pichler & Hochgesang 2008: 222)

The grammar writer should be well aware of the fact that not only a sign language may employ a possessive sign to denote existence, as ASL does, but the converse is also attested: for example, ÖGS uses an existential sign to denote possession (Chen Pichler & Hochgesang 2008).

2.1.5.1 Possessives

Predicative possession [Semantics – Chapter 11] has been studied fairly extensively in ASL, in which it is usually expressed with the sign glossed HAVE. However, another less common option is to employ spatial mechanisms such as displacement or the use of classifiers [Morphology – Chapter 5] / classifiers The negative counterpart of HAVE is the unrelated sign NONE, which is often accompanied by a head shake and the mouth pattern 'oo.' The word order is usually possessor-HAVE-possessum, consistent with the SVO order of ASL. The sign HAVE denotes a variety of possessive relations, including alienable as well as inalienable possession, just like English *have*:

5_2.1.5.1 _1_ASL_father have other family

a. FATHER HAVE OTHER FAMILY
'(My) father has another family.'
q
b. IX_2 HAVE TIME
'Do you have time?'
c. SUE HAVE HOUSE IX BRAZIL
'Sue has a house in Brazil.'
d. IX_2 HAVE M-E-A-S-L-E-S
'You have measles.' (ASL, Chen Pichler & Hochgesang 2008: 222–223)

The grammar writer should be aware of the fact that a possessive verb may be sensitive to the kind of possessor or possessum involved. It is also important to keep in mind that the position of the verb that is used to denote possession is likely to reflect the basic word order of the language. Thus, in DGS, an SOV language, the verb used in possessives comes after the possessum (and not before it as in ASL):

5_2.1.5.1 _2_DGS_pro1 car exist

IX_1 CAR EXIST
'I have a car.'
(DGS, adapted from an ÖSG example in Chen Pichler et al. 2008: 446)

The verb HAVE is not necessarily present in predicative possessives in ASL. As exemplified below, HAVE can be dropped and this is particularly common with kinship terms modified by a number:

L-A-R-R-Y FOUR KID
'Larry has four kids.' (ASL, Chen Pichler & Hochgesang 2008: 222)

Zeshan & Perniss (2008) observe that using suppletive negation is very common in possessive and existential constructions across sign languages of the world. The suppletive sign used in ASL to negate a possession is glossed NONE. This sign is usually sentence-final, thereby following the possessor and the possessum:

IX_1 PAGER NONE
'I don't have a pager.'/ 'I have no pager.'
(ASL, Chen Pichler & Hochgesang 2008: 224)

As discussed by Cormier & Fenlon (2009), BSL uses the sign HAVE-NEG_{poss} for negation of possession, a sign which is phonologically related to HAVE. Interestingly, this sign is not used for the negation of existence. However, the sign NOT-HAVE (which is unrelated to HAVE) can be used to negate both possession and existence and the same applies to the general negator NOTHING.

2.1.5.2 Existentials

A common way to express existence is to use a verb like HAVE, but other strategies can also be used. In an SVO language like ASL, HAVE typically precedes the object whose existence is asserted:

HAVE MEDICINE
'There is medicine.' (ASL, Chen Pichler & Hochgesang 2008: 226)

By contrast, in an SOV language like LSC, the existential sign follows the object whose existence is asserted:

5_2.1.5.2 _1_LSC_mountain snow there-be

MOUNTAIN SNOW THERE-BE
'There is snow on the mountains.' (LSC, Quer & GRIN 2008: 46)

Existentials in ASL tend to be accompanied by a head nod that is strongest over the sign HAVE but it may extend to the rest of the clause. In fact, existentials in ASL can be only expressed by head nod over the object in the absence of HAVE:

hn
PROBLEM
'There is a problem.' (ASL, Chen Pichler & Hochgesang 2008: 226)

Negative existentials commonly use a syncretic sign like NONE. Even in ASL this sign appears most commonly after the object whose existence is negated:

PROBLEM NONE
'There is no problem.' (ASL, Chen Pichler & Hochgesang 2008: 227)

The grammar writer should be aware that if in his/her data an expression like NOT HAVE appears in addition to the syncretic sign like NONE, this may due to influence from spoken language.

In languages that use HAVE both for possession and existence, it is expected that we find sentences that are ambiguous between the two readings. For instance, the following example can be translated in two ways:

POSS_1 OFFICE HAVE WINDOW
'My office has a window.'/ 'There is a window in my office.'
(ASL, Chen Pichler & Hochgesang 2008: 223)

Elicitation materials

Passive-like constructions

It may not be easy to detect passive or passive-like constructions in unstructured, freely occurring data, since use of passive is more frequent in written text than spoken/signed. Thus, structured elicitation tasks may be needed. The tasks may involve asking informants questions that guide them to answer from the patient's perspective. Another possibility is using visual materials depicting scenes where agents are not identifiable, and the patient role is more prominent. It is known that in some languages passive can only be used for completed events rather than ongoing (Keenan & Dryer 2007). So the grammar writer should be aware of this during the preparation of the elicitation tasks and materials.

Earlier studies that have been done on passive in sign languages concentrated on agreement verbs, and animate agents and patients. Here we summarize Sze's (2010) observations regarding methodology of data collection in HKSL: her informants tended to report the events where the agent is not identifiable using an indefinite pronoun such as 'someone', which will be the agent of an active clause, not passive. She then asked the informants whether they could describe the situation without using 'someone'. She reports that when the informant sees the agent in the picture, even without a face or partially, there is still a strong preference for the use of 'someone'. So, to elicit a potential passive clause, the visual material of the scene should present the result of the event without the agent. She also reports that the elicitation of agentless, potentially passive constructions requires very specific pragmatic contexts, with sufficient contextual clues, that

is, non-manuals, to clarify that the signer (who describes the visual scene) is not the agent.

Possessive and existential constructions

Zeshan & Perniss (2008) discuss several strategies to elicit possessive and existential constructions. They suggest to involve pairs of signers in the following four games.

The family tree game targets inalienable possession in the domain of kinship ('I have a sister'). One signer asks another signer about his/her family and fills out a family tree chart across multiple generations based on the signer's descriptions.

In the doctor-patient game, one signer (in the role of the doctor) 'diagnoses' the illness of the other signer (in the role of the patient) by inquiring about the patient's symptoms. The game is designed to elicit attributive (e.g. *my head*) and predicative (e.g. *I have a headache*) possessive constructions.

The picture comparison game elicits possessive and existential expressions. Each participant is given a picture that the other cannot see. The game requires signers to find the differences between the two pictures through statements and questions such as "On my picture, there is a man carrying a bucket. Does the man in your picture have a bucket?"

In the picture matching game, signers are asked to assign belongings to people by matching pictures of objects to pictures of people. For each match, signers are asked to give an explanation for why they have assigned a particular object to a particular person. The game targets mainly alienable possession (e.g. 'The bicycle belongs to the girl', 'the girl has a bike').

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2.2 Grammatical functions

2.2.0 Definitions and challenges

2.2.0.1 What is a grammatical function?

Grammatical functions are *syntactic* entities and should not be confused with semantic categories like thematic roles / thematic roles [Semantics – Section 6.1] (theta-roles or semantic roles). Still, it is important to note that theta-roles relate to grammatical

functions in a systematic way. For instance, if a verb has an agent and a patient, in an active clause the agent will always be the subject and the patient will be the object. This can be seen with the verb *eat*, as in the following example where *John* is the subject and *the apple* is the object:

John ate the apple

More generally, agents are always subjects in active clauses but not vice versa. Subjects can bear a variety of theta-roles as shown by the following examples.

a. Mary (*experiencer*) loves classical music
b. The car (*patient*) broke down
c. The winner (*recipient*) received a gold medal
d. The ball (*theme*) rolled down the hill

2.2.0.2 Methodological challenges

It is easy to distinguish subjects from objects in languages with a fairly rigid word order [Syntax – Section 2.3], or with clear subject agreement or clear case marking, but this is more difficult in languages with relatively free word order, like many sign languages. Still, it is usually assumed that all sign languages have grammatical functions (but see Engberg-Pedersen 2002, and Bouchard 1996 for a different view), although they do not necessarily display exactly the same properties across all sign languages.

It may be harder to pinpoint subject properties in sign languages than spoken languages because some subject properties that are familiar from spoken languages do not apply to sign languages. For instance, case marking in many spoken languages is based on grammatical functions such that nominative case typically marks subjects and accusative case marks direct objects. This can be seen in English:

a. He (*nominative*) knows them (*accusative*)
b. They (*nominative*) know him (*accusative*)

This does not apply to sign languages because they do not have morphological case (but see Meir (2002) for a discussion of an object-marked pronoun in Israeli SL).

Another well-known subject property of many spoken languages is that (nominative) subjects trigger person and number agreement with the finite verb, whereas objects do not. This is shown in the following examples from German where the form of the (boldfaced) finite verb changes according to the person and number of the subject but the person and number of the object (*ein Buch* 'a book' versus *many books* 'viele Bücher') makes no difference:

a. Ich (1p.sg.) **habe** (1p.sg.) ein Buch/viele Bücher
'I have a book/many books.'

b. Du (2p.sg.) **hast** (2p.sg.) ein Buch
'You have a book.'
c. Er/Sie (3p.sg.) **hat** (3p.sg.) ein Buch
'He/She has a book.' (German)

This does not straightforwardly carry over to sign languages, where agreement is only found with a certain class of verbs, namely, agreement verbs [Lexicon – Section 3.2.2] / agreement verbs. Still, there is a contrast between subjects and object with respect to agreement in sign languages. Thus, Meir (2002) argues that the orientation or facing of the hands with agreement verbs is determined by the grammatical functions of the arguments (for regular as well as backward agreement verbs): the facing is towards the direct object of transitive verbs and towards the indirect object of ditransitive verbs.

2.2.1 Subject and object identification

2.2.1.1 Specific position(s) for subject and object

The clearest evidence for grammatical functions in sign languages comes from basic word order. Most sign languages that have been studied to date are either SVO (e.g. ASL, LSB, HKSL, and SSL) or SOV (e.g. NGT, DGS, IPSL, LIS, VGT, and Irish SL). In other words, the basic word order is either subject – verb – object or subject – object – verb. This means that the subject precedes the object in the basic word order of these sign languages. This is illustrated by the following example:

FATHER LOVE CHILD
'The father loves the child.' (ASL)

Various deviations from the basic word order are possible in ASL and other sign languages, but these tend to be marked in some way or restricted to certain contexts. For instance, the object of the verb can be moved in front of the subject by topicalization [Pragmatics – Section 4.2]. A topicalized object is usually accompanied by some non-manual marker, such as brow-raise, a forward head-tilt and a pause:

5_2.2.1.1 _1_ASL_child father love

top
CHILD FATHER LOVE
'The father loves the child.' (ASL)

Note that object topicalization shows that pragmatic relations like topic (and comment) must be distinguished from grammatical relations like subject and object.

OSV word order can also arise in some sign languages as a result of subject pronoun copying [Lexicon – Section 3.7] / pronoun copying [Syntax – Section 2.2.1.3] in sentence-final position accompanied by subject pro-drop:

5_2.2.1.1_2_NGT_book buy ix3a

BOOK BUY IX$_3$
'He buys a book.' (NGT, Perniss et al. 2007: 15)

Objects may precede subjects with agreement verbs without any special marking on the object. Aspectual [Lexicon – Section 3.3.2] / Aspectual [Morphology – Section 3.3] / Aspectual [Semantics – Chapter 2] / Aspectual marking or the use of a classifier may also license movement of the object past the subject, resulting in OSV order (see Quadros and Lillo-Martin 2010 and references cited there for examples).

Evidence for grammatical functions based on word order is not restricted to established sign languages. Even in very young sign languages word order is sensitive to grammatical functions. Thus, Padden et al. (2010) argues that the SOV order of ABSL involves subjects as the first element and cannot be explained by pragmatic principles such as 'background first' or discourse principles such as 'topic first'.

Subjects differ from objects not only in that subjects precede objects in neutral word order. There is also a distinction with respect to hierarchical relations. The base position of objects is inside the verb phrase (VP) headed by the transitive verb whereas subjects are outside the VP:

a. Subject [$_{VP}$ Verb – Object]
b. Subject [$_{VP}$ Object – Verb]

Note that a transitive verb and its object form a VP whether the verb precedes the object, as in (a), or the object precedes the verb, as in (b). This means that VPs are found both in SVO languages and SOV languages.

Evidence for a VP constituent in sign languages comes from various syntactic phenomena where VPs behave like syntactic units. The fact that VPs can be topicalized in sign languages is probably the most obvious evidence for a VP constituent. Further evidence comes from the fact that the spreading of negative non-manuals is sensitive to syntactic constituents like VPs. Pfau (2002) shows that, if the negative headshake of DGS spreads in the absence of a manual negation, it must spread to the whole VP and cannot spread to a subpart of the VP. The distribution of temporal and frequency adverbs in LSB and ASL also indicates that transitive verbs form a VP with their objects. Quadros & Lillo-Martin (2010: 229–230) point out that adverbs like YESTERDAY or SOMETIMES cannot break up the string verb + object, although they have a relatively free distribution. This restriction follows naturally if verbs and their objects form an indivisible syntactic constituent.

The grammar writer should use this kind of evidence to establish what the basic position of subject and object is in the relevant sign language.

2.2.1.2 Special anaphoric properties for subject and object

The term anaphor [Pragmatics – Chapter 2] refers to noun phrases that are referentially deficient and can only be used if they refer to another noun phrase, the so-called antecedent. A typical example of an anaphor is a reflexive pronoun,

e.g. *himself* in English. This pronoun requires an antecedent as shown by the contrast between the following sentences:

a. *Himself went home (*no antecedent*)
b. John hurt himself (*'John' is the antecedent*)

The reflexive in the second sentence is understood as referring to *John*. In other words, the meaning is: 'John hurt John'. By contrast, the reflexive lacks an antecedent in the first sentence and this example is therefore ungrammatical.

Reflexives [Lexicon – Section 3.7.4] in spoken languages display a clear subject-object asymmetry. Whereas a reflexive object can refer to a subject antecedent, the opposite pattern is ruled out: A reflexive subject cannot have an object antecedent. This contrast is illustrated by the following examples from English and NGT:

a. He likes himself
b. *Himself likes him

5_2.2.1.2_1_NGT_ix-a talk about self+ix-a

c. IX$_3$ TALK ABOUT SELF+IX$_3$
d. *SELF-$_3$ TALK ABOUT IX$_3$
'He talks about himself.' (NGT, Kimmelman 2009: 32)

Moreover, in many other sign languages, a pronoun in object position cannot be bound by a subject within the same clause. Instead, a reflexive must be used:

MARY IX NOT LIKE CRITICIZE SELF/*PRONOUN
'Mary does not want to criticize herself ' (ASL, Koulidobrova 2009: ex. (10))

The grammar writer should test for the existence of these asymmetries in anaphoric relations between subject and object in the sign language under investigation.

2.2.1.3 Strategies of pronoun copying for subject and object

One syntactic phenomenon that may distinguish subjects from objects is Subject Pronoun Copy (Padden 1988). In this construction, which is found in some sign languages, a clause-final pronoun refers to the subject of the clause. This pronoun is often accompanied by a head nod:

WOMAN BUY CAR IX3
'The woman is buying a car, she is.' (Auslan, Johnston & Schembri 2007: 204)

The constituent which the sentence-final pronoun refers to can be either a full noun phrase or a pronominal. It can also be omitted:

DANCE IX3
'She is dancing.' (Auslan, Johnston & Schembri 2007: 204)

Pronoun copy seems to be restricted to subjects in Auslan. By contrast, both subject and object pronoun copies are possible in ASL. In fact, the same clause in ASL can have two copies as in the following example. Still, there is a distinction here as the subject copy precedes the object copy.

JOHN$_i$ LIKE IX$_j$, IX$_i$, IX$_j$
'John likes her, him, her.' (Neidle et al. 2000: 172)

Crasborn et al. (2009) argue that pronoun copy in NGT actually refers to the topic of the sentence, including spatio-temporal elements.

The grammar writer should try to establish whether pronoun copies exist in the sign language under investigation and whether they are restricted to subjects or not.

2.2.1.4 Null arguments for subject and object

It is very common in sign languages for subjects and objects to be unexpressed, in which case they are often referred to as null arguments [Syntax – Section 2.1.2]. Context plays a crucial role in licensing null arguments in sign languages, at least with plain verbs. This is nicely illustrated by the following example, where both subject and object are omitted because the context makes it clear that the subject is the speaker and the object is TEA:

re
a. WANT TEA
'Do you want tea?'
b. WANT
'Yes, I do.' (Auslan, Johnston & Schembri 2007: 208)

Null subjects have been investigated more extensively than null objects in sign languages. Wulf et al. (2002) found that subjects of plain verbs in ASL are actually more often null than overt. In their corpus, only 35% of the pronominal subjects were marked with a manual sign. They also found that the use of overt versus null subjects correlates with various linguistic factors. For instance, first person singular subjects were more likely to be overtly expressed than other kinds of subjects. Manual pronominal subjects also occurred more often in case of switch-reference [Semantics – Chapter 2] than if the subject was coreferential with the preceding subject. By contrast, dialogue was found to disfavour overt subjects. McKee et al. (2011) obtained fairly similar results in their study of overt and covert subjects in Auslan and New Zealand Sign Language.

The grammar writer should be aware of the possibly extensive use of subject and object omission in the language under investigation, and describe the phenomenon.

2.2.2 Other grammatical functions: arguments versus adjuncts

Of course subjects and objects, that is, arguments, are not the only constituents that a clause can display. Each predicate can combine as well with other dependents that

are typically not obligatory and thus do not belong to the argument structure / argument structure [Syntax – Section 2.1] of the predicate, but nevertheless express important information concerning the predicate itself, the event, the attitude of the subject or that of the speaker and so on and so forth. This type of constituent is called an *adjunct* because it is optionally *added* on the top of the required arguments. Typically adjuncts can be distinguished from arguments by at least two criteria: the first is optionality. Arguments are usually not optional, since they belong to the structure of the predicate. Adjuncts are optional, in that, even if they are absent, the sentence is not incomplete.

This optionality criterion should, however, be handled with care, since there are cases in which constituents that truly belong to the argument structure of a predicate, and thus qualify as arguments, can be omitted in the clause. This is particularly true in sign languages, where arguments can be left unexpressed if the content provides the relevant (and required) information (see null arguments [Syntax – Section 2.2.1.4]). Still, an adjunct can be defined as an element that is both syntactically and semantically optional in a clause. By contrast, null arguments are semantically active – they are either licensed in the context or receive an indefinite [Pragmatics – Section 1.3] or generic interpretation.

This brings us to another factor to keep in mind, namely the distinction between syntactic and semantic arguments. A category like 'at school' is optional in the sentence 'David arrived (at school)', so it does not qualify as a syntactic argument, but semantically it must be (contextually) understood that David arrived somewhere.

The second criterion for distinguishing adjuncts from arguments is that the former are typically less constrained in their distribution. While it makes sense to try to establish an unmarked word order for subject and object [Syntax – Section 2.3.1.1], this is less clear for adverbs. This relative freedom of adjuncts is illustrated below in English: the adjuncts, the adverb *loudly* and the preposition phrase *in his room*, seem to distribute rather freely.

a. David laughed loudly in his room
b. David loudly laughed in his room
c. In his room David laughed loudly.

The grammar writer should describe whether in the language under investigation free distribution qualifies as a criterion for distinguishing arguments and adjuncts, and describe adjuncts defined along these terms.

2.2.3 Types of adjuncts

Typically adjuncts can be classified along two dimensions: The first dimension concerns their categorical status. Typically in English adjuncts can be adverbial phrases

[Syntax – Chapter 6] (a), prepositional phrases [Lexicon – Section 3.8] (b), noun phrases [Syntax – Chapter 4] (c), and (adverbial) clauses [Syntax – Section 3.5; Semantics -Section 14.2] (d).

a. David sleeps heavily
b. David sleeps in his room
c. David sleeps all day
d. David sleeps because the shades are closed

The grammar writer should check whether the sign language expresses the same variability in the syntactic realization of adjuncts, and how this typology correlates with the second classification described below.

The second dimension of classification concerns their function: adjuncts can be classified according to the constituent they modify: there are thus low adjuncts, as those illustrated below, that modify the predicate.

David sleeps profoundly, completely, well, with his mouth open, snoring, ...

A second class of adjuncts modify the event expressed by the verb, as those given in the next example below, that modify in various ways the spatial or temporal location of the event.

David sleeps from nice to nine, every day, twelve hours, in his bed, with his teddy bear,

Adjuncts modifying higher portions of the clause typically contain aspectual information [Semantics – Chapter 2], or subject oriented modifications, as shown below.

David sleeps because he is tired, in order to rest, happily, willingly, ...

Finally, adjuncts that attach to the highest clausal level modify the speech act [Pragmatics – Chapter 3] / speech act itself, and typically express the attitude of the speaker.

David sleeps, probably, because the shades are closed, fortunately, in my opinion, ...

This coarse classification of adjuncts according to the constituent they modify reflects in fact what has been argued to be a universal hierarchy of functional positions of the clause, where prototypically adverbs are realized.

We reproduce below the particular version of this hierarchy as proposed by Cinque (1999) for spoken languages; each position in the hierarchy is filled by an adverb that can be taken as a representative of the relevant adjunct class.

[Mood speech-act *frankly*
 [Mood evaluative *fortunately*
  [Mood evidential *allegedly*
   [Mood epistemic *probably*
    [Tense past *once*
     [Tense future *then*

[Modality irrealis *perhaps*
[Modality necessity *necessarily*
[Modality possibility *possibly*
[Aspect habitual *usually*
[Aspect repetetive *again*
[Aspect frequentative(I) *often*
[Modality volitional *intentionally*
[Aspect celerative(I) *quickly*
[Tense anterior *already*
[Aspect terminative *no longer*
[Aspect continuative *still*
[Aspect perfect(?) *always*
[Aspect retrospective *just*
[Aspect proximative *soon*
[Aspect durative *briefly*
[Aspect generic/progressive *characteristically*
[Aspect prospective *almost*
[Aspect sg.completive(I) *completely*
[Aspect pl.completive *tutto*
[Voice *well*
[Aspect celerative(II) *fast/early*
[Aspect repetetive(II) *again*
[Aspect frequentative(II) *often*
[Aspect sg.completive(II) *completely*

The function of an adjunct typically affects its realization, in addition to its distribution. For example, typically adverbs of the lower level can be realized non-manually in sign languages, while higher adverbs are more robustly realized manually.

To illustrate, non-manual markers can convey manner information, as in the following LIS example: the non-manual marking 'mm' produced with closed lips simultaneously to the verbal sign WALK expresses a manner adjunct that we can translate as 'quietly'.

5_2.2.3_1_LIS_daniele walk

mm
DANIELE WALK
'Daniele walks quietly.' (LIS)

This means that the two criteria of classification of adjuncts that have been introduced above, namely the category of the adjunct and its function, are likely to interact significantly: an adverb [Lexicon – Section 3.5] expressing time, for example, will tend to come first in many sign languages (see below for an example in LSE), while this is not necessarily so with adverbial temporal *clauses* [Semantics – Section 14.2.2]

PAST WEEK MEETING START TEN END QUARTER TO THREE
'Last week the meeting started at ten and ended at a quarter to three.'
(LSE, Cabeza Pereiro & Fernández Soneira 2004: 69)

For this reason we strongly recommend that the grammar writer describe the relevant adjuncts in relation to their realization, and thus devote a separate description to clausal adjuncts (see adverbial clauses [Syntax – Section 3.5]), adverbial adjuncts (see adverbial phrases [Syntax – Chapter 6]) and nominal adjuncts (see noun phrases [Syntax – Chapter 4]).

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2.3 Word order

2.3.0 Definitions and challenges

2.3.0.1 Order between subject, object and verb

Although the notion of word order in principle applies to all constituents in a clause, in practice the investigation of word order in a given language usually starts from the

identification of the order of the constituents bearing the grammatical function of subject and object with respect to the verb.

Languages of the world vary a lot as far as word order is concerned. Some languages are quite strict, so it is easy to identify a word order as the basic one. English is a good example. In the following sentences, the noun phrase that precedes the verb is interpreted as the agent, while the noun phrase that follows the verb is interpreted as the theme.

a. A teacher saw John
b. John saw a teacher

If a verb obligatorily takes both an agent and a theme, the agent will be the subject and the theme will the object. So the English sentences in the example above provide evidence that the basic word order of English is S(ubject)-V(erb)-(O)bject. However, even in rigid word order languages like English the word order can be affected. For example, in the following sentence, where the object *a teacher* is contrastively focused [Pragmatics – Section 4.1], the word order becomes OSV.

A TEACHER John saw

Other languages have a much more flexible word order than English, though. In fact, most sign languages studied up to now seem to belong to this group. For these languages, even the identification of the basic word order can be a challenge, so it is important to be clear on the very notion of *basic* word order.

2.3.0.2 Identifying the basic word order

One possibility is to identify the basic word order as the most frequent one. Another possibility is to identify it as the least pragmatically marked (i.e. unmarked), namely the most neutral one. Still another possibility is to spot the basic word order as the one that requires less morphological marking. As these factors may diverge, a proper combination of them has also been suggested (Hawkins 1983).

Various considerations converge in suggesting that word order frequency may not be the most promising approach for sign languages. On the one hand, few sign languages have large annotated corpora, and even for sign languages that do have a corpus, its dimension is not comparable to annotated corpora for major spoken languages. So it would be practically difficult to use the frequency criterion. A second caveat is that the search for the most frequent order should not be uninformed of the syntactic structures of the language under consideration. One example can illustrate this point. In Germanic languages like German and Dutch, a specific rule, called Verb Second, applies in matrix declarative clauses. According to this rule, the finite verb must immediately follow the first constituent in the sentence, but there is no restriction on what type of constituent can come first. This rule has the power to override the basic word order in matrix clauses. For these reasons, some researchers have proposed that in order to identify the word order of German and Dutch one should look

at embedded clauses, where the Verb Second rule does not apply. As matrix sentences are more frequent than embedded clauses, the existence of rules that re-arrange word order in matrix clauses can jeopardize the prospect of identifying the basic word order as the most frequent one. The same concern applies to other types of structures. For example interrogative clauses or imperatives may have a special word order. In principle, one might look at the most frequent word order by keeping these factors under control (for example, not considering constructions with special word order rules). In practice, however, the grammar writer is likely to start his or her investigation of the syntax of a given sign language by word order, so at this early stage it might be impossible for him/her to have the necessary command of the language to keep confounding factors under control.

Given these difficulties, some researchers have proposed that there are languages that lack a basic word order. This has been proposed for spoken languages (cf. Mithun 1992) and for sign languages as well (cf. Bouchard & Dubuisson 1995).

However, although not without problems, the criterion that identifies the basic word order as the least pragmatically marked is easier to implement. There are ways to identify sentences that have a neutral word order. For example, usually the first sentence in a narrative is the most neutral one, since it presupposes no preceding context. Another rule of thumb is to look at sentences that are the answer to questions like "What happened?". These questions require that the entire answer, not just a part of it, be in focus. More precisely, there is broad focus [Pragmatics – Section 4.1] / broad focus instead of narrow focus [Pragmatics – Section 4.1]. For example, if I ask "What happened?", the sentence in (i) is a natural answer in English while the sentences in (ii) and (iii), which have a marked word order because the constituent 'Bill' is a narrow focus or a topic, are weird.

What happened?
(i) John kicked Bill
(ii) BILL, John kicked
(iii) As for Bill, John kicked him

Finally, the last criterion that has been proposed is to look at sentences where there is less morphological marking. The rationale behind this proposal is that morphology can convey information that word order conveys in other cases. For example in English the SVO word order indicates that *John* is the subject in the sentence "John likes Mary". However in languages like Latin or Japanese where there is a morpheme for nominative and accusative, word order is more flexible since it is not necessary to set subject and object apart by looking at the linear order. Although sign languages typically do not have a rich concatenative morphology, they can use non-manual marking to indicate that a constituent is a topic [Pragmatics – Section 4.2] / topic or a focus [Pragmatics –Section 4.1]. For this reason, the grammar writer should be aware that sentences with special non-manual marking might be cases where the word order is marked, because it is affected by the informational structure.

Of course, word order investigation inside the clause should not be restricted to subject, object and verb. The position of adverbial expressions [Lexicon – Section 3.5] and functional signs like temporal and aspectual auxiliaries, agreement markers, modal verbs [Morphology – Section 3.4], negation [Morphology – Section 3.5] signs and subordinating conjunctions should also be investigated.

A debated issue in the linguistic literature is whether the order between verb and object correlates with the order between the verb and these functional words. Researchers have observed that in the languages in which the verb follows the object, these functional words tend to follow the verb, while in the languages in which the verb *precedes* the object, these functional words tend to precede the verb (Dryer 1992). The grammar writer may investigate if in his/her sign language such correlation holds or not.

A general concern regarding the investigation of word order is that non-grammatical factors may play a role. The first issue is the possible influence of the spoken language that is dominant in the area where the sign language under investigation is used. The usual precautionary measures should be taken, like excluding (or analyzing separately) exchanges involving hearing people, especially if these are not fluent in the sign language.

Another important factor affecting word order is the genre of the text which is analyzed. For example, a dialogue naturally builds a context that is presupposed among the participants of the dialogue and facilitates establishing certain constituents as topic or focus categories. As mentioned, the onset of a narrative may neutralize this.

2.3.0.3 The challenge of simultaneity

Spoken languages are intrinsically linear: coming through the oral channel, spoken words are produced linearly, one after the other and there is virtually no possibility for simultaneous productions during speech (with the limited exception of prosodic suprasegmental features [Phonology – Chapter 2]). On the contrary, sign languages exploit more articulators simultaneously: in particular, the two hands can sometime provide simultaneously two different bits of information, and the non-manual components can vehicle grammatical features that are not necessarily represented on the co-occurring manual signs. This modality-related specificity makes it difficult or even pointless to discuss about word *order* in some cases. The grammar writer should be aware of this possible complication in assessing the word order tendencies of the language under investigation.

We can descriptively distinguish three types of simultaneity that should be handled with care in trying to account for ordering restrictions in a given sign language.

1. Full simultaneity: In this type of simultaneous construction, each of the hands of the signer is active, each producing morphemes of separate lexical entities. At least

one of the hands is actively moving in signing space. The example below illustrates a typical full simultaneous construction (Sallandre 2007; Miller 1994):

dh: CL:1 (person: approaches) CL:1 (person: moves away)
ndh: KNOWLEDGE-INCREASE KNOWLEDGE-DIMINISH
'When I'm around them (i.e. ASL) signers, (my ability) increases and when I'm not around them, it decreases.' (LSQ, Miller 1994: 88)

This example can be described as the simultaneous production of two related clauses, which are thus not ordered.

Typically, we might expect that the two hands perform one of the following functions (Sallandre 2007):

- they describe simultaneous actions (as in the example above)
- they represent two different referents
- one represents a topic [Pragmatics – Section 4.2] while the other expresses the rest of the clause
- one hand expressed the cause of an event while the other depicts the result

In many cases simultaneous constructions make use of classifiers [Morphology – Chapter 5] / classifiers, in classifier constructions [Lexicon – Section 1.2.1] / classifier constructions [Semantics – Chapter 7].

2. Perseverations: In some other cases, both hands are active but one holds a sign introduced previously while the other hand goes on signing. Typically, after a two-handed sign the non-dominant hand might retain the handshape of that sign throughout the next sign or signs. In the example below there is perseveration of the sign CAR/DRIVE on the non-dominant hand, while the dominant hand signs what happens during the driving.

DRIVE GO IX-forward RECOGNIZE IX-BUILDING
(2 handed) ----------(2 handed)
'She drove around and recognized the building over there.'
(JSL, Vermeerbergen et al. 2007: 248)

The syntactic function of this type of simultaneity is not clear, and many assume that it is purely a prosodic effect. Nevertheless the grammar writer should be aware of this possible confound in assessing the dimension of word order in the language under investigation.

3. Partial simultaneity: A source of partial simultaneity is given by pointing signs, which frequently double referential expressions on the non-dominant hand. An example is given below (Liddell 2003: 255).

dh: BUT FOOD DELICIOUS
ndh: IX-food (ASL)

Another frequent case of partial simultaneity is given by numerals, which are frequently held by the non-dominant hand while the dominant hand goes on describing what is associated to the given numbering.

Some of these cases of simultaneity are not unique to sign languages, but also happen in spoken languages with gestures accompanying speech. Gestures in general constitute a grey area in the description of sign languages, and the grammar writer should be aware of the difficulty in some cases of teasing apart purely grammatical constructions from mere gestural phenomena.

2.3.1 Identification of the basic order of constituents in the main declarative clause

2.3.1.1 Order of subject, object, and verb

The investigation of word order may start from the identification of the unmarked order of constituents in a main declarative clause. Although the order of subject, object and verb may not be rigid, the grammar writer might try to identify the order which is more natural as an answer to the question "What happened?" or in the first sentence of a narrative, where no constituent is likely to be given special prominence.

In many sign languages the subject or the object can be null, so not all the sentences with a transitive verb are suitable for the identification of the basic word order.

In sign languages that have been studied to date the basic word order has been identified as either SVO (e.g. ASL, LSB, HKSL, and SSL) or SOV (e.g. NGT, DGS, IPSL, LIS, VGT, and Irish SL).

Also in spoken languages, the two most common orders are by far SVO and SOV, although VSO is also fairly well attested (the other orders are very rare).

A potential complication is raised by the fact that the position of a pronominal subject may be different from the position of a full noun phrase subject. NSL can illustrate this. In NSL the basic word order is SVO as shown by the following sentence.

BOY DRINK MILK
'The boy drinks milk.' (NSL)

However, if the subject is a pronominal index, it can appear sentence finally. The VOS order is not attested when the subject is a full noun phrase.

DRINK MILK IX
'He drinks milk, (he does).'
*DRINK MILK BOY (NSL)

The VOS order is acceptable only if there is a pause between MILK and BOY and the pronominal index is repeated.

DRINK MILK. BOY IX-IX (NSL)

The investigation of word order should also mention the order between the subject and an intransitive verb. The basic order is expected to be SV, at least if the language is SVO or SOV. However, as in the case of transitive verbs, pronominal subjects may be special. We illustrate this with NSL, where the order is SV with a full noun phrase subject, unless the subject is pronominal. In the latter case the order can be VS.

a. MAN SLEEP
   'The man is sleeping.'
b. *SLEEP MAN
c. SLEEP IX
   'He is sleeping.' (NSL)

Finally the grammar writer should investigate whether there are differences between the order of the subject and an unergative [Syntax – Section 2.1.1.2] / unergative verb and the order of the subject and an unaccusative [Syntax – Section 2.1.1.2] / unaccusative verb.

2.3.1.2 Order of auxiliaries (i.e. agreement, tense, and aspectual markers) with respect to the verb

In this section the grammar writer should describe the relative order of auxiliaries [Morphology – Section 3.3] with respect to the verb, verifying in particular whether they precede of they follow it.

2.3.1.3 Order of modals with respect to the verb

Modal [Morphology – Section 3.4] verbs are known to display a distribution in many languages that does not overlap with lexical verbs. In this section the grammar writer should verify whether modal verbs display any specific distribution in the language under investigation.

2.3.1.4 Order of negation with respect to verb, modals and auxiliaries

When the sentence contains functional signs that indicate agreement, tense or aspectual information, and negation [Lexicon – 3.11.1] / negation [Morphology – Section 2.1.1.2], it is useful to describe the possible positions of these functional signs with respect to the verb and its argument. For example, in DGS and other sign languages an agreement auxiliary [Lexicon – Section 3.3.4] (also called Person Agreement Marker or PAM) combines with a plain verb which cannot express agreement overtly (cf. Rathmann 2003). In DGS PAM may appear sentence-finally or it may occur between the subject and the object, possibly depending on dialectal variations.

5_2.3.1.4_1_DGS_i poss cat like 1pam3

a. I POSS CAT LIKE $_1$PAM$_3$
'I like my cup.'

5_2.3.1.4_2_DGS_hansi ipamj mariej like

b. HANS$_i$ $_i$PAM$_j$ MARIE$_j$ LIKE
'Hans likes like Marie.' (DGS, Rathmann 2003: 183)

Other functional signs are aspectual markers [Lexicon – Section 3.3.2], for example the sign glossed as FINISH in ASL and the one glossed as DONE in LIS. In ASL, which has SVO as its basic order, the perfect marker FINISH precedes the verb. In LIS, which has SOV as its basic order, the perfect marker DONE follows the verb.

a. JOHN FINISH VISIT MARY
'John has visited Mary.' (ASL, Zucchi et al. 2010: 199)

5_2.3.1.4_3_LIS_gianni house buy done

b. GIANNI HOUSE BUY DONE
'John has bought a house.' (LIS, Zucchi et al. 2010: 204)

Although tense [Lexicon – Section 3.3.1] / tense [Semantics – Chapter 1] information is typically conveyed by time adverbials, some sign languages contain tense auxiliaries. These signs often derive from time adverbials (Aarons et al. 1995 for ASL) or from modal verbs. The grammar writer may investigate the position of these signs and study if there are differences when they are used as auxiliaries and when they are used as modals (or time adverbials).

The position of negation [Lexicon – Section 3.11.1] / negation [Morphology-Section 2.1.1.2] / negation [Semantics – Chapter 12], with respect to the verb, modals and auxiliaries should also be verified. In LIS, a SOV language, negation follows the verb, modals and aspectual markers [Lexicon – Section 3.3.2], while in ASL, a SVO language, it precedes the verb.

a. GIANNI ARRIVE NOT
'Gianni doesn't arrive.' (LIS)
b. JOHN NOT BUY HOUSE
'John has not bought a house.' (ASL)

The grammar writer should also consider that many sign languages display different signs of negation carrying different pragmatic meanings, such as negative particles [Lexicon – Section 3.11.1], negative words, and negative adverbials. The position of these different signs of negation may vary in the sentence and should therefore be investigated in the target sign language.

2.3.1.5 Order of arguments of ditransitive verbs

Ditransitive verbs / ditransitive (*give* or *send*) take three arguments. The grammar writer may want to describe the possible orders between them. Many languages admit a permutation between the theme argument and the goal [Semantics – Section 6.1], so this is an aspect that should be taken into consideration.

2.3.1.6 Position for different types of adverbs and adjuncts

Although it is not unusual for the same adverb [Lexicon – Section 3.5] to be found in more than one position in the sentence, each type of adverbs may be associated to one non-marked position, as with any adjunct [Syntax – Section 2.2.3]. The grammar writer should see if there are different positions for (among others) the following types of adverbs: adverbs of time (*yesterday*), adverbs of place (*outside*), adverbs of manner (*slowly*), adverbs of frequency (*often*) and sentential adverbs, which conveys the attitude of the speaker toward the content of the sentence (*probably*).

However, the grammar writer should consider that in sign languages some adverbs are naturally realized non-manually on the verb, so their order in the clause is by definition the same as the verb.

The grammar writer should keep in mind that adjuncts can also be realized through other means, such as adverbial clauses [Syntax – Section 3.5; Semantics-Section 14.2] and noun phrases.

2.3.2 Basic order of constituents in other clauses

2.3.2.1 Basic order in the different types of sentence

After analyzing the word order in declarative sentences [Syntax – Section 1.1; Semantics – Section 13.1], the grammar writer may want to see if in the other sentence types (question [Syntax – Section 1.2] / question [Semantics – Section 13.2], imperative [Syntax – Section 1.3] / imperative [Semantics – Section 13.3] / imperative and exclamative [Syntax – Section 1.4] / exclamative [Semantics – Section 13.4]) / exclamative the order is different. In particular, in many sign languages wh-signs [Syntax – Section 1.2.3] / wh-signs are found in a position which does not correspond to their grammatical function (typically sentence finally or sentence initially). If a language uses a special sign to convey imperative force, its position should be detected. Also, since a a change in word order is a property of imperative clauses observed in many spoken languages, the grammar writer should investigate if such a change also applies to the target sign language in the imperative mode.

2.3.2.2 Basic order in the different types of subordinate clauses

Two types of clauses can be embedded: declarative [Syntax – Section 1.1] and interrogative clauses [Syntax – Section 1.2] (also called indirect questions). The basic word order in embedded declaratives and interrogatives may or may not be the same as the word order in matrix declaratives and interrogatives, even more so considering that some (spoken) languages have special word order rules for matrix clauses (cf. Verb Second in Western Germanic languages). It may be interesting to study if the position of the wh-signs [Syntax – Section 1.2.3] is the same in matrix and embedded clauses. Finally, if the sign language under study has signs for subordinating conjunctions, these should be detected.

2.3.3 Deviations from the basic order of constituents

Although most known sign languages have a flexible word order, it is not the case that anything goes. So, after analyzing what is the basic, unmarked word order in the language, it is important to analyze the possible and impossible order permutations. In doing so, the grammar writer should try to determine which factor makes possible or favors these changes. Since, topic [Pragmatics – Section 4.2] / topic or focus [Pragmatics – Section 4.1] / focus constituents are often dislocated in specific positions in the sentence and are often accompanied by specific non-manual markers, attention should be given to these factors. For example, in NSL, which is usually SVO, the order may be reversed to OSV, if the object is focalized and a pause intervenes between the object and the rest of the clause:

CAR GRANDPA HAVE
'A car is what grandfather has?' (NSL)

2.3.3.1 List of attested and unattested permutations

After analyzing what is the basic, unmarked word order in the language, the grammar writer should analyze the possible and impossible order permutations for the language under investigation.

2.3.3.2 Non-manuals accompanying the deviations from the basic word order

In describing permutations, the grammar writer should try to determine which factor favors these changes. Topic [Pragmatics – Section 4.2] or focus [Pragmatics – Section 4.1] / focus constituents are known to be often dislocated in specific positions in the sentence and are often accompanied by specific non-manual markers. In this section the grammar writer should describe which specific non-manual markers correlate with any given permutation.

2.3.3.3 Specific order for topicalized elements

In this section the grammar writer should describe the permutations that correspond to topicalization strategies.

In sign languages, topics usually occupy the left periphery of the clause and are marked by dedicated non-manual markers. Studies on topic marking in various sign languages (Aarons 1994, 1996 for ASL; Sze 2013 for HKSL; Brunelli 2011 for LIS, a.o.) show that: (i) sign languages vary in the non-manuals marking topics; (ii) different kinds of topic may co-exist in the same sentence (usually not more than two); (iii) topics can be distinguished by ordering restrictions (distribution in the sentence), non-manual marking, discourse function, and whether they are base-generated in the left-periphery of the sentence or moved. Example (a) below illustrates an ASL sentence with a base-generated topic (VEGETABLE) marked by a large movement of the head back, wide eyes, and a forward head movement ('tm2'). The ASL sentence in (b) displays two topics preceding the main clause: a base-generated topic (JOHN) introducing known referent marked by a cluster of NMMs (head down, wide eyes, mouth open, raised eyebrows and rapid headnods, 't3-bg') and a moved topic (MARY) expressing contrastive focus and marked by raised eyebrows, wide eyes, head tilted back, and the head moving down ('t1-mv'). According to Aarons (1994), moved topics must follow base-generated topics in ASL.

tm2
a. VEGETABLE, JOHN LIKE CORN
'As for vegetables, John likes corn.' (ASL, Aarons 1996: 78)

t3-bg t1-mv
b. JOHN$_j$, MARY$_i$, IX$_j$ LOVE t_i
'You know John, *Mary* he loves.' (ASL, Aarons 1994: 179)

2.3.3.4 Specific order for focused elements

In this section the grammar writer should describe the permutations that correspond to focalization strategies.

Similarly to topics, focused elements usually tend to appear at the left of the sentence in sign languages, they are marked by dedicated non-manual markings and may carry out different discourse functions. In some sign languages, focused constituents may be followed by an indexical sign or by a determiner-like element functioning as an intensifier, as in the ASL example below. The focused constituent (KAY) is marked by brow raise and lean back ('br').

br
KAY THAT, TOLD FINISH
'It's Kay that I told.' (ASL, Wilbur 2012: 475)

Languages may vary as to the distribution of topic and focus in the sentence.

2.3.3.5 Word order variations according to the different types of verbs (plain, agreeing)

Most sign languages of the world have three types of verbs (Padden 1983): plain verbs [Lexicon – Section 3.2.1], agreement verbs [Lexicon – Section 3.2.2] and spatial verbs [Lexicon – Section 3.2.3]. Word order may change according to these classes, as it is well known at least since Fischer (1974, 1975). In particular, sentences with agreement verbs exhibit a freer word order than sentences with plain verbs. For example, in NSL, where the basic word order is SVO, the order SOV is also commonly found with agreeing verbs:

5_2.3.3.5_1_NSL_joe-ixi eva-ixj ikickj

JOE-IX$_i$ EVA-IX$_j$ $_i$KICK$_j$
'Joe kicked Eva.' (NSL)

Because of this, claims about the basic word order of particular sign languages are often based on sentences with plain verbs rather than agreement verbs.

The word order differences between plain verbs and agreement verbs can be further illustrated through LSB. As shown below, LSB allows an OSV order with the agreement verb ASSISTIR 'watch' but not with the plain verb GOSTAR ('like'). Note that since there is no topic marking in these examples, we can assume that they are not derived by topicalization. Importantly, the sentence with GOSTAR would be grammatical if the predicate were irreversible (for example, 'John likes football'), showing that the reversible/irreversible character of the predicate interacts with the agreeing/non agreeing character of the verb.

	eg:b	eg:a	eg:b
a.	TV$_i$	IX<det> JOÃO$_j$	$_j$ASSISTIR$_i$
	'John watches TV.'		
			hn
b.	*IX<det> MARIA IX<det> JOÃO		GOSTAR
	'John likes Mary.'		(LSB, Quadros & Lillo-Martin 2010: 238–239)

2.3.3.6 Word order variations according to the different types of predicates (reversible/irreversible)

Another factor that researchers have claimed plays a role in word order is the reversible/irreversible character of the predicate. If the predicate is reversible, namely the two characters can perform the action on each other ('John saw Mary'), word order may be the only clue to understand who is the agent and who is the theme. If the predicate is irreversible, ('John is eating a sandwich'), word order is less crucial in determining argument structure. This may have consequences. For example, in NSL, sentences with SOV order are more commonly found in narratives and when

the predicate is irreversible. The verb in SOV-clauses is normally intensified, as in the following sentence:

JOE CHOCOLATE EAT-intensified
'Joe gorged himself on chocolate.' (NSL)

In many sign languages, the SVO order is preferred in sentences with reversible arguments whereas SOV is more common with irreversible arguments. This holds in ASL (Fischer 1975), HZJ (Milković et al. 2006), LSB (Quadros 1999), LIS (Volterra et al. 1984) and VGT (Vermeerbergen et al. 2007). Kimmelman (2012) also reports that semantic reversibility of the sentence favors SVO in RSL.

The contrast between irreversible arguments and reversible arguments is exemplified in (a) and (b) below:

hn
a. IX<det> JOÃO FUTEBOL GOSTAR
'John likes soccer.'

hn
b. *IX<det> JOÃO IX<det> MARIA GOSTAR
'John likes Mary.' (LSB, Quadros & Lillo-Martin 2010: 239)

Not only is an SOV order ruled out with reversible arguments in LSB (as shown above), but the order OSV is also impossible, even though it is allowed with irreversible arguments:

hn
a. FUTEBOL IX<det> JOÃO GOSTAR
'John likes soccer.'

hn
b. *IX<det> MARIA IX<det> JOÃO GOSTAR
'John likes Mary.' (LSB, Quadros & Lillo-Martin 2010: 239)

Although reversibility/irreversibility of the subject and object arguments is relevant for word order in many sign languages, this is not the case for all sign languages. For instance, reversibility/irreversibility of subject and object does not influence word order in Auslan, Irish SL and HKSL (Johnston et al. 2007; Sze 2003). Hence, the grammar writer should check if reversible sentences differ from non-reversible sentences in the sign language under investigation.

Elicitation materials

Researchers have adopted different approaches in collecting data on word order in sign language. The approach characterizing the first studies on word order involves the use of

elicited data either in the form of translations from the spoken language, grammaticality judgments or elicitation from drawings. In general, elicited data present some disadvantages: they often lack a discourse and pragmatic context against which to check their interpretation, or they might erroneously suggest one. However, elicitation procedures with the necessary recommendations may turn out to be a very useful approach. The grammar writer should avoid translations from the spoken language as this might induce the signer to follow the word order of the spoken language. The elicitation from drawings avoids such drawback favoring the presence of a narrative context with no shared information between the signer and his interlocutor, so it likely elicits an unmarked word order. The grammar writer should avoid presenting images favoring a focused interpretation. To provide a clarifying example, the investigation on LIS word order carried out by Volterra et al. (1984) involved the participation of two interacting signers both provided with couples of drawings minimally different for the direction of the action performed (namely, 'the woman embraces the girl' versus 'the girl embraces the woman'). One of the signers was told which of the two drawings he/she had to describe to his partner. This elicitation approach might have induced the signer to produce marked orders reflecting the contrastive information present in the two drawings.

More recently, the availability of technological equipment and the collection for some sign languages of naturalistic corpora, has induced researchers to annotate naturalistic and spontaneous data to investigate word order. Among the advantages of using naturalistic data is the possibility to interpret them at the light of the discourse context in which they are produced. However dialogues naturally build a context which is presupposed among participants, thus facilitating the establishment of certain constituents as topic or focus categories. On the other hand, naturalistic data might lack specific structures preventing the grammar writer to carry out an in-depth analysis of the phenomenon. The grammar writer is therefore advised to use more than on approach when carrying out research on word order in the target sign language.

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2.4 Null arguments

2.4.0 Definitions and challenges

2.4.0.1 What is a null argument?

Some languages allow the arguments of a verb in a tensed clause not to be expressed as an overt pronoun [Lexicon – Section 3.7] or a lexical noun phrase [Syntax – Chapter 4]. This is the situation in which the term 'null argument' is commonly used. Spoken languages vary with respect to whether they allow the arguments of the verbs to be silent. Null arguments are most commonly observed in languages like Italian, Spanish, Catalan, and Turkish, which have a rich verbal agreement morphology. English, on the other hand, which does not have a rich verbal morphology, does not allow arguments of a predicate to be phonologically null in a sentence. In the Turkish and Catalan examples below, the verb bears the person and number agreement marker for the subject that is not phonologically expressed (*e* indicates the phonologically null pronoun).

a. Kitab-ı bitir-di-m
book-ACC finish- PAST-1SG
'I finished the book.' (Turkish)

b. Al camp *e* ho aprofiten tot.
in-the countryside it use.3PLeverything
'In the countryside they use everything.'
(Catalan, Barbera & Quer 2013: ex. (1a))

Languages that identify the referent of the null argument by means of verbal agreement morphology are said to use a licensing strategy based on agreement.

Similar to spoken languages, many sign languages also allow one or more of the arguments of the verb in a tensed clause to be phonologically unexpressed. In the ASL question-answer exchange below, the agreeing verb *send* is marked for subject and object agreement.

DID JOHN SEND MARY THE PAPER?
YES, $_{A}$SEND$_{B}$
'Yes, (he) sent (it) to (her).' (ASL, Lillo-Martin 1986: 421)

As can be observed, neither the subject nor the object argument of the verb *send* is pronounced in the response. The null pronouns are nevertheless interpreted as a definite pronominal such as *he*, *her*, and *it*.

2.4.0.2 Further explanations/distinctions

Significantly, it is not only those spoken languages with a rich agreement system that allow null arguments. Languages like Chinese and Japanese, which do not mark their

verbs for agreement also license null arguments. In Speaker B's responses below, either the subject (a), or the object (b), or both (c) can be null.

Speaker A:
Zhangsan kanjian Lisi le ma?
Zhangsan see Lisi ASP Q
'Did: Zhangsan see Lisi?'
Speaker B:
a. *e* kanjian ta le.
(He) see he ASP
'(He) saw him.'
b. ta kanjian *e* le.
He see (he) ASP
'He saw (him).'
c. *e* kanjian *e* le.
(he) see (him) ASP
'(He) saw (him).' (Chinese)

Spoken languages like Chinese, which do not have a rich verbal agreement morphology but still allow null arguments, are said to use the 'licensing by topic [Pragmatics – Section 4.2] / topic' strategy to identify the referent of the argument that is not phonologically expressed.

Sign languages also allow sentences with null arguments of verbs belonging to classes other than agreeing verbs. In ASL, the verb *eat* is a plain verb [Lexicon – Section 3.2.1] and can occur with a null subject and a null object.

A: Did you eat my candy?
B: YES, EAT-UP
'Yes, (I) ate (it) up.' (ASL, Lillo-Martin 1986: 421)

However, Bahan, et al. (2000) argue that in ASL a null argument is possible with a plain verb only in the presence of non-manual agreement markers. When this happens, the head and the eyes are non-manual agreement markers of, respectively, the subject and the object: the head is leaned towards the point in space associated with the subject, while the eye gaze is directed towards the point in space associated with the object. Bahan, et al. claim that if the plain verb is signed without the non-manual agreement marker, the argument cannot be null but has to be phonologically realized. It is therefore important to determine if the particular sign language has a non-manual marker of agreement and also to see if the language licenses null arguments.

Licensing of null arguments by topic is also possible in some sign languages. Sign languages therefore can use one or both of the two types of strategies in licensing null arguments: (i) a null pronoun licensed by verb agreement, (ii) a null pronoun licensed by topic.

2.4.0.3 Methodological challenges

There are a number of methodological challenges in analyzing null arguments in a sign language. One has to do with determining whether the verb of the clause with a null argument is an agreeing [Lexicon – Section 3.2.2] or a non-agreeing (plain) verb [Lexicon – Section 3.2.1], and in the latter case, whether the sign language has non-manual marking of agreement on plain verbs.

Correlated with this issue is another challenge, namely, determining the nature and properties of topic constructions in the language being analyzed. This is significant since the most common licensing strategy in sentences with null arguments and plain verbs has been the identification with topic.

2.4.1 Subject and object null arguments

Null arguments are typically subjects and objects of their clauses. Null subjects and objects can occur in sentences with both agreeing and plain verbs.

2.4.1.1 Null subjects

A sign language that has optional non-manual agreement marking on agreeing verbs may or may not differentiate between the two productions of the agreeing verb in allowing a null subject in the clause.

In ASL, for example, which is a language in which a non-manual agreement marker optionally occurs with the agreeing verb, the null subject of the agreeing verb is allowed regardless of whether the non-manual agreement marker is present or absent.

With respect to allowing null subjects in sentences with plain verbs, sign languages exhibit variation. Sign languages might have optional non-manual agreement markers that are produced simultaneously with the plain verb. Sign languages differ with respect to whether they allow a null subject in the absence of such non-manual agreement marker when the verb of the clause is a plain verb.

If a language licenses null pronominal subjects and pronominals in sentence-final position (as in the ASL example below), the subject is more likely to occur after the verb rather than in the initial position of the sentence which is the common position for subjects.

$_{i}\textsc{blame}_{j}$ $\textsc{fred}_{j}$, $\textsc{ix}_{i}$
'(He/she) blames Fred, him/her.' (ASL, Neidle et al. 2000: 59)

In those sentences in which a null argument occurs in subject position, in addition to a pronominal in sentence-final position, there may optionally be a tag.

2.4.1.2 Null objects

Sign languages also allow null objects to occur with agreeing and plain verbs. Null objects seem to behave similarly with null subjects with respect to whether a sign language will allow a null object to occur in a construction or not. As in the case of null subjects, null objects can occur with agreeing verbs. A sign language that has an optional non-manual agreement marker with agreeing verbs might allow a null object regardless of whether the non-manual agreement marker is present or not.

Bahan et al. (2000) claim that a null object is not allowed with plain verbs in ASL in case of absence of a non-manual object agreement marker (the eye-gaze directed towards the signing space associated with the object).

a. *JOHN$_i$ LOVE
   eye gaze$_i$
b. JOHN$_i$ LOVE
   'John loves (him/her).' (ASL, Bahan et al. 2000: 32–33)

2.4.2 Types of verbs that can license null subjects

Null pronouns may be licensed by different verb classes is sign languages. Languages have been observed to allow null arguments with agreeing, spatial and plain verbs.

In many sign languages agreeing verbs [Lexicon – Section 3.2.2] with or without non-manual agreement license null arguments to a higher degree of frequency than plain verbs with non-manual agreement. In some sign languages, e.g. Auslan, null subjects have been recorded to occur most frequently with spatial verbs.

With respect to allowing null subjects in sentences with plain verbs [Lexicon – Section 3.2.1], sign languages exhibit variation. A sign language which has an optional non-manual agreement marker produced simultaneously with the plain verb might not license a null subject in the absence of the non-manual agreement marker. In ASL, according to Bahan et al. (2000) for example, null subjects and null objects of plain verbs are not licensed in the absence of the non-manual agreement markers. In such cases, the arguments have to be overtly expressed.

2.4.3 Null subjects in main clauses

A number of factors allow for null subjects in main clauses. In this section the grammar writer should describe the distribution of null arguments in main clauses, as opposed to their distribution in embedded environments.

2.4.4 Null arguments in embedded clauses

It is cross-linguistically common for the distribution of null arguments to vary in matrix and embedded environment, especially in non-finite clauses. In English, for example, null arguments have a freer distribution in non finite clauses than in matrix clauses. In the following sentences the verb *leave* does not take an overt argument (in the first sentence the null argument must refer back to the subject of the main clause, while in the second sentence it refers to the object of the main clause).

a. John decided to leave
b. David ordered Bill to leave

The grammar writer should check if this holds also in the sign language under investigation, even though this is made difficult by the fact that in most sign languages there are no clear diagnostics to set apart finite and non-finite clauses.

It is also possible that a sign language will *not* allow a null argument in an embedded clause to have a definite referent. In LSC, a SOV sign language, for example, the null argument in an embedded clause with either a plain verb or an uninflected agreeing verb cannot be definite.

JORDI SAY-$_1$ LAURA TEACH
1. *Jordi$_i$ says to me that Laura teaches him$_i$
2. *Jordi$_i$ says to me that he$_i$ teaches Laura
3. Jordi says to me that Laura teaches/is a teacher.

(LSC, Quer & Rosselló 2013: 349)

2.4.5 Pragmatic and semantic conditions licensing null arguments

Although null arguments are commonly licensed by verbs that are marked for agreement (manually as in the case of agreeing verbs or non-manually in the case of plain verbs), it is possible that a sign language also uses a different licensing strategy for null arguments.One such strategy is licensing by a topic [Pragmatics – Section 4.2] / topic phrase. Both agreeing and plain verbs can allow a null argument that is coreferential with the topic phrase. The next sentence shows topic marking of the null object of the plain verb:

t
THAT COOKIE, IX$_1$ HOPE SISTER$_{3a}$ SUCCEED $_{3a}$PERSUADE$_{3a}$ MOTHER$_{3b}$ EAT
'That cookie, I hope my sister manages to persuade my mother to eat.'

(ASL, Koulidobrova 2017)

2.4.6 Referential properties of null arguments

One of the characteristics of null arguments in spoken languages is that they can be ambiguous with respect to their referent. In the case of verb phrase ellipsis in the following English sentence, it is ambiguous as to whether Audrey lost her own book or Jane's book.

Jane lost her book, Audrey did too.

Null arguments of plain and agreeing verbs in sign languages can also have ambiguous reading. Note that in LSC, even in the case of an agreeing verb can the referent of the null subject be ambiguous.

5_2.4.6_1_LSC_maria say daughter

MARIA SAY DAUGHTER POSS$_i$ LETTER SEND-LETTER DIRECTOR. LAURA ALSO SAY LETTER SEND-LETTER DIRECTOR

Lit. ' Maria says her daughter sent a letter to the director. Laura also says *e* sent a letter to the director. '

e = Maria's daughter, *e* = Laura's daughter (LSC, Quer & Rosselló 2013: 355)

The ambiguity in the interpretation of such constructions can be resolved through context.

Elicitation materials

The analysis of null argument structures requires careful elicitation of data. Data elicitation tasks and grammaticality judgment tasks can determine the constructions in which null arguments are licensed. Picture descriptions can uncover the contextual factors which determine the choice of null arguments over phonologically realized arguments.

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2.5 Clausal ellipsis

In addition to null arguments [Syntax – Section 2.1.2] / null arguments, parts of the clause can be unpronounced if a suitable antecedent is present that provides the content for the missing category. For sake of explicitness, in the examples below we indicate the elliptical category by strikethrough. This means that the sentences must be intended with words/signs unuttered. We use English to define categories of clausal ellipsis and start from deletion of smaller units and move to ellipsis that involve deletion of bigger units.

In the elliptical construction called gapping the finite verb is elided in the second conjunct of a coordination / coordination [Syntax – Section 3.1]:

John bought a cake, and Sally ~~bought~~ an ice cream.

Also the entire verb phrase can go unpronounced as in the following example, and this is called verb phrase (VP) ellipsis.

John has already left while I have not ~~already left~~

Another type of ellipsis is stripping. Under stripping, everything in a clause is deleted under identity with corresponding parts of the preceding clause, except for one constituent**.** The following sentence contains an example of stripping because everything but the subject is deleted:

John broke a vase, and Mary ~~broke a vase~~ too

However, the following sentence is another case of VP ellipsis because the category expressing tense and agreement (the auxiliary *do*) is not deleted.

John broke a vase, and Mary did ~~break a vase~~ too

Finally, an entire clause out of which a *wh*-phrase has moved may undergo ellipsis and this is called sluicing:

John bought something but I do not know what ~~John bought~~

The grammar writer may be interested in the study of ellipsis not only to unveil what categories can be omitted in the sign language she or he is studying but because ellipsis can give information on the internal structure of the clause. For example, typically ellipsis affects the verb, or the verb and its object(s), while it does not happen that the verb and the subject undergo ellipsis but the object is not elided, as illustrated by the ungrammaticality of the following sentence (sluicing is an exception which is due to the fact that the *wh* object has moved to a dedicated position outside the verb phrase).

*John broke a vase, and ~~Mary broke~~ a vase too

Under the assumption that ellipsis targets constituents [Syntax – Section 2.0.1] / constituents, this is taken as an indication that the inner constituent of a transitive clause is composed by the verb and its object while the subject is later added to this nucleus. So, ellipsis is a useful tool to study clause structure.

While the sign language literature on argument ellipsis is wider, lesser attention has been devoted to ellipsis in the clausal domain. Jantunen (2013) discusses candidate cases of gapping, VP ellipsis and sluicing in FinSL. The following example illustrates gapping:

GIRL HAS-GOT TWO-PIECES. BOY ~~HAS-GOT~~ ONE-PIECE
'The girl has two and the boy (has) one.'

(FinSL, modified from Jantunen 2013: 317)

Cecchetto et al. (2015) make a systematic use of signs like SAME ('as well'), YES or NOT to probe elliptical constructions in LIS and discuss cases such as the following, in which the verb and the object are deleted but the auxiliary for future survives ellipsis.

5_2.5_1_LIS_gianni bean eat fut

GIANNI BEAN EAT FUT. PIERO ~~BEAN EAT~~ FUT SAME
'Gianni will eat beans and Piero will too.' (LIS, Cecchetto et al. 2015: 9)

Given that the auxiliary survives ellipsis, the preceding sentence is interpreted as a case of VP ellipsis. This sentence contrasts minimally with the following one, which, since the auxiliary is elided too, can be interpreted as a case of stripping.

GIANNI BEAN EAT FUT. PIERO ~~BEAN EAT FUT~~ SAME
'Gianni will eat beans and Piero too.' (LIS, Cecchetto et al. 2015: 9)

Finally, the following sentence is a paradigmatic cases of sluicing, (the embedded interrogative precedes the matrix verb KNOW because indirect questions precede the main verb in LIS).

5_2.5_2_LIS_gianni someone meet

GIANNI SOMEONE MEET BUT ~~GIANNI MEET~~ __wh WHO I-KNOW NOT
'Gianni met someone but I do not know who.' (LIS, Cecchetto et al. 2015: 10)

As signs functionally equivalent to SAME, YES or NOT are likely to be found in all sign languages, their occurrence in sentences consisting of the coordination of two clauses is the natural environment to look for cases of ellipsis. As a proviso, the grammar writer should be advised that while cases of stripping, gapping and sluicing are robustly attested cross-linguistically, VP ellipsis is rarer. Furthermore, sign languages often express information about tense and agreement without the use of auxiliaries, so it may be difficult or even impossible to set apart VP ellipsis and stripping, which are normally distinguished by the presence/absence of the auxiliary.

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2.6 Pronoun copying

2.6.0 Definitions and challenges

Pronoun copying is the copying of an argument [Syntax – Section 2.1.2] of a verb within its clause. One of the copies occurs in the regular position of the argument.

The other copy, which is in the form of a pronominal IX agreeing in space with that argument, occurs most often in the clause final position. Pronoun copying is very common to sign languages, as illustrated below for ASL.

5_2.6.0_1_ASL_ix1 go-away ix1

a. IX_1 GO-AWAY IX_1
'I'm going for sure.' (ASL, Padden 1988: 86)

b. IX_3 NOT-LIKE ICE-CREAM IX_3
'S/he doesn't like ice cream.' (ASL, Cormier et al. 2013: ex (8))

Sign languages differ from spoken languages in this respect. Not many spoken languages seem to have pronoun copying. One exception is (Canadian) French. In the following sentence the pronoun *moi* ('me') is reduplicated in sentence final position.

(Moi) Je le connais moi
Me I him know me
'I know him.' (French, cited in Bos 1995)

Pronoun copying is to be distinguished from another phenomenon commonly attested in sign languages, namely doubling, which may apply to categories other than arguments. In the example below, the auxiliary *will* is doubled and the doubled auxiliary occurs after the verb.

hn
IX_1 WILL LEAVE WILL IX_1
'I will leave.' (ASL, Petronio 1993: 134)

In clauses that contain both doubling and pronoun copy, the subject pronoun copy follows the doubled auxiliary, at least in ASL.

2.6.1 Personal pronoun copying

In pronoun copying, the argument that is copied can be a noun phrase [Syntax – Chapter 4] (NP), an overt pronoun [Lexicon – Section 3.7] or a null pronoun. The argument that is most commonly copied is the one functioning as the subject of its clause. The sentence below illustrates the pronoun copy of a subject noun phrase.

GIRL IX_{left}, IX_{left} BOOK THROW-AWAY IX_{left}
'That girl, she threw away the book.' (NGT, Crasborn et al. 2009: 359)

A null subject too can have a copy in sentence-final position. Below is an example illustrating the copy of a null subject.

neg
BUT CAR BUY IX_1 PU_1 //
'But I am not going to buy a car.' (NGT, Bos 1995: 128)

In the example above, the subject is a first person null pronoun. The pronoun copy in the form of the pronominal IX, which agrees in number and person with the doubled null argument, appears in clause final position.

Pronoun copying can also occur in matrix polar interrogatives, as shown below:

5_2.6.1_1_ASL_brother like salad ixbrother

_____ _br
$BROTHER_3$ LIKE SALAD IX_3?
'Does (my) brother like salad?' (ASL, Davidson & Caponigro 2016: ex. (61))

A pronoun copy can occur in imperatives as well, at least in some sign languages.

SCARE IX_a? HEY, ASK SCARE ASK SCARE IX_a IX_{Aby}
'Are you scared? Hey, Aby, ask Laura if she is scared.'
(ASL, Davidson & Caponigro 2016: ex. (32))

Pronoun copying can also occur in complex sentences that contain an embedded sentence. In such cases, in ASL the pronoun copy is the copy of the subject of the matrix clause.

IX_1 DECIDE [IX_a SHOULD $_aDRIVE_b$ SEE CHILDREN] IX_1
'I decided he ought to drive over to see his children, I did.'
(ASL, Padden 1988: 95)

In the example above, the index IX in the sentence-final position can only be interpreted as the subject of the matrix clause. The pronoun copy can refer only to the subject of the matrix clause, but not to the subject of the embedded clause. The grammar writer should check whether the same restriction applies to the sign language under description.

Pronoun copying has also been observed to apply in indirect questions [Syntax – Section 1.2] / questions. In ASL, in such cases, the pronoun copy in the sentence-final position can be ambiguous between referring to the subject of the matrix declarative clause or to the subject of the embedded polar interrogative.

neg
MOM REMEMBER BROTHER LIKE SALAD (IX_{mom}/$IX_{brother}$)
'Mom doesn't remember whether her brother likes salad.'
(ASL, Davidson & Caponigro 2016: ex. (62))

In the example above, the pronoun copy in the sentence-final position can be the double of either subject: the matrix subject IX_{mom} or the subject of the embedded question $IX_{brother}$, but it is ungrammatical in ASL to have two different subject pronoun copies. The grammar writer should be careful about these restrictions.

Pronoun copying in ASL distinguishes between subordination [Syntax – Section 3.2] / subordination and coordination [Syntax – Section 3.1] / coordination constructions. As illustrated in the example repeated below, in a sentence containing an embedded clause, the sentence-final subject pronoun copy can only refer back to the matrix subject.

IX_1 DECIDE [IX_a SHOULD $_a\text{DRIVE}_b$ SEE CHILDREN] IX_1
'I decided he ought to drive over to see his children, I did.'
(ASL, Padden 1988: 95)

In a sentence that contains a conjoined clause, however, the sentence-final subject pronoun copy cannot refer back to the first conjunct.

[IX_a SIT_a] [IX_b STAND_b $\text{IX}_{*a/b}$]
'He sat there and she stood there, she did.' (ASL, Padden 1988: 88)

In sentences such as the example above, which contains a conjoined clause, the pronoun copy can only refer to the subject of the second conjunct. Referring the copied pronoun back to the (null) subject of the first conjunct is not possible.

The grammar writer should verify whether this distinction between coordinated and subordinated sentences with respect to pronoun copying is also attested in the relevant sign language.

2.6.2 Syntactic properties of pronoun copying

2.6.2.1 Possible subject-object asymmetry in pronoun copying

In most sign languages there is an asymmetry between the function of the arguments that are doubled in pronoun copying. In general, pronoun copying applies to subjects much more freely than to other arguments.

Some sign languages have also been reported to copy objects and adverbials such as a locative phrase. The frequency of copying of a non-subject, however, is much lower than that of subjects. In NGT, for example, the occurrence frequency for second and third arguments has been observed to be approximately 5% to 6% (Bos 1995). The grammar writer should check whether pronoun copy is restricted to subjects or can also hold for other arguments.

2.6.2.2 Position of the copying pronoun

One word of caution is that not all instances of multiple IXs are considered to be pronoun copies, but only those in clause-final position.

Multiple IXs that appear in the regular position of the argument are not pronoun copies, but rather simple pronouns.

The category of the verb may have an effect on the position of the subject pronoun copy. In some sign languages, plain verbs and agreement verbs behave differently

with respect to where the pronoun copy occurs in the clause. In those languages, a subject pronoun copy may intervene between the agreeing verb and the person agreement marker [Lexicon – Section 3.3.4] (PAM), as shown below.

IX_1 TEACHER NEW IX_{3a} $_1\text{HELP}_{3a}$ IX_1 $_1\text{PAM}_{3a}$
'I help the new teacher.' (DGS, Pfau & Steinbach 2011)

But if the verb is a plain verb, the pronoun copy cannot occur between the verb and the person agreement marker.

*IX_1 TEACHER NEW IX_{3a} LIKE IX_1 $_1\text{PAM}_{3a}$
'I like the new teacher.' (DGS, Pfau & Steinbach: 2011)

The grammar writer should carefully observe the interaction of verb classes and the position of the pronoun copy.

2.6.3 Prosodic features of pronoun copying

The pronoun copy is generally unstressed. There is usually no intonational break [Phonology – Section 2.2.3] before the pronoun copy. In the attested cases, no pause occurs before the pronoun and there is no lengthening of the preceding sign.

2.6.4 Functions of pronoun copying

Pronoun copying is closely related to information structure. The most common use of pronoun copying is to express emphasis [Pragmatics – Section 4.1.4]. It has however also been noted that it can convey other functions such as focus [Pragmatics – Section 4.1] / focus and topic [Pragmatics – Section 4.2] / topic.

The following examples from NGT illustrate that pronoun copying expresses topic. Here the first IX localizes the topic noun phrase: the topic is $\text{GIRL-IX}_{\text{left}}$, while the second IX_{left} is a resumptive pronoun in subject position that indicates left dislocation of the topic phrase. The third IX in clause-final position is the pronoun copy referring to the topicalized subject $\text{GIRL-IX}_{\text{left}}$.

5_2.6.4_1_NGT_girl-ixleft, ixleft book throw-away girl-ixleft

$\text{GIRL-IX}_{\text{left}}$, IX_{left} BOOK THROW-AWAY $\text{GIRL-IX}_{\text{left}}$
'That girl, she threw away the book.' (NGT, Crasborn et al. 2009: 359a)

Since the final IX in this example refers to the topic, the phenomenon in these sentences has been labeled as 'topic agreement'. The grammar writer should describe the most common informative function of pronoun copying in the relevant sign language.

Elicitation materials

There are a number of methodological issues that need to be taken into consideration in eliciting and identifying pronoun copying. For one, elicitation of pronoun copying through specifically designed tasks shares the same challenges as elicitation tasks for information structure phenomena such as topic/focus. Given the fact that pronoun copying is closely related to information structure, it can best be elicited through tasks similar to those designed to induce other types of information structure sensitive constructions.

Contexts of natural production where the informants are led through unmonitored, free sessions of signing on issues, inducing them to produce the construction in a more natural manner are more likely to yield better results.

A challenge in data interpretation is how to identify the pronoun copy construction correctly. The crucial distinction is between doubling versus pronoun copying constructions. Since both involve doubling of the IX, the distinction lies on the position occupied by the copied IX and its function. However, the grammar writer is helped by the consideration that pronoun copy occurs in clause/sentence-final position.

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Chapter 3 Coordination and subordination

3.0 Introduction

In addition to a classification in sentence types [Syntax – Chapter 1] (declaratives, imperatives, interrogatives, and exclamatives), sentences can be classified according to their internal complexity. A sentence is simple when it consists of a single independent clause ('Mohammed arrived on time') while it is complex when it consists of a main and a subordinate clause or of two (or more) coordinate clauses. In principle, the level of subordination is unlimited ('John said that I think that Mohammed claimed that Kazuko is convinced that you arrived on time') although in practice there are limitations of the sentence length due to cognitive limitations (for example, working memory).

The main difference between subordination and coordination is that coordinated clauses have the same status while the main clause and the subordinated one do not. For example, the two clauses that form the coordinated sentence 'Mohammed arrived on time and Sarah arrived late' might be used as independent sentences. In contrast, subordination is a syntactic mechanism by which a clause becomes dependent on another one. Therefore, in the complex sentence 'If Mohammed arrives on time, Miriam will be surprised', the subordinate clause 'if Mohammed arrives on time' could never be used as an independent sentence while the main clause 'Miriam will be surprised' might.

3.1 Coordination of clauses

3.1.0 Definitions and challenges

3.1.0.1 What is coordination?

By coordination we mean the combination of at least two constituents / constituents [Syntax – Section 2.0.1], often belonging to the same syntactic category such as noun phrases [Syntax – Chapter 4], verb phrases, or clauses, either through conjunction or juxtaposition. Conjunction refers to combining at least two constituents through the use of conjunctions / conjunctions [Lexicon – Section 3.9] such as *and, but,* and *or.*

Juxtaposition, on the other hand, refers to the coordination of constituents without such conjunctions. This section focuses on properties of coordinated clauses. The reader is referred to sections on other types of phrases for a discussion of coordination of those constituents.

3.1.0.2 Methodological challenges

We expect sign languages to have developed grammaticalized forms to create complex coordinated structures, just like spoken languages have. Still, the means employed by sign languages to coordinate clauses may differ from the means employed by spoken languages. Given the multidimensionality of sign languages and their tendency to avoid functional elements like conjunctions, the grammar writer investigating clausal coordination in the target sign language should be aware of the fact that non-manual marking may play a key role in signaling coordinated clauses.

Non-manual markers observed in complex clauses with coordination may have (morpho-)syntactic as well as prosodic [Phonology – Chapter 2] functions. A non-manual marker identified by the grammar writer may, for example, function to mark a constituent as a conjunct (non-final or final) or a clause as a coordinated complex clause. However, it may also serve as a prosodic cue marking the clausal boundaries, similar to tone variation and pauses in spoken languages. In that sense, the non-manual marker identified may not be unique to clausal coordination. Non-manual markers such as eye-blinks, facial expressions, head and shoulder position, and eye gaze direction have been identified in a number of sign languages as markers of clausal boundaries. The grammar writer should be aware that all these prosodic means may be employed by sign languages as the only syntactic markers signaling the peripheries of coordinated clauses.

3.1.1 Types of clausal coordination

Recall that conjunction refers to combining at least two constituents / constituents [Syntax – Section 2.0.1] through the use of conjunctions such as *and, but*, and *or*. Juxtaposition, on the other hand, refers to the coordination of constituents without such conjunctions. The following English examples illustrate conjunction.

a. My son received the letter **and** Carla ran to the train station.
b. I accept your decision **but** you must explain me your reasons.
c. She will watch the movie **or** go to bed.

The following provides an example of juxtaposition from Pacoh, a Mon-Khmer mountain language of Vietnam, where two verb phrases are juxtaposed without any conjunction.

Do	[cho	t'ôq	cayâq,	cho	t'ôq	apây]
she	return	to	husband	return	to	grandmother

'She returns to (her) husband and returns to her grandmother.'

(Pacoh, Tang & Lau 2012: 342)

When employed, conjunctions may be used differently: some languages may use them to introduce only the last conjunct, as shown in English; some other languages require one conjunction for each conjunct, as in the following Upper Kuskokwim Athabaskan example.

nongw	dona?	totis	leka	?isdlal	**ts'e?**	ch'itsan'
from.river	upriver	portage	dog	I.did.not.take	**and**	grass
ch'itey	nichoh	**ts'e?**	<.....>			
too.much	tall	**and**	...			

'I did not take the dogs to the upriver portage because the grass was too tall, and ...'

(Upper Kuskokwim Athabaskan, Tang & Lau 2012: 342)

There are three main types of conjunction: adversative conjunction (corresponding to the use of conjunctions like *but* in English), disjunctive conjunction (corresponding to the use of conjunctions like *or* in English), and conjoined conjunction (corresponding to the use of conjunctions like *and* in English).

Juxtaposition may be the preferred option for conjunctive coordination signaling simultaneous and sequential events in a sign language. The ASL examples below illustrate the juxtaposition of clauses to represent sequential (a) and simultaneous (b) events, respectively.

a. $_{3}$GIVE$_{1}$ MONEY IX$_{1}$ GET TICKET
   'He'll give me the money, then I'll get the tickets.'
b. HOUSE BLOW-UP, CAR $_{i}$CL:3-FLIP-OVER
   'The house blew up and the car flipped over.' (ASL, Padden 1988: 85)

Here the grammar writer may briefly mention how the target language expresses coordination, namely if constituents are simply juxtaposed without the use of conjunctions or whether conjunctions are employed, and how the different types of coordination (adversative, disjoined and conjoined) are expressed.

3.1.2 Coordination by manual markers

If the sign language under investigation makes use of manual markers to coordinate clauses, the grammar writer should investigate what manual signs of conjunction are used in conjoined conjunction, adversative conjunction and disjunctive conjunction (see, for instance, Waters & Sutton-Spence (2005) for BSL).

Their position in the sentence should also be described and their optionality or obligatoriness verified.

3.1.2.1 Manual markers of coordination

ASL makes use of overt lexical markers such as AND and BUT. In the example below, the second conjunct is marked by a headshake ('hs') as well.

hs
$_1$PERSUADE$_3$ BUT CHANGE MIND
'I persuaded her to do it but I/she/he changed my mind.' (ASL, Padden 1988: 95)

Researchers have observed that some sign languages use manual conjunctions only for some of the functions of coordination. Auslan, for example, uses the conjunction BUT, not the conjunction AND.

K-I-M LIKE CAT BUT P-A-T PREFER DOG
'Kim likes cats but Pat prefers dogs.' (Auslan, Johnston & Schembri 2007: 213)

3.1.2.1.1 Manual markers in conjoined coordination

The grammar writer can list the manual markers in conjoined coordination in this section.

3.1.2.1.2 Manual markers in adversative coordination

The grammar writer can list the manual markers in adversative coordination in this section.

3.1.2.1.3 Manual markers in disjunctive coordination

The grammar writer can list the manual markers in disjunctive coordination in this section.

3.1.2.2 Position of manual markers of coordination

In this section, the grammar writer should address the following questions: do conjunctions occur in every conjunct or in only one of the conjuncts? What is the position of the conjunction: conjunct-initial or conjunct-final?

3.1.2.2.1 Position of manual markers in conjoined coordination

The grammar writer can describe the positions of the manual markers in conjoined coordination in this section.

3.1.2.2.2 Position of manual markers in adversative coordination

The grammar writer can describe the positions of the manual markers in adversative coordination in this section.

3.1.2.2.3 Position of manual markers in disjunctive coordination

The grammar writer can describe the positions of the manual markers in disjunctive coordination in this section.

3.1.2.3 Optionality or obligatoriness of manual markers of coordination

In this section, the grammar writer should include information related to whether the manual markers of coordination are obligatory or optional.

3.1.2.3.1 Optionality or obligatoriness of manual markers in conjoined conjunctions

The grammar writer is advised to mention the optionality/obligatoriness of the manual markers in conjoined conjunctions in this section.

3.1.2.3.2 Optionality or obligatoriness of manual markers in adversative conjunctions

The grammar writer is advised to mention the optionality/obligatoriness of the manual markers in adversative conjunctions in this section.

3.1.2.3.3 Optionality or obligatoriness of manual markers in disjunctive conjunctions

The grammar writer is advised to mention the optionality/obligatoriness of the manual markers in disjunctive conjunctions in this section.

3.1.3 Coordination by non-manual markers

Non-manuals marking coordinate constituents seem to be largely employed by many sign languages for which a description of the syntactic phenomenon is available. Some sign languages, like ASL, employ non-manual markers even in the presence of manual conjunctions; other sign languages, like HKSL, adopt non-manuals when lexical conjunctions are absent, namely in juxtaposition. A different set of non-manuals may be employed to mark the different types of coordination (conjoined, adversative, disjunctive coordination) and their spreading domain may vary accordingly.

For example, HKSL employs distinct non-manuals to mark the different types of coordination: head nods mark conjunctive coordination, head nods together with

body turns to the left and to the right are present in disjunction, while adversative conjunction may either require head turn or forward and backward body leans in addition to head nods (Tang & Lau 2012: 344). Note also that final and non-final conjuncts may be marked differently. It has been reported that in TİD, while the non-final conjunct may be marked by a head thrust, the final conjunct is marked by a backward body lean. Non-manual markers marking non-final conjuncts may be marking continuation while those marking the final conjunct may mark completion (Göksel & Kelepir 2016).

Among the different non-manual markers attested, head nods/thrusts and body turn seem to be cross-linguistic cues playing a crucial role in marking coordination in sign languages.

3.1.3.1 List of non-manual markers of coordination

In these subsections the grammar writer is advised to describe the non-manual markers found in different types of coordination in the sign language investigated.

3.1.3.1.1 Non-manual markers in conjunctive coordination

The grammar writer can describe the non-manual markers in conjunctive coordination in this section.

3.1.3.1.2 Non-manual markers in disjunctive coordination

The grammar writer can describe the non-manual markers in disjunctive coordination in this section.

3.1.3.1.3 Non-manual markers in adversative coordination

The grammar writer can describe the non-manual markers in adversative coordination in this section.

3.1.3.2 The spreading domain of non-manual markers of coordination

In these subsections, the grammar writer is advised to describe the spreading domains of the non-manual markers found in different types of coordination in the sign language investigated.

3.1.3.2.1 Spreading domain of non-manual markers in conjunctive coordination

The grammar writer can describe the spreading domains of the non-manual markers in conjunctive coordination in this section.

3.1.3.2.2 Spreading domain of non-manual markers in disjunctive coordination

The grammar writer can describe the spreading domains of the non-manual markers in disjunctive coordination in this section.

3.1.3.2.3 Spreading domain of non-manual markers in adversative coordination

The grammar writer can describe the spreading domains of the non-manual markers in adversative coordination in this section.

3.1.4 Properties of coordination

This section describes the properties of coordination that have been identified in the literature on spoken and sign languages. Describing these properties may help the grammar writer to tease apart complex constructions involving embedding from constructions made up of coordinated clauses, especially if the target sign language does not mark coordination with conjunctions obligatorily.

The grammar writer should be aware that not all sign languages will display these properties, but if they do, then these properties can be very useful to identify and describe coordination.

3.1.4.1 Extraction

A major property of coordinated clauses is related to extraction, that is, movement of a constituent to the left edge or to the right edge of the sentence. Typical cases of extraction are movement of wh-phrases and topics. Researchers have observed that for many languages extraction of a conjunct out of coordination is not possible. Nor is it possible to extract a constituent from within a conjunct.

In the English example in (a) below, we see that a conjunct, here *what*, cannot be moved to a different position in the sentence, that is, it cannot be extracted. Example (b) shows that a constituent contained in a conjunct, that is, *what*, contained in the verb phrase *drinking what*, cannot be moved to a different position either (*t* stands for 'trace' and marks the original position of the extracted constituent).

a. * What$_i$ did Michael eat and t_i?
b. * What$_i$ did Michael play golf and read t_i? (Tang & Lau 2012: 345)

The same violation can be observed in HKSL if an object is extracted from either the first or the second verb phrase conjunct during topicalization / topicalization [Syntax – Section 2.3.3.3] / topicalization [Pragmatics – Section 4.2] / topicalization [Pragmatics – Section 4.3.2]. Example (a) provides an example of coordination without extraction. Examples (b) and (c) are derived from (a) and involve movement of a constituent

through topicalization. In (b) COOKING has been moved from the first conjunct to the sentence-initial position, and in (c) DESIGN GAME has been moved from the second conjunct to the sentence-initial position. Example (d) provides another example of coordination without extraction. Examples (e) and (f) are derived from (d) and involve movement of a wh-phrase replacing a constituent in either the first or the second conjunct to the right edge of the sentence. In (e) WHAT, replacing the constituent SPEEDBOAT, is moved from the first conjunct. In (f) WHAT, replacing the constituent COW^CL:CUT-WITH-FORK-AND-KNIFE, is moved from the second conjunct.

a. FIRST GROUP RESPONSIBLE COOKING, SECOND GROUP RESPONSIBLE DESIGN GAME
'The first group is responsible for cooking and the second group is responsible for designing games.'

top
b. *COOKING$_i$, FIRST GROUP RESPONSIBLE t_i, SECOND GROUP RESPONSIBLE DESIGN GAME

top
c. *DESIGN GAME$_i$, FIRST GROUP RESPONSIBLE COOKING, SECOND GROUP RESPONSIBLE t_i
d. YESTERDAY DAD PLAY SPEEDBOAT EAT COW^CL:CUT-WITH-FORK-AND-KNIFE
'Daddy played speedboat and ate steak yesterday.'
e. *YESTERDAY DAD PLAY t_i, EAT COW^CL:CUT-WITH-FORK-AND-KNIFE WHAT$_i$
Lit. '*What did daddy play and eat steak?'
f. *YESTERDAY DAD PLAY SPEEDBOAT EAT WHAT$_i$
Lit. '*What did daddy play speedboat and eat?'

(HKSL, Tang & Lau 2012: 345)

However, no violation occurs if the structure is such that one constituent seems to be extracted from both conjuncts (Ross 1967; Williams 1978). In the example below, *who* is interpreted to be the object of the verbs in both conjuncts.

Laura wondered who$_i$ [Tom hated t_i] and [Sarah loved t_i]

Extraction is, however, impossible if the constituent extracted out of both conjuncts carries out a different syntactic role in each conjunct. The ungrammaticality of the following example is due to the fact that *a woman* is the subject in the first conjunct but the object in the second one.

*John has hired a woman who t_i likes mountain climbing and people admire t_i

The following examples are from HKSL. In (a), the topicalized object carries out the same grammatical role in each conjunct and can therefore be extracted from both. However, (b) is ungrammatical because the extracted argument [IX BOY] is the subject in the first conjunct and the object in the second conjunct.

top
a. ORANGE$_i$, MOTHER LIKE t$_i$, FATHER DISLIKE t$_i$
'Orange, mother likes (and) father dislikes.'
top
b. *IX BOY$_i$, t$_i$ EAT CHIPS, GIRL LIKE t$_i$
Lit. 'As for the boy, (he) eats chips (and) the girl likes (him).'
(HKSL, adapted from Tang & Lau 2012: 346)

The grammar writer should be aware of the fact that extraction of wh-items in sign languages may not always be possible even if the extracted wh-item bears the same grammatical role in each conjunct. The following HKSL example shows that, although the wh-item WHAT is the object of the verb in both conjuncts, it cannot be extracted from both of them.

c. *MOTHER LIKE t$_i$ FATHER DISLIKE t$_i$ WHAT$_i$
Lit. 'What does mother like and father dislike?'
(HKSL, adapted from Tang & Lau 2012: 346)

The discussion above has shown that if extraction of a conjunct or of a constituent out of a conjunct is possible, then the construction is likely *not* to be a coordinate structure. If, on the other hand, extraction is not possible, then the construction is likely to be a coordinate structure.

3.1.4.2 Gapping

In some spoken languages, the verb of a conjunct can be elided or "gapped" under conditions of identity with the verb in the other conjunct. The following is an example from English. The verb *eats* in the second conjunct is elided or gapped since it is identical to the verb in the second conjunct. The gapped constituent is marked with Ø.

[Sally eats an apple] and [Paul Ø a candy] (Tang & Lau 2012: 347)

It has been observed that word order may determine whether the gapped verb can be in the first or in the second conjunct (Ross 1970: 251). More specifically, in languages with SVO order, the elided verb is obligatory in the second conjunct (a), while in languages with SOV order gapping occurs strictly in the first conjunct (b).

a. [Sally eats an apple] and [Paul Ø a candy] (Tang & Lau 2012: 347)
b. [Sally-wa lingo-o Ø], [Paul-wa ame-o tabeda]
Sally-TOP apple-ACC Paul-TOP candy-ACC eat-PAST
Lit. 'Sally an apple and Paul ate a candy.' (Japanese, Tang & Lau 2012: 347)

Gapping within coordinate structures has been observed in ASL (Liddell 1980). In ASL, the non-manual marker 'head nod' obligatorily accompanies the object of the conjunct where the verb has been elided. ASL therefore marks gapping by means of a non-manual marker.

In HKSL, different verb types behave differently in allowing gapping of the verb in one conjunct of coordinated structures: plain verbs (a) allow gapping but agreeing (b) and classifier verbs / classifier verbs [Morphology – Section 5.1] / classifier verbs [Semantics – Section 7.1] (c) do not (in (a), 'bl' stands for 'body lean').

a. TOMORROW PICNIC, IX_1 BRING CHICKEN WING, PIPPEN SANDWICHES, KENNY COLA, CONNIE CHOCOLATE
   (bl forward + hn: CHICKEN WING, PIPPEN; bl forward+hn: SANDWICHES; bl forward+hn: COLA; bl forward+hn: CHOCOLATE)
   '(We) will have a picnic tomorrow. I will bring chicken wings, Pippen (brings) sandwiches, Kenny (brings) cola, (and) Connie (brings) chocolate.'

b. *$KENNY_{3a}$ $_{3a}SCOLD_{3b}$ $BRENDA_{3b}$, PIPPEN Ø CONNIE
   'Kenny scolds Brenda (and) Pippen Ø Connie.'

c. *IX_1 HEAD WALL Ø, BRENDA HEAD WINDOW
   CL:HEAD-BANG-AGAINST-FLAT-SURFACE
   'I banged my head against the wall and Brenda against the window.'

(HKSL, Tang & Lau 2012: 347–348)

The discussion above has shown that, in a complex sentence, gapping of the verb in one clause under conditions of identity with the verb of the other clause is possible only if the structure is a coordination of two clauses.

3.1.4.3 Scope

Another property associated with coordination is the scope of certain morphemes such as question morphemes [Syntax – Section 1.2.1.3] and negation [Syntax – Section 1.5]. If a single lexical sign is interpreted to affect the meaning of two constituents, then these constituents can be analyzed as conjuncts of a coordinate structure.

3.1.4.3.1 Scope of negation [Syntax – Section 1.5] / [Semantics – Section 12.2]

If a single negative marker is interpreted as negating two constituents, these constituents can be considered to be coordinated. The sign NOT-HAVE below negates both clauses (in square brackets) thus proving them to be conjuncts of a coordinated structure.

[TEACHER PLAY SPEEDBOAT] [EAT COW^CL:CUT-WITH-FORK-AND-KNIFE]
NOT-HAVE
'The teacher did not ride the speedboat and did not eat beef steak.'

(HKSL, adapted from Tang & Lau 2012: 348)

When negation is marked by a non-manual marker, the spreading domain of the non-manual marker may show the scope of negation, that is, the constituent it negates. In

the example below, only the first conjunct is negated (marked by a headshake glossed as 'neg'; 'hn' = headnod).

neg hn
$_{i}$INDEX TELEPHONE $_{j}$INDEX MAIL LETTER
'I didn't telephone but she sent a letter.' (ASL, Padden 1988: 90)

3.1.4.3.2 **Scope of yes/no questions** [Syntax – Section 1.2.1]

A question morpheme has scope over both conjuncts of a coordinated structure. In the example below, the clause-final morpheme RIGHT-WRONG has scope over both clauses, thus, showing them to be conjuncts of a coordinated structure (hn = head nod, bt = body turn, re = raised eyebrows).

hn+bt left hn+bt backward right
PIPPEN BRENDA THEY-BOTH GO HORSE-BETTING. BRENDA WIN, PIPPEN LOSE,
re
RIGHT-WRONG?
Lit. 'Pippen and Brenda both went horse-betting. Did Brenda win and Pippen lose?'
(HKSL, Tang & Lau 2012: 348)

The grammar writer can consider the properties illustrated in this section as a test to verify the possibility of coordination of clauses in the target sign language.

Elicitation materials

Although coordination of clauses or of smaller constituents may occur frequently in spontaneous production, an in-depth analysis of the phenomenon may require a substantial body of evidence for each type of constituent combined, for conjoined, disjunctive, and adversative coordination. If a general description of the phenomenon is already available, the grammar writer investigating coordination in the target sign language may ask for grammaticality judgments or ask signers to produce a target sentence. This procedure has the advantage of focusing on the fine-grained aspects of the phenomenon, but it may compromise the production of spontaneous non-manual marking which would emerge in naturalistic settings.

For these reasons, it may also be useful to use elicitation techniques leading to the production of coordinated clauses in semi-naturalistic settings. As is often the case with linguistic research on sign languages, a good way to elicit coordination is through the employment of visual material depicting a situation the signer is asked to describe. Another semi-naturalistic task the grammar writer may use is the presentation of a signed story. The signer may be asked to continue the story by imagining what could happen to the characters.

Adversative coordination may be elicited through a game presenting an unlucky character who tries to do things but never succeeds in doing them. After showing some of the character's unfortunate attempts to reach a positive result, the signer may be asked to imagine some other unsuccessful adventures the character may be involved in.

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3.2 Subordination: distinctive properties

3.2.0 Definitions and challenges

3.2.0.1 A definition of subordination

By subordination, we mean a syntactic mechanism by which clauses are combined. As opposed to coordination / coordination [Syntax – Section 3.1], where clauses share an equal status in the sentence, a core property of subordination is the asymmetric status of the two (or more) clauses being in a hierarchical relation.

The main clause, also called the *independent clause*, is syntactically and semantically autonomous, while the subordinate clause, also called *dependent*, is syntactically and semantically dependent on the main clause. In this section, we will use the term "main clause" to refer to the independent clause and the term "subordinate clause" to refer to the dependent clause.

In this section, the grammar writer will be guided into the observation of a number of properties that can be associated with subordination, and is advised to use them to introduce subordinate clauses and distinguish them from coordinate clauses. Languages, however, vary a lot with respect to the properties that can define subordinate clauses. The grammar writer is, therefore, advised to verify their validity in the target sign language. The grammar writer is then referred to various sections in the Syntax part, namely the sections on argument clauses [Syntax – Section 3.3], relative clauses [Syntax – Section 3.4], adverbial clauses [Syntax – Section 3.5], comparative clauses [Syntax – Section 3.6], and comparative correlatives [Syntax – Section 3.7], where specific subordinate constructions are discussed, and for a detailed and specific description of the manual and non-manual markers of subordination that may be employed in each construction.

3.2.0.2 Different types of subordination

Subordinate clauses can be classified roughly as follows: argument clauses [Syntax – Section 3.3] / argument clauses (i.e. clauses functioning as subject or object), relative clauses [Syntax – Section 3.4] / relative clauses, and adverbial clauses [Syntax – Section 3.5] / adverbial clauses. The example in (a) below illustrates an argument clause, (b) a relative clause, and (c) an adverbial clause.

a. [**That** the speech was boring] was evident to everybody.
b. I talked to the woman [**who** was asking for you].
c. I won't say anything else [**if** you don't stop yelling at me].

Among the subordinated clause types mentioned above, the relative clause is the only one that is embedded in a noun phrase rather than being directly embedded in a larger clause.

As shown in the examples above, spoken languages often mark subordinate clauses through subordinate markers (shown in bold) signaling their dependent status with respect to the main clause. However, this is not always the case. Sometimes, no subordinate marker is available and it may be difficult to establish whether we are dealing with a coordinate or a subordinate structure. The example below exemplifies an English complement clause not introduced by an overt subordinate marker.

I feared [my plane was late].

3.2.0.3 Methodological challenges in identifying a subordinate clause

For many sign languages for which a description of subordination is available, researchers have noted that there are no or few subordination markers, and non-manual markers are often the only syntactic devices that mark a clause as a subordinate clause and distinguish it from a coordinate clause.

For example, researchers have observed that in many sign languages conditional clauses [Syntax – Section 3.5.1] / conditional clauses and relative clauses [Syntax – Section 3.4] / relative clauses are commonly marked by non-manual markers only. The following example illustrates this with minimal pairs: (a) and (c) are instantiations of coordinate clauses (juxtaposition) while (b) and (d) minimally differ from them in the use of non-manuals (cond = conditional marker; r = relative clause marker), marking the clause over which they spread as subordinate.

a. ANNA SICK HOME STAY
'Anna is sick and she stays home.' (LIS)

5_3.2.0.3_1_LIS_anna sick home stay

cond
b. ANNA SICK HOME STAY
'If Anna is sick, she will stay home.' (LIS)

c. RECENTLY DOG CHASE CAT COME HOME
'The dog recently chased the cat and came home.' (ASL, Liddell 1978: 71)

5_3.2.0.3_2_ASL_recently dog chase cat come home

r
d. RECENTLY DOG CHASE CAT COME HOME
'The dog that recently chased the cat came home.' (ASL, Liddell 1978: 66)

Similarly, in many sign languages, object clauses [Syntax – Section 3.3.2] are not marked, unless associated with special non-manual markers expressing topic or *similia*. The following provides an example from LIS in which the non-manual raised eyebrows ('re') spreads over the object clause, making it as topicalized.

5_3.2.0.3_3_LIS_piero bike fall gianni tell

re
PIERO BIKE FALL GIANNI TELL
'Gianni said that Piero fell from the bike.' (LIS, Geraci et al. 2008: 49)

3.2.0.4 Methodological challenges in identifying the (non-)finiteness of a clause

An issue related to subordination is finiteness, that is, to determine whether the subordinated clause is finite or non-finite. Note that determining the (non-)finiteness of the clause under investigation may also help determine whether a clause is subordinated

or not. If one finds evidence that the clause displays properties of a non-finite clause, then one can conclude that it has to be subordinated. Of course, this is different for finite clauses: they may or may not be subordinated.

Here we describe the notion "finiteness" and discuss the methodological challenges in identifying clauses as finite or non-finite in spoken and sign languages. Although the distinction between finite and non-finite clauses dates back to traditional grammars and is amply used, it is not univocally defined.

Morphologically, (non-)finiteness is seen as a property of forms in a verbal paradigm. For example, non-finite forms, which in English comprise participles (*eaten/eating*), gerunds (*eating*), and infinitives (*to eat*), are identified as poorer and more defective than finite forms like indicative and subjunctive, which can be specified for features like tense [Morphology – Section 3.2] / tense [Semantics – Chapter 1], aspect [Morphology – Section 3.3] / aspect [Semantics – Chapter 2], and person and number agreement [Morphology – Section 3.1]. However, this morphological criterion can be difficult to apply to languages for which a fully satisfactory morphological description is not available, as is the case with many sign languages.

Another difficulty is that the morphological divide between finite and non-finite forms is not clear, since there are well-known cases of intermediate forms, such as infinitives inflected for person (e.g. Portuguese) or for tense (e.g. Latin). As agreement in sign languages is realized spatially and, given the importance of space in sign language, one can hypothesize that agreement involving space might be realized also in non-finite forms. A final complication is that even in indisputable cases of finite clauses, tense specification in many sign languages is not expressed by tense morphology on the verb. For all these reasons, trying to identify non-finite clauses in sign languages based on a purely morphological criterion is not particularly promising.

Another possible test to set apart finite and non-finite clauses is that finite forms can occur with a fully specified lexical subject (e.g. 'John resigned'), while non-finite clauses *typically* cannot occur with a visible subject (e.g. 'John decided (*he) to resign').

However, even this test is not without problems. The first obvious observation is that many sign languages allow null subjects, namely all clauses, including finite clauses, can occur with a phonologically null pronominal expression [Syntax – Section 2.4.1.1]. Hence, the absence of a lexical subject [Syntax – Section 2.2.1] is no indication that the clause is non-finite. Secondly, there are constructions in which a lexical subject can occur in non-finite clauses. The intermediate cases mentioned above are one example, in which a lexical subject can occur with infinitives inflected only for person or only for tense. Another example are perception verbs, which in English and many Romance languages can select a non-finite clause with a lexical subject (e.g. 'I saw her running away'). Similarly, in English the infinitival complement of verbs like *want* and *expect* may have a lexical subject (e.g. 'I want/expect her to come'). For all these reasons, the presence/absence of a lexical subject is not a reliable criterion to set finite and non-finite clauses apart, at least if it is taken in isolation.

A final method to set apart finite and non-finite clauses is less dependent on the morpho-syntactic peculiarities of the given language and, as such, it should be more

easily applicable cross-linguistically. The criterion is that only a finite verb can appear as the main verb of a full, independent clause. In contrast, non-finite verbs cannot head an independent clause and may occur only in subordinate clauses. This happens because a matrix clause locates the event described by the verb as being overlapping, past or future with respect to utterance time, and only finite forms are anchored to the time of utterance by virtue of being fully tensed. A non-finite verb is connected to the utterance time only indirectly by virtue of being dependent on a finite verb. For example, in sentences like 'John decided to leave' and 'John will decide to leave' (at least in the absence of time adverbials in the embedded clause) the event of leaving is located in the past or in the future, not on its own ground but contingent on the form of the *matrix* verb.

Although useful, even this test is not without problems. A caveat is that finite forms can, *but need not*, head a main clause. Of course, finite verbs can occur in subordinate clauses ('John decided that he will leave'), so the occurrence of a verb in an embedded clause is no guarantee that the verb is non-finite.

For all these reasons, the existing research on non-finite clauses in sign languages is very limited and, in fact, it cannot be excluded that sign languages (or at least some sign languages) do not overtly mark the distinction between finite and non-finite forms. Still, sign languages display modal verbs [Syntax – Section 2.3.1.3] / modal verbs [Morphology – Section 3.4] / modal verbs [Semantics – Chapter 4], which cross-linguistically may introduce non-finite clauses. Furthermore, for at least two sign languages (ASL and LIS), it has been explicitly claimed that the distinction between finite and non-finite clauses is real, so the existence of non-finite clauses is a research question that the grammar writer may want to consider.

There are two main types of verbs that are likely to introduce non-finite clauses and the grammar writer may start his/her analysis from them: control predicates and raising predicates. Some modal verbs may be listed among the former type.

Control predicates

Predicates like *want* are called *subject* control predicates because the controller, namely the category that determines the reference of the implicit subject of the embedded verb, is the matrix subject (e.g. 'Mary wants to leave'), while other predicates, like *ask* are called *object* control predicates because the controller is the indirect object, as in 'Mary asked John to leave'.

Although some semantic classes of verbs tend to be control predicates cross-linguistically (verbs of order, intention and desire, for example), the set of control predicates must be determined empirically language after language because of lexical idiosyncrasies. The following is a very partial list of control predicates in English, which, due to their semantics, might (but need not) be control predicates in other languages.

Subject control predicates: *want, try, manage, start, hope, fail, plan, wait, desire, choose, decide*.
Object control predicates: *allow, ask, command, convince, demand, persuade, order, permit, make, help, tell*.

Modal verbs like the counterparts of English *want*, *can* and *must*, at least in some languages and in some uses, may be analyzed as verbs introducing a non-finite clause. The English sentence 'Mary wants to swim' is an example. It is called a control structure because the phonologically null subject of the infinitival clause depends on (i.e. "is controlled by") an argument of the main verb (the subject in this case).

Modal verbs do not always introduce a non-finite clause, though. For example, *can* in the English sentence 'Mary can swim' is normally analyzed as a special type of auxiliary, so it would be a mono-clausal sentence.

The grammar writer should be aware of these two general types of possible analyses for modal verbs.

Raising predicates

A second class of verbs that cross-linguistically may take a non-finite clause are verbs like *seem*, *be likely*, *appear*, etc. These predicates have different properties from control predicates. A key difference is semantic in nature because raising verbs are one-place predicates, in contrast to control verbs, which are two-place predicates. This is shown by the fact that (a) is roughly synonymous with (b), a sentence in which the main subject is the expletive pronoun *it*, a sort of place-holder that does not contribute any meaning to the sentence. On the other hand, (d) is sharply ungrammatical, because the meaningless expletive pronoun does not qualify as the external argument of *want*.

a. John seems to be the winner.
b. It seems that John is the winner.
c. John wants to be the winner.
d. *It wants that John is the winner.

Other properties follow from this. For example, the subject of control predicates is typically sentient or volitional, but no such restriction holds for the subject of raising predicates. This property is illustrated by the contrast between (b) and (d) in the examples given below.

a. The dean decided to reduce the money for our department.
b. *The crisis decided to reduce the money for our department.
c. The dean seems to go against our plans.
d. The crisis seems to go against our plans.

Another consequence of the fact that the raising predicate is mono-argumental is that it can take an infinitival clause with a meteorological verb, while a control predicate cannot. This is shown by the contrast below.

a. It seems to be raining right now.
b. *It is trying to rain.

Since the differences between raising and control predicates are semantically based, it is possible that they show up in sign languages as well.

A potential confounding factor is that there may be verbs that alternate between a control and a raising construction. These cases are rare but are attested, one example being *begin* in English.

a. It began to rain.
b. John began to eat a sandwich.

Begin is a raising verb in (a), as witnessed by the fact that it introduces an infinitival clause with a meteorological verb, but it is a control verb in (b) since the matrix subject is volitional.

The work on non-finite clauses in sign languages is extremely limited, and there is no standard way to elicit them. So, it is hard to give well-informed methodological advice to the grammar writer. However, a possible starting point is the following: the grammar writer may initially focus on verbs that, given their semantics, are known to be prototypical examples of control predicates (say, *order* or *decide*). The next step is looking for any property that systematically differentiates the complement clauses of these verbs from clauses that, given their internal structure, are clear cases of finite clauses. If the complement clause of the verb that is a good candidate for being a control verb is systematically different from "good" cases of finite clauses, that clause is a candidate for being a non-finite structure. In fact, the two works that have reported the existence of non-finite clauses in sign languages seem to have used this strategy.

Aarons' (1994) study on ASL syntax is the first work. She argues that a topic phrase [Pragmatics – Section 4.2] / topic phrase [Pragmatics – Section 4.3.2] / topic phrase [Syntax – Section 2.3.3.3] can be extracted out of an embedded clause only if this clause is non-finite. After showing that ASL has a dedicated position for topic phrases in the left periphery of the clause, she shows that a phrase that is the argument of an embedded non-finite verb can access the topic position in the main clause, while the same is impossible if the embedded verb is finite. This is illustrated in the following sentences. Example (a), according to Aarons, is a sentence with an embedded non-finite clause. Example (b) shows a permutation of the same sentence where the embedded subject moved to the topic position of the main clause. Example (c) shows the sentence where the embedded object moved to the same position.

a. TEACHER REQUIRE JOHN LIPREAD MOTHER
   'The teacher requires John to lipread mother.' (ASL, Aarons 1994: 84)
   top
b. JOHN, TEACHER REQUIRE LIPREAD MOTHER
   'John, the teacher requires to lipread mother.' (ASL, Aarons 1994: 84)
   top
c. MOTHER, TEACHER REQUIRE JOHN LIPREAD
   'Mother, the teacher requires John to lipread.' (ASL, Aarons 1994: 84)

According to Aarons, (d) differs minimally from (a) because the verb REQUIRE in (d) selects a finite clause. This is indicated by the fact that the embedded clause contains

an auxiliary-like verb (MUST). Since the clause is finite, no topic phrase can be extracted out of it, as shown by the ungrammaticality of (e) and (f).

d. TEACHER REQUIRE JOHN MUST LIPREAD MOTHER
'The teacher requires that John must lipread mother.' (ASL, Aarons 1994: 84)

top
e. *JOHN, TEACHER REQUIRE MUST LIPREAD MOTHER (ASL, Aarons 1994: 84)

top
f. *MOTHER, TEACHER REQUIRE JOHN MUST LIPREAD (ASL, Aarons 1994: 84)

Confirmation of the claim that arguments may not be extracted from finite embedded clauses comes from sentences with verbs that require tensed complements. According to Aarons, the verb SAY in ASL is such a verb. As a consequence, extraction of a topic from the complement clause of SAY is also ungrammatical.

Geraci et al. (2008) is the second work arguing for the presence of non-finite clauses in a sign language. They claim that in LIS, finite and non-finite clauses may be disentangled by using two tests. The first one is distributional. Although SOV is the unmarked word order in LIS, it is never possible for a finite clause to intervene between the matrix subject and the matrix verb, as confirmed by the ungrammaticality of the example given below. That the embedded clause below is finite is at least consistent with the fact that it has an overt subject (although the presence of an overt subject is not a fully reliable test).

*GIANNI PIERO CONTRACT SIGN KNOW
'Gianni knows that Piero signed the contract.' (LIS, Geraci et al 2008: 49)

However, when the matrix verb is a subject control predicate, as in (a) below, or an object control predicate, as in (b), the complement clause *can* appear in the SOV order, namely between the matrix subject and the matrix verb:

a. GIANNI CONTRACT SIGN FORGET
'Gianni forgot to sign the contract.' (LIS, Geraci et al. 2008: 52)

b. COOK MARIA MEAT EAT FORCE
'The cook forced Maria to eat meat.' (LIS, Geraci et al. 2008: 52)

The hypothesis that the embedded clause in these examples is non-finite is supported by the observation that the subject cannot be overt (MARIA in (b) is analyzed as being in the same clause as *force*, as in 'John forced Mary out of the kitchen').

The second difference between finite and non-finite clauses identified by Geraci et al. for LIS parallels what Aarons observed for ASL, namely that non-finite clauses are transparent for extraction, while finite clauses are not. Geraci et al. did not look at topic phrases but considered wh-phrases [Syntax – Section 1.2.3] instead: a *wh*-phrase can be moved out of a non-finite clause in control structures like the examples just given (a and b above), and it can reach the dedicated position for *wh*-phrases in the matrix clause. However, a *wh*-phrase can never be moved out of a non-finite clause.

The grammar writer may want to start his/her investigation by checking whether the complement clauses of likely cases of control verbs show the properties that set them apart from finite clauses in both LIS and ASL, namely the extractability of arguments. On the other hand, the positional test applied to LIS is only applicable to sign languages that display SOV as basic word order.

Other tests are conceivable in principle. First, if a given sign language overtly expresses tense [Morphology – Section 3.2] / tense [Semantics – Chapter 1] and aspect [Morphology – Section 3.3] / aspect [Semantics – Chapter 2], it would be interesting to check if the complements of control verbs are any different in this respect.

Second, the grammar writer might also want to check if the complement clause whose finite/non-finite status is being investigated can include a time adverbial [Syntax – Section 6.4.2.1] referring to a time different from the time of the matrix event.

Third, investigation of complements of perception verbs could also help the grammar writer to identify properties of non-finiteness, at least if perception verbs in the sign language under investigation pattern as in languages where they can introduce non-finite structures.

Finally, it is always important to study prosodic cues for clause boundaries [Phonology – Section 2.2] and to investigate whether they are different for finite and non-finite clauses.

Overall, this is an area that is still rather unexplored, so much work is needed. In particular, differences between raising and control predicates have not been studied yet, but might well be detectable by future work.

3.2.1 Subject pronoun copy as a subordination property

In some sign languages, though not all, it is possible to have a pronoun at the end of the sentence that refers to the main clause subject. In a language with unmarked SVO order, this results in sandwiching the object clause between constituents of the main clause and the pronoun referring to the main subject. This phenomenon is called Subject Pronoun Copy (SPC) [Syntax – Section 2.6]. The availability of Subject Pronoun Copy differentiates between subordination and coordination and can be used as such by the grammar writer to introduce subordination.

In the following complex ASL sentence, the sentence-final pronoun IX_1 is co-referential / co-referential [Pragmatics – Chapter 1] / co-referential [Pragmatics – Chapter 2] with the subject of the main clause, IX_1, and there is no pause in the signing production.

IX_1 DECIDE IX_i SHOULD $_i\text{DRIVE}_j$ SEE CHILDREN IX_1
'I decided he ought to drive over to see his children, I did.'

(ASL, adapted from Padden 1988: 88)

However, in constructions with coordination, the subject pronoun copy can only be co-referential with the subject of the second conjunct but not with the subject of the first conjunct, as shown by the ungrammaticality of the following example.

*$_1$HIT$_3$ IX$_3$ TELL MOTHER IX$_1$
'I hit him and he told his mother, I did.' (ASL, Padden 1988: 86)

Thus, Subject Pronoun Copy can be used as a diagnostic for subordination in a language that allows it. If the complex construction allows for the presence of a pronoun in clause-final position referring to the main clause subject, one can conclude that the clause sandwiched between the main verb and the final subject pronoun is subordinated, and it is not an instance of coordination.

This diagnostic is not applicable to all sign languages, however. In NGT, for instance, a subject pronoun copy co-referential with the subject of the main clause is not allowed after the subordinate clause. Rather, it must appear after the main verb, as shown in the example below (where the Subject Pronoun Copy is marked by boldface):

INGE$_3$ IX$_3$ KNOW **IX$_3$** IX$_1$ ITALY $_1$GO.TO$_{neu.space}$
'Inge knows that I am going to Italy.' (NGT, adapted from Van Gijn 2004: 94)

The grammar writer is advised to verify whether Subject Pronoun Copy is possible in the sign language investigated before using it to introduce a distinction between coordinate and subordinate structures.

3.2.2 Position of question signs

In some sign languages, the position of a question sign in an embedded clause may be restricted to a single position, in contrast to a variety of positions available for a question sign in a simple question. In ASL, for instance, question signs in simple questions may occupy three different positions: they may be clause-initial, clause-final or in situ, as in (a) below. However, in indirect questions, wh-signs invariably occupy the initial position within the subordinate clause, regardless of their syntactic role, as the contrast between (b) and (c) shows.

a. MEG BUY WHAT
'What did Meg buy?' (ASL, Caponigro & Davidson 2011: 343)
b. *TIM KNOW MEG BUY WHAT
c. TIM KNOW WHAT MEG BUY
'Tim knows what Meg bought.' (ASL, Caponigro & Davidson 2011: 349)

Thus, when introducing subordinate clauses, and more precisely indirect questions, the grammar writer could investigate the possible positions of question signs, and contrast these with possible positions of question signs in simple questions.

3.2.3 Spreading of non-manual markers

Another property that seems to go with subordination and can thus be used as such to describe subordination is the spreading behavior of the non-manual markers. The two conjuncts of a coordinate structure [Syntax – Section 3.1] may display different non-manual markers and there may be a pause between the two conjuncts.

In contrast with coordinate clauses, in complex sentences a non-manual marker that originates in the main clause may spread over the subordinate clause with no pause at the potential clausal boundary, hence, marking the embedded status of the subordinate clause with respect to the matrix clause. In (a) below, the non-manual for negation ('neg') associated with the main clause spreads over the embedded complement clause, and similarly in (b), the yes/no question non-manual marker ('y/n') spreads over the entire sentence including the embedded clause.

5_3.2.3_1_ASL_1index want jindex go-away

a. neg
IX$_i$ WANT IX$_j$ GO-AWAY
'I didn't want him to leave.' (ASL, adapted from Padden 1988: 89)

5_3.2.3_2_ASL_remember dog chase cat

b. y/n
REMEMBER DOG CHASE CAT
'Do you remember that the dog chased the cat?' (ASL, Liddell 1980: 124)

Thus, spreading of non-manual markers over both clauses may be taken as a property of a subordination relation.

However, two words of caution are in order. First, different non-manual markers associated with a single syntactic or semantic function may have different spreading domains. For instance, there may be more than one non-manual marker for negation in a given language, and each non-manual marker may have different functions and different spreading domains. One may spread over only one sign, for instance, the manual sign for negation, or over a small constituent such as a verb phrase, while the other may spread over the entire negative sentence. One would need to take the latter type into consideration in determining the subordination relation between two clauses. Second, the type of the main verb may affect the spreading domain of the non-manual marker for negation in complex clauses.

3.2.4 Interpretation of embedded negation in the matrix clause

Researchers have observed that some verbs such as *want* and *think*, when they take clausal objects, can be negated even though what is really negated is the embedded

predicate. For instance, in the English examples below, (a) actually expresses (b) since the speaker has a wish and that is 'not going to school'. Even though the verb *want* seems to be negated by the auxiliary *don't* in (a), this sentence does not express that the subject 'does not want X', that is, negation does not negate 'wanting'. Similarly, the speaker uttering sentence (c) does not intend to express that the subject 'she' does not think. Rather, what 'she thinks' is that 'you are not angry'.

a. I don't want to go to school.
b. I want not to go to school.
c. She doesn't think you're angry.

Thus, the possibility of having a negative marker associated with verbs such as *want* and *think* when they function as main verbs may point to a subordination relation since the negative markers in such constructions actually negate the embedded verb, not the main verb.

Elicitation materials

The grammar writer is referred to the different types of subordinate constructions in the relevant sections for suggestions on specific elicitation techniques.

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3.3 Argument clauses

3.3.0 Definitions and challenges

3.3.0.1 What is an argument clause?

The obligatory constituents of a sentence are determined by the semantic properties of the predicates (verbs, adjectives). Clauses can be arguments of a predicate. Take a verb like *know* that takes two arguments; these can be either realized by two NPs [Syntax – Chapter 4], or by an NP and a clause.

a. John knows the truth.
b. John knows that he will leave.

The verb *surprise* also takes two arguments. They can either both be realized by NPs, as in (a) below, or they can be realized by a clause and an NP, as in (b).

a. His decision surprised everybody.
b. That he decided to leave surprised everybody.

The same holds for adjectives [Syntax – Chapter 5], such as *aware*, which can take both a PP and a clausal argument.

a. I am aware of the problem.
b. I am aware that he will leave soon.

This means that the semantic properties of predicates do not always specify a unique syntactic category which can serve as their arguments. Reconsider the examples above, repeated here.

a. John knows that he will leave.
b. That he decided to leave surprised everyone.

In both cases, there is a clause in an argument position. But in (a) the clause is an object; while in (b) the clause is a subject: it is a subject clause.

3.3.0.2 How to recognize an argument clause

Arguments of predicates can be usually identified by a number of criteria: typically, in many languages, the subject [Syntax – Section 2.2.1] can be identified by the position it occupies in the clause, and the same holds for the object [Syntax – Section 2.2.1]; there are also agreement phenomena between the arguments and the verb that identify them in many cases and in many languages. And finally, there is a meaning relation connecting the arguments to the predicate: technically, arguments receive a thematic role (theta-role) from the predicate.

When it comes to identifying argument clauses one should be very cautious, since relying only on position criteria would not work. Even in languages that normally exhibit a fixed constituent order with NPs, clauses are frequently dislocated; they are produced in a position that does not correspond to the prototypical position for, say, subjects or objects. Even agreement phenomena cannot be the only criterion for identifying argument clauses because a) not all predicates exhibit morphological agreement; and b) clauses do not carry all the formal features associated with NPs: they do not correspond (necessarily) to a locus in space, they have no number feature, and are only associated to a default third person singular. Finally, the semantic criterion as well is not always enough to identify argument clauses. This is particularly true with subject clauses, which might receive no theta role from the predicate and simply stand in a syntactic relation with it, especially when the predicate is a raising [Syntax – Section 3.2.0.4] verb, such as *seem* or *appear*. The safest way of identifying an argument clause is by using what we call the *gap procedure*: if in a given utterance, a predicate that needs an argument appears to lack it in the prototypical position and there is on the other hand a clause that is subordinate but has no obvious adverbial function, then the gap and the clause are to be related, and the clause is an argument clause. An example is given below.

SURPRISE IX_1 [IX_3 DRINK TEA]
'It surprises me that she drinks tea.' (ASL, Kastner & Davidson 2013)

In this example, there is a gap in subject position (the first person pronoun is the object) and there is a subordinate clause in the utterance: we thus assume that the clause corresponds to the gap and that it is a subject clause.

3.3.0.3 Methodological challenges

As is always the case when subordination is involved, it is difficult to rely only on naturalistic or corpus data to gather the relevant data for the description of the phenomenon: subordination is quite generally avoided or kept to the minimum in face-to-face conversations, and it is unlikely that a simple corpus will contain sufficient and reliable information. Argument clauses are only a subset of all the subordinate clauses a grammar can display, so they will be even less attested. This does not mean that argument clauses are not part, actually a core part, of the grammatical competence of a given language's users. It means, however, that the grammar writer will need to rely on sources other than spontaneous production to investigate

this aspect. Perhaps the most careful and fruitful strategy is that of starting from naturalistic data (e.g. a corpus if available or even a simple recorded interchange between some signers), displaying the relevant construction, namely one argument clause, and then searching for elicited judgments from informants by trying to slightly modify the source data in the aspects that are believed to be relevant for a complete description (e.g. its position within the clause, its non-manual markers, the realization and interpretation of the subject and so on and so forth), and discuss the result with trained informants.

3.3.1 Subject clauses

A subject clause (or subjective) is a subordinate argument clause carrying the syntactic function of a subject [Syntax – Section 2.2.1]. Subject clauses can be either (i) simple clauses, with no special interpretation, or they can be (ii) free relative clauses [Syntax – Section 3.4], or (iii) interrogative clauses [Syntax – Section 1.2.3]. All three types are illustrated below. In the following, however, we will only treat the normal case (a), referring to the relevant sections for the two special types.

a. [That John will come] should be clear to you.
b. [EXAM DONE WHO] EXIT CAN
'Whoever has finished the exam can go out.' (LIS, Branchini 2007: 104)
c. [Whether I am coming or not] is uncertain.

3.3.1.1 Position(s) within the matrix clause

In many spoken languages, subject clauses are often "extraposed", that is, they are uttered in a peripheral position, either at the beginning or at the end of the sentence. This is illustrated below for English: while the *that*-clause carries the function of the subject of the clause, it cannot easily be realized in the canonical preverbal position for subjects (example (a) is thus awkward): it has to be expressed postpredicatively, in what we thus call an "extraposed" position.

a. ?That John will leave is unlikely.
b. It is unlikely that John will leave.

This "extraposition" is obligatory in embedded contexts, at least in many spoken languages, as illustrated below: here the subordinate clause takes a clausal subject, which needs to be obligatorily extraposed, as in (b).

a. *I think that that John left early disappointed them.
b. I think that it disappointed them that John left early.

There is a strong cross-linguistic tendency for clausal subjects to appear in clause-final position.

Languages differ on whether the extraposed clause is duplicated by a resumptive pronoun. This is obligatory in English, where the subject position has to be filled by a dummy pronoun (the pronoun *it* in the above examples), and in this case, this is clearly related to the fact that even in very simple clauses ("it rains") the subject position must be filled in English.

The grammar writer should thus pay attention to a) the position of the subject clause within the sentence, and b) whether its basic position close to the verb is resumed by some form of indexation or localization in space, as has been reported for example for ASL, as illustrated below.

[IX$_3$ DRINK TEA]$_c$ IX$_c$/THAT$_c$ SURPRISE IX$_1$
'That she drinks tea surprises me.' (ASL, Kastner & Davidson 2013)

3.3.1.2 Special non-manual markers

In most sign languages, subordination in general is marked only through special NMM. The grammar writer should pay particular attention to this aspect in subject clauses, and verify whether the non-manual marker of the clause changes according to its position. It is indeed possible that the extraposition phenomena that subject clauses frequently undergo are associated to topicalization [Syntax – Section 2.3.3.3] / topicalization [Pragmatics – Section 4.2] / topicalization [Pragmatics – Section 4.3.2] / topicalization or focalization [Syntax – Section 2.3.3.4] / focalization [Pragmatics – Section 4.1] / focalization [Pragmatics – Section 4.3.1] / focalization procedures, which are typically associated with specific prosodic markings, and thus specific non-manual markers. Subject clauses sitting in unmarked subject position, if they are allowed, should also be investigated with respect to their non-manual marker.

3.3.1.3 Tense and aspectual marking

Subject clauses can correspond to at least three types of structures:

1. They can be small clauses, containing only a subject and a nominal or adjectival predicate:

[John president] sounds good to me.

2. They can be non-finite clauses: typically non finite clauses have a null anaphoric subject and lack tense marking:

[To be lazy] is not an option.

3. They can be complete clauses, with a verb, possibly agreeing, with tense and aspectual marking, and its argument(s):

[IX$_3$ DRINK TEA]$_c$ IX$_c$/THAT$_c$ SURPRISE IX$_1$
'That she drinks tea surprises me.' (ASL, Kastner & Davidson 2013)

Many languages display phenomena of tense dependency [Semantics- Section 2] (*sequence of tenses*) between the subject clause and the main clause. This dimension should be considered carefully, and described in details.

3.3.1.4 Anaphoric relations

The arguments of the subject clause can be either autonomous or anaphoric to those of the root clause. Typically, these anaphoric relations are asymmetric. Just to illustrate, in English it is OK for a pronominal in the subject clause to be anaphoric to a referential expression in the root clause (a), while the reverse, a pronominal in the root clause anaphoric to a referential expression in the subject clause, is impossible (b).

a. That he_i was fired didn't surprise $John_i$.
   That he_i left too early was obvious to $John_i$.
b. *That $John_i$ was fired didn't surprise him_i.
   *That $John_i$ left too early was obvious to him_i.

The grammar writer should describe any asymmetry in these anaphoric relations.

3.3.1.5 Null arguments

(Some) subject clauses can display a null subject, even if the language does not display null subjects in main clauses. English, for example, disallows any omission of the subject in main clauses, but can display null subjects in subject clauses (when non-finite), as illustrated below.

To be lazy is not an option.

The null subject of subject clauses typically displays anaphoric or anti-anaphoric relations to an argument of the main clause; this may vary according to the language or to the specific type of subject clause even within the same language. This can be illustrated in Italian, which displays the two types of relation: in non-finite clauses, obligatory anaphoricity is observed: the subject of the subject clause is *controlled* by an argument of the main clause:

A	Giovanni	è	stato	ordinate	[ø	di	partire].
To	Giovann	has	been	ordered		to	leave

'It has been ordered to John to leave.' (Italian)

The opposite phenomenon, called obviation, is observed when the subject clause is in subjunctive mode: the subject of the subject clause must be disjunct from the argument of the main clause.

Mi	addolora	che	[ø	parta].	(ø ≠ me)
to.me	makes.sad	that		leaves	

'It makes me sad that he/she leave.' (Italian)

In the example above, the null subject of the subject clause can be interpreted with any referent *but* with that corresponding to the argument of the main clause.

These phenomena of obligatory or banned anaphoricity relations should be considered with great caution.

3.3.2 Object clauses

An object clause (or completive, or complement clause) is a subordinate argument clause carrying the syntactic function of an object. Object clauses can be (a) simple clauses, with no special interpretation, or (b) free relative clauses [Syntax – Section 3.4], or (c) interrogative clauses [Syntax – Section 1.2.3]. All three types are illustrated below. In the following, however, we will only treat the normal case (a), referring to the relevant sections for the two special types.

a. PIERO CONTRACT SIGN GIANNI KNOW
'Piero knows that John signed the lease.' (LIS, Geraci et al. 2008: 49)

b. EXAM DONE WHO PAOLO MEET
'Paolo met whoever took the exam.' (LIS, Branchini 2007: 109)

c. EXAM DONE WHO PAOLO ASK
'Paolo asked me who took the exam.' (LIS, Branchini 2007: 109)

3.3.2.1 Verbs taking object clauses

Verbal predicates that take an object clause are traditionally classified into a number of groups characterized in semantic terms. The various groups are reported to behave consistently as far as the syntax of the object clause they select is concerned. The description of object clauses in the given sign language should take into account this classification, a version of which is given below:

- Desiderative predicates: *want, prefer, yearn, arrange, hope, be afraid, refuse, agree, plan, aspire, decide, mean, intend, wish, need, long, expect, resolve, strive, demand, choose, offer, be eager, be ready, …*
- Directive/manipulative predicates: *cause, force, make, persuade, tell, threaten, let, cajole, command, order, request, ask, press, charge, command, induce, compel, signal, forbid, prevent (from), enable, …*
- Implicative predicates/achievement predicates: *manage, chance, dare, remember to, happen to, get to, try, forget to, fail, avoid, refrain, decline, neglect, …*
- Factive/commentative predicates: *regret, hate, be sorry, be glad, like, dislike, loath, be surprised, be shocked, …*
- Experiencer-object verbs: *thrill, amuse, cheer, satisfy, sadden, …*
- Phasal predicates/aspectual verbs: *begin, start, continue, keep on, finish, stop, cease, …*

- Modal predicates: *can, be able, ought, should, may, be obliged, must, …*
- Perception predicates: *see, hear, watch, feel, sense, smell, …*
- Attitude predicates: *claim, believe, think, suppose, assume, doubt, deny, …*
- Utterance predicates: *tell, say, report, promise, ask, …*

3.3.2.2 Position(s) within the matrix clause

There is cross-linguistic evidence that clause-internal object clauses are dispreferred, although not always disallowed. In particular, in SOV languages, object clauses rarely occur in the canonical object position (that is, sentence internally, following the subject and preceding the verb). While there are some SOV languages in which clausal objects obligatorily follow the verb, some SOV languages (like Japanese) do allow clause-internal sentential objects.

LIS, which is also SOV, is reported to strongly disallow or maybe completely ban object clauses in canonical position, at least as far as finite clauses are concerned. As shown below, the object clause appears either to the left (a) or to the right (b), but not in the canonical clause-internal position of the object (c).

a. PIERO CONTRACT SIGN GIANNI KNOW
b. GIANNI KNOW PIERO CONTRACT SIGN
'Gianni knows Piero signed the contract.'
c. * GIANNI PIERO CONTRACT SIGN KNOW (LIS, Geraci et al. 2008: 49)

Whether the object clause can be realized in the canonical object position in special cases, or whether it is always obligatorily realized at the left or right periphery is still an object of investigation.

The "extraposed" clause is reduplicated in some languages by a pronominal in the canonical position. This has been also reported for LIS, and for ASL, but in both cases, this resumption is neither obligatory nor is it related to factivity.

3.3.2.3 Factivity

Predicates differ on whether they are factive or not, that is, whether they presuppose the truth of the proposition they have as their argument or not. While factivity is a semantic notion, it is known to correlate with specific syntactic properties of the argument clause. Typically, in English, factive clauses can be paraphrased with *the fact that*. While English has no special way of introducing or marking factive clauses, other languages (e.g. Greek, Persian, Spanish) mark factive clauses with a determiner-like element, as illustrated below for Spanish.

Estoy	contento	**del**	que	me	hayas	invitado.
I.am	happy	of.the	that	me	you.have	invited

'I am happy that you have invited me.' (Spanish)

In ASL, the same function has been claimed to be performed by spatial localization, with an index resuming the factive clause, as shown in the example below.

IX$_3$ REMEMBER IX$_c$/THAT$_c$ [BUILDING$_b$ COLLAPSE]$_c$
'He remembers that the building collapsed.' (ASL, Kastner & Davidson 2013)

In LIS, the factive clause can be marked by the same determiner-like element that we find in relative clauses [Syntax – Section 3.4] (glossed PE).

[PIERO CONTRACT SIGN DONE] PE GIANNI FORGET
'Gianni forgot that Piero signed the contract.'
(LIS, Cecchetto & Donati 2016: 193)

3.3.2.4 Special non-manual markers

In most sign languages, subordination in general is marked only through special non-manual markers. The grammar writer should pay particular attention to this aspect in object clauses, and verify whether the non-manual markers of the clause changes according to its position. It is indeed possible that the extraposition phenomena object clauses frequently undergo are associated with topicalization [Syntax – Section 2.3.3.3] / topicalization [Pragmatics – Section 4.2] / topicalization [Pragmatics – Section 4.3.2] / topicalization or focalization [Syntax – Section 2.3.3.4] / topicalization [Pragmatics – Section 4.1] / topicalization [Pragmatics – Section 4.3.1] / focalization procedures, which are typically associated with specific prosodic markings, and thus specific non-manual markers. Object clauses in non-marked object position, if they are allowed, should also be investigated with respect to their non-manual markers.

3.3.2.5 Tense and aspectual marking

Object clauses can correspond to at least three types of structures:

1. they can be small clauses, containing only a subject and a nominal or adjectival predicate;
2. they can be non-finite clauses: typically non-finite clauses have a null anaphoric subject and lack tense marking;
3. they can be complete finite clauses, with a verb, possibly agreeing, with tense and aspectual marking, and its argument(s).

Many languages display phenomena of tense dependency (sequence of tenses) between the object clause and the main clause. This dimension should be observed carefully.

3.3.2.6 Anaphoric relations with the main clause arguments

There is typically an asymmetry in the possibilities of anaphoric relations between the object clause and the main clause; while arguments of the object clause can be pronominal anaphoric to arguments of the main clause, the opposite is allegedly never possible. The pattern of anaphoric relations between the arguments of the root clause and those of the object clause should be investigated.

Particular attention should be given to so-called indexical reference shifts / indexical reference shifts [Pragmatics – Chapter 6] / indexical reference shifts [Syntax – Section 3.3.3], that is, to whether the language to be described allows the shift of the reference of indexicals like *I* or *here* in (some) object clauses. That this is the case in a number of sign languages has been largely shown. An example is given below for LSC.

topic				RS-i		
IX_{3a}	$MADRID_{m}$	MOMENT	$JOAN_{3a}$	THINK	IX_{1}	STUDY FINISH $HERE_{b}$

'When he was in Madrid, Joan thought he would finish his study here (in Barcelona).' (LSC, adapted from Quer 2005: 154)

In the example above, the first person pronoun IX_{1} is interpreted as referring to Joan and not to the signer. This shift in reference of the pronoun is indicated by non-manual signals co-articulated with the manual signs. For example, while uttering the sentence that contains the pronoun, the signer may shift the body slightly toward the locus where the name coreferential with the pronoun was previously signed (this is indicated by the non-manual-marking RS-i). See the section on role shift [Syntax – Section 3.3.3] for more on these particular phenomena.

3.3.2.7 Occurrences of null arguments

Object clauses can contain null arguments, which typically display either free, or, anaphoric or anti-anaphoric relations to the argument of the main clause; this may vary according to the language or to the specific type of object clause even within the same language. This can be illustrated in Italian for null subjects, since Italian displays the three types of relation: in indicative clauses, the null subject can be freely interpreted as anaphoric or not to the subject of the root clause:

Gianni	ha	saputo	che	ø	parte	domani.	ø = Gianni, x
Gianni	has	known	that	ø	leaves	tomorrow	ø = Gianni, x

'Gianni has heard that he will leave tomorrow.' (Italian)

In infinitival clauses, obligatory anaphoricity is observed: the subject of the object clause is *controlled* by an argument of the main clause, as shown below.

Dubito	[ø	di	partire]	ø = me
doubt.1SG		to	leave	

'I doubt of leaving.' (Italian)

The opposite phenomenon, called *obviation*, is observed when the object clause is in the subjunctive mode.

Dubito	che	[ø	parta]	ø ≠ me
doubt.1SG	that		leave	

'I doubt that she/he leave.' (Italian)

These phenomena of obligatory or banned anaphoricity relations should be observed with great caution.

3.3.3 Role shift

In spoken languages like English, a distinction can be drawn between direct speech and indirect speech, exemplified by the following sentence pair:

John said "I'll never ask her for a favor again."
John said that he would never ask her for a favor again.

Indirect speech is typically expressed through an object clause, while direct speech is expressed by an independent clause. Things are more complicated in sign languages.

Role shift / role shift [Pragmatics – Chapter 6] is a sign language phenomenon that may be used in contexts where direct speech is used but has a much more general distribution (Lillo-Martin 2012). Role shift is characterized by two general properties: (i) semantically, the expressions that are signed under role shift are somehow interpreted 'from another person's perspective', or 'with respect to another context' than the context of the actual speech act; (ii) morphosyntactically, role shift is overtly marked by some modification, which may involve (a) body shift, (b) change in the direction of eye gaze, and/or (c) altered facial expressions in order to mark that the signer is adopting somebody else's perspective. Scholars usually distinguish between role shift as used to report someone else's speech or thought (attitude role shift), and role shift used to describe physical actions performed by someone else (action role shift).

Sentence (b) below illustrates the phenomenon of attitude role-shift. It is a possible continuation of sentence (a). In (b) two noteworthy phenomena signal that the signer is adopting the swimmer's perspective. First, the signer shifts his body right before the beginning of the embedded clause towards locus *3* (associated with the arrogant French swimmer); this is notated as 'RS_3' (for 'role-shift to *3*'s perspective'), followed by a line over all the expressions during whose articulation the signer's body remains shifted. Second, a first person pronoun IX_1 is used in the embedded subject position; however, it does not refer to the actual speaker, but rather to the agent of the reported speech act (namely the arrogant French swimmer). Example (c) is another possible continuation of (a). Although the meaning is similar, in (c) no role shift takes place, so the pronoun in the embedded clause is third person and no body shift is observed. In (c) the speech act / speech act [Pragmatics – Chapter 3] is reported by using the signer's perspective.

a. SEE [THAT ARROGANT FRENCH SWIMMER]$_3$ IX_3? YESTERDAY IX_3 ANGRY.
'See that arrogant French swimmer? Yesterday he was angry.'
(ASL, Schlenker 2016a: 15)

RS$_3$
b IX$_3$ SAY IX$_1$ WILL LEAVE
'He said: "I will leave."' (ASL, Schlenker 2016a: 15)
c. IX$_3$ SAY IX$_3$ WILL LEAVE
'He said that he would leave.' (ASL, Schlenker 2016a: 15)

The phenomenon of action role shift is illustrated by sentence (d), which is another possible continuation of (a).

RS$_3$
d. IX$_3$ $_1$WALK-WITH-ENERGY(CL-ONE) (ASL, Schlenker 2016a: 15)
e. IX$_3$ WALK-WITH-ENERGY(CL-ONE)
'He walked away with energy.' (ASL, Schlenker 2016a: 15)

The sentence in (d) contrasts with the standard third person description in (e). While both clauses start with the third person pronoun IX$_3$, in (d) the signer's body leans towards the swimmer's location and the directional verb WALK is marked for first person, that is, its articulation starts from the signer's body. On the other hand, in (e) there is no body lean and the verb is marked for third person, that it, its articulation starts from the swimmer's location.

Crucially, the action described in (d) involves no speech or thought act whatsoever, therefore this instance of role shift could not possibly be analyzed as reporting someone else's utterance or mental attitude. The *action* performed by someone else is reported by assuming his or her perspective.

3.3.3.1 Markers of role shift

The grammar writer should investigate which non-manual markers signal role shift. Body shift toward the locus of the person whose perspective is adopted is of course expected, but this does not need to involve shifting of the entire body. Head shift or eye gaze might suffice and, in principle, there might be different markings for attitude role shift and action role shift.

When doing this, the grammar writer should be aware that the signer may adopt facial expressions of the person whose perspective is adopted and these may be grammatical facial expressions (say, brow raise if the person whose perspective is adopted asks a yes/no question) or affective ones (say, when a person is reported as being puzzled, happy or angry).

Especially when reporting a dialogue or an event involving two or more characters, the signer might role shift into (assume the perspective of) multiple characters. This may happen sequentially, as when the signer shifts back and forth between two loci in the signing space linked to two characters, or simultaneously, when, in action role shift, the dominant and the non-dominant hands represent two characters involved in some action.

3.3.3.2 Integration of the role-shifted clause into the main clause

An issue that the grammar writer should keep in mind is whether (or to what extent) the clause in which role shift takes place is integrated into the main clause. Stated differently, the issue to be investigated is whether role shift involves a genuine case of subordination [Syntax – Section 3.2] of an object clause or not. Since many sign languages do not have the counterpart of complementizers like *that* which overtly signal subordination, the issue might not be easy to decide and might require the use of specific tests.

One test involves long-distance dependencies, in which a certain phrase occupies a position different from the one in which it is interpreted. For example, a wh-phrase [Syntax – Section 1.2.3] / wh-phrase can be linked to a position inside an embedded clause in an indirect speech report (a), while the same is impossible in case of a direct speech report (b):

a. What did John say he understands _ ?
b. *What did John say "I understand _ "?

This suggests that in English, a "direct speech clause" is not fully integrated into the matrix clause. In some sign languages, it might be impossible to apply this test because wh-phrases are not found in the left (or right) periphery of the clause to begin with. For these sign languages, it might be easier to exploit long-distance dependencies involving (contrastive) focus [Syntax – Section 2.3.3.4] / (contrastive) focus [Pragmatics – Section 4.1] / (contrastive) focus [Pragmatics – Section 4.3.1] / (contrastive) focus, where a difference in acceptability between indirect (a) and direct (b) speech is also observed.

a. BOOKS, John said that he never buys_ (not magazines)
b. *BOOKS, John said "I never buy _ " (not magazines)

Another way to investigate the integration issue involves cases of long-distance topicalization [Syntax – Section 2.3.3.3] / topicalization [Pragmatics – Section 4.2] / topicalization [Pragmatics – Section 4.3.2] / topicalization. Once again, direct speech (b) blocks a long-distance dependency, suggesting a loose integration within the main clause.

a. Mary, John said that he met _
b. *Mary, John said "I met _ "

This is an area where variation between direct speech and role shift (and among sign languages) might be expected. For example, for some signers, the following ASL sentences with and without role shift have the same acceptability status, suggesting that grammatical dependencies can be created between the role-shifted clause and the matrix clause, unlike what happens in English direct speech:

Context: The speaker is in New York City; the listener was recently in Los Angeles with John.

BEFORE IX_3 JOHN IN LA,

a. No role shift

   WHO IX_3 SAY IX_3 WILL LIVE WITH THERE WHO

b. Role-shift

RS

WHO IX_3 SAY IX_1 WILL LIVE WITH HERE WHO

'When John was in LA, who did he say he would live with there?'

(ASL, Schlenker 2016a: 37)

A different way to identify the level of integration is to investigate whether indexicals in the role-shift clause can be evaluated with respect to the context of the actual speech act. This may happen in LSC, as shown by the sentence below, where one indexical under role shift, namely the embedded first person pronoun IX_1, is interpreted with respect to the shifted context (and thus denotes Joan); while the other indexical, namely HERE, refers to the location of the actual speech act – and hence to Barcelona.

Uttered in Barcelona:

topic RS-i

IX_3 $MADRID_m$ MOMENT $JOAN_i$ THINK IX_1 STUDY FINISH $HERE_b$

'When he was in Madrid, Joan thought he would finish his study here (in Barcelona).' (LSC, Quer 2005: 154)

The fact that HERE in the role-shifted clause can be evaluated with respect to the context of the speech act indicates that the role-shift clause is more syntactically integrated than cases of direct speech, as shown by the following English sentence, which cannot mean that Joan said that he would finish his studies in Barcelona even if the sentence is uttered in Barcelona. So, *here* in the direct speech report cannot be interpreted with respect to the context of the utterance of the matrix clause.

Uttered in Barcelona:
When he was in Madrid, Joan said "I will finish my study here."

It is possible that not all indexicals pattern alike in this respect. In DGS, for example, personal indexicals such as IX_1 and IX_2 are always interpreted relative to the context of the reported utterance. By contrast, the indexicals HERE and TODAY are generally interpreted relative to the actual context of utterance. On the other hand, TOMORROW and YESTERDAY are generally ambiguous and can be interpreted relative to both contexts. Hübl (2014) relates this complex pattern to the iconic deictic properties of these indexical signs, but this is an area in which cross-linguistic variation might be found.

3.3.3.3 Syntactic contexts introducing attitude role shift

The grammar writer should investigate which verbs can introduce an attitude role-shift context. Although it is expected that these verbs belong to the class of verbs used to report a speech act or a mental attitude (i.e. verbs like *say*, *think*, *hope*, *fear*,

etc.), fine-grained lexical distinctions may emerge. In English, for example, a verb like 'deny' does not allow direct speech:

John denied that he would leave.
*John denied "I will leave."

Another question that the grammar writer may look at is whether attitude role shift is allowed when the subject of the verb reporting a speech act is a *wh*-phrase. In English in this syntactic context, both direct and indirect speech are allowed.

Who$_i$ said that he$_i$ would leave?
Who said "I will leave"?

The grammar writer may investigate whether role shift is possible when the subject of the verb reporting the speech act does not denote a definite individual whose point of view can be adopted. The same issue arises if the subject of the verb reporting a speech act is a quantifier / quantifier [Semantics – Chapter 10] / quantifier [Lexicon – Section 3.10.2] / quantifier [Syntax – Section 4.4]:

Nobody$_i$ said that he$_i$ would leave. / Everybody$_i$ said that he$_i$ would leave. /
Someone$_i$ said that he$_i$ would leave.
Nobody said "I will leave." / Everybody said "I will leave." /
Someone said "I will leave."

Here, as well, the fact that the subject of the main clause is not a referential expression might impact on role shift.

3.3.3.4 Special signs introducing action role shift

While identification of verbs introducing attitude role shift is easier because these are (a subset of) verbs that report a mental attitude or an act of saying, the identification of specific signs introducing action role shift is less direct. However, there might be specific expressions akin to *was like* in sentences like 'John was like…' followed by a specific posture or by the gesture of John fainting. Given that action role shift is much more ubiquitous than corresponding cases in spoken languages, specialized signs might exist.

3.3.3.5 Syntactic differences between action role shift and attitude role shift

One issue to be investigated is whether there are syntactic differences between action role shift and attitude role shift. In ASL, for example, a first person pronoun usually does not occur under action role shift, though full first person pronouns are acceptable under attitude role shift. Non-manual markings might also be different in the two kinds of role shift. For example, in attitude role shift, actual body movement towards the locus of the person whose perspective is adopted might be mandatory, even more

so if a dialogue between two characters is reported, while in action role shift, a change in facial expressions and/or the interruption of eye contact with the actual addressee might suffice.

Differences might also concern the level of integration of the role-shifted clause within the matrix clause. Although the issue of syntactic integration of role-shifted expressions has been investigated only for attitude role shift, in principle the same issue arises for action role shift. This might be investigated by applying the tests involving long-distance dependencies to action role shift clauses. However, this should be checked language after language, and new tests might be necessary, since this is an area where current research is quite limited.

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3.4 Relative clauses

3.4.0 Definitions and challenges

3.4.0.1 A definition of relative clauses

A relative clause is a clause that modifies a noun, and thus, it has an adjectival function. The noun that is modified is called "the head" of the noun phrase (or "head noun"). Depending on the language, any constituent can be relativized, that is, can be the head. In the following example, the object of the verb of the relative clause, *admire*, is relativized. The blank line in the example indicates where the head, *artist*, is interpreted. The noun phrase containing the relative clause can have any grammatical function. In this example, it is the subject of the main clause. (For reasons of simplification, in the examples provided in this chapter, the relative clause is in italics and, where marked, the head is in bold. Where present, the underscore illustrates the gap where the head is interpreted but not pronounced.)

[The **artist** *that Laura admires* __] makes beautiful pottery.

Languages form relative clauses in a variety of ways. If the sign language that is studied does not mark a relative clause with a special manual sign, identifying relative clauses may be a challenging task. In sign languages for which a description of relative clauses is available it has been observed that non-manual markers are often the only linguistic means distinguishing relative clause constructions from coordinate clauses / coordinate clauses [Syntax – Section 3.1].

3.4.0.2 Properties of relativization

In the following sections we illustrate some properties of relativization that may help in identifying the presence of a relative clause in the language under investigation.

3.4.0.2.1 Non-manual markers

As already mentioned, non-manuals are often the only device by which a relative construction is distinguished from a coordination of two clauses. The following examples

illustrate a minimal pair, namely two clauses differing only in the presence of relative clause non-manual markers responsible for the different syntactic nature of the two sentences: a juxtaposition of two clauses in (a) and a relative construction in (b) (rel = relative clause non-manual marker(s)).

5_3.4.0.2.1_1_ASL_recently dog chase cat AND come home

a. RECENTLY DOG CHASE CAT COME HOME
'The dog recently chased the cat and came home.' (ASL, Liddell 1978:71)

5_3.4.0.2.1_2_ASL_recently dog chase cat come home

rel
b. RECENTLY DOG CHASE CAT COME HOME
'The dog that recently chased the cat came home.' (ASL, Liddell 1978:66)

3.4.0.2.2 Impossibility of production in isolation

While in a coordinate construction / coordinate construction [Syntax – Section 3.1], as in (a); both conjuncts can be uttered in isolation, as shown in (b) and (c); in a relative construction, as the one in (d); the noun phrase containing the relative clause cannot be uttered in isolation, as shown in (e); as opposed to the main clause that can appear in isolation, as in (f). All examples are from LIS.

a. CHILD_{3a} TOY BREAK MOTHER_{3b} $_{3b}\text{SCOLD}_{3a}$
'The child breaks the toy and (his) mother scolds (him).' (LIS)
b. CHILD TOY BREAK
'The child breaks the toy.'
c. MOTHER_{3b} $_{3b}\text{SCOLD}_{3a}$
'The mother scolds him.'
rel
d. CHILD_{3a} TOY BREAK PE MOTHER_{3b} $_{3b}\text{SCOLD}_{3a}$
'The mother scolds the child that broke the toy.'
rel
e. *CHILD TOY BREAK PE
f. MOTHER_{3a} $_{3a}\text{SCOLD}_{3b}$
'The mother scolds (him).'

3.4.0.2.3 Position of temporal adverbials

While temporal adverbials [Syntax – Section 6.4.2.1] introducing a coordinate structure modify the predicate of both conjuncts (a), temporal adverbials preceding the head of an internally headed relative clause only modify the relative clause predicate but not the main clause (b).

a. YESTERDAY DOG CAT CHASE HOME COME
'Yesterday the dog chased the cat and came home.' (LIS)

rel
b. YESTERDAY IX_3 **FEMALE** CYCLE IX_1 LETTER $SEND_3$
'I sent a letter to that lady who cycled yesterday.'
(HKSL, Tang & Lau 2012: 360)

In externally headed relative clauses [Syntax – Section 3.4.0.3], however, as illustrated in the DGS example below, the time adverbial preceding the head, being external to the relative clause, can refer and modify the main clause but not the relative clause (in square brackets). The grammar writer may therefore also use this diagnostic to verify the presence of externally or internally headed relative clauses in the target sign language.

5_3.4.0.2.1_3_DGS_yesterday man (ix3) rpro-h3 cat stroke arrive

rel
YESTERDAY **MAN** IX_3 [RPRO-H_3 CAT STROKE] ARRIVE
'The man who is stroking the cat arrived yesterday.'
(DGS, adapted from Pfau & Steinbach 2005: 513)

3.4.0.3 Syntactic types of relative clauses: diagnostics

The position of the head noun in noun phrases containing a relative clause differs across languages. In this respect, four types of relative clauses have to be distinguished: (i) externally headed, (ii), internally headed, (iii) correlative clauses and (iv) free relatives.

In externally headed relative clauses, the head noun appears outside the relative clause, but is interpreted as one of its constituents. The example below illustrates this type.

The **artist** *that Laura admires* __ makes beautiful pottery.

The head noun *artist* is external to the relative clause. We can assume that the relative clause contains a gap (represented by the blank line) where the head noun *artist* is interpreted.

In internally headed relative clauses, the head noun is in the position in which it is interpreted, that is, inside the relative clause. The sentence below exemplifies this type of relative clause. Clearly, the head noun *keeki-o* is internal to the relative clause (in italics).

Yoko-wa	*Taro-ga*	*sara-no*	*ue-ni*	***keeki-o***	*oita-no-o*	tabeta
Yoko-TOP	Taro-NOM	plate-GEN	on-LOC	cake-ACC	put-NM-ACC	ate

'Yoko ate a piece of cake which Taro put on a plate.'
(Japanese, adapted from Shimoyama 1999: 147)

In correlative clauses, the relativized noun has two copies: one in the position where it is interpreted inside the relative clause, and one in the main clause. The

following example illustrates this type. There are two copies of the noun *laRkii* 'girl'.

jo	***laRkii***	*khaRii*	*hai*	vo	**laRkii**	lambii	hai
REL	girl	standing	is	DEM	girl	tall	is

Lit. 'Which girl standing is that girl tall is'
'The girl who is standing is tall.' (Hindi, Dayal 1991: 647)

Finally, in free relatives, there is no overt head noun that is modified, as illustrated below.

I liked __ *what he cooked* __

While the examples provided here all belong to spoken languages, sign languages are known to display the same typological variation in the syntax of relative clauses. The grammar writer should be also aware that some sign languages are reported to display more types.

Below we list some useful diagnostistic tests that can be used to identify the syntactic type of the relative clause under investigation.

(i) Signs marking the clause boundary

One way to verify whether a sign (in our case the head or the relativization sign) belongs to a clause is by establishing the clause boundary. Every sign language has specific signs that invariably mark the sentence-initial position. In LIS, for example, such signs are time adverbials. By eliciting a relative clause with a time adverbial modifying the relative predicate and marking the relative clause left periphery, we can verify whether the head is internal or external to it. If it is external, the head precedes the time adverbial, if it is internal, the head follows it. As illustrated in the LIS example below, the head (MAN) follows the time adverbial (TODAY) modifying the relative clause predicate (BRING), thus showing that the head is internal to the relative clause.

rel
TODAY MAN PIE BRING PE YESTERDAY (IX_3) DANCE
'The man who today brought the pie danced yesterday.'
(LIS, Branchini 2007: 150)

The example also shows that the relativization sign PE belongs to the sentence-initial relative clause since it precedes the time adverbial (YESTERDAY) that modifies the matrix predicate (DANCE), thus, marking the main clause sentence-initial boundary.

(ii) Non-manual markers

Since non-manuals mark the relative clause, their spreading domain helps the grammar writer in identifying the structure of the material inside the relative clause. If the non-manual markers spread over the head, this suggests that the head is internal to the relative clause; on the other hand, if the head is not marked by the relative clause non-manual marker, the head is external to the relative clause. In example (a),

the non-manual markers only spread over the relative pronoun RPRO-NH$_3$ but not over the head, BOOK, suggesting that we are dealing with an externally headed relative clause. In contrast, in (b), the non-manual markers spread over the head of the relative clause, TEACHER, suggesting that it is an internally headed relative clause.

5_3.4.0.3_1_DGS_book rpro-nh poss father read.mp4

rel

a. BOOK [RPRO-NH$_3$ POSS$_1$ FATHER READ]
'the book which my father is reading' (DGS, Pfau & Steinbach 2005: 512)

5_3.4.0.3_2_LSC_[teacher my son help+++] ix1 plant give

rel

b. [TEACHER MY SON HELP+++] IX$_1$ PLANT GIVE
'I gave a plant to the teacher who has helped my son a lot.'
(LSC, Mosella 2012: 198)

Research on non-manual markers has shown that eye blinking and pauses in the signing stream mark syntactic boundaries between two clauses. Analysis of these non-manual markers can therefore be also useful in establishing the relative clause and the main clause boundaries.

(iii) Repetition of the head in both clauses
A test to verify the presence of correlatives is the possibility for the head to be produced in both clauses. In the following ASL example, the head BOOK is produced in both the relative clause and the main clause, and for this property it is claimed to be a correlative clause ('wr' indicates 'nose wrinkle' and PT is a demonstrative pronoun).

br wr
[PT GIRL BORROW **BOOK**] [THAT **BOOK** GONE]
'The book the girl borrowed is missing.' (ASL, Galloway 2012)

It is, however, important to keep in mind that correlative clauses generally allow three possibilities: the head is produced only in the relative clause, only in the main clause, or in both clauses.

(iv) Lack of a head
If no head is produced in either clause but the relevant non-manual markers are produced over one of the two clauses, it is likely that the relative clause is a free relative clause. Similar to spoken languages, free relative clauses in sign languages may display the presence of a wh-element, as shown in the LIS example below.

5_3.4.0.3_3_LIS_exam done who exit can

rel
EXAM DONE WHO EXIT CAN
'Who has taken the exam can go out.' (LIS, Branchini 2007: 207)

(v) Presence of ordinals

Ordinals / Ordinals [Lexicon – Section 3.10.1.2] only modify externally and internally headed relative clauses, not correlatives. They can therefore be used as diagnostics to verify the presence of correlatives. In the LIS example below, the ordinal FIRST modifies the head WOMAN but also the whole NP containing the relative clause [WOMAN $_1$KISS PE] thus showing that it cannot be a correlative clause.

rel

FIRST WOMAN$_{3a}$ $_1$KISS PE$_{3a}$ NOW BANK WORK

'The first woman I kissed now works in a bank.' (LIS, Branchini 2007: 154)

3.4.0.4 Semantic types of relative clauses (restrictive versus non-restrictive): diagnostics

Relative clauses are also classified as restrictive and non-restrictive. Restrictive relative clauses limit the set of possible entities the noun specified by the clause can refer to, whereas non-restrictive clauses simply provide further information about the modified noun. Example (a) below has a restrictive clause (marked by the absence of commas in English) since it identifies one student among many, and expresses that only the one that read the manual carried out the experiment. Example (b), on the other hand, exemplifies a non-restrictive clause (marked by commas in English) since the relative clause does not uniquely identify the student as the one who read the manual. It just provides further information about the student.

a. The **student** *who read the manual* carried out the experiment. (restrictive)
b. The **student**, *who read the manual*, carried out the experiment. (non-restrictive)

Examples (c) and (d) below provide further examples:

c. My **cousin** *who lives in Spain* is visiting me now. (restrictive)
d. My **cousin**, *who lives in Spain*, speaks Spanish fluently. (non-restrictive)

Example (c) implies that the speaker has more than one cousin, and the relative clause 'who lives in Spain' uniquely identifies the cousin that the speaker is talking about. The person uttering (d), on the other hand, may have only one cousin. Thus, the relative clause does not identify a cousin among a number, but simply provides further information about him.

A set of diagnostics is commonly associated with restrictivity and can be used to verify the interpretation of relative clauses. Each property is first illustrated with an English example and with an example from LIS (see Branchini 2007; Branchini & Donati 2009). Note that in some of the following sign language examples, the non-manual markers are not provided.

(i) Possibility of a pronominal head

While the head of a non-restrictive relative clause can be a pronoun (a), the head of a restrictive relative clause cannot (b) and (c).

a. We, who are women, think that you, who are men, should go now.
b. *We who are women think that you who are men should go now.
c. *YESTERDAY IX_2 FELL-OFF BIKE PE TODAY NEW GLASSES BUY WANT
*'You that yesterday fell off the bike today want to buy new glasses.' (LIS)

(ii) Possibility of a proper noun head
While the head of a non-restrictive relative clause can be a proper noun / proper noun [Lexicon – Section 3.1.2] (a), the head of a restrictive relative clause cannot (b) and (c).

a. John, whom you saw yesterday, is a good friend.
b. *John whom you saw yesterday is a good friend.
c. *MARIA CAKE COOK LIKE PE PREPARE DONE
*'Maria who likes to cook cakes has prepared a pie.' (LIS)

(iii) Possibility of a quantified head
While a quantified head can be the head of a restrictive relative clause (a), it is incompatible with a non-restrictive relative clause (b) (Ross 1967).

a. Every student who attended my course will be rewarded.
b. *Every student, who attended my course, will be rewarded.

No example from a sign language is available to illustrate this at the moment.

(iv) Possibility of an ordinal head
An ordinal preceding the head of a restrictive relative clause modifies the head and the whole relative clause (a), while an ordinal preceding the head of a non-restrictive relative clause only modifies the head of the relative clause (b).

a. The first woman that I kissed works in a bank.
b. The first woman, that I kissed, works in a bank.
rel
c. FIRST WOMAN KISS PE NOW BANK WORK
'The first woman I kissed now works in a bank.' (LIS)

In the LIS example above in (c), the ordinal FIRST modifies the entire relative clause, that is, FIRST does not refer to the first woman standing in a row or to the first woman who ever existed, but to *the woman I kissed*, as the translation makes clear. Thus, the relative clause here is interpreted as restrictive.

(v) Scope of matrix negation
A negative element [Syntax – Section 1.5] / negative element [Semantics – Section 12.2] modifying the matrix predicate modifies both the head and the restrictive relative clause (a), but it only modifies the head of a non-restrictive relative clause (b), not the non-restrictive relative clause (Demirdache 1991).

a. I haven't met a girl who doesn't like to wear make-up.
b. *I haven't met a girl, who doesn't like to wear make-up.

rel
c. ONE WOMAN MAKE-UP NOT PE IX$_1$ MEET NEVER
'I never met a woman who doesn't wear make-up.' (LIS)

In the LIS example above in (c), the matrix negation (NEVER) modifies the head and its relative clause 'a woman who doesn't wear make-up'. Thus, the relative clause here is interpreted as restrictive.

(vi) Intensional verbs
While intensional verbs take the entire restrictive relative clauses into their scope, they take scope only over the head in non-restrictive relatives (Zhang 2001).

a. #Gianni thinks that Mary likes men, who own big cars.
b. Gianni thinks that Mary likes men who own big cars.

rel
c. GIANNI THINK MEN CAR CL-BIG-CAR PE MARIA LIKE
'Gianni thinks that Maria likes men who own big cars.' (LIS)

In the LIS example in (c), the intensional verb *think* takes scope over the whole relative clause *men who own big cars*. Thus, the relative clause is interpreted as restrictive.

(vii) Interpretation of ellipsis
In ellipsis / ellipsis [Syntax – Section 2.0.6] / ellipsis [Syntax – Section 2.5] constructions a constituent of a sentence is not pronounced but it is interpreted as identical to a constituent in another part of the sentence. In (a) below, for instance, the second clause does not have a lexical verb and an object, but 'my brother does not' is interpreted as 'my brother does not like the cake'.

The possible interpretations of elided predicates correlate with restrictive and non-restrictive interpretations of the relative clauses in the sentence. While the antecedent of the elliptical constituent must include a restrictive relative clause (b), it may not include a non-restrictive relative clause (a).

a. My sister likes the cake, which by the way I bake well, and my brother does not (= like the cake)
b. My sister likes the cake I bake, and my brother does not (= like the cake I bake)

5_3.4.0.4_1_LIS_cake ix-1 cook pe sister poss-1 like brother not

rel
c. CAKE IX$_1$ COOK PE SISTER POSS$_1$ LIKE BROTHER NOT
'My sister likes the cake that I bake, my brother does not.' (LIS)

In the English example in (a), the ellided constituent is interpreted as 'like the cake' while in (b) and in the LIS example (c), it is interpreted as 'like the cake that I bake', thus, including the restrictive clause.

(viii) Modification by sentence adverbs
While sentence adverbs [Syntax – Section 6.4.1] / sentence adverbs [Lexicon – Section 3.5.2] of modification, such as *by the way* in the examples below, can appear inside non-restrictive relative clauses, they cannot appear inside restrictive relative clauses (Ogle 1974).

a. The boys, who by the way have lost the case, should give up.
b. *The boys who by the way have lost the case should give up.
c. *WOMAN MAN BY-THE-WAY KISS PE PASTA MAKE
*'The woman that by the way kissed the man can make pasta.' (LIS)

The ungrammaticality of the LIS example in (c) shows that the relative clause here is interpreted as restrictive.

(ix) Category restrictions of the head
While the head modified by a non-restrictive relative clause can belong to any syntactic category (an adjective, a preposition, etc.), the head modified by a restrictive relative clause can only be a noun (Sells 1985).

a. My sister is intelligent, which my brother never is.
b. *My sister is intelligent which my brother never is.
c. *SISTER POSS_1 INTELLIGENT PE BROTHER POSS_1 NEVER
*'My sister is intelligent which my brother never is.' (LIS)

The ungrammaticality of the LIS example in (c) shows that the relative clause here is interpreted as restrictive.

The following table summarizes for each property the behavior displayed by restrictive and non-restrictive relatives in English.

Property	Restrictive	Non-restrictive
1. Pronominal head	No	Yes
2. Proper name head	No	Yes
3. Quantified head	Yes	No
4. Ordinal head	Yes	No
5. Matrix negation	Yes	No
6. Intentional verbs	Yes	No
7. Ellipsis	Yes	No
8. Sentential adverbs	No	Yes
9. Any category	No	Yes

Analyses of relative clauses in the sign languages studied so far have shown that the semantic differences between restrictive and non-restrictive relative clauses can result in syntactic differences. While restrictive relative clauses may be marked by relativization signs and specific non-manual markers, non-restrictive relative clauses may lack the presence of relativization signs and of non-manuals marking relative clauses.

Non-restrictive relative clauses rather look like conjoined clauses or parentheticals, whose boundary is sometimes marked by an eye blink, a non-manual marker often used to mark clause boundaries.

3.4.1 Type of relative clause

The first thing to do while describing relativization in a given language is identifying the type of strategy that is used in the language under investigation. The grammar writer is advised to used the diagnostics listed above [Syntax-Section 3.4.0.3], and to keep in mind that some (sign) languages are reported to display more than one type.

3.4.2 Presence or absence of a relativization sign

Spoken languages differ in the way they mark relative clauses. They may employ: (a) a complementizer, (b) a relative (or personal) pronoun, (c) a determiner, (d) a participial form, or (e) nothing. The elements that mark the relative clause are underlined in the following examples, while the modified noun is in bold.

a. The **book** *that I read* is interesting.
b. The **woman** *who lives next door* is a singer.
c. *Peemɛ* ***thep*** *khii-pa* *the* nee yin.
   Peem.ERG book.ABS carry-PART the.ABS I.GEN.be
   'The book that Peem carried is mine.' (Tibetan, Keenan 1985:161)
d. *Kitap* *oku-yan* **çocuk** soru sorar
   book read-SUBJ.REL.PART child question asks
   'The child who is reading /reads /read books asks questions.' (Turkish)
e. *The writer I met* is selling his house.

Sign languages show the same variation. There are sign languages that do not employ any relativization sign marking the relative clause, as illustrated by the following LSB example.

GIRL *FALL BICYCLE* STAY HOSPITAL
'The girl that fell off the bicycle is in the hospital.'
(LSB, reported in Pfau & Steinbach 2005: 511)

In analyzing relative clauses in the target sign language, the grammar writer should verify the presence of manual signs of relativization marking the relative clause and/or its head, their specificity for human/non-human referents and for singular/plural heads, their position(s), and their optionality/obligatoriness in the construction.

3.4.2.1 List of relativization signs

In the sign languages that employ relativization signs, these signs come in different forms. Sign languages displaying internally headed relative clauses [Syntax – Section 3.4.0.3], for example ASL, may employ a determiner-like sign spatially agreeing with the relative clause head (in the example below, the determiner-like sign is glossed as THAT).

5_3.4.2.1_1_ASL_recently dog that chase cat come home

rel
RECENTLY ***DOG*** *THAT CHASE CAT* COME HOME
'The dog which recently chased the cat came home.' (ASL, Liddell 1978: 66)

Other markers may be specified for humanness or number.

3.4.2.1.1 Human/non-human specificity of the relativization sign

DGS exhibits externally headed relative clauses [Syntax- Section 3.4.0.3] and uses a manual sign equivalent to a relative pronoun marking the relative clause as subordinate. DGS has two different relative pronouns: one for human referents (RPRO-H: an upright ☝-hand resembling a person classifier) and one for non-human referents (RPRO-NH: a pointing sign) – in the examples below, both are accompanied by a non-manual marker ('re' = raised eyebrows).

5_3.4.2.1.1_1_DGS_man rpro-h cat stroke

re
a. **MAN** *RPRO-H CAT STROKE*
'the man who is stroking the cat'

5_3.4.2.1.1_2_DGS_book rpro-nh poss father read

re
b. **BOOK** *RPRO-NH* $POSS_1$ *FATHER READ*
'the book which my father is reading'
(DGS, adapted from Pfau & Steinbach 2005: 512)

3.4.2.1.2 Singular/plural specificity of the relativization sign

A language may have relativization signs marked for the number feature (singular/plural) of the head noun.

3.4.2.2 Position of the relativization sign

The position of manual signs of relativization may vary. They may be realized next to the head (as in the ASL example above) or at the relative clause periphery (as is true

for the marker PE in the LIS example below), and their presence may be optional or obligatory.

rel
TODAY ***MAN***$_{3a}$ *PIE BRING PE* YESTERDAY (IX$_{3a}$) DANCE
'The man who today brought the pie danced yesterday.'
(LIS, Branchini 2007: 150)

3.4.2.3 Optionality or obligatoriness of the relativization sign

The grammar writer should check whether the relativization sign is optional or obligatory.

3.4.3 Position of the noun phrase with the relative clause within the matrix clause

In spoken languages, the position of the relative clause with respect to the main clause is often tightly connected to the word order of the language and to the syntactic role carried out by the noun phrase with respect to the matrix predicate.

In the English example in (a), an SVO language, the relative clause modifies the object of the main clause, thus the NP modified by the relative clause occupies a post-verbal position, the position of objects in English. In the Japanese example in (b), the relative clause, again, modifies the object of the main clause but since Japanese is an SOV language, the object NP appears between the subject and the matrix predicate.

a. I saw [the **house** *that they want to buy.*]
b. Taro-ga [***ringo-ga*** *kittin-ni* *aru* *no-o*] tot-te tabeta
Taro-NOM apple-NOM kitchen-in be NO-ACC pick.up ate
'Taro picked up and ate the apple that was in the kitchen.'
(Japanese, Nishigauchi 2003: 1)

Relative clauses in the sign languages for which a description is available behave differently as to the sentential position of the noun phrase containing a relative clause.

In LIS, NPs with relative clauses occupy a sentence-initial position regardless of their syntactic role in the matrix clause (c), while in DGS, the position of the NP with a relative clause corresponds to the position of the NP alone. Thus, DGS patterns with languages like English (d).

5_3.4.5_LIS_dogi ixi eat a-lot pei doctor (ixi) vet bring

rel
c. [***DOG***$_{3a}$ *IX*$_{3a}$ *EAT A-LOT PE*$_{3a}$] DOCTOR (IX$_{3a}$) VET BRING
'I took to the vet the dog that eats a lot.' (LIS, Branchini 2007: 150)
d. INDEX$_1$ **BOOK** *RPRO-NH*$_3$ *TABLE LIE-ON* KNOW
'I know the book which is lying on the table.'
(DGS, adapted from Pfau & Steinbach 2005: 515)

Summing up, the position of the relative clause with respect to the main clause should be verified. Three possibilities may occur: NPs with relative clauses (i) always appear in a (dislocated) sentence-initial/final position regardless of their syntactic role; (ii) stay in-situ; (iii) may be optionally produced inside the matrix clause or dislocated to the sentence periphery.

3.4.4 Subject versus object relativization

Some languages mark relative clauses in a specific way depending on whether the relativized noun is the subject or the object (or another main constituent) of the predicate of the relative clause. In English, for instance, if the head is human and the object of the predicate, it may be optionally marked with the relative pronoun *whom*, as opposed to *who*, which would be used if the head noun was the subject of the predicate. In (a) *a man* is the subject of *climbed*, whereas in (b) *the man* is the object of *to date*.

I once met [a **man** *who had climbed Mt. Everest*].
I met [the **man** *whom my sister used to date*].

There are also some languages that mark this difference with different inflectional markers on the predicate of the relative clause. The following examples are from Turkish:

a. Ara-yan kadın
call-SUBJ.REL woman
'the woman who called' (Turkish)

b. Ara-dığ-ım kadın
call-OBJ.REL-1POSS woman
'the woman whom I called' (Turkish)

In (a), the head noun *kadın* 'woman' is the subject of the verb *ara* 'call', and the verb has a marker for subject relativization, *-yan*. In (b), on the other hand, the head noun *kadın* 'woman' is the object of the verb *ara* 'call', and the verb has a marker for object relativization, *-dığ*, followed by the first person possessive marker expressing the person features of the subject of the relative clause.

Thus, the grammar writer should investigate whether the target sign language marks subject and object relativization differently: by different manual signs or non-manual markers.

3.4.5 Displacement of noun phrases with relative clauses

Relative clauses are reported to be frequently displaced in sign languages. In the following examples from LIS, an SOV language, although the noun phrase modified by

a relative clause (marked by relative clause non-manuals: rel = relative) is the object of the main predicate WASH, it must precede the matrix subject PAOLO, as in (a), and cannot be in its argument position, as in (b). If the NP were not modified by a relative clause, it could occur between the subject and the verb, as in (c).

a. rel
YESTERDAY DOG_{3a} FIND PE_{3a} $PAOLO_{3b}$ IX_{3b} WASH
'Paolo washed the dog that I found yesterday.' (LIS, Branchini 2007: 151)

b. * rel
$PAOLO_{3b}$ IX_{3b} YESTERDAY DOG_{3a} FIND PE_{3a} WASH
Intended: 'Paolo washed the dog that I found yesterday.'

c. PAOLO DOG WASH

The grammar writer should verify whether relative clauses can be displaced in the language under investigation, and describe the non-manual marker and the positions the displacement is associated to.

3.4.6 Special non-manual marking

Where no manual sign of relativization is present, non-manual marking is often the only way to distinguish between a relative clause and a coordination / coordination [Syntax – Section 3.1] of two clauses. The analysis of potentially specific non-manual markers in relative clauses as well as their obligatoriness or optionality and their spreading domain is, therefore, crucial in describing how relative clauses are expressed in the target sign language. The following non-manuals marking relative clauses have been identified in the sign languages studied up to now: raised eyebrows, squinted eyes, head nodding over the head or over the relativization sign, backward head tilt, tensed upper lip, and tension of the upper cheeks.

Sign languages usually employ a combination of different non-manual markers. The sequence of manual signs a non-manual marker co-occurs with is called the "spreading domain" of the non-manual marker. The spreading domain of a non-manual marker may be the entire clause or a smaller constituent. In relative clauses, the spreading domain of the different non-manual markers may not overlap: while one may spread over the entire relative clause, another one may spread only over the relativization sign (if present) or over the head, as shown in the examples reported below (rel = relativization; nod = head nod; re = raised eyebrows).

5_3.4.6_1_ASL_1ask3 give1 dog ursula kick that

rel nod
$_1ASK_3$ $GIVE_1$ DOG URSULA KICK THAT
'I asked him to give me the dog that Ursula kicked.' (ASL, Liddell 1978: 85)

re
YESTERDAY MAN (IX_3) RPRO-H_3 CAT STROKE ARRIVE
'The man who is stroking the cat arrived yesterday.'
(DGS, adapted from Pfau & Steinbach 2005: 513)

rel
DOG_{3a} IX_{3a} EAT A-LOT PE_{3a} DOCTOR (IX_{3a}) VET BRING
'I took to the vet the dog that eats a lot.' (LIS, Branchini 2007: 150)

3.4.6.1 List of non-manual markers

The grammar writer can list the non-manual markers of relative clauses in this section.

3.4.6.2 The spreading domain of each non-manual marker

In this section the grammar writer can describe the spreading domain per non-manual marker of relative clauses listed in the preceding section.

3.4.7 Restrictive vs non-restrictive relative clauses

In this section the grammar writer should describe whether the language distinguishes between restrictive and non restrictive relative clauses, using the definitions and the diagnostics discussed above [Syntax: Section 3.4.0.4].

Elicitation materials

Relative clauses create complex sentences not frequently occurring in spontaneous production. It is for this reason that it may be not easy to find them in a corpus containing only free conversational data. An in-depth analysis of the phenomenon trying to verify the syntactic and semantic types available in the literature requires a substantial body of evidence.

If a general description of the phenomenon is already available in the target sign language, the grammar writer may ask for grammaticality judgments or ask the signer to produce a target sentence by translating it from the spoken language. This has the advantage that the grammar writer can focus on the fine-grained aspects for which a detailed investigation is needed. However, these investigation techniques can have some drawbacks, one of which is the influence that the spoken language construction may have on the sign language production or the risk that the informant is not competent enough in the spoken language. Another risk concerns the use of non-manual marking. In artificial situations in which the sentence to be judged as grammatical

or ungrammatical is later produced by the signer, production of the relevant non-manual marking may be avoided or seriously modified from the otherwise spontaneous production.

For these reasons, it may be useful to use elicitation techniques that lead to the production of relative clauses in a semi-naturalistic setting.

The grammar writer should try to avoid the production of what he/she believes to be the relevant construction in the target sign language by only facilitating its elicitation.

Starting from early investigations on relative clauses, an elicitation technique successfully employed toward this end is the presentation in the target sign language of a story with limited information about three different characters. The characters are introduced in a generic manner and referred to, for instance, as *one man*, *another man*, and *the next man*, no proper name is provided. The informant is either asked to retell the story or to answer questions regarding the characters. The most convenient way for the informant to refer to the story characters is with a relative clause.

An example of a story used to elicit relative clauses in LIS is provided below.

Elicitation context
I love dogs. In my house I have three dogs.
One dog is ill and tomorrow I will take it to the vet, another dog yesterday chased a cat and today came home. The next dog is very fat and loves to eat bones.

The informant was then asked 'What dog came home today?' The most convenient way to answer this question is by using a relative clause 'The dog that yesterday chased the cat came home today'.

A similar methodology mainly adopted to elicit relative clauses in spoken languages with children makes use of puppets to enact the story presented. After acting out the story with the puppets, the grammar writer may ask the informant which referent he/she would like to be, or which referent does something in the story. The risk when using puppets is that, in answering the question, informants may avoid producing a relative clause by directly pointing to the relevant referent. A similar drawback is found in a variation of the task, in which the informant is presented pictures illustrating a story and asked questions about the story characters. Pictures involve a further risk: they might not adequately represent the story, and they may provide the informant with too much information that could be used to avoid producing relative clauses. A picture representing a man eating an apple, for instance, may lead the informant to answer the question 'What man would you like to be in this picture?' by simply saying 'the tall man' or 'the man with the apple' rather than 'the man who is eating the apple'.

Something more should be said for the elicitation of free relative clauses, that is, of relative clauses lacking an overt head. If a description of full relative clauses, that

is, of relative clauses with an overt head, in the target sign language already exists, the grammar writer may present one such construction to the informant. The grammar writer may then ask the informant to avoid producing the referent head in the aim of referring to a non-specific referent, to a generic one. An example of an elicitation technique of a free relative clause is provided below.

Elicitation context
We are at university. Students are taking a written exam. The professor tells them that they have an hour to complete the exam and says that no one can leave the room before completing the exam. He says 'the student that finishes the exam can go out'.

The informant is then asked the following questions: 'What should I say if I wanted to say that anyone, a generic person, once he/she has finished the exam can go out?' and 'Can I omit the referent *the student* in my sentence? If yes, what should I say?'

If, however, no description of relative clauses is available in the target sign language, the grammar writer is advised to follow the elicitation techniques illustrated above for eliciting full relative clauses first.

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3.5 Adverbial clauses

3.5.0 Definitions and challenges

3.5.0.1 Adverbial clauses

An adverbial clause is a constituent of a complex sentence which is sentential in form but fulfills an adverbial function such as expressing the time, location, manner, purpose, reason, circumstance, concession/contrast, substitution, addition, and condition of the main event (Sæbø 2011). These different adverbial functions are exemplified below, with the adverbial clauses underlined.

a. If you come home earlier, we can have dinner together. (condition)
b. You were not at home when I called you. (time)
c. The referee cancelled the game because it started to snow heavily. (reason)
d. Yesterday John met Mary where he had proposed to her. (location)
e. You should do it as I told you. (manner)
f. We stopped driving to work in order to save money. (purpose)
g. He got into the army by lying about his age. (circumstance)
h. Although she had not slept much the night before, she continued to work as hard. (concession)
i. You talk to my mother instead of talking to me. (substitution)
j. Besides waking me up in the middle of the night, he accused me of not caring about his feelings. (addition)

In addition to these, languages may have absolutive clauses where the adverbial function or the semantic relationship between the subordinate clause and the main clause is not marked overtly but understood from the context. This is exemplified below.

Having talked to her boss about the promotion, she went on vacation feeling relieved.

3.5.0.2 Ways of marking adverbial clauses

In most languages, adverbial clauses display typical properties of subordinate clauses [Syntax – Section 3.2] / subordinate clauses. In that respect, three ways of marking

adverbial clauses have been attested: with (i) subordinating morphemes, (ii) special (non-finite) verb forms, and (iii) specific word orders different from main clauses (Thompson et al. 2007: 238). In addition to these, it has been attested in many sign languages that adverbial clauses are marked by non-manual markers.

(i) Subordinating morphemes in adverbial clauses
These are also called subordinating conjunctions / conjunctions [Lexicon – Section 3.9.2] such as *when, while, as, if, before, after, until, because, since,* etc. They may function as complementizers, and thus may occur clause-initially in head-initial languages (a), and clause-finally in head-final languages (b).

a. **when** the rain stopped
b. ame ga agaru **to**
   rain NOM stop when (Japanese, adapted from Thompson et al. 2007: 238)

(ii) Special verb forms in adverbial clauses
The verbs in adverbial clauses may lack certain inflections such as tense or agreement that a verb would bear in a finite clause [Syntax – Section 3.2] / finite clause.

(iii) Word order
In some languages such as German and Swedish, the (internal) word order in adverbial clauses is different from the word order in an independent clause, usually following the general pattern of word order in subordinate clauses. In such cases, the positions of the verb, certain adverbs, and negation may be different from the positions of these constituents in main clauses (Thompson et al. 2007: 239–240). Compare the position of the finite verb in the German matrix clause (a) with that of the verb in the adverbial clause (b).

a. Maria **half** Peter.
   Mary helped Peter
b. ... weil Maria Peter **half**.
   ... because Mary Peter helped (German)

The (external) position of the adverbial clause may also be fixed in a sentence. In Korean, for instance, the adverbial clause typically precedes the main clause. In other languages, the position of the adverbial clause is determined by its role in linking the main clause that it modifies to the preceding discourse.

3.5.0.3 Types of adverbial clauses

The following types of adverbial clauses have been attested: conditional, temporal, locative, manner, purpose, reason, circumstantial, concessive, substitutive, additive, and absolutive (Thompson et al. 2007). Each type of adverbial clause is discussed in more detail in this chapter.

3.5.0.4 Adverbial clauses in sign languages

To date, no extensive work has been done on different types of adverbial clauses in sign languages with the exception of conditional clauses. However, researchers have observed that, for instance, temporal clauses and conditional clauses are marked with non-manual markers such as raised eyebrows, and that they tend to appear in sentence-initial position (Pfau & Quer 2010).

Moreover, it has been observed that some sign languages have subordinating morphemes in adverbial clauses. Auslan, for instance, has the following: BEFORE, AFTER, UNTIL, BECAUSE, THROUGH (meaning 'because'), IN-CASE, etc. (Johnston & Schembri 2007). Some of these subordinating morphemes may be borrowed from a spoken language, and thus, may be fingerspelled.

3.5.0.5 Methodological challenges

It should be noted that not every language uses subordination to express every adverbial function. Some may use coordination [Syntax – Section 3.1.1] / coordination or juxtaposition [Syntax – Section 3.1.1] / juxtaposition, for instance, for expressing a sequence of events (Thompson et al. 2007: 240). The following example is from Nupe (a Kwa language), where purpose is expressed by means of a serial verb construction. The second verb is not marked as being subordinate.

Musa	bé	lá	èbi
Musa	came	took	knife

'Musa came to take the knife.' (Nupe, Thompson et al. 2007: 242)

The grammar writer should be aware of the fact that the expression of an adverbial function such as expressing the time or the reason of an event may or may not be accomplished by means of subordination [Syntax – Section 3.2]. The following examples illustrate a causal relation between two sentences that is not expressed by adverbial modification.

Mary arrived late at work. The highway was closed for roadwork.
Peter hit the little boy and he started to cry.
Peter was tired. Therefore, he went home.

To describe a clause as an adverbial (i.e. subordinate) clause, the grammar writer may need to look for independent properties pointing to subordination.

Moreover, as noted above, as in many spoken languages, in sign languages a clause may be ambiguous between two types of adverbial clause, for example between a conditional and a temporal clause or between a reason and a purpose clause. In those cases, the context usually disambiguates between these types. The following example from ASL, for instance, is ambiguous between a temporal and a conditional clause. 're' stands for raised eyebrows.

re
RAIN NOT GO PICNIC
'If it rains, we won't go on the picnic.'
'When it rains, we won't go on picnics.' (ASL, Coulter 1979: 26)

Note finally that it has been observed that at least some sign languages may mark adverbial clauses only with non-manual markers. Manual signs such as the conditional marker IF may be optional. In the absence of manual signs marking the clause or sentence type, determining what the non-manual markers mark may be challenging. For instance, in some languages such as ASL a non-manual marker, brow raise, occurs both in polar questions and the antecedent of conditional sentences (Wilbur & Patschke 1999). If the sign language does not have any other means to mark a conditional sentence, such as a sign with the meaning 'if', then it may be difficult to differentiate between a polar question [Syntax – Section 1.2.1] / question-answer pair from a conditional sentence, as in 'Does it rain? I go to the cinema' versus 'If it rains, I go to the cinema' (Cecchetto 2012). However, as discussed by Barattieri (2006) for LIS, there are cases where a polar question-answer pair can be distinguished from a genuine conditional [Syntax – Section 3.5.1] / conditional sentence even in the absence of a specialized sign. One test is reversibility. While in some languages the order of protasis and apodosis can be switched ('If it rains, I go to the cinema' versus 'I go to the cinema if it rains'), if the answer precedes the question, the conditional meaning is lost ('I go to the cinema. Does it rain?'). In addition, the semantics of the conditional may make the question-answer strategy awkward. This happens in counterfactuals like 'Had Germany won the war, Europe would be very different' whose content cannot be expressed by an exchange like 'Did Germany win the war? Europe is very different'.

In BSL, as well, a conditional may look like a rhetorical question-answer pair [Syntax – Section 1.2.0.3]; however, there is a difference: there is a longer pause after the rhetorical question, and the eyebrows are higher and the head further back in the rhetorical question than in the simple conditional (Sutton-Spence & Woll 1999: 89).

Researchers have also observed that in some sign languages such as Israeli SL, topics, polar questions, and conditionals have similar non-manual markers since the latter have grammaticalized from the former (Janzen 1999; Pfau & Steinbach 2005). Again, in the absence of an obligatory topic or conditional marker, one would have to identify means other than non-manuals to differentiate between the two constructions.

3.5.1 Conditional clauses

A conditional sentence is a sentence consisting of two clauses, one of which (the *protasis* or *antecedent*) expresses a condition [Semantics – Section 14.2.1] whose

fulfillment or non-fulfillment is relevant to the degree of reality assigned to the other (the *apodosis* or *consequent*). For instance, in the following English example, the first clause is the protasis/antecedent clause, and the second clause is the apodosis/consequent clause:

If Mary comes home early today, we will go out for dinner.

We will use the terms *antecedent clause* and *consequent clause* in the rest of the discussion. However, bear in mind that these terms do not imply an obligatory order between the two clauses. In many languages the antecedent clause may not have to precede the consequent clause.

Conditional sentences can be subdivided into two main categories: predictive/central and non-predictive/peripheral (Dancygier 1998; Haegeman 1984, 2014). Predictive/central conditionals are those constructions in which the occurrence of the event expressed in the consequent clause depends on the fulfillment of the condition expressed in the antecedent clause, as in the following English example:

If you drop the glass, it will break.

In non-predictive/peripheral conditional constructions, on the other hand, the occurrence of the event expressed in the consequent clause does not depend on the fulfillment of the condition expressed in the antecedent clause, as the following English example illustrates:

If you are hungry, there is some pasta in the fridge.

Predictive/central conditionals can further be subdivided into two types: *open or factual conditionals*, in which the fulfillment of the condition is seen as a realistic possibility, and *remote* or *counterfactual conditionals*, in which the fulfillment of the condition is impossible, contrary to fact or at least unlikely. Examples of open conditionals in English would be:

a. If it rains tomorrow, the concert will be cancelled.
b. If John is at home, he must be sleeping.

The sentence (a) above, for instance, is an open conditional since there is a possibility that it rains tomorrow. An example of a counterfactual conditional would be:

If I were you, I would call her immediately.

The sentence above is a counterfactual conditional [Semantics – Section 14.2.1] since it is not possible that I can be you. Other examples of counterfactual conditionals are given below:

a. If she had apologized, I would have forgiven her.
b. If she came tomorrow, you would meet her.

Moreover, concessive conditional clauses may be introduced with a combination of a "contrary-to-expectation" morpheme such as *even* and a conditional complementizer *if*.

The antecedent clauses of conditional sentences in some languages are introduced with a conditional complementizer such as *if* in English, and/or the predicate of the antecedent clause can be marked with a conditional affix as in the Turkish example below:

gel-se
come-COND
'if he/she came' (Turkish)

The predicate of the consequent clause can also be marked for the conditional. For instance, in the Italian example, *io partirei* 'I would leave', *-ei* is the conditional affix added to the verb infinitive *partir(e)*.

Sign languages predominantly mark conditional sentences with non-manual marking, and they may have obligatory or optional complementizers corresponding to *if* in English. Manual signs such as IF may be optional. In the absence of manual signs marking the clause or sentence type, determining what the non-manual markers mark may be challenging.

3.5.1.1 The role of non-manual markers in conditional sentences

Conditionals in sign languages are typically accompanied by non-manual markers, especially with different facial expressions such as raised eyebrows, change in head orientation, or head movement. For instance, in BSL, a conditional clause can be marked by brow movement as well as head tilt and (optionally) the sign IF (Sutton-Spence & Woll 1999). In ASL, conditional clauses are marked with brow raise, head up and tilted, eye gaze shifts, and eye blinks (Baker & Padden 1978), and the final sign of the antecedent clause is accompanied by a head thrust (Liddell 1986). In the following examples, 'ht' stands for head thrust and 're' stands for raised eyebrows.

ht
re
TOMORROW RAIN PICNIC CANCEL
'If it rains tomorrow, no picnic.' (ASL, adapted from Liddell 1986: 248)

Different non-manual markers may differentiate between different semantic types of conditionals such as factual versus counterfactual. Each component of a conditional sentence, namely, the antecedent and the consequent clause, may also be associated with different non-manual markers.

For instance, in Israeli SL, factual conditionals are systematically associated with brow raise, and counterfactual conditionals with brow raise together with squint.

a. *factual conditional*

re

IF IX_3 INVITE-ME BIRTHDAY-PARTY OF-HIM IX_1 GO

'If he invites me to his party, I will go.'

b. *counterfactual conditional*

re

squint

IF IX_3 STOP SMOKE IX_3 LIVE

'If he had quit smoking, he would be alive.'

(Israeli SL, adapted from Dachkovsky 2005: 109, 113)

The following two visuals show the contrast between factual and counterfactual non-manual markers in Israeli SL: the antecedent of the factual conditional is marked with raised eyebrows, the antecedent of the counterfactual conditional with raised eyebrows together with squint.

factual conditional

counterfactual conditional

(Israeli SL, Dachkovsky 2008: 68f)

In the case of more than one non-manual marker in a conditional, each may have a different semantic/pragmatic function (Dachkovsky & Sandler 2009). The following is an example of a counterfactual conditional clause and the non-manual markers marking the antecedent and the consequence in Israeli SL. It has been argued that in Israeli SL counterfactuals, brow raise signals continuation and squint marks the information shared with the interlocutor.

squint

brow raise

head forward head up

head back

IF GOALKEEPER HE CATCH-BALL WIN GAME WIN

'If the goalkeeper had caught the ball, (the team) would have won the game.'

(Israeli SL, Dachkovsky & Sandler 2009: 292)

Moreover, the antecedent clause may be followed by an eye blink and a change in head orientation (Pfau & Quer 2010: 391).

It is important to note, as we did above under "Methodological challenges" [Syntax – Section 3.5.0.5], that a non-manual marker may not be uniquely marking conditionals. For instance, it has been shown for ASL that brow raise occurs in a variety of constructions in addition to conditionals, namely topics [Syntax – Section 2.3.3.3] / topics [Pragmatics – Section 4.2;] / topics [Pragmatics – Section 4.3.2], relative clauses [Syntax – Section 3.4], yes/no questions [Syntax – Section 1.2.1], etc. (Wilbur & Patschke 1999).

3.5.1.2 Factual conditionals

In factual conditionals, the fulfillment of the condition is seen as a realistic possibility. The following is an example of a factual conditional from Israeli SL:

re
IF IX_3 INVITE-ME BIRTHDAY-PARTY OF-HIM IX_1 GO
'If he invites me to his party, I will go.'
(Israeli SL, adapted from Dachkovsky 2008: 72)

3.5.1.2.1 Non-manual markers and their properties in factual conditionals

In many sign languages studied so far, antecedents of factual conditionals are marked with raised eyebrows together with other non-manual markers such as different positions of the head, eyegaze shifts, and eyeblinks.

In this section, we advise the grammar writer to:

- List the non-manual markers marking the antecedent and the consequent clauses. Also, indicate the spreading domains and obligatoriness/optionality.
- Identify the function of each non-manual marker associated with the factual conditional clause, if there is more than one.
- Mention whether these non-manual markers also occur in other types of adverbial clauses. If so, discuss whether the clauses are ambiguous or whether there are ways to differentiate between the two.

3.5.1.2.2 Manual conditional signs in factual conditionals

ASL, for instance, has the optional manual conditional markers I-F and SUPPOSE. LIS signers use a variety of optional signs such as IF, EXAMPLE, IN-CASE, OCCASION. The language may also have a manual sign in the consequent clause such as THEN.

In this section, we advise the grammar writer to list the manual conditional signs, their distributions and possible occurrences, and also indicate their obligatoriness/optionality.

3.5.1.2.3 Order of the components of the factual conditional clause

We recommend that the grammar writer check whether there is a strict order of the antecedent and the consequent clause, or whether can they be used in any order. For example, see the two possibilities attested in English below:

I will fire him if he comes to work late again.
If he comes to work late again, I will fire him.

We also advise the grammar writer to check whether the different orders have different pragmatic functions and whether they can be used in similar contexts or require different kinds of contexts.

3.5.1.3 Counterfactual conditionals

In *counterfactual conditionals*, the fulfillment of the condition is impossible, contrary to fact, or at least unlikely. The following is an example of a counterfactual conditional from Israeli SL:

re
squint
IF IX_3 STOP SMOKE IX_3 LIVE
'If he had quit smoking, he would be alive.'
(Israeli SL, adapted from Dachkovsky 2008: 74)

3.5.1.3.1 Non-manual markers and their properties in counterfactual conditionals

In this section, we advise the grammar writer to:

- List the non-manual markers marking the antecedent and the consequent clauses. Also, indicate the spreading domains and obligatoriness/optionality.
- Identify the function of each non-manual marker associated with the counterfactual conditional clause, if there is more than one .
- Mention whether these non-manual markers also occur in other types of adverbial clauses. If so, discuss whether the clauses are ambiguous or whether there are ways to differentiate between the two.

3.5.1.3.2 Manual conditional signs in counterfactual conditionals

In this section, we advise the grammar writer to list the manual conditional signs, their distributions and possible occurrences and also indicate their obligatoriness/optionality. Note that the language under analysis may employ the same manual conditional sign, such as IF, for all types of conditional clauses.

3.5.1.3.3 Order of the components of the counterfactual conditional clause

We advise the grammar writer to check whether there is a strict order of the antecedent and the consequent clause, or whether can they be used in any order. For example, see the two possibilities attested in English below:

I would fire him if he came to work late every day.
If he came to work late every day, I would fire him.

We also advise the grammar writer to check whether the different orders have different pragmatic functions and whether they can be used in similar contexts or require different kinds of contexts.

3.5.1.4 Concessive conditionals

A typical example of a concessive conditional in English is a clause with *even if*:

Even if he apologizes, I will not forgive him.

3.5.1.4.1 Non-manual markers and their properties in concessive conditionals

In this section, we advise the grammar writer to:

- List the non-manual markers marking the antecedent and the consequent clauses. Also, indicate the spreading domains and obligatoriness/optionality.
- Identify the function of each non-manual marker associated with the concessive conditional clause, if there is more than one.
- Mention whether these non-manual markers also occur in other types of adverbial clauses. If so, discuss whether the clauses are ambiguous or whether there are ways to differentiate between the two.

3.5.1.4.2 Manual conditional signs in concessive conditionals

In this section, we recommend that the grammar writer list the manual signs for concessive conditionals, their distributions and possible occurrences and also indicate their obligatoriness/optionality. In this type of conditional clause, the language may combine two signs with the meanings ‘even’ and ‘if’, or there may be a single sign expressing the meaning ‘even if’.

3.5.1.4.3 Order of the components of the concessive conditional clause

We advise the grammar writer to check whether there is a strict order of the antecedent and the consequent clause, or whether can they be used in any order. For example, see the two possibilities attested in English below:

Even if he apologizes, I will not forgive him.
I will not forgive him even if he apologizes.

3.5.1.5 Non-predictive/peripheral conditionals

Languages have constructions that have the form of canonical conditional sentences (e.g. with a conditional complementizer, conditional marking on the verb, or conditional non-manual marking) but do not actually express a conditional link between the two clauses. These are called *non-predictive/peripheral* conditionals. The grammar writer should be aware of this difference, and of the fact that the difference in meaning may correlate with difference in form, for instance, in the form of the absence/presence of a complementizer, non-manual marking, word order restrictions, etc. We provide more examples of this kind from English below:

a. If Mary called you, (then) she must have forgiven you.
b. If he is such a good boss, why does he force his employees to work on weekends?
c. If I may so, you are overreacting.
d. If you were at the meeting, did the board discuss my proposal?
e. If you do not have time now, we can talk tomorrow.
f. He will have to work very hard to improve his situation, if you know what I mean.
g. He trapped two mongeese, if that's how you make a plural of "mongoose".
h. Grandma is feeling lousy, if I may put it that way. (Dancygier 1998: 104)

3.5.1.5.1 Non-manual markers and their properties in non-predictive/peripheral conditionals

In this section, we advise the grammar writer to:

- List the non-manual markers marking the antecedent and the consequent clauses. Also, indicate the spreading domains and obligatoriness/optionality.
- Identify the function of each non-manual marker associated with the non-predictive/peripheral conditional clause, if there is more than one.
- Mention whether these non-manual markers also occur in other types of adverbial clauses. If so, discuss whether the clauses are ambiguous or whether there are ways to differentiate between the two.

3.5.1.5.2 Manual conditional signs in non-predictive/peripheral conditionals

In this section, we advise the grammar writer to list the manual conditional signs, their distributions and possible occurrences, and also indicate their obligatoriness/optionality. Note that the language under analysis may employ the same manual conditional sign, such as IF, for all types of conditional clauses.

3.5.1.5.3 Order of the components of the non-predictive/peripheral conditional clause

We advise the grammar writer to check whether there is a strict order of the antecedent and the consequent clause, or whether can they be used in any order.

3.5.1.6 Other conditional constructions

Some languages have what is sometimes called "Imperative and Declarative (IaD)" [Syntax – Section 1.3.9] constructions. These constructions express conditionality by means of an imperative clause followed by a declarative, as in example (a); this example is almost identical in meaning to example (b).

a. Don't do your homework and you will be grounded.
b. If you don't do your homework, you will be grounded.

3.5.2 Temporal clauses

This type of adverbial clause expresses a temporal relationship [Semantics – Section 14.2.2] between two clauses. The time of the event in the adverbial clause can be before, after or simultaneous with the time of the event [Semantics – Chapter 1] in the main clause. The morphemes that express this relationship can be subordinating conjunctions such as English *when, while, as, before, after, since, until, now that, once, as soon as*, etc. or verbal affixes, as in the Turkish example below (Thompson et al. 2007: 246):

Sen	gel-ince	ben	gid-er-im.
you	come-when	I	go-AORIST-1SG

'I will go when you come.' (Turkish)

The adverbial clause can also be in the form of a relative clause:

By the time we got back, the steaks were all gone. (Thompson et al 2007: 246)

Uyan-dığ-ın	zaman	ben-i	ara.
wake-REL.PRT.-2SG	time	I-ACC	call

'Call me when you wake up.' (Lit. 'Call me at the time when you wake up.')
(Turkish)

In some languages, a clause with a certain subordinating morpheme, such as for example *since* in English, may be ambiguous between a temporal and reason clause.

Moreover, in some languages, *before*-clauses contain a negative morpheme with no negative meaning, as illustrated by the following Turkish example.

Sen	gel-me-den	(önce)	yemeğ-e	başla-dı-k.
you	come-NEG-ABL	before	dinner-DAT	start-PAST-1PL

'We started eating before you came.' (Turkish)

In clauses expressing simultaneity of the events, one of the events is usually foregrounded / foregrounded [Pragmatics – Section 5.3] while the other is backgrounded / backgrounded [Pragmatics – Section 5.3]. This contrast may be marked in a number of ways in different languages. The language may use a marker explicitly signalling

simultaneity in the form of an affix, for instance, or the verb in the adverbial clause may be marked with a continuative / continuative [Semantics – Section 2.1.2], durative / durative [Semantics – Section 2.1.2], or imperfective / imperfective [Semantics – Section 2.1] aspect.

While I was doing the dishes, my roommate tidied up the living room.

In the English example above, both the subordinating morpheme *while* and the progressive aspect of the verb *was doing* express simultaneity.

The following is an example of a temporal clause from ASL, marked by the non-manual raised eyebrows.

re
RAIN NOT GO PICNIC
'When it rains, we won't go on picnics.' (ASL, Coulter 1979: 26)

3.5.2.1 Internal structure of temporal clauses

We recommend that the grammar writer discuss whether the temporal clauses are in the form of a (free) relative clause [Syntax – Section 3.4]. If yes, describe what the possible head nouns are; these may be a sign meaning 'time', an empty head with the interpretation of 'time', or some other noun that expresses time.

3.5.2.2 Manual signs marking subordination in temporal clauses

If the temporal clauses contain subordinating morphemes such as WHEN, WHILE, BEFORE, AFTER, UNTIL, etc., list them. Note that there may be sign languages where these are fingerspelled.

3.5.2.3 Other markers of subordination in temporal clauses

We recommend that the grammar writer indicate whether the verb in the clause shows any properties of subordination such as lack of tense, aspect, or agreement marking.

3.5.2.4 Non-manual markers in temporal clauses

Researchers have observed that time/temporal clauses are marked with non-manual markers in sign languages. For instance, ASL (a), DGS, and Israeli SL (b) mark these clauses with raised eyebrows (Pfau & Quer 2010).

a. re
RAIN NOT GO PICNIC
'When it rains, we won't go on picnics.' (ASL, Coulter 1979: 26)

re

b. I GO-OUT HOUSE, MEET NEIGHBOR
'When I went outside, I met a neighbor.'

(Israeli SL, Dachkovsky & Sandler 2009: 300)

However, such clauses may be ambiguous as to whether they are temporal or conditional. So, the ASL example above can also be interpreted as 'If it rains, we won't go on the picnic'. The grammar writer should therefore check whether the same ambiguity occurs in the language s/he is describing.

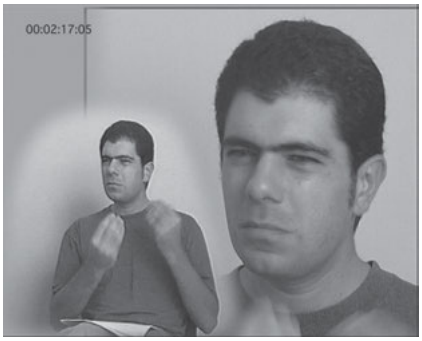
Moreover, a sign language may additionally mark the remoteness of the past of the time of the main event by a different non-manual marker that in general may be used by signers to indicate to the addressee that the information given by the signer may not be easily accessed by him/her. For example, in Israeli SL this is expressed by squint (i.e. tensed eyes).

squint

GAME YOU LOSE DISAPPOINTED YOU
'When you missed the game, were you disappointed?'

(Israeli SL, Dachkovsky 2005: 123)

The following figure shows the non-manual squint marking remote past in temporal clauses in Israeli SL:



(Israeli SL, Dachkovsky 2008: 76)

In this section, we advise the grammar writer to:

- List the non-manual markers marking temporal clauses. Also, indicate the spreading domains and obligatoriness/optionality.
- Identify the function of each non-manual marker associated with temporal clauses, if there is more than one.
- Mention whether these non-manual markers also occur in other types of adverbial clauses. If so, discuss whether the clauses are ambiguous or whether there are ways to differentiate between the two.

3.5.2.5 Position of the temporal clause with respect to the main clause

In this section, we recommend that the grammar writer describe the position of the temporal clause with respect to the main clause.

3.5.2.6 Simultaneous expression of the main event and the adverbial clause

Thanks to the means provided by the visual modality, that is, the availability of two manual articulators, two events may be expressed simultaneously in sign languages. The grammar writer should check whether this is possible, for instance, by means of buoys / buoys [Lexicon – Section 1.2.3] / buoys [Pragmatics – Section 2.2.3], and if yes, whether one of the events expressed shows any properties of subordination.

3.5.3 Locative clauses

Locative clauses express the location of the main event. They may have a subordinating morpheme such as *where* in the English example in (a), or may be in the shape of a relative clause, as in the Turkish example in (b):

a. Yesterday John met Mary *where* he had proposed to her.

b.

Bilgisayar-ım-ı	yemek	ye-diğ-im	*yer-de*	bırak-tı-m.
computer-1POSS-ACC	food	eat-NOMIN-1POSS	place-LOC	leave-PAST-1SG

'I left my computer at the place/where I ate.' (Turkish)

Because of the modality-specific use of the signing space [Pragmatics – Chapter 8], it is very likely that sign languages make use of modality-specific means such as the topographic signing space [Pragmatics – Section 8.1.2] to express locative relations [Semantics – Section 14.2.3].

3.5.3.1 Internal structure of locative clauses

We recommend that the grammar writer discuss whether the locative clauses are in the form of a (free) relative clause. If yes, describe what the possible head nouns are; these may be a sign meaning 'place', an empty head with the interpretation of 'place', or some other noun that expresses location.

3.5.3.2 Manual signs marking subordination in locative clauses

If the locative clauses contain subordinating morphemes such as those with the meaning 'where', list them. Note that there may be sign languages where these are fingerspelled.

3.5.3.3 Other markers of subordination in locative clauses

We recommend that the grammar writer indicate whether the verb in the clause shows any properties of subordination such as lack of tense, aspect, or agreement marking.

3.5.3.4 Non-manual markers in locative clauses

In this section, we advise the grammar writer to:

- List the non-manual markers marking locative clauses. Also, indicate the spreading domains and obligatoriness/optionality.
- Identify the function of each non-manual marker associated with locative clauses, if there is more than one.
- Mention whether these non-manual markers also occur in other types of adverbial clauses. If so, discuss whether the clauses are ambiguous or whether there are ways to differentiate between the two.

3.5.3.5 Position of the locative clause with respect to the main clause

In this section, we advise the grammar writer to describe the position of the locative clause with respect to the main clause.

3.5.3.6 Simultaneous expression of the main event and the adverbial clause

Thanks to the means provided by visual modality, that is, the availability of two manual articulators, two events may be expressed simultaneously in sign languages (e.g. by classifier constructions). The grammar writer should check whether this is possible, and if yes, whether one of the events expressed shows any properties of subordination.

3.5.4 Manner clauses

Manner [Semantics – Section 14.2.4] clauses express the way the event in the main clause is realized. They may contain a subordinating morpheme as in the English examples below:

a. Carry this *as* I told you.
b. Mary is carrying this *as* Peter told her/as Peter did.
c. Peter eats rice *as* I eat pasta. (Thompson et al. 2007: 249)

They may also be in the shape of a relative clause:

Carry this *the way* (that) I told you. (Thompson et al. 2007: 249)

Note that in the examples above, the material in the main clause *carry this* is understood in the manner clause, but it is elided / elided [Syntax – Section 2.5]: 'Carry this the way I told you ~~to carry this~~.'

In some languages such as Swahili, the head noun in the relative clause may be null, but is understood as 'the way'.

Sema kama a-sema-vyo yeye
say as SUBJ-say-REL he
'Say it as he does.' (Swahili, Thompson et al. 2007: 249)

In some languages, manner adverbial clauses may be in the form of a postpositional clause such as in the Turkish example below which contains the postposition *gibi* 'like':

Sana söyle-diğ-im gibi yap
you.DAT say-NOMIN-1POSS like do
'Do as I told you.' (Turkish)

3.5.4.1 Internal structure of manner clauses

We advise the grammar writer to discuss whether the manner clauses are in the form of a (free) relative clause. If yes, describe what the possible head nouns are; these may be a sign meaning 'way', an empty head with the interpretation of 'way', or some other noun that expresses manner.

3.5.4.2 Manual signs marking subordination in manner clauses

If the manner clauses contain subordinating morphemes, list them. Note that there may be sign languages where these are fingerspelled.

3.5.4.3 Other markers of subordination in manner clauses

We recommend that the grammar writer indicate whether the verb in the clause shows any properties of subordination such as lack of tense, aspect, or agreement marking.

3.5.4.4 Non-manual markers in manner clauses

In this section, we advise the grammar writer to:

- List the non-manual markers marking manner clauses. Also, indicate the spreading domains and obligatoriness/optionality.
- Identify the function of each non-manual marker associated with manner clauses, if there is more than one.
- Mention whether these non-manual markers also occur in other types of adverbial clauses. If so, discuss whether the clauses are ambiguous or whether there are ways to differentiate between the two.

3.5.4.5 Position of the manner clause with respect to the main clause

In this section, we advise the grammar writer to describe the position of the manner clause with respect to the main clause.

3.5.4.6 Simultaneous expression of the main event and the adverbial clause

Thanks to the means provided by visual modality, that is, the availability of two manual articulators, two events may be expressed simultaneously in sign languages. The grammar writer should check whether this is possible, and if yes, whether one of the events expressed shows any properties of subordination.

3.5.5 Reason clauses

Reason clauses express a reason [Semantics – Section 14.2.5] for the main event (Thompson et al. 2007: 250–255). They may contain subordinating morphemes such as *because, since, as, for* in English.

I called you *because* I missed you.

Some sign languages also use subordinating morphemese such as REASON in reason clauses.

OFTEN BORROW CAR SUNDAY FROM-TO TUESDAY IX_1 PERIOD-FROM-TO
REASON WORK MONDAY TUESDAY
'I often borrow the car from Sunday through Tuesday because I work on Monday and Tuesday.' (NSL, adapted from Vogt-Svendsen & Bergman 2007: 230)

Reason clauses may be marked with special morphology on the main verb. In the Turkish example below, the nominalized verb is marked with ablative case, which typically marks source.

Çok	acık-tığ-ım-dan	kalan	pizza-yı	ye-di-m.
very	get.hungry-NOMIN-1POSS-ABL	remaining	pizza-ACC	eat-PAST-1SG

'I ate the remaining pizza since I got hungry.' (Turkish)

In Turkish, this type of clause may be in the form of a postpositional clause, as well:

Çok	acık-tığ-ım	için …
very	get.hungry-NOMIN-1POSS	for

'Since/for I got very hungry …' (Turkish)

Note that reason clauses may be marked by the same marker as purpose clauses, which express the purpose [Semantics – Section 14.2.6] of the main event. There are many languages that use the same morpheme to express both reason and purpose.

This could be because both types of clauses express some sort of an explanation. However, the event expressed in the purpose clause is unrealized at the time of the main event, whereas the event in the reason clause may or may not be realized. Thus, a language may mark the unrealized property of the purpose clause in some way. Good candidates for such marking may be subjunctive, irrealis, or future morphology on the verb. For illustration, consider the following examples from Kanuri (a Nilo-Saharan language of Africa).

a. *Purpose*

Biska	Monguno-ro	lete-ro	tawange	ciwoko
yesterday	Mongunu-to	go.VN-ro	early.1SG	get.up.1SG.PAST

'Yesterday I got up early to go to Monguno'

b. *Reason*

Biska	Monguno-ro	lengin-dɵ-ro	tawange
yesterday	Mongunu-to	go.1SG.IMPERF-DEF-RO	early.1SG

ciwoko
get.up.1SG.PAST
'Yesterday I got up early because I was going to Monguno'

(Kanuri, Thompson et al. 2007: 251)

Purpose and reason clauses differ in two ways in these examples: (i) the verb in the purpose clause (a) is a non-finite verbal noun (VN), but the verb in the reason clause (b) is finite, and (ii) the verb in the reason clause (b) has definite marking, expressing that the event is an asserted fact. The purpose clause in (a) has no such marking since the event is unrealized.

3.5.5.1 Internal structure of reason clauses

We recommend that the grammar writer discuss whether the reason clauses are in the form of a (free) relative clause. If yes, describe what the possible head nouns are; these may be a sign meaning 'reason', an empty head with the interpretation of 'reason', or some other noun that expresses reason.

3.5.5.2 Manual signs marking subordination in reason clauses

If the reason clauses contain subordinating morphemes, list them. Note that there may be sign languages where these are fingerspelled.

3.5.5.3 Other markers of subordination in reason clauses

We recommend that the grammar writer indicate whether the verb in the clause shows any properties of subordination such as lack of tense, aspect, or agreement marking.

3.5.5.4 Non-manual markers in reason clauses

In this section, we advise the grammar writer to:

- List the non-manual markers marking reason clauses. Also, indicate the spreading domains and obligatoriness/optionality.
- Identify the function of each non-manual marker associated with reason clauses, if there is more than one.
- Mention whether these non-manual markers also occur in other types of adverbial clauses. If so, discuss whether the clauses are ambiguous or whether there are ways to differentiate between the two.

3.5.5.5 Position of the reason clause with respect to the main clause

In this section, we advise the grammar writer to describe the position of the reason clause with respect to the main clause.

3.5.5.6 Simultaneous expression of the main event and the adverbial clause

Thanks to the means provided by visual modality, that is, the availability of two manual articulators, two events may be expressed simultaneously in sign languages. The grammar writer should check whether this is possible, and if yes, whether one of the events expressed shows any properties of subordination.

3.5.6 Purpose clauses

Purpose clauses express the purpose [Semantics – Section 14.2.6] of the main event (Thompson et al. 2007: 250–255). They may contain subordinating morphemes such as *in order to*..., *so that* ... in English.

We stopped driving to work *in order to* save money.

They may be in the form of postpositional clauses, as in the following Turkish examples:

a. Havaalanın-a git-mek üzere yola çık-tı-k.
airport-DAT go-INF upon leave-PAST-1PL
'We left to go to the airport.' (Turkish)

b. Berkin ekmek al-mak için ev-den çık-tı.
Berkin bread buy-INF for home-ABL leave-PAST
'Berkin left home to buy bread.' (Turkish)

In some languages such as Tamil and Turkish, purpose clauses are marked with dative, benefactive or allative ('direction to') case.

Berkin ekmek al-ma-ya git-ti.
Berkin bread buy-NOMIN-DAT go-PAST
'Berkin went to buy bread.' (Turkish)

Some languages have a special subordinating morpheme for negative purpose clauses, such as *lest* in English:

Lest he spear me, I danced about. (adapted from Thompson et al. 2007: 253)

There are languages that use the same morpheme to express both reason and purpose (for similarities and differences between reason and purpose clauses, see the previous section [Syntax – Section 3.5.5.]).

3.5.6.1 Internal structure of purpose clauses

We recommend that the grammar writer discuss whether the purpose clauses are in the form of a (free) relative clause. If yes, describe what the possible head nouns are; these may be a sign meaning 'purpose', an empty head with the interpretation of 'purpose', or some other noun that expresses purpose.

3.5.6.2 Manual signs marking subordination in purpose clauses

If the purpose clauses contain subordinating morphemes, list them. Note that there may be sign languages where these are fingerspelled.

3.5.6.3 Other markers of subordination in purpose clauses

We recommend that the grammar writer indicate whether the verb in the clause shows any properties of subordination such as lack of tense, aspect, or agreement marking.

3.5.6.4 Non-manual markers in purpose clauses

In this section, we advise the grammar writer to:

- List the non-manual markers marking purpose clauses. Also, indicate the spreading domains and obligatoriness/optionality.
- Identify the function of each non-manual marker associated with the purpose clause, if there is more than one.
- Mention whether these non-manual markers also occur in other types of adverbial clauses. If so, discuss whether the clauses are ambiguous or whether there are ways to differentiate between the two.

3.5.6.5 Position of the purpose clause with respect to the main clause

In this section, the grammar writer should describe the position of the purpose clause with respect to the main clause.

3.5.6.6 Simultaneous expression of the main event and the adverbial clause

Thanks to the means provided by visual modality, that is, the availability of two manual articulators, two events may be expressed simultaneously in sign languages. The grammar writer should check whether this is possible, and if yes, whether one of the events expressed shows any properties of subordination.

3.5.7 Concessive clauses

Concessive clauses are those that express a concession [Semantics – Section 14.2.7], against which the proposition in the main clause is contrasted (Thompson et al. 2007: 262). Concessive clauses are expressed with a subordinator such as *although, even though, except that, despite the fact that, in spite of the fact that, no matter what, whoever/whatever/ whenever/ wherever,* etc. in English. See the following examples for illustration.

a. *Although* she had not slept much the night before, she continued to work as hard.
b. *Even though* the landlord had lowered the rent, they still could not afford it.
c. *Except that/despite the fact that/in spite of the fact that* he had trouble with one of his classmates, he liked his school.
d. *No matter what* I said, she still left the city.
e. *Whatever* the boss thinks, I will hire this candidate.

3.5.7.1 Internal structure of concessive clauses

We recommend that the grammar writer discuss whether the concessive clauses are in the form of a (free) relative clause. If yes, describe what the possible head nouns are.

3.5.7.2 Manual signs marking subordination in concessive clauses

If concessive clauses contain subordinating morphemes, list them. Note that there may be sign languages where these are fingerspelled.

3.5.7.3 Other markers of subordination in concessive clauses

The grammar writer should indicate whether the verb in the clause shows any properties of subordination such as lack of tense, aspect, or agreement marking.

3.5.7.4 Non-manual markers in concessive clauses

In this section, the grammar writer is advised to:

- List the non-manual markers marking concessive clauses. Also, indicate the spreading domains, and obligatoriness/optionality.
- Identify the function of each non-manual marker associated with concessive clauses, if there is more than one.

– Mention whether these non-manual markers also occur in other types of adverbial clauses. If so, discuss whether the clauses are ambiguous or whether there are ways to differentiate between the two.

3.5.7.5 Position of the concessive clause with respect to the main clause

In this section, we advise the grammar writer to describe the position of the concessive clause with respect to the main clause.

3.5.7.6 Simultaneous expression of the main event and the adverbial clause

Thanks to the means provided by visual modality, that is, the availability of two manual articulators, two events may be expressed simultaneously in sign languages. The grammar writer should check whether this is possible, and if yes, whether one of the events expressed shows any properties of subordination.

3.5.8 Substitutive clauses

Some languages use subordinating morphemes expressing substitution [Semantics – Section 14.2.8] such as *instead of* and *rather than* in English (Thompson et al. 2007 263).

You talk to my mother *instead of* talking to me.

There are other languages that use a construction or a morpheme with the meaning 'in place of'. Similar to *before*-clauses, one can expect a non-finite verb, a morpheme expressing the unrealized nature of the event or a negative marker in the adverbial clause.

3.5.8.1 Internal structure of substitutive clauses

The grammar writer should discuss whether the substitutive clauses are in the form of a (free) relative clause. If yes, describe what the possible head nouns are.

3.5.8.2 Manual signs marking subordination in substitutive clauses

If the substitutive clauses contain subordinating morphemes, list them. Note that there may be sign languages where these are fingerspelled.

3.5.8.3 Other markers of subordination in substitutive clauses

The grammar writer should indicate whether the verb in the clause shows any properties of subordination such as lack of tense, aspect, or agreement marking.

3.5.8.4 Non-manual markers in substitutive clauses

In this section, the grammar writer is advised to:

- List the non-manual markers marking substitutive clauses. Also, indicate the spreading domains, and obligatoriness/optionality.
- Identify the function of each non-manual marker associated with the substitutive clause, if there is more than one.
- Mention whether these non-manual markers also occur in other types of adverbial clauses. If so, discuss whether the clauses are ambiguous or whether there are ways to differentiate between the two.

Note that this type of clause may be marked with a non-manual marker expressing the unrealized nature of the event.

3.5.8.5 Position of the substitutive clause with respect to the main clause

In this section, the grammar writer should describe the position of the substitutive clause with respect to the main clause.

3.5.8.6 Simultaneous expression of the main event and the adverbial clause

Thanks to the means provided by visual modality, that is, the availability of two manual articulators, two events may be expressed simultaneously in sign languages. The grammar writer should check whether this is possible, and if yes, whether one of the events expressed shows any properties of subordination.

3.5.9 Additive clauses

Some languages have subordinating morphemes that express one state of affairs in addition [Semantics – Section 14.2.9] to another (Thompson et al. 2007: 264). These can have meanings such as 'besides' and 'in addition'. Whether or not the clause in question is a subordinate adverbial clause or an independent clause would have to be identified independently.

Besides waking me up in the middle of the night, he accused me of not caring about his feelings.

In the English example above, the non-finite / non-finite [Syntax – Section 3.2.0.4] form of the verb in the adverbial clause – a gerundial form in this case – signals that it is subordinate to the main clause.

3.5.9.1 Internal structure of additive clauses

The grammar writer should discuss whether the additive clauses are in the form of a (free) relative clause. If yes, describe what the possible head nouns are.

3.5.9.2 Manual signs marking subordination in additive clauses

If the additive clauses contain subordinating morphemes, list them. Note that there may be sign languages where these are fingerspelled.

3.5.9.3 Other markers of subordination in additive clauses

The grammar writer should indicate whether the verb in the clause shows any properties of subordination such as lack of tense, aspect, or agreement marking.

3.5.9.4 Non-manual markers in additive clauses

In this section, the grammar writer is advised to:

- List the non-manual markers marking additive clauses. Also, indicate the spreading domains, and obligatoriness/optionality.
- Identify the function of each non-manual marker associated with additive clauses, if there is more than one.
- Mention whether these non-manual markers also occur in other types of adverbial clauses. If so, discuss whether the clauses are ambiguous or whether there are ways to differentiate between the two.

3.5.9.5 Position of the additive clause with respect to the main clause

In this section, we recommend that the grammar writer describe the position of the additive clause with respect to the main clause.

3.5.9.6 Simultaneous expression of the main event and the adverbial clause

Thanks to the means provided by visual modality, that is, the availability of two manual articulators, two events may be expressed simultaneously in sign languages. The grammar writer should check whether this is possible, and if yes, whether one of the events expressed shows any properties of subordination.

3.5.10 Absolutive clauses

An absolutive clause [Semantics – Section 14.2.10] is one which does not have a specific subordinating morpheme expressing the relationship between it and the main clause, but has some sort of marking signalling that it is a subordinate clause. This may be a general subordinator or a non-finite verb form. The relationship between the two clauses is inferred from the context (Thompson et al. 2007: 264).

a. Having talked to her boss about the promotion, she went on vacation feeling relieved.
b. Seeing me in my wedding gown, my father could not restrain his tears.

In the English examples above, even though there is no subordinating morpheme, the adverbial clause is understood to be subordinate because the verb is in the non-finite/gerundial form.

3.5.10.1 Markers of subordination in absolutive clauses

By definition, absolutive clauses are not expected to involve subordinating morphemes with specific meanings. However, the grammar writer should check whether the verb in the clause shows any properties of subordination such as lack of tense, aspect, or agreement marking.

3.5.10.2 Non-manual markers in absolutive clauses

In this section, we advise the grammar writer to:

- List the non-manual markers marking absolutive clauses. Also, indicate the spreading domains, and obligatoriness/optionality.
- Identify the function of each non-manual marker associated with absolutive clauses, if there is more than one.
- Mention whether these non-manual markers also occur in other types of adverbial clauses. If so, discuss whether the clauses are ambiguous or whether there are ways to differentiate between the two.

3.5.10.3 Position of the absolutive clause with respect to the main clause

In this section, the grammar writer should describe the position of the absolutive clause with respect to the main clause.

3.5.10.4 Simultaneous expression of the main event and the adverbial clause

Thanks to the means provided by visual modality, that is, the availability of two manual articulators, two events may be expressed simultaneously in sign languages. The grammar writer should check whether this is possible, and if yes, whether one of the events expressed shows any properties of subordination.

Elicitation materials

A picture or movie description may be used to elicit adverbial clauses.

Needless to say, isolated conditional sentences would be hard to elicit in specifically designed elicitation tasks, and guiding informants to discuss issues which would lead them to produce conditional sentences might result in more frequent and natural use of these constructions.

In one study (Dachkovsky & Sandler 2009), the researchers wrote target sentences in the spoken language, and to avoid the listing effect, they embedded them in mini-discourses in order to provide a controllable context and to minimize extraneous associations that a signer might have had in his/her mind. In order to reduce both artificiality and interference from the spoken language, they asked the informants to read the discourse and the target sentence, internalize its meaning, and create a corresponding sign language sentence, which they conveyed to another signer.

In another study (Checchetto et al. 2011), two signers were involved in explaining the rules of a game such as chess. One signer does not know or at least is asked to pretend not to know the rules. The other one explains the rules. They come up with sentences such as 'If you do this, then you win'.

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3.6 Comparative clauses

3.6.0 Definitions and challenges

3.6.0.1 What is a comparative clause?

In semantic or cognitive terms, comparison [Semantics – Section 8.1] can be defined as a mental act by which two entitites are assigned a position on a scale. If the positions on the scale are different, then we speak of comparison of inequality, which finds its linguistic encoding in comparative constructions. If they are the same, we speak of comparison of equality, which is is realized as equative constructions.

The comparative construction essentially involves three things: a predicative scale, which is usually encoded as a gradable predicate such as 'tall', and two entities: the first term of comparison and the second term of comparison. They can be either simple (two NPs) or complex.

3.6.0.2 Types of comparatives

Typologically, there are four types of comparative constructions attested in the world's languages (Stassen 2013; also see Dixon 2008a). Since very little is known about comparatives in sign languages, the grammar writer is strongly encouraged to refer to the typology briefly sketched below in order to describe the relevant phenomena.

(i) Exceed comparatives

In 'exceed' comparatives, the comparison is established by a verb expressing a difference on a scale, such as 'exceed' in English. The first term of comparison is typically the subject of the verb, while the second term of comparison is its object. The comparative predicate appears as a secondary predicate on these arguments. An example from Duala (Cameroon) is given below.

Nin	ndabo	e	kolo	buka	nine.
this	house	it	big	exceed	that

'This house is bigger than that.'

(Duala, Ittman 1939: 187, cited in Stassen 2013)

In the example above, *nin ndabo* 'this house' is the first term of comparison and the subject of the verb *buka* 'exceed', *nine* 'that' is the second term of comparison, and *kolo* 'big' is the comparative predicate.

(ii) Location comparatives

In location comparatives, the second term of comparison is typically introduced by some preposition or other marker expressing a spatial meaning, which can either mark an origin ('from'), a target ('to'), or a location ('at'). The comparison is directly

established through this spatial relation. An example from Mundari (India) is given below.

sadom-ete hati maranga-e
horse-from elephant big-3SG.PRES
'The elephant is bigger than the horse.'
(Mundari, Hoffmann 1903: 110, cited in Stassen 2013)

(iii) Conjoined comparatives
In so-called conjoined comparatives, the comparative construction usually consists of two structurally independent clauses, one of which contains the first term of comparison, and the other containing the second term of comparison. Furthermore, the two clauses show a structural parallelism, in that the two terms of comparison have the same grammatical function in the two conjoined clauses. If, for example, the first term of comparison is the grammatical subject in its clause, the second term of comparison will also have subject status in its clause.

The direction of the comparison, that is, whether it is a superiority ('more') or an inferiority ('less') comparison, arises from the meaning of the two predicates employed. An example is given below from Amele, a language spoken in Nort-Eastern Papua New Guinea.

Jo i ben jo eu nag
house this big house that small
'This house is bigger than that house.'
(Amele, Roberts 1987: 135, cited in Stassen 2013)

(iv) Subordinated comparatives
In subordinated comparatives, the comparative construction is biclausal as well, but the comparative clause is subordinate, not conjoined to the main clause. The comparison is provided by a modifier of the noun/adjective/adverb that is compared, such as *more*, or *less*. In spoken languages, the comparative clause is usually introduced by a specific particle or complementizer, and the comparative clause can be either full-fledged or elided. The English *than*-comparative is an instance of this subordinated comparative.

John is taller than Mary (is).

In this type, the comparative clause can be shown to block extraction and to behave in many respects like a (free) relative clause [Syntax – Section 3.4.0.2].

In many languages, comparatives of equality, or equatives, differ greatly from comparatives of inequality. In English, for example, they display a correlative structure: a biclausal construction with a correlative word establishing the comparison. An example is given below.

John is **as** tall **as** Mary (is).

3.6.0.3 Comparatives in sign languages

As we said above, very little is known about comparatives in sign languages. A partial exception is LIS, where a comparative construction has been described by Aristodemo & Geraci (2015). An example of such a construction is given below.

MARIA TALL GIANNI (TALL)-SCALE-MORE
'Gianni is taller than Maria.' (LIS, Aristodemo & Geraci 2015)

Here the comparative morpheme is incorporated into the predicate, which is thus repeated twice in what looks like a conjoined comparative: there seem to be two structurally independent clauses, one of which contains the first term of comparison, and the other containing the second term of comparison. Furthermore, the two clauses show a structural parallelism, in that the two terms of comparison have the same grammatical function. The direction of the comparison, that is, whether it is a superiority ('more') or an inferiority ('less') comparison, arises from the meaning of the two predicates employed (with the possible complication of the morpheme incorporation).

Another exception is TİD, where comparison can also be expressed through a conjoined comparative. Interestingly, however, this is not the only option in that sign language. TİD is reported to also use the locative strategy, as illustrated below.

IX_{3a} RED COAT$_{3a}$ IX_{3b} BLACK COAT$_{3b}$ $_{3a}\text{IX}_{3b}$ EXPENSIVE
'The black coat is more expensive than the red coat.'
(TİD, Kaşıkara, Özsoy & Özparlak 2015)

Here the compared adjective EXPENSIVE is only expressed once, while the two terms of comparison are located in the signing space. Comparison is expressed by moving an indexical sign ($_{a}\text{IX}_{b}$) from the location of the first argument to that of the second term of comparison.

3.7 Comparative correlatives

3.7.0 Definitions and challenges

Comparative correlatives are biclausal constructions believed to be syntactically coordinated and semantically involving subordination of the first clause to the second clause. Two patterns of comparative correlatives are attested across languages: a symmetric pattern featuring the presence of a modifier, such as *more*, in both clauses (a), and an asymmetric pattern where the verb is reduplicated in the first clause but not in the second clause where an optional marker of quantity is present; the latter strategy is illustrated by the Japanese example in (b), where *youku* functions as the optional marker of quantity.

a. The more Gianni runs, the more he sweats.
b. Hashire-ba hashiru-hodo, Gianni-wa (youku) taberu
run-ba run-DEGREE, Gianni-NOM (a lot) eat
'The more Gianni runs, the more he eats.' (Japanese, Geraci 2007: 69)

The interpretation of comparative correlatives is very similar to conditional clauses [Semantics – Section 14.2.1] / conditional clauses [Syntax – Section 3.5.1], however, unlike conditional clauses, by changing the order of the two clauses, the interpretation of the structure changes accordingly.

LIS displays both patterns of comparative correlatives: in the symmetric pattern, the equivalent of the English comparative correlative in (a) is produced through the reduplication of the verbs both in the first and in the second clause, and the same non-manuals mark both clauses, as shown in (c).

5_3.7.0_1_LIS_gianni run-reduplication, sweat-reduplication

squint squint
re re
c. GIANNI RUN-reduplication, SWEAT-reduplication
'The more Gianni runs, the more he sweats.' (LIS, Geraci 2007: 52)

In the asymmetric variant, the verb is reduplicated only in the first clause while the second clause displays the presence of the verbal modifier MORE, and the non-manual markers are produced only over the first clause, as shown in (d).

re
squint
d. GIANNI RUN-reduplication, SWEAT MORE
'The more Gianni runs, the more he sweats.' (LIS, Geraci 2007: 52)

We advise the grammar writer to verify the presence of one or more variants of comparative correlatives in the target sign language. He/she should also be aware that comparative correlatives might be sensitive to the type of predicate or modifier involved in the construction. In both variants of comparative correlatives displayed by LIS, while atelic verbs trigger reduplication of the verb (c), stative verbs yield a different verbal morphology, namely intensification, whereby the movement of the sign for the predicate or modifier is articulated slower and more tensed (e,f).

5_3.7.0_2_LIS_sea deep-intensification, cold increase-reduplication

e. SEA DEEP-intensification, COLD INCREASE-reduplication
'The deeper the sea, the colder the water.'
f. HAIR LONG-intensification, TIME DRY MORE
'The longer the hair, the more time to dry them.' (LIS, Geraci 2007: 71)

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Chapter 4 The noun phrase

4.0 Introduction

4.0.1 What is a noun phrase?

A **noun phrase** is a single noun [Lexicon – Section 3.1], a pronoun [Lexicon – Section 3.7] or a group of words containing a noun or a pronoun as its head that function together as a constituent [Syntax – Section 2.0.1] of a sentence. The typical syntactic function of a noun phrase in a sentence is to express the subject, direct object, indirect object of the verb or the object of a preposition/postposition [Lexicon – Section 3.8]. As the argument of the predicate, each of the noun phrases bears the relevant semantic relation by which it is associated with the verb of the sentence.

With respect to the internal structure of a noun phrase, the head noun can be modified by a determiner [Lexicon – Section 3.6], one or more adjectives [Lexicon – Section 3.4], quantifiers [Lexicon – Section 3.10.2], or a numeral [Lexicon – Section 3.10.1]. A noun phrase can also contain a complex modifier called a relative clause / relative clause [Syntax – Section 3.4]. In a noun phrase the head noun can be modified with any one or more or none of these constituents. The following is an example of a noun phrase in English, where the only obligatory constituent is the head noun *friends*.

some of our old *friends* who are not living in this town anymore

Nouns are typically classified as proper nouns (or proper names) [Lexicon – Section 3.1.2], e.g. *John, Pierre, Jane,* or common nouns [Lexicon – Section 3.1.1], e.g. *book, pencil, house, boy,* which may behave differently with respect to the type of modifiers they take. Common nouns are also further classified as count nouns, for example, *book, pencil, student,* versus mass nouns, for example, *water, air, electricity,* where the type of the noun determines number marking. Count nouns are those that can have singular and plural forms. Mass nouns do not typically have plural forms.

4.0.2 Further distinctions

Noun phrases are syntactic domains in which not only the head noun but also other constituents such as determiners and adjectives can carry marking for grammatical features such as gender, case, and number. This is usually referred to as agreement / agreement [Lexicon – Section 3.3.4] or concord. Sign languages generally differ from spoken languages significantly with respect to these morphosyntactic properties in that while agreement/concord is observed in many spoken languages, sign languages have typically been observed to lack it.

4.0.3 Methodological challenges

One of the challenges in describing the noun phrase in a sign language is to determine whether a sequence of a noun and a potential modifier such as PICTURE BEAUTIFUL/BEAUTIFUL PICTURE constitutes a noun phrase such as 'beautiful picture' or a clausal constituent with a subject and a predicate such as 'the picture is beautiful.' Determining the functions of the prenominal and postnominal modifiers (as attributive / attributive [Lexicon – Section 3.4.1] versus predicative / predicative [Lexicon – Section 3.4.2]) will help identify noun phrases. In the following ASL examples, for instance, the adjective OLD is interpreted as an attributive adjective in the prenominal position in (a), BEAUTIFUL as a predicative adjective in the postnominal position in (b).

a. [POSS_1 OLD FRIEND]
'my old friend' (ASL, MacLaughlin 1997: 196)

b. [BIG RED BALL IXadv_i] BEAUTIFUL
'The big red ball over there is beautiful.' (ASL, MacLaughlin 1997: 193)

For the sign language under investigation, the grammar writer needs to determine whether there is a difference in the interpretation of the prenominal and postnominal structures.

4.1 Determiners

4.1.0 Definitions and challenges

4.1.0.1 What is a determiner?

Determiners are a class of functional elements that modify the noun. Being functional, determiners lack descriptive content, represent a closed class, and sometimes can be unexpressed. In this section, determiners are categorized into two groups: articles and demonstratives.

Articles are elements whose function is to provide information on referentiality [Pragmatics – Chapter 2] (i.e. the relation between the noun and what the noun refers to). In traditional grammar books, articles are characterized as either definite or indefinite. Definite articles (prototypically *the* in English) are used when the interlocutors can identify the referent(s) of the nominal expression. Definite [Pragmatics – Section 1.2] articles can be used for three different purposes (Lyons 1999): i) to refer back to something or someone that has been previously mentioned in the discourse (e.g. 'The cat was feeling hungry', with the cat being already introduced in the discourse); ii) to refer to something or someone that is easily identifiable in the extra-linguistic context (e.g. 'Could you pass me the pen?', with the pen being visible to the interlocutors); iii) to refer to a referent that is unique in its genre (e.g. 'the Earth,' or 'the driver' when talking about a bus trip). Indefinite [Pragmatics – Section 1.3] articles (prototypically *a*/*an*), on the other hand, are used when the interlocutor cannot identify the referent(s) of the nominal expression. Indefinite articles are used to introduce new information, specifically new referent in the discourse (e.g. 'Yesterday I saw a cat,' with the cat being a first-mention entity).

Similar to articles, demonstratives provide information on referentiality in that they are intrinsically definite. In addition to that, they convey a deictic [Pragmatics – Section 1.1] / deictic interpretation. This means that in order to interpret demonstratives, it is necessary to consider the spatio-temporal context in which they are expressed. Demonstratives encode the deictic features [± proximal] and [± distal] which help the interlocutor locate the corresponding referent(s) with respect to the speaker's spatiotemporal coordinates. Roughly, [± proximal] means close to the speaker and [± distal] means far. This can be intended as a spatial relation (e.g. 'this book' is closer to the speaker than 'that book') or a temporal relation (e.g. 'this month' is closer to the utterance time than 'that month'). Some languages distinguish between [± proximal] with respect to the speaker and [± proximal] with respect to the interlocutor, in addition to [± distal]. As for sign languages, the use of the spatial dimension as a gradient continuum allows sign languages to be extremely precise in conveying deictic specifications.

4.1.0.2 Methodological challenges

In this section, we classify determiners as articles and demonstratives. Cross-linguistically, these two categories show an important distributional

difference: demonstratives are consistently found in all of the world's languages, whereas articles are not. Considering definite articles, there are several possibilities: they can constitute a distinct word class; they can be homophonous with demonstratives so that the two classes are not distinguishable; or they may be absent, leaving nouns unspecified for definiteness (Dryer 2013a). With respect to indefinite articles, the options are the following: they may constitute a distinct word class; they can be homophonous with cardinal 'one' so that the two types of elements are not distinguishable; or they may be absent, leaving nouns unspecified for indefiniteness (Dryer 2013b).

Importantly, demonstratives and articles should not be considered as being in complementary distribution since it might be the case that they may co-occur (Giusti 1997). In this respect, cross-linguistic variation is found, as shown below (Alexiadou, Haegeman & Stavrou 2007: 106).

a. *This the book
a'. *The this book (English)
b. Ez a haz (Hungarian)
this the house
c. Afto to vivlio (Greek)
this the book (Alexiadou, Haegeman & Stavrou 2007: 106)

The grammar writer should investigate whether an article and a demonstrative can co-occur within the same noun phrase.

In sign language linguistics, determiners are frequently identified as part of pointing signs [Lexicon – Section 1.2.2] / pointing signs. What the grammar writer should pay particular attention to is the linguistic function associated with these signs. As a matter of fact, in many sign languages, pointing signs are multi-functional elements in that they can function not only as articles or demonstratives [Lexicon – Section 3.7.1], but also as personal pronouns [Lexicon – Section 3.7.2] and locatives [Lexicon – Section 3.7.1] (Pfau 2011). In some cases, they might be used as possessive [Lexicon – Section 3.7.3] modifiers, too. Therefore, it may be hard to identify real determiners.

Another analytical challenge of studying determiners in sign languages is that both manual and non-manual components must be taken into consideration. As similarly noticed for negation [Syntax – Section 1.5], in some cases, a determiner's function can be conveyed even though no corresponding manual sign is produced. In such cases, determiners can be detected by looking at specific non-manual markers, such as eye gaze and head tilt (Neidle & Nash 2012).

4.1.1 Articles

Unlike demonstratives, articles are determiners that cannot be used in isolation or occur as an answer to a question. This is shown in the examples below (Alexiadou, Haegeman & Stavrou 2007: 106).

a. I like the *(book). (English)
b. I like that. (English)
c. Ho visto il *(ragazzo).
have.1SG see.PTCP the boy
'I have seen the (boy).' (Italian)
d. Ho visto quello.
have.1SG see.PTCP that
'I have seen that.' (Italian)

In order to study the syntactic behavior of articles, the grammar writer should consider word order issues (i.e. the distribution of the article with respect to the noun), simultaneous manual articulation (i.e. the use of both manual articulators), and the role of non-manual marking.

4.1.1.1 The position of the article

Considering word order within the noun phrase, some different distributional patterns may emerge in the sign language under investigation.

The article may appear at the beginning of the noun phrase, as shown in the example in ASL below.

IX_{3a} BOY LIKE CHOCOLATE
'The boy likes chocolate.' (ASL, Neidle et al. 2000: 89)

Another option is to produce the article in postnominal position. This happens, for example, in LIS.

FURNITURE_{a} ANTIQUE IX_{3a} BROKE
'The antique furniture is broken.' (LIS, Bertone 2009: 8)

We also expect the possibility to find two co-indexed pointing signs, one before and one after the noun, even if this does not seem to be a common option. Although no example from a sign language is available yet to the best of our knowledge, the following illustrates a potential example:

IX_{3a} TEACHER IX_{3a} ARRIVE
'The teacher arrived.'

The grammar writer should verify the nature of both elements in order to assess whether they both function as articles.

4.1.1.2 Simultaneous manual articulation

Another aspect that the grammar writer should bear in mind is the case of simultaneous articulation in which the noun and its modifiers (e.g. adjective, cardinal number,

etc.) are expressed by the dominant hand (d.h.) and the article by the non-dominant hand (n.h.). In the LIS example below, the noun and the article are articulated simultaneously.

d.h. FURNITURE$_a$ ANTIQUE
n.h. IX$_{3a}$----
'The furniture is antique.' (LIS, Bertone 2009: 8)

4.1.1.3 Non-manual marking

Definite and indefinite articles may be accompanied by eye gaze (eg) and wandering eye gaze in some sign languages. These non-manual markers accompanying the definite article may spread solely over this item, or over the entire noun phrase.

a. eg$_{3a}$
IX$_{3a}$ MAN$_a$
'the/that man' (ASL, Bahan 1996: 268)

b. eg$_{3a}$
IX$_{3a}$ MAN$_a$
'the/that man' (ASL, Bahan 1996: 269)

Similarly to what happens with definite articles, the markers co-occurring with indefinite articles may spread solely over this item, or over the entire noun phrase.

a. wandering gaze
SOMETHING/ONE WOMAN
'some/a woman' (ASL, Bahan 1996: 273)

b. wandering gaze
SOMETHING/ONE WOMAN
'some/a woman' (ASL, Bahan 1996: 273)

4.1.1.4 Articles expressed by non-manual marking only

In some cases, there may be no manual sign expressing the article but the function of an article may be expressed by non-manual markers *in lieu* of the corresponding manual sign. This is possible both with the definite and indefinite interpretation, as illustrated in the two HKSL examples below.

a. eg$_{3a}$
FEMALE-KID COME
'that/the girl is coming' (HKSL, Tang & Sze 2002: 300)

b. eg$_{3a}$
MALE CYCLE
'a man is cycling' (HKSL, Tang & Sze 2002: 302)

In HKSL, the definite and the indefinite interpretations are associated with different eye gaze patterns. When the noun has a definite reading, the eye gaze must point toward the locus of the referent. When the noun has an indefinite reading, the eye gaze points toward the addressee, so that the signer keeps eye contact with him or her. The grammar writer should verify whether articles can be expressed non-manually in the language under investigation.

4.1.2 Demonstratives

4.1.2.0 Definitions and challenges

In many sign languages, demonstratives and articles are phonologically very similar. They are both realized as pointing signs and it is not easy to draw a clear line between the two categories. This is not an accident since it probably reflects a diachronic process in which demonstratives gradually lose their deictic features and undergo phonological weakening resulting in the emergence of definite articles. This is well-attested in spoken languages: Latin demonstrative *ille*, for example, led to definite articles in Italian (*il*), French (*le*), and Spanish (*el*). The grammar writer is referred to Pfau (2011) for a discussion on the diachronic evolution of pointing signs.

Demonstratives do not display the same distributional restrictions as articles. In fact, a demonstrative can be combined with a noun (transitive usage) or can be used on its own (intransitive usage). These two distributional patterns are shown in the examples below (Alexiadou, Haegeman & Stavrou 2007: 95).

a. This (English)
b. This book (English)
c. Dat
   'that' (Dutch)
d. Dat boek
   'that book' (Dutch)

4.1.2.1 The position of the demonstrative

Considering the distribution of demonstratives vis-à-vis the noun, we expect in principle three different options. The demonstrative may precede the noun (a), follow it (b), or it can be doubled (c), so that it appears both before and after the noun. The three patterns are exemplified below.

a. IX-DEM BOOK EXPENSIVE
   'That book is/was expensive.' (NGT, Brunelli 2011: 56)
b. IX_1 DECIDE BOOK IX-DEM BUY
   'I decided to buy that book.' (DGS, Pfau 2011: 149)
c. IX-DEM_i BOOK NEW TWO IX-DEM_i MINE
   'These two new books are mine.' (LIS, Bertone 2009: 23)

The grammar writer should check the position of the demonstrative with respect to the noun. As for doubling, caution should be used in order to distinguish it from the reinforcer construction.

4.1.2.2 Demonstrative reinforcer construction

Some languages allow for the demonstrative reinforcer construction. This construction contains three items: a noun, a demonstrative, and a reinforcer, which is a locative element added to provide additional information about distance such as 'here' and 'there'. This construction has been observed in a number of spoken languages (Alexiadou, Haegeman & Stavrou 2007: 117–118).

a. Den här mannen
'the here man' (Swedish)
b. Ce livre-là
'that book there' (French)
c. This guy here (non-standard English)

The demonstrative reinforcer construction has also been observed in some sign languages. In the ASL example below, the first pointing sign functions as a demonstrative, whereas the second one functions as a locative adverb (Bahan et al. 1995).

top
IX WOMAN IX ARRIVE EARLY
'That woman (there), (she) arrived early.' (ASL, Bahan et al. 1995: 3)

The second pointing sign is analyzed as the reinforcer because the path length of this sign can be modified to iconically show proximity and distance. Crucially, this articulatory modification is not possible with the first pointing sign of the construction, which is analysed as the demonstrative, as shown below.

a. IX_{i} MAN $\text{IX}_{[+\text{DISTAL}]}$ KNOW PRESIDENT
'The/that man over there knows the president.'
(ASL, Neidle & Nash 2012: 270)
b. *$\text{IX}_{[+\text{DISTAL}]}$ MAN IX_{i} KNOW PRESIDENT

4.1.2.3 Non-manual marking

The ostensive nature of demonstratives may correlate with eye gaze directed in the same direction of the pointing sign. Typically, eye gaze, head posture, and eyebrows may provide additional information on how far the referent is with respect to the signer. The non-manual markers accompanying the demonstrative may spread solely over this item, or over the entire noun phrase.

4.1.2.4 Anaphoric usage

Demonstratives are not always deictic [Pragmatics – Section 1.1], and hence do not always need to rely on the extra-linguistic context. In some cases, they refer to an entity previously mentioned in the linguistic context. This entity functions as an antecedent and demonstratives are used anaphorically [Pragmatics – Chapter 2]. In some languages, the deictic and anaphoric function of demonstratives may be conveyed by different items and may display different distributional patterns.

This is the case in ASL, where the deictic demonstrative is a pointing sign and the anaphoric demonstrative is realized as a Y-shaped sign (THAT). Differently from its deictic counterpart, ASL anaphoric demonstrative does not often occur before the noun (Neidle & Nash 2012).

a. IX MAN
'the/that man' (deictic use) (ASL, Neidle & Nash 2012: 270)

b. ??THAT MAN
'that man' (anaphoric use) (ASL, Neidle & Nash 2012: 271)

Due to possible distributional differences, deictic and anaphoric demonstratives should be investigated separately.

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4.2 Possessive phrases

4.2.0 Definitions and challenges

The crucial components of a possessive noun phrase are the *possessor* [Semantics – Chapter 11], (someone who possesses something) and the *possessed* (often referred to as *possessum* or *possessee* as well) as in the following example from English:

John's	car
possessor	possessed

The most obvious interpretation of the noun phrase *John's car* is the car that John owns but other interpretations that do not involve ownership are also possible (the car that John picked for his daughter, the car that John wants to buy, the car that John rented etc.).

All languages distinguish syntactically between attributive and predicative possession constructions (Heine 1997). An NP like *John's car* exemplifies attributive possession, that is, a relationship between the possessor and the possessed within an NP. By contrast, predicative possession is expressed by a full clause (e.g. *This car is John's / his, John has a car*, *The car belongs to John*). This section only describes attributive possessive phrases.

Many languages mark the relation between the possessor and the possessed in some way, for example, by possessive markers, agreement markers or case suffixes. Languages may mark the possessor, the possessed, or both (Croft 2002).

4.2.1 Ways of expressing the possessive relation in the noun phrase

The following ways of expressing the possessive relation [Semantics – Section 11.1] in a possessive noun phrase have been observed in the sign languages studied so far:
(i) with attributive possessive pronouns
(ii) with a possessive marker/linker
(iii) with juxtaposition of the possessor and the possessed

These means are described in detail in the following sections. The grammar writer should investigate which of these means are attested in the sign language studied.

4.2.1.1 Attributive possessive pronouns

In possessive noun phrases, the possessor may be expressed by a pronominal element such as *my, your, his, our,* etc., as in 'my car'. These elements are called either (attributive) possessive pronouns, possessive determiners, or possessive adjectives. Note that they are different in meaning and function from predicative possessive pronouns such as *mine, yours, his, ours,* etc. as in 'This car is mine'. Since this section is only on (attributive) possessive pronouns, when we use the term possessive pronoun, we will be referring to pronouns such as *my, your, his, our,* etc.

Possessive pronouns in sign languages are directional like personal pronouns but they usually have a handshape that differs from the pointing [Lexicon – Section 1.2.2] handshape of personal pronouns (Cormier 2012).

Most sign languages have a set of pronouns that express the possessor. A small number of sign languages studied so far have been found to lack such pronouns (Perniss & Zeshan 2008). These sign languages use personal pronouns instead.

The grammar writer should investigate whether the language studied has a set of possessive pronouns different from the set of personal pronouns [Lexicon – Section 3.7.2] and also identify the different distributional possibilities of possessive pronouns within the noun phrase.

4.2.1.2 Possessive markers

Languages may use special markers to express the possessive relation between nouns/noun phrases in a possessive phrase. The possessive *-s* in English (as in *the old man's house*) is an example of possessor marking with a bound morpheme attached to the possessor.

In some sign languages, the possessive phrase may contain a sign that seems to mark the relation between the possessor and the possessee. In the following example this sign is glossed as POSS.

a. BRUNO POSS BOOK (ASL, Abner 2012: 24)

These possessive markers may occur between the possessor and the possessed as in the example (a) above, but they can also occur before the possessor as in (b) below:

b. POSS BRUNO BOOK (ASL, Abner 2012: 24)

The sign language studied may have more than one such marker. For ASL, two different signs have been observed. One is glossed as POSS, as in (a) above, and the other is a borrowing from English, and is glossed as APOSTROPHE-S, as in the example (c) below:

c. BRUNO APOSTROPHE-S BOOK (ASL, Abner 2012: 24)

The following is a similar example from LSC.

d. BOOK DE TEACHER
'the teacher's book' (LSC, Quer & GRIN 2008: 36)

The possessive marker (or 'linker') is glossed as DE, whose relation to the Spanish/Catalan preposition *de* is unclear (Quer & GRIN 2008).

The grammar writer should investigate the possibilities of possessive markers in the language studied.

4.2.1.3 Juxtaposition

Researchers have observed that in some sign languages it is possible to have a possessive noun phrase with only the possessor and the possessed but no possessive marker.

BRUNO BOOK
'Bruno's book.' (ASL, Abner 2013: 129)

Juxtaposition structures and structures with a possessive marker such as POSS have been reported to have different semantics in ASL.

4.2.2 The position of the possessive pronoun

Regarding the position of the possessive pronoun, in many languages the preferred order is possessor-possessed, but other word orders are also possible in some languages. The following examples show that possessive pronouns may precede or follow the possessed noun or they can be reduplicated.

a. POSS_1 COMPUTER
'my computer'
b. COMPUTER POSS_1
'my computer'
c. POSS_1 COMPUTER POSS_1
'my computer' (ASL, Chen Pichler & Hochgesang 2008: 217)

The grammar writer should investigate different possible word orders.

4.2.3 Agreement with the possessor

Possessive pronouns in sign languages show spatial agreement [Lexicon – Section 3.3.4] in much the same way as personal pronouns. In some sign languages like ASL

possessive pronouns display manual as well as non-manual agreement (MacLaughlin 1997; Neidle et al. 2000). Manual agreement is seen when a possessive pronoun is signed in the location of the possessor, whereas non-manual agreement involves a head tilt (towards the possessor) and eye gaze (in the direction of the possessed). The grammar writer should be aware of this possibility for the sign language he/she is working on.

4.2.4 Agreement with the possessed

In some spoken languages the form of the possessor inside a noun phrase varies according to the grammatical features (gender and number) of the possessed (Corbett 2006: 47). In ASL, for example, research has shown that agreement with the possessed may be established through eye gaze.

4.2.5 Possessive phrases with the possessed elided

Although possessive phrases usually occur with a possessed noun, this noun can be omitted as in the following examples:

a. $_{a}$BRUNO POSS$_{3a}$
'Bruno's' ('a [thing] of Bruno's') (ASL, Abner 2013:129)

b. POSS$_{3a}$
'his/hers' ('a [thing] of [his/hers]')

The grammar writer should check whether this is possible in the language studied.

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4.3 Numerals

4.3.0 Definitions and challenges

4.3.0.1 What is a numeral?

Generally speaking, when the term 'numeral' is used in the nominal domain, it indicates an item specifying the number of the entities referred to.

At closer inspection, numerals can be classified according to three main categories: cardinals (which answer the question 'how many?'), ordinals (which answer the question 'in what order?'), and distributive numerals (which answer the question 'how many each?'). The grammar writer should first identify cardinals and then ordinals and distributive numerals which are usually derived from cardinals. Notice that not all languages have a distinct word class for ordinals and distributives (Dryer et al. 2013).

In particular, cardinal numerals are used to count entities and also as a strategy to express plurality [Semantics – Chapter 9]. In some sign languages plurality is expressed via noun reduplication [Phonology – Section 3.3.1]. However, in some sign languages (e.g. DGS), the two strategies, namely, modification by cardinal numerals and noun reduplication, are not compatible. In others (e.g. ESL), the presence of the numeral does not have a blocking effect over noun reduplication.

a. FIVE BOOK
'five books' (DGS, Steinbach 2012: 120)

b. *FIVE BOOK++
'five books' (DGS, Steinbach 2012: 120)

c. APPLE BIG FOUR
'four big apples' (ESL, Miljan 2003: 214)

d. CUP+++ FOUR
'four cups' (ESL, Miljan 2003: 214)

4.3.0.2 Numerals and number

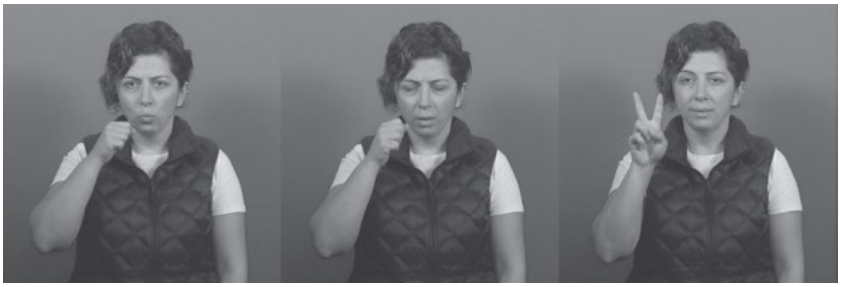
In the investigation on syntactic phenomena concerning the nominal domain of a language, it is important not to confuse two similar terms, namely numeral and

number. Numerals express a numerical quantification (e.g. 'two', 'seven', 'twenty-six'), whereas number marks count distinctions (e.g. singular, plural, dual, trial) on nouns, adjectives, determiners, etc.

4.3.0.3 Methodological challenges

Sometimes it may be difficult to determine whether a numeral co-occuring with a noun modifies it or whether it has a predicative function. Prosodic clues may help identify the construction. It has been noticed in TİD, for instance, that the numeral and the noun can be separated by a prosodic break, namely a head nod or an eye blink (Zwitserlood et al. 2012), as in (b). In this case, the two elements are not contained in the same syntactic constituent (as in (a)) and the numeral is predicative.

a. FOUR CUP
'four cups'



eyeblink
headnod
b. CUP TWO
'of cups, there are two'

(TİD, Zwitserlood et al. 2012: 1648)

Therefore, non-manual markers may help the grammar writer to determine whether the numeral is included in the noun phrase or not.

This section discusses the distribution of numerals, focusing on the case of cardinals since this type of numerals has received the most attention in the literature. Therefore, the two terms will hereafter be used interchangeably.

In order to study the syntactic behavior of cardinals, the grammar writer should consider several aspects: word order issues (i.e. the distribution of the cardinal vis-à-vis the noun), the possibility to have cardinals included in floating constructions, the distinction between definite and indefinite reading, phenomena of numeral incorporation, the role of the prosodic contour, and cardinals included in Measure Phrases.

4.3.1 The position of the numeral

In principle, cardinals can be found in three distributional patterns: i) they may precede the noun, as in NZSL, shown in (a); ii) they may follow the noun, as in LSQ, shown in (b); iii) they can be repeated so that they sandwich the noun, as it sometimes happens in VGT, shown in (c).

a. TWO LECTURER
'two lecturers' (NZSL, Wallingford 2008: 12)

b. STUDENT THREE
'three students' (LSQ, Bouchard & Parisot 2004)

c. TWO MONKEY TWO
'two monkeys' (VGT, Heyerick et al. 2010)

4.3.2 Floating numerals

Many languages are known to have constructions with floating quantifiers [Syntax – Section 4.4.2]. In these constructions a quantifier such as *all*, *both*, *each* is separated from the rest of the noun phrase, as shown in the example below:

The children have all read the books. (English)

In some languages, numerals may enter a floating construction similarly to quantifiers. In the following Japanese example, the numeral 'two' modifies its noun phrase 'student' even though another constituent 'office' occurs in-between.

Gakusei-ga	ofisu-ni	huta-ri	ki-ta.
student-NOM	office-to	two-CL	come-PST

'Two students came to the office.' (Japanese, Miyagawa 1989: 43)

This construction has been found in a sign language as well. In ASL, a numeral can be stranded when the noun phrase it modifies is topicalized [Pragmatics – Section 4.2] (Boster 1996).

top
BOOK I WANT THREE
'I want three books.' (ASL, Boster 1996: 159)

However, it is not possible to topicalize the numeral on its own, as in the following example.

top
*THREE I WANT BOOK
'I want three books.' (ASL, Boster 1996: 159)

If the noun phrase contains an adjective, it will accompany the noun rather than the stranded quantifier as shown in these examples:

a. top
RED BOOK I WANT THREE
'I want three red books.' (ASL, Boster 1996: 170)

b. top
* BOOK I WANT THREE RED
(Intended: 'I want three red books.') (ASL, Boster 1996: 170)

The grammar writer should check if these options are available in the language under investigation.

4.3.3 Definite and indefinite reading

In the study on the distribution of numerals, the grammar writer should verify the semantic interpretation of numerals. If they are associated with first-mentioned referents (i.e. entities that have not yet been introduced into the discourse), they receive an indefinite [Pragmatics – Section 1.3] / indefinite reading. If they are associated with already-mentioned referents (i.e. entities that have already been introduced into the discourse and can be identified by the interlocutor), they receive a definite [Pragmatics – Section 1.2] / definite reading.

In some languages, this semantic distinction corresponds to different distributional patterns. For example, in Shupamem, numerals with indefinite interpretation are prenominal, whereas numerals with definite interpretations follow the noun and trigger the presence of an obligatory agreement marker.

a. pɛʔ pón
two child.PL
'three books' (Shupamem, Vázquez-Rojas 2011: 235)

b. pón pí pà:
child.PL AGR two
'the two children' (Shupamem, Vázquez-Rojas 2011: 235)

The fact that the position of the numeral vis-à-vis the noun can be affected by information structure has also been reported in sign language research. In particular, it has been noticed that in LIS when numerals are associated with discourse-new information (i.e. indefinite reading), they can appear either before or after the noun. When they convey discourse-old information (i.e. definite reading), they must appear in postnominal position (Mantovan, Geraci & Cardinaletti 2014).

TWO CHILD
'two children'

CHILD TWO
'two children/the two children'

(LIS, Mantovan, Geraci & Cardinaletti 2014: 115–116)

The two cases might be distinguished also by different non-manual markers. This is the case in LIS, where cardinals with indefinite reading are usually accompanied by backward-tilted head and raised eyebrows, whereas those with definite reading are compatible with squinted eyes, lowered eyebrows, and chin down.

4.3.4 Numeral incorporation

In some special cases, it is not possible to determine the position of the cardinal with respect to the noun because the two signs come together to form a single sign. Specifically, the hand configuration of numerals (usually from 1 to 5, in some cases from 1 to 10) combines with movement, location, and orientation of a noun root. This complex phenomenon is an instance of simultaneous morphology and is known as numeral incorporation.

Numerals cannot be combined with any type of noun root. The signs which can undergo numeral incorporation are usually nouns indicating temporal information (e.g. HOUR, WEEK, MONTH) and pronouns.

a. TWO-HOUR
'two hours' (DGS, Steinbach 2012: 122)

b. TWO-YOU
'the two of you' (DGS, Steinbach 2012: 122)

Other signs that can be modified in order to accommodate numeral incorporation are classifiers.

THREE-HIGHWAY
'three lane highway' (ASL, Jones 2007: 87)

4.3.5 Measure Phrases

Cardinals might show a special distributional pattern when included in Measure Phrases (e.g. 'three weeks'). Measure Phrases are constructions containing a noun referring to a measure of time, capacity, weight, length, temperature, or currency.

For example, in LIS, cardinals within Measure Phrases consistently precede the measure noun showing a different pattern with respect to other cardinals.

a. FIVE MONTH
'five moths' (LIS, Mantovan, Geraci & Cardinaletti 2014: 115)
b. FOUR-HUNDRED METER
'four hundred meters' (LIS, Mantovan, Geraci & Cardinaletti 2014: 115)

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4.4 Quantifiers

4.4.0 Definitions and challenges

4.4.0.1 What is a quantifier?

A quantifier is an expression that identifies the number or amount of the set denoted by the noun it modifies. The following are some of the quantifiers / quantifiers [Lexicon – Section 3.10.2] in English: *no, some, both, few, a few, several, enough, many, most, each, every, all,* and numeral [Lexicon – Section 3.10.1] quantifiers such as *two, three*. Since Section 4.4. describes numerals, in this section we concentrate on the quantifiers other than numerals. Quantifiers are typically classified together with determiners [Lexicon – Section 3.6] / determiners or nominal modifiers.

4.4.0.2 Methodological challenges

Similar to the methodological problem discussed for numerals [Syntax – Section 4.3], one challenge in analyzing quantifiers is to identify whether a sequence of a noun and a quantifier such as CHILDREN MANY constitutes a quantifier phrase such as 'many children' or a predicative structure such as 'As for children, there are many.'

4.4.1 The position of the quantifier

Quantifiers may precede or follow the noun they quantify, that is, the head noun. In the following example from ASL, the quantifiers precede the noun GIRL:

ALL/ONE/NONE GIRL LIKE MATH
'All/one/no girl(s) like math.' (ASL, Davidson & Gagne 2014)

NGT patterns with ASL in that quantifiers precede the head noun in NGT, as in (a) and (b). In LIS, however, quantifiers follow the head noun, as in (c) and (d) (Brunelli 2011).

a. ALL CAR EXPENSIVE NICE
'All expensive cars are nice.' (NGT, adapted from Brunelli 2011: 52)

b. PLACE MANY OTHER SIGN SPECIAL PLACE HAVE
'Many other signs have a special place.' (NGT, adapted from Brunelli 2011: 52)

c. CAR EXPENSIVE ALL NICE
'Expensive cars are all nice.' (LIS, adapted from Brunelli 2011: 52)

d. IX_1 APPLE MANY EAT
'I eat/ate many apples.' (LIS, adapted from Brunelli 2011: 52)

LIS and NGT also contrast in the order in which quantifiers and possessives appear. In LIS, the order is Noun-Possessive-Quantifier, as in (a), whereas it is Quantifier/Possessive-Noun in NGT, as in (b):

top
a. FRIEND(S) $POSS_1$ ALL (IX_3 ARC) DEAF
'All my friends are deaf.' (LIS, adapted from Brunelli 2011: 63)

top
b. ALL FRIEND DEAF
'All my friends are deaf.' (NGT, adapted from Brunelli 2011: 63)

Quantifiers and higher adjectives such as OTHER, NEXT/FOLLOWING, PAST/PREVIOUS are postnominal in LIS, but prenominal in NGT. OTHER appears in the order N-OTHER-Q in LIS. In NGT, on the other hand, it appears in the order Q/OTHER-N, or in the order Q-OTHER-N if the quantifier MANY is used for Q.

In some sign languages the order between the quantifier and the head noun depends on the quantifier. In TSL, for instance, the existential quantifier SOME can occur both prenominally and postnominally, as in (a) and (b) below, while A-LITTLE, ALL, ANY and MOST can occur only postnominally, as in (c) and (d) below, and the quantifiers EVERY, OTHER, ANOTHER are restricted to the prenominal position, as in (e):

a. IX_3 CLOTHES SOME UNWEARABLE
'He has some unwearable clothes.' (TSL, Lai 2005: 45)

b. IX_3 SOME CLOTHES UNWEARABLE
'He has some unwearable clothes.'

c. IX_3 MONEY ALL TAKE BUY BOOK
'He spent all the money buying books.' (TSL, Lai 2005: 48)

d. IX_2 QUESTION ANY HAVE ASK TEACHER
'If you have any questions, you can ask the teacher.' (TSL, Lai 2005: 49)

e. IX_3 ASK EVERY TEACHER QUESTION SAME.
'He asked every teacher the same question.' (TSL, Lai 2005: 55)

A combination of quantifiers and distributives can be used as well, as in the following cases:

FIVE BEDS CL(B)+++
'five beds in a row' (BSL, adapted from Sutton-Spence & Woll 1998: 107)

In this case the proform is repeated three times. The number information is in the '5'-hand quantifier and proform indicates the distributive.

4.4.2 Floating quantifiers

The following examples illustrate what are known as floating quantifiers in English:

a. The children have all read the books.
b. The students have each arrived.
c. John's brothers have both read the book.

In each of these cases, the quantifiers *all*, *each* and *both* are separated from their corresponding noun phrase, i.e. *the children*, *the students* and *John's brothers* respectively, thus creating a discontinuous constituent (Bobaljik 2003).

However, there are restrictions as to where these floating quantifiers can appear. In English they can appear to the left of an auxiliary verb, as in (a), between auxiliary verbs, as in (b) and (c), but not in any of the positions to the right of the lexical verb, as in (d) and (e) below:

a. The computers all will have been moved to the new office.
b. The computers will all have been moved to the new office.
c. The computers will have all been moved to the new office.
d. *The computers will have been moved all to the new office.
e. *The computers will have been moved to the new office all.

A floating quantifier can also appear between an auxiliary verb and an adjectival predicate, as in (a) and (b):

a. We were all fast asleep. (Quirk et al. 1985: 382)
b. The children are all healthy.

The possibility of floating quantifiers has been observed in sign languages as well. In the following LIS examples, the quantifier ALL appears in combination with a kind of relative clause labeled as 'PE-clause' (Branchini and Donati 2009). In (a) the quantifier ALL modifies the head noun CHILDREN but it is separated from it. Similarly, in (b), the negative quantifier NOBODY modifies the head noun BOY but is separated from it.

rel
a. CHILDREN$_i$ CAKE EAT PE$_i$ TODAY ALL [E] STOMACHACHE
'All the children that ate the cake today have stomachache.'
(LIS, Branchini & Donati 2009: 170)

rel
b. BOY$_i$ EXAM DONE PE$_i$ PASS [E] NOBODY
'No boy that took the exam passed.' (LIS, Branchini & Donati 2009: 170)

Grammar writers should pay attention to the possible positions for quantifiers given the basic word order of the language they are working with. They should also consider the possible word order options of combinations of quantifier + possessive + adjective + noun. Also, they should check in what conditions, if at all, quantifiers, can be floated.

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4.5 Adjectives

4.5.0 Definitions and challenges

4.5.0.1 Adjectival modification

Adjectives have two main functions: attributive [Lexicon – Section 3.4.1] / attributive and predicative [Lexicon – Section 3.4.2] / predicative. Typically, when an adjective occurs in a noun phrase, modifying the noun, it is considered to have an attributive function as in 'the new car'. When the adjective is in the predicate position as in 'The car is new,' it is considered to have the predicative function. In this section we will only concentrate on adjectives having attributive function as modifiers of nouns, since we are dealing with the structure internal to the noun phrase.

Adjectives are also categorized semantically. Most commonly identified adjective categories are the following: adjectives that denote quality, size, shape, color, provenance, value, dimension, physical property, speed, human propensity, age; those that are speaker-oriented or subject-oriented; and those that are manner adjectives and thematic adjectives (Sproat & Shih 1991; Cinque 1994; Dixon 1982). The position of an adjective within the noun phrase and with respect to other adjectives may depend on the semantic category it belongs to.

The distribution of adjectives within a noun phrase is mainly analyzed in two ways: (i) their position with respect to the head noun (prenominal versus postnominal) and (ii) their position with respect to other adjectives.

4.5.0.2 Methodological challenges

The grammar writer should take into consideration whether the relative order of the adjectival modifier with respect to the head noun makes a difference in its function. Given a sequence of a noun and an adjective such as CAR NEW, it may be a challenge to determine whether the adjective is a modifier and the sequence is a noun phrase as in 'new car' or whether the adjective functions as a predicate and the sequence is a predication structure as in 'The car is new'.

There are languages where a postnominal adjective is interpreted as predicative while a prenominal adjective is interpreted as attributive. Irish SL is such a language (Leeson & Saeed 2012). In the Irish SL examples below, the prenominal SMALL is interpreted as an attributive adjective, (a), but when it is postnominal, as a predicative adjective (b).

a. SMALL HANDBAG
'(It was a) small handbag.' (Irish SL: Leeson & Saeed 2012: 153)

b. WHEN JASON SMALL
'When Jason was small' (Irish SL: Leeson & Saeed 2012: 153)

In languages where both attributive and predicative adjectives can be postnominal, identifying the function of an adjective in a sentence might pose a harder challenge. However, there may be clues in the sign language under investigation that may help make the distinction. LIS has been reported to distinguish nominal constituents from verbal constituents non-manually (Bertone 2009: 8). In the example below, the non-manual marking associated with the noun phrase spreads over FURNITURE in (a) but over FURNITURE ANTIQUE $(IX)_i$ in (b). This leads to the analysis that the adjective ANTIQUE is a predicative adjective in (a) but an attributive adjective in (b).

a. NP VP
d.h. $FURNITURE_a$ ANTIQUE
'The furniture is antique.' (LIS, adapted from Bertone 2009: 8)

b. NP VP
d.h. FURNITURE$_a$ ANTIQUE (IX$_{3a}$) BROKEN
'The antique furniture is broken.' (LIS, adapted from Bertone 2009: 8)

Different positions of the adjectival modifiers do not always correlate with different functions. In TSL, for instance, the adjective can precede or follow the head noun without a difference in the functional meaning.

a. IX$_3$ RAISE [CUTE CAT FIVE] Adj N Num
'She raises five cute cats.'
b. IX$_3$ [CAT CUTE FIVE] HAVE N Adj Num
'She has five cute cats.' (TSL, Zhang 2007: 65)

The adjective CUTE in the prenominal and post-nominal positions in the two TSL examples above are both interpreted attributively.

We advise the grammar writer to determine whether different positions of adjectival modifiers correlate with different functions such as attributive [Lexicon – Section 3.4.1] and predicative [Lexicon – Section 3.4.2].

4.5.1 Prenominal versus postnominal adjectives

Depending on the language, we may observe the following distribution for adjectival modifiers: (i) strictly prenominal (i.e. before the noun), (ii) strictly postnominal (i.e. after the noun), or (iii) occuring prenominally and postnominally. In those languages where adjectival modifiers can occur in either position, again we have two possibilities: (i) all adjective classes can occur in either position, with no meaning difference, or (ii) the pre- versus post-nominal distribution is determined by the semantic class the adjective belongs to.

English belongs to the languages of the strictly prenominal type. In example (a) below all the adjectives precede the head noun. In the French example in (b), on the other hand, the possessive adjective precedes the head noun while most adjectives belonging to other classes follow it.

a. their big red cottage (English)
b. mes livres intéressants (French)
'my interesting books'

LIS seems strictly postnominal since all adjectives follow the head noun, as shown in (a–c) below.

a. [EXAMPLE **PAST**]
'previous/last example' (LIS, Brunelli 2011:54)
b. [EXAMPLE **NEXT**] EASY
'The next/following example is easy.' (LIS, adapted from Brunelli 2011: 55)

c. [MAN **OLD**] BOOK IX BUY
'The old man buys/bought the book.' (LIS, Brunelli 2011: 60)

In NGT, adjectives can be prenominal and postnominal but the position of an adjective is determined by its semantic type: while adjectives expressing relative temporal relations like PREVIOUS, FOLLOWING, typically precede the head noun, as in (a) and (b), an attributive adjective such as OLD can follow it, as in (c).

a. **[previous** EXAMPLE]
'previous/last example' (NGT, Brunelli 2011: 54)
b. LOOK [**FOLLOWING** EXAMPLE++]
'Look at the next/following examples.' (NGT, Brunelli 2011: 55)
c. [MAN **OLD**] BOOK BUY
'The old man buys the book.' (NGT, Brunelli 2011: 60)

The following provide further examples from TİD. OTHER precedes the head noun in (a) whereas an adjective expressing a physical property, BIG, follows it, as in (b).

5_4.5.1_1_TİD_other man money sit

a. [**OTHER** MAN] MONEY SIT
'The other man is sitting on money.'

5_4.5.1_2_TİD_rabbit big strong

b. [RABBIT **BIG**] STRONG
'The big rabbit is strong.' (TİD, Özsoy et al. 2012: 8)

The grammar writer should check whether adjectives must be prenominal or postnominal in the language studied or whether either order is possible.

4.5.2 Symmetric adjectives

There are also sign languages in which adjectives can freely precede or follow the head noun with no difference in meaning. For the TSL examples below the Adj-N and N-Adj orders are interpreted identically.

a. [**CUTE** CAT] IX_1 LIKE
b. [CAT **CUTE**] IX_1 LIKE
'I like cute cats.' (TSL, adapted from Lai 2005: 15)

The following TİD examples also show that both orders are possible in the same language.

5_4.5.2_1_TİD_sun yellow round

a. SUN **YELLOW ROUND**
'the yellow round sun' (TİD, Özsoy et al. 2012: 8)

5_4.5.2_TİD_red pants

b. **RED** PANTS
'red pants' (TİD, Özsoy et al. 2012: 8)

If the language the grammar writer is analyzing can have both prenominal and postnominal modifiers, he/she should check (i) whether all kinds of adjectives can freely occur in either of these positions and (ii) whether these different positions induce different interpretations of the adjectives.

4.5.3 Reduplicated adjectives

The adjective modifier of a noun phrase can be reduplicated. In constructions in which the adjective is reduplicated, one of the adjectives occurs prenominally and the other postnominally, as in the TİD example below.

5_4.5.3_1_TİD_pointed hat pointed

POINTED HAT **POINTED**
'a pointed hat' (TİD, Özsoy et al. 2012: 9)

The grammar writer should check whether reduplication is possible with adjectives and whether single occurence versus reduplication induces any difference in meaning.

4.5.4 Ordering restrictions among adjectives

In studies done on spoken languages, adjectives in a noun phrase have been observed to typically exhibit ordering restrictions (Dixon 1982; Sproat & Shih 1991; Cinque 1994; Teodorescu 2006). The ordering is mostly, but not uniformly, sensitive to the semantic classes of adjectives, that is, adjectives belonging to the same class pattern together with respect to their ordering restrictions. Adjectives that denote quality, for example, generally precede adjectives conveying size, which in turn precede adjectives conveying shape, in all languages as reflected in the following hierarchy.

a. Quality > Size > Shape > Color > Provenance (Sproat & Shih 1991)

The following two hierarchies represent other ordering restrictions that have been proposed:

b. Possessive > Speaker-oriented > Subject-oriented > Manner/Thematic
(Cinque 1994)

c. Value > Dimension > Physical property > Speed > Human Propensity > Age > Color (Dixon 1982)

In the absence of any intonational differences indicating different interpretations of the noun phrase, the only grammatical order of adjectives in a noun phrase in English, for instance, is the one in which the adjective denoting quality precedes the one which denotes size, which in turn precedes the color adjective, as exemplified below.

a beautiful small black purse
#a beautiful black small purse
#a small beautiful black purse
#a small black beautiful purse etc. (English, Teodorescu 2006: 399)

The following examples illustrate strict ordering of different adjective classes in LIS.

a. Origin precedes color: VASE CHINA RED
*VASE RED CHINA
'red Chinese vase'
b. Origin precedes quality: VASE CHINA OLD
*VASE OLD CHINA
'old Chinese vase'
c. Color precedes quality: VASE RED OLD
*VASE OLD RED
'red old vase' (LIS, Bertone 2009: 17)

In the LIS examples above the adjective indicating origin precedes the color and quality adjectives, while color adjectives typically precede quality adjectives.

We advise the grammar writer to investigate whether the sign language studied imposes ordering restrictions among different semantic classes of adjectives. The grammar writer should also aim at identifying the unmarked order of adjectives, and make sure that the different orders of adjectives are not correlated with different information structure interpretations like focus [Pragmatics – Section 4.1] or topic [Pragmatics – Section 4.2].

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4.6 Multiple NP constituents

4.6.0 Definitions and challenges

Typological studies on a large number of languages have revealed that even though it seems that the order of the constituents in a noun phrase such as articles, demonstratives [Lexicon – Section 3.7.1], adjectival modifiers, numerals [Lexicon – Section 3.10] / numerals and quantifiers [Lexicon – Section 3.10] / quantifiers is not identical in every language, the variation is in fact quite restricted (Greenberg 1964).

The findings of these studies are summarized as the following generalization (Greenberg 1964, "Universal 20"):

i. In the prenominal position, the order of demonstrative, numeral, and adjective (or any subset thereof) modifiers conforms to the order **Dem>Num>A>N**
ii. In postnominal position, the order of the same elements (or any subset thereof) conforms to the order **N>Dem> Num> A** or
iii. to the order **N>A> Num>Dem**.

There are, however, exceptions to the statements in (ii)–(iii) (Hawkins 1983).

Many sign languages have also been shown to conform to the generalizations above at varying degrees (cf. Bahan et al. 1995 and MacLaughlin 1997 for ASL; Miljan 2000 for ESL; Bertone 2009, Brunelli 2011 and Mantovan & Geraci 2012 for LIS; Nuhbalaoğlu & Özsoy 2014 for TİD and Zhang 2007 for TSL).

4.6.1 Prenominal modifiers

In noun phrases with multiple modifiers, sign languages have been observed to exhibit differences with respect to how strictly they conform to the following ordering of the modifiers: Dem(onstrative) – Num(eral) – Adj(ective) – N(oun).

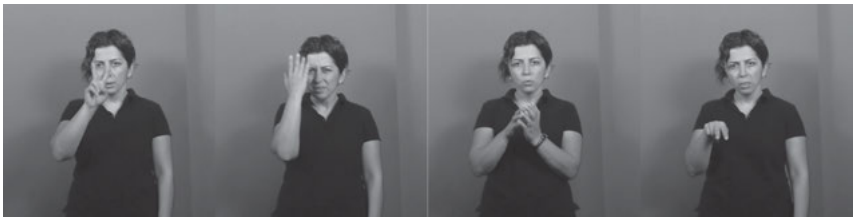
While there seems to be no exception to the generalization that Dem is in the leftmost position, sign languages vary with respect to the relative order of numeral and adjectival modifiers. TSL, for example, has the strict Dem-Num-Adj-N order in the head final noun phrase constructions.

a. Num-Adj-N
   IX_3 FIVE CUTE CAT HAVE
   'She has five cute cats.' (TSL, adapted from Zhang 2007: 65)
b. Dem-Adj-N
   IX_{DET} CUTE CAT IX_1 BELONG-TO
   'That cute cat belongs to me.' (TSL, adapted from Zhang 2007: 66)
c. Dem-Num-N
   $IX_{DET.PL}$ FOUR CAR IX_1 FRIEND BELONG-TO
   'Those four cars belong to my friend.' (TSL, adapted from Zhang 2007: 66)
d. Dem-Num-Adj-N
   $IX_{DET.PL}$ FIVE NAUGHTY BOY IX_1 BELONG-TO STUDENT
   'These five naughty boys are my students.'
   (TSL, adapted from Zhang 2007: 67)

However, the following orders have been reported to be unacceptable in TSL : *Adj Num N, * Adj Dem N and * Num Dem N (TSL, Zhang 2007:10).

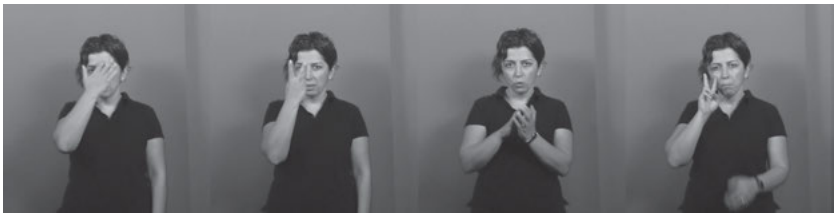
Some sign languages, on the other hand, have been observed to allow variation in the relative order of pre-nominal constituents. With respect to adjectival and numeral modifiers in TİD, for example, the two categories can occur in either order in the prenominal position without any semantic distinction between the two orders.

a. Num-Adj-N



TWO BLACK DOG SEE_3-PAST
'I saw two black dogs.'
(TİD, Nuhbalaoğlu & Özsoy 2014)

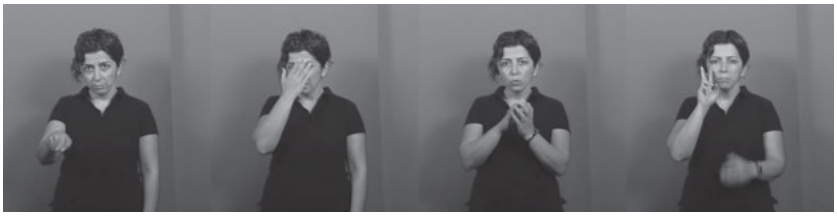
b. Adj-Num-N



BLACK TWO DOG SEE$_3$-PAST
'I saw two black dogs.'
(TİD, Nuhbalaoğlu & Özsoy 2014)

Even in TİD, however, demonstratives (and possessives) have been observed to be more restricted with respect to the position in which they can occur. In contrast to the grammaticality of orders in which Dem precedes all the other constituents as in (a) and (c) below, the corresponding *Adj-Dem-N (b) and *Num-Dem-N (d) orders are ungrammatical.

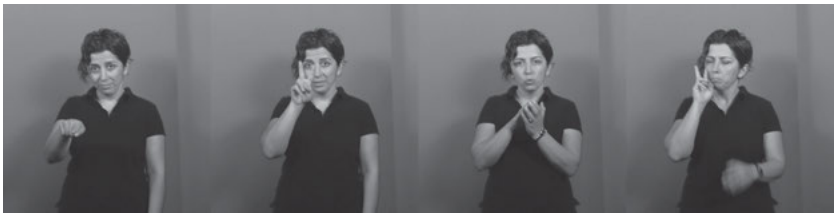
a. Dem-Adj-N



IX BLACK DOG SEE$_3$-PAST
'I saw the/that black dog.'

b. Adj-Dem-N
*BLACK IX DOG SEE$_3$-PAST
'I saw the/that black dog.'

c. Dem-Num-N



IX TWO DOG SEE$_3$-PAST
'I saw the/those two dogs.'

d. Num-Dem-N
*TWO IX DOG SEE_3-PAST
'I saw the/those two dogs.' (TİD, Nuhbalaoğlu & Özsoy 2014)

We advise the grammar writer to check which orders are possible among the prenominal modifiers.

4.6.2 Postnominal modifiers

TSL is a language which allows a symmetrical distribution of the constituents of the noun phrase in that all modifiers can precede and follow the head noun. The modifiers can be split between prenominal and postnominal position, as in (a) and (b) below or all modifiers can occur postnominally, as in (c) below.

a. $IX_{DET\cdot PL}$ **NAUGHTY** BOY **FIVE** IX_1 BELONG-TO STUDENT
b. $IX_{DET\cdot PL}$ **FIVE** BOY **NAUGHTY** IX_1 BELONG-TO STUDENT
c. $IX_{DET\cdot PL}$ BOY **NAUGHTY FIVE** IX_1 BELONG-TO STUDENT
All mean: 'These five naughty boys are my students.'
(adapted from Zhang 2007: 12)

When there are multiple modifiers in the postnominal position, as in (c) above, the relative positions of the noun phrase constituents in TSL must conform to Dem N Adj Num.

Similar to TSL, TİD allows split ordering of the modifiers in the pre- and postnominal positions. When there are multiple constituents postnominally, the relative order between a color adjective and a numeral seems to be free, as shown below.

a. IX_1 DOG **TWO BLACK** SEE_3-PAST
b. IX_1 DOG **BLACK TWO** SEE_3-PAST
'I saw two black dogs.'
(TİD, Nuhbalaoğlu & Özsoy 2014)

We recommend that the grammar writer check which orders are possible among the postnominal modifiers.

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Chapter 5 The structure of adjectival phrases

5.0 Definitions and challenges

5.0.1 What is an adjectival phrase?

Adjectival phrases (APs) are defined as phrases in which an adjective / adjective [Lexicon – Section 3.4] functions as the head of the phrase. Adjectival phrases [Syntax – Section 4.5] typically modify NPs.

APs can either precede or follow the noun / noun [Lexicon – Section 3.1] they modify. Modification is subject to language-specific rules, and, within one language, modification depends on the class of the adjective and on whether they perform an attributive / attributive [Lexicon – Section 3.4.1] or predicative / predicative [Lexicon – Section 3.4.2] function.

5.0.2 Internal structure and position with respect to the noun

Researchers have observed that the position of the AP affects its internal structure. Typically, languages tend to have what we might call a "side of recursion", that is, the side of the clause where subordination and other expansions are more likely to occur. APs sitting on the side of recursion tend to have a richer internal structure

than those on the other side. Just to illustrate, consider the following English examples. Most adjectives tend to be prenominal in English, but complex APs can only be produced postnominally (the right being the "side of recursion" in English).

a. A beautiful river
b. A very beautiful river
c. ?A [more than ever beautiful] river
d. A river [beautiful more than ever]

The grammar writer should be aware of this parameter possibly affecting the internal structure of adjectival phrases in the sign language under consideration.

The position of the adjective with respect to the noun can also be modulated by the number of adjectives that modify the noun. Mantovan (2014), for example, claims that if two adjectives modify the noun in LIS, typically one precedes the noun while the other follows it. For example, an adjective that occurs after the noun when it is the only adjective in the phrase, can occur before the noun if another adjective is present.

So, a caveat is that, ideally, any conclusion based on examples with a single adjective should be confirmed with examples including more than one adjective.

5.1 Intensifiers and other modifiers

Many adjectives are gradable (or scalar), that is they can be placed along a scale from more to less. A paradigmatic example of gradable adjective is *tall* (*very tall*, *taller than*, ...), while a non-gradable adjective is *pregnant* (?**very pregnant*, ?**more pregnant than*, ...). The degree or intensity of a gradable adjective can be made explicit through the use of a modifier, which can be either preposed (as in English, e.g. *very smart*) or postposed to the adjective. In most sign languages this modification of the adjective can either be made manually, through a modification of signs, or non-manually, by modifying the articulation of the sign for the adjective or adding a non-manual marker such as a specific facial expression.

5.1.1 Manual modifiers

A list of manual signs functioning as intensifiers of the adjective should be provided here, specifying their position with respect to the adjective.

5.1.2 Modifications of manual signs and non-manual modifiers

All sign languages that have been described exhibit the possibility of expressing the intensity or the degree of the adjective by modifying the form of the adjectival sign itself.

In ASL, intensive and approximative modifications have been described. When an adjective, say 'tall', is modulated to reflect intensity, the additional meaning that is added is essentially that of 'very'. This modulation, according to Klima and Bellugi (1979: 259) is characterized by tension in the muscles of hand and arm, a long tense hold at the beginning of the sign, a very rapid single performance, and a final hold. Note also that the intensification modification does not just involve a modification of the manual sign but also additional non-manual modification; it is generally accompanied by an intensified facial expression and often a sideward head movement.

The approximative modulation is essentially the opposite of the intensive one. Taking again 'tall' as an example, the approximative modulation conveys a meaning of 'sort of tall' or a small degree of the adjective's quality or attribute. Klima and Bellugi (1979: 260) characterize this modulation in ASL as consisting of "a lax HC [hand configuration] and an extreme reduction in size and duration in each iteration of the sign. The movement of the sign is extremely reduced and minimal".

The grammar writer should be aware of this possibility and search for the actual manual modifications of the adjective available in the sign language under investigation. Other important dimensions that should be observed is the extension of the marking, and whether it coincides with the sign expressing the adjective or whether it can start/finish earlier/later.

5.1.3 Iteration and stacking

Intensification and degree are not the only modifiers that can enter an AP. The adjective can also be modified by some qualitative adverbs, as in English *beautifully warm*, or by some other adjective, as in *dark blue*.

An important dimension that should be described is whether the various modifiers of the adjective are in complementary distribution, or whether they can be stacked, and in which order. An aspect of this question concerns also the possibility of iteration, as in English *very very nice*, which is attested in many languages. Finally, the interaction of manual signs and non-manual modifiers should also be described here.

5.1.4 Degree comparatives

The gradability of adjectives also accounts for the other class of modifiers that adjectives can go with, namely comparatives [Syntax – Section 3.6] / comparatives [Semantics – Chapter 8] / comparatives. Typically, comparatives can either be formed by coupling the adjective with a word/sign meaning 'more/less/as', or by modifying the form of the adjective itself as to incorporate this meaning, as in English *nicer*.

In LIS, for example, the analytic form is realized with the manual sign MORE, as in (b), while the synthetic form is realized by incorporating a scale morpheme (SCALE-MORE) into the adjective (Aristodemo and Geraci 2015). In (a), SCALE-MORE is realized

as an arch movement on the vertical axis into a point in space which is higher than the point in space where the previous mentioning of 'tall' was produced. When available, the two strategies are in free distribution, as below.

a. MARIA TALL GIANNI (TALL)-SCALE-MORE
'Gianni is taller than Maria.'
b. MARIA TALL GIANNI MORE (TALL)
'Gianni is taller than Maria.' (LIS, Aristodemo & Geraci 2015)

The degree comparative can either go alone, or be completed by two more constituents: what is called the second term of comparison (as 'me' in *taller than me*), and/or a constituent quantifying the difference compared, as in *three meters taller than me*. In LIS, when the differential quantifier is expressed, the scale morpheme gets incorporated into it instead of into the adjective, as shown in the example below.

MARIA TALL GIANNI A-BIT-SCALE-MORE
'Gianni is a bit taller than Maria.' (LIS, Aristodemo & Geraci 2015)

5.1.5 Superlatives

A final type of modification related to the gradability of adjectives is the so-called superlative, which posits the adjective as being to the highest degree on a scale, as in *the most beautiful*. Superlatives can be divided into absolute and relative, according to whether the scale is unspecified, as in the former example, or specified, as in *the most beautiful of this room*.

5.2 Arguments

While many adjectives are gradable and thus can be modified accordingly, only few adjectives can have arguments, according to their selectional properties. For those adjectives that can take arguments, the grammar writer should specify (i) the form of the argument [Syntax – Section 2.1.2] (whether it is a NP/PP, as in *proud of his son*, or *full of anger*; or a clause, as in *proud that you are my son*, or *curious what decision he will take*); (ii) whether these arguments occur in a fixed position, and whether this is pre- or post-adjectival.

5.3 Adjuncts

Some adjectives can also be modified by constituents they do not select. In this case their relation to the adjective is frequently reducible to a causal relation (as in *happy to hear from you*); or to some kind of comparison [Syntax – Section 3.6;] / comparison

[Semantics – Chapter 8] (as in *red as a tomato*). Here again very little is known for sign languages, and the form, order and restrictions of these constituents should be looked at with care.

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Chapter 6 The structure of adverbial phrases

6.0 Definitions and challenges

6.0.1 What is an adverbial phrase?

Adverbial phrases are constituents headed by adverbs / adverbs [Lexicon – Section 3.5], not to be confused with adverbial clauses [Syntax – Section 3.5] / adverbial clauses [Semantics – Section 14.2], which are sentences that are constituents of a complex sentence. Adverbial phrases (in bold in the following examples) are adjuncts, and as such may modify an adjective (a), another adverbial (b), a clause (c) or a verb (d) by providing information regarding the grammatical categories of tense / tense [Semantics – Chapter 1] / tense [Morphology – Section 3.2] (*yesterday*), aspect / aspect [Semantics – Chapter 2] / aspect [Morphology – Section 3.3] (*already*), and modality / modality [Semantics – Chapter 4] / modality [Morphology – Section 3.4] (*necessarily*, *probably*) or information regarding manner (*proudly*) and place (*here*).

Adverbial phrases typically answer questions like *how? where? when? how frequently? to what extent?*

a. He was **quite** clear.
b. The children spoke **very** loudly.

c. John's horse **certainly** will win the race.
d. John's horse will **quickly** pace towards the finish line.

6.0.2 Classes of adverbs

Adverbials can belong to different categories or classes. Some adverbials may modify the meaning of the entire sentence, as in (a) where the adverbial *certainly* refers to the fact that *John's horse will win the race*, while others may just modify a constituent such as the verb in (b), where *quickly* specifies the manner of the event described by the verb (*pace*). Sentential adverbials and VP-adverbials usually occupy different positions in the sentence.

a. John's horse **certainly** will win the race.
b. John's horse will **quickly** pace towards the finish line.

Sometimes the same adverbial may be used as a sentential adverbial (as in (a) below), or as an adverbial modifying the verb phrase (b).

a. **Naturally**, she raised many questions.
b. She **naturally** raised many questions.

In (a) the adverb *naturally* means 'of course' and modifies the whole sentence, whereas in (b) it modifies just the verb specifying the manner questions were raised, that is, 'in a natural way'.

Adverbs may be grouped into different classes, depending on the kind of information they provide.

6.0.3 Analytical challenges

In spoken languages, adverbial phrases may often contain a constituent modifying the head of the adverbial phrase, usually expressing intensification, as in the following examples:

a. He climbed the mountain **more** quickly.
b. The children walked in the room **very** awkwardly.

Sign languages, however, may express the same meaning without necessarily employing two manual signs. Sign languages may convey complex adverbial phrases by modulating the verb sign in its speed, movement, path and place of articulation. In addition, non-manual markers such as shoulder movement or facial expressions may be the only grammatical markers conveying complex adverbial information.

6.1 Independent manual adverbs

One possibility to convey adverbial information is through an independent dedicated manual sign. In the following example, the sign ON-TIME provides information on the manner in which the action expressed by the verb is carried out.

5_6.1_1_LIS_GIANNI ARRIVE ON-TIME

GIANNI ARRIVE ON-TIME
'Gianni arrives on time.' (LIS, Cecchetto et al. 2006: 949)

The grammar writer should identify the manual signs conveying adverbial information as well as their unmarked preferred positions within the sentence. Sometimes other positions, besides the unmarked preferred position, are allowed. However, in spoken languages, changes in the position of adverbs within the sentence usually correlate with a difference in prosody [Phonology – Chapter 2] and sometimes, as we saw in the previous section [Syntax – Chapter 6.0.2], with a change in meaning. The grammar writer is therefore advised to verify whether different available positions for an adverbial manual sign correlate with a change in non-manual marking and a change in meaning.

6.2 Modification of manual signs

A second option used in sign languages to convey adverbial information is through the modification of manual signs. The sign for the verb may be, for instance, modified in its speed, movement, path and place of articulation to convey manner information. In the following LIS example, the verbal sign WALK is modified in its speed to convey the adverbial information 'quickly'.

5_6.2_1_LIS_LUCA WALK-fast

LUCA WALK-fast
'Luca walks quickly.' (LIS)

Classifier predicates / Classifier predicates [Morphology – Section 5.1] may also be modified with the same function. In the following LIS example, the classifier predicate CL-CAR-DRIVING is produced with a zigzag movement to convey information about the manner the action expressed by the classifier predicate is carried out.

5_6.2_2_LIS_LUCA CL-CAR-DRIVING-zigzag

LUCA CL-CAR-DRIVING-zigzag
'Luca drives zigzag.' (LIS)

Manner and frequency of movement may also be modified to convey aspectual information.

The grammar writer should verify any change in the modulation of manual signs from their citation form conveying adverbial information.

6.3 Non-manual adverbs

Many sign languages that employ independent manual signs to convey adverbial information may also do so through non-manual adverbials. Sometimes, non-manual markers accompany the adverbial manual sign to intensify its meaning. This is the case of ASL deictic locative signs (corresponding to *there* or *here*) that can be produced with tensed facial expression to convey a high degree of physical proximity, or of temporal signs, like RECENT, whose lexical non-manual marking can be intensified to convey a high degree of temporal proximity.

More often, non-manuals are the only markers conveying adverbial information in the sentence. Specific non-manual markers can convey manner information, as in the following LIS example: the non-manual marking 'mm' produced with closed lips simultaneously to the verbal sign WALK conveys the manner adverb 'quietly'.

5_6.3_1_LIS_DANIELE WALK

mm
DANIELE WALK
'Daniele walks quietly.' (LIS, adapted from Lerose 2009: 51)

Non-manual adverbs usually are coextensive with the lexical sign they modify, or may extend over other signs in the case of sentential adverbials.

The grammar writer should identify non-manual adverbials and the spreading domain of non-manual adverbs in the target sign language.

6.4 Classes of adverbs

A broader classification of adverbs concerns the domain of the material they modify: while sentential adverbs modify the entire sentence, VP-adverbs modify just the verb.

6.4.1 Sentential adverbs

Sentential adverbs modify the whole sentence conveying the attitude of the speaker/signer towards the content of the sentence.

Probably, Rebecca felt guilty

The sentence below shows a sentential adverb in LIS (CERTAIN) modifying the whole proposition DANIELE COME.

CERTAIN DANIELE COME
'Daniele is certainly coming.' (LIS, adapted from Lerose 2009: 56)

6.4.2 VP-adverbs

VP-adverbs modify the sentence predicate by adding information regarding the time, manner, place, aspect, and modality of the described event. In the following sections, adverbial phrases are classified according to the type of adverbial information conveyed. We shall take into consideration the main classes of adverbs available cross-linguistically.

6.4.2.1 Temporal adverbs

Temporal [Semantics – Section 14.2.2] adverbs modify the verb by specifying when the event described by the predicate takes place (see tense [Semantics – Chapter 1]). They answer the question *when?* Among sign languages, tense information is commonly encoded by an independent manual sign, or, in some sign languages, by non-manual markers.

When conveyed by an independent manual sign, time adverbials usually appear sentence-initially, as in the following LSE example.

PAST WEEK MEETING START TEN END QUARTER TO THREE
'Last week the meeting started at ten and ended at a quarter to three'
(LSE, Cabeza Pereiro & Fernández Soneira 2004: 69)

Other sign languages, like ASL, allow their occurrence also in sentence-final position (a) or between the subject and the (modal) verb (b).

a. J-O-H-N BUY CAR TOMORROW
'John will buy a car tomorrow.'
b. J-O-H-N TOMORROW CAN BUY CAR
'John can buy a car tomorrow.' (ASL, Aarons et al. 1995: 238)

6.4.2.2 Manner adverbs

Manner [Semantics – Section 14.2.4] adverbs specify the way in which an event takes place. They answer the question *how?*. They are commonly conveyed by modifying the verbal sign, or through non-manual markers. In some cases, they are conveyed by an independent manual sign.

If manner information is encoded in the target sign language by an independent manual sign, the grammar writer should verify its unmarked position in the sentence. In LIS, when an independent manual sign is adopted, it occupies a post-verbal position.

IX$_1$ LISTEN ANNOYANCE
'I listen to you with annoyance.' (LIS, Natural 2014: 31)

6.4.2.3 Locative adverbs

This class of adverbs provides information regarding the location where the event takes place. They answer the question *where?*. Locative [Semantics – Section 14.2.3] information is commonly conveyed by an independent manual sign.

If conveyed by an independent manual sign, the grammar writer should verify the position of locative adverbs in the target sign language. According to Lerose (2009), in LIS locative adverbs occupy a post-verbal position.

DANIELE EAT OUTSIDE
'Daniele eats outside.' (LIS, adapted from Lerose 2009: 54)

6.4.2.4 Adverbs conveying aspectual information

Sign languages often convey aspectual information [Semantics – Chapter 2; Morphology – Section 3.3] through modification of the verb sign.

A continuative [Semantics – Section 2.1.2] action (corresponding to the adverb *continuously*) is marked in ASL by slow (arch-shaped) reduplication of the verbal sign. Iteration of an action (corresponding to the adverb *repeatedly*) is expressed in SSL through fast reduplication [Phonology – Section 3.3.1] of the predicate with repeated short movements. Habitual [Semantics – Section 2.1.1] events (corresponding to the adverb *usually*) are marked by reduplication of the verbal sign as well, but differ from iterative aspectual information in ASL in that they involve smaller and faster movements.

If the target sign language conveys aspectual information by independent adverbial manual signs, the grammar writer should verify their preferred position in the sentence.

6.4.2.5 Adverbs conveying deontic modality

Deontic adverbs convey the obligatoriness of the action expressed by the sentence predicate (*necessarily*).

A word of caution is needed: deontic adverbs are not to be confused with modal markers expressing deontic modality / modality [Morphology – Section 3.4.1] / modality [Semantics – Section 4.2] (*must*, *should*) that sign languages commonly use.

If the target sign language conveys deontic adverbs by independent manual signs, the grammar writer should verify their preferred position in the sentence.

6.4.2.6 Adverbs conveying epistemic modality

Epistemic [Morphology – Section 3.4.2] / epistemic [Semantics – Section 4.1] adverbs convey the speaker/signer's attitude towards the truth of the proposition (*perhaps*, *certainly*).

If the target sign language conveys epistemic adverbs by independent manual signs, the grammar writer should verify their preferred position in the sentence.

6.4.2.7 Adverbs of degree

Adverbs of degree convey the intensity or degree of a verb (a), adjective (b) or another adverb (c).

a. Tom couldn't **quite** understand what was going on.
b. He was **extremely** happy.
c. She spoke **very** loudly.

Sign languages seem to express degree by altering the manual sign that is modified (be it a verb, adjective, or adverb) changing its speed and movement and by the employment of non-manual markers rather than using a dedicated manual sign.

In the following LIS sentence, the adverb of degree 'a lot' modifying the verb STUDY is not realized as a manual sign, rather, the sign for the verb is altered in its realization, namely, it is reduplicated (reduplication is indicated by '++' in the glosses) and produced with longer and wider movements with respect to its citation form.

5_6.4.2.7_1_LIS_DANIELE STUDY++

DANIELE STUDY++
'Daniele studies a lot.' (LIS, adapted from Lerose 2009: 55)

If the target sign language conveys adverbs of degree by independent manual signs, the grammar writer should verify their preferred position in the sentence.

6.4.2.8 Adverbs of frequency

Adverbs of frequency specify how often an event takes place (*frequently*, *sometimes*, *seldom*). They answer the question *how often?*.

They partially overlap with adverbs conveying iterative, habitual, and durative aspectual information, but they embrace a broader semantic area. Across sign languages, adverbs of frequency are conveyed by an independent manual sign (a) or by inflecting the verbal manual sign they modify (b).

a. IX$_3$ PIZZA IX$_3$ EAT SOMETIME
'He sometimes eats pizza.'

5_6.4.2.8_1_LIS_IX-1 WORK ARRIVE LATE++

b. IX$_1$ WORK ARRIVE LATE++
'I always arrive late at work.' (LIS, Natural 2014: 32)

If the target sign language conveys adverbs of frequency by independent manual signs, the grammar writer should verify their preferred position in the sentence.

6.5 Adverbial phrase modifiers

Adverbial phrases may contain more material than just the head, namely, the adverb. When this happens, the head is modified by the material appearing inside the adverbial phrase.

Adverbs can be modified by degree words expressing intensity or comparison [Semantics – Chapter 8].

6.5.1 Adverbs modified by degree words expressing intensity

An adverb can be modified by a degree word expressing intensity. In English, for example, the adverb can be preceded by *very, so, quite, too*, *extremely, incredibly,* etc.

John was walking **too** quickly

No specific studies on the modification of an adverb by a degree word expressing intensity in sign languages are at the moment available.

6.5.2 Adverbs modified by degree words expressing comparison

Adverbs may undergo comparison by being modified by degree words expressing comparison in their comparative and superlative forms. When undergoing comparison, in English the adverb is preceded by *more/less* or *most/least* yielding the adverbial phrase *more/less quickly, most/least quickly*.

No studies on comparative and superlative degree words modifying an adverb in sign languages are at the moment available.

Elicitation materials

Since the production of adverbial phrases is not frequent in spontaneous conversation, the grammar writer is advised to use elicitation techniques such as a situational

context he/she should sign to the consultant followed by questions aiming at eliciting adverbial phrases. To exemplify, after presenting the context in (i), the consultant can be asked the question in (ii).

(i) You have a job meeting at 9. It's 8:45 and you are still at home. The job meeting is half an hour away, walking distance, from your place.
(ii) How are you walking to get there on time?

Another elicitation technique involves asking grammaticality judgments. It is, however, advisable to use grammaticality judgments after eliciting the data through situation contexts, just to verify the position(s) adverbial manual signs occupy in the sentence.

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Chapter 0 Preliminary considerations – The meaning of words and sentences

Semantics is the component of grammar that investigates the meaning of linguistic expressions. In this section we focus on the meaning of morphemes, words, constituents, and sentences. The meaning of more complex expressions such as discourse units and text parts are discussed in the Pragmatics part [Pragmatics]. Unlike pragmatics, semantics does not describe and explain linguistic meaning of utterances and language use in context. Instead, semantics focuses on the truth-conditional (or cognitive) aspects of literal (context independent) meaning of morphemes, words, or sentences.

In this introduction to the Semantics part, we briefly outline how the grammar writer should use this part. We already mentioned in the general introduction [Introduction] that semantics is included in the Manual but not in the Checklist. This is due to the fact that we made the decision to integrate semantics as a core part into the Manual to address the dimension of meaning and to avoid that the discussion of the meaning of simple and complex grammatical categories is distributed across sections describing the formal aspects of these grammatical categories.

We think that the traditional structure of reference grammars typically leads to a blending of formal and functional categories in the grammatical descriptions. In general, we are convinced that an independent discussion of the relevant semantic notions, which is not influenced by the formal implementations in a language, provides important background information to the grammar writer for investigating their potential lexical, phonological, morphological, and syntactic realizations in the target language under investigation. Hence, the grammar writer should be aware of the fact that the description of grammatical categories involves semantic fieldwork aiming at a detailed description of the meaning of grammatical categories, especially since there is typically no one-to-one-relation between the form and the function of a grammatical category.

> Semantic fieldwork aims to establish facts about the meaning of utterances, and parts of utterances, in the language under investigation. These semantic facts are often subtle, are usually context-dependent, and are almost never accessible by direct native-speaker intuitions (i.e., one cannot simply ask questions of the form "What does X mean?"). Imagine, for example, the task of a researcher interested in the semantic contribution of the English definite article *the*. One cannot ask a native speaker, "What does *the* mean?" I argue below that the required information also cannot be extracted from textual materials alone. Instead, one must construct a range of example sentences, paired with particular discourse contexts, and ask the speaker whether in the discourse contexts provided, the sentences are (a) felicitous and (b) true. From this type of primary data involving judgments about the felicity and truth of whole utterances, the semanticist reasons backward to establish the precise contribution of *the*.
>
> (Matthewson 2004: 370–371)

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Let us illustrate this point with temporal categories as a simple example (for a detailed discussion of tense [Semantics – Section 1] in semantic fieldwork, see Matthewson 2006). The following examples show that German, like many other languages, distinguishes between present, past, and future tense. The grammatical system provides three different forms to refer to different points in time.

a. Ein Mann geht in die Kneipe. (German)
   a man go-PRESENT in the pub
   'A man goes/is going to the pub.'
b. Ein Mann wird in die Kneipe gehen.
   a man FUTURE in the pub go
   'A man will go to the pub.'
c. Ein Mann ging in die Kneipe.
   a man go-PAST in the pub
   'A man went to the pub.'

However, a closer look reveals that the picture is more complex: The (unmarked) verbal present tense form cannot only be used to refer to the present but also to refer the future as in example (a) and to the past (in the historical present in (b)). Moreover, present tense is also used for generic reference as in (c).

a. Morgen geht ein Mann in die Kneipe. (German)
   tomorrow go-PRESENT a man in the pub
   'Tomorrow, a man will be going to the pub.'
b. Geht da gestern ein Mann in die Kneipe ...
   go-PRESENT PARTICLE yesterday a man in the pub
   'Yesterday, a man was going to the pub ...'
c. Peter spielt Klavier.
   Peter play-PRESENT piano
   'Peter plays piano.'

The grammar writer may decide either that the present tense has a specific temporal meaning, that is, it is used to refer to the utterance time but permits reference to a time in the present or in the future in certain contexts or that the temporal reference of the present tense is always pragmatically fixed, that is, the present tense has no specific temporal meaning. No matter what the grammar writer decides, these examples show that the grammatical category of (morphosyntactic) tense must not be conflated with the semantic notion of tense. Since the same holds true for other grammatical categories, we have devoted an entire part of the Blueprint to the elucidation of concepts related to meaning.

Since all semantic concepts are also addressed from a formal perspective in the Lexicon [Lexicon], Morphology [Morphology], and Syntax [Syntax] parts, the grammar writer is advised to always double-check the corresponding sections to get

a comprehensive description of the formal and functional properties of the respective grammatical categories. Cross-references to the corresponding sections in the Lexicon, Morphology and Syntax parts are always given in the introduction to each section. For many topics, more than one section will be relevant. The following table gives an overview of the most relevant cross-references of all sections in the Semantics part.

Semantics section	*Corresponding sections*
Tense	Lexicon (Tense markers [Lexicon – Section 3.3.1]) Morphology (Tense [Morphology – Section 3.2]) Syntax (Temporal clauses [Syntax – Section 3.5.2]) Syntax (Temporal adverbs [Syntax – Section 6.4.2.1])
Aspect	Lexicon (Aspectual markers [Lexicon – Section 3.3.2]) Morphology (Aspect [Morphology – Section 3.3]) Syntax (Adverbs conveying aspectual information [Syntax – Section 6.4.2.4])
Event structure	Morphology (Aspect [Morphology – Section 3.3])
Modality	Lexicon (Modality markers [Lexicon – Section 3.3.3]) Morphology (Modality [Morphology – Section 3.4]) Syntax (Adverbs conveying deontic modality [Syntax – Section 6.4.2.5]) Syntax (Adverbs conveying epistemic modality [Syntax – Section 6.4.2.6])
Evidentiality	Morphology (Modality [Morphology – Section 3.4]) Pragmatics (Role shift [Pragmatics – Section 6])
Argument structure	Lexicon (Verbs [Lexicon – Section 3.2]) Morphology (Agreement [Morphology – Section 3.1]) Syntax (The syntactic realization of argument structure [Syntax – Section 2.1] Semantics (Argument clauses [Semantics – Section 14.1]) Syntax (Null arguments [Syntax – Section 2.4]
Classifiers predicates	Morphology (Classifiers [Morphology – Section 5]) Syntax (Classifier handshape [Syntax – Section 2.1.2.4]) Pragmatics (Classifier handshapes [Pragmatics – Section 2.2.2])
Comparison	Syntax (Comparative clauses [Syntax – Section 3.6]) Syntax (Intensifiers and other modifiers [Syntax – Section 5.1]) Syntax (Adverbs modified by degree words expressing comparison [Syntax – Section 6.4.2.5])

Plurality and number	Lexicon (Numerals [Lexicon – Section 3.10.1]) Morphology (Number [Morphology – Section 4.1]) Syntax (Numerals [Syntax – Section 4.3])
Quantification	Lexicon (Quantifiers [Lexicon – Section 3.10]) Syntax (Quantifiers [Syntax – Section 4.4])
Possession	Lexicon (Pronouns [Lexicon – Section 3.7.3]) Syntax (Possessive phrases [Syntax – Section 4.2])
Negation	Lexicon (Negative particles [Lexicon – Section 3.11.1]) Morphology (Negation [Morphology – Section 3.5]) Syntax (Negatives [Syntax – Section 1.5])
Illocutionary force	Lexicon (Question particles [Lexicon – Section 3.11.2]) Syntax (Sentence types [Syntax – Section 1]) Pragmatics (Speech acts [Pragmatics – Section 3])
The meaning of embedded clauses	Lexicon (Conjunctions [Lexicon – Section 3.9]) Syntax (Coordination and subordination [Syntax – Section 3])

Note finally that we do not include elicitation materials in sections that belong to the Semantics part since elicitation materials can be found in corresponding sections in the Lexicon, Morphology, and Syntax parts. A detailed discussion of the methodology of semantic fieldwork and its relevance for grammatical description can be found in Matthewson (2004) and Bochnak & Matthewson (2015).

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Chapter 1 Tense

1.0 Definitions and challenges

In this section, the term tense is defined from a semantic point of view, and semantic distinctions useful for the grammar writer are briefly presented and explained. The morphosyntactic realization of tense is discussed in detail in the Morphology section

on tense [Morphology – Section 3.2]. The absolute tenses [Semantics – Section 1.1] are defined in Section 1.1, the relative tenses [Semantics – Section 1.2] in Section 1.2. In Section 1.3 the possibility of coding degree of remoteness [Semantics – Section 1.3] is presented.

Tense is the grammaticalized expression of location in time (Comrie 1985: 9). Tense marking serves to locate situations or eventualities (events, states, processes, etc.) in time; it is the basic grammatical category that – together with adverbial [Lexicon – Section 3.5] and aspectual [Semantics – Section 2] encoding of temporality – enables us to reconstruct the temporal relation between the speech situation (actual context of utterance) and the situation described in a sentence and to reconstruct the relative order of situations described (Fabricius-Hansen 2004). When we analyze the possibilities how tense can be coded in languages we describe the relation between the time of utterance and the time of reference.

Traditionally the term 'tense' is used for temporal meaning as well as for the form expressing the temporal meaning. In this section, it is only used for temporal meaning, and we will refer to temporal forms as tense marking. The following three distinctions are necessary to describe the meaning of tense.

a. *Utterance time* (UT) – also known as speech time – is the time at which the sentence is uttered.
b. *Event time* (ET) – also known as time of situation – is the time at which the relevant event takes place.
c. *Reference time* (RT) or *topic time* (TT) – also known as time of orientation – is the time for which some claim is made (Klein 1992, 1994; Fabricius-Hansen 2004).

While utterance time and event time are sufficient for the analysis of absolute tenses, reference time is necessary to analyze relative tenses. The difference between the TT and the ET can be illustrated as follows:

YESTERDAY I ATTEND DEMONSTRATION PROCESSION
'I attended a demonstration procession yesterday.'
(DTS, adapted from Kristoffersen et al. 2008)

In the sentence above the TT is the day before the UT and the ET is a specific interval at the day before the UT (e.g. 4 pm–5 pm). The ET is part of the TT. By contrast, in the following sentence the ET is identical to the TT and the UT is after the ET and TT.

<u>past</u>
COME O´CLOCK FOUR (DTS, adapted from Kristoffersen et al. 2008)
'I arrived four o'clock.'

As shown in the two sentences above, the RT, TT, and the ET may refer to events/ situations that happen at a specific point in time (e.g. Monday 4 pm) or they may

happen at intervals (e.g. Monday from 4 pm to 5 pm). As opposed to this, the UT is always a point (e.g. the point at which the sentence is uttered). UT can be simultaneous to or included in ET:

pres
GIANNI HOUSE BUY (LIS, Zucchi 2009: 103)
'Gianni buys/is buying a house.'

In the sentence that follows, the TT and the ET precede the UT. The ET is included in TT:

past
GIANNI HOUSE BUY (LIS, Zucchi 2009: 103)
'Gianni bought a house.'

In the next sentence the UT precedes the TT and the ET. The ET is included in the TT:

fut
GIANNI HOUSE BUY (LIS, Zucchi 2009: 103)
'Gianni will buy a house.'

Tense does not establish reference times or event times. Tense indicates the relation between the ET and the TT. The relations can be deictic (that is, the UT is the same as the TT or the UT is included in TT), labeled 'absolute' or 'deictic tense', or it can be relational non-deictic (that is, the UT is not identical to or part of the TT), labeled 'relative' or 'anaphoric tense'.

The event time may represent a complete situation (perfective point of view) or a situation that is a part of a situation of the same type (imperfective point of view) depending on the situation type and aspectual properties of the sentence. Here, we are in an area where tense interacts with aspect [Semantics – Section 2] and Aktionsart/event structure [Semantics – Section 3]. Thus, many languages distinguish formally between perfective and imperfective aspect within the past tense (Fabricius-Hansen 2004), and alleged tense markers may not really code relations between ET and UT but between TT and ET. The relations between TT and ET are aspectual relations such as progressive, perfective, perfect, and prospective (see Klein 1994; Binnich 1991).

1.1 Absolute tense

The term 'absolute' is used for tenses that, in their normal use, are anchored directly in the time of utterance, for example, the present and present progressive (*happens, is happening*), (simple) past and past progressive (*happened, was happening*), and future and future progressive (*will happen, will be happening*) tenses in English. There are three basic ordering relations between ET and UT (= RT/TT)

to be distinguished, corresponding to the three deictic notions of present, past, and future: the described situation may overlap with the time of utterance, it may precede the time of utterance, or it may be located after the time of utterance. These relations can be encoded cross-linguistically by the present, past, and future tenses, respectively (Fabricius-Hansen 2004). The following table gives a schematic overview of the absolute tenses:

Tense	Definition	Formalism
Present	Event time overlaps utterance time	ET ≥ UT or ET ≤ UT
Past	Event time precedes utterance time	ET < UT
Future	Event time follows utterance time	ET > UT

1.2 Relative tense

Relative tenses differ from absolute tenses by locating the event time not directly with respect to the utterance time but as preceding or following a secondary time of reference (i.e. the RT or TT) that may precede, follow, or overlap with the utterance time. (Fabricius-Hansen 2004). The table below gives a schematic overview of the relative tenses:

Tense	Definition	Formalism	Example
Past perfect/anterior	Event time precedes reference time and reference time precedes utterance time	ET < TT < UT	(a)
Future perfect/anterior	Event time precedes reference time and reference time follows utterance time	ET < TT > UT	(b)
Past posterior	Event time follows reference time and reference time precedes utterance time	ET > TT < UT	(c)
Future posterior	Event time follows reference time and reference time follows utterance time	ET > TT > UT	(d)

Note that the examples are not necessarily examples of tense marking in DTS, rather they are examples showing temporal meanings.

a. INDEX$_1$ BUY CANDY BUT PRIOR GOING-TO CINEMA EAT-PILL ALREADY EMPTY
'I bought candy, but I had eaten all of it before I arrived to the cinema.'

b. INDEX$_2$ MUST REGISTER WITHIN FIRST MAY MUST
'You have to register before May 1st.'

c. INDEX$_3$ CRAFTSMAN SAY RELY-ON HOUSE DONE PRIOR OCTOBER
'The craftsmen had said that they expected the house to be ready a bit before October.'

d. INDEX$_1$^PLURAL WALK TOUR AFTERWARDS EVENING EAT
'After dinner we will go for a walk.'
(DTS, adapted from Kristoffersen et al. 2008)

1.3 Degree of remoteness

A small number of the world's languages have the capacity to express grammatically not only simple tense relations of past and future, but also finer distinctions indicating the distance or 'degree of remoteness' from the RT/TT. These tense systems give the possibility to grammatically encode the distance in time between ET and RT/TT. This capacity to express grammatically various degrees of remoteness constitutes an important dimension of the tense-aspect-mood systems in these languages (Botne 2012). Some tense systems encode degree of remoteness in a very detailed manner. The following table (adapted from Farr 1999) shows an example of the system from Korafe, a Papuan Language of Papua New Guinea.

Morpheme	Tense
-teni	Hodiernal past (from sunrise the day of speaking up to time of speaking)
-ani	Diurnal past (after noon preceding day up to time of speaking)
-mutani	Diurnal past 2 (24 hours before Diurnal past)
-seni	Remote (from two days before the day of speaking till very distant past)

Sign languages may use the spatial properties of the singing space to express different degrees of remoteness on the time line [Morphology – Section 3.2.1].

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Chapter 2 Aspect

2.0 Definitions and challenges

The grammatical category of aspect encodes meanings that have to do with different ways of presenting the internal temporal properties of situations or eventualities (events, states, processes, etc.) – for the morphosyntactic realization of aspect, see the detailed discussion in the Morphology section on aspect [Morphology – Section 3.3]. Although strongly interacting with the category of tense, aspect does not situate the eventuality with respect to other deictic points in time, but is rather concerned with the internal temporal organization of eventualities, as one can see in the characterization of the different types of aspectual notions. This notion of aspect is also called aspectual viewpoint. Natural languages, though, often encode aspect in close interaction with tense [Semantics – Section 1] and for this reason tense markings [Morphology – Section 3.2] often involve aspectual distinctions as well. Take for instance the following contrast in Portuguese between the imperfective past in (a) and the perfective past in (b).

(a) eu lia (Portuguese)
'I used to read/I was reading.'
(b) eu li
'I read.'

Most sign languages described to date do not show morphological tense marking [Morphology – Section 3.2], but they systematically display aspect morphology [Morphology – Section 3.3].

In this section we concentrate on the notions of aspect that are normally realized by dedicated morphosyntactic categories (inflectional affixes, specific periphrases, etc.) and do not depend on the intrinsic lexical meaning of the predicate. However, the term 'aspect' is also often used to refer to aspectual classes (*Aktionsarten*) determined by the lexical semantics of predicates and the combination with their arguments. These notions of lexical aspect are dealt with in a separate section on event structure [Semantics – Section 3]. The grammar writer, though, should be aware that the two notions of aspect are not totally independent and more often than not they do interact in actual language examples.

In dealing with aspectual categories, it should be kept in mind that the labels to identify them are not always used consistently across authors and languages, especially when it comes down to discussing particular markers in specific languages. Therefore, the grammar writer is advised to review the literature on specific aspectual notions and markings, before committing to a concrete choice. Here attempts have been made to keep to the most widely accepted notions for sign and spoken languages.

2.1 Imperfective

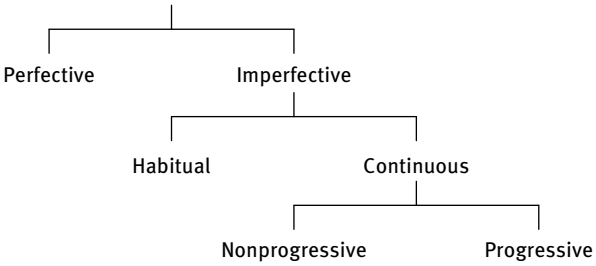
The most basic aspectual distinction is the one between perfective / perfective [Semantics – Section 2.2] and imperfective. Perfective aspect presents the eventuality as a whole from the outside and as something bounded. It does not look at its internal structure. By contrast, imperfective aspect presents the eventuality from inside, during its course and within its boundaries (if at all). An eventuality or situation is not perfective or imperfective by nature: in principle it can be presented from both viewpoints, as in the following English example:

Dany baked a cake yesterday. While he was baking it, the smoke alarm went off.

In this case, the verb *bake* refers to the same type of eventuality, but the viewpoint from which it is presented here as occurring in the past is different: in the first sentence it is interpreted perfectively, but in the second imperfectively. This is reflected in English by the choice of simple past morphology in the former, and of the past progressive or continuous in the latter. The entailment patterns are different in each case. Compare the following entailment patterns for the perfective and imperfective sentence, respectively:

a. 'Mary walked to the store' *entails* 'Mary reached the store'
b. 'Mary was walking to the store' *does not entail* 'Mary reached the store'

Imperfective aspect, though, often displays further distinctions, as reflected in the following classification of aspectual oppositions by Comrie (1976). At the same time, there are other specific aspectual meanings that fall under the category of the perfective, which will be discussed in section 2.2.



Classification of aspectual oppositions (Comrie 1976: 25)

2.1.1 Habitual

Habitual aspect denotes that an eventuality takes place regularly or holds over an extended period of time, thus characterizing it.

a. When I was a child, I would play in the street.
b. In her youth she always wore a hat.
c. He answers his emails in the evening, never in the morning.

2.1.2 Continuative/durative

Continuative (or continuous/durative) aspect refers to the imperfective aspect category that is not habitual (Comrie 1976: 26). It focuses on the development of the eventuality.

2.1.3 Progressive

The progressive is the type of imperfective aspect that specifically presents the (non-stative) eventuality as ongoing. The English continuous tenses realize this aspect, as in the following examples.

a. He is cleaning the bathroom.
b. When I came in, she was still sleeping.

2.1.4 Conative

Conative aspect expresses the meaning of trying to do something (and not necessarily succeeding) of imperfective forms like the present or the past imperfective tenses in Ancient Greek or Latin, as in the following example:

Pestilentem domum vendo. (Latin)
unhealthy house sell-PRS.1SG
'I am trying to sell my unhealthy house/I am offering my unhealthy house for sale.'

In a sense this is not properly speaking a category of grammatical aspect, but rather a particular use of imperfective forms related to intentionality (modal). Notice, though, that this label has been used in the sign language literature for aspectual notions that do not correspond to this traditional definition.

2.2 Perfective

Within perfective aspect (eventuality viewed as a whole from the outside and as something bounded), a number of further aspectual distinctions can be established. Note that the perfect can be better characterized as a tense [Semantics – Section 1], and should not be confused with perfective aspect: it relates a state to a previous situation. However, it can also be seen as a category overlapping with both tense and aspect.

2.2.1 Iterative

Iterative aspect denotes repetition of single eventualities on a single occasion or over a period of time, but it differentiates itself from the habitual in that those eventualities are bounded and countable. In this sense it can be considered a subtype of perfective aspect.

a. She called me three times yesterday.
b. I will repeat it as many times as you need it.
c. dara~dara-tha raa-ja warirr
break-RED-ACT spear-ACT nothing
'(They) speared (him) but (their spears) broke and broke again, nothing (happened).' (Kayardild, Evans 1995: 290, apud Velupillai 2010: 213)

2.2.2 Inceptive/inchoative

Inceptive aspect encodes the beginning of a new event.

He started to cry.

Inchoative aspect denotes the beginning of a state.

The sun started to shine.

The grammar writer should keep in mind that for sign languages like ASL, the "unrealized inceptive aspect" has been identified (Liddell 1984, 2003): it denotes the aborted start of an action (i.e., 'I was about to leave when the telephone rang') or the initial phase of an eventuality that never got to completion. It can be paraphrased in English with the use of *almost* in the following sentence:

John almost opened the door.

At least under one of the two possible readings it is perfective in the sense that it does indicate a change of state (reading (b)). Under reading (a) the start of the action did not even take place.

a. ... but then he changed his mind and stopped before he got to the door knob.
b. ... but it was too heavy and he was only able to push it a little bit.

2.2.3 Completive

Completive aspect denotes the completion of an eventuality. The closest translation in English is that of the perfect, but it is not identical to it.

á gbè ạdhè bhi nì o (Engenni, Thomas 1978: 73, apud Velupillai 2012: 213)
one let.go.home day be.black COMPLE in.fact
'Let's go home! It has got dark, you know.'

ASL has been shown to display a specific marking for 'delayed completive' aspect (Brentari 1998) that denotes protraction in the phase preceding the completion of the event.

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Chapter 3 Event structure

3.0 Definitions and challenges

Event structure or situation type refers to the internal temporal structure of eventualities and it is also known under other denominations like *Aktionsart*, actionality or inner aspect. Unlike grammatical or viewpoint aspect, it is determined by the lexical meaning of the relevant predicate and its interaction with the properties of its arguments (aspectual composition). The morphosyntax of event structure is briefly discussed in the Morphology section on aspect [Morphology – Section 3.3].

One can identify three kinds of lexical aspectual distinctions:

- Punctual versus durative: Punctual eventualities are not conceived of as lasting in time, while durative ones are, even if they are very short. Punctual events have no real internal structure. Durative ones are made of a string of phases.
- Telic versus atelic (terminative versus durative): Telic eventualities are conceptualized as involving a change of state that amounts to the end point (*telos*) of the event. Atelic eventualities do not contain such an end point as part of the event description.
- Stative versus dynamic: Stative eventualities refer to situations that are constant and do not change or evolve over time, while dynamic eventualities contain an element of change.

3.1 Event types

On the basis of these oppositions, predicates have been classified in five types (Vendler 1967; Dowty 1979; Comrie 1976; Smith 1997), as summarized in the following table:

Eventuality type	Internal temporal properties	Examples
State	Stative, Durative [Telicity N/A]	Believe in democracy, hate pumpkin
Activity	Dynamic, Durative, Atelic	Run in the park, cry
Accomplishment	Dynamic, Durative, Telic	Bake a cake, walk to the store
Achievement	Dynamic, Punctual, Telic	Reach the summit, win a race
Semelfactive	Dynamic, Punctual, Atelic	Knock, cough, blink

3.2 Testing event types

There are linguistic tests that distinguish telicity versus atelicity:

(i) *for-* versus *in*-adverbials: Perfective telic predicates can be combined with *in*-adverbials and not with *for*-adverbials. Atelic predicates allow *for*-adverbials but are incompatible with *in*-adverbials.

   a. Dany walked to the beach in an hour/*for an hour.
   b. Dany walked on the beach for an hour/*in an hour.

(ii) Compatibility with the terminative *finish*: Telic predicates combine unproblematically with *finish*, but the result is odd with atelic predicates.

   a. Dany finished walking to the beach.
   b. ?Dany finished walking on the beach.

(iii) Compatibility with 'take x time' versus 'spend x time': Telic predicates combine naturally with the former construction but not with the latter (examples (a–b)), while the opposite holds for atelic predicates (examples (c–d)).

   a. It took Dany one hour to walk to the beach.
   b. ?It took Dany one hour to walk on the beach.
   c. ?Dany spent one hour walking to the beach.
   d. Dany spent one hour walking on the beach.

Aktionsart cannot be completely lexically specified, as shown by the phenomenon of aspectual composition exemplified in the following sentences.

a. Mike wrote a letter with the computer. (Accomplishment)
b. Mike wrote letters with the computer. (Activity)

The Aktionsart of an event description like *write* seems to depend on the nature of its object or affected theme: when the latter is a count object, we get an accomplishment, but when it is non-countable, it yields an activity.

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Chapter 4 Modality

4.0 Definitions and challenges

Modality is a means to express unrealized possibilities, necessities, chances, wishes, intentions, obligations, and so on. In accordance with Bybee & Dahl (1989), in this section the term 'modality' refers to the semantic domain. The morphosyntactic realization of modality is discussed in the Morphology section modality [Morphology – Section 3.4].

The term 'mood' is avoided, as it is mostly associated with grammatical categories like indicative and subjunctive or the illocutionary force [Semantics – Section 13] of a sentence. Note that sometimes the term 'modality' also includes the grammatical category of 'evidentiality' [Semantics – Section 5]. Moreover, in sign language research,

the term 'modality' is also frequently used for describing the modality (channel) of the production and perception language of a language (visual-manual modality of sign languages as opposed to the auditory-vocal modality of spoken languages). Hence, the grammar writer should always be clear about terminology in this area.

Following Bybee & Fleischman (1995: 2), using means of coding modality has the effect that the factual or declarative semantic value of a proposition is supplemented by additional modality meaning. Thus, the proposition is provided with values such as hypothetical, potential, desiderative, and so forth.

4.1 Epistemic and deontic modality

In this section, the categories of modality are based on Palmer's (2001: 7f, 24–85) distinction. The first category, labeled 'propositional modality', is associated with the signer's or speaker's attitude on a proposition and implies the signer's or speaker's evaluation/judgment on/about a proposition (*epistemic modality*). In addition, with 'propositional modality' the indication of the evidence for a proposition can be meant (*evidential modality*). The second category, called 'event modality', is associated with events, states, situations, and so on, which did not happen in the past but could have happened. The two different subcategories depend on whether the influencing source is external (*deontic modality*; expressed, for instance, by permission or obligation), or internal (*dynamic modality*; expressed, for example, by ability or willingness). The various descriptions on modality in spoken and sign languages show that primarily epistemic and deontic modality are distinguished and, if present, evidential modality is described (Wilcox & Wilcox 1995; Wilcox 1996; Pfau et al. 2012). Dynamic modality is rarely distinguished from deontic modality in language descriptions. The differentiation is expressed in a simplified way and Palmer (2001: 10–18, 22) lists various further possible means of coding modality meaning (e.g. by interrogatives [Syntax – Section 1.2], conditional clauses [Syntax – Section 3.5.1], negatives [Syntax – Section 1.5], etc.).

With regard to existing findings on sign language research, various means of coding epistemic and deontic modality have been identified in sign languages. A systematic coding of evidential modality has not yet been observed for any sign language. In the following, we briefly describe how modality meaning is encoded in sign languages. To begin with, existing research on sign languages shows that modality can be coded in various lexical and syntactic/prosodic ways, including lexical and syntactic/prosodic non-manual components (Herrmann 2012; Pfau et al. 2012).

4.2 Modality coded by modals

In a sign language, epistemic or deontic modality may be expressed by different signs. What is known so far is that in various sign languages two types of signs exist which code these modality meanings. First, epistemic and deontic modality can be coded

by modal verbs [Lexicon – Section 3.3.3]. Modal verbs are signs that provide modality meaning and take a complement as illustrated by the following example:

INDEX$_1$ $_2$HELP$_1$ MUST (LSC, Pfau & Quer 2007: 143)
'You must help me.'

The modal verb MUST conveys a deontic modality meaning and follows the agreeing verb HELP. It takes the main verb and its arguments as complement (Pfau & Quer 2004: 16).

Modal verbs in sign languages, just like modal verbs in many spoken languages, typically express deontic modality meaning, epistemic modality meaning, or both as is illustrated by the following two examples from English (a) and German (b). In these examples, the modals *must* and *muss* can either receive a deontic or epistemic interpretation depending on the modal base.

a. John must be at home.
b. John muss zu Hause sein. (German)
John must at home be.INF

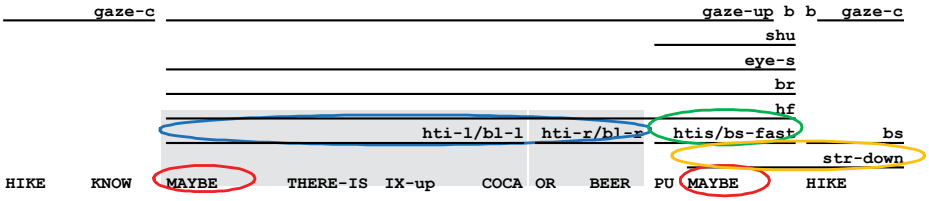
For both examples:
(i) Deontic reading: 'It was required for John to be at home.'
(ii) Epistemic reading: 'It is possible and there is evidence that John is at home.'

The following illustration shows two ASL modals that convey the deontic modality interpretations 'must' (a) and 'should' (b).

MUST

SHOULD (ASL)

The following example illustrates that a modal can express both deontic and epistemic modality. In this case various factors such as syntactic position and context may disambiguate the interpretation of the modal.



'While I am hiking I think that at the hut there might be cola or beer available. But I am unsure.'

Abbreviations: gaze-c – gaze to the camera; gaze-up – looking upward; b – blinking movement; shu – shoulders up; eye-s – eyes squinted; br – raised brows; hf – head forward; hti-l/r – head tilt to the left/right, bs-l/r – body lean to the left/right, htis – head tilts to the side, bs – body sways; bs-fast – fast body sways; str-down – mouth action 'lips stretched, corners down'; PU – palm-up. (ÖGS, Lackner 2013: 175)

In the example above, the first occurrence of the sign MAYBE is associated with the potentiality of the situation (i.e. deontic modality), while the second production of MAYBE is more likely associated with the signer's unsureness/uncertainty on the proposition (i.e. epistemic modality).

4.3 Modality coded by modality expressions

Signs of cognition, perception, or emotion can also express modality – especially epistemic modality meaning – as the signer's attitude on a proposition can be expressed by such signs. These signs are frequently linked with a complement in which hypothetical or unrealized events/situations/etc. are formulated. In sign languages for which these modality signs have been described the linked complement clauses are expressed either in a declarative or interrogative way. Signs conveying modality means are for example the ÖGS signs KNOW-NO or INDECISIVE (Lackner 2013: 315–317).

A possible implementation of a sign of cognition conveying epistemic modality meaning is illustrated in the following example.

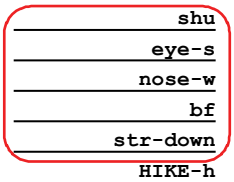
'While I am hiking I am completely uncertain and unaware whether the hut is open or closed.'

Abbreviations: eye-s – squinted eyes; hf – head forward; hf-large – head forward in an intensified way; bs – body sways; str-down – mouth action 'lips stretched, corners down'; PU – palm-up. (ÖGS, Lackner 2013: 161)

In the example above, the modality sign KNOW+NO displays a sign of cognition expressing lack of knowledge (encircled in red). It is linked with an interrogative clause [Syntax – Section 1.2] expressed the proposition that the epistemic modal expression takes as complement (the entire embedded polar interrogative is color-coded light rose, the main clause dark rose, the embedded clause medium rose).

4.4 Modality coded by non-manuals

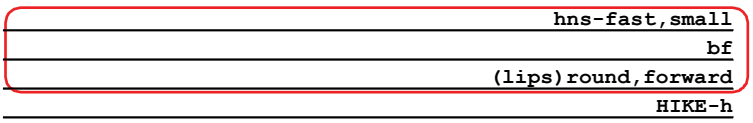
In many sign languages, modality can also be coded by non-manual markers (Herrmann 2012). When modality is only coded by non-manuals, the first possibility is that one or more non-manuals (co-)occur. These non-manual markers trigger a modality interpretation. This phenomenon is illustrated in the following:



'don't-know'

Abbreviations: shu – shoulders up; eye-s – squinted eyes; nose-w – wrinkled nose; bf – furrowed brows; str-down – mouth action 'lips stretched, corners down'; HIKE-h – holding of the preceding sign HIKE. (ÖGS, Lackner 2013: 352)

The non-manuals in the previous ÖGS example express the signer's lack of knowledge and insecurity/uncertainty and consequently display an expression that conveys epistemic modality meaning (Lackner 2013: 352). Modal non-manuals can either only accompany a constituent or the whole clause as is illustrated in the following example:



HIKE MUST IX-UP MUST WATER DRINK MUST++ YET/YES+ MUST+ HIKE
'While I am hiking I am **convinced** that there must be water up there.'
(ÖGS, Lackner 2013: 331)

In a sign language there are probably further manual and non-manual indicators that express that something is hypothetical, unreal, wished, etc., and thus provide modality meaning. In ÖGS, for instance, signers look upward (or somewhere to the front – frequently described as 'staring into the space'; definitely not to the dialogue partner) when expressing hypothetical thoughts. This is described as 'hypothetical space', which can also be used to express modality (Lackner 2013: 260–270).

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Chapter 5 Evidentiality

5.0 Definitions and challenges

Evidentiality is a grammatical category used to mark the source of information. Consider the following example from Kannada: the suffix *-ante* is used to mark the fact that the speaker does not have direct evidence for the information conveyed by the sentence, but that he received it from someone else.

nimma	pustaka	avara	hattira	illav-ante
your	book	he.POSS	near	NEG-QUOT

'(It is said that) your book is not with him.'

(Kannada, adapted from de Haan 2013)

The topic of evidentiality has received considerable attention in the typological literature in the last 30 years (Aikhenvald 2004). However, sign language research has almost completely ignored this topic (see further for the few existing references).

Therefore, the grammar writer may add a section on evidentiality in morphology or syntax if he/she finds evidence for evidentiality as an active grammatical category in the sign language under investigation.

Aikhenvald (2007) argues that it is necessary to distinguish evidentiality as a grammatical category and information source as the conceptual category that can be expressed by this grammatical marker (similar to the difference between 'tense' [Semantics – Section 1] and 'time' as a grammatical and conceptual category respectively). Thus, every language has some means to express the source of information in a given sentence. For instance, one might use a matrix clause overtly specifying the source of information expressed by the subordinate clause [Syntax – Section 3] as in the following English example:

I have been told by my teacher that the Earth is round.

However, not every language has a grammaticalized category of evidentiality. Aikhenvald further argues that the conceptual category of the information source can be either expressed by evidentials (specific grammatical means), by evidential strategies (grammatical markers that are used to express other meanings, but in addition have evidential semantics, such as perfective marking in some languages), and by other (non-grammatical) means, such as using a matrix verb to specify the source of information. Note, however, that in the literature the term 'evidentiality' is quite often used broadly to refer to both the conceptual and the grammatical category (see Cornillie 2007 in support of this usage).

There has been some debate on whether evidentiality is a type of modality [Semantics – Section 4]. The issue arises because in some languages, including many Germanic languages, modal verbs [Lexicon – Section 3.3.3] also express evidentiality. For instance, the following sentence in Dutch with the modal verb *moet* 'must' depending on the context can express epistemic modality or evidentiality. Note that, unlike *moet*, English *must* does not have the evidential meaning.

het	moet	een	goede	film	zijn	(Dutch)
it	must	a	good	movie	be.INF	

'It must be a good movie. OR It is said to be a good movie.'

However, many researchers, including de Haan (2001), have argued that evidentiality is a category separate from modality. Firstly, in many languages evidentials are not expressed by modal verbs or any other modality markers. Secondly, the meaning of evidentiality (the speaker received the information from a particular source) is logically independent of the meaning of epistemic modality (the speaker evaluates the probability of the truth of the proposition). Thus, semantically, it is necessary to analyze the category of evidentiality separately.

The grammar writer should be aware of the following analytic challenges:

- It is necessary to distinguish between the conceptual category of information source and the (potential) grammatical category of evidentiality.

– If an evidential marking is attested, it is necessary to specify the types of evidence it can express by a particular marker.
– Evidentiality should not be confused with epistemic modality, although some modal verbs might have evidential semantics.

5.1 Grammatical evidentiality markers

Typologically, evidentiality markers can specify different types of information sources. For instance, Aikhenvald (2007: 211) lists the following types:

I. Visual – evidence comes from seeing
II. Sensory – evidence comes from hearing, smell, or taste
III. Inference – evidence is inferred based on seeing
IV. Assumption – based on evidence other than seeing, due to general reasoning
V. Reported – reported information without explicit mentioning of the source
VI. Quotative – reported information with an overt source reference

Different languages can group different types together. For instance, in Quechua there are three evidential categories: one for sensory evidence (I and II), one for inference (III and IV), and one for reported (V and VI), while in Abkhaz types II–VI are all grouped together as non-first-hand evidentials (Aikhenvald 2007: 211–212).

There are some languages that have dedicated evidential markers. These markers can be affixes, clitics, particles, etc. (de Haan 2013). For instance, in the following example from Shipibo, the suffix *-ronqui* is a reported evidential marker.

cai-ronqui reocoocainyantanque (Shipibo, Faust 1973)
going-REPORT he.turned.over
'Reportedly, while he was going [in his boat], he turned over.'

However, to date there are almost no *manual* grammatical markers of evidentiality described for any signed languages. Burkova (2012) described a *non-manual* marking of inference in RSL. Studying conditionals [Syntax – Section 3.5.1], she found that if the main clause in the conditional sentence is a not an immediate result of the conditional, but a logical consequence (the signer draws a logical conclusion based on the conditional), a particular non-manual marking appeared, namely sidewards head tilt, frowned eyebrows, squinted eyes, eye gaze directed away from the addressee, and lips either pursed or puckered. This combination of non-manuals is glossed in the example below as *inf*.

inf
LIGHT+WINDOW / HOUSE IX NEIGHBOR COME IX BE (RSL, Burkova 2012: 70)
'Since there is light in the windows, the neighbors must have returned home.'

5.2 Other markers of information source

Some non-evidential grammatical markers may have evidential semantics in addition to their own primary meaning. Aikhenvald (2007) uses the term *evidential strategies* to describe such markers. She mentions that conditional mood, perfect [Semantics – Section 2.2], passive marking [Syntax – Section 2.1.3.2], nominalizations, assertiveness, and other categories can give rise to evidential meanings. So far no descriptions of the evidential meaning of other grammatical categories in sign languages exist. However, the grammar writer should check whether such categories (if present in the sign language under investigation) also have evidential semantics.

Aikhenvald (2007) argues that every language has the means of expressing the source of information. These means include open word classes (verbs [Lexicon – Section 3.2], adverbs [Lexicon – Section 3.5], etc.), closed word classes, such as modal verbs [Lexicon – Section 3.3.3], and speech report constructions.

As for open word classes, the information source can be specified using a matrix verb or parenthetical (*I think John is ill* – inference or assumption); an adverb (*John is reportedly ill* – reported source), or by other constructions (*According to me, John is ill*). Of course, similar ways of expressing information source are available in sign languages:

IX_1 THINK IX_2 ILL (RSL)
'I think you are ill.'

Jarque and Pascual (2015) discuss lexical items that are used to mark evidential semantics in LSC, and list almost 30 different signs such as verbs of perception like SMELL, psych verbs like FEEL.IN.HEART, and communication predicates like SAY that can be used in this manner.

As for closed word classes, it has been observed that in sign languages modal verbs can have evidential extensions (as discussed above for spoken languages). In addition, verbs like *seem* can be used to express evidentiality-related semantics as well. The following example shows that *seem* can be used in a situation where the speaker does not have first-hand evidence to the fact that she is ill.

It seems that Mary is ill.

A similar finding has been reported for ASL. According to Shaffer (2004: 190), the verb SEEM in the following example can only be used if the signer has some evidence to support the claim, but not in the case of belief without evidence.

top	bf
TIM, JENNIFER	DIVORCE SEEM

(ASL, Shaffer 2004: 190)
'It looks like Tim and Jennifer are going to get a divorce.'

It is possible that some manual and non-manual marking of epistemic modality in sign languages (see section modality [Semantics – Section 4]) in some contexts also have evidential semantics; the grammar writer should describe if this is the case.

All languages have means of expressing the fact that someone said something; that is, direct speech or indirect speech constructions. Since these constructions are not dedicated to expressing evidentiality (reported or quotative) and are not obligatory, they are not considered evidentiality markers, but of course their functions are related to evidentiality. Role shift [Pragmatics – Section 6] is used in most sign languages as a reported speech (and reported action) construction, so it may also be used to express evidential semantics. Shaffer (2012) specifically discussed the evidential functions of attitude role shift [Pragmatics – Section 6.1] (reported speech) in ASL. She found that signers frequently employ the following strategy: they use role shift to point out that some information has been conveyed to them in the past; the information itself is then signed without role shift. This is exemplified in the following example:

role shift

YES YES AND IX$_1$ HEARD. $_3$SIGN-TO$_1$. WHAT? VRS START CUT ...

'Yes, and I heard, I was told, and was shocked to hear, that the VRS companies are starting to disconnect the calls ...' (ASL, adapted from Shaffer 2012: 142)

Jarque and Pascual (2015) discuss whether role shift is an evidential strategy in LSC or not. They include cases where role shift spreads over the whole reported utterance, that is, typical cases of reported speech. Note that the use of role shift to indicate information source would not qualify as evidentiality marker according to Aikhenvald's (2007) classification, but it might be on the way of becoming a grammaticalized marker of reported evidentiality (for further arguments in favor of analyzing role shift as evidentiality marking, see Jarque and Pascual (forthcoming)). The grammar writer thus should discuss evidential extensions of the use of role shift for reported or quoted information.

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Chapter 6 Argument structure

6.0 Definitions and challenges

In order to express a complete predication referring to a particular event or situation, predicates (typically verbs [Lexicon – Section 3.2], but also adjectives [Lexicon – Section 3.4] and nouns [Lexicon – Section 3.1]) combine with dependents or participants. Dependents that are syntactically and semantically selected by the verb and typically obligatorily co-appear with a predicate are known as 'arguments' of that predicate. Take for instance the verb *provide* in English: in order to form a complete predication, it needs to co-occur with constituents referring to a provider (*the officer*), the thing supplied (*the relevant directions*) and the recipient of that thing (*her*). Note that all alternatives that lack one of those arguments result in ungrammaticality, because the predication is semantically incomplete.

a. The officer provided her with the relevant directions.
b. *The officer provided her.
c. *The officer provided with the relevant directions.
d. *Provided her with the relevant directions.

It is generally assumed that the information about the arguments of a predicate is determined in its lexical entry. The argument-taking property of a predicate constitutes the 'argument structure' of that predicate or 'valency'. The syntactic realization of argument structure [Syntax – Section 2.1] is discussed in the corresponding Syntax section. Here, we focus on the semantic properties of argument structure.

In the example above, the lexical entry would specify that the English verb *provide* requires three arguments encoding the provider, the thing provided and the recipient of the act of providing. This can be expressed abstractly with the following notation:

provide (x, y, z)

However, from the paraphrases we offered, it is clear that the argument slots are associated with richer semantic properties in the lexical entry: there is an agent (the one who provides something), a theme (the thing that is provided) and a recipient (the receiver of that thing). This is why lexical representations of predicates are enriched with 'thematic roles' [Semantics – Section 6.1] (or 'theta-roles/θ-roles') associated to each argument slot, and understood to be determined (assigned) by the predicate. Thematic roles encode the general semantic interpretation of an argument with respect to a predicate. In the case at hand above, we would get the following representation:

provide (AGENT, THEME, RECIPIENT)

This kind of representation is referred to as 'thematic structure'. One of the important motivations for the identification of thematic structures is that they allow for generalizations over groups of predicates in the lexicon sharing the same thematic structure. In this particular case, it is clear that *provide* has the same thematic grid in *give* or *deliver* in English and in give in LSC:

a. The officer gave her the relevant directions.
   give (AGENT, THEME, RECIPIENT)
b. The officer delivered the relevant information to her.
   deliver (AGENT, THEME, RECIPIENT)
   top top
c. BOOK DAVID IX_3 $IX_{1\ 1}$GIVE$_3$ ALREADY (LSC)
   'I already gave the book to David.'
   give (AGENT, THEME, RECIPIENT)

As we see from the examples above, the same thematic arguments can be realized by different types of syntactic constituents [Syntax – Section 2]. The THEME is realized as a PP introduced by with in the case of *provide*, but as regular DP in the case of *give* and *deliver*. The RECIPIENT is instantiated as a DP with *provide* and *give*, but as a PP with *deliver*. Sometimes such differences in syntactic realization of the same thematic role do not have an effect on interpretation, while in other cases it does to a smaller or to a greater extent. Notice, for instance, that *provide* can have the alternative syntactic realization of its argument structure as in the following example:

The officer provided the relevant directions for her.

Here the THEME is realized as a DP. What looks like the RECIPENT argument, though, is often characterized in a more fine-grained classification of theta-roles as a BENEFACTIVE or BENEFICIARY. Arguments marked for this role encode the participant

who may receive the THEME argument, but not necessarily (as opposed to a RECIPIENT, which receives it).

Despite the lexical encoding of thematic roles, the surface realizations of arguments can be affected by different factors. One of them, for instance, has to do with the occurrence of implicit arguments, as in the following example:

The officer provided the relevant directions.

Although the interpretation imposes that the directions are provided to someone, in certain cases the RECIPIENT does not need to be overtly expressed. Something similar occurs with *eat*, which allows for the two different syntactic realizations of the argument structure illustrated in (a) and (b).

a. Dana already ate her lunch.
b. Dana already ate.

Implicit arguments, though, are not always licensed, as we do not get the following alternation, despite the fact that both *eat* and *bring* have a THEME in their respective argument structures.

a. David brought the wine.
b. *David brought.

On the syntactic realization of argument structure [Syntax – Section 2.1] see the corresponding section. Observe, for instance, that turning an active sentence into a passive one does not alter the thematic roles [Semantics – Section 6.1] associated with the arguments, but the grammatical function [Syntax – Section 2.2] they realize:

[$_{\text{AGENT}}$ The officer] provided [$_{\text{RECIPIENT}}$ her] [$_{\text{THEME}}$ with the relevant directions]. →
[$_{\text{THEME}}$ The relevant directions] were provided [$_{\text{RECIPIENT}}$ to her] [$_{\text{AGENT}}$ by the officer].

In the passive, though, the expression of the AGENT with a *by*-phrase is not obligatory and often remains implicit. We find argument structure changes [Syntax – Section 2.1.3] clearly determined by morphosyntax, but in some cases the alternations seem to be more in the lexical semantics, as in the transitive/intransitive alternation [Syntax – Section 2.1.1.5].

a.	The coast guard sank the suspicious boat.	→	transitive
b.	The suspicious boat sank.	→	intransitive

Another instance is exemplified by the following argument structure alternation [Syntax – Section 2.1.3] known as *spray/load* alternation, exemplified here (Larson 1988; Dowty 1991, 2000):

a. They loaded hay onto the truck.
b. They loaded the truck with hay.

Although at first sight they seem to be equivalent, they have been argued to show subtle semantic differences (e.g. the truck must be full of hay for the second example

to be true, while that is not the case for the first example). Those differences have led to the argument that we have two different lexical entries for load: $load_1$, as in *They loaded hay onto the truck*, where it has the same argument structure as *put* (AGENT, THEME, LOCATION); and $load_2$, as in *They loaded the truck with hay*, where it has the same argument structure as *fill* (AGENT, THEME). In the latter case *with hay* would not be an argument but an adjunct (see below).

The study of argument structure is based on the idea that each predicate has a number of discrete theta-roles to assign to its arguments to get a well-formed predication, and that each argument must receive one theta role from its predicate. This principle is formalized as the Theta-criterion (Θ-criterion, from Chomsky 1981: 36):

Theta-criterion
a. Each argument bears one and only one θ-role, and
b. Each θ-role is assigned to one and only one argument.

As can be observed, the principle is understood as a biunivocal relation between the stock of theta-roles a predicate has and the arguments that bear them. However, the first clause of the criterion might be too strong for instances of cases of secondary predication. In the following example the internal argument *her tea* receives the THEME theta-role from the verb *drink*, but it is also an argument of the secondary predicate *cold*, of which it is predicated as a THEME.

My sister always drinks her tea cold.

Argument structure is only concerned with constituents that are required by the lexical semantics of the predicate, and not with 'adjuncts' that can come along with the predication. As the label suggests, their co-occurrence with a predicate is not required by its lexical semantics and is not assigned a theta-role specified in its argument structure.

It is important to keep in mind that the syntactic realization of a constituent does not determine its argument or adjunct status with respect to the predicate it is linked to. The same type of constituent can be an argument with one predicate and an adjunct with another one, as the PP *in the kitchen* in the following examples (a) and (b), respectively: with *place* it realizes its LOCATION argument, but with *eat* it realizes an adjunct expressing the location of the event, but it is not obligatory. In this connection, spatial verbs are an especially interesting class of verbs in sign languages since they productively use the three-dimensional signing space [Pragmatics – Section 8] to express (topographic) spatial relations (see classifier predicates [Semantics – Section 7]).

a. My sister placed the plant *(in the kitchen).
b. She ate her lunch (in the kitchen).

A similar contrast can be observed with an adverbial phrase like *very badly*: with intransitive *dress*, it is required by the predicate as an argument realizing the MANNER theta-role, but with *speak* it is just a manner adjunct [Syntax – Section 3.5.4].

a. He dresses *(very badly).
b. He spoke (very badly).

Although the study of argument structure has mainly focused on the lexical semantics of verbs and verbs classes, it concerns other categories like nouns and adjectives. Notice that the morphosyntactic realization and obligatoriness of arguments in DPs and APs is different from what we observe in verbal predications.

a. [$_{\text{AGENT}}$ My] interpretation [$_{\text{THEME}}$ of her works]
b. rid [$_{\text{THEME}}$ of debts]

In analyzing argument structure it is essential to keep in mind all the morphosyntactic factors that can affect argument realization [Syntax – Section 2.1.2]. Remember that there are semantic and syntactic tests that can help to either identify theta-roles or to discriminate between arguments and adjuncts (see Benedicto & Brentari 2004). For instance, an AGENT argument must be combinable with an adverb expressing volition like *willingly* or *on purpose*: in the following two sentences, although causation is involved in the two predications, the subject in (a) is an AGENT, while in (b) it is a CAUSE.

a. The teacher opened the window on purpose.
b. The wind opened the window (*on purpose).

On the syntactic side, it is well known that arguments can be wh-extracted [Syntax – Section 1.2.3] naturally from certain domains, while adjuncts cannot:

a. ?What were you wondering [how to fix t_{what}] ?
b. *How were you wondering [what to fix t_{how}]?

6.1 Thematic roles

The description of argument structure typically relies on the existence of a closed inventory of thematic roles (or semantic roles) that a predicate can encode lexically for the semantic interpretation of its arguments. Theta-roles like AGENT or THEME, for instance, are universally accepted, but the lists of roles proposed differ from scholar to scholar in granularity and length. An expected hurdle is that sometimes it is difficult to identify the thematic interpretation of an argument with an existing type of theta-role, and then the solution is either to stretch the interpretation of an existing role or to create a new, more specific one. In fact, theta-roles are shorthand for bundles of thematic relations that cluster on one argument. Therefore, Dowty (1991) develops a more elaborated concept of proto-roles, which is flexible enough to account for the difficulties to identify thematic interpretations of arguments and to constrain the syntactic realization of arguments in a uniform way.

In the following table a list of theta roles generally agreed upon in the literature is offered, together with their interpretations.

Theta-role	Interpretation
AGENT	Participant that carries out the action or brings about the event.
THEME	Participant that is affected by the event, by getting altered, moved or by undergoing some process.
GOAL	End point of the movement or place/entity towards which a participant moves.
SOURCE	Starting point of the movement, or place/entity from which a participant moves. Participant that initiates a process.
PATH	Path of the movement.
LOCATION	Place where the event takes place.
RECIPIENT	Participant that receives the theme (a special type of GOAL with verbs of transfer).
BENEFACTIVE/ BENEFICIARY	Participant in whose benefit the event takes place.
EXPERIENCER	Participant that perceives or experiences the event, or sentient locus of a mental event.
CAUSE	Reason or source of the alteration associated with the event.
INSTRUMENT	Means or instrument by which the event takes place, assisting the agent.
QUANTITY	Spatial or temporal measure of the event.
PATIENT	Participant undergoing an event passively. Typically restricted to animates. Often subsumed under THEME.

Predicates of movement can encode a full range of arguments expressing SOURCE, GOAL and PATH, as in the following example:

[$_{\text{THEME}}$ The rock] rolled [$_{\text{SOURCE}}$ from the top of the hill] [$_{\text{GOAL}}$ to the valley] [$_{\text{PATH}}$ along the edge of the forest].

Verbs of transfer like *give* or *send* have received a double analysis in terms of thematic roles. The most widespread and traditional one takes this class of verbs as realizing the argument structure AGENT-THEME-RECIPIENT:

[$_{\text{AGENT}}$ The student] gave [$_{\text{THEME}}$ his essay] [$_{\text{RECIPIENT}}$ to the teacher].

Alternatively, under a locative interpretation of thematic roles, the same predication is viewed as a motion event interpreted metaphorically as movement of the THEME from a SOURCE argument to a GOAL argument:

[$_{\text{SOURCE}}$ The student] gave [$_{\text{THEME}}$ his essay] [$_{\text{GOAL}}$ to the teacher].

The question of the linking of the theta-roles of a predicate with its arguments is not a trivial issue, since despite the regularities, it is hard to find universal mapping principles of theta roles onto syntactic structure. However, although different theta-role hierarchies have been proposed to regulate that mapping, some facts are clear, and

for instance, an argument marked with the theta-role of AGENT will always dominate a THEME argument in the initial syntactic structure of an active clause.

An interesting case in this connection is the one represented by verbs of perception and emotion, also known as psychological predicates [Syntax – Section 2.1.1.3] (psych-verbs or psych-predicates). They all have an argument that feels or perceives, which receives the theta-role of EXPERIENCER, and an argument that expresses the stimulus of the experience. The latter is generally seen as the bearing the CAUSE theta-role, but more specific roles have been proposed such as TARGET or SUBJECT-MATTER (in some cases this argument is simply treated as a THEME). An interesting property of this class of verbs is that with some of them the EXPERIENCER argument is realized as a subject, and with others it is realized as an object. That is why we talk about subject-experiencer verbs and object experiencer-verbs. Here you have one example of each class in English and an example of subject-experiencer predicate in ASL:

a. [$_{\text{EXPERIENCER}}$ They] enjoyed [$_{\text{CAUSE/TARGET/SUBJECT-MATTER}}$ your article].
b. [$_{\text{CAUSE}}$ Your article] annoyed [$_{\text{EXPERIENCER}}$ the boss].
c. MARY HATE SUE. (ASL)
'Mary hates Sue.'

Note that in some cases it is difficult to assign a specific theta-role, and some extra reflection is needed. At face value, in the following example one would assign AGENT to the subject. However, it is an inanimate participant, and agents are typically animate and volitional.

The board provides the necessary information.

In this particular case, one possibility would be to interpret the subject argument as a SOURCE. Or alternatively, as a surrogate AGENT (inanimates that acquire an agentive property by virtue of having been endowed with it by a proper agent – in this particular case, the person that introduced the data into the board).

One way to respond to the difficulties created by a closed list of theta-roles has been to propose generalized semantic roles. A solution has been to propose two prototypical roles, namely a proto-agent and a proto-patient, defined by a list of lexical entailments that will follow or not for each argument depending on the predicate. A different implementation in a similar line is the postulation of macro-roles like ACTOR and UNDERGOER.

6.2 Semantic decomposition of thematic roles

A different way to approach the topic of thematic relations in predications is to abandon the idea that they are discrete and to decompose the lexical semantics of the predicates from which they derive (Jackendoff 1983, 1990). So, for instance the verb *give* (in the transfer of possession interpretation) can be lexically decomposed as

'x cause y to pass from x's possession to y's possession', and the verb *break* as 'x cause y to become broken.' The way to formalize this consists in postulating more primitive abstract predicates like ACT, CAUSE or BECOME that help make explicit the event structure of a predicate, in combination with the lexical root represented by the predicate, with its idiosyncratic meaning. From this perspective, the lexical semantics of a verb like *break* would look as follows:

[[x ACT] CAUSE [y BECOME <*BROKEN*>]

In this example, the variables x and y correspond to the argument slots of the external and internal argument of the predicate respectively. Such a semantic decomposition approach allows to easily generalize over verb classes. For instance, the verbs break, *dry*, *open* and *shorten* can be shown to share the same event structure:

break: [[x ACT] CAUSE [y BECOME <*BROKEN*>]]
dry: [[x ACT] CAUSE [y BECOME <*DRY*>]]
open: [[x ACT] CAUSE [y BECOME <*OPEN*>]]
shorten: [[x ACT] CAUSE [y BECOME <*SHORT*>]]

So the canonical realization of the event structure [Semantics – Section 3] predicates expressing externally caused states can be represented in the following template:

[[x ACT] CAUSE [y BECOME <*STATE*>]]

From such lexical conceptual structures the entailments of the arguments are argued to be derivable. Operations on them also account for well-known lexical alternations.

The primitive predicates that appear in such decomposed event structures form a restricted set: ACT/DO, CAUSE, BECOME, GO, BE, STAY and LET.

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Chapter 7 Classifier predicates

7.0 Definitions and challenges

Classifiers [Morphology – Section 5] are generally considered to be complex morphemes with referential properties and a non-specific meaning, which are expressed by particular handshapes. Classifier handshapes denote physical and geometrical properties of the entity they refer to and they represent a broad class of noun objects (Supalla 1986). The classification of handshapes is established according to visual and geometrical properties of the entity. The predicate indicates handling, movement or location of the entity denoted. Therefore, classifier predicates are a combination of a particular manual handshape, which has the referential properties (it is linked to a previously introduced entity), and verbs (or rather verb stems) expressing handling, motion and location. Classifier handshapes are overt markers of argument realization, which are incorporated in the predicate.

In the following example, the antecedent 'car' is introduced by the lexical sign for CAR. Right after, the classifier is uttered. The particular handshape stands for a geometrical property, which denotes the group of vehicles. The movement expresses the predicate 'be at a location'. The antecedent 'man' is introduced by the lexical sign for MAN. The classifier predicate afterwards expresses that the human upright entity (expressed with a particular handshape) is moving (the movement of the predicate).

CAR CL:vehicle: 'at location a' MAN CL:upright-human 'move to a'
'A man approached the car.'

As shown in the Morphology part, classifier predicates [Morphology – Section 5] are divided into three main categories, namely entity classifiers, body part classifiers and handle classifiers. Entity classifiers / Entity classifiers [Morphology – Section 5.1.1] (or whole entity classifiers) represent a broad class of noun objects (Supalla 1986). Some examples of whole entity classifier handshapes that are common across sign languages are the -handshape (for objects with smooth flat surfaces, e.g. a sheet of paper or a book), the -handshape (for long and/or thick cylindrical objects, e.g. a cup or a tree), and the -handshape (for long, thin objects, e.g. a pen or a person). They occur in verbs that express a motion or localization in space of an entity, and are combined with the phonological motion feature of the verb.

Body part classifiers [Morphology – Section 5.1.2] / Body part classifiers (also referred to as limb classifiers) don't refer to entities as a whole but rather to parts of a human or animal body, mostly limbs, expressed, for instance, by a -handshape for feet. Just like entity classifiers, body part classifiers may express the location or movement of a part of the entity. Other body part classifiers may refer to the head of an animate being (e.g. the -handshape in the verb BOW), to the mouth, or even to the eyelids. Although sometimes body part classifiers are subsumed under entity classifiers, the main difference between the two is that while entity classifiers substitute the previously introduced antecedent, body part classifiers refer back to a partial component of the antecedent.

The following two examples exhibit the distinction between entity and body part classifiers. The first one includes two entity classifiers. First, the classifier for 'tree' stands for the previously introduced antecedent TREE. Second, the classifier for 'human standing upright' substitutes the antecedent MAN. The second example includes an entity classifier for tree (it substitutes it) and a body part classifier, which expresses the feet of the man that has been previously introduced. While in the first example the classifier denoting an upright human totally refers back to the man, the flat feet on the second example refer only partially back to the man introduced.

a. MAN TREE CL:tree:'at a location a' / CL:upright-human:'stand next to tree'
'A man is standing next to a tree.'
b. MAN TREE CL:tree:'at a location a' CL:flat-feet:'walk to the tree'
'A man is walking to a tree.'

Handle (or handling) classifiers [Morphology – Section 5.1.3] / Handle (or handling) classifiers occur with verbs that involve the holding or the manipulation of a referent. In contrast to entity and bodypart classifiers, they indirectly represent the entity they refer to, as they represent only the part of the object that is handled. For instance, the handshape configuration of handle classifiers may represent holding the handle of a mug, the handle of a suitcase, or the stem of a flower. The particular handshape encodes an iconic aspect associated with an action involving the theme [Semantics – Section 6.1] argument of a verb, but they do not reflect the characteristics of the theme per se.

As complex morphemes, the study of classifiers may be approached from different areas. In the present section classifiers are approached according to their contribution in the creation of meaning. The grammar writer will find ample complementary information about classifiers in the following sections of the Blueprint:

- The composition of classifier constructions [Morphology – Section 5] may be found in the Morphology part.
- The syntactic contribution of classifiers and its function as argument realization [Syntax – Section 2.1] may be found in the Syntax part.
- The contribution of classifiers as an element instantiating reference tracking [Pragmatics – Section 2] may be found in the Pragmatics part.

7.1 Reference

Classifier handshapes establish a link to a discourse referent from the domain of interpretation. They do not directly refer to a particular discourse referent, but rather inherit the semantic properties of the previously introduced antecedent. For instance, a thumb-handshape classifier denotes a long upright entity. In LSC, this classifier may be used to refer to a rabbit or to a bottle, depending on the entity previously introduced. A flat-handshape, for example, denotes a flat entity, without much volume, and in LSC may refer to a piece of paper, to a book, to a turtle, or to the surface of a table. Therefore, they represent a broad class of possible noun denotations, not directly tied to a particular meaning but rather to a group of entities.

The grammar writer should bear in mind that the same classifier handshape may refer to different kinds of entities, but also may function as different kinds of classifiers. For instance, depending on the context, a flat handshape may stand for a turtle (as an entity classifier) or it may also stand for the legs of the turtle. In the first case, the movement of the handshape denotes the movement of the whole animal, while in the second case it denotes the movement of the legs. Importantly, the predication (movement) in both classifier constructions disambiguates the kind of classifier and the meaning attributed. In LSC, the limb classifier is coarticulated with the role shift [Pragmatics – Section 6] / role shift of the entity denoted, as indicated by the facial expression of the signer (Barberà & Quer, in press).

7.2 Anaphora

Classifiers present a dependent referentiality (reference [Pragmatics – Section 1]), which is shown in the inherent anaphoric potential: they are dependent on the antecedent previously introduced, which provides the link with the referent from the domain. This means that from a semantic and pragmatic point of view, classifiers function as proforms, that is, as markers that stand for the noun and have some referential properties (Engberg-Pedersen & Pedersen 1985; Friedman 1975; Garcia & Sallandre 2013; Kegl 1986; Supalla 1986; Kegl & Wilbur 1976). Some studies have simply assumed that an anaphoric relation between the classifier handshape and an argument of the predication is present (Benedicto & Brentari 2004; Chang, Su & Tai 2005; Cuxac 2000; Glück & Pfau 1998; Zwitserlood 2003, 2012). In these accounts, movement or localisation in the construction is taken to be a verb or root stem. The classifier as well as the locus in space are considered functional elements, such as inflectional affixes.

Classifiers are also definite in terms of the familiarity [Pragmatics – Section 1.2] conditions they present. Since they are attached to an antecedent present in the universe of discourse they cannot refer to a new, unknown entity.

Interestingly, the antecedent of the classifier is not always introduced before the anaphoric expression. In some contexts, it is also possible that an underspecified classifier handshape appears without previous introduction of the coreferential noun. That is, instances of backwards anaphora (i.e., cataphora) are also felicitous with classifiers. However, it is important to note that these cases are mainly restricted to literary contexts and only possible with classifiers that happen to be quite lexicalised. In the fragment below, the underspecified entity classifier denoting a two-legged entity is uttered first. In the subsequent sentence, the coreferential chain is established and the discourse referent ('man') attributing meaning to the anaphora is uttered.

PARC IX SEAT BENCH CLe(N):flat-surface / CLe(2):legged-entity-seated.
___br
MAN NEWSPAPER READ.
'In a park, there was someone seated on a bench. It was a man reading the newspaper.' (LSC, Barberà & Quer, in press)

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Chapter 8 Comparison

8.0 Definitions and challenges

Comparison introduces orderings between two or more objects with respect to the degree to which they possess some property. The essential ingredients for a comparison to be successfully carried out are:

1) The property that is compared must have a gradable dimension.
2) The availability of abstract representations of the degrees in terms of scales.

In the prototypical case, a comparison involves two objects that are explicitly expressed as in the example in (a), where the tallness of *John* is compared with respect to that of *Mary*. In other cases, a comparison is made with respect to a precise measure, as in (b). However, some form of comparison is also involved even when the gradable predicate is used in its positive form. In the example in (c), the height of *John* is compared with some standard degree of tallness that is contextually determined.

a. John is taller than Mary.
b. John is taller than 1.70 meter.
c. John is tall.

Although the semantics of comparison has received little attention in sign language, there are several interactions that are emerging between iconic properties of signs and semantic properties of comparative constructions. This is particularly true when gradable adjectives [Lexicon – Section 3.4] and classifier constructions [Morphology – Section 5] are considered. The syntactic properties of comparative constructions [Syntax – Section 3.6] are discussed in the corresponding Syntax part.

8.1 What can be compared?

In this section the grammar writer will indicate what kind of objects/properties can be compared. Indeed, comparison may involve properties that are expressed by several morphological categories as in the following examples from LIS:

a. GIANNI TALL MARIA MORE (adjectives) (LIS)
'Maria is taller than Gianni.'
b. GIANNI RUN FAST PIERO LESS (adverb)
'Gianni runs faster than Piero.'
c. GIANNI RUN PIERO MORE (verbs)
'Gianni runs more than Piero.'
d. LEO POTATOES CL-SASS GIANNI MORE (nouns)
'Gianni has more potatoes than Leo.'

Each of the examples above includes a specific dimension that is compared (tallness, velocity, amount of running, amount of potatoes).

Only predicates that are gradable can enter into comparative constructions. For instance, the adjective DEAD is not gradable, hence once used in a comparative construction the result is not acceptable, as shown by the LIS example below:

*GIANNI DEAD PIERO MORE/LESS (LIS)
Intended: 'Gianni is more/less dead than Piero.'

The possibility of a predicate to enter a comparative construction is the key test for its gradability.

However, in some cases predicates can be selective in terms of what kind of comparison they can enter. This is the case of FULL in LIS, for instance. As opposed to its English counterpart, FULL cannot enter more-comparatives in LIS; nonetheless, it should be considered a gradable adjective since it can enter a less-comparatives as shown below:

a. *GLASS WINE IX_a FULL IX_b MORE (LIS)
b. This glass is fuller than that one.
c. GLASS WINE IX_a FULL IX_b LESS
d. This glass of wine is less full than that one.

The grammar writer should carefully describe the semantic reasons why certain predicates can only enter specific comparative constructions and not others. In this specific case, the reason why some gradable adjectives cannot enter a more-comparative construction in LIS is due to the fact that they include an iconic reference to the maximum degree of the property hence the incompatibility with more-comparatives [Semantics – Section 8.3].

Another aspect that should be described is what is asserted and what is inferred by the comparative construction. In the English examples below, when the comparative form of the adjective is used it is only asserted that the height of *Gianni* is superior to that of *Piero* but the addressee is not allowed to infer that either *Gianni* or *Piero* is tall with respect to the contextually available standard of comparison. Both *Gianni* and *Piero* can be short with respect to the relevant comparison class. On the other hand, the LIS equivalent enables this inference: the sentence in (a) includes the additional meaning that both Gianni and Piero are tall. The grammar writer should discuss whether this additional meaning is present or not, and if so, whether it is part of what is asserted in a comparative construction or whether it is derived by some additional inference (entailment, presupposition [Pragmatics – Section 7.3] or implicature [Pragmatics – Section 7.1]).

a. PIERO TALL GIANNI MORE (LIS)
b. Gianni is taller than Piero.
c. Piero is shorter than Gianni.

8.2 Gradable predicates

The class of gradable predicates encompasses predicates that refer to dimensions (e.g. height, size, cleanness) that can be ordered with respect to degrees along a scale (Seuren 1973; von Stechow 1984; Bierwisch 1989; Kennedy 1999).

Some predicates, namely the relative predicates, evoke scales that are open: for instance, the scale of height evoked by the predicate *tall* does not have either an upper or a lower limit. Other predicates, the absolute predicates, make reference to scales that are closed, that is that have an upper and/or lower boundary (Unger 1975; Kennedy & McNally 2005). For instance, the predicate *straight* is gradable, but there is a maximum standard of straightness, and thus the scale has an upper limit; the predicate *dirty* on the other hand has a lower boundary, that corresponds to the minimum standard of dirt (that is, cleanness); predicates such as *full* or *empty* denote scales that are closed on both sides: a container cannot neither fuller nor emptier than a maximum standard. The grammar writer should list here (or in a table) gradable predicates according to their relative vs. absolute feature. Alternatively, the grammar writer may decide to describe the semantic properties of gradable predicates by introducing dedicated subsections for relative and absolute predicates.

Relative predicates (tall/short, big/small, wide/narrow...)
Absolute predicates
a. With an upper boundary (straight, clean, ...)
b. With a lower boundary (bent, dirty, ...)
c. With upper and lower boundary (full, empty ...)

These predicates can be identified with a distributional criterion: relative predicates can be modified by adverbs such as *very*; absolute predicates with an upper boundary by adverbs such as *almost*; with a lower boundary by *slightly*; with upper and lower boundary by *half*.

a. Piero is [very / #almost / # slightly / #half] tall
b. The rope is [#very / almost / # slightly / #half] straight
c. The cloth is [very / #almost / slightly / #half] dirty
d. The bottle is [#very / almost / slightly / half] full

The distinction between relative and absolute predicates has a direct correspondence in the way they contribute to the meaning of the entire clause. Relative predicates are interpreted with respect to a standard that must be contextually retrieved, making reference to a comparison class or using perceptual cues. Thus, relative predicates are context-dependent, since the very same sentence below can be judged as true in case the height of Pietro (184 cm) is compared to the average height of Italian men, and false if the comparison class comprises basketball players.

PIERO TALL (LIS)
'Pietro is tall.'

Absolute predicates do not exhibit the same contextual variability, since the standard of comparison is identified with the maximum or minimum standard of the scale (Kennedy & McNally 2005). Thus, a sentence like the following is true as long as the line is completely straight, and the standard of straightness cannot be contextually modulated.

LINE STRAIGHT. (LIS)
'This line is straight.'

Relative and absolute predicates also differ because the former exhibit some form of vagueness, whereas the latter give rise to crisper judgments. Assuming that the average height of Italian men is 178 cm, if Gianni is 179 cm tall, then he probably would not count as neither tall nor not-tall for an Italian man. A predicate like *clean* or *straight* is not vague in that sense: even a small deviation from the standard of comparison (maximum cleanness or straightness) would normally render the predicate false: a cloth with a single spot does not count as clean, and a slightly bent rope is not straight. An exception to this latter case is imprecise readings (Unger 1975; Kennedy & McNally 2005). Absolute gradable adjectives normally allow for imprecise readings in both spoken and sign languages as shown by the LIS and English examples below:

a. GIANNI ASSIGNMENT RIGHT LUCA MORE (LIS)
'Gianni's assignment is correct, Luca's one is better.'
b. This glass is full, that one is fuller.
c. *GIANNI ASSIGNMENT RIGHT COMPLETELY LUCA MORE
'Gianni's assignment is totally correct, Luca's one is better.'
d. *This glass is completely full, that one is fuller.

In these examples, a sentence with an absolute gradable predicate is asserted (e.g. this glass is full) and then a more-comparison is established with respect to another object (e.g. that one is fuller). At the semantic level, what happens is that the degree of fullness the first glass is compared with respect to the standard, which corresponds to the maximum degree because *full* is an absolute gradable adjective. In the second part of the example, it is asserted that another glass exceeds the degree of fullness of the first one. As a result, it is literally asserted that the degree of fullness of the second glass exceeds the maximum standard degree of fullness, which is clearly a non-sense. Nonetheless the sentence is acceptable. This is due a semantic effect that is called imprecise reading (roughly the ASSIGNMENT/*glass* is interpreted as being *almost* RIGHT/*full*) and disappears once the adverb *completely* is used. In this section the grammar writer should discuss the standard cases of imprecise readings. Special cases where iconicity conflicts with availability of imprecise readings are discussed in the section on iconicity [Semantics – Section 8.4] below, where iconic effects on the semantics of comparison are treated. Alternatively the grammar writer may decide to discuss special cases of imprecise readings directly in this section.

8.3 Visible comparisons

While spoken languages use abstract scales and degrees to establish the comparison between objects, sign language may use visible strategies to establish the ordering between two objects with respect to a property (Aristodemo & Geraci 2015). This is normally done by using iconic scales, namely lines in the signing space whose points correspond to degrees of the property encoded by the predicate. For instance in the case of TALL in LIS, a vertical line is used as a scale of tallness and the hand movement targets points on that line to indicate different degrees of tallness as shown in the example below. The grammar writer should discuss whether this way of expressing comparison is alternative to the use of the lexical sign MORE or whether the sign more can be redundantly used in those cases.

6_8.3_1_LIS_MAN TALL WOMAN SCALE-more

MAN TALL WOMAN SCALE-more (LIS)
'The woman is taller than the man.'

The grammar writer should also carefully describe what the constraints are on the availability of this alternative strategy of conveying comparisons. These constraints may be not simply semantic, like in the case of LIS where both morphological and phonological factors constrain the use of visible scales (Aristodemo & Geraci 2015).

8.4 Iconicity and comparative constructions

Comparison is a domain of semantics where iconic properties of signs seem to interact in a significant way with abstract semantic features. In this section the grammar writer should describe the various ways in which iconic components of signs interact with the semantics of comparison. As an example, the case of absolute gradable adjectives [Lexicon – Section 3.4] is considered. If similar phenomena are attested, the grammar writer should report them in this section.

Absolute gradable adjectives normally allow for imprecise readings [Semantics – Section 8.2]. However, if the maximum standard is iconically visible in the sign, then an imprecise reading is not accessible anymore, as in the case of FULL in LIS (Aristodemo & Geraci 2015):

*GLASS WINE IX_a FULL IX_b MORE (LIS)
'This glass of wine is fuller than that one.'

The grammar writer should provide the criteria that make the maximum standard iconically visible and a list of iconic absolute gradable adjectives that display this behavior. Alternatively, these facts can be discussed at the end of the section on gradable predicates [Semantics – Section 8.2].

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Chapter 9 Plurality and number

9.0 Definitions and challenges

9.0.1 Singularis and pluralis

Singularis is the marking of the noun if it refers to an entity only. Often languages distinguish between singularis and non-singularis. The term used for these two forms are singular and plural. While singular is generally the unmarked form, plural is usually marked. Depending on the morphosyntactic properties of the language under investigation, plural can be expressed on various lexical items such as nouns [Lexicon – Section 3.1], verbs [Lexicon – Section 3.2], adjectives [Lexicon – Section 3.4], number words [Lexicon – Section 3.10.1], quantifiers [Lexicon – Section 3.10.2] or classifier constructions [Morphology – Section 5]. Since number can be encoded in various expressions, this section is linked to other sections discussing lexical, morphological, and syntactic aspects of the grammatical realization of plural and number. For the grammatical implementation of plurality and number, the grammar writer is referred to the Lexicon section on numerals and quantifiers [Lexicon – Section 3.10], the Morphology sections on verbal number markers [Morphology – Section 3.1.2] and nominal number inflection [Morphology – Section 4.1] and the Syntax section on numerals [Syntax – Section 4.3].

9.0.2 General number

Some languages require to choose between singular and some kind of plural whenever a noun is used, but in other languages, it is optional to mark the number of the noun, and forms of the noun are found with no number marking. One of the terms suggested noun forms with no reference to number are general number (Andrzejewski 1960; Corbett 2000). A general form of a noun has one or more referents of the entity denoted by the noun. Some languages have just one form used for both singular and general number and (an)other form(s) for plural.

9.0.3 Paucal number

Some languages have a more fine-grained number system that distinguishes between one/a few/many – the form that expresses 'a few' is called paucal. The definition of 'few' varies among languages.

9.0.4 Dual, trial, and quadral

The simplest distinction found in languages that has number marking on the noun is the distinction between one and more than one entity, but many languages have a much more complex number system.

Some languages distinguish between one entity, two entities, and more than two entities. The form for two entities is the dual form. Dual marking is commonly found in sign languages. When a language has the dual system, the plural gets the value of three or more entities. Some languages have number systems that distinguish between one, two, three, four, and more than four: singular, dual, trial, quadral, and plural. In some languages the number system of pronouns can be more detailed than the number system of nouns.

9.0.5 Count nouns and mass nouns

The distinction between count nouns and mass nouns is complex; in this section, the main difference will be addressed. Count nouns denote what is countable and denumerable – in other words, count nouns denote entities that can be listed individually such as persons, cups, or chairs.

A mass noun denotes a substance or an abstraction that is homogenous and not differentiable, for example, beer, education, and vegetables. Some nouns may not be unique mass nouns or count nouns, but can be classified as a typical mass noun or a typical count noun.

9.1 Nominal plural

Nominal number [Morphology – Section 4.1] is associated with entities and specifies the number of referents. The number of referents can be marked on the nominal expressed by morphological means such as reduplication of the noun as in the following example (Steinbach 2012).

FOUR PERSON++ KILL (DST, adapted from Kristoffersen et al. 2008)
'Four persons were killed.'

Nominal number can also be expressed by syntactic means, for example, by number agreement on the verb:

the fish jump [3.p. plural] vs. the fish jumps [3.p. singular]

And finally, nominal number can be expressed by lexical items such as collective nouns:

A-HILL-OF CARROT (VGT, adapted from Heyeric et al. 2011)
'lots of carrots'

9.2 Verbal plural

Verbal number [Morphology – Section 3.1.2] is associated with events. Verbal plural marks the number of events or the number of participants involved in an event. Note that verbal number is associated with the semantics of the verb, not with the referents involved in the verb action. Languages are found that mark the amount of referents involved in the verb action on the verb, etc.

a. The fish jumps.
b. The fish jump.

In (a) one fish is jumping, in (b) more than one fish are jumping but it is not a joined event. The distinction between singular and plural in this example is morphologically marked on the verb (i.e. 3rd person singular vs. 3rd person plural), but it is still a nominal plural, providing information about the amount of referents involved.

A verbal plural gives information on the amount of events – e.g. the amount of jumping actions involved or that the event involves more than one participant – e.g. fish jumping together as a joint event. In DTS, verbs can be marked by reduplication to denote the amount of events. Moreover, spatial modification (i.e. horizontal arc movement and movement reduplication) of agreement verbs [Lexicon – Section 3.2.2] and classifier predicates [Morphology – Section 5] can be used to express (collective and distributive) plural interpretations with (one of) the arguments [Semantics – Section 6] of the verb (Steinbach 2012).

MIKKEL LETTER SEND+++ (DTS)
'Mikkel sent the letter to many persons.'

9.3 Lexical plural

Languages can have lexical items with no singular form (pluralis tantum) or with separate lexemes for the plural form.

a. people
b. we
c. our
d. CHILDREN (DTS, adapted from Kristoffersen et al. 2008)
'children'

Interestingly, DTS has another sign for child, and this sign has a singular and a plural form:

a. CHILD (DTS, adapted from Kristoffersen et al. 2008)
'child'
b. CHILD++
'children'

Not only plural (meaning more than one) but also dual, etc. can be lexicalized, as the following shows:

a. BOTH (DTS, adapted from Kristoffersen et al. 2008)
'the two of us/you/them'
b. FOUR-KRONE
'four Danish kroner'
c. FIVE-KRONE
'five Danish kroner'

Lexical plural can be expressed by collective nouns and with classifier constructions as in this example:

SHELVE BOOK CL-books-in-rows (DTS)
'The shelves contained many books.'

Note finally that many sign languages permit number incorporation, that is, with some signs such as pronouns or temporal expressions the handshape of numerals (up to 5 with one-handed signs) can be incorporated to express the number of entities referred to. This is illustrated by the following examples (Steinbach 2012).

a. 2-OF-THEM, 3-OF-THEM, ... (DGS)
b. 1-YEAR, 2-YEAR, ...
c. IN-1-DAY, IN-2-DAY, ...

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Chapter 10 Quantification

10.0 Definitions and challenges

In this section, quantification is defined from a semantic point of view, and semantic distinctions useful for the grammar writer are briefly presented and explained. Lexical (i.e. parts of speech [Lexicon – Section 3]) and morphosyntactic (i.e. Noun phrase [Syntax – Section 4]) aspects of quantification are discussed in detail in the Lexicon section on numerals and quantifiers [Lexicon – Section 3.10] and the Syntax section on quantifiers [Syntax – Section 4.4]. Although in most cases it seems fairly transparent to users, determining the interpretation of a sentence containing a quantified expression is not a trivial task. It becomes obvious when we compare examples like (a) and (b).

a. David just left.
b. Everyone just left.

For the first sentence in (a) to be judged as true it is sufficient to know the referent of the proper name *David* and whether he left recently or not in a given context of utterance. By contrast, for the second sentence in (b) to be properly evaluated we need to know the relevant set of individuals over which *everyone* quantifies and verify that all its members have indeed left in the relevant context. Somewhat it generalizes over

individuals. That sentence can be used truthfully in a different context where different individuals are talked about and all of them just left. This is not the case for the first sentence, which can only be properly used if there is an individual rigidly identified by the name *David* that just left.

Like *everyone*, there are several other expressions in English such as *some*, *most*, *few, nothing*, etc. that are characterized as quantifiers. Syntactically they belong to the class of determiners or pronouns [Lexicon – Section 3.7], but semantically they behave as operators that quantify over a set of individuals, with different interpretations.

However, quantification is not limited to the nominal domain. Another area where we observe quantified interpretations are sentences containing adverbials such as *often*, *usually*, *always*, *never*, *on most occasions*, *every morning*, etc. In a sentence like *David always reads the newspaper online* the sentence is true if it faithfully reports David's habit of reading the newspaper online (and not on paper, for instance) on every occasion that he reads the newspaper. Again this statement does not talk about a particular reading event by David, but it is generalizing over them and saying that they all involve online reading. Sign languages are known to express such meanings lexically, but also through aspectual inflections [Morphology – Section 3.3] (habitual, iterative, etc.). Related quantificational meanings encoded by inflection are the dual, the plural distributive and the plural multiple.

As with many other topics, quantification in sign languages is an understudied domain. The easiest place to start is by paying attention to quantifier signs [Lexicon – Section 3.10.2], but the role of non-manuals and use of sign space should not be neglected, as certain meanings or nuances can be encoded through non-manual markers. For the purpose of description, the grammar writer should concentrate at the start on nominal quantifiers as the primary goal, but can always add information on adverbial ones to reach a more complete description.

The grammar writer should be aware that despite the correspondences of quantifier signs with spoken language glosses, the exact characterization of the quantificational interpretation of each individual sign must be determined case by case. As is often the case, attention should be paid to the possible realizations of a single quantificational meaning by different signs that do not have counterparts in the corresponding ambient spoken language (or the elicitation language more generally) and might have idiosyncratic contexts of use.

Additional elicitation materials for judgments on the scope of quantifiers can be found in *The Scope Fieldwork Project*:

http://udel.edu/~bruening/scopeproject/scopeproject.html

10.1 Types of quantifiers

The typical quantificational meanings that first come to mind are those that allow us to interpret a statement as either general or particular. Natural languages encode

these two possibilities in two different types of nominal quantifiers: the universal and the existential ones, represented in predicate logic by the logical operators ∀ and ∃, respectively.

Let's start by considering a sentence with an existential quantifier like *someone* in the following English example:

Someone whistled.

The information we get from this sentence is that some entity of human type whistled (some time in the recent past). This information can be conveyed in a slightly more formal way by the following paraphrase:

For any human entity, this entity has whistled.

The second part of this expression can be represented in predicate logic as *whistle* (*x*), that is, as a predication with a free variable (*x*) that occupies the argument position [Semantics – Section 6] of the predicate. Note that this formula cannot be a well-formed expression because it contains an unbound variable that does not take us to any particular element of the relevant domain of entities. A general property of such logical representations is that variables must be bound and operators must always bind a variable. In this case, the operator in question is the existential operator, which is represented by the symbol ∃. It is placed before the variable it binds, before the predication that contains such variable:

∃ x [*whistle* (*x*)]

We read this logical representation as "There is an x, such that x has whistled."

Next to the existential quantifier, in predicate logic we find the universal quantifier, which has been used as the logical translation of noun phrases headed by *every* or *each*, as in the following example:

Every child whistled.

As before, we can rewrite the quasi-logical representation in (a) by introducing the universal quantifier, which we represent with the symbol ∀ (b). We read (b) as (a).

a. For all x , x a child, x whistled.
b. ∀x [*child* (*x*)] [*whistle* (*x*)]

Note that here the variable is restricted by the descriptive content on the N (i.e. [*child* (*x*)]) with which the quantifier *every* forms the quantified NP *every child*. This is called the restrictor of the quantifier. The rest of the formula (i.e. [*whistle* (*x*)]) is called the nuclear scope.

A sentence with a quantified subject [Syntax – Section 2.2] as in the previous examples does not state that a specific entity is within the range of the property denoted by the VP (whistling, in this case), but that some entities in the universe of discourse are in its extension (i.e. that the set of whistling entities contains some

entities – in our example every child). With *someone*, it will be true if the set denoted by *whistle* (*x*) contains at least one element; otherwise it will be false. The interpretation of the same sentence with a universal quantifier follows the same interpretive procedure, with the important difference that we require all the values assigned to the variable to make the statement true. Thus, for the sentence with *everyone* above, if there is a single entity in the domain of discourse that did not whistle, the sentence is false. The formal interpretation of a quantified formula involves assigning different values to the variable bound by the quantifier and verifying the truth or falsity of the predication with respect to a particular assignment of values.

However, natural languages do not exhaust their repertories of quantifiers with these two types. Some of those other quantifiers can be represented on the basis of the universal and the existential one, but this strategy turns out to be insufficient in the end for other quantifiers like *few* or *most*. A more satisfactory way to understand the interpretations of natural language quantifiers is Generalized Quantifier Theory (Barwise & Cooper 1981), which represents the meaning of quantifier determiners on the basis of set theory. The idea is very simple. We assume that common nouns denote sets of individuals. Thus, *child* denotes the set {x: x is a child} (which we read as "the set of those x such that x is a child"). For an intransitive verb like *laugh* we assume that the predicate denotes a set: those individuals that laugh. The question is then what role the determiner has in a sentence like *Every child laughs*. It seems clear that the purpose of *every* in this sentence is precisely to relate the class of all children with the kind of laughing individuals. Specifically, the relationship that *every* states is "a subset of" so that the sentence *Every child laughs* is true when the set of children is a subset of the individuals who laugh. This subset relation is expressed by the symbol ⊆: the formula A ⊆ B means that A is a subset of B or is included in B, namely, that all member of A is also a member of B:

{x: x is a child} ⊆ {x: x laughs}

With the help of set theory, then, can we identify the abstract semantic relation that the determiner *every* encodes in English. What one then needs to show is that the rest of quantifier determiners that exist also express relations between sets and that the interpretation of an intransitive sentence with a subject introduced by a determiner [Lexicon – Section 3.6] can be generalized as follows:

Det	N	V
R	*A*	*B*

In this formula, R is a relation between sets and A and B and are the sets are denoted by N and V which are in the relation R.

In the corresponding sentence containing the indefinite determiner *a* in English (*A child laughs*), the interpretation is obviously different. For this sentence to be true, there must be at least one member of the set of children is also a member of the set of individuals who laugh. In this case what we do is ensure that the intersection of the two sets is not empty and that, therefore, it contains at least one element. In set

notation it gets expressed as $A \cap B \neq \emptyset$. In this way, the sentence with an existentially quantified subject is amenable to the same type of interpretation in terms of set theory.

$\{x: x \text{ is a child}\} \cap \{x: x \text{ laughs}\} \neq \emptyset$

In fact, the meanings of all natural language quantifiers can be shown to be expressible with the same means. Next, some other typical cases of quantifiers are presented. We start with the negative determiner *no*: in this case the intersection of the two sets is empty and must contain no elements.

No child laughs.
$\{x: x \text{ is a child}\} \cap \{x: x \text{ laughs}\} = \emptyset$

Numerals [Lexicon – Section 3.10.1] are associated with two basic interpretations. Depending on the context, the quantified subject will be interpreted either as "exactly two children" or "at least two children", depending on the context (this is basically a pragmatic ambiguity):

Two children laughed.
$|A \cap B| = 2$, or
$|A \cap B| \geq |2|$

A more complex type of quantifier is represented by *most*. In the following example the determiner compares the children that laughed with the totality of children (in a class, for instance). For the sentence to be true, the number of children who protested must be higher than half of the total number of children, as schematized in the accompanying formula representing the meaning of *most*:

Most children laughed.
$|A \cap B| > 1/2\ |A|$

Cases of nominal quantifiers that are heavily context-dependent for their interpretation are *few* and *many*. If we utter a sentence like *Few children laughed* in a situation where only 2 out of the 10 relevant children laughed, it will be judged as true. However, if the number of laughing children in that context is 4 or 5, our intuitions get blurred.

Few children laughed.
Few A B $|A \cap B|$ = does not contain more than *n* elements, where n varies across contexts depending on a number of factors.

As its mirror image, *many* behaves in a parallel fashion:

Many children laughed.
Many A B $|A \cap B|$ = contains more than *n* elements, where n varies across contexts depending on a number of factors.

From the perspective laid out here, the definite determiner is also a quantifier. In its referential use, it typically imposes requirements on the context for its interpretation.

For a sentence like *The doctor laughed* to be acceptable, the context must allow us to identify a single member in the class of doctors. When the singular definite determiner is chosen, the domain must contain a single member, which must also be familiar [Pragmatics – Section 1.2] in the context of utterance. If that contextual condition is not satisfied, the sentence is uninterpretable.

The doctor laughed.
the A B the unique A in B such that "the A B" is true

The interpretations of more complex types of quantifiers like the following ones can be expressed in a rather simple and transparent way:

a. *At least five* children laughed.
   $|A \cap B| \geq 5$
b. *Less than six* children laughed.
   $|A \cap B| < 6$
c. *At most seven* children laughed.
   $|A \cap B| \leq 7$
d. *Exactly seven* children laughed.
   $|A \cap B| = 7$
e. *All children but three* laughed.
   $|A \cap B| = |A| - 3$

Sign languages are known to realize the most common types of quantifiers lexically, such as ALL, EACH, SOME, MOST, FEW, MANY, NO, numerals, etc. An important property noticed for ASL (Boster 1996) and LSC (Quer 2012b) is that quantified phrases often appear split in two parts: the restrictor of the quantifier in the topic position with relevant non-manual marking, and the quantifier in the object or focus position. This relates to the information-structural status of both parts of the quantified phrase and their semantic split between restrictor and nuclear scope of the quantification.

a. br
   BOOK I WANT THREE. (ASL, Boster 1996: 159)
   'I want three books.'
b. br
   *THREE I WANT BOOK.
   'I want three books.'

However, both elements can also appear linearly together in their argument position:

a. I WANT BOOK THREE. (ASL, Boster 1996: 160)
   'I want three books.'
b. I WANT THREE BOOK.
   'I want three books.'

It is important to check whether these different structures for the same lexical items involve different interpretations in terms of focus, for instance.

An important aspect to take into consideration when describing the quantificational system of a language is that quantified statements that feature nominal quantifiers might be realized in the language under study by other types of operators. Negation is a very typical case. For LSC it has been noted that the all-purpose sentence negator (NEG2) can take scope over the sentence arguments, as in the following example: notice that the elliptical object is bound by the sentential negation, and although the English translation features a nominal quantifier, there is no nominal counterpart in the LSC sentence.

	br	hs	hs
PEOPLE	SOME	BRING	NEG2.

(LSC, Quer 2012b: 88)
'Some people didn't bring anything.'

10.2 Strong and weak quantifiers

Quantifier phrases have been known to cluster in two groups, weak and strong, with respect to certain properties (Milsark 1974, 1977; McNally 2014). The main context where they split are existential sentences:

a. There is a mouse. (weak)
   There are mice/many mice/two mice in the garage.
b. *There is the mouse/every mouse/each mouse/my mouse. (strong)
   *There are most mice/both/neither/two of the mice in the garage.

Indefinite NPs, bare plurals, *many,* or numerals appear felicitously in existential contexts, unlike definite descriptions, the universal, possessive NPs, the proportional quantifier (*most*), strongly presuppositional [Pragmatics – Section 7.3] quantifiers like *each*, *both* or *neither* and overt partitive NPs, which are in principle out in that same environment.

A second environment where the behavior of the two groups splits is in the possibility to function as predicate nominals:

a. Jane is a university lecturer.
   They are university lecturers/two university lecturers.
b. *Jane is every lecturer/each lecturer.
   *They are most/both university lecturers.

Although the testing contexts do not always distinguish between weak and strong quantifiers in the same way, the grouping of strong and weak interpretations for each group is quite robust. Crosslinguistic differences across specific quantifiers and also in the properties of the testing contexts, though, might blur the distinctions. It is well

known that many sign languages have a single predicate HAVE for possession and existence (Zeshan 2008), which might arguably have an impact on its tolerance to strongly quantified NPs. In any case, paying attention to the weak/strong distinction can contribute to a better characterization of the lexical quantifiers in a given language.

Some sign language indefinites have been shown to overtly mark specificity and domain size. For details, see section 2.1.2.2.3 on specificity [Pragmatics – Section 1.4].

10.3 Quantifier interaction

When more than one quantifier appear in a sentence, it is possible to find scope interactions between them. Their inherent properties as a quantifier (being able to take wide scope over another element versus having fixed scope as determined by the position where it appears) determine the available options for interaction. The following English sentence ambiguously encodes two different interpretations depending on the scope interaction of the two quantified arguments. The ambiguity is roughly represented in (a) and (b):

Two policemen have arrested every demonstrator.
a. 'There are two policemen such that they have arrested every demonstrator.'
b. 'For every demonstrator, there are two possibly different policemen that have arrested him or her.'

In interpretation (a) the indefinite subject has scope over the universally quantified object, so it describes a situation where the same two policemen have arrested all demonstrators. In contrast, interpretation (b) reflects a situation where every demonstrator might have been arrested by two (possibly) different policemen, and this is taken to be the result of the universally quantified object taking scope over the indefinite subject. While the former scope relation reflects surface order, the latter does not. Determining the scopal properties of quantifiers when they co-occur in the same structure is important for the characterization of their semantic interpretation (Quer & Steinbach 2015).

However, the possibilities of scope interaction might be limited by other factors. Take for instance the following LSC sentence, which is unambiguous. The reason is that the distribution of the subject set over the object set is marked overtly with the distributive/plural [Semantics – Section 9] morpheme. Overt distributive marking appears not only on the numeral ONE associated with the subject and the possessive pronoun of the object, but also in the agreeing verb morphology.

5_10.3_1_LSC_student one+++ teacher poss+++ ask+++

br

STUDENT ONE+++ TEACHER POSS+++ ASK+++ (LSC)

'Each student asked his/her teacher.'

Nevertheless, relative scope is not always marked overtly in sign languages. In the following LSC sentence the scope interaction does not seem to be affected by the surface order of the two quantified NPs or by the fact that one is marked with the distributive morpheme (STUDENT NEW GROUP+++), and the two interpretations paraphrased are possible: wide scope PROFESSOR TWO of over STUDENT NEW GROUP+++ (i), and wide scope of STUDENT NEW GROUP+++ over PROFESSOR TWO (ii).

5_10.3_2_LSC_student new group+++ professor two guide

br

STUDENT NEW GROUP+++ PROFESSOR TWO GUIDE (LSC)

(i) 'There are two professors such that each has shown all the new groups of students around.'

(ii) 'For every new new group of students, there are two possibly different professors that have shown them around.'

Bare nouns have been shown to enter scope interactions with quantified NPs that give rise to different interpretations, as reflected in the following ASL example.

br

BOOK, TWO STUDENT BUY. (ASL, Petronio 1995: 607)

(i) 'Two students each bought a book.'

(ii) 'Two students together bought a book.'

(iii) 'Two students bought books.'

Without a context, the preferred interpretation is (i), but with additional context the other two readings are also possible. However, sign languages do differ as to the range of ambiguity they display in scope interactions. For instance, an example in LSC comparable to the one above can only mean (ii). For the readings (i) and (iii), morphological marking on the verb would be required: dual and random reduplication (allocative) morphology, respectively.

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Chapter 11 Possession

11.0 Definitions and challenges

In everyday usage possession is more or less equivalent to ownership and the possessed item is said to be the property of the possessor (Lyons 1977: 722), but the linguistic expression of possession is broader and can be viewed as the realizations of a – typically asymmetric – association or relationship between two referents – typically nouns. In this section we focus on the meaning of possession. The grammatical realization of possession is discussed in detail in the Morphology Part in the possessive pronouns [Lexicon – Section 3.7.3] and in the Syntax part in the section possessive phrases [Syntax – Section 4.2].

Many different strategies are employed in marking possession in the languages of the world – possessive relations can be expressed within a noun phrase and beyond a noun phrase within a predicative structure.

Possessive constructions may cover a wide range of meanings: the possessor may own, rule over, have the right to use, or may be associated with the possessum. The core meanings for possessive relations can be distinguished as follows:

1. Kinship relations, covering both relations by blood such as 'father' and 'sister' and relationship by marriage such as 'husband' and 'sister-in-law'.
2. Whole-part relations, covering body parts such as 'the nose of a man', plant parts such as the 'leaf of a flower', but also relations such as 'the roof of a house'.
3. Ownership of a property, such as 'John's book', referring to the book John owns.
4. General associations such as 'John's book' referring to the book John reads, the book John wrote, or the book on John. (Søegaard 2005)

In many languages, one possessive marker can be used to express all kinds of relationships. That is the case for many Indo-European languages, but all kinds of combinations are found across the world's languages: kinship and whole-part relations may be expressed in one way, and other types of ownership and associations in another way, or whole-part and body part relations may be expressed differently from ownership and kinship (Aikhenvald & Dixon 2013: 3).

As a part of the comparative study entitled *Sign Language Typology: Possession and Existentials*, directed by Ulrike Zeshan and Pamela Perniss, an eliciting task was developed for targeting possessive and existential constructions in sign languages (Zeshan & Perniss 2008).

The grammar writer should pay attention to the fact that culture has a great impact on how the languages code possession. The Native American language Hocak has three different possessive verbs. One is reserved for kinship, another one for domestic animals, while the third one is reserved for inanimate objects, including body parts (Søegaard 2005: 98). Some languages may include pet animals in the category of kinship nouns.

11.0.1 Useful distinctions

The term possessum is used for the possessed item and the term possessor is used for the possessing entity. In a noun phrase [Syntax – Section 4] (or possessive phrase [Syntax – Section 4.2]) the possessum is the head, and the possessor is the modifier. In the following example *car* is the possessum and *Peter* is the possessor.

Peter's car

In an analysis of possessive constructions the animacy of the possessor and the alienable/inalienable distinction of the possessum can be of great importance. The definiteness of the possessum can be relevant too. When it comes to the analysis of predicative possessive constructions, it may be important to draw a line between existential and possessive constructions.

11.0.2 Possessor: Animate or inanimate

Languages can formally mark the distinction of animacy of the referent. In some languages, this is made morphologically, and in others animacy is marked by gender or case. The subclass of animates consists of words with reference to persons and animals. Some languages categorize plants as animate, while other languages categorize plants as inanimate.

Generally speaking a possessor tends to be animate or human. The possessor is often expressed with a personal pronoun or a proper name. The Indo-European languages display a special set of possessive pronouns, as does, for example, DTS. DTS can refer to a possessor both with the personal pronoun INDEX as in example (a) and with the possessive pronoun POSS as in example (b).

a. INDEX$_1$ MOTHER (DTS)
'my mother'
b. POSS$_1$ MOTHER
'my mother'

Constructions with inanimate possessors seem to have more restrictions on the distribution of the possessive markers, as is illustrated by the following English example.

a. Peter's son
b. the son of Peter
c. *the house's roof
d. the roof of the house

11.0.3 Possessum: Alienable or inalienable

Languages can formally mark possessive relationships according to the semantics of the possessed item; nouns can be categorized as either alienable or inalienable. Some grammarians employ alternative terms, for example 'optionally possessed' or 'separable' for alienable and 'obligatorily possessed' or 'inseparable' for inalienable.

If a possessed item is seen as having only a temporary or non-essential dependence on a possessor, it is said to be alienable. If the relationship to the possessor is seen to be a permanent one or a necessary one, it is said to be inalienable. Prototypical groups of inalienable nouns are kin terms and body parts, but the general division between these two kinds of possessive relations is obviously dependent on the culture in question and is different from one language to another. In some languages, only blood-related kinship is marked as inalienable, whereas other languages mark both blood relations and relationship by marriage as inalienable. Some languages mark all body parts as inalienable; some exclude for example, hair. In some languages, names, domestic animals, and the house you own or vital items (e.g. your canoe) are marked as inalienable, in others they are marked as alienable. The grammatical

division into two possession classes tends to occur more frequently in indigenous languages spoken by small communities, and several sign languages mark alienable and inalienable relationships differently (Dixon 2010: 278).

11.0.4 Existence, location, or possession?

Many languages can use the same lexical item to express existence, location, and possession, and Lyons (1967, 1968) suggests that the three kinds of constructions all originate from locative constructions. Typological surveys have shown that the order of the constituents is identical in the majority of the surveyed languages (Clark 1978; Freeze 1992). In several sign languages, the same relational sign can be used to express locative, existential, and possessive relations (Zeshan & Perniss 2008; Cormier & Fenlon 2010; Pichler et al 2008; Kristoffersen 2003). A guide for the grammar writer to distinguish between these three prototypical types of construction could be:

(i) Existential constructions have an indefinite nominal phrase and an inanimate locative phrase:
There is a book on the table.

(ii) Locative constructions have a definite nominal phrase and an inanimate locative phrase:
The book is on the table.

(iii) Possessive constructions have an animate possessor and an indefinite or a definite possessum:
   a. Tom has a book.
   b. The book is Tom's.

In some languages such as BSL and DTS the negated form of the existential use differ from the negated form of the possessive use as in the following example (for BSL, see Cormier & Fenlon 2010).

a. SISTER HAVE-NOT (DTS)
'[He] has no sister.'

b. COFFEE EMPTY
'There is no coffee.'

11.1 Strategies in coding possessives

Possessive constructions display practically the full range of morphosyntactic strategies used by languages to relate two morphemes, words, or syntactic elements, and the list of means to encode a possessive relation presented here is not exhaustive (for a more detailed classification, see Croft 2003: 32–42).

The simplest strategy is juxtaposition, that is, a strategy that does not involve any additional morphosyntactic marking to express the relation between possessor and possessum.

MAN WIFE (DTS)
'the man's wife'

Relational strategies involve the employment of an additional morpheme to encode the relation between possessor and possessum, as, for instance, the anaphoric possessive pronoun in apposition to the overt possessor in DTS.

a. MAN_i POSS-3SG$_i$ WIFE (DTS)
'the man's wife'
b. POSS-SG3$_i$ OPINION (ÖGS)
'he has an opinion'

An additional strategy is the use of overt linkers such as the possessive enclitics in DTS and ASL in the following examples (the glossing in DTS example is ^S-GENITIVE and in ASL example ^S)

a. GO WITH DAD^S-GENITIVE STOMACH (DTS, Kristoffersen et al. 2008)
'Is dad's stomach ok?'
b. POSS$_1$ FATHER^S BROTHER^S WIFE (ASL, Pichler et al. 2008: 443)
'my father's brother's wife'

In many sign languages, possessive pronouns [Lexicon – Section 3.7.3] and personal pronouns [Lexicon – Section 3.7.2] can also be used in prenominal position (a–c) and they can be copied in postnominal position (d) (Cormier & Fenlon 2010: 18):

a. $\text{POSS}_{\text{non1}}$ book (BSL, Cormier & Fenlon 2010: 18)
'your book'
b. POSS_{1sg} DAUGTHER (DTS, Kristoffersen et al. 2008)
'my daughter'
c. IX_1 MOTHER (BSL)
'my mother'
d. IX_2 GRANDMOTHER IX_2 (HZJ, Pichler et al. 2008: 443)
'your grandmother'

An alternative strategy is spatial morphological marking. Sign languages may mark possession parallel to the agreement marking by changing the place of articulation [Phonology – Section 1.2] of possessum or the possessor. In the following example the possessum HOUSE is articulated to the left of the signer, an area in the singing space that previously has been assigned to the possessor PETER. Given that HOUSE is associated with the same locus as PETER, this sentence marks a possessive relation between Peter and the house.

PETER IX$_{3i}$ WORK/ HOUSE$_{i}$ EMPTY (DTS)
'Peter is working, he is not at his house.'

Predicative possessive constructions are yet another strategy. Marking predicative possession may involve a verb of ownership such as 'have', or 'belong' as in the following example from BSL.

a. JOHN HAVE-POSS CAR (BSL, Cormier & Fenlon 2010: 21, 25)
'John has a car'
b. BOOK$_{i}$ $_{i}$BELONG$_{e}$ TEACHER$_{e}$
'That book is the teacher's.'

Some languages may employ an existential construction or a locational construction to express the possessive relation. The choice of a predicative possessive construction may depend on several parameters: the possessive relation, the semantics of the possessum, or the possessor as well as the definiteness and animacy of possessor and possessum. In addition, the order of the constituents may differ according to the same parameters as in the next two examples (Kristoffersen 2003; Pichler et al. 2008; Zeshan & Perniss 2008; Cormier & Fenlon 2010; Aikhenvald & Dixon 2013: 27).

a. IX$_{1}$ EXISTENTIAL PILLOW (DTS, Kristoffersen 2003: 136)
'I had a pillow.'
b. [JOHN] EXISTENTIAL BOOK DETERMINER
'[John] has the book.'

Note finally that in some sign languages, a possessive relation can also be expressed by classifier constructions [Morphology – Section 5].

11.2 Kinship

Kinship relations cover both relations by blood and relationship by marriage and in many languages the two types of kinship relations are expressed by the same possessive constructions. DTS has genitival possessive pronouns (a), possessive enclitics (b), a possessive marked by an anaphoric possessive pronoun in apposition to the overt possessor (c), and a possessive verb construction (d). Kinship relations can be expressed by all four constructions.

a. IX$_{non1i}$ ADORE POSS $_{non1e}$ SIBLING++ (DTS, Kristoffersen et al. 2008)
'He adores his siblings.'
b. DAD^S-GENITIVE NEW WIFE
'dad's new wife'
c. POSS$_{1}$ HUSBAND$_{i}$ POSS $_{non1i}$ SISTER
'my husband's sister'
d. PETER EXISTENCE DAUGHTER$_{i}$ / IX$_{i}$ VERY BEATIFUL INDEX IX$_{i}$
'Peter has a daughter, she is very beautiful.'

In some of the languages that have different categories for alienable and inalienable nouns such as the Nilotic language Lango, blood-related relatives such as 'father' and 'sister' are categorized as inalienable and the relationship by marriage such as husband and sister-in-law are categorized as alienable (Noonan 1992; Aikhenvald & Dixon 2013: 12–13).

11.3 Whole-part relations

Whole-part relations cover body parts such as 'my kidney', plant parts such as 'the root of the oak', and relations such as 'the top of the mountain'.

11.3.1 Body parts

In many languages, body parts are classified as inalienable, and the relation between possessor and possessum can be expressed by the same means as kinship. In some languages the juxtaposition of possessor and possessum is the preferred construction for expressing kinship and body parts relations as in examples (a–d).

a. BABY EAR (BSL, Cormier & Fenlon 2010: 19)
'the baby's ear'

b. WOMAN SON
'the woman's son'

c. MOTHER SISTER (HZL, Pichler et al. 2008: 443–444)
'the sister of (my) mother'

d. CAT WHISKER
'the cat's whiskers'

The grammar writer should be aware that the exact semantic content of the 'inalienable' body part set varies across languages. Tariana, an Arawak language, considers all body parts except hair as inalienable (Aikhenvald & Dixon 2013: 12). Koyukon, an Athabaskan language, distinguishes between body parts that are possessed and inalienable as leg, head, and eye and body products that can be separated from the body such as blood, urine, and milk together with abnormal parts of the body such as warts and scabs (Aikhenvald & Dixon 2013: 13).

11.3.2 Whole-part relations with an inanimate possessor

Relations such as the one in 'the top of the mountain' are classified in some languages as kinship and body part relations as inalienable and can be expressed by the same constructions. In Danish it is possible to express this relation with the use of all of the strategies used for expressing possession (a), whereas the way to express the relation is more restricted in English as can be seen in example (b).

a. husets tag (Danish)
house-def^s-genitive roof
'the roof of the house'
b. *the house's roof (English)
c. the roof of the house

The grammar writer should be aware that some sign languages tend to have similar restrictions on how to express possession of an inanimate possessor. One strategy is the use of classifier construction as in (a) and the juxtaposition of possessor and possessum as in (b).

a. TAXI FOUR WHEEL CL-wheels-shape-and-location (ÖGS, Pichler et al. 2008: 448)
'the taxi has four wheels'
b. HOUSE ROOF (DGS)
'the roof of the house'

11.4 Ownership and association

Ownership and association are often expressed by the same possessive construction. This is illustrated by the following example, which is ambiguous. It can receive the following interpretations: (i) the book Shakespeare owns, (ii) the book Shakespeare wrote, (iii) the book for Shakespeare to read, and (iv) the book written about Shakespeare (Søgaard 2005: 205).

The book of Shakespeare

The first reading, that is, the book Shakespeare owns, is implying ownership; the additional three readings are implying other kinds of associations between possessor and possessum.

11.4.1 Ownership

Ownership is considered the asymmetric relation between two referents where the possessor can be said to have legal rights to his property – the possessum. As mentioned earlier in this section, there are differences in the way languages mark personal items regarding alienability. In some languages a man's house and cow will be coded as inalienable; in other languages expressing ownership of a house or a cow will follow the pattern for alienable possession.

11.4.2 Association

In addition to the core type of ownership, locative constructions tend to subsume association in general (a–c), location (d), and attribution and properties in general (e).

a. Joan's teacher
b. Peter's knife
c. the book of Shakespeare (the one he wrote, or the one written about him)
d. the top of the mountain
e. the man's temperament (Dixon 2010: 262–263)
f. the knife of Peter's
g. *the knife of Peter

Some languages tend to restrict the use of possessive constructions that can express the associative reading. For example (b) can be paraphrased into (f), but not into (g). This is a different pattern from the one that is found in English for kinship relations, as shown in the following example.

a. Peter's sister
b. *the sister of Peter's
c. the sister of Peter.

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Chapter 12 Negation

12.0 Definitions and challenges

Negation systematically changes the meaning of expressions by introducing various kinds of oppositions. Sentential negation, for example, changes the polarity of a clause from positive to negative. By contrast, constituent negation only affects the constituent in the scope of negation. These constituents are in some way inconsistent with each other in the context of utterance. Negative utterances are generally less informative than their positive counterparts, but this does not mean that negative utterances cannot be informative. In a trial, it can, for instance, be quite important to be informed about the fact that Peter is not the murderer. Negative clauses are typically the marked counterparts of the corresponding positive clauses, which usually remain unmarked. Hence, while languages have different kinds of negative markers, only very few languages have corresponding positive markers.

Every natural language possesses ways to express different kinds of negation. Although most languages share core uses of particular negative markers, the variety of negative markers is quite extensive. Cross-linguistically, negation can be expressed with various parts of speech such as affixes, particles [Lexicon – Semantics 3.11], verbs [Lexicon – Semantics 3.2], modal verbs [Lexicon – Semantics 3.3.3], adverbs [Lexicon – Semantics 3.5], or quantifiers [Lexicon – Semantics 3.10.2] and it interacts in interesting ways with different parts of speech, especially with modal verbs and quantifiers. Therefore, negation is relevant to different parts of the Manual. This section on the semantics of negation is linked to various sections of the Lexicon, Morphology, and Syntax parts, especially to the sections negative particles [Lexicon – Section 3.11.1], negation [Morphology – Section 3.5], and negatives [Syntax – Section 1.5]. In these sections, negation is discussed as a lexical, inflectional, and syntactic category.

Negation operates on different levels. A negative expression can affect a lexical item (lexical negation [Semantics – Section 12.1]), a constituent, the whole sentence (sentential and constituent negation [Semantics – Section 12.2]), or even a pragmatically inferred element such as an implicature or presupposition (metalinguistic negation [Semantics – Section 12.3]).

12.1 Lexical negation

Many languages have negative words/negative particles [Lexicon – Section 3.11.1] such as *no*, *not,* or *nobody*; derivational negative morphemes [Morphology – Section 2.1.1.2] such as *un-* in *unpleasant* or German *Un-* in *Untugend* ('bad habit'); and bound inflectional negative elements [Morphology – Section 3.5] such as the Turkish negative suffix *-mi* in the following example (Dryer 2013). These expressions scope either only over the corresponding lexical expression or they take scope over the entire clause to express sentential negation [Semantics – Section 12.2].

bil-mi-yor-um (Turkish)
know-NEG-TNS-1SG
'I don't know.'

These expressions have an inherently negative meaning. As is not uncommon for lexical items, this meaning is not always completely transparent. In addition, some items such as *any* in English are sensitive to negative polarity, namely they do not have an inherently negative meaning but they must occur in the scope of a negation.

12.2 Sentential and constituent negation

Negation can take scope over different kinds of sentential elements. The notion of scope is therefore important for the semantic analysis of negation. On the basis of scope, we can distinguish between sentential negation (or external negation) and constituent negation (or internal negation). In sentential negation, illustrated by example (a), the negative marker takes scope over the whole clause. In this case, the negation changes the truth conditions of the sentence to the opposite. By contrast, in constituent negation, illustrated by examples (b) and (c), the scope is confined to a particular constituent of the clause. Constituent negation can even affect parts of a word as in (d). The scope of negation depends on various factors such as syntactic position, prosodic marking and context. Constituent negation can be used in contrastive sentences as example (e). The negation operates over a set of alternatives. In (e), the negation *nicht* opposes two elements (*Auto* and *Fahrrad*) and excludes the first of the two alternatives.

a. John didn't finish his paper.
b. John finished his paper not long ago.
c. Peter has no coffee.
d. Johannes hat den LKW nicht beladen, sondern entladen. (German)
   Johannes have.3SG the truck not load.PTCP but unload.PTCP
   'Johannes did not load the truck; he unloaded it.'
e. Peter fährt nicht Auto, sondern Fahrrad.
   Peter drive.3SG not car but bike
   'Peter does not drive a car, but a bike.'

In some languages, syntactic negation is formed by more than one negative expression. A typical example is the sentential negation in French, which can be formed with two elements, the negative verbal clitic *ne* and a negative particle such as *pas*. In other languages, double negation is only used in emphatic contexts.

Negative concord [Syntax – Section 1.5.1.2.3] is a related phenomenon. Again, two or more negative expressions in a sentence are interpreted as a single negation. Consider the following two examples: Standard Italian is a negative concord language in which negation can be marked twice in a sentence. Semantically, however, the sentence in (a) has only a single negative meaning. By contrast, Standard German is not a negative concord language. Hence, the corresponding example in (b) does not yield a single negative meaning. Semantically, in German (although not in Italian) both negative expressions are active.

a. Gianni non ha incontrato nessuno. (Italian)
   Gianni NEG have.3SG meet.PTCP no one
   'Gianni met nobody.'
b. Johannes hat niemanden nicht gesehen. (German)
   Johannes have.3SG nonone not see. PTCP
   'Johannes didn't see nonone.'

A related phenomenon are negative polarity items such as *anything* in English, which are also licensed in the scope of negation.

Note finally that the scope of syntactic negation does not necessarily correspond to the surface position of the negative expression. Two examples are negation raising (a) and interaction with (the scope of) quantifiers (b). In (a), the negation can be interpreted in the embedded clause (i.e. 'I want not to eat'). In (b), the scope of the quantifier and the negation interact semantically and the negation can also scope over the quantifier. As a consequence, the sentence is ambiguous. Prosodic markers such as bridge accent may help to disambiguate such sentences.

a. I don't want to eat.
b. Alle Kinder waren nicht auf der Party. (German)
   all children be.PST not at the party
   'It's not the case that all children were at the party.'
   'For all children, it's the case that they were not at the party.'

12.3 Metalinguistic negation

Negative expressions can not only be used to negate a sentence or a constituent at the propositional level (i.e. descriptive negation), but can also be used to introduce an opposition at a pragmatic level of meaning. In this case, the speaker or signer does not implicate that the corresponding affirmative utterance is false. Instead, he/she is negating or objecting either pragmatic aspects of meaning such as implicature [Pragmatics – Section 7.1] or presupposition [Pragmatics – Section 7.3] triggered by the utterance or the use or pronounciation of linguistic expressions or the register. Typically, the contrast introduced by the negation is resolved in the clause that immediately follows the metalinguistic negation. In example (a) the negation affects the scalar implicature triggered by the scalar expression *good*. In (b), the negation scopes over the pronunciation of the word *umfahren*, which has two different meanings depending on its pronunciation. And in (c), the register is objected. Metalinguistic negation is similar to so-called scare quotes in (d–e) used in many written language to indicate the same kinds of disagreement. The example in (e) nicely illustrates the interaction of scare quotes and metalinguistic negation.

a. This was not good – it was excellent!
b. Ich will ihn nicht UMfahren – ich will ihn umFAHren. (German)
   'I don't want to knock over him – I want to drive around him.'
c. Das ist kein Starter – das ist ein Amuse Gueule.
   'This is not a starter – it's an amuse gueule.'
d. We watch 'color' TV, you, on the other hand, watch 'colour' TV.
   (Predelli 2003: 22)
e. I am not a 'philtosopher', I am a philosopher. (Predelli 2003: 24)

Since meatlinguistic negation operates at the pragmatic level, lexical negation is not expected to trigger a metalinguitic interpretation as is illustrated by the following example.

I'm {not happy/*unhappy} with the plan, I'm ecstatic! (Horn & Wansing 2016)

Note finally that metalinguistic negation – like scare quotes – is highly context dependent. In many cases, the component of meaning becomes only clear in the second affirmative clause, which resolves the objection introduced by the metalinguistic negation in the first clause.

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Chapter 13 Illocutionary force

13.0 Definitions and challenges

Sentence types are complex grammatical forms, which have been grammaticalized to perform specific speech acts [Pragmatics – Section 3.3]. Typically, declaratives [Syntax – Chapter 1.1] are used to make statements, that is, the speaker wants to inform the addressee about something. By contrast, interrogatives [Syntax – Chapter 1.2]

are used to elicit information from the addressee. The four major sentences types [Syntax – Chapter 1], declaratives [Syntax – Section 1.1], interrogatives [Syntax – Section 1.2], imperatives [Syntax – Section 1.3], and exclamatives [Syntax – Section 1.4] are (language specific) formal devices that are used to indicate specific illocutionary acts; that is, the grammatical properties of sentence types indicate different (illocutionary) meanings.

The formal (syntactic and prosodic) properties are described in the section on sentence types [Syntax – Section 1]. The pragmatic properties of the corresponding illocutionary acts are dealt with in the section on speech acts [Pragmatics – Section 3.3]. In this section, we focus on the semantic properties of the illocutionary force, that is, with the structural meaning of sentence types. An alternative term for illocutionary force found in the linguistic literature is sentence mood. Consider the following two examples in (a) and (b):

a. You will read this book.
b. Read this book!

Both sentences express the proposition that the addressee will read this book. However, while the declarative in (a) is an assertion, the imperative in (b) is a command. Hence, the two sentences express the same proposition but have two different illocutionary forces – due to the fact that (a) and (b) are different sentence types. Both sentences are typically used for different speech acts since they have different illocutionary potentials. Note, however, that there is no one-to-one-relation between illocutionary force and speech act. The relation between sentence type, illocutionary force, and speech act is discussed in more detail in the Pragmatic part in the section on speech acts [Pragmatics – Section 3.3].

13.1 Declarative force

Declaratives are possibly the most common type of sentence in any given language. Declarative sentences are typically used make assertions [Pragmatics – Section 3.1], that is, to express statements, to make known, to explain, or to describe. In other words: to give information. That is, the speaker or signer adds a new proposition to a common ground and wants the addressee to share this information. This means that declaratives [Syntax – Section 1.1] are the dominant sentence type in human communication. The declarative force of the declarative sentence in (a) can be described as (b):

a. Mary is ill.
b. The speaker/signer asks the addressee to share the common knowledge that Mary is ill.

Prosodic [Phonology – Section 2] features are usually neutral unless a specific part of the sentence is stressed for information structure [Pragmatics – Section 4] or emphatic

reasons. In the case of written documents and especially in essays and reports most of the writing consists of declaratives. Hence, when we support an idea or have a discussion or have a controversy our arguments are mostly built with declarative sentences.

13.2 Interrogative force

With interrogative [Syntax – Section 1.2], we mean a specific grammatical form (i.e., a sentence type), which is specialized to elicit information from the addressee such as in the direct question in (a) or to report a doubt or a similar attitude towards a certain propositional content such as in the indirect question in (b).

a. What have you done?
b. I wonder what you did

Questions [Pragmatics – Section 3.2] are in a way the counterpart to assertions [Pragmatics – Section 3.1]. In questions, the addressee is asked to add new information to the common ground. However, questions do not always presuppose that the speaker or signer does not know the proposition under discussion. Exam questions, questions in educational context (such as teaching or presentations), or rhetorical questions are examples that illustrate that the speaker or signer may very well know the answer to the question he/she is asking. The interrogative force of the interrogative sentence in (a) can be described as (b):

a. Is Mary ill?
b. The speaker/signer asks the addressee to share the common knowledge whether Mary is ill.

Typically, interrogation is expressed by using a full sentence, but there are cases in which part of the interrogative sentence is unexpressed (*Any problem?* meaning 'Do you have any problem'). Many languages distinguish between polar questions [Syntax – Section 1.2.1], alternative questions [Syntax – Section 1.2.2] and content questions [Syntax – Section 1.2.3].

Polar questions are sometimes called yes/no questions because they ask whether a certain state of affairs holds or not, so they are naturally answered by 'yes' (or 'no'). A direct polar question in English is *Are you sick?* while an indirect polar question in English is the embedded clause in *I wonder whether you are sick*.

Alternative questions are so called because they present two or more options for the reply. A direct alternative question in English is *Do you want coffee or tea?* while an indirect alternative question is *He asked me whether I preferred coffee or tea*.

Content questions elicit a more refined answer than 'yes' or 'no' because they are used to ask the addressee to fill in some specific missing information. In many languages, they contain a specialized set of interrogative words or phrases (interrogative pronouns [Lexicon – Section 3.7.5]) that have a common morphological marking

(*what*, *which*, *who*, *why*, *when* etc.). Since in English this marking is the morpheme *wh-*, content questions are sometimes called *wh*-questions. We will use the label Q(uestion)-signs for signs which roughly correspond to *wh*-words. A direct content question in English is *What do you want?* while an indirect content question is *He asked me what I wanted*.

It is worth stressing that indirect questions are interrogative clauses that are embedded in declarative sentences, so the markers for questions (for example, non-manual-marking, Q-signs and question particles) are expected to occur only in the embedded clause and not in the entire sentence.

The grammar writer should be aware of the existence of rhetorical questions [Pragmatics – Section 3.2], which are asked more to assert something than to elicit a reply. Rhetorical questions can be used if what is asserted is thought to be obvious or at least shared information in the context of utterance. Examples are *Who would support cannibalism?* if this question is used to express the meaning that nobody would support it, or *Who does not like chocolate?* if this question is used to assert that the average person likes chocolate. Although rhetorical questions do not have a distinct form in English, it is possible that some sign languages mark rhetorical questions in a special way, for example by a modified non-manual marking.

Another special kind of questions are echo questions [Pragmatics – Section 3.2] and assertional questions [Pragmatics – Section 3.2], illustrated by the German examples in (a) and (b). Both examples combine features of declaratives (word order) and interrogatives (intonation – with a strong accent on the interrogative word *wen* in (a)), i.e. they are mixed sentence types with very specific functions. Typically, they are used to express one's surprise about a statement or to indicate that one didn't get the statement. In many languages, echo questions have distinct formal properties and specific pragmatic functions that distinguish them from regular interrogatives.

a. Du hast wen getroffen? (German)
you have.2SG whom meet.PTCP
'You met whom?'

b. Die Bayern haben das Spiel verloren?
the Bayern have.3SG the game lose.PTCP
'Bayern Munich lost the game?'

13.3 Imperative force

In the previous section we have shown that interrogative [Syntax – Section 1.2] refers to a sentence type, which is specialized to elicit information from the addressee. By contrast, imperatives are grammatical forms, which are specialized to elicit a specific

behavior from the addressee. The corresponding imperative force of the imperative sentence in (a) can be described as (b):

a. Go home!
b. The speaker/signer asks the addressee to go home.

Hence, while interrogatives typically elicit linguistic behavior, imperatives are used to elicit non-linguistic behavior of the addressee. A potential confounding factor is that sometimes a question can be used to express a command as in example (a) below and conversely an imperative can be used to elicit information from the addressee as in (b).

a. Could you pass me the salt, please?
b. Tell me the name of the President.

Still languages, develop grammaticalized forms that are *typically* associated with imperative force and these forms are the object of the corresponding section on imperatives [Syntax – Section 1.2] in syntax. Contrary to its name (imperative, from 'impero', meaning 'command'), the imperative is not used only for commands. In most languages, the same form that is used to give orders is also used for other functions that maybe are related, but not obviously. Typical uses of imperatives include at least:

a. invitations
b. suggestions/advice
c. permission
d. instructions
e. recommendations

As already mentioned, it is important to bear in mind that imperative sentences are not the only way to express a command in a given language. In English, for example, you can give an order with a simple declarative, provided you add the right intonation in the right context, as in the following example.

You are going to wash your hands!

For politeness, one can also give orders in even more indirect ways, leaving to pragmatic implicatures [Pragmatics – Section 7.1] the interpretation of the utterance as an order. In the next example for example, a polar (or yes/no) question is used to obtain something from the addressee.

Could you wash your hands, (please?)

In some languages, you can also express a command with the simple verb in the infinite mood. This can be illustrated in the Italian example below, where the infinitival ending is clearly recognizable.

Lavarsi le mani! (Italian)
wash-INF-CL the hands
'Wash your hands!'

Other more explicit ways to express commands involve the use of deontic modals, such as *should* or *must* in English, as in

You should wash your hands.

By imperative force, however, we mean something different, namely the meaning of a specific sentence type that can unambiguously express commands and other restricted functions, as listed above.

It can be distinguished from modal deontic constructions in a very simple and cross-linguistic valid way: while modal constructions can be true or false, hence being propositional, imperative sentences cannot. Consider the following pair.

a. Wash your hands!
b. You should wash your hands

While you can say that (b) is true (or false), this dimension does simply not apply to (a), which can be felicitous or infelicitous according to the context and the respective role of speaker and addressee, but is not valuable on the veridical dimension.

13.4 Exclamative force

By exclamative [Syntax – Section 1.4] we mean a grammatical form that is specialized to convey a surprise, denoting as unexpected either all or some part of the content of a clause. Exclamative force is the corresponding meaning of such grammatical forms. In other words, the unexpectedness can either concern the entire event, or focus on one constituent of the clause. In the first case, illustrated in (a) below, we speak of a total exclamative; in the latter, shown in (b), we have to do with a partial exclamative.

a. John has arrived!
b. What a beautiful day!

According to Zanuttini & Portner (2003), exclamatives can be defined as the sentence type associated to the following properties:

1. Exclamatives contain a wh-operator – variable structure.
2. Exclamatives contain an abstract factive operator in the periphery of the clause associated with complementizers and *wh*-elements.

On the basis of these properties, they propose a set of three tests that can unambiguously set apart real exclamatives from other sentence types used with an exclamative meaning in cases that do not display any specific superficial property. These tests are:

a. factivity
b. scalar implicatures
c. question/answer pair

These tests can be used by the grammar writer to determine the actual range of constructions to be described as exclamatives in the language under description.

13.4.1 Testing exclamatives: Factivity

The factivity of exclamatives is shown by two facts. First, they can only be embedded under factive predicates such as *know*, as seen below.

Mary knows/*thinks/*wonders how very nasty he is.

Second, when they are embedded under a factive verb like *know* or *realize*, in the present tense and with a first person subject, this verb cannot be negated.

*I don't know/realize how very nasty he is.

13.4.2 Testing exclamatives: Scalar implicatures

Exclamatives convey that something is surprising or noteworthy in some way. They thus introduce a conventional scalar implicature to the effect that the proposition they denote lies at the extreme end of some contextually given scale that cannot be denied: this is shown by the awkwardness of the continuation below, which is perceived as a contradiction.

??How very nasty he is! – though he's not extremely nasty.

13.4.3 Testing exclamatives: Question/answer pairs

The third property distinguishing exclamatives from interrogatives and declaratives is their inability to function in question/answer pairs. Unlike interrogatives, exclamatives may not be used to ask questions.

a. A: How tall is she? B: Two meters.
b. A: How very tall she is! B: *Two meters.

Unlike declaratives, exclamatives cannot be used as answers.

A: How tall is her child? B: *How very tall she is!

These criteria can be used to tease apart real exclamatives (and real exclamative force) from other sentence types used with an exclamative meaning. Going back to the unclear examples (a and b) repeated below, we can show that they fail all the tests just given.

a. Isn't he the nastiest man on earth?
b. He's so nasty!

The rhetorical question in (a) can be answered: thus it is not a proper exclamative.

Isn't he the nastiest man? No, he's not.

The declarative exclamative in (b), on the other hand, can be embedded under a non factive predicate, as below, so again it is not a strict exclamative.

a. I think he's so nasty.
b. I don't KNOW he's so nasty

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Chapter 14 The meaning of embedded clauses

14.0 Definitions and challenges

Embedded clauses can express different semantic relations between the proposition expressed by the embedded clause and the proposition expressed by the matrix clause (or the denotation of one element contained in the matrix clause). In this section, we discuss the three main semantic functions of embedded clauses:

(i) realization of an argument of a predicate (argument clauses [Semantics – Section 14.1])
(ii) adverbial modification (adverbial clauses [Semantics – Section 14.2])
(iii) nominal modification (relative clauses [Semantics – Section 14.3])

Note that embedded clauses do not have the privilege to express these functions. All functions can be realized by other syntactic elements. Arguments of a predicate can, for instance, also be linked to noun phrases [Syntax – Section 4] or prepositional phrases. For adverbial modification we can also use adverbials [Lexicon – Section 3.5] or implicit discourse relations [Pragmatics – Section 5]. And nominal modification can also be expressed with adjectives [Lexicon – Section 3.4]. Again, we do not have a one-to-one relation between form and meaning.

In addition, the same embedded clause can express more than one relation. A well-known example is the temporal clause introduced with *since*, which can also be used as reason clauses to express a causal relation. Consider the following adverbial clauses in English. The subordination *since* does not only express the temporal relation in (a) but also the causal relation in (b).

a. Since he moved to Amsterdam, he has been a professor.
b. Since he teaches in Amsterdam, he is learning Dutch now.

Therefore, embedded clauses may be ambiguous between two different interpretations. In those cases, the context usually disambiguates between these types. The following example from ASL, for instance, is ambiguous between a temporal and a conditional clause. 're' stands for raised eyebrows.

re
RAIN NOT GO PICNIC (ASL, Coulter 1979: 26, cited in Pfau & Quer 2012)
'If it rains, we won't go on the picnic.'
'When it rains, we don't go on picnics.'

Note finally, that not every language uses subordination to express every adverbial function. Some may use coordination or juxtaposition for, for instance, expressing a sequence of events. The following example is from Nupe (a Kwa language) where purpose is expressed by means of a serial verb construction. The second verb is not marked as being subordinate.

Musa bé lá èbi (Nupe, Thompson et al. 2007: 242)
Musa come.PST take.PST knife
'Musa came to take the knife.'

Even languages that have adverbial clauses at their disposal may use alternative strategies to express the corresponding adverbial function. In German, a causal relation can be expressed explicitly with the reason clause in (a). However, the same function can also be expressed with coordination [Syntax – Section 3.1] or juxtaposition (with or without a causal adverbial) as is illustrated in the examples (b), (c) and (d).

a. Peter kam zu spät, weil die Autobahn gesperrt war. (German)
   Peter come.PST too late because the highway close.PTCP be.PST
b. Peter kam zu spät. Die Autobahn war gesperrt.
   Peter come.PST too late the highway be.PST close.PTCP
c. Die Autobahn war gesperrt und Peter kam zu spät.
   the highway be.PST close.PTCP and Peter come.PST too late
d. Die Autobahn war gesperrt. Deshalb kam Peter zu spät.
   the highway be.PST close.PTCP therefore come.PST Peter too late
   'Peter was late because the highway was closed.'

Note finally that sign languages may mark adverbial clauses only with (multifunctional) non-manual markers such as brow raise. Manual signs such as the conditional marker IF may be optional. In the absence of manual signs marking the clause or sentence type, determining what the non-manual(s) mark may be challenging. For instance, in some sign languages such as ASL a non-manual marker, brow raise, occurs both in polar questions and in the antecedent of conditional clauses (Wilbur & Patschke 1999). If the signer does not use additional conditional markers such as a sign with the meaning 'if', then it may be difficult

to differentiate between a polar question-answer pair (meaning 'Does it rain? I go to the cinema.') and a conditional clause (meaning 'If it rains, I go to the cinema') (Cecchetto 2012).

14.1 Argument clauses

Argument clauses [Syntax – Section 3.3] like (a) are arguments of the selecting verb (and noun) and thus listed in the argument structure [Semantics – Section 6] of the predicate. Their main function is to realize one of the verbs argument. Just like the corresponding noun phrase in (b), the argument clause in (a) receives a theta role [Semantics – Section 6.1] of the verb.

a. Mary regrets that she left New York.
b. Mary regrets her decision.

Argument clauses are licensed by verbs that semantically select for a propositional argument such as *regret*, *know*, *see,* or *say*. Verbs that do not select for propositional argument such as *eat* cannot license argument clauses. Argument clauses can occur in subject and in object position. In addition, some verbs select declarative [Syntax – Section 1.1] argument clauses (a), other interrogative [Syntax – Section 1.2] clauses (b). Some verbs select both declarative and interrogative argument clauses (c).

a. Mary regrets that/*whether she left New York.
b. Mary asked *that/whether she left New York.
c. Mary knows that/whether she left New York.

Note finally that argument clauses can be finite and non-finite. In the latter case, the subject of the (non-finite) argument clause is not realized in syntax. Depending on the verb type and the context, the implicit argument can be linked (or controlled by) to the subject (a) or to the object (b) of the matrix clause.

a. Peter promised Mary to support her mother.
b. Peter allows Mary to visit her mother.

14.2 Adverbial clauses

In this section, we focus on the meaning of adverbial clauses. The morphosyntactic marking is discussed in the corresponding sections on conjunctions [Lexicon – Section 3.9] coordination and subordination [Syntax – Section 3] in the Lexicon and Syntax part.

14.2.1 Conditional clauses

A conditional clause [Syntax – Section 3.5.1] consists of two clauses. One clause (the *protasis* or *antecedent*) expresses a condition whose fulfillment or non-fulfillment is relevant to the degree of reality assigned to the other clause (the *apodosis* or *consequent*). In the following example, the first clause is antecedent, and the second clause the consequent:

[If it is raining]$_{\text{antecedent}}$ [we (always) stay at home]$_{\text{consequent}}$

In conditionals, the antecedent can be analyzed as the restrictor [Semantics – Section 10] of a universal quantifier [Lexicon – Section 3.10.2] and the consequent as the nuclear scope [Semantics – Section 10]. More generally, conditionals can be analyzed as restrictions of a (possibly covert) modal operator such as *always* in our example (Lewis 1975; Kratzer 2012).

a. For all situations s, it is raining in s, we stay at home in s
b. ∀s [*rain* (*s*)] [*stay-at-home* (*s*)]

Semantically, conditionals can be divided into two main categories: predictive/central and non-predictive/peripheral (Dancygier 1998; Haegeman 1984, 2014).

Predictive conditionals are the canonical conditionals. In the following example, the occurrence of the event expressed in the consequent (i.e. the restrictor 'that the glass breaks') depends on the fulfillment of the condition expressed in the antecedent (i.e. the nuclear scope 'that the addressee drops the glass'). There is usually a causal link between the two events.

If you drop the glass, it will break.

Predictive conditionals can further be divided into *open* and remote/counterfactual *conditionals*. Open conditionals are also referred to as realis/real/factual/neutral, and counterfactual or remote conditionals are also referred to as irrealis/unreal. In open conditions such as (a), the fulfillment of the condition is seen as a realistic possibility. As opposed to this, in remote conditionals such as (b), the fulfillment of the condition is impossible, contrary to fact or at least unlikely (Trask 1993). An example of an open conditional in English would be:

a. If it rains tomorrow, the concert will be cancelled.
b. If I were you, I would call her immediately.

In non-predictive/peripheral conditionals such as the following example, the occurrence of the event expressed in the consequent clause does not depend on the fulfillment of the condition expressed in the antecedent clause. The conditionality holds not in the domain of the proposition but in some other contextually specified domain,

typically the discourse structure [Pragmatics – Section 5] or the speech act [Pragmatics – Section 3], i.e. the following sentence does not mean that in all situations in which the addressee is hungry (= the restrictor) there is pasta in the fridge (= the nuclear scope). The sentence is used to inform the addressee about the fact that there is pasta in the fridge, which is especially relevant in situations, in which he/she is hungry.

If you are hungry, there is some pasta in the fridge.

Here, the existence of pasta in the fridge does not depend on the condition of the hearer being hungry. Similarly, in the following there is no causal link between the two clauses:

If John is such a good worker, why don't you give him a raise?

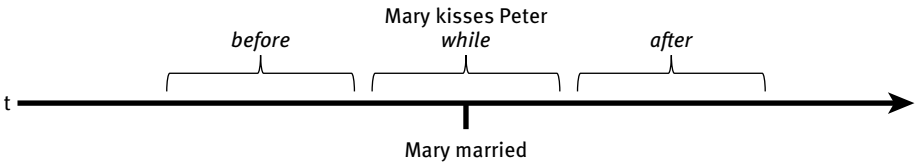
Note finally that some languages have what is sometimes called 'imperative-and-declarative' constructions. These constructions express conditionality with an imperative clause followed by a declarative, as in (a). This sentence gets almost the same interpretation as the corresponding conditional in (b).

a. Don't do your homework and you will be grounded.
b. If you don't do your homework, you will be grounded.

14.2.2 Temporal clauses

Temporal clause [Syntax – Section 3.5.2] expresses a temporal relationship between two events/situations. The time of the situation expressed by the adverbial clause can be before, after or simultaneous with the time of the situation expressed in the main clause. Languages use different expressions to mark the relationship between two situations. English, for example, has a variety of subordinating conjunctions [Lexicon – Section 3.9.2] like *when, while, as, before, after, since, until, now that, once, as soon as*.

a. Mary kissed Peter [*before* she married].
b. Mary kissed Peter [*after* she married].
c. Mary kissed Peter [*while* she married].



The temporal relation between the two situations expressed in the matrix clause and the adverbial clause is specified by the temporal expression, that is, temporal

expressions like the English conjunctions in (a–c) overtly link the time of the situation described in the adverbial clause to the time of the situation described in the matrix clause. Moreover, the situation described in the adverbial clause must be presupposed since it is the reference point for the situation asserted by the matrix clause. In order to understand when Mary kissed Peter, we have to know when she married. Hence, the situation described in the adverbial clause is backgrounded or not-at-issue (relative to the situation described in the matrix clause, which is foregrounded or at-issue [Pragmatics – Chapter 7]) (Johnston 1994).

Note finally that temporal expressions such as *before* in (a) above trigger a scalar implicature. Semantically, *before* expresses any relation of anteriority. However, sentence (a) above does not mean that Mary kissed Peter 2 million years before she married. The scalar implicature adds the additional meaning that both situations are temporally closely related.

14.2.3 Locative clauses

Locative clauses [Syntax – Section 3.5.3] such as the following English example express the location the situation described in matrix clause is located at.

Yesterday John met Mary [*where* he had proposed to her].

Like temporal clauses, locative clauses provide background information.

The grammar writer should be aware of the fact that sign languages productively use the topographic signing space [Pragmatics – Section 8.1.2] to express locative relations [Semantics 14.2.3].

14.2.4 Manner clauses

Manner clauses [Syntax – Section 3.5.4] express the way the event in the main clause is realized. They may contain a subordinating expression such as *as* or a relative clause specifying a (possibly empty) manner expression as in the following English examples. In the latter case the whole manner expression is nominal.

a. Carry this [*as* I told you]. (Thompson et al. 2007: 249)
b. Carry this [*the way* (that) I told you]. (Thompson et al. 2007: 249)

14.2.5 Reason clauses

Reason or causal clauses [Syntax – Section 3.5.5] give a reason for the main event, that is, they establish a clausal relation between the two propositions. The causal relation

may be realized with verbal morphology, subordinating causal expressions, or with non-manual markers. English, for example, uses a variety of causal subordinations such as *because, since, as, for*.

I called you [*because* I missed you].

Like conditional clauses, reason clauses can operate at different levels. This is illustrated by the following examples from German. In the first sentence (a) the reason clause with the sentence initial causal conjunction *weil* ('because') gives a reason for the proposition expressed in the matrix clause (propositional interpretation). In the second sentence (b), the reason clause does not modify the matrix proposition but gives a reason why the speaker believes the matrix proposition (epistemic interpretation). Finally, in the third sentence (c), the reason clause modifies the speech act the speaker performed, that is, it gives a reason why the speaker was asking the question (speech act interpretation).

a. Die Straße ist weiß, weil es geschneit hat. (German)
the street be.3SG.PRS white because it snow.PTCP have.3SG.PRS
'The street is white and the reason for this is that it has snowed.'
b. Es hat geschneit, weil die Straße ist weiß.
it have.3SG.PRS snow.PTCP because the street be.3SG.PRS white
'The speaker believes that it has snowed and the reason for his/her believe is that the street is white.'
c. Bist du aufgeregt? Weil du rauchst schon die dritte Zigarette.
be.2SG.PRS you nervous because you smoke.2SG.PRS PARTICLE the third cigarette
'The speaker asks the addressee whether he/she is nervous and the reason why he/she is asking is that the addressee smokes the third cigarette.'

Reason clauses can be ambiguous between the three interpretations. In this case, additional contextual information is necessary to specify the intended interpretation. In addition, languages have developed grammatical means to disambiguate among the interpretations. On the one hand, clausal conjunctions may have a preference for one of the interpretations. On the other hand, markers of syntactic and prosodic (dis-)integration can be used for disambiguation. In the German examples in (a–c), main clause order (i.e. verb-second) is used to distinguish the propositional interpretation in (a) from the epistemic and speech act interpretations in (b–c). Only the reason clause in (a) is a proto-typical embedded verb-final clause. By contrast, in the reason clauses in (b–c), the verb is in second position, i.e. they have the same structure as matrix clauses.

14.2.6 Purpose clauses

Purpose clauses [Syntax – Section 3.5.6] express the purpose of the main event. They may contain subordinating morphemes such as *in order to*..., *so that* ... in English.

We stopped driving to work [*in order to* save money].

In some languages, reason and purpose clauses are realized with the same grammatical markers. Note that both types of adverbial clauses express some sort of an explanation. Therefore, the same underspecified marker may be used for both kinds of relation. However, the event expressed in the purpose clause is unrealized at the time of the main event, whereas that in the reason clause may or may not be realized. Therefore, additional grammatical markers such as subjunctive may be used to express the unrealized property of the purpose clause.

14.2.7 Concessive clauses

Concessive clauses [Syntax – Section 3.5.7] are the semantically most complex adverbial clauses. Concessive clauses express a concession, against which the proposition in the matrix clause is contrasted. The meaning of a concessive clause involves conditionality. This can be seen in example (a). The concessive clause expresses the underlying expectation that people do not continue to work as hard if they have not slept much the night before. Unlike conditionals, the proposition expressed by the adverbial clause does not cancel the proposition expressed by the matrix clause. That is, concessive clauses are used to assert that the proposition of the matrix sentence is true even if a stereotypical expectation is the opposite. The meaning of concessive clauses can therefore described at two different levels as indicated in (b). At the first level, example (a) states that both propositions (i.e. expressed by the adverbial clause and the main clause) are true (b1). At the second level, the concessive clause states that both proposition usually exclude each other (i.e. negative conditional meaning) (b2).

a. [*Although* she had not slept much the night before], she continued to work as hard.
b. 1. She had not slept much the night before and she continued to work as hard.
   2. Usually she does not continue to work as hard if she had not slept much the night before.

Concessive clauses are expressed with various kinds of subordinating expression such as *although, even though, except that, despite the fact that, in spite of the fact that, no matter what, whoever/whatever/whenever/wherever,* etc. in English.

Like conditional and reason clauses, concessive clauses also operate at different levels (Antomo & Steinbach 2013). This is illustrated by the following examples from German. The concessive clause can again modify the proposition of the matrix clause (propositional interpretation) (a), the evidence the speaker has for his/her assertion (epistemic interpretation) (b), and the speech act (speech act interpretation) made by the speaker (b).

a. Ich nehme das Auto, obwohl es keine Parkplätze gibt. (German)
I take.1SG.PRS the car although there no parking-lot.PL be.3SG.PRS
'I take the car although there are no parking lots.'
b. Barcelona ist eine tolle Stadt. Obwohl – da gewesen bin ich selbst noch nicht.
Barcelona be.3SG.PRS a great town although – there be.PTCP be.1SG.PRS I self PARTICLE not
'The speaker claims that Barcelona is a great town but he does not have any evidence for this claim since he has not visited the town yet.'
c. Mein Klient hat ein Alibi! Obwohl – der Richter hat eigentlich
my client have.3SG.PRS a alibi although the judge have.3SG PARTICLE
verboten, darüber zu sprechen.
prohibit.PTCP about-this to talk.INF
'The speaker says that his client has an alibi. And he/she made this assertion although the judge did not allow to talk about this.'

Note finally that concessive clauses can also be used to withdraw the matrix proposition. In this case, the concessive clause is an independent matrix clause that follows the clause it modifies. In addition, both clauses are separated by a prosodic break.

Ich nehme das Auto, obwohl – es gibt keine Parkplätze. (German)
I take.1SG.PRS the car although there no parking-lot.PL be.3SG.PRS
Ich nehme besser mein Fahrrad.
I take.1SG.PRS better my bike
'I take the car – ... but there are no parking lots. Therefore, I better take my bike. '

14.2.8 Substitutive clauses

Some languages use subordinating morphemes expressing substitution such as *instead of* and *rather than* in English. Substitutive clauses [Syntax – Section 3.5.8] mark the unrealized nature of the event described in the adverbial clause.

You talk to my mother [*instead of* talking to me].

14.2.9 Additive clauses

Some languages use additive clauses [Syntax – Section 3.5.9] to express one state of affairs in addition to another. These can have meanings such as 'besides' or 'in addition'.

[*Besides* waking me up in the middle of the night] he accused me of not caring about his feelings.

14.2.10 Absolutive clauses

An absolutive clause [Syntax – Section 3.5.10] is a clause that does not have a semantically specific subordinating morpheme expressing the relationship between it and the main clause, but has some sort of general grammatical marking that the corresponding clause is a subordinate clause. In the following example, the non-finite form of the verb signals subordination and semantic dependence. Since the semantic relationship between the two clauses is not overtly specified, it must be inferred from the context, see the section on discourse structure [Pragmatics – Section 5]

[Having talked to her boss about the promotion], she went on vacation feeling relieved.

14.3 Relative clauses

Relative clauses modify nominal expressions. In the following example the object *the artist* of the relative clause is relativized. At the same time, *the artist* is the subject of the matrix clause. In principle, the noun phrase can have any grammatical function in the matrix and relative clause. Note, however, that there may be language-specific restrictions on the grammatical functions of nouns in relative clauses. Moreover, languages use quite different morphosyntactic strategies to mark relative clauses. These formal restrictions are discussed in the corresponding syntactic section on relative clauses [Syntax – Section 3.4].

The artist [that Laura admires] makes beautiful pottery.

Relative clauses are a powerful semantic tool because they express a property of the head noun even if this property is not lexicalized. For example, it is unlikely for a language to have an adjective expressing the property 'Laura admires'. Still by using the corresponding relative clause in the example above, the speaker can express the meaning that the artist with that very property makes beautiful pottery. Relative clauses can be used to identify a discourse referent [Pragmatics – Section 1] in context or to provide additional information about a discourse referent.

Traditionally, relative clauses have been classified in two main semantic categories: restrictive [Semantics – Section 14.3.1] and non-restrictive [Semantics – Section 14.3.2] (or appositive) relative clauses. Recently a third type has been identified, namely amount relative clauses.

14.3.1 The semantics of restrictive relative clauses

Restrictive relative clauses are nominal modifiers that yield an intersection of the property denoted by the head noun and the property denoted by the relative clause.

For example, in the following sentence the restriction of the determiner 'the' is provided by the intersection of the set of boys and of the set of individuals who can dance. So, the noun phrase *the boys who can dance* refers to subset of boys who can dance as opposed to the set of all boys. Restrictive relative clauses provide necessary information to identify the (set of) discourse referent(s).

I like the boys who can dance.

14.3.2 The semantics of non-restrictive relative clauses

Non-restrictive relative clauses (or called appositive relative clauses) modify the whole noun phrase rather than intersecting with the head noun. In the following sentence, the non-restrictive relative clause *who can dance* does not delimit the set of contextually salient boys, but simply provides additional (background or not-at-issue) information about the boys, that is, unlike restrictive relative clauses, they are not necessary to identify the (set of) discourse referent(s).

I like the boys, who can dance.

Morphosyntactically and prosodically, non-restrictive relative clauses may differ from their restrictive counterparts. In addition, graphematic means can be used. In written English, for example, non-restrictive relative clauses are marked with commas. Moreover, non-restrictive relative clauses may contain particles such as *übrigens* ('by the way') in German that are not semantically licensed in restrictive relative clauses. Semantic differences between the two kinds of relative clauses are discussed in the next section.

14.3.3 Semantics differences between restrictive and non-restrictive relative clauses

Although non-restrictive relatives cannot be uttered in isolation, they have independent illocutionary force [Semantics – Section 13], as independent sentences do. As a consequence, a matrix clause together with a non-restrictive clause expresses the same meaning as the corresponding coordination of these two clauses as is illustrated in (a) and (b) below. By contrast, restrictive relative clauses cannot be replaced by coordinative structures.

a. The men, who can cook pasta, are Italians.
b. The men are Italians and they can cook pasta.

Due to their different semantic functions, restrictive and non-restrictive relatives can be distinguished also based on the type of head they can modify. Recall that the semantics of restrictive relatives require that there is an intersection between the property expressed by the head noun and the property expressed by the relative

clause. Therefore, restrictive relatives cannot modify a proper name (or a pronoun), since a proper name denotes an individual, not a property:

*John that I like a lot arrived late.

By contrast, non-restrictive relative can modify names and pronouns since they provide additional (non-intersective) background information.

John, who I like a lot, arrived late.

Conversely, a restrictive relative clause can modify phrases containing a quantifier [Syntax – Section 4.4] if its restriction [Semantics – Section 10] (the head noun) denotes a property. This can be seen in the following example.

a. Every man who can cook pasta can join the competition.
b. No man who can cook pasta can join the competition.

This is not possible for non-restrictive relative clauses as the following sentences illustrate.

a. *Every man, who can cook pasta, can join the competition.
b. *No man, who can cook pasta, can join the competition.

14.3.4 Amount relative clauses

As opposed to (non-)restrictive relative clauses, so-called amount relative clauses, which have been identified only recently, are much rarer. Amount relatives are used to delimit a quantity of objects or an amount of substance. The following example is ambiguous between a restrictive interpetation (i.e. 'it will take us a long time to read *the very same books* he read') and an amount interpretation (i.e. 'it will take us a long time to read *the quantity of books* he read').

It will take us the rest of our lives to read the books that he read last week.

Other examples such as the following one only yield the amount reading.

It will take us the rest of our lives to drink the champagne that there was on the floor after last night's party. (Grosu 2002: 151)

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Chapter 0 Preliminary considerations – Meaning in discourse

This brief introduction is meant as a guide to what pragmatics is, as one of the components of grammar. Our purpose is to give a very general introduction to the field of linguistics pragmatics.

0.1 What is pragmatics?

In linguistics, pragmatics is generally understood as a theory of language use. Like semantics, pragmatics does not focus on formal, i.e. phonological, morphological, and syntactic, aspects of language but on aspects related to meaning. However, while semantics describes the literal meaning of morphemes, words or, sentences, pragmatics focuses on meaning *in context*. In linguistics, various definitions of pragmatics are available:

> Pragmatics [is] a general functional perspective on (any aspect of) language, i.e. [...] an approach to language which takes into account the full complexity of its cognitive, social, and cultural (i.e. 'meaningful') functioning in the lives of human beings. (Verscheuren 1995)

> Pragmatics is the study of the conditions of human language uses as these are determined by the context of society. (Mey 1993)

> Language consists of grammar and pragmatics. Grammar is an abstract formal system for producing and interpreting messages. General pragmatics is a set of strategies and principles for achieving success in communication by the use of grammar. Grammar is functionally adapted to the extent that it possesses properties which facilitate the operation of pragmatic principles. (Leech 1983)

> Pragmatics has as its topic those aspects of the meaning of utterances which cannot be accounted for by straightforward references to the truth conditions of the sentences uttered. Put crudely: PRAGMATICS = MEANING – TRUTH CONDITIONS. (Levinson 1983)

> Gricean pragmatics assumes a distinction between literal and speaker's meaning [...]. This distinction corresponds to that between linguistic capability and its utilization: The linguistic capability derives the literal meaning of an utterance, while the general principles of utilization derive how speakers and listeners use the literal meaning for communication. (Sauerland & Schumacher 2016)

Following these definitions, pragmatics investigates quite different fields of language use. On the one hand, pragmatics (in a broader sense) can be seen as the interface between language and society, culture and cognition. Following this definition, pragmatics aims at a better understanding of the social interaction of humans, the cultural

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foundations of language, and the conditions of human cognition. On the other hand, pragmatics (in a narrow sense) can be seen as a core part of grammar interacting especially with semantics. The division of labor between semantics and pragmatics is especially important for the constitution of meaning. Consider the following two examples as an illustration of the interaction between semantics and pragmatics:

a. I met you yesterday.
b. Some guests are already leaving.

In order to fully understand example (a), the addressee must know what the deictic [Pragmatics – Chapter 1.1] expressions *I*, *you* and *yesterday* refer to. The first person pronoun [Lexicon – Chapter 3.7], for example, refers to the speaker or signer of the utterance, which can only be fixed in the context of utterance. Hence, we need pragmatic enrichment to get the full meaning of sentence (a). Depending on the context, the reference for deictic expressions can be very different. Consequently, sentence (a) can mean that Mary met Josef on December 24, that Paul met Sue on March 21, ...

Example (b) is different. Semantically (namely, literally), it means that some and possibly all guests are already leaving. That sentence (b) has this meaning is shown by the fact that the sentence 'In fact, they are all leaving' is a possible continuation of (b). However in many contexts of use, (b) is associated to the scalar implicature [Pragmatics – Chapter 7.1] that some *but not all* guests are already leaving. This very general pragmatic enrichment is due to the fact that the quantifier [Lexicon – Chapter 3.10.2] *some* is less informative than the quantifier *all*. Hence, the use of the less specific expression blocks the meaning of the more specific one. Interestingly, sentence (b) has additional context depending meanings. In a context where someone is asking the time, this sentence can mean that it's already late (since some guests are already leaving). In another context where someone is asking whether the party is successful, the same sentence can mean that it's not really successful (since some guests are already leaving).

0.2 Organization of the Pragmatics Part

In this part we take the narrow definition as a starting point and understand pragmatics as the part of grammar in which we describe meaning in discourse. However, we also address aspects relevant for the broader definition such as, register, politeness, and communicative interaction.

Consequently, the first chapters deals with meaning in discourse and addresses topics such as speech acts, reference, reference tracking, information structure, and discourse structure. The remaining chapters broaden the perspective and discusses more peripheral topics such as conversational and conventional implicatures, presuppositions, figurative meaning, and politeness, as well as register and communicative interaction. In addition, this part includes two chapters that seem to be

modality-specific, namely the use of the signing space and role shift (a sign language specific way to report someone else's speech and actions). Both chapters do not have direct counterparts in spoken languages grammars since they depend on specific aspects provided by the visual-gestural modality and are therefore relevant for a comprehensive description of pragmatic aspects of sign languages.

0.3 How to use the Pragmatics Part

Unlike the part on semantics, this part does not only provide background information (by defining the meaning of grammatical categories such as tense, aspect, or negation) but is also an integral part of the reference grammar. The grammar writer is invited to carefully check and describe all aspects discussed in the chapters of this part. There are, however, two caveats for the grammar writer: First, pragmatic topics are still not well established in reference grammars. Second, in research on sign languages, many pragmatic aspects are still under-investigated. Hence, he/she will not always find clear instructions on how to proceed and elicitation materials are sometimes scarce. Fortunately, there is a kind of semantic and pragmatic turn in recent sign language linguistics. This new development will definitely help the grammar writer in his/her own investigations.

It should be obvious that a number of topics discussed in this chapter are also addressed in other parts of the Blueprint. This is not surprising, as pragmatics has clear relations to other areas, most importantly semantics but also lexicon, syntax and prosody. To give an illustrative example: The pragmatic chapter on speech acts [Pragmatics – Chapter 3] is directly linked to the syntactic chapter on sentence types [Syntax – Chapter 1] and the semantic chapter on illocutionary force [Semantics – Chapter 13]. Although there is no clear one-to-one relation between sentence types, illocutionary force, and speech acts (see speech acts [Pragmatics – Chapter 3]), we nevertheless find a correlation between, for example, interrogatives, interrogative force, and questions. Moreover, questions have also a direct link to the lexicon and prosody since languages use specific interrogative pronouns [Lexicon – Chapter 3.7.5], question particles [Lexicon – Chapter 3.11.2] and specific intonational patterns [Phonology – Chapter 2.3] among others to express questions.

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Chapter 1 Reference

1.0 Definitions and challenges

1.0.1 What is reference?

Reference is the symbolic relationship between a linguistic expression and a concrete or abstract entity that it represents. To give an example, let's consider the two sentences below, in a context where *Fido* is the name of my dog. By uttering either the first or the second sentence, I claim that what my dog is doing is barking. They are therefore equivalent. To refer to my dog, the two sentences use different referring expressions. In the first sentence, the proper name *Fido* is used. In the second sentence, the definite description *my dog* is used. The two referring expressions refer to the same entity.

a. Fido barks.
b. My dog barks.

The reference of an expression is the set of entities that the expression denotes. In this section, we will call the linguistic expression 'referring expression' and the abstract entity that it represents will be called 'discourse referent'. Referring expressions may be instantiated by definite noun phrases, indefinite noun phrases, pronouns, proper names, and bare nouns.

A traditional classification distinguishes between deictic and anaphoric uses of noun phrases [Syntax – Chapter 4] / noun phrases. A noun phrase is deictic when it receives its reference from an extralinguistic context. A noun phrase is anaphoric when it picks up a discourse referent from the preceding text or discourse [Pragmatics – Chapter 5] / discourse. However, in face-to-face communication the distinction is not so clear-cut, as there are contexts where the difference between a deictic and an anaphoric element is blurred. In the following sentence with no previous explicit mention of the postman, the personal pronoun *he* can be used to refer to the postman.

Context: After the postman is leaving a building.
He comes every day.

Since the two interlocutors share the same immediate physical context, the speaker can use a personal pronoun *he* as a first mention referring expression. In this context, the pronoun has a deictic function because the reference can be picked out from the extralinguistic context. The pronoun picks up a referent that belongs to the common experience and background of the interlocutors. Hence, anything in the immediate environment (or contextual setting) towards which the attention is directed can become a discourse referent, whether it has been explicitly introduced with a previous full noun phrase or not. This is an important feature that most sign languages share due to their typical use in face-to-face interaction.

The main goal of this section is to study the referential potential of referring expressions (i.e. their semantics) and the specific reference that is generated in different situational uses (i.e. pragmatics). In this section, meaning is considered from a textual and discourse perspective through the use of referring expressions, which are instantiated via morphophonological, lexical and syntactic means.

1.0.2 Methodological challenges

When describing how reference is conveyed in a particular sign language, a body of discourse materials is very much needed. Corpus data (if available) provide an important general picture of how reference works in a particular language and can be used at a preliminary stage to frame specific questions and intuitions. Importantly, corpus data may be used to determine the structures that are common and frequent in the language to be described. However, corpus data should always be complemented with elicited data and felicity judgments. Elicitation tasks and felicity judgments (that is, judgments from native signers about whether an expression is more adequate in one context or another or more adequate compared to a competing expression) will provide additional contexts which are possibly not found in the corpus data, as well as negative evidence. This is why the study of reference must be ideally based on a combination of the observation of large representative signed datasets, elicitation tasks and felicity judgments.

The grammar writer should provide a list of different kinds of referring expressions found in the sign language under investigation and a description of the formal (morphosyntactic) and functional (semantic and pragmatic) properties of these expressions and the contexts these expressions are typically used in. As already mentioned in the introduction to the Pragmatics Part, the grammar writer should be aware that the issue of reference is also relevant to other parts of the reference grammar such as determiners [Lexicon – Chapter 3.6], pronouns [Lexicon – Chapter 3.7] and noun phrases [Syntax – Chapter 4].

1.1 Deixis

Deixis is the main strategy to refer to present discourse referents in most sign languages studied to date. Deictic elements are indexical [Pragmatics – Chapter 6] expressions that directly refer to objects present in the context of conversation. Their interpretation is related to the spatiotemporal coordinates of the actual context of utterance, such as *I-here-now* (cf. Cormier 2007, 2012; Friedman 1975; Meurant 2007; Pizzuto et al. 2008; Liddell 2003 for particular accounts on deixis in sign languages). In this section, we focus on deictic expressions referring to concrete or abstract discourse referents, leaving aside local and temporal deictic expressions like HERE, NOW, YESTERDAY, etc. (for temporal expressions see section on tense [Semantics – Chapter 1]).

In sign languages, deictic referring expressions generally consist of an index handshape [Phonology – Chapter 1.1.1] / handshape directed to a present object or person, to the body of the signer or to some location previously established in the signing space [Pragmatics – Chapter 8] / signing space which is associated to a discourse referent. This 'pointing' may be used for many different functions, as described below. The hand configuration may show some variation. One reason for variation are assimilation processes [Phonology – Chapter 3.1.1] where the handshape of the pointing sign assimilates with the handshape of neighboring signs. Because of their inherent use in face-to-face interaction, sign languages make a great use of deictic elements.

1.1.1 Pointing

Pointing may be expressed with manual signs directed to an area in signing space. A pointing sign may co-occur with a noun or rather be alone. Pointings may undertake different functions. In the first sentence below, the pointing co-occurs with a noun and therefore functions as a determiner [Lexicon – Chapter 3.6]. In the second sentence the pointing occurs alone and functions as a pronoun [Lexicon – Chapter 3.7]. Moreover, sign languages have the potential of also directing eye gaze to a spatial location. Eye gaze may co-occur with the manual sign in both anaphoric and deictic reference. Eye gaze may also be used alone to refer to present or absent discourse referents.

a. IX_{3a} MAN SMART (LSC)
'The/that man is smart.'

b. IX_{3a} BRAVE (LSC)
'He is brave.'

The form and function of the pointing sign and the distribution of non-manual markers such as eye gaze may serve as a starting point for the grammar writer to search for deictic expressions in the sign language under investigation.

1.1.2 Social deixis

Social deixis marks the reference to the social characteristics of, or distinctions between, the participants in the speech event. The distinction between familiar and polite second and third person pronouns is an expression of social deixis, which denotes different social rankings of the participants in the conversation.

In some sign languages, a frequent alternate form to the index handshape, which in this case is not due to phonological assimilation but rather to social considerations,

is the B-handshape in contexts of formal deixis. The use of B-handshape in personal pronouns encodes honorific treatment in Libras (Berenz 2002).

PLEASE IX-B-HAND$_2$ SEAT (Libras, Berenz 2002)
'Please, have a seat.'

In other sign languages, such as LSC (Barberà 2012b, 2014; Morales-López et al. 2005), IPSL (Zeshan 2000) and ASL (Liddell 1990; Schlenker & Lamberton 2012), the upper part of the frontal plane in signing space is used to denote social hierarchical relations, and precisely superiority. The contrast between the upper and the lower frontal plane is associated with asymmetrical relations such as parents-children, boss-worker, professor-student, etc. In such contexts, a locus established on the upper part of the frontal plane denotes the individual who is higher in the social hierarchy.

a. MY FATHER IX$_{U.A}$ SELF$_{U.A}$ BUSINESSMAN. IX$_{U.A}$ RICH (LSC)
'My father is a business man. He is rich.'

7_1.1.2_1_LSC_ DEAN IX3U.A 3U.ATELL1 SCHEDULE 1GIVE3U.A

b. DEAN IX$_{3U.A}$ $_{3U.A}$TELL$_1$ SCHEDULE $_1$GIVE$_{3U.A}$ (LSC)
'The dean asked me to give her the schedule.'

1.1.3 Lack of deixis

Generic reference (or reference to kinds) – that is, nouns denoting general properties rather than particular individuals – may be expressed with bare nouns, which do not co-occur with pointing. This is not to say that all bare nouns express genericity, since bare nouns may also denote definite, indefinite, or specific referents, given the appropriate context. However, a bare noun is the default to express genericity in sign languages such as French Belgian Sign Language (de Vriendt & Rasquinet 1990), Libras (Sá et al. 2012), and LSC (Quer 2005b, 2010).

7_1.1.3_1_LSC_ LIONS EAT MEAT

LIONS MEAT EAT (LSC)
'Lions eat meat.'

1.2 Definiteness

Definite noun phrases [Syntax – Chapter 4] are nominal arguments that denote discourse referents that have the property of being unique ((a), (b)) or the property of

being familiar. A discourse referent is familiar if it is known by both the signer and the addressee, due to the fact of being co-present (c), culturally shared and therefore part of the common ground (context) (d) or already mentioned in the previous discourse (e).

a. **The sun** is shining.
b. **The book** is on the table.
c. Just give **the shelf** a quick wipe before I put this vase on it.
d. **The president** is visiting the school tomorrow.
e. An elegant dark-haired woman, a man with dark glasses and two children entered the compartment. I immediately recognized **the woman**.

1.2.1 Manual marking

Prenominal pointing signs have been argued to function as a definite article [Syntax – Chapter 4.1] in some sign languages like ASL (Bahan et al. 1995), though others have argued that either prenominal or postnominal pointing signs can have definite reference (Ahlgren & Bergman 1990 for SSL; Bahan 1996, MacLaughlin 1997 and Wilbur 2008 for ASL; Tang & Sze 2002 for HKSL).

IX WOMAN IX ARRIVE EARLY (ASL, Bahan et al. 1995: 3)
'The/That woman there arrived early.'

1.2.2 Non-manual marking

In some sign languages, the co-articulation of squinted eyes on the noun phrase denotes discourse referents that are both known and familiar by the discourse participants. This has been attested for DTS (Engberg-Pedersen 1993), Israeli SL (Dachkovsky & Sandler 2009), and DGS (Herrmann 2013).

sq. eyes
IX_1 COLLAGUE WORK HARD (DTS, Engberg-Pedersen 1993)
'My colleague (the one that you know) works hard.'

Raised eyebrows (topic [Pragmatics – Chapter 4.2] / topic marking) also marks shared knowledge of the referent being talked about.

In NGT and RSL, a wrinkled nose appears to combine with noun phrases when the discourse referent is known to the addressee but not active in the discourse (Kimmelman 2014).

n. wrink

IX$_1$ WALK IX$_1$ HOUSE WALK GO CAR IX$_1$ WALK (NGT, Kimmelman 2014: 56)
'I went from my house to the car.'

1.3 Indefiniteness

While definite noun phrases are used in cases where both the signer and the addressee know the discourse referent, indefinite noun phrases refer to discourse referents that are not known by the addressee. The main function of indefinite noun phrases is to introduce new discourse referents into the discourse, and they cannot be used to refer back to already introduced discourse referents. In the English example below, the indefinite noun phrase in the second sentence refers to a man different from the man in the first sentence.

A man$_i$ entered the room. A man$_j$ opened the window.

The referents of indefinite NPs also refer to non-unique discourse referents – that is, they can be used in contexts in which there is more than one discourse referent having that property. Leaving aside salience and prominence contexts, the use of a definite article [Syntax – Chapter 4.1], for example, is not felicitous when referring to stars since generally there are many stars. This is why example (b) is marked with the non-felicitous symbol '#' meaning that although the sentence is grammatical it is not applicable in a context where no particular star is intended from a group formed by many stars.

a. A star appeared.
b. #The star appeared.

1.3.1 Manual marking

Manual indefinite determiners exist in different sign languages. These signs select a noun and may occur in either prenominal or postnominal position when functioning as determiners, but they can also appear alone and function as pronouns. One of these determiners is the one-based indefinite, where a sign derived from the numeral ONE is used with the meaning 'somebody'. In ASL, LIS, and LSC the indefinite determiner SOMETHING/SOMEONE has the same articulation as the numeral ONE but it includes a tremoring movement. By contrast, in HKSL, the indefinite determiner, which again has the same articulation as the numeral ONE, does not involve a tremoring movement (Tang & Sze 2002).

7_1.3.1_1_LSC_ONE FEMALE MOMENT PREGNANCY BEGINNING ALWAYS THROW-UP

a. ONE FEMALE MOMENT PREGNANCY BEGINNING ALWAYS THROW-UP (LSC)
'At the beginning of the pregnancy, women always throw up.'

b. YESTERDAY SOMEONE FEMALE-KID COME (HKSL, Tang & Sze 2002)
'A girl came yesterday.'

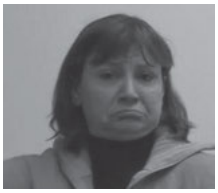
Other indefinite pronouns are formally identical to interrogative pronouns [Lexicon – Chapter 3.11.2] and they concatenate with other personal pronouns (WHO^IX$_{3PLU}$ 'someone') or other indefinite determiners (WHO^SOME 'someone').

7_1.3.1_2_LSC_WHO^IX3PLU MONEY 3STEAL3U

WHO^IX$_{3PLU}$ MONEY $_{3}$STEAL$_{3U}$ (LSC)
'Someone stole the money.'

1.3.2 Non-manual marking

The non-manual marking for indefiniteness differs across sign languages. In ASL indefiniteness is marked with wrinkled nose, furrowed brows, and a slight rapid head shake (Bahan 1996; Bahan et al. 1995). As for HKSL, indefiniteness is marked with eye gaze directed towards the addressee (Tang & Sze 2002). As for LSC, indefiniteness is marked by sucking the cheeks in and pulling the mouth ends down, sometimes combined with a shrug (Barberà 2015).



(LSC, Barberà 2015)

Indefiniteness non-manual marking in LSC

1.4 Specificity

Indefinite noun phrases can further be subdivided into specific and non-specific ones. Specific indefinites indicate that the signer, but not the addressee, knows the discourse referent. Non-specific indefinites are used when neither the signer nor the addressee know the discourse referent. While definiteness implies that the discourse referent is accessible to both interlocutors, specificity implies accessibility to the signer alone. In English, for instance, the indefinite determiner *a* is used both for specific and non-specific noun phrases, as shown below. Yet specificity in English has observable effects on co-reference, and the co-referential pronoun (either *it* or *one*) disambiguates the two possible readings. Under the specific reading in example (a), the indefinite noun phrase refers to an identifiable book. Under the non-specific reading in example (b), Celia is looking for an element of the kind 'syntax book', but there is not any concrete book that the signer has in mind when uttering the sentence.

Celia wants to read a book about syntax ...
a. ... but she cannot find it.
b. ... but she cannot find one.

1.4.1 Manual marking

Researchers have documented overt marking of specificity in some sign languages (ASL, HKSL, LIS, LSC). Manual signs, such as pointing and determiners, directed towards the lower frontal plane (with a tensed realization and directed towards a concrete spatial location) trigger a specific interpretation. That is, the signer is talking about a particular discourse referent that he/she has in mind.

GROUP$_{L.A}$ FRIEND SOME$_{L.A}$ INSIDE IX$_{3C}$ HIDE DURING YEAR-TWO
'Some of the friends were hidden there for two years.' (LSC, Barberà 2015: 263)

The grammatical categories which may be directed towards the lower frontal plane in LSC to yield a specific interpretation are the following: pointing, non-anchored common nouns [Lexicon – Chapter 3.1], plain verbs [Lexicon – Chapter 3.2.1], and inflected

agreement verbs [Lexicon – Chapter 3.2.2]. Hence, the grammar writer may check what kind of expressions can be spatially modified for specificity.

In contrast, when the signs are directed towards the upper frontal plane (with a non-tensed and vague realization), they refer to non-specific discourse referents. That is, in these contexts the signer is talking about a discourse referent that neither the signer nor the addressee knows.

$\text{IX}_{3.\text{PLU.U.B}}$ SOME $_1$DENOUNCE$_{3\text{U.B}}$ $\text{IX}_{3\text{C}}$ THERE-IS (LSC, Barberà 2015: 264)
'Someone denounced they were there.'

The upper location in non-specificity contexts (topographic uses of space are not included here) is a marked area, where typically only determiners and inflected agreement verbs may be directed. When this happens, a non-specific reading arises. Note that the facial expression corresponds to that for indefiniteness, illustrated above in the section on non-manual marking [Phonology – Chapter 1.5] of indefiniteness.

a. $_{3\text{L}}$-ADVISE-$_1$ (LSC, Quer 2010)
'Someone (that I know) advised me.'

b. $_{3\text{U}}$-ADVISE-$_1$
'Someone (that I don't know) advised me.'

Moreover, some sign languages (LSC and LIS) have a lexical sign that marks exclusiveness and thus non-specificity. One example is the sign HEARING in LIS, which is used in contexts where the identity of the discourse referent is neither known nor is the discourse referent close to the signer (Geraci 2012). As the example below shows, the use of this sign does not have a pejorative meaning as it can be used in a context where the corresponding discourse referent helps the signer.

HEARING $\text{IX}_{3\text{U}}$ COME HELP (LIS, Geraci 2012)
'Someone (not known) came and helped.'

1.4.2 Non-manual marking

Particular non-manual markings have been reported for the specific versus non-specific distinction in sign languages. As for ASL, specificity is marked with direct eye gaze to the spatial location, while non-specificity is marked with darting eye gaze

generally towards an upward direction (Bahan 1996). In the case of HKSL, specificity is marked with eye gaze towards the addressee and non-specificity is marked with round protruded lips, lowered eyebrows, and a visible bilabial stop (Tang & Sze 2002). In the latter interpretation, eye gaze follows the path of the hand, suggesting that there is no localized referent in signing space. Finally, in LSC, specificity is marked with eyes wide open, sucking the cheeks, pulling the mouth ends down, and sometimes combined with a shrug. Non-specificity is marked with a darting eye gaze towards the upper frontal plane (Barberà 2015).

Darting eyegaze in LSC (LSC)

1.5 Impersonal reference

Impersonal reference consists of reference to human entities whose identity is not clear or whose degree of reference in the discourse is very low. Natural languages have many strategies for impersonal reference marking, such as impersonal pronouns, indefinite pronouns, and passive constructions. In addition, deictic and personal pronouns can receive an impersonal reading via reference transfer in specific contexts. Possible strategies to mark impersonal reference in a particular sign language are the following: singular indefinite pronouns (one-based pronouns, indefinite particles, and generic ontological-category nouns such as PERSON), plural pronouns, and zero marking.

7_1.5_1_LSC_ONEU MOMENT HOSPITAL GO ALWAYS THINK RESULT WORST

ONE$_{U}$ MOMENT HOSPITAL GO ALWAYS THINK RESULT WORST
'When one is admitted to the hospital, always fears the worst results.'
(LSC, Barberà & Quer 2013: 246)

Inflection [Morphology – Chapter 3] may be also used as a strategy to denote impersonality. One possibility is to have neuter verb inflection for agreement verbs. In LSC it is also possible to use a movement path going from a location established amidst the loci for first and third person to a location established amidst the loci for second and third person location.

7_1.5_2_LSC_IF 1/3A-INSULT-2/3 BETTER IGNORE. REALLY ILL-MANNERED IX3A

IF $_{1/3a}$-INSULT-$_{2/3}$ BETTER IGNORE. REALLY ILL-MANNERED IX$_{3a}$
'If they insult you, you better ignore them. They are the ones who are ill-mannered, indeed.' (LSC, Barberà & Quer 2013: 253)

As mentioned above, deictic and personal pronouns can also receive an impersonal interpretation. In LSE, conditional contexts license the use of second person pronouns with an impersonal value (Costello 2015). As shown in the example below, the second person pronoun does not have deictic reference but rather a low referential value with a quasi-universal meaning. This can be proven by the fact that the sentence below may be uttered to a man. In SSL a particular form of an index sign directed to the chest (considered to be a first person pronoun) may have an impersonal and exclusive interpretation (Nilsson 2004).

IX_2 PREGNANT SMOKE QUIT MUST (LSE, Costello 2015)
'When you are pregnant, you have to quit smoking.'

Elicitation materials

The grammar writer can use various elicitation materials that have recently been developed for fieldworks on semantic and pragmatic topics. Here, we give a list of elicitation materials available online:

- Sections 2.1.1.10 and 2.1.1.11 of the *Lingua Descriptive Studies Questionnaire* (http://www.eva.mpg.de/lingua/tools-at-lingboard/questionnaire/linguaQ.php#morphology)
- Elicitation materials of references to people and places: http://fieldmanuals.mpi.nl/volumes/2004/initial-references-to-persons-and-places/
- Elicitation materials of typological tools for field linguistics:http://www.eva.mpg.de/lingua/tools-at-lingboard/stimulus_kits.php
- Elicitation materials of Totem Fields Storyboards:http://totemfieldstoryboards.org/

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Chapter 2 Reference tracking

2.0 Definitions and challenges

Reference tracking has to do with specifying the referents' identity, in other words, with signaling which referent we are talking about. Consider the two examples below: in (a) the pronoun *himself* can only refer to *John*, so it is clear that the subject and the object refer to the same person; in (b), on the contrary, the pronoun *him* cannot be used to refer to John, but only to refer to any other person instead, so it is clear that the subject and the object refer to different persons.

a. John saw himself.
b. John saw him.

Spoken languages have various means of reference tracking: different types of pronouns, agreement morphology, and switch-reference markers. Similarly, sign languages make use of pronouns [Lexicon – Chapter 3.7] / pronouns (including zero forms), but also verbal agreement [Morphology – Chapter 3.1] / verbal agreement and classifier [Morphology – Chapter 5] / classifier handshapes for reference tracking. Some modality-specific means, such as buoys [Pragmatics – Chapter 2.2.3] / buoys and non-manual markers realized simultaneously by the non-dominant hand, the upper part of the body and the face, can be used for reference tracking as well.

Also note that reference tracking and especially the choice of the anaphoric expression used usually depend on structural and pragmatic factors. One prominent aspect is the accessibility (or salience) of the antecedent: while highly accessible discourse referents can be picked up by morphologically reduced forms (such as zero forms, weak pronouns or clitics), less reduced (and more marked) forms such as demonstrative pronouns or definite NPs are used to pick up less accessible discourse referents (Ariel 2001). Hence, the grammar writer should always test various contextual settings and be aware of the fact that the accessibility of an antecedent may have an influence on the distribution of pronominal expressions and the judgments of native signers. In addition, researchers have argued that many sign languages belong to the group of discourse configurational languages that systematically permit the mission of pronominal expressions referring back to highly accessible discourse referents. As a consequence the grammar writer may find examples of reference tracking without anaphoric expressions.

2.1 Pronouns

The properties of pronouns in the languages of the world have been analyzed in the field of anaphora studies and Binding Theory. This field is extremely broad in

typological scope and theoretical analysis (see Huang 2000; Büring 2005 a.o.). In the following we very briefly summarize the most basic aspects of the study of pronouns to provide necessary background information for the grammar writer.

Before we discuss the various types of pronouns [Lexicon – Chapter 3.7], we have to introduce the notion of co-reference. Co-reference means that two noun phrases have the same referent. In glossing, co-reference is usually marked with the help of indexes: for instance, in the English example discussed in the previous section and repeated below, the noun phrase *John* and the reflexive pronoun *himself* are assigned the same index *i*. The noun phrase with which the pronoun is co-referent is called 'antecedent'. By contrast, the pronoun *he* receives a different index (i.e. *j*) since it must not be co-referential with *John*.

a. John_i saw himself_i.
b. John_i saw him_j.

Pronominal expressions are the main means of expressing co-reference in sign languages. Referents are localized in space; that is, they are associated with certain areas (so-called referential loci) in the signing space [Pragmatics – Chapter 8] / signing space. Later these areas can be pointed to (or referred to through verbal agreement [Morphology – Chapter 3]). Pointing to a specific area activates the referent associated with this area. For instance, in the following example the referent CAT is associated with the locus *a*. Several sentences later the signer uses the sign IX-a directed to the same locus *a* to refer back to the cat.

IX-a CAT THINK. [...] IX-a PIPE CLIMB.IN (NGT)
'The cat thinks. ... He climbs into the pipe.'

Most languages have distinct pronominal expressions to express co-reference of discourse referents within one clause. These pronouns are called 'reflexive' pronouns [Morphology – Chapter 3.7.4], as opposed to non-reflexive pronouns that cannot express co-reference in such a local context. A different terminology can also be used to label these different types of pronouns, for instance, 'anaphor' (local) versus 'pronoun' (non-local), respectively (Chomsky 1981). However, following Büring (2005), we use the terms reflexive and non-reflexive pronoun since these terms are the most transparent ones.

The examples (a) and (b) above illustrate a reflexive pronoun *himself* and a non-reflexive pronoun *him* in English. Unlike the reflexive pronoun, the non-reflexive pronoun such as *him* can be co-referent with some other NP in the previous discourse context, but it cannot be co-referent with the subject of the same sentence. In addition, some languages also have reflexive and non-reflexive possessive pronouns [Morphology – Chapter 3.7.3]. Consider the following example, which shows that the Russian reflexive possessive pronouns *svoj* has to be co-referent with *Vanja*, while the non-reflexive possessive pronoun *ego* doesn't have to.

a. Vanja$_{i}$ poter'al svoj$_{i/*j}$ rukzak. (Russian)
Vanja lost POSS.REFL backpack
'Vanja has lost his (own) backpack.'
b. Vanja$_{i}$ poter'al ego$_{j/i}$ rukzak.
Vanja lost POSS backpack
'Vanja has lost his backpack.'

Some sign languages make a similar distinction between two different types of pronouns. Non-reflexive pronouns are usually pointing signs (see Cormier 2012 for details), and they probably exist in all sign languages. ASL, BSL, NGT, and RSL at least also have reflexive pronouns that are distinct in form from the non-reflexive pronouns. Consider the example below: The reflexive pronoun SELF in RSL must be co-referent with the NP BOY.

BOY$_{i}$ SEE SELF$_{i}$ (RSL)
'The boy saw himself.'

Note that in some spoken and sign languages reflexive pronouns can also be used as intensifiers (or emphatically). For instance, in (a) the English pronoun *myself* is not really used to refer back to the NP *I*, but to express the idea of performing the action independently. Similarly, the NGT pronoun ZELF in (b) is used in the same function.

a. I'll do it myself.
b. IX-1 ZELF DO (NGT)
'I'll do it myself.'

Another important distinction is the one between personal and possessive pronouns. Possessive pronouns that are formally different from regular pronouns exist in many sign languages (Cormier 2012). For instance, in the following example (a) from RSL, the possessive pronoun POSS has the B-handshape. RSL also has a possessive reflexive pronoun glossed as SVOJ. Consider example (b), where this pronoun has to be co-referent with the NP IX-1.

a. IX-1$_{i}$ SEE POSS-a$_{*i/j}$ BROTHER (RSL)
'I saw his brother.'
b. IX-1$_{i}$ LOVE SVOJ$_{i/*j}$ BROTHER
'I love my brother.'

Some spoken languages do not make a distinction between reflexive and non-reflexive pronouns. In these languages, a single pronoun can be used to express co-reference in any context. For instance, in the example below the Haitian Creole pronoun *li* 'him' can be co-referent with the subject NP *Emile* or with another discourse referent available in the previous discourse. Haitian Creole thus does not have a specific reflexive pronoun to indicate co-reference with the subject of the same sentence. It is not clear whether some sign languages also lack reflexive pronouns altogether.

Emile$_i$ dwe ede li$_{i/j}$ (Haitian Creole, Huang 2000: 21)
Emile should help him
'Emile should help him/himself.'

So far, we have shown that reflexive pronouns are typically co-referent with the subject of the same sentence. The picture is, however, more complex. Although reflexive pronouns are typically 'bound' by the subject [Syntax – Chapter 2.2] / subject, they can also be co-referent with other NPs in a sentence. But even in these cases, the choice of the NP is not arbitrary. Languages vary at least in two directions: (i) on the grammatical function of the antecedent, and (ii) on its the structural distance.

First, in many languages, it is the subject that has to be co-referent with the reflexive pronoun. In (a) below the Russian reflexive pronoun *sebja* can only be co-referent with the subject *Vanja* but not with the object *Petja*. However, in English reflexive pronouns can be co-referent with non-subjects as well. In some sign languages, reflexive pronouns can also only be co-referent with subjects, for instance, in (b) the reflexive possessive SVOJ can only be co-referent with the subject BOY.

a. Vanja$_i$ pokazal Pete$_j$ sebja$_{i/j*}$ (Russian)
Vanja showed Petja self
'Vanja showed Petja himself.'
b. [BOY IX-a]$_i$ [GIRL IX-b]$_j$ SVOJ$_{i/*j}$ LIFE TELL (RSL)
'The boy tells the girl about his own (*her own) life.'

Secondly, languages differ with respect to the distance between the antecedent and the reflexive pronoun, that is, languages can have different local domains for co-reference. For instance, in English the antecedent cannot be in the matrix clause if the reflexive pronoun is in the subordinate clause in (a). However, the Russian reflexive pronoun *sebja* can have an antecedent in the matrix clause in (b). Note that reflexive pronouns usually are co-referent with the most local antecedents, that is, with co-arguments of the same predicate [Syntax – Chapter 2.1].

a. *John$_i$ asked me to criticize himself$_i$.
b. Vanja$_i$ poprosil menja$_j$ pokritikovat sebja$_{i/j}$ (Russian)
Vanja asked me to criticize self
'Vanja asked me to criticize him.'

As opposed to reflexive pronouns, non-reflexive pronouns are always co-referent with an antecedent outside its local domain. For instance, we have seen that English *him* cannot be co-referent with a co-argument of the same predicate in the same sentence. Note that the local domain for non-reflexive pronouns does not have to coincide with the local domain for reflexive pronouns. This is shown by the fact that sometimes reflexive and non-reflexive pronouns are not in complementary distribution:

John looked around him$_i$/himself$_i$.

Apart from the notion of co-reference, another notion is useful for the pragmatic analysis of pronouns, namely the notion of binding. Consider the following example: the NP *every boy* is a quantifier / quantifier [Semantics – Chapter 10], and therefore, it is not possible to say that it has a specific referent. However, in one of the possible readings (i.e. with co-reference of *he* and *every boy*), the reference of the pronoun *he* is dependent on the antecedent *every boy*. Therefore, we can speak of variable binding (or bound pronoun): the pronoun *he* introduces a variable which is bound by the quantifier *every boy*. This is also the case in sign languages, where pronouns can be semantically bound as well, as (b) shows for ASL.

a. [Every boy]$_i$ thinks that he$_{i/j}$ is sick.
b. [ALL BOY-a]$_i$ WANT [ALL GIRL-b]$_j$ THINK IX-a$_i$ LIKE IX-b$_j$ (ASL, Kuhn 2013)
'Every boy wants every girl to think that he likes her.'

Likewise, a reflexive pronoun can be semantically bound by a quantifier. This is illustrated by the English example in (a) below. The same is true for sign languages, as (b) shows.

a. [Every boy]$_i$ saw himself$_i$.
b. [ALL BOY]$_i$ PAINT SVOJ$_i$ MOTHER (RSL)
'Every boy painted his own mother.'

Some researchers have argued that even if the antecedent is a referential expression (i.e. *the boy*, *John*), a reflexive pronoun is semantically bound and not just co-referential with it. This can be demonstrated by a variety of tests, such as VP-ellipsis and the *only*-test. Consider the following examples, which show that in English reflexive and non-reflexive pronouns give rise to different interpretations. These differences can be explained if reflexive pronouns are analyzed as variables bound by the antecedent, and non-reflexive pronouns as expressions co-referent with the antecedent (for details see Bach & Partee 1980; Büring 2005).

a. John$_i$ loves his$_i$ wife, and so does Bill.
[Bill loves his own or John's wife]
a'. John$_i$ loves himself$_i$, and so does Bill.
[Bill loves himself, not John]
b. Only John$_i$ loves his$_i$ wife.
[Nobody else loves his own wife, or nobody else loves John's wife]
b'. Only John$_i$ loves himself$_i$.
[Nobody else loves him/herself, not nobody else loves John]

In sign languages, too, it is possible to analyze reflexive pronouns as bound variables, in contrast to non-reflexive pronouns expressing co-reference. Consider the following examples from RSL: The reflexive possessive SVOJ can be bound by a quantifier, while the non-reflexive possessive pronoun POSS cannot be bound by a quantifier in this position.

a. [ALL BOY]$_i$ PAINT SVOJ$_i$ MOTHER (RSL)
'Every boy painted his own mother.'
b. [ALL BOY]$_i$ PAINT POSS-A$_{*i/j}$ MOTHER
'Every boy painted his (someone else's) mother.'

Some spoken languages display yet another type of pronouns, namely logophoric pronouns or logophors. These pronouns can only be used in subordinate clauses and refer back to the subject of the matrix predicate of speaking or mental activities. For instance, in Donno Sɔ the logophoric pronoun *inyemɛñ* has to be co-referent with the subject *Oumar* of the matrix verb *gi* 'say'.

Oumar$_i$	Anta$_j$	inyemɛñ$_{i/*j}$	waa	be	gi	(Donno Sɔ, Huang 2000: 174)
Oumar	Anta	LOG.ACC	seen	AUX	said	

'Oumar said that Anta had seen him.'

Although no logophoric pronouns have yet been found in sign languages, a parallel can be drawn between the behavior of logophoric pronouns and the first person non-reflexive pronouns under role shift [Pragmatics – Chapter 6] / role shift. Role shift is often used to express the utterance or attitude/mental state of a person, and the first person pronoun within role shift can only refer back to this person (but not to the actual signer).

In this section, we suggest that the grammar writer do the following:

- List all of the pronouns, including reflexive, possessive, and logophoric pronouns if available in the sign language under investigation.
- What kind of pronouns can be distinguished?
- Examine the conditions of co-reference of the pronouns: whether they can only be co-referent with subjects or co-arguments of the same predicate (these are reflexive pronouns), or whether they have to have an antecedent outside the sentence or another kind of local domain (these are non-reflexive pronouns).
- Consider the local domain within which reflexive pronouns must be bound by their antecedent. Are there any restrictions on possible antecedents of reflexive pronouns (i.e. grammatical function or thematic role)? What is the local domain within which the non-reflexive pronouns must not have an antecedent?
- Discuss whether reflexive and non-reflexive pronouns can be analyzed as bound variables.
- Discuss if there any logophoric pronouns.
- Discuss whether reflexive pronouns can also be used emphatically and for intensification.

2.2 Other means

Pronouns, both reflexive and non-reflexive, are the most typical devices used for reference tracking. However, sign languages also have other morphosyntactic means of tracking reference, namely spatial agreement, classifier handshapes, and buoys.

2.2.1 Agreement

Most sign languages have spatial verbal agreement [Morphology – Chapter 3]. Thus, verbs can change their movement and/or orientation in order to agree with the loci associated with their arguments [Semantics – Chapter 6] / arguments. Note that the linguistic status of agreement has been questioned, and several theoretical analyses of the phenomenon exist (see Mathur & Rathmann 2012).

Verbal agreement is used for reference tracking, because when arguments are associated with certain locations in the signing space, the verb can unambiguously show co-reference or non-co-reference through spatial agreement. Quite often spatial locations for referents are established in one sentence, and in the following sentence these referents remain covert, while verbal agreement is used for reference tracking (Steinbach & Onea 2016). For instance, in the following example, the discourse referents of BOY and GIRL are associated with locations *a* and *b*. In the following discourse these locations are re-used by agreement verbs to specify the co-reference to the two discourse referents. As a consequence, the use of pronouns is not necessary for reference tracking since the spatial modification of the agreement verb ANSWER provides all information necessary to identify the antecedents.

BOY IX-a GIRL IX-b TALK. a-QUESTION-b. b-ANSWER-a. (RSL)
'A boy is talking to a girl. He asked a question. She answered him.'

Note also, that some researchers have argued for a separate category of spatial verbs [Lexicon – Chapter 3.2.3] / spatial verbs, which do not agree with their arguments but with topographic locations. However, this is still a case of reference tracking, as the identity (= co-reference) of topographic locations is again established through spatial agreement.

2.2.2 Classifier handshapes

Classifying handshapes (also known as classifiers [Morphology – Chapter 5] / classifiers) are frequently used in most sign languages described to date. There are many different types of classifiers and many different theoretical analyses (Zwitserlood 2012). The three major groups of predicate classifiers are (whole) entity classifiers [Morphology – Chapter 5.1.1], body part classifiers [Morphology – Chapter 5.1.2], and handle classifiers [Morphology – Chapter 5.1.3]. The former two are used to represent (body parts of) referents that move or are located somewhere, while the latter represent objects that are being moved or handled.

As in the case of agreement verbs, verbs of motion or location incorporating classifiers can be used for reference tracking, as classifiers help identify the referent, which is one of the arguments of the verb. Quite often overt pronominal expressions can be omitted if the classifier is used for reference tracking. Consider the next example, where in the last sentence there is no overt subject, but the referent is made clear through the use of the classifier for small animals.

BIRD IX-a WALK-CL:'small animal'. HOW BE? WALK-CL:'small animal' (RSL)
'The bird (Tweety) walks. She thinks: What should I do? She walks.'

Note finally that unlike predicate classifiers, Size-and-Shape Specifiers [Morphology – Chapter 5.2] are not used for reference tracking.

2.2.3 Buoys

Sometimes the handshape of a sign is held on the non-dominant hand, while the other hand continues to articulate several separate signs. This phenomenon is called weak hand holds (see Vermeerbergen, Leeson & Crasborn 2007). Sometimes the holds occur in order to express discourse relations, which often involve reference tracking. Following Liddell (2003), such meaningful discourse-level holds are often called buoys.

One common type of buoy is the list buoy, where the signer holds a handshape with outstretched fingers in order to track a certain number of referents. For instance, the signer may hold the handshape with four outstretched fingers, while telling about his four sons. The four fingers ensure the presence of the four referents in discourse; the signer may also point towards the fingers in order to express co-reference with one of the sons.

h1: IX-1 SON IX-a TEN YEAR IX-b SIX YEAR IX-c IX-d THREE YEAR (RSL)
h2: FOUR----------
'I have four sons, a ten year-old, a six-year old, and two three year-olds.'

List buoys can also be built consecutively: in this case, the hand is held, but the fingers are outstretched when new referents are introduced. After the list handshape is fully built, it can be again used for reference tracking.

Another type of buoy that can also be used for reference tracking is what Liddell (2003) calls the pointer buoy. Pointer boys are pronominal pointing signs held by the non-dominant hand. They typically refer to prominent discourse referents. For, instance, in the example below the signer points at the location associated with the referent of CAT, introduced before. The pointer boy is very similar to pronouns. However, the fact that it is articulated simultaneously with the non-dominant hand while the signer continues signing with the dominant hand makes the referent more prominent.

h1: THINK MONKEY. LOOK. NICE. (RSL)
h2: IX-a----------
'She thinks it (the cat) is a monkey. She looks at it. "It's nice!"'

Liddell (2003) also describes a somewhat similar type of buoy, namely the theme buoy, where an index finger pointing upwards is used to establish or perseverate a prominent referent in the discourse. In the following example adapted from Liddell

(2003: 246–247) the buoy THEME is first associated with the concept of experience, and then this concept is preserved through the hold, and referred back to through pointing to the buoy.

h1: ONE EXPERIENCE THAT <...> IX-a IX-1 MISS; ENJOY (ASL)
h2: THEME THEME-a----------
'One experience that ... I miss those things, I enjoyed them.'

When a referent is prominent, even a full lexical sign can be held with the non-dominant hand. Liddell (2003) calls this type of holds "fragment buoys".

In this section, the grammar writer is advised to do the following:

- Verify whether in the language under investigation verb agreement and predicate classifiers can be used for reference tracking. This can be shown if their use leads to the omission of pronouns.
- Find out whether the language has list, pointer, and fragment buoys, and what their discourse functions are.

Elicitation materials

The grammar writer can use various elicitation materials that have recently been developed for fieldworks on semantic and pragmatic topics. Here, we give a list of elicitation materials available online:

- Sections 2.1.1.10 and 2.1.1.11 of the *Lingua Descriptive Studies Questionnaire* (http://www.eva.mpg.de/lingua/tools-at-lingboard/questionnaire/linguaQ.php#morphology)
- Elicitation materials of references to people and places: http://fieldmanuals.mpi.nl/volumes/2004/initial-references-to-persons-and-places/
- Elicitation materials of typological tools for field linguistics: http://www.eva.mpg.de/lingua/tools-at-lingboard/stimulus_kits.php
- Elicitation materials of Totem Fields Storyboards: http://totemfieldstoryboards.org/

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General sources on reference tracking:

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Chapter 3 Speech acts

3.0 Definitions and challenges

3.0.1 What is a speech act?

People use language not only to convey meaning. They use language mainly to act. Utterances can be used to claim something (a), to insult someone (b), to promise something to someone (c), to ask something (d), or to baptize a person (e), among many other things (for sign languages see Campbell 2001; Baker & van den Bogaerde 2012).

a. Obama won the election.
b. You are a bloody motherfucking asshole.
c. Trust me. I will get my car.
d. What's your name?
e. I hereby name this ship Mary Ann.

What these acts have in common is that they can be performed linguistically, that is, by uttering a sentence. Some of these acts can also be performed without language (i.e. insulting), for others we have to utter a sentence (i.e. baptizing in example (e)). Acts that are performed linguistically are called 'speech acts'. Speech acts can either be explicit performative such as example (e) or implicit performative such as example (c). Explicit performatives are typically introduced by a performative verb in the first person singular form (i.e. *name* in (e)). However, a speaker or signer does not always explicitly say or sign what kind of speech act he/she is performing.

Another important distinction is the one between direct and indirect speech acts. The following example illustrates a speech act that is performed in an indirect way (for sign languages see Roush 1999). At first sight, the speaker is asking, whether the addressee is able to pass him/her the salt, that is, the speaker is uttering a polar interrogative [Syntax – Chapter 1.2.1] (or yes/no interrogative). However, in most contexts, the speaker may not be interested in whether the signer has the ability to pass him/her the salt. It's more likely that he/she is asking the addressee to pass him/her the salt, that is, the indirect speech act is a request to pass the salt.

Can you pass me the salt?

In order to understand an indirect speech act, the addressee has to understand the intention of the speaker or signer. Indirect speech acts are a specific kind of conversational implicature [Pragmatics – Chapter 7.1] involving pragmatic enrichment. One reason for using indirect speech acts is politeness (which does not mean that indirect speech acts are always polite). Indirect speech acts are typical face-saving strategies. The grammar writer should therefore also consult the section on politeness [Pragmatics – Chapter 11] and check to what extent indirect speech acts are used in the sign language he/she investigates. The grammar writer may start with a description of highly conventionalized forms that are used with high frequency.

3.0.2 Speech acts, illocutions, and felicity conditions

According to Austin (1962), a speech act consist of three kinds of acts that are performed by the speaker or signer (see also Searle 1971 and Levinson 1983: 236):

Locutionary act:	The utterance of a sentence with determinate sense and reference.
Illocutionary act:	The making of a statement, offer, promise, etc. in uttering a sentence, by virtue of the conventional *force* associated with it.
Perlocutionary act:	The bringing about of effects on the audience by means of uttering the sentence, such effects being special to the circumstances of utterance.

In the following, we ignore the perlocutionary act, since the relation between the locutionary act and the illocutionary act is at the heart of the linguistic description of speech acts. The locutionary act consists of the utterance of grammatical well-formed sentences (as described in the parts on phonology, morphology, and syntax) with a corresponding meaning (as described in the parts on semantics and pragmatics). Speech acts generally add (or sometimes remove) propositions to a common ground (namely the information shared by the speaker or signer and by the addressee). Consider the following two examples. In both examples, the speaker utters a sentence that consists of the same three words: *Peter*, *is* and *ill*.

a. Peter is ill.
b. Is Peter ill?

With both sentences the speaker refers to a person called 'Peter' and says that this person has the property of being ill. However, although both sentences contain the very same words, the speaker performs quite different illocutionary acts. Typically, declaratives [Syntax – Chapter 1.1] are used to make statements. The speaker wants to inform the addressee that Peter is ill, i.e., he/she adds the proposition *that Peter is ill* to the common ground. The declarative can also be used to give a reason why the speaker or signer cannot come to the party or why Peter stays away from class. By contrast, interrogatives [Syntax – Chapter 1.2] are used to elicit information from the addressee (i.e. whether the proposition *that Peter is ill* is part of the common ground) or to report a doubt or a similar attitude towards a certain propositional content. Hence, sentences types [Syntax – Chapter 1] such as declarative and interrogative are formal devises that indicate illocutionary acts. The interrogative in (b) has, for example, the illocutionary force [Semantics – Chapter 13] indicating that the utterance is a question. The grammar writer should investigate the formal devices that indicate illocutionary force in the sign language under investigation. Besides sentence types, languages use other devices such as intonation, particles, specific adverbials, modals, or performative verbs.

Speech acts are complex linguistic categories. Speakers or signers utter a sentence (or a sequence of sentences) with appropriate grammatical and semantic structure in order to accomplish a specific goal of linguistic action in context. Speech acts are subject to general social conditions and to more specific linguistic felicity conditions. The former are, for example, relevant for speech acts like firing, baptizing, or commanding since not everyone is allowed or able to perform such speech acts. The latter are important to describe the conditions that apply to a specific speech act. Conditions specific to the speech act of promising are, for example, that the speaker or signer (i) utters that he/she would perform a future action, (ii) intends to perform this action, (iii) believes that he/she can perform this action, (iv) thinks that the addressee wants him/her to perform this action and (v) intends to place him/herself under the obligation to perform the action. Consequently, the locutionary act of a felicitous promise must include a sentence that refers to a future event. In addition, the speaker or signer must be able to be responsible for the event referred to and the event must be in the interest of the addressee.

3.0.3 Analytical challenges

Although languages have developed illocutionary force indicating devices, the relation between the form of a sentence and its function in a specific context of utterance is quite flexible. Take for instance declaratives, which are typically used to make

assertions. However, declaratives can also be used for other kinds of speech acts such as questions or requests – especially explicit performatives such as 'I ask you ...'. Similarly, assertions cannot only be made with declaratives but also with interrogatives as the famous example of rhetorical question shows ('Who does not like chocolate?'). Formally, rhetorical questions are interrogatives. Functionally, a speaker or signer uses them to make a statement, i.e., to perform an assertive speech act. Nevertheless, the unmarked way to make an assertion is to use a declarative sentence. Assertional interrogatives are pragmatically marked since they can only be used in specific contexts. Moreover, rhetorical questions always trigger an additional pragmatic effect, which is typically not available for simple declaratives.

Hence, the division of labor between syntax (sentence type [Syntax – Chapter 1]), semantics (illocutionary force [Syntax – Chapter 13]), and pragmatics (speech act) is to some extent regulated but allows at the same time for some flexibility to achieve specific pragmatic effects in context (Truckenbrodt 2004, 2011). Especially (conventionalized) indirect speech acts may cause problems to the grammar writer since they involve a reinterpretation of the illocutionary force of the utterance. The grammar writer should be aware of this challenge and try to distinguish unmarked from marked realizations of speech acts as well as direct from indirect speech acts. Moreover, the grammar writer should carefully investigate the formal devises used in the respective sign language to indicate illocutionary force. We already mentioned the importance of sentence types. The grammar writer should also check additional manual and especially non-manual devices in marked and unmarked realizations of speech acts. Some of these devices might be language specific, others even modality-specific. And finally, he/she should give a lists of verbs that can be used in explicit performative speech acts.

3.1 Assertions

The main function of assertional speech acts is the extension of the common ground shared by the speaker or signer and the addressee. With an assertion, the speaker or signer adds a new proposition to a common ground and wants the addressee to share this new information – a proposition the addressee may not have been aware of before. In addition, the speaker or signer commits him/herself to the justified belief that the proposition expressed by his/her utterance is true. This is summarized in the following definition of Bach & Harnish (1979: 42) ('S' stands for speaker (and signer), 'A' for addressee).

In uttering e, S asserts that q if S expresses:
(i) the belief that q, and
(ii) the intention that A believes that q.

Hence, the speaker or signer is expected to have good evidence for the truth of the proposition added to the common ground and he/she should be able to provide this evidence to the addressee if necessary. The unmarked way to make assertions is by

using declaratives [Syntax – Chapter 1.1]. Compared to other sentence types, declaratives are morphosyntactically and prosodically unmarked across languages and the corresponding declarative force [Semantics – Chapter 13.1] is particularly adapted to exchange information. That's exactly what interlocutors do with assertions. In the following example, the speaker or signer S asserts the proposition that the sign language class starts at 5 p.m. and wants the addressee to add this proposition to the common ground, i.e. that he/she also beliefs that the sign language class starts at 5 p.m.

S to A: The sign language class starts at 5 p.m.

Although declaratives are the unmarked sentence type for assertional speech acts, assertions are not restricted to declaratives. Rhetorical questions such as the following example are a prominent example for interrogatives used to make an assertion. However, interrogatives are not the unmarked sentence type for assertions but for questions [Pragmatics – Chapter 3.2]. Therefore, rhetorical questions typically trigger additional pragmatic effects, which are not available for declaratives.

a. Was Mussolini going to be moderate? (Levinson 1983: 110)
   (Intended meaning: 'Mussolini was definitely not going to be moderate.')
b. Mussolini was not going to be moderate.

The grammar writer should describe the illocutionary force indicating devices for assertions and check the relation between non-declarative sentence type and assertions.

3.2 Questions

Questions are typically made with interrogatives [Syntax – Chapter 1.2]. As opposed to declaratives, interrogatives are morphosyntactically and prosodically marked sentence types, and the corresponding interrogative force [Semantics – Chapter 13.2] is particularly adapted to request information. By asking the following question, the speaker or signer S does not want the addressee to add the proposition that the sign language class starts at 5 p.m. to the common ground but he/she want the addressee to add to the common ground the information when the sign language class starts.

S to A: When does the sign language class start?

Typically, the speaker or addressee who is asking a question does not know yet when the sign language class starts. Questions are in a way the counterpart to assertions. In assertions it's the speaker or signer who adds new information to the common ground. In questions, it is the addressee who is asked to add new information. However, questions do not always presuppose that the speaker or signer does not know the proposition under discussion. Exam questions, questions in educational context (such as teaching or presentations), or rhetorical questions are examples that illustrate that the speaker or signer may very well know the answer to the question he/she is asking.

Questions are directive speech acts, that is, the speaker or signer wants the addressee to do something. By asking a question, the speaker or signer wants the addressee to give an answer, that is, to perform a linguistic action, another speech act. The answer depends on the kind of question: polar question, alternative question, or content question. In many languages, different sentence types are used as illocutionary force indicating devices. Polar interrogatives indicate, for example, polar questions [Syntax – Chapter 1.2.1] and content interrogatives [Syntax – Chapter 1.2.3.3] indicate content questions. Note that in sign languages, content questions can also be asked without question signs [Syntax – Chapter 1.2.3] (Petronio & Lillo-Martin 1997; Sandler & Lillo-Martin 2006). In the following ASL example, only the non-manual marking marks the sentence as a content interrogative [Syntax – Chapter 1.2.3]. The meaning of the elided question sign must be deduced from context.

wh
TIME (ASL)

The grammar writer should again be aware of the fact that the speech act of a question is not always performed with interrogatives and vice versa. On the one hand, interrogatives can be used to make an assertion (rhetorical questions) or commands (in indirect speech acts). On the other hand, in explicit performatives, a declarative can be used to ask a question (i.e. 'I hereby ask you when the sign language class starts.') Another interesting kind of questions are echo questions (a) and assertional questions (b). Echo questions are, for instance, used when speakers or signers want to express their surprise or incredulity or when they did not really understand what someone said. In many languages, echo and assertional questions have distinct formal properties and specific pragmatic functions that distinguish these marked interrogatives from their unmarked counterparts.

a. This Blueprint has been published when?
b. The Blueprint has been published?

The grammar writer should describe the illocutionary force indicating devices for questions and check the relation between non-interrogative sentence types and questions. In addition, he/she should investigate whether different kinds of questions such as echo questions, assertional questions, exam questions, or rhetorical questions are realized by specific sentence types or are marked by specific illocutionary force indicating devises (for questions in sign languages see Cole 1996).

3.3 Commands and requests

Commands and requests are, like questions [Pragmatics – Chapter 3.2], directive speech acts. In both kinds of speech act the addressee is asked to perform an action. As opposed to questions, the action the addressee is asked to perform is not necessarily

another speech act but can also be a non-linguistic action. Hence, the addressee is not asked to add a proposition to the common ground but to perform the action described by the proposition. Typically, the addressee is the agent [Semantics – Chapter 6.1] of this proposition, as is illustrated in example (a) below. Just like for assertions and questions, languages have developed a specific sentence type for commands, namely imperatives [Syntax – Chapter 1.3]. Again, there is no one-to-one relation between sentence type, illocutionary force and speech act. On the one hand, imperatives can also used for other functions such as invitations, suggestions, permissions or instructions. On the other hand, commands and requests can be expressed with other sentence types such as declaratives or questions as is illustrated in (b).

a. You are going to wash your hands!
b. Can you wash your hands, please?

The grammar writer should describe the illocutionary force indicating devices for imperatives and requests (including especially non-manual markers, deictic [Pragmatic – Chapter 1.1] expressions or modality markers [Lexicon – Chapter 3.3]) and check the relation between non-imperative sentence types and the speech acts of command and requests. In addition, he/she should investigate whether different kinds of commands and requests are realized by specific sentence types or marked by specific illocutionary force indicating devises.

3.4 Exclamatives

As opposed to the other speech acts introduced in the previous sections, exclamatives do not necessarily address an interlocutor. Hence, unlike assertions, questions and commands/requests, exclamatives are 'expressive' speech acts that are not used to ask the addressee to add a proposition to the common ground or to perform the action described by the proposition. Instead, the main purpose of exclamatives is the expression of surprise. The speaker finds either the whole proposition or a part of it unexpected, that is, the speaker or signer expresses a particular attitude to the proposition. In degree exclamatives such as the example below, the speaker or signer expresses, for instance, surprise about the degree of tallness.

How tall Mary is!

We already mentioned that exclamatives do not add a (new) proposition to the common ground. The proposition conveyed is presupposed [Pragmatics – Chapter 7.3] in expressive speech acts (see the section on exclamative [Syntax – 1.4] for a more detailed discussion of the properties of exclamatives).

Languages provide various means to realize exclamative speech acts. Some languages have developed extra exclamative [Syntax – 1.4] sentence types that typically combine features of the three major sentence types – declaratives, interrogatives,

and imperatives. Therefore, exclamatives are sometimes classified as minor sentence types. Moreover, languages have developed different kinds of exclamatives, that is, exclamatives show interesting cross-linguistic variation. The grammar writer should therefore describe all kinds of exclamatives and the illocutionary force indicating devices for exclamatives provided by the sign language under investigation (including especially non-manual markers, question words/interrogative pronouns [Lexicon – Chapter 3.7.5], degree (scalar) adjectives [Morphology – Chapter 3.4], and negation [Morphology – Chapter 3.5]).

Elicitation materials

A helpful tool to elicit speech acts is the Discourse Completion Test (DCT) developed in the Cross-cultural Speech Act Realization Project (CCSARP), see Blum-Kulka & House (1989) and Blum-Kulka, House & Kasper (1989); see also the section on register and politeness [Pragmatics – Chapter 11]. For the description of different speech acts in sign languages, the grammar writer may also use corpus data if available.

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Chapter 4 Information structure

4.0 Definitions and challenges

The term information structure refers to the internal organization of the constituents of an utterance with respect to a particular context. An English sentence such as 'My neighbour is an artist' can be uttered at the beginning of a conversation, as a starter sentence where other information is expected to follow, in which case it will have a particular intonation [Phonology – Chapter 2.3] / intonation pattern (more generally prosody [Phonology – Chapter 2] / prosody). Alternatively, it can be uttered to express the proposition that the signer's neighbour is an artist, and not, for example, a decorator, possibly as a response to a previous utterance by the addressee. In this case, the constituent 'an artist' is brought to the foreground, and is presented either as a new piece of information, or simply for reasons of contrast to another constituent in context. Conveying this information requires a different context and uses another prosodic pattern. This is one aspect of information structure and it is called focus [Pragmatics – Chapter 4.1] / focus. Other means of expressing focus such as word order will be discussed below.

In both cases discussed above, the utterance is about 'my neighbour'. In information structural terms, 'my neighbour' is the topic [Pragmatics – Chapter 4.2]/ topic of the sentence. In many languages, topics occur at the beginning of a sentence, that is, they are syntactically marked by fronting or topicalization [Syntax – Chapter 4.3.3].

But they may also have morphologically and prosodic properties that distinguish them from non-topic constituents.

4.0.1 Categorizing information structure units

Terms that are commonly used for describing information structure are focus, topic, background (information), emphasis, and contrast. Some researchers propose a bipartite partion of information structure centered on old versus new information and on the related concepts of topic and focus: focusing brings a constituent to the foreground and can be defined as a way of making a constituent salient or prominent (for different reasons, corresponding to different types of focus). By contrast, topic (which also has subcategories) states what the sentence is about. Both concepts are employed for cohesion in discourse. Other researchers take contrast and the old/new status of information as two separate parameters. This yields a different, but still bipartite partition of information structure. A consequence is that terminology is not always univocally used and the grammar writer should be cautious about the terminological differences and the theoretical models they are couched in. The following list illustrates some terminological pairs that have been used to refer to the bipartite articulation of information structure:

- Topic – Comment
- Theme – Rheme
- Link – Tail
- Background – Focus

Some researchers argue for tripartite distinctions of information structure units. This type of distinction breaks up an utterance into the following three parts:

Topic – Focus – Background

In this type of approach the sentence is usually first divided into Topic and Comment (the non-topical part), and the Comment is further divided into Focus (new information) and Background (non-topical old information). This gives us the following two-layer distinction.

Topic – Comment
Background – Focus

Note finally that researchers have argued that the two layers are intertwined, that is, Focus is not only a part of the Comment but Topic is a also a part of the Background.

In the following we briefly mention some issues related to terminology that might be relevant to the grammar writer. For a more detailed description and analysis of topic and focus see Jackendoff (1972), Reinhart (1982), Lambrecht (1994), Rooth (1996), Roberts (1996), and Büring (2010b).

(i) Focus

Focus refers to the information structure status of an item that is brought to the foreground and is presented as a new piece of information in the context of the utterance. Sometimes sentences only contain new information. Such sentences are usually (but not always) used as opening lines in a conversation. These cases are often called presentational or all-new focus [Pragmatics – Chapter 4.1.1], all-new-information sentences, thetic sentences, or out-of-the-blue sentences. In other cases, only a part of the sentence is new information.

A related distinction is the one between broad focus and narrow focus. These refer to the parts of a sentence that are covered by focus. If a single phrase (or a word/sign) is focused, this is referred to as narrow focus (irrespective of the function of focus). If more than one phrase (e.g. two phrases or the whole sentence are focused) this is referred to as broad focus.

Emphatic focus [Pragmatics – Chapter 4.1.4] (or corrective focus) refers to the highlighting of an item already mentioned in the previous discourse with the pragmatic effect of emphasis or correction. It should be noted that all new information sentences may contain a constituent with emphatic focus. The property that sets apart emphatic focus from contrastive focus [Pragmatics – Chapter 4.1.3] is that segments smaller than phrases can be the target of emphatic focus. This is illustrated in the example below, where a single phoneme is focused with an emphatic or corrective effect. Any other type of focus, including contrastive, would not be possible in this case.

I didn't say BOWL, I said BALL.

(ii) Topic

Topic refers to the information structural status of an item that sets the stage for expressing a new piece of information, that is, the item the signer and addressee agreed to 'talk about'. Topics are both 'backward looking' and 'forward looking' (i.e. they serve as the ground) (Janzen 1998, 1999). Backward looking topics pick up a prominent constituent of the previous sentence in order to provide new information about the corresponding referent. Forward looking topics are salient elements that are likely to be the topic of the following sentence. Consider the following little discourse. The first sentence introduces *Mary* into the discourse. It's very likely that the addressee is interested in how Mary is doing (the corresponding question under discussion would be: *How is Mary doing?*) Consequently, Mary is likely to be the forward looking topic of the first sentence and *she* (referring back to *Mary*) is definitely the backward looking topic of the second sentence.

Yesterday, I meet Mary.
She was very tired.

Topics typically organize the discourse. They can be seen as a file card where the new information provided by the subsequent sentences is stored. The term aboutness topic refers to an item that tells us what the sentence is about. Other terms for topic

are theme and link. Sentences without a topic (all new information sentences) are called thetic sentences (as opposed to categorial sentences which have a topic). Topic shift refers to switching to another topic in discourse and is discussed in the section on discourse structure.

(iii) Background
The term background covers the information that is assumed as shared by the signer and addressee. Another term used for background is tail. All new information sentences, by definition, do not have a background/tail (Vallduví 1992).

(iv) Contrast
The term contrast can be understood as an overarching term that is relevant to both focus and topic: when a new piece of information is brought in and is introduced to replace a previously highlighted element, this is contrastive focus. Sentence (a) conveys, for example, not only the information that it is Sue who is a doctor and not John, but also the information that the addressee mentioned that John was a doctor or that the signer believes that the addressee was thinking so. Contrastive topic on the other hand points to another type of contrast: sentence (b) contrasts Sue and John in terms of their occupation.

a. SUE is a doctor, not JOHN
b. Sue is a DOCTOR. John is an ARTIST

The fact that contrast can be associated with both focus and topic (which are opposing concepts) has been one of the reasons why different terms have been proposed for the same phenomenon and has led to analyses where a constituent considered to be a topic by one researcher is taken to be focus by another (and vice versa, see e.g. the overview in Lillo-Martin & Quadros 2008: 165–167). The same applies to the term topicalization, which is a term distinct from topic; see section on hanging topic, topicalization, and left dislocation [Pragmatics – Chapter 4.0.7] (Wilbur 2012).

4.0.2 The sentential status of information structure

Although sentences are linked to other sentences and information structure is relevant to larger pieces of text, traditionally when we speak of information structure, we look at the sentential level and the sentence internal organization of units of information. Information structure refers to the particular ways of organizing sentence internal constituents [Syntax – Chapter 2.0.1] and the tools that a language employs for achieving this. It is different from how discourse is structured. Discourse structure is the term used for the structuring of sentences or fragments of sentences in a larger context. Since context is relevant to both notions of structure, these two aspects of organizing information sometimes may have overlapping parts.

4.0.3 The marking of information structure units

In natural languages there are generally three ways of marking information structure. Information structure units may be marked:

(i) *morphologically* (e.g. Fula, Japanese): by special affixes, clitics, and functional words and phrases (e.g. English 'as for' in topics, or 'it' clefts for focus)
(ii) *syntactically* (e.g. Hungarian): by placing the item in a specific position in the sentence, i.e. through word order variation, fronting and cleft-sentences, among others.
(iii) *prosodically* (e.g. English): through suprasegmental elements (pitch, stress etc.), e.g by placing stress on a particular constituent without changing word order.

Note that spoken languages typically do not mark the whole focused constituent prosodically but only one element (i.e. one syllable). The corresponding element is called the focus exponent. Depending on context, the very same focus exponent can be used to mark different constituents as is illustrated in the examples (a) and (b). In both sentences, the noun *book* is the focus exponent. However, in context (a) it only marks the direct object *a book* as being the focus of the sentence. By contrast, in context (b), the whole VP *read a book* is the focus of the sentence.

a. What did Mary read?
   Mary read [a BOOK]$_{\text{FOCUS}}$
b. What did Mary do?
   Mary [read a BOOK] $_{\text{FOCUS}}$

Languages often use a combination of these strategies. Prosody is usually a relevant factor alongside morphological and syntactic means.

Like spoken languages, sign languages make use of all three means plus other strategies for marking information structure units:

(i) *morphologically*: focus may be accompanied by items such as THAT and SELF (ASL, see Wilbur 2012; Herrmann 2013).
(ii) *syntactically* (word order [Syntax – Chapter 2.3] variation): topics generally occur as the first constituent of a sentence (as in most spoken languages, where topics occur either at the beginning, or towards the beginning of a sentence); see Aarons (1994), Zeshan (2006b), Wilbur (1997, 2012), Wilbur & Patschke (1998). Focus is also marked by word order variation. Focused constituents either occur after the topic phrase, or at the end of a sentence (Lillo-Martin & Quadros 2008; Wilbur 2012).
(iii) *prosodically* [Phonology – Chapter 2]: topics may be followed by an intonational break and accompanied by brow raise in various sign languages. Focus is marked by prosody (eye blinks, brow raise, hand hold, size, velocity and length of manual signs) and sentential position (Crasborn & van der Kooij 2013, Lillo-Martin & Quadros 2008; Wilbur 2012 and references therein).

(iv) *wh-words or interrogative pronouns* [Lexicon – Chapter 3.7.5]: finally, focusing may employ wh-words (wh-clefts) (Lillo-Martin & Quadros 2008; Wilbur 2012; Caponigro & Davidson 2011).

The examples for these strategies are given in the sections below.

4.0.4 Association of focus/topic with content/yes-no questions

Focusing and wh-constructions (content interrogatives [Syntax – Chapter 1.2.3]) are associated: Wh-questions require the fulfillment of missing information, and focusing supplies this information. This affinity can be systematically used in eliciting focused constituents (see elicitation materials below). The connection carries over to syntax as well: in many languages, strategies used in wh-questions are found in focused sentences. For example, wh-phrases and focus phrases may appear in the same position in some languages (e.g. Turkish). It might therefore be enlightening to understand the structure of one construction in order to understand the structure of the other. However, it is also necessary to keep in mind that the two construction types might behave differently. Another relevant factor is that topics may have grammaticalized from yes-no questions (Janzen 1998, 1999).

4.0.5 The separation of information structural concepts from prosodic concepts

Items such as focus and topic are associated with various prosodic properties. However, it is important to keep in mind that the former are semantic concepts and the latter are phonetic/phonological concepts. Stress and pitch are phonetic notions that may or may not mark focus (e.g. they may mark discourse strategies or emotive states), and focus may or may not be expressed by stress or pitch (e.g. it may be expressed through a sharp fall). Similar concerns apply to topic and other information structural units.

4.0.6 Association of topic and subject

There is a strong connection between the topic of a sentence and the grammatical subject [Syntax – Chapter 2.2] / subject of a sentence in subject-oriented languages. Especially in the absence of any markers that distinguish between these two, subjects tend to be the topic by default. In languages where subjects occur in preverbal position, they are typically the topic of the sentence, as topics also occur at the beginning of the sentence. In fact, in sign languages topics always occur at the beginning. If a language has scrambling, any major constituent can occur in the beginning of a

sentence as a topic (e.g. Turkish and German, where objects can be fronted as topics). See Li (1976) for discussions on the similarities and difference between topics and subjects.

4.0.7 Hanging topic, topicalization, and left dislocation

In the literature on both sign and spoken languages, confusion often arises regarding the term 'topic'. Although the term is pragmatic by definition, some researchers use it to refer to a specific syntactic realization of the pragmatic function. To avoid confusion, we mention here some of the terms that should be used to refer to these realizations instead, namely hanging topic, (syntactic) topicalization [Syntax – Chapter 4.3.3], and left dislocation.

The hanging topic illustrated in example (a) is a construction in which the topic does not belong to the main clause of the sentence, but appears before it as a separate, prosodically isolated item. (Syntactic) topicalization illustrated in (b) is used to refer to the syntactic configuration where a constituent appears in the sentence-initial position, while a trace or gap coindexed with the 'tpoicalized' constituent is left in the original base position. Topicalization is a typical syntactic means to mark topics. Topicalization can, however, also be used to mark focused elements (Wilbur 2012: 472, based on Ziv 1994). Therefore, the grammar writer should keep apart the syntactic configuration of topicalization and the pragmatic concept of topic. Finally, the left dislocation in (c) is similar to topicalization, but instead of a trace there is a resumptive pronoun in the corresponding main clause.

a. *Hanging topic*: As for left dislocation, the definition is from McCawley
b. *Topicalization*: Left dislocation$_i$, many people are confused about t_i.
c. *Left Dislocation*: (As for) left dislocation$_i$, we use McCawley's definition for it$_i$.

Aarons (1994) demonstrated that the difference between topicalization and left-dislocation is relevant for ASL. See also Wilbur (2012) for further discussion.

4.0.8 Methodological challenges

The grammar writer should be aware of the following methodological challenges:

- Separating focus from topic is a major challenge, as both may have contrastive features or use the same markers (see section on morphological and prosodic markers of topic and focus below).
- Different types within each group are not easy to identify and may differ cross-linguistically.
- The usage of different terminology by different researchers can be misleading, and reflects the controversial definition of information structural units.

– Using question-answer pairs for elicitation may not always be helpful in identifying information structural items.

Note finally that we use the following abbreviations in the glosses:
– *I-focus*: information focus
– *C-focus*: contrastive focus
– *tm1,2,3*: topic marker 1,2,3
– *t-c*: topic comment

4.1 Focus

Focus is an obligatory constituent of a sentence from an information structural perspective. All sentences are expected to provide items of new information. New information can be the property of a whole sentence, the property of a particular constituent denoting a particular entity (or concept) introduced into the discourse, or it can be contrastive or corrective, which means that it invalidates a previously mentioned item and supplies a new one. Emphasis is also a form of highlighting a constituent, but different from the other kinds of focus.

The constituents that are not in focus (and in some views also the topic) are called the background. Background is the information that focus is set against.

4.1.1 All-new focus

This term refers to sentences that lack a particular salient part, but instead present information that is all new (sometimes this kind of focus is also called 'neutral' or broad focus). Mostly they are out-of-the-blue declarative sentences that are usually conversation starters – for example, answers to questions such as 'What happened yesterday?'. All studies on the structure of thetic sentences by definition concern all-new or neutral focus. Thetic sentences are a good starting point to investigate neutral word order and neutral intonation.

Thetic sentences (which for our purposes here are prosodically Intonational Phrases, i.e. IPs) are noted as having (periodic) eyeblinks at the end (ASL: Wilbur 1994; Israeli SL: Nespor & Sandler 1999; DGS: Boyes Braem 1999; HKSL: Tang & Lau 2012; TİD: Gökgöz & Arık 2011). Long pauses, lengthening of the final sign or hold, change in head position, change in facial expression, change in brow position, and hand down are also attested at the end of thetic sentences (see Tang & Lau 2012; Sandler 1999 for Israeli SL: Göksel & Kelepir 2016 for TİD; and the references above). Morphologically heavy items may also appear in clause-final position (as may focus elements, but these may not always be neutral focus) (cf. Nespor & Sandler 1999; Wilbur 1999ab; Brentari & Crossley 2002). The grammar writer should

check these markers carefully in various contexts since none of these indicators is obligatory (see e.g. Herrmann 2010 for DGS), and some of them may actually be markers of turn taking, rather than the signs of declaratives in general (see also Crasborn 2007).

4.1.2 New information focus

As the name suggests, new information focus supplies new information for a single constituent, as in the case of the answer to the questions below:

A: WHAT YOU READ? (ASL, Lillo-Martin & Quadros 2008: 169)
'What did you read?'
I-focus
B: BOOK STOKOE I READ
'I read Stokoe's book.'
or
B': I READ STOKOE BOOK
'I read Stokoe's book.'

In ASL, the new information focus phrase can be at the beginning (B) or in the end (B') of the clause (see also section morphological and prosodic markers of topic and focus [Pragmatics – Chapter 4.3] below for an example where the focus follows the topic).

New information focus may also be expressed by means of wh-clefts as is illustrated in the following example (Wilbur 1997):

whc
JOHN BUY WHAT SHIRT (ASL)
'What John bought was a shirt.'

The grammar writer should be aware of the fact that in some sign languages, focused items that occur at the end of a clause cannot be morphosyntactically complex (see Lillo-Martin & Quadros 2008 for ASL and Libras).

4.1.3 Contrastive focus

Contrastive focus indicates the contrast between what is said in relation to one or more constituents in a previous sentence. In spoken languages, it may occupy the same position as new information focus but typically has higher pitch (i.e. is more stressed). In sign languages, it may be marked by a distinct non-manual marker (Lillo-Martin & Quadros 2008: 170).

a. A: YOU READ CHOMSKY BOOK
'Did you read Chomsky's book?'
C-focus
B: NO, BOOK STOKOE I READ (ASL: Lillo-Martin & Quadros 2008: 168)
'No, I read Stokoe's book.'

tm1
b. JOHN(fs)$_i$ NOT-LIKE JANE. MARY(fs)$_j$, IX$_i$ LOVES t_j. (ASL: Wilbur 2012: 472)
'John doesn't like Jane. It's *Mary* he loves.'

hn
c. CRY BABY (ASL, adapted from Lillo-Martin & Quadros 2008: 168)
'The BABY is the one crying.'

The two manual articulators (dominant and non-dominant hand) can also be used as a modality-specific strategy to mark contrastive focus (see Crasborn & van der Kooij 2013, and section on simultaneous constructions [Lexicon – Chapter 1.3.3]).

4.1.4 Emphatic focus

Emphatic focus is used for intensifying an item. These constructions usually repeat the focus constituents in sentence-final position. The second constituent in the final position is considered the emphatic element. Emphatic focus is restricted to syntactic heads or morphologically simplex items (Lillo-Martin & Quadros 2008), for example, a VP containing a verb and object is not expected to be doubled in sign languages (see section on focus doubling [Pragmatics – Chapter 4.1.5]).

hn
JOHN CAN READ CAN (ASL: Lillo-Martin & Quadros 2008: 168)
'John really can read.'

It should be noted that there may be ways of marking emphatic focus other than by doubling, for example, by a particular prosodic contour or a specific non-manual maker.

4.1.5 Focus doubling

As already illustrated in the previous subsection, the focused constituent can be doubled at the end of the sentence. Focus doubling may occur with modals, verbs, temporal signs, negative signs, quantifiers, nouns, and wh-elements (Petronio & Lillo-Martin 1997; Nunes & Quadros 2006; Lillo-Martin & Quadros 2008: 171). Like single-focused elements in sentence-final position (see section on new information focus [Pragmatics – Chapter 4.1.2]) doubled-focused elements are morphologically simplex

or restricted to heads (see also the previous section on emphatic focus [Pragmatics – Chapter 4.1.4]). Focus doubling is a common way of marking emphasis. However, doubling may also indicate other kinds of focus. Therefore, the grammar writer should be cautious about other possible discourse functions of this strategy (e.g. as turn increments, see Ford et al. 2002).

There are two views on the status of focus doubling and sentence-final focused elements. The first view considers the doubled element and sentence-final focused element as related items. The doubled part is simply the doubling of a focal element, and the non-doubled sentence-final focus is the result of the omission of the corresponding sentence internal element, thereby leaving only the final focus as an overt constituent. Thus, this view implies that doubled focus and sentence-final focus are an integral part of the clause (Lillo-Martin & Quadros 2012). The alternative view (Neidle et al. 2000) takes the doubled element as a tag and the single occurrence of the final focal element as originating in that position (similar to their view on sentence final wh-words).

4.2 Topic

Topics in sign languages have the following prominent characteristics:

(i) They occur in sentence-initial position, i.e. they are topicalized [Syntax – Chapter 4.3.3.3] (hence syntactically marked) (Fischer 1975; Liddell 1980; Aarons 1994; for different types of topic, see also Aarons 1994).
(ii) They are separated from the comment by specific non-manual markers (hence prosodically marked) (Wilbur 1994; Zeshan 2004).
(iii) If the language is pro-drop, they can be omitted.

Note that just as there may be spoken languages where topics are not grammatically marked (Büring 2010b), there may also be sign languages that do not use a special (manual or non-manual) marking for topics. In fact, Sze (2011) claims that in HKSL, the most typical type of topics, so-called 'aboutness topics', are not marked in any particular manner. In contrast, 'scene-setting topics', that is, topics that provide a framework for the location or temporal specification of the event described in the sentence, are typically marked by brow raise and a specific head and body position. Scene-setting topics may be discourse old or discourse new. By contrast, aboutness topics are generally discourse old. This distinction also has a syntactic reflex: scene-setting topics are typically instantiated by adjuncts (adverbials) and aboutness topics by arguments of the verb.

In the literature, some sentences are treated as having more than one topic (Aarons 1994).

tm3 tm2
JOHN(fs)$_i$, VEGETABLE, IX$_i$ PREFER ARTICHOKE (ASL)
'As for John, as for vegetables, he prefers artichokes.'

Similarly in NGT, an argument topic (with no specific non-manual marking) can precede a scene-setting topic (Crasborn et al. 2009: 359):

IXrt PERSON, TOMORROW AT-HOME, IXrt NEWSPAPER READ IXrt (NGT)
'The man, tomorrow at home, he will read the newspaper.'

Note that the fine distinction between topic, topicalization, and left dislocation may blur the fact that some constituents in sentence-initial position that may be analyzed as pragmatic topics are in fact cases of left dislocation or (syntactic) topicalization (see the section on hanging topic, topicalization, and left dislocation [Pragmatics – Chapter 4.0.7] above). For this reason some researchers contest the idea that two (pragmatic) topics can co-occur. For example Wilbur (2012) claims that in Aaron's example above, only the constituent marked with tm2 (i.e. VEGETABLE) is the syntactic topic of the sentence, and the one with tm3 is left dislocation. Wilbur also points out the co-occurrence of topicalization and (hanging) topic, and observes that when these two occur in the beginning of a clause, hanging topic is in the first position and topicalization (marking focus in this case) is in the second position. The grammar writer should therefore carefully check the morphosyntactic and prosodic marking of sentence-initial elements and their respective functions.

It has been also noted elsewhere as well that when a topic and a focused phrase co-occur in sentence-initial position, the general tendency is for the topic to appear first, followed by the (topicalized) focused phrase (ASL: Neidle 2002).

A: FRUIT WHAT JOHN LIKE? (ASL, Lillo-Martin & Quadros 2008: 169)
'As for fruit, what does John like?'
t-c I-focus
B: FRUIT, BANANA, JOHN LIKE MORE

Another strategy to realize the topic syntactically is to have the topic in second position, with the focus being the first constituent in the sentence:

A: WHAT YOU READ IX SCHOOL (ASL, Lillo-Martin & Quadros 2008: 170)
'What did you read at school?'
I-focus top
B: BOOK STOKOE, IX SCHOOL, I READ
'At school, I read Stokoe's book.'
or
top
B': IX SCHOOL I READ BOOK STOKOE
'At school, I read Stokoe's book.'

4.3 Morphological and prosodic markers of focus and topic

The following markers are reported (mainly for ASL) as markers that are used with topic and focus.

4.3.1 Focus

Focus in sign languages is often marked prosodically: both manually and non-manually. As for manual prosody, focused signs are often larger in amplitude, longer in duration, contain more repetitions, and have higher velocity than non-focused signs (Crasborn & van der Kooij 2013, Wilbur 2012). Brow raise and head nod are two of the most common non-manual markers that accompany focus (Wilbur 2012), but for NGT other non-manual markers have been identified, such as head movements and body movements, as well as specific uses of mouthing and eye gaze (Crasborn & van der Kooij 2013).

More specifically, we list some manual and non-manual markers that have been attested for the various types of focus below.

New information focus: THAT (optional, ASL) follows the focused item with (obligatory) brow raise and primary stress on focused item; if followed by old information, prosodic break after THAT. THAT occurs with lean back (Wilbur & Patschke 1998).

Contrastive focus: According to Wilbur & Patschke 1998: 296) lean forward is used to mark the correct response and lean backward is used to mark the rejected response. The focused item has brow raise, which may span SELF and SELF occurs with lean forward.

lean back lean forward
IX$_1$ NOT SAY 'DEATH', IX$_1$ SAY 'BET' (ASL)
'I didn't say "death", I said "bet".'

Emphatic focus: Wilbur (2012: 476) points out that SELF can be used as an intensifier.

Focus particles: Like spoken languages, sign languages use focus particles [Lexicon – Chapter 3.11] such as 'only' (restrictive focus) or 'even' (expanding focus) as is illustrated by the examples (a) and (b) below. Hermann (2012) notes that in DGS the focus associated items 'only', 'also', and 'even' are expressed by manual markers (the last one accompanied by non-manual markers).

a. 'only' (restricting focus) ASL:
br br
cs lean back
IX$_1$ RECENT FIND-OUT WHAT, KIM ONLY-ONE GET-A
'I recently found out that Kim is the only one who got an A.'
(ASL, Wilbur & Patschke 1998: 285)

b. 'even' (expanding focus):
lean forward
hn
ALL KNOW-THAT SAME BILL(fs)$_j$ INDEX$_j$ TEST IX$_j$ GET-A
'Everyone knows that even Bill got an A.'

Parallel focus: This is the term used when two items in the clause are contrasted with each other. In ASL left/right leans and forward/backward leans are used (Wilbur & Patschke 1998: 296).

	lean left	lean right	
IX2 LIKE WHAT,	CHOCOLATE	VANILLA	(ASL)

'Do you prefer chocolate or vanilla?'

4.3.2 Topic

Topics can be marked with the following non-manual markers:
- Periodic eyeblinks at the right edge (Wilbur 1994)
- Raised eyebrows and single head movement – the head tilts back before it moves downward (tm2 in Aarons 1994).
- Aarons (1994) mentions two more non-manual markers (i.e. tm1 and tm3), which Wilbur (2012: 472) calls topicalization and left dislocation, respectively. tm1: raised eyebrows, head tilted slightly back and to the side; tm3: raised eyebrows, rapid head nod.

In addition, topics may occupy the sentence-initial position (typically accompanied by non-manual markers such as raised eyebrows).

Finally, it is worth noting that there may be some overlap between the markers for focus and topic).

(Link)	Focus	Tail	
	br		
	MARY	JIM LOVE TEASE [t]	(ASL, Wilbur 1997)

'(Jim doesn't like to tease Jane.) It's MARY whom Jim loves to tease.'

Link	Focus	Tail
br		
MARY		JIM LOVE TEASE

'As for Mary, Jim loves to tease her.'

Elicitation materials

The elicitation of focus is easier than the elicitation of topic. The University of Potsdam and the Humboldt University of Berlin developed a questionnaire designed for the investigation of information structure from a typological perspective, the Questionnaire for Information Structure (QUIS) (Skopeteas et al. 2006). This questionnaire provides helpful tools for the elicitation of natural linguistic data. In addition, the

grammar writer may use different kinds of question-answer pairs to elicit various kinds of topic and focus structures. Moreover, the grammar writer could introduce contexts in which objects or people are contrasted, for example, a signer could be asked to describe a situation and another signer could question these situations, forcing the first signer to correct her/his comment. And finally, the grammar writer may ask signers to elaborate on a specific discourse topic to investigate the marking of topics.

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Chapter 5 Discourse structure

5.0 Definitions and challenges

5.0.1 Discourse structure

When the language to be described is analyzed from a discourse structure perspective, the relations between grammatical elements and their effects are considered beyond the sentence level. Discourse is formed by a set of logically united utterances, which are also connected to the context. Utterances are united through the so-called 'discourse markers' and provide the flow of discourse with coherence and logical order. Discourse markers [Pragmatics – Chapter 5.1] may be overt, when they explicitly mark the logical connection between the two utterances, as in example (a) below, but in other cases they may also be non-overt, leaving the connection to be provided by the reasoning of the addressee, as shown in example (b) below. These examples show that cohesive devises are used to establish coherence [Pragmatics – Chapter 5.1] overtly. However, coherence does not necessarily depend on cohesion since it can also be established implicitly via pragmatic enrichment (using world knowledge).

a. Joana was not feeling well. This is why she didn't come to the hike.
b. None came to the hike. It was raining.

Besides being coherently connected one after the other, fragments of discourse also contain referring expressions [Pragmatics – Chapter 1], which are interconnected across utterances. After a noun phrase [Syntax – Chapter 4] has been introduced, like *my friend* in the example below, a co-referential [Pragmatics – Chapter 2] pronoun [Lexicon – Chapter 3.7] *he* in the following utterance provides the discourse context

with unity. The relation between referring expressions beyond the sentence establishes cohesion to the overall discourse structure.

I couldn't reach my friend last night through Skype. He was probably at the Deaf club.

Interestingly, referring expressions are not only co-referential to elements previously introduced, but also to extra-linguistic elements, which are part of the world and shared by the discourse participants. In the example below the noun phrase introducing the discourse referent the pronoun *he* is co-referent with has not been mentioned in the previous context. In this example, the pronoun (possibly accompanied by some (non-)manual pointing gesture) refers deictically to some individual present in the immediate physical context.

While walking into a room:
What is he doing here?

Due to their face-to-face communication nature, sign languages make a great use of co-referential pronouns linked to the physical environment. In many cases, the full noun phrase is not introduced, but rather a deictic sign directed to some object or individual found in the physical common ground (deixis [Pragmatics – Chapter 1.1] / deixis).

5.0.2 Analytical and methodological challenges

The grammar writer should be aware that research into discourse structure in sign language is still a very new area. In order to obtain a general description of discourse structure, a large body of signed discourses is needed (Frederiksen et al. 2013). Corpus data may be complemented with felicity judgment tasks by native signers. Judgment tasks may consist of the presentation of signed contexts, followed by a presentation of (part of) a discourse with some variations in the use of discourse markers and co-referential expressions. Signing participants would have to judge then which option is more adequate according to the particular context.

The term 'sentence' is a syntactic notion, which has to do with a unit of information from a syntactic point of view. From a discourse point of view, it is more adequate to talk about 'utterances', which typically express concrete speech acts [Pragmatics – Chapter 3] and specific units of information. This is why in this subsection the relevant units of information are called 'utterances' rather than 'sentences'.

5.1 Coherence and discourse markers

Coherence is the property by which a text or discourse is organized for the transmission of global meaning. A discourse is usually produced and interpreted as an articulated and coherent construction formed by units of information. The ordering and the

logical connections between two or more utterances (units of information) are understood by the addressee on the base of the information available outside the discourse. In addition, two or more utterances may be connected by discourse markers, which include discourse connectors or conjunctions [Lexicon – Chapter 3.9] and structuring markers, reformulation and argumentative markers, and discourse particles [Lexicon – Chapter 3.11.3]. In the example below, the overt discourse connector (i.e. the coordinative conjunction) *and* triggers the causal pragmatic reasoning that Mary married because of pregnancy. This perceived quality of meaning is interpreted according to the world (or encyclopedic) knowledge of interlocutors outside the text level.

Mary got pregnant and she married.

As shown at the beginning of this section, discourse markers may be overt or non-overt. As for sign languages, when they are overt (explicitly marked) they may occur manually, non-manually, and spatially. In the following sections, these three strategies are described with a few examples from sign languages.

5.1.1 Manual discourse markers

In the sections coordination [Syntax – Chapter 3.1] and subordination [Syntax – Chapter 3.1], the grammar writer will include a description of manual markers used for coordination and subordination, their position in the sentence, and their obligatoriness or optionality. Although in these two sections, the markers are considered from a sentential point of view, the same manual markers can also be described as discourse connectors from a discourse perspective. The section communicative interaction [Pragmatics – Chapter 10] also includes a subsection on discourse markers [Pragmatics – Chapter 10.1] regulating signed conversations.

A possible classification of discourse markers that may be used to classify discourse markers in a particular sign language is shown in the table below (taken from Schiffrin 1996).

Discourse structuring markers	*Ordering markers*	Initial
		Continuity
		Closure
Discourse connectors	Additive, adversative, disjunctive, contrastive, disjunctive, ...	
Reformulation markers	Explanatory	
	Recapitulate markers	
Argumentative markers	Reinforcement	
	Exemplifiers	

The grammar writer should consider this classification as a starting point to analyze the sign language under description. Please note that the classification is based on the study of spoken languages only. Therefore, some peculiarities or even modality-specific issues may be likely found. The grammar writer should ideally look for discourse markers that contribute to the overall organization structure and function as discourse connectors, reformulation markers, and argumentative markers. In order to give a preliminary idea of what could be found, some examples of discourse structuring markers found in sign languages are discussed below. These studies are based on particular signed discourses, which may be tied to specific discourse situations.

In ASL, Roy (1989) claims that the sign NOW, besides indicating present tense, also functions as a discourse marker, marking a shift into a new subtopic as well as calling attention to what is coming up next in the text. Roy argues that there are some distributional and formal criteria that distinguish the use of the ASL discourse marker NOW from the use of the temporal sign NOW. The discourse marker form of NOW is a sign that occurs in an utterance-initial position only and can occur with topic marking. Moreover, this form does not consistently occur with a final hold and may occur with a body shift.

_____br
a. NOW CL:FISH IX3 TRUE STRANGE IX3 (ASL, Roy 1989: 236)
'Now, as for the fish, it is truly unique, it is.'
__body-shift
b. NOW MALE WILL RED BEGIN LOOK-FOR ON
'When the male changes to red, he begins to search on.'

Like the discourse marker, the temporal marker NOW is a two-handed sign that can occur in utterance-initial position. However, unlike the discourse marker, the temporal marker does not occur with topic marking. In addition, it consistently displays a final hold on both hands and is not accompanied by prior pauses or body shifts.

FISH DECIDE BEGIN NOW BREED (ASL, Roy 1989: 237)
'The fish decides to begin breeding now'

Another ASL discourse marker contributing to discourse structure is NOW-THAT, which is a sign formed simultaneously with NOW on the right hand and THAT on the left hand. While NOW functions as a discourse marker by shifting the attention to a new section of the discourse and by maintaining the progression through an episode group, the discourse marker NOW-THAT occurs at the initial utterance of the episode that starts a new episode group. NOW-THAT is used to introduce the introductory episode group from the developmental episode group, and the developmental group

from the closing episode. The following diagram (Roy 1989: 243) illustrates the distribution of NOW and NOW-THAT:

NOW	Episode 1	Introductory episodes
	Episode 2	
NOW-THAT	Episode 3	Developmental episodes
NOW	Episode 4	
NOW	Episode 5	
NOW	Episode 6	
NOW	Episode 7	
NOW-THAT	Episode 8	Closing episode

Metzger & Bahan (2001) note that the ASL sign FINE (produced with an open five handshape tapping on the signer's chest) is used as a discourse marker to separate the different events or episodes in a long stretch of discourse. It has a similar structuring function as the discourse marker NOW, but according to the authors it always occurs utterance final closing each episode.

a. ANNOUNCE HAVE TIME TIME-NINE-O'CLOCK IX SILENCE FOR ONE MINUTE. FINE. (ASL, Metzger & Bahan 2001: 132)
'We were all told that there was time set aside for a moment of silence, at nine o'clock. Okay.'

b. DURING POSS-1 CLASS TIME EIGHT-TO TEN. FINE.
'That happened to be during the time I was teaching, since my class met from 8 to 10 o'clock. Okay.'

The LSE sign APARTE ('aside') introduces sub-comments of a single and bigger comment (Villameriel 2008). It is an enumerating device, which functions at the microstructure, that is, at the level of the utterance. This contrasts with the ASL signs NOW or NOW-THAT, which function at the macrostructure level, that is, at the overall, global meaning of discourse.

PERSON CHARACTER DIFFERENT PARTICIPATE CHARLOT DRUNK
APARTE, GIRL SUSPICIOUS
APARTE, COUPLE OLD DISCUSS ALWAYS
APARTE, BOYFRIEND MAN NICE (LSE, Villameriel 2008)
'The various characters who participate (in the film) are Charlot, the drunk; the suspicious girl; the old couple who always discuss and the boyfriend, who is nice.'

5.1.2 Non-manual discourse markers

In the syntactic sections coordination [Syntax – Chapter 3.1] and subordination [Syntax – Chapter 3.1], the grammar writer may include a description of non-manual

markers and their spreading domain. In this section, he/she should focus on the functional properties of non-manual discourse markers.

5.1.3 Strategies using signing space

Signing space [Pragmatics – Chapter 8] may be used as a strategy to express side information, which is not-at-issue [Pragmatics – Chapter 7] and deviates from the main discourse (Klein & von Stutterheim 1992; Roberts 1996; Simons et al. 2011). Auslan, for example, uses the non-manual strategy of physically leaning (or even stepping) to the side when the signer wants to refer to secondary information, which moves the discourse away from the main topic (Locker McKee 1992).

5.2 Cohesion

Cohesion can be identified based on linguistic structures that link different parts of discourse, such as referring terms (by using a pronoun [Lexicon – Chapter 3.7] / pronoun to refer to a prior referent, for example). Cohesive devices make it possible for the addressee to keep track of the discourse referent. In the example below, the antecedents *Peter* and *Anne* are introduced in the first utterance. The second utterance is overtly linked to the first one by means of the two anaphoric expressions, the pronouns *he* and *she*, which are used for reference tracking [Pragmatics – Chapter 2] and refer to the two antecedents, respectively.

Peter and Anne went to school together. He is an artist now and she is a lawyer.

In signed discourse, cohesion can be established not only by lexical and grammatical means, but also spatially. Pointing to areas within the signing space for the purpose of referring back to previously introduced discourse referents is known as 'referential spatial mapping' [Pragmatics – Chapter 8.1.1] (Winston 1995). Different strategies at the morphological and syntactic levels are attested using space for referring to various kinds of referents introduced in the discourse beyond the sentence level (Bogaerde & Baker 2012; Meurant 2008).

5.2.1 Manual strategies

Pronouns [Lexicon – Chapter 3.7] / Pronouns and determiners [Lexicon – Chapter 3.6] / determiners are one of the main means to refer back to already introduced discourse referents in previous utterances. In sign languages, pronouns and determiners are directed towards locations in space and the consistency in the direction towards space previously associated with referents contributes in building up connected and

cohesive discourse and to ensure reference tracking [Pragmatics – Chapter 2] (Morgan 1996, 2000). This is shown in the following BSL example.

MAN IX$_a$ WOMAN IX$_b$ [...] 3$_a$-LOOK-3$_b$ (BSL, Morgan 2000: 285)
'There is a man and there is a woman [...]. He looks at her.'

Classifier handshapes [Morphology – Chapter 5] / Classifier handshapes denoting entities also add to the overall cohesion of the discourse (Perniss 2007ab). The three major groups of predicate classifiers are (whole) entity classifiers [Morphology – Chapter 5.1.1], bodypart classifiers [Morphology – Chapter 5.1.2], and handle classifiers [Morphology – Chapter 5.1.3]. The former two are used to represent (body parts of) referents that move or are located somewhere, while the latter represent objects that are being moved or handled. Classifier handshapes are anaphorically connected to a previously introduced antecedent. The following excerpt is an instance of the discourse referent for *rabbit* referred back to by two handshape classifiers denoting the whole entity: the thumb and the 3-handshape.

7_5.2.1_1_LSC_COINCIDE DAY HEAT STRONG SUN RABBIT FEEL START TIRED CLe(thumb):entity-moving SEARCH SEE TREE SMALL CLe(3):entity-moving CLe(3):lie-down

COINCIDE DAY HEAT STRONG SUN RABBIT FEEL START TIRED
CLe(thumb):entity-moving SEARCH SEE TREE SMALL CLe(3):entity-moving CLe(3):lie-down.
'It was a very hot and sunny day. The rabbit was running and he lay down next to a small tree.' (LSC, Barberà & Quer, to appear)

In addition to lexical signs that provide the discourse with logical unity, signers also produce discourse markers with the non-dominant hand that guide the discourse as it proceeds and serve as conceptual landmarks. This kind of discourse marker is called 'buoys / buoys' [Pragmatics – Chapter 2.2.3] (Liddell 2003: 223). List buoys are used for making associations with up to five entities and serve to enumerate these discourse referents. They differ from numerals in two ways. Firstly, list buoys are normally produced by the non-dominant hand. Secondly, the fingers are oriented to the side rather than vertically upward, which appears most common in numerals for one to five across sign languages studied to date. The associations between discourse referents and the fingers are generally made by contacting the tip of the appropriate digit and describing or commenting about the corresponding referent. The comment can either follow or precede the contact with the digit. Signers can even hold the non-dominant hand while singing the comment with the dominant hand. List buoys can be used to make associations with ordered or unordered sets of discourse referents, depending on the sign language.

The grammar writer should check whether both options are possible or rather only one. If both ordered and unordered sets of referents are possible (as it is the

case in ASL), list buoys are a strategy of cohesion. If only ordered sets (and thus only enumerated items) are possible, besides being a strategy of cohesion, list buoys also provide the discourse with coherence.

Switching hands (from dominant to non-dominant) in order to articulate the sign with the hand on the side nearest the established spatial location is known as dominance reversal and also provides discourse with cohesion. Dominance reversals were first identified in ASL discourse (Frishberg 1985) and have been found as a productive strategy contributing to discourse cohesion in many sign languages.

5.2.2 Non-manual strategies

Role shift [Pragmatics – Chapter 6] / Role shift is another important strategy of referential cohesion. Role shift is used to indicate the part of the discourse presented from the point of view of a particular participant. The participant referred to may be some other person or the signer himself or herself at some time other than the present. The non-manuals indicate that a referential shift is taking place. The referential shift is enough for reference tracking and no repetition of the full noun phrase to identify the signer of the utterance in the scope of role shift is needed (Perniss 2007a, 2007b).

_____rs:friend ___rs:signer
FRIEND ASK-1 LIKE JAPAN FOOD IX2 YES LOVE IX1
'My friend asked me, 'Do you like Japanese food?', 'Yes, I love it', I replied.'
(Auslan, Johnston & Schembri 2007: 274)

Topic marking [Pragmatics – Chapter 4.2] / Topic marking and squinted eyes also mark discourse referents previously introduced. While the former neutrally refers to an antecedent already introduced, the latter refers back to an antecedent already introduced but not very salient in discourse (i.e. an antecedent that is still retrievable) (Dachkovsky & Sandler 2009).

5.2.3 Strategies using signing space

Besides pronouns and determiners, articulating the sign for the discourse referent in a particular location in signing space (that is, spatially modifying a manual sign in a previously established location) also contributes to providing the discourse with cohesion. This spatial modification may also co-occur with body lean towards the targeted location. As shown in the example below, nouns can be directly articulated at a spatial location.

IX1 REAL HARD TIME SELF1 2hCL:CC$_a$ A-R-T$_a$ SCIENCE 2hCL:CC$_b$ ANALYZE$_b$.
'I had a hard time separating on one side art and, on the other side, science, which I analyze.' (ASL, Winston 1995: 93)

5.3 Foregrounding and backgrounding

Sign languages can use specific spatial means to identify foreground and background. Foregrounding information refers to highlighting the most salient piece of discourse. The less-salient stretch of discourse, which does not make the discourse advance, is considered backgrounded. The foreground is also known as 'figure' and background as 'ground' (Perniss 2007a). In most cases, the background provides the necessary context for the foreground. Sign language classifiers show the possibility of overtly codifying backgrounding strategies in a unique way because of the availability of an 'extra', relatively independent articulator – the non-dominant hand – and the simultaneity afforded by the manual-visual system. Therefore, in many sign languages grounding dependencies are expressed with bimanual structures. Moreover, the dominant hand is typically specialized in referring to the foreground information, while the non-dominant hand is typically specialized in the background one, though dominance reversals are also possible as illustrated above. Foregrounding and backgrounding may have a short or a long scope in the particular stretch of discourse. In the following English translation of an LSC fragment of discourse, the signer keeps the classifier handshape for a slice of bread in the non-dominant hand all along the underlined part thus keeping this backgrounded information present in the fragment for as long as it is relevant.

7_5.3_1_LSC_Take the bread, spread the tomato, pour some olive oil and add some salt. Then, leave it aside for a while so it can be absorbed by the bread. After that, you can eat it

(To prepare bread with tomato...) Take the bread, spread the tomato, pour some olive oil and add some salt. Then, leave it aside for a while so it can be absorbed by the bread. After that, you can eat it.

(LSC, Frigola, Aliaga, Barberà & Gil, to appear)

Elicitation materials

As already mentioned, the grammar writer may use corpus data if available, which can be complemented with felicity judgment tasks by native signers. In judgment tasks, the grammar writer may either vary the context a specific utterance is linked to or the utterance that is linked to a fixed context. In addition, the grammar writer can use the questionnaire designed for the investigation of information structure, the Questionnaire for Information Structure (QUIS), Skopeteas et al. (2006). This questionnaire provides helpful tools for the elicitation of natural linguistic data. Moreover, signers could be asked to describe a situation or elaborate on a specific discourse topic to investigate the marking of topics. For the collection of narrative discourse, the grammar writer can use various kinds of modality-neutral elicitation materials such as (i) videos

from Silvester and Tweety, (ii) The Pear Stories (http://www.pearstories.org/), (iii) The Frog Stories (Mayer 1969), (iv) the elicitation materials described in Perniss (2007a) and the Totem Field Storyboards, designed for semantic and pragmatic fieldwork (http://totemfieldstoryboards.org/). The L&C Field Manuals and Stimulus Materials may be also useful: http://fieldmanuals.mpi.nl/projects/space-project/.

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Chapter 6 Reporting and role shift

6.0 Definitions and challenges

6.0.1 Role shift

Role shift [Syntax – Chapter 3.3.3] / Role shift is a common sign language phenomenon characterized by two general properties: (i) semantically, the expressions that are signed under role shift are somehow interpreted 'from another person's perspective' than the actual signer, or 'with respect to another context' than the context of the actual speech act; (ii) morphosyntactically, role shift is typically marked overtly by some non-manual articulation, which may involve (a) body shift or change in body posture, (b) head movement, (c) change in the direction of eye gaze, and/or

(d) altered facial expressions in order to mark that the signer is adopting somebody else's perspective.

Semantically, role shift can be used to report utterances or thoughts of another person (so called *attitude role shift*) or to report the actions another person performed (so called *action role shift*). In role shift, some or all aspects of the linguistic and gestural content are taken to be literally or iconically borrowed from the reported situation. In addition, some or even all indexicals [Pragmatics – Chapter 1.1] can or must be interpreted with respect to the context corresponding to the person whose perspective is adopted (the 'shifted context'). Because of these semantic effects, role shift is often compared to context shift in some spoken languages, a phenomenon in which some indexical or speaker oriented expressions (i.e. *I*, *here*, *now* or modal particles and expressions such as *what the hell*) are evaluated with respect to a shifted context rather than with respect to the context of the actual speech act.

The grammar writer should also carefully read the corresponding section on role shift in syntax [Syntax – Chapter 3.3.3]. He/she is free to decide whether he/she prefers to split the description of role shift into a more formal part (i.e. scope of non-manual markers, combination with embedding matrix clauses, ...) – which should go to syntax – and a more functional part (i.e. behavior of indexicals, expression of multiple perspectives, ...) – which should stay in pragmatics or whether he/she prefers to keep the description of role shift together. In the latter case, the description of role shift can either be integrated into syntax or pragmatics.

6.0.2 Terminology

Various terms are used when describing the phenomena grouped under role shift. These are shifted perspective, shifted reference, referential shift, role playing, role taking, role switching, reference shift, constructed dialogue, constructed action, context shift, perspective shift, body shift, attitude role shift, and action role shift. Sometimes these terms are used interchangeably, sometimes they are used to refer to different aspects of role shift.

Recent studies on role shift usually distinguishes between two different but related kinds of role shift (Metzger 1995; Lillo-Martin 2012; Quer 2013; Schlenker 2016a, Cormier et al. 2015, Davidson 2015):

(i) *Attitude role shift* (or quotational role shift), which is used to report linguistic content such as utterances, thoughts, or attitudes towards propositions; and
(ii) *Action role shift* (or non-quotational role shift), which is used to report or describe non-linguistic action and the emotional state of a person.

Both kinds of role shift are similar in that the signer uses the manual and non-manual articulators to reproduce or report linguistic or non-linguistic actions of another

person performed in another context. Thus, both kinds of role shift trigger a shift in context or perspective.

> Role shift plays two, sometimes, overlapping roles in the grammar of sign languages. First, in its quotational use, it is used to directly report the speech or the unspoken thoughts of a character (also known as constructed discourse). [...] Secondly, in its non-quotational use, role shift expresses a character's action, including facial expressions and nonlinguistic gestures. That is, the signer embodies the event from the character's perspective. This embodiment is also referred to as constructed or reported action. (Pfau & Quer 2010: 396).

One formal difference between these two kinds of role shift is that attitude role shift is usually accompanied by a rotation of the signer's body and a change in head position and eye gaze. Action role shift, on the other hand, may not involve these non-manual markers since it does not involve a communicative setting including reported signer and addressee. By contrast, in action role shift especially in the cases of embodying animals, for example, the use of affective facial expressions may be prominent.

6.0.3 Comparison with spoken languages

While attitude role shift can be compared to reported speech in spoken languages, action role shift does not seem to have a clear direct counterpart in spoken languages. Unlike spoken languages, sign languages can easily integrate gestural components since gesture and sign use the same modality (Pfau & Steinbach 2007). Reporting the action of another person by using action role shift is a typical feature of sign language narration. By contrast, the auditive-oral modality of spoken languages only permits the integration of vocal gestures, which of course only allows reporting other people's vocal behavior. Thus, in spoken languages, the appearance of non-linguistic items in a sentence is possible but very limited (but note that speakers may also use additional co-speech gestures in multi-modal communication):

John went hmmm ..., John was like, pfffttt.

In spoken languages, context shift in reported speech is often reported as introduced by certain verbs such as *say*, *complain*, *ask*, *blurt*. We can also think of verbs such as *think*, *imagine*, *be like* as introducing role shift ('John was like, yeah, I'll do that'). But there are also cases where none of these introductory predicates are used, rather, a certain utterance may be expressed in a particular tone and accompanied by certain co-speech gestures where the narrator imitates the speaker of an utterance, by which the hearer can deduce the shift in context or perspective (Streeck 2002).

Another example of context shift found in written spoken language narration is Free Indirect Discourse, a mix of direct and of indirect discourse (Eckardt 2014): Tenses [Semantics – Chapter 1] and pronouns [Lexicon – Chapter 3.7] are always adapted to the context of the narrator, that is, they take the form that they would have

in indirect speech (e.g. *What would she do tomorrow, she wondered*), while everything else – including the indexicals *here, now, today, yesterday*, demonstratives (e.g. *this*) and speaker oriented expressions – is adapted to the context of the protagonist, that is, it behaves as in direct discourse (e.g. *What will I do tomorrow, she wondered*). Although Free Indirect Speech and role shift share certain properties (i.e. both are mixed forms of reported speech and both allow certain indexicals to shift), the phenomenon of role shift as standardly described is not completely identical to Free Indirect Speech, since (i) role shift, unlike Free Indirect Discourse, is typically marked by certain grammatical (non-manual) markers; and (ii) in attitude role shift in ASL first person pronouns do get interpreted with respect to a shifted context. However, the grammar writer might find it useful to make a comparison between attitude role shift and Free Indirect Discourse (Hübl 2014).

In sign languages, verbs of saying and thinking such as SAY, ASK, ANSWER, or THINK are commonly used as markers to introduce attitude role shift. However, role shift is often only marked by the non-manual means mentioned above. This holds especially for action role shift. The absence of manual markers and the availability of layering informational units by using various articulators simultaneously makes role shift much more complex than similar phenomena in spoken languages.

6.0.4 Role shift and context/perspective shift

Semantically, role shift arguably triggers a shift in context and/or perspective (but see Davidson 2015 for a partially different view). Context shift is the phenomenon whereby a narrator mentally places himself/herself in an eventuality or a state of affairs characterized by a time and place that is different from the time and place of the situation in which he/she expresses the utterance. Thus, a particular eventuality or a state of affairs is expressed as if the narrator is there, and as if he/she is expressing the utterance from within that place and time. In such cases, an utterance has two contexts: the actual context in which it is uttered, and the (constructed, virtual shifted) context in which it is 'uttered from'. This phenomenon is captured in the phrase "blending mental spaces" (Fauconnier 1997). It is for this reason that utterances of this type may have grammatical properties that are directly associated with the shifted context (e.g. the usage of the adverbial *here* to refer to the place where the original utterance was expressed, rather than the location that the narrator is in) and the actual context (e.g. the narrator using his/her own body to depict the target of an attack).

Perspective is an integral part of narration, and one of the types of narration, character perspective signing (Perniss 2007), relates to context shift. Under context shift, the perspective of a signer changes, from being the narrator of a particular speech act, to the (additional) role of being another person, animal, or object. As an extension of this role, a narrator can situate himself/herself as if he/she is in the situation that he/she is narrating. Thus, the point of evaluation of the indexicals is shifted. The other

type of narration is observer perspective (Perniss 2007) where the signer, conceptually situates himself outside of the event that he is describing (see also section on perspective [Pragmatics – Chapter 8.3]).

Other than the conceptualization of the signer as being inside or outside of the event, the difference in perspective is marked by several factors: signing space [Pragmatics – Chapter 8], representation of the referents in the signing space, the types of classifiers [Morphology – Chapter 5] used, the size of Size-and-Shape-Specifiers [Morphology – Chapter 5.2] (SASSes), and the direction of motion. The differences are as follows:

(i) Event space projections: Life-sized space, and signing space surrounds the signer in character perspective; model-sized space, and signing space is located in front of signer in observer perspective.
(ii) Conceptualization of signer: Inside in character perspective; outside of the event in observer perspective.
(iii) Classifiers: Handle classifiers typical with character perspective; entity classifiers typical with observer perspective.
(iv) SASSes: Large-scale SASSes in character perspective; small-scale SASSes in observer perspective.
(iv) Direction of motion (between referents): Along the sagittal axis in character perspective; along the lateral axis in observer perspective (Perniss 2007: 1316–1317).

Thus, character perspective 'zooms in' on the event, whereas observer perspective 'zooms out'. It is known that signers have flexible zooming in and out of the actions from wider to closer perspective and vice versa (Kubuş 2008).

6.0.5 Role shift and embodiment

Embodiment (referent projection, whole body signs, body part and handle classifier [Morphology – Chapter 5.1]) is the phenomenon whereby the actual signer (i.e. the narrator) of a discourse uses his/her body as one of the interlocutors or agents in the narrated discourse. Thus the narrator's body becomes the locus of the action and movements of some other entity, in other words, the narrator 'becomes' the entity. The narrator not only assumes the role of human participants, but also non-human, and even inanimate ones (hence the idea of body as a classifier, Supalla 1994). Thus, the narrator adopts the narrated character's words, facial expressions, gestures, and attitudes and thus conveys certain pieces of information by expressing it directly (as in adopting an angry face), alongside the possibility of e.g. using the sentence X ANGRY 'x was angry'. The following example is illustrative of embodiment:

> In more performative ASL, or ASL used in storytelling, signers tend to use more referent projections (i.e., body classifiers or whole body signs). For example, a signer might use reference projection to show the demeanor and gait of a man walking and holding a leash, then quickly change the body demeanor to show a dog with front legs walking. It is understood from the quick

sequence that the object at the other end of the man's leash is an animal, but the body does not move from side to side, nor are the signer's legs involved. Instead, the body remains fixed as the hands are used to depict the walking gait of the legs. After the event is expressed on the hands, the following sequence is expressed by the body:

(Man) TORSO-SWAYS. RIGHT-ARM-HANDLING-LEASH (Dog) TORSO-LEANS-FORWARD. ARMS-EXTENDED-OUTWARD-WITH-FISTS-ALTERNATING MOVEMENT.

(ASL, Aronoff et al. 2003: 66)

In embodiment, the signer's head, body, torso, and limbs take over the referent's head, body etc. In other words, the referent is projected to the body of the narrator (see Davidson 2015). Within a single discourse, the referent can switch from one entity to another (e.g. from a cat to a dog). Engberg-Pedersen (1993) notes that older signers use reference projection in DTS more than young signers. Thus, the grammar writer should take this factor into consideration when analyzing embodiment. Embodiment in some instances replaces entity classifiers; for example, the body may act as one of the animate entities in a conversation, rather than expressing them both with entitiy classifiers. The usage varies from language to language.

In other constructions, the body can also be used in other functions, for instance to mark agreement or in classifier constructions (Aronoff et al. 2003); therefore, the grammar writer should be aware of these different syntactic phenomena and their functions.

6.1 Attitude role shift and (in)direct speech

Since attitude role shift is typically used to report utterances, thoughts, or attitudes of other persons, this kind of role shift may share properties with direct and indirect speech in spoken languages. Direct speech is reporting a thought or utterance from the perspective of the person to whom that thought or utterance is attributed. If someone, say John, has said 'I'll never ask her for a favor again' and another person is reporting this to someone else, they can do this by a word-by-word rendition such as 'John said: "I'll never ask her for a favor again".' This is an instance of 'direct speech'. In direct speech, the quoted material is not an integrated part of the sentence and thus not used by the actual speaker/signer but only mentioned. Direct speech may or may not be verbatim, that is, a word-by-word repetition of what John said. In fact, it is generally assumed that no rendition can capture what has been said by a person at a particular moment (e.g. the rendition may not match the accent of that person). The important property here is that the speaker represents the quoted part as what John actually said and it is expected that the quote closely corresponds to the original utterance (Brendel et al. 2011).

Another option to report the utterance of another person is indirect speech. In indirect speech, the quoted material is not mentioned but used by the actual speaker/signer since it is an integrated part of the sentence (see subordination [Syntax –

Chapter 3.2]). As a consequence, the here and now of the original utterance and location has to be adapted to the actual context. The utterance is expressed from the viewpoint of the actual speaker/signer with respect to the time of the actual utterance: 'John said that *he would never ask her for a favor again*'. This shift has morphosyntactic ramifications, which in this case are a change in the pronoun [Lexicon – Chapter 3.7] (referring to John as *he* and not *I*), a change in tense (*would* instead of *will*), and the presence of a syntactic complementizers or conjunctions [Lexicon – Chapter 3.9] (*that*).

In English, the usage of a first person pronoun in a subordinate clause with the complementizer *that* requires its reference to be that of the actual speaker. However, in some spoken languages this does not have to be the case; some languages allow the following: 'John said that I'll never ask her for a favour again', where *I* refers to *John*. Reported speech in such languages has some similarities to attitude role shift in sign languages:

SEE [THAT ARROGANT FRENCH SWIMMER]$_a$ IX-a? YESTERDAY IX-a ANGRY.
'See that arrogant French swimmer? Yesterday he was angry.'

No role shift:
IX-a SAY IX-a WILL LEAVE
'He said that he would leave.'

Role shift:
RS_a_____
IX-a SAY IX-1 WILL LEAVE (ASL, Schlenker 2016a: 15)
'He said: "I will leave."'

The first example without role shift is a typical case of indirect discourse. The matrix subject is a pronoun *IX-a* referring to someone other than the narrator; the same pronoun appears in the embedded clause [Syntax – Chapter 3.2], a pattern that is also found in the English translation. By contrast, in the second example, which is a typical example of attitude role shift, two noteworthy phenomena arise. First, the signer shifts his/her body right before the beginning of the quotation, showing that he/she is adopting the position of the person denoted by locus *a*; this is notated as RS_a (for 'role shift to *a*'s perspective'), followed by a line over all the expressions during whose utterance the signer's body remains rotated. Second, a first person pronoun *IX-1* is used in the embedded subject position; however, it does not refer to the narrator, but rather to the agent of the reported speech act (namely the arrogant French swimmer).

In this section, the grammar writer is advised to:

- Check whether indexicals must, can, or must not shift in attitude role shift and which indexicals belong to which group.
- Describe the distribution and interpretation of speaker oriented (expressive) expressions in the scope of attitude role shift.

- Describe the non-manuals used to mark attitude role shift, the scope of these non-manuals, and their combination. The grammar writer should be aware that some non-manuals may be optional while others are more obligatory (Herrmann & Steinbach 2012). In addition, the grammar writer should check whether attitude role shift triggers a change in the way of signing (for example, to mimic the reported signer).
- Provide a list of verbs that are frequently used to introduce attitude role shift.
- Check whether some sentence types [Syntax – Section 1] or specific expressions must not occur in the scope of attitude role shift.
- Check the interaction between attitude role shift and indirect speech.

6.2 Action role shift

In action role shift, the signer 'enacts' or takes the role of another person (Lillo-Martin 2012). Some of the dimensions along which constructed action takes place are the following:

> Articulation of words or signs or emblems indicates what the character says or thinks; Direction of head and eye gaze indicates direction character is looking; Facial expressions of affect, effort, etc. indicate how the character feels; Gestures of hands and arms indicate gestures produced by the character. (Liddell & Metzger 1998: 672)

Typical characteristics of action role shift are: (i) cases of constructed action are much more ubiquitous than in spoken languages, and because of the expressive means of sign languages much more can be expressed through this type of 'quotation'; (ii) the narration of an event in this way may be the unmarked form in sign languages – at least in some genres/registers (Quinto-Pozos 2007); (iii) sign languages can blend (and linguistically express) the properties associated with the narrator, and the time and place of utterance, with the narrated event, its time, place and agent (e.g. LSC; Quer 2005a); (iv) some components of the role-shifted material are gestural and correspond to elements of the reported action. An example for constructed action is given below:

SEE [THAT ARROGANT FRENCH SWIMMER]$_a$ IX-a? YESTERDAY IX-a ANGRY.
'Do you see that arrogant French swimmer? Yesterday he was angry.'

a. IX-a WALK-WITH-ENERGY(CL(1))
   'He walked away with energy.'
   RS$_a$_____
b. IX-a 1-WALK-WITH-ENERGY(CL(1)) (ASL, Schlenker 2016a: 15)
   'He walked away with energy.'

While both clauses start with the third person pronoun *IX-a*, only in (b) do we see the signer's body rotate, and only in (b) do we see a first person classifier predicate whose subject is understood to denote the French swimmer under discussion. The

action described in (b) does not involve the quotation of any linguistic material and no speech or thought act is involved. In addition, in ASL a full first person pronoun usually does not occur under action role shift. Finally, it appears that iconic elements of the role-shifted clause are understood to be isomorphic to some elements of the action described or reported. Determining which aspects of the action described by action role shift can be 'integrated' is an important challenge in the description of action role shift. The gestural material that can be integrated seems to be confined at least to the upper part of the body, the head, and the face and must be performed within the limits of the signing space. In some accounts (e.g. Davidson 2015) the signer's rotated body serves as a kind of 'person classifier' in role shift, as it allow the signer to iconically represent (or demonstrate) the behavior of another agent.

In this section, the grammar writer is advised to:

- Check whether indexicals must, can, or must not shift in action role shift and which indexicals belong to which group.
- Describe the distribution and interpretation of speaker oriented (expressive) expressions in the scope of action role shift.
- Describe the non-manuals used to mark action role shift, the scope of these non-manuals, and their combination. The grammar writer should especially focus on gestural non-manual components such as change of body posture, head position, and facial expressions.
- Describe the interaction of linguistic and gestural components in attitude role shift.
- Describe the transition between narrator perspective and action role shift.
- Check whether multiple perspectives can be expressed in attitude role shift (i.e. whether different articulators can be used to express different perspectives).

Elicitation materials

The elicitation of role shift can be done by asking informants to report stories, conversations, or occurrences where other people are involved, or to tell fables or other children's stories with two or more animals or personified objects. For the collection of narrative discourse including two or more characters, the grammar writer can use various kinds of modality-neutral elicitation materials such as (i) videos from Silvester and Tweety, (ii) The Pear Stories (http://www.pearstories.org/), (iii) The Frog Stories (Mayer 1969), (iv) the elicitation materials described in Perniss (2007ab) and the Totem Field Storyboards, designed for semantic and pragmatic fieldwork (http://totemfieldstoryboards.org/). For the annotation of attitude and action role shift see Cormier et al., to appear.

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Chapter 7 Expressive meaning

7.0 Definitions and challenges

7.0.1 Expressive meaning

In a discourse [Pragmatics – Chapter 5], a sentence often means more than what is actually said. Generally, the target meaning goes beyond what is actually conveyed by the lexical meaning of words or signs. Moreover, natural language meanings are highly context-dependent: a discourse unit will often take on different values depending on the context in which it is used. This is what is known as *expressive meaning*: the meaning that is conveyed but not actually said, which in many contexts is due to pragmatic enrichment (see also the section on figurative meaning [Pragmatics – Chapter 9]). The following dialogue shows an instance of pragmatic enrichment in

the answer of B. With this answer, B wants A to implicate that he/she cannot go to the cinema because the baby is ill. Instead of giving a direct negative answer, B provides an answer that has the same effect as a negative reply (i.e. by providing a reason for not going to the cinema). This kind of interaction is very frequent in our day-by-day interaction.

A: Do you want to go to the cinema?
B: The baby is sick.

The meaning of all expressions may be divided into two dimensions: the descriptive meaning and the implicated meaning [Pragmatics – Chapter 7.1]. The descriptive meaning of "The baby is sick" refers to the truth conditional content, i.e. whether the baby is sick or not. This dimension is also known as 'what is said' (Grice 1975) or the 'at-issue' content (Potts 2005). The other dimension of meaning forms the implicated meaning ('what is meant') or the 'not-at-issue' content, that is, the meaning not directly included in the morphosyntactic unit but conveyed by the signer with the utterance in context, i.e. that the speaker cannot go to the cinema because the baby is sick.

In an utterance like the one shown below, the descriptive meaning is the regular semantic content of the corresponding syntactic unit used in this utterance. The implicated meaning is the projected meaning not conveyed by the syntactic unit, but triggered in this particular case by the connective (conjunction [Lexicon – Chapter 3.9]) *but*. The use of the connective triggers an expressive meaning that babies are usually not quiet.

Joana is a baby, but she is quiet.
Descriptive meaning: 'Joana is a baby; she is quiet.'
Implicated meaning: 'Usually, babies are not quiet.'

In the following example, the focus particle [Pragmatics – Chapter 4.3.1] *even* triggers the implicature that, according to the speaker, Julia was not expected to pass the test.

Even Julia passed the test.
Descriptive meaning: 'Julia passed the test.'
Implicated meaning: 'Julia was among the least likely to pass the test.'

The next example shows another type of implicated meaning. In this utterance, the implicated meaning is a necessary condition (to be on holidays earlier) in order for the descriptive content to be true.

Martí is still on holidays.
Descriptive meaning: 'Martí is on holidays.'
Implicated meaning: 'Martí was on holidays earlier.'

Three different but related phenomena compose the expressive meaning dimension: (i) conversational implicatures [Pragmatics – Chapter 7.1] / conversational implicatures, (ii) conventional implicatures [Pragmatics – Chapter 7.2] / conventional

implicatures, and (iii) presuppositions [Pragmatics – Chapter 7.3] / presuppositions. Each one is defined and exemplified below.

7.0.2 Analytical challenges

The units that trigger an expressive meaning may be not only language-specific, but they also cut across the different interfaces of the grammar of a language. The most widely studied lexical units, especially in English, are adverbs (like *even*, *only*), connectives (like *but*, *therefore*) and implicative verbs (like *manage*, *continue*, *fail*), among others. At the syntax level, parentheticals and relative clauses have been shown to project expressive meaning. Last but not least, discourse particles, on the one hand, and intonation [Phonology – Chapter 2.3] and prosody [Phonology – Chapter 2], on the other, also participate in conveying some extra meaning.

At present, research on expressive meaning in a particular sign language is still incipient (Herrmann 2013; Schlenker et al. 2013; Davidson 2014). The grammar writer may want to start by looking at the possible units triggering meaning that is not conveyed in the string. Moreover, it will be important to look at the non-manual component and also at the use of signing space [Pragmatics – Chapter 8] as expressive meaning may be derived from these two sign language specific aspects.

7.1 Conversational implicature

Conversational implicatures are closely connected to the conversational maxims and the cooperative principle established by Grice (1975). Conversational maxims are a set of rules that interlocutors generally follow, and expect each other to follow, and without which conversation would be impossible. These rules are embedded in the single overarching cooperative principle; each of the maxims covers one aspect of linguistic interaction and describes what is expected from a cooperative speaker and signer with respect to that maxim. The cooperative principle and the maxims are the following (Grice 1975; Levinson 1983; Meibauer 2006):

Cooperative principle
Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged.

The Maxim of Quantity
1. Make your contribution as informative as is required (for the current purposes of the exchange).
2. Do not make your contribution more informative than is required.

The Maxim of Quality
1. Do not say what you believe to be false.
2. Do not say that for which you lack adequate evidence.

The Maxim of Relevance
Be relevant (i.e. make your contributions relevant).

The Maxim of Manner
1. Avoid obscurity of expression.
2. Avoid ambiguity.
3. Be brief (avoid unnecessary prolixity).
4. Be orderly.

Note that various authors developed and refined Grice's theory of conversational implicatures, typically leading to a systematization and reduction of the maxims (Horn 1984; Sperber & Wilson 1995; Levinson 2000; for an overview see Meibauer 2006).

Let us imagine a context of an office where the secretary leaves the office at 5 p.m. every day. Since this is a fact well known by all the employees, the implicated meaning of B's answer (i.e. that it is (shortly after) 5 p.m.) in the following dialog is related to the topic under discussion and it thus follows the maxim of relevance. However, instead of saying that it is 5p.m., B uses shared known evidence to provide the answer and expects the interlocutor to implicate this the meaning.

A: What time is it?
B: The secretary just left.

In some contexts, signers decide to flout a maxim. When this happens, he/she violates it in such an obvious way that the interlocutor will realize it and the conversational implicature arises. If in a letter of recommendation a professor writes the following sentence, which violates the maxim of quantity and the maxim of manner, the reader will implicate that Dr. X is not a good candidate for the job offer.

Dr. X has a beautiful writing.

One important feature of a conversational implicature is that its contribution to the meaning of the utterance is not truth-conditional. This means that if it turned out that the implicature did not hold, the truth of the statement would not be affected. A second feature is that the implicature is context-dependent: if the context were different, the same sentence might not give rise to the same implicature. Implicatures that are highly context-dependent are called particularized conversational implicatures. By contrast, implicatures that are less context-dependent are called generalized conversational implicatures. The latter are typically related to specific linguistic expressions.

The most distinguished kind of generalized conversational implicature are scalar implicatures, which are often connected to lists of lexical items ordered

by entailment: <some, most, all>, <might, must>, <or, and>. An example is given below. In this context the speaker uses the quantifier [Lexicon – Chapter 3.10.2] / quantifier *some*. In the set of ordered lexical items, *some* is lower in the entailment scale. This means that the speaker did not use *most* nor *all* because in this case the meaning of the utterance would be different. By not using a higher and more specific lexical item on the scale, the conversational implicature that arises is that "Some, but not all, linguists are fun".

Some linguists are fun.
Descriptive meaning: 'Some if not all linguists are fun.'
Conversational implicature: 'Not all linguists are fun.'

In what follows, we present some tests characterizing conversational implicatures. Conversational implicatures are not conventional meanings. Therefore, and unlike conventional implicatures and presuppositions, they can be cancelled. With the use of *most* in the first utterance, the implicature raised is that 'not all linguists are fun', otherwise the speaker would have chosen the quantifier *all* instead of *most*. But the second utterance cancels this projected meaning by adding that it is the case that all of them are fun.

Most linguists are fun. In fact, all of them are fun.
Descriptive meaning: 'Most if not all linguists are fun.'
Conversational implicature 'Not all linguists are fun' is cancelled.

Conversational implicatures can be reinforced. In the example below, the implicature raised is that John has only two cars, no more. The second clause reinforces this meaning.

John has two cars, and no more than two cars.
Conversational implicature: 'John has exactly two cars.'

Conversational implicatures are non-detachable. This means that any way of phrasing the same proposition in the same context will result in the same implicature, as it cannot be detached from the proposition, as shown below.

Perhaps/Possibly/Maybe it is raining.
Conversational implicature: 'It is possible that it is not raining.'

Last but not least, conversational implicatures are calculable. This means that it is possible to work out the implicature based on the literal meaning of the utterance, the maxims, and the context of utterance. Consider the following example. B has uttered this proposition and there is no reason to think that B is not following the cooperative principle. The proposition wouldn't have been relevant unless Peter owns a Toyota and B thinks that Peter may be at Helen's place. Hence, B believes that Peter owns a Toyota and that he is at Helen's place.

A: Where is Peter?
B: There is a black Toyota in front of Helen's place.

In the case of sign languages, and more particularly ASL, scalar implicatures have been tested from an experimental perspective. Recent studies (Davidson 2014; Davidson, Caponigro & Mayberry 2009) have investigated scalar implicatures through participants rating descriptions of situations including one of the following expressions: (a) quantifiers [Lexicon – Chapter 3.10.2], (b) numerals [Lexicon – Chapter 3.10.1], and (c) classifiers [Morphology – Chapter 5]. The latter show interesting modality-specific differences between spoken and sign languages due to the difference in the channel. An example with numerals is given below. Numerals are more consistently rejected in under-informative situations. This means that the inference from (a) to (b) is particularly strong.

a. There are two bowls.
b. There are not three bowls.

In the case of the classifier system use, there is the addition of information about the spatial layout (that is, information on how objects are localized in space). The results of this experiment show that for a prototypical scale like quantifiers and a less prototypical scale like numbers, ASL patterns just like English with regards to scalar implicatures: native signers reject under-informative descriptions more than they reject true sentences, and no significant differences were found between the languages on the quantifier and number scale. Concerning the use of classifiers, there was a quantitatively higher percentage of implicatures drawn based on scales built through listing items and expressed with classifiers. In an empirical study on English and ASL, more ASL signers responded pragmatically than English speakers did, that is they computed the implicature on this scale. For instance, if a picture shown to the subjects contained three different objects, and the corresponding signed sentence was as shown below, the signers considered the description not maximally informative. The localisation of the classifiers in signing space seemed to arise the implicature that 'there were only those two objects' and the description was thus rejected.

THERE CANDLE CL_a GLOBE CL_b (ASL, Davidson 2014)
'There is a candle and a globe.'

The grammar writer should check whether implicatures in the sign language under investigation can be calculated in the same contexts as described for many spoken languages and whether the same kinds of implicatures (particularized, generalized, scalar) can be found. In addition he/she should describe which expressions can be argued to form a scale triggering a specific scalar implicature. And finally, he/she should check whether modality-specific means such as non-manual markers and the use of the signing space are relevant for the description of conversational implicatures.

7.2 Conventional implicature

The guiding intuition for conventional implicatures is that they are entailed by lexical and constructional meanings. Conventional implicatures, like conversational implicatures, are non-truth-conditional (the statement of the utterance is not affected even if the implicature does not hold). But unlike conversational implicatures, they are not context-dependent (in order to hold, they do not depend on the context). Conventional implicatures do not require a calculation based on the maxims and the context; instead they are consistently attached to a particular lexical expression, regardless of the context. Some examples of implicated meaning triggered by a conventional implicature are shown below. In the first example there is a conventional implicature to the effect that there exists some contrast between being huge and being agile, and this is triggered by the connective (conjunction [Lexicon – Chapter 3.9]) *but*.

Eric is huge but agile.
Descriptive meaning: 'Eric is huge; Eric is agile.'
Conventional implicature: '(Roughly) being huge normally precludes being agile.'

Conventional implicatures are conventional precisely because they are conventionally attached to a particular linguistic expression, regardless of the context. Thus, the implicature of contrast associated with *but* cannot be eradicated via cancellation, as shown below.

#Eric is huge but agile, and there is no contrast between being huge and being agile.

Some other elements that trigger conventional implicatures in English are indicated below, in a non-exhaustive list:
- Adverbials [Lexicon – Chapter 3.5]: *almost, already, even, only...*
- Connectives and conjunction [Lexicon – Chapter 3.9]: *but, therefore...*
- Implicative verbs: *manage, stop, continue, fail...*
- Parentheticals: nominal appositives, non-restrictive relative clauses
- Expressives: curses words
- Intonational [Phonology – Chapter 2.3] contours

The grammar writer should take expressions that have been described to trigger conventional implicatures in spoken languages and check whether the corresponding expressions also trigger conventional implicatures in the sign language under investigation.

7.3 Presupposition

The presupposition of an utterance is found in the pieces of information that the signer assumes (or acts as if he assumes) in order for the utterance to be meaningful

in the current context. For instance, in the exemplified utterance below the presupposition is that 'Manel used to call me'. This piece of information is necessary to be assumed for the descriptive meaning to be true.

Manel stopped calling me.
Descriptive meaning: 'Manel stopped calling me.'
Presupposition: 'Manel used to call me.'

Some other elements that trigger a presupposition in English are indicated below, in a non-exhaustive list.

- Implicative verbs: *manage, stop, continue, fail, ...*
- Pronouns [Lexicon – Chapter 3.7] and determiners [Lexicon – Chapter 3.6]: *he, she, the, ...*
- Discourse particles [Lexicon – Chapter 3.11.3]: *even, only, too, also, ...*
- Interrogative clauses [Syntax – Chapter 1.2] and relative clauses [Syntax – Chapter 3.4]

Note that Schlenker et al. (2013) as well as Steinbach & Onea (2016) argue that specific spatial configurations trigger presuppositions, that is, signing space [Pragmatics – Chapter 8] is relevant to express not-at-issue meaning.

Both conventional implicatures and presuppositions are generated by the content of particular linguistic expressions that trigger them. However, the main distinction between the two is the fact that in presuppositions the additional meaning is relevant for the evaluation of the truth of the proposition. As shown in the previous example, there is a previous meaning ('Manel used to call me') that needs to be true in order for the assertion to be true. Just as conventional meaning, neither conventional implicatures nor presuppositions can be cancelled. If they are cancelled, the signer is expressing a contradiction. This is what distinguishes these two phenomena from conversational implicatures, as defined above.

The grammar writer should take lexical expressions and syntactic structures that have been described to trigger presuppositions in spoken languages and check whether the corresponding expressions also trigger presuppositions in the sign language under investigation. In addition, the grammar writer should not also check modality-specific means such as spatial configurations and non-manual markers.

Elicitation materials

As stated at the beginning of the section, work dealing with expressive meaning in sign languages are still scarce. The only available publications, with a good description of the elicitation materials used, are Davidson et al. (2009) and Davidson (2014). These materials or some adaptations may be used as a starting point for research on this topic. Concerning conventional implicatures and presuppositions, the grammar writer should take the expressions that have been described to trigger conventional

implicatures and presuppositions in spoken languages and check whether the corresponding expressions also trigger conventional implicatures and presuppositions in the sign language under investigation. And finally, he/she should check whether modality-specific aspects such as non-manual markers and the signing space can be used to express expressive meaning. The studies described in Herrmann (2013) and Schlenker et al. (2013) are a first starting point for research on this topic.

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Chapter 8 Signing space

8.0 Definitions and challenges

8.0.1 Signing space

The three-dimensional space where the articulation of signs takes place is called signing space. It is generally considered to be constrained to the horizontal and the frontal plane in front of the signer's torso. In some sign languages, pointing signs directed to the back of the signer are also possible but the articulation of the sign does not reach further than the back of the signer's body. It is important to note that this space is not only used for articulatory reasons as the place where the hands and the arms move (analogously to how the tongue moves in the mouth for spoken languages) but, more importantly, it carries linguistic meaning *per se*.

The main principle guiding the use of signing space to express meaning is the association of referents with locations in space. Traditionally, the use of space to achieve referent-location associations has been analyzed as taking two main forms, namely a syntactic and a topographic one. In the syntactic use of space, locations in signing space are chosen arbitrarily. They are abstractly identified with discourse referents and also with the corresponding arguments of the verb. For example, a location *a* in signing space may be associated with the discourse referent 'woman' and a location *b* can be associated with the discourse referent [Pragmatics – Chapter 1] 'man'. These locations in space can be linked to the arguments [Semantics – Chapter 6] / arguments of the verb. By articulating an agreement verb [Lexicon – Chapter 3.2.2] like GIVE with a movement from location *a* to location *b*, the signer is conveying that the woman gives something to the man, as in the example below.

WOMAN IX_{3a} MAN IX_{3b} $_{3a}GIVE_{3b}$ (LSC)
'A woman gives (something) to a man.'

The topographic use of signing space is used to convey the spatial distribution of the objects being described. It exploits the iconic properties of the visual-spatial modality since the actual spatial location of the objects being talked about matches the spatial disposition of locations in signing space. To express a descriptive spatial arrangement such as the English sentence below (mainly expressed with affixes and prepositions in spoken languages), most sign languages make use of classifier [Morphology – Chapter 5] constructions localized in a certain disposition in signing space, as is shown in the still below. This spatial arrangement to convey spatial descriptions in sign language comprises the so-called topographic use.

Topographic use of signing space with LSC classifiers

(LSC)

'The book is on the table.'

8.0.2 Analytical challenges

The use of spatial devices for structuring discourse in signing space has been traditionally assumed to be similar across sign languages since it is likely that the iconic potential in the visual-spatial channel creates a homogenizing effect. However, the study of geographically distant sign languages has contributed to enrich the knowledge of the use of signing space. A distinction that is often made is between so-called urban sign languages (i.e. sign languages used in developed countries, mostly in the Western world) and rural sign languages (i.e. sign languages used in small communities with a high incidence of hereditary deafness, also known as village sign languages (Zeshan 2006a; de Vos 2012) or shared sign languages (Nyst 2012)).

One differential feature between urban sign languages and rural sign languages is the size of the three-dimensional signing space. Some rural sign languages have a reportedly larger articulatory signing space than urban sign languages. For instance, the size of signing space to convey meaning is bigger in KK in Bali, Indonesia (Marsaja 2008), and in AdaSL in Ghana, Africa (Nyst 2007). Another differential aspect concerns the localization of discourse referents in signing space. In rural sign languages, such as KK (de Vos 2012) and ABSL (Sandler et al. 2011), signers use absolute pointings to localize events or non-present third person referents. To localize a person, they utter the corresponding name sign followed by a pointing sign directed towards the actual geographic location frequented by the individual referred to, which is usually that person's house, work place, or patches of farmland (see section on topographic use [Pragmatics – Chapter 8.1.2] below). A final distinctive aspect concerns the frame of reference chosen to convey spatial arrangements within the topographic use of space. As described in the section on perspective [Pragmatics – Chapter 8.3] below, while urban sign languages have a preference for a relative frame of reference, which encode the spatial relationship between a figure and a ground object from a viewpoint, the rural sign languages studied to date have a preference for an absolute frame of reference, which uses conventional absolute relations, like cardinal directions or geographical landmark systems.

The grammar writer should be aware of these differences and try to analyze the sign language under description with respect to those features characterizing his/her sign language.

8.1 Uses of signing space

8.1.1 Abstract use

Signing space may be used abstractly. Within the abstract use of space, locations in signing space are chosen arbitrarily to identify discourse referents. Entities are assigned a particular location in space, which does not have any semantic import. These locations represent purely abstract references and, more concretely, syntactic relations as they are used to represent the arguments [Semantics – Chapter 6] of the verb. This means that abstract locations are movable as they can be shifted without affecting the truth conditions of the sentence. If we have a look at the example (a) below, the discourse referent 'woman' is localized in location *a*, and 'man' in location *b*. However, the same meaning can be conveyed even if we invert the areas were the two discourse referents are localized, as in (b). What is important is that in both examples the articulation of the verb moves from the location established for the subject to the location established for the object.

7_8.1.1_1_LSC_WOMAN IX3a MAN IX3b 3aGIVE3b and 7_8.1.1_2_LSC_WOMAN IX3b MAN IX3a 3bGIVE3a

a. WOMAN IX_{3a} MAN IX_{3b} $_{3a}GIVE_{3b}$ (LSC)
'A woman gives (something) to a man.'

b. WOMAN IX_{3b} MAN IX_{3a} $_{3b}GIVE_{3a}$
'A woman gives (something) to a man.'

Discourse referents in sign languages are associated with spatial locations, which may be further referred back to in co-referential contexts (Klima & Bellugi 1979). Such a spatial location is called 'referential locus' or 'r-locus' (Lillo-Martin & Klima 1990), which have a reference-tracking [Pragmatics – Chapter 2] / reference-tracking function. Once the discourse referent has been introduced and associated with a particular location, this location may be used in further discourse to refer back to the antecedent. This reference-tracking function may be achieved by both pronominal forms and agreement verbs [Lexicon – Chapter 3.2.2]. A corresponding example with a pronominal form referring back to a previously introduced discourse referent is shown below, where the articulation of the third person pronoun is directed to the same location the referent has been established at (see the section on pronouns [Lexicon – Chapter 3.7]).

JOANA IX_{3a} YEAR NEXT IX_{3a} UNIVERSITY PARTICIPATE [several utterances]
IX_{3a} HAPPY (LSC)
'Joana will start the university next year. [several utterances] She is happy.'

This abstract use of space is also productive for reflexive pronouns in the languages that have them. In ASL, reflexive pronouns [Lexicon – Chapter 3.7.4] have a different phonological form, involving a thumb handshape. In NGT, reflexive pronouns have the same form as regular pronouns, that is, with an index handshape. What is important here is that the reflexive interpretation is again obtained with a coincidence in the location in signing space where the noun and the pronouns are localized. The pointing and the reflexive pronoun directed to the same location overtly expresses co-reference [Pragmatics – Chapter 2].

a. JOHN$_a$ LIKE SELF$_a$ (ASL, Sandler & Lillo-Martin 2006: 374)
'John like himself.'

b. BOY IX$_{3a}$ PAINT IX$_{3a}$ (RSL, Kimmelman 2009: 10)
'The boy paints himself.'

Another abstract use of signing space is the use of the frontal plane to denote (non-) specificity [Pragmatics – Chapter 4] and (in)definiteness [Pragmatics – Chapter 1.2], as well as the domain of quantification [Semantics – Chapter 10] of quantifier [Lexicon – Chapter 3.10.2] signs. The former aspect has been described for LSC and the latter for ASL and LSC, too. The frontal (or vertical) plane extends vertically parallel to the signer's body. The upper area of the signing space is the area where non-specific indefinite discourse referents (those entities which are not identifiable by the signer and the addressee) are localized in LSC. As shown in the example below, when the Noun Phrase [Syntax – Chapter 4] is localized in an upper location (as indicated with the subscript u), the interpretation is that the corresponding referent is not known (i.e. non-identifiable) by the signer and the addressee.

IX$_1$ OFFER PEN-DRIVE ONE$_u$ PERSON$_u$ LIKE COMPUTER (LSC, Barberà 2012b: 268)
'I will offer a pen-drive to someone who likes computers (but I don't have anyone in mind).'

As for quantifiers, the frontal plane may be used with an overt quantifier signed increasingly higher (on the upper part of the frontal plane) to indicate increasingly larger domains. Moreover, the frontal area in signing space can express intermediate domain sizes by intermediate placement of the quantifier between low and high planes, as shown below.

a. POSS-1 FAMILY IX-ARC$_{low}$ WEAR CLOTHES (ASL, Davidson & Gagne 2014)
'My family, they all wear clothes.'

b. IX-ARC$_{mid}$ NOT WEAR CLOTHES
'They all (at the nudist colony) don't wear clothes.'

c. IX-ARC$_{high}$ WEAR CLOTHES
'They all (people generally) wear clothes.'

The localization of discourse referents in signing space is a distinguishing feature between rural sign languages and urban sign languages. Abstract locations are not

frequent in the grammar of rural sign languages, where absolute pointings are more common. In KK (de Vos 2012) and ABSL (Sandler et al. 2011), signers use absolute pointings to localize events or non-present third person reference. To localize a person, they utter the corresponding name sign followed by a pointing sign directed towards a geographic location associated to the individual, which is usually that person's house, work place, or patches of farmland. These absolute localizations do not qualify as abstract, and rather tend towards the topographic use described below.

8.1.2 Topographic use

The topographic use of space expresses spatial relations among objects and it is represented by meaningful locations that exploit the iconic properties of the visual-spatial channel. Topographic locations are meaningful by themselves, so a small change in the location affects the truth conditions of the utterance. Space is used to represent spatial arrangements via signed descriptions, and thus the actual spatial relations of signs are significant. Two examples are given in the stills below. The descriptive location in (a) represents a bike leaning against a tree. In (b) the descriptive location represents a person seated on a tree. In both cases the location of the manual articulators is meaningful.

(LSC)

a. A bike is leaning against a tree.

(LSC)

b. A person is seated on a tree.

Spatial information in sign languages is mainly conveyed by classifier [Morphology – Chapter 5] constructions and by placing the classifier handshapes in certain locations in signing space (also with respect to the body of the signer). For instance, in LSC to convey that the book is on the table, an entity classifier will be used to refer to the book and it will be localized above a flat surface classifier representing the table, as shown below.

(LSC)

The book is on the table.

If more than one referent is represented in space, first the backgrounded entity is introduced (the so-called 'ground' in the literature on language and space, e.g. Talmy 1985), and then the smaller entity, which is in the focus of attention (the so-called 'figure'). The particular position of one handshape with respect to the other expresses the spatial relation between referents. This is achieved by virtue of the simultaneous use of the two manual articulators (Perniss 2007ab; Pfau & Steinbach 2015).

There are in particular two contexts in which topographic locations of real-world entities are transferred to signing space. The first one concerns the representation of geographic maps and other geographic information. In such contexts, the cities or regions are localized in an imaginary map transferred into the frontal plane in front of the signer's body. This means that cities, countries, or regions that are in the north are localized in an upper area in the frontal plane; regions in the south are localized in a lower area; regions in the east are localized in an area to the right, and regions in the west are localized in an area to the left of the signing space. The second context concerns the representation of maps or plans of a room. In such a context, the objects or areas are localized in an imaginary map transferred into the horizontal plane (Emmorey, Tversky & Taylor 2000).

Another iconic use of the upper part of the frontal plane is when referring to social hierarchical relations, and more particularly superiority. The contrast between upper and lower frontal plane is associated with asymmetrical relations such as parents-children, boss-worker, professor-student, etc. In such contexts, a location established on the upper part of the frontal plane denotes the individual who is higher in the social hierarchy. This use has been described for LSC (Barberà 2012b; Morales-López et al.

2005), for IPSL (Zeshan 2000), and for ASL (Liddell 1990; Schlenker & Lamberton 2012; Schlenker, Lamberton & Santoro 2013). Definite NPs formed by common nouns such as MINISTRY, GOVERNMENT, BOSS, DEAN, FATHER^MOTHER and UNIVERSITY are generally associated with the upper part of the frontal plane. Also name signs [Lexicon – Chapter 3.1.2] referring to someone higher in the social hierarchy are also associated with an upper R-locus (see also chapter on figurative meaning [Pragmatics – Chapter 9]).

Some rural sign languages have been described as making extensive use of the topographic space, KK among them (Marsaja 2008; de Vos 2012). KK signers use real-world locations instead of establishing abstract locations despite the ambiguities. The sign for a place may be localized differently depending on where the signer is in relation to the corresponding referent. Likewise, Inuit SL uses pointing signs to localize cities (Ottawa) with an absolute frame of reference (Schuit, Baker & Pfau 2011). In Inuit SL the set-up of locations in signing space reflects how the signer experienced the original event described and the discourse is kept as close to the actual situation as possible. The actual locations may be close by, but often they are outside of the community, as seen in the example below, where the signer points towards Winnipeg, which is almost 1500 kilometer south of the community where this sentence was signed, called Rankin Inlet. The absolute frame of reference used in these situations reflects the importance of knowing the relevant directions (Schuit, Baker & Pfau 2011).

NEXT-DAY NEXT-DAY 3aPLANE-FLY3b. WINNIPEG INDEX-LOCwinnipeg
W'pegPLANE-FLY-WITH-STOPS1 HERE (Inuit SL, Schuit, Baker & Pfau 2011: 22)
'In two days, they take a plane that flies them to Winnipeg, followed by the plane from Winnipeg, that flies with some stops to here (Rankin Inlet).'

The main difference between the topographic and the abstract use of space is that while the former conceptualizes the position of the object in signing space, the latter establishes a formal and abstract relationship between the object and the corresponding associated spatial location. Moreover, they are also different from a formal point of view: while topographic uses of space exploit richer and freer sets of locations in the three-dimensional space, abstract uses are composed of spatial planes and fixed trajectories within each plane. Importantly, the two uses of space are not mutually exclusive and one single utterance may combine the two. This is the case with topographic locations that are referred back to further in discourse. For example, a signer could use a classifier [Morphology – Chapter 5] predicate to establish a referent at a certain descriptive location in signing space, for example, a man on a tree, as represented in the figure above. Subsequently, the signer could direct a verb sign, for example, TELL, to the same location, specifying the man as the grammatical object of the predicate (see Liddell (1990: 318) and Perniss (2012: 416), for a similar example). The man is still conceived of as seated on the tree at the time he is told something. In this example, the location associated with the man is both functioning syntactically (i.e. abstractly) and topographically.

8.2 Temporal expressions

Signing space is also used to convey temporal information, both at the lexical level and at the discourse level (Engberg-Pedersen 1993; Brennan 1983; Pfau, Steinbach & Woll 2012a). At the lexical level, tense [Semantics – Chapter 1] is expressed by means of adverbials [Lexicon – Chapter 3.5], which make use of time lines [Morphology – Chapter 3.2.1] / time lines projected in signing space. These time lines are also used at the discourse level. The *basic time line* extends forward from the dominant shoulder and is perpendicular to the signer's body. The reference point for the time line is the signer's body, and the default meaning is deictic [Pragmatics – Chapter 1.1], that is, referring to the time of utterance. In general, in adverbials referring to the past in urban sign languages, path movement proceeds backwards, while in adverbials referring to the future, forward movement is used. The length of the path movement (together with the facial expression) indicates distance in time.

7_8.2_1_LSC_YEAR-TWO-PAST IX1 HOLIDAY GO GREECE

YEAR-TWO-PAST IX_1 HOLIDAY GO GREECE
'Two years ago I went to Greece on holidays.'
(LSC, Quer et al. 2005, http://blogs.iec.cat/lsc/grammar-2/time/?lang=en)

The sequence time line is parallel to the body and extends left to right, representing early to later periods or moments in time. This is the space in which the sequences of temporal units such as hours, weekdays, months, years, and periods are articulated. The directionality of the sequence time line may reflect language culture [Socio-historical background – Chapter 2.3] because the sequence time line in LIU extends right to left (Emmorey 2002a: 111).

7_8.2_2_LSC_TUESDAY, THURSDAY FRIDAY IX1 EXAM

TUESDAY, THURSDAY FRIDAY IX_1 EXAM
'I have an exam on Tuesday, Thursday and Friday.'
(LSC, Quer et al. 2005, http://blogs.iec.cat/lsc/grammar-2/time/?lang=en)

The anaphoric time line [Morphology – Chapter 3.2.1] extends diagonally across signing space. Events [Semantics – Chapter 3] and situations are determined in relation to a point of reference marked along this line. Relations of anteriority are expressed to the left in the diagonal (from the signer's perspective) and relations of posteriority are expressed to the right of the diagonal, with regard to the point of reference. The temporal reference point is thus determined within the narration in the discourse and this is why it is considered anaphoric. It is distinguished, for instance, from the sequence time line because it always includes an established point of reference.

7_8.2_3_LSC_IX1 WANT CHRISTMAS BEFORE FLAT NEW MOVE++.

_____br

IX$_1$ WANT CHRISTMAS BEFORE FLAT NEW MOVE++

'I want to move to my new flat before Christmas.'

(LSC, Quer et al. 2005, http://blogs.iec.cat/lsc/grammar-2/time/?lang=en)

Finally, in order to indicate hour sequences some sign languages may use the frontal (or vertical) plane in front of the signer's body in an alternate manner. This is where the units corresponding to an imaginary clock are placed.

7_8.2_4_LSC_IX1 MUST TAKE-PILL++ TIME 3ipsilateral 6lower 9contralateral

IX$_1$ MUST TAKE-PILL++ TIME 3$_{\text{ipsilateral}}$ 6$_{\text{lower}}$ 9$_{\text{contralateral}}$

'I must take a pill at 3pm, at 6pm, and at 9pm.'

(LSC, Quer et al. 2005, http://blogs.iec.cat/lsc/grammar-2/time/?lang=en)

A rural sign language such as KK does not make use of spatial time lines. Still, when signers refer to temporal expressions they use spatial positions, but in a different way. Because the village lies close to the equator, pointing approximately 90° upwards signifies 'noon', and pointing 180° to the West means 'late afternoon time' or 'six o'clock in the afternoon'. This spatial pointing is based on the position of the sun at the respective time (Marsaja 2008: 166).

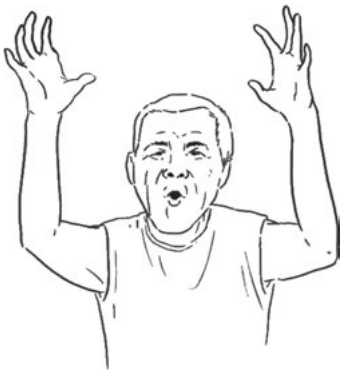
8.3 Perspective

The perspective from which an event is reported bears on the localization of discourse referents in signing space. The way in which signing space is structured depends on how signers project the event being described onto signing space. These representations take two major forms. On the one hand, signers can have an external viewpoint, the so-called *observer perspective*, in which the signer's role is thus that of an observer who can oversee the whole event space, which is mapped in a reduced size onto the space in front of the body. On the other hand, the signer's viewpoint can be within the event. Such an event-internal perspective, called *character perspective*, is achieved by assuming the role of a character within the event (see also role shift [Pragmatics – Chapter 6]). In this way, the character's location coincides with that of the signer and the entities in the event space are mapped onto sign space as they are seen by that character. When using an observer perspective, the signer makes a greater use of entity classifiers [Morphology – Chapter 5.1.1], which contribute to provide an external perspective of the event described. In contrast, when using a character perspective the signer uses more handle classifiers [Morphology – Chapter 5.1.3] that contribute to the internal angle from which the event is described.

Besides the perspective from which the event is described, frame of reference systems are also employed to express the spatial relationship between two objects. Expressions using a relative frame of reference encode the spatial relationship

between a figure and a ground object from a viewpoint, which is typically that of the speaker or signer. An example of such an expression in English is 'The kid is standing to the left of the tree'. With the expression 'to the left of the tree' the position is indicated from the perspective of the viewer. An absolute frame of reference is not based on intrinsic features of the objects, but rather on conventional absolute relations, like cardinal directions or geographical landmark systems. An example of an English expression using an absolute frame of reference is 'The kid is standing to the north of the tree'. Within absolute frames of reference, the expressions are valid regardless of the position of the signer. Last but not least, intrinsic frames of reference make use of conventionalized names given to sides or facets of objects, based on canonical orientation or derived from the internal geometry. This particular spatial relationship is exemplified in English with the following expression: 'The kid is in front of the tree'. In most of the times, a relative frame of reference will be expressed together with an observer perspective, whereas an intrinsic frame of reference will co-occur with character perspective.

Although urban sign language may use the three frames of reference, it has been shown that they predominantly deploy a relative frame of reference (Emmorey 2002; Perniss 2007a). This contrasts with the frame of reference used in some rural sign languages, and especially shown in KK (de Vos 2012), where figure-ground constructions are expressed mostly through an absolute frame of reference and sometimes through a relative frame of reference. The English translation of the KK example below shows that a pointing sign localizes the tunnel being talked about from an absolute frame of reference and using the cardinal direction.



(KK, de Vos 2012: 271)

'There is a huge tunnel, in the south.'

The English translation of the KK example below shows that independently from whether the signer is facing west or facing north, the sentence is signed the same as in the translation. Therefore, a relative frame of reference is used.

(KK, de Vos 2012: 280)

'The truck was going this way, and the motorbike was headed this way. The motorbike was dragged along in this direction.'

As already mentioned, the grammar writer should check whether the sign language under study resembles rural sign languages or urban sign languages. However, as warned at the beginning of this chapter, this classification is not to be taken too rigidly, as some SL may have features from rural SL and some others have features of urban SL. For instance, KK, which lacks verbal agreement (de Vos 2012), uses an absolute frame of reference with pointing signs, while IUR uses an absolute frame of reference with both pointing signs and agreement verbs. It is therefore desirable to review and analyze each aspect according to the features mentioned.

Elicitation materials

The elicitation materials to investigate the use of signing space in a particular sign language should employ, as much as possible, drawings and/or stills together with contexts providing spatial descriptions and directions. The use of contexts will narrow down the amount of possibilities extracted from the narration of the drawings/stills.

Doctoral dissertations and books focusing on signing space contain some stimulus materials and explanations of how to use them. The grammar writer is referred to Arık (2009), Barberà (2012b), Perniss (2007ab), and De Vos (2012).

In addition, the grammar writer can use various kinds of modality-neutral elicitation materials for spatial descriptions such as (i) videos from Silvester and Tweety, (ii) The Pear Stories (http://www.pearstories.org/), (iii) The Frog Stories (Mayer 1969), (iv) the elicitation materials described in Perniss (2007a) and the Totem Field Storyboards, designed for semantic and pragmatic fieldwork (http://totemfieldstoryboards.org/). The L&C Field Manuals and Stimulus Materials may be also useful: http://fieldmanuals.mpi.nl/projects/space-project/

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Chapter 9 Figurative meaning

9.0 Definitions and challenges

Metaphor [Pragmatics – Chapter 9.1] / Metaphor has traditionally been analyzed as a poetic device: it is a linguistic expression in which words are used not in their literal meaning [Pragmatics – Chapter 7], but to refer to some other concepts. In contemporary linguistic analyses, metaphor is viewed as a general cognitive mechanism, which is important for the constitution of meaning of many expressions in everyday language. Lakoff (1993) argues that metaphor is an integral part of the human cognitive system whereby two different concepts can be mapped on each other and one (typically abstract) concept is understood through the other (typically more concrete) concept. For instance, the expression 'He's living on borrowed time' is based on the metaphorical mapping between the concept of time and the concept of money. Another important aspect is that metaphorical meanings may cause systematic changes of meaning such as, for example, in the English future [Semantics – Chapter 1] marker *going to*, which can be traced back to the movement verb *to go*. This line of analysis has also been applied to sign languages (Taub 2001). Many signs referring to abstract notions can be analyzed as metaphorical because they map the abstract concept to some concrete concept, which is then iconically represented by the sign. For instance, the NGT sign UNDERSTAND depicts a grabbing action, so it is based on the metaphorical mapping between grabbing and understanding. Moreover, the concrete concept of grabbing is iconically represented in NGT.

Metonymy [Pragmatics – Chapter 9.2] / Metonymy means that one entity stands for another related entity: a part for a whole as in example (a), a writer for his writing (b), a place for an institution (c), etc. Metonymy is also present in sign languages, where similar constructions are also possible. In addition, metonymy is present in many iconic signs, such as frozen signs based on classifiers. A more general approach to metonymy (Kövecses 2000) suggests that since emotional experience and physical effects of a particular emotion are parts of the same domain, when the physical effect is used to refer to the emotion (*to have cold feet*), this can be seen as an instance of metonymy, too. Within such an analysis, many emotional and cognitive signs can be analyzed as metonymic.

a. She's just a pretty face
b. I read Dostoevsky
c. The White House made an announcement

The grammar writer should be aware of the following methodological challenges:
- It is challenging but important to describe the precise mappings involved in metaphorical signs instead of just giving names to the metaphors (Taub 2001).
- Sometimes it is difficult to distinguish metaphors from metonymies.

– Sometimes it is difficult to understand exactly what concrete concept the sign iconically represents, which would also mean that different metaphoric interpretations can be suggested.

The grammar writer should identify different kinds of metaphors and metonymies used in the sign language under investigation and describe the productive processes underlying these two kinds of systematic meaning transfers. He/she may also give a list of frequent forms of conventionalized metaphors and metonymies. And finally, the grammar writer may investigate the modality-specific influence of iconicity on the metaphor and metonymy and the role of metaphor in language change.

9.1 Metaphor

There are two major views on metaphor. In the traditional analysis metaphor is viewed as a rhetorical device, a property of poetic language. In the more contemporary linguistic analysis metaphor is viewed as a cognitive mechanism responsible for systematic changes of meaning of many expressions in everyday language. The second approach has been proven fruitful when applied to sign languages. In the following sections we discuss the cognitive basis of metaphors, the types of metaphors, and metaphors in the grammar.

9.1.1 Cognitive basis of metaphors

Traditionally metaphor has been analyzed as a poetic linguistic expression in which words are used not in their literal meaning, but to refer to some other concepts. For instance, in the Latin expression *repetitio est mater studiorum* ('repetition is the mother of studies'), the word *mater* ('mother') is not used literally, but to hint on the tight relation between repetition and studying. However, metaphor is not limited to poetic speech but a general property of all natural languages. Many expressions in everyday language are metaphoric as well. For instance, in the following sentence, the word *cross-road* is also not used literally.

We are at a cross-road in our relationship.

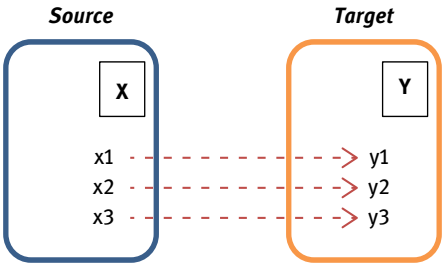
Since the 1980's, many researchers have argued that metaphor is a cognitive mechanism of mapping concepts to each other (Lakoff 1993). In such a mapping usually a more abstract concept is mapped to and understood through a more concrete concept. Therefore, the term 'metaphor' is used to refer to such mappings, while the linguistic instantiations of metaphors are referred to as 'metaphorical expressions'.

The names of metaphors are often formulated in the form of X IS Y. Lakoff (1993: 206–207) gives an example of a metaphor LOVE IS A JOURNEY. This metaphor means

that English speakers map the concept of love with the concept of a journey. This mapping links parts of the concepts with each other, so that the lovers correspond to travelers, the love relationship corresponds to the vehicle, and difficulties in the relationship correspond to impediments in travel. This metaphor is manifested in different metaphorical expressions, such as

a.	We may have to go our separate ways.	(lovers are travelers)
b.	Our relationship is off the tracks.	(love is a vehicle)
c.	The marriage is on the rocks.	(impediments in the journey are difficulties in the relationship).

Consider the following figure illustrating the metaphoric mapping. There are two domains: X and Y, and these domains have elements or participants which are mapped to each other. The domain X could be journey, and the domain Y could be love, and the connected elements could be lovers (y1) and travelers (x1), love (y2), and vehicle (x2) etc. The speaker uses the domain of journey in order to understand the structure of the domain of love. The more concrete domain is called the source (X), and the more abstract domain that is understood in the terms of the source is called the target (Y).



An interesting question is whether the same kind of metaphors can be found in typologically (and culturally) different languages and especially in the two different modalities of language. If metaphors are based on general cognitive principles, we expect that different languages would use similar metaphoric expressions. Research has shown that this is indeed the case for some spoken languages (Gibbs et al. 2004). Research on sign languages has also shown that in many different sign languages, abstract signs are metaphoric in the sense of Taub (2001) and that sign languages use metaphors similarly to each other and to spoken languages (Wilcox 2000; SLS 2005).

Several researchers (starting with Wilbur 1987) have applied this theory of metaphor to sign languages. One common finding is that sign languages rarely have any fixed idiomatic expression consisting of multiple words/signs. In addition, it is not very common for signs to be used in a metaphorical sense. For instance, in Russian the adjective *glubokij* ('deep') can be used metaphorically in the expression *glubokaja mysl'* ('a deep thought'). Unlike the Russian word, the corresponding RSL sign DEEP

can never be used to refer to a thought. The occasional metaphorical usages of signs are often attributable to the influence of the spoken language. For instance, the RSL sign GREEN also means 'young' which parallels the Russian metaphorical use of the corresponding word. However, conceptual metaphors are often instantiated in single signs where abstract notions are mapped to more concrete concepts, which are then iconically depicted. Therefore, the grammar writer should focus on single signs and describe the metaphorical and iconic aspects of these signs.

Consider the following example from Taub (2001). She analyses the ASL sign I-INFORM-YOU (an inflected form of the agreement verb [Lexicon – Chapter 3.2.2] / agreement verb INFORM). The sign contains a movement from the head of the signer to the addressee, and the handshape changes [Phonology – Chapter 1.3.2] from the O-hand to the open hand. Taub argues that this sign is a metaphorical expression based on a metaphorical mapping. Literally, the sign can be interpreted as taking an object from the signer's head and throwing it to the addressee (this is the source domain). This concrete concept is iconically depicted by the sign. In addition, this concept of transferring an object is metaphorically mapped to the concept of information transfer (the target domain). The head is mapped to the mind, the ideas to objects, considering and idea is mapped to holding an object, communication the idea to someone is mapped to tossing the object.

As the example shows, metaphoric signs in sign languages may be iconic in the sense that they iconically depict the concrete concept (source) that is metaphorically mapped to the abstract meaning of the sign (target). Taub (2001) therefore proposes a model that can be used to analyze both iconic and metaphoric signs in sign languages: the Analogue-Building Model of Linguistic Iconicity.

9.1.2 Types and combinations of metaphors

Metaphors are usually mappings between more concrete and more abstract concepts. According to Lakoff (1993), we use metaphor to understand complex contexts in terms of our experience, in particular, our body. Therefore, the most basic (primary) metaphors have an embodied experiential basis (Grady 1997). For instance, Grady (1997) lists the following metaphors: INTIMACY IS CLOSENESS (a), MORE IS UP (b), TIME IS MOTION (c), SIMILARITY IS CLOSENESS (d).

a. We have a close relationship.
b. Prices are high.
c. Time flies.
d. Those colors aren't the same, but they are close.

These metaphors also have instantiations in sign languages. For instance, the NGT sign EXPENSIVE contains a high location, and the RSL sign SIMILAR consists of putting together the index fingers of the two hands.

Another basic class of metaphors (ontological metaphors) is used to conceptualize abstract entities as objects. For instance, when we say 'we are working toward peace', the concept of *peace* is mapped to a concrete object which we could move toward. This type of metaphors is also very common in sign languages. For example, the NGT sign ANSWER uses the baby O-handshape, as if the signer is holding a small object and giving it to the addressee, so the abstract concept of *answer* is mapped to a small object that you can give.

Yet another basic type of metaphor has to do with the fact that emotions are often located in body parts or associated with bodily reactions ('my heart aches for you'). Sign languages use this metaphor as well: for instance, most signs for thought (cognitive verbs [Lexicon – Chapter 3.2]) in RSL are located near the forehead. We return to these metaphors below. For types of metaphors see Lakoff & Johnson (1980).

Sometimes more than one metaphor can be combined in one phrase. For instance, the expression *within the coming weeks* uses the metaphor TIME IS A LANDSCAPE (thus the word *within* can be used) and the metaphor TIME IS A MOVING OBJECT (thus the word *coming* can be used). Similarly, different parameters within a sign can make use of different metaphors. For instance, the RSL sign SAD is located on the chest (and uses the metaphor the CHEST IS THE CONTAINER OF EMOTIONS) and also contains a downward movement (and uses the metaphor UNHAPPY IS DOWN, compare to *I'm feeling down*). Sometimes only one parameter is used metaphorically, while in other signs all parameters participate in a metaphoric mapping.

9.1.3 Metaphors in grammar

According to the cognitive theory of metaphor (Lakoff 1993), metaphors do not only have to do with lexical expressions, but also with grammatical categories. For instance, Lakoff & Johnson (1980) argue that English has a metaphor INSTRUMENT IS A COMPANION, which is manifested in the fact that the preposition *with* is used to refer to instruments (*I sliced the salami with the knife)* and to companions (*I went with her*).

Taub (2001) has argued that metaphorical mapping is responsible for the verbal agreement/verbal agreement. For instance, the ASL verb DEFEAT uses the following metaphors: EFFECTS ARE OBJECTS and EFFECTS MOVE FROM AGENT TO AFFECTED ONE. Thus, although the verb DEFEAT does not refer to the physical transfer, it refers to transfer metaphorically.

9.2 Metonymy

Metonymy is another notion that had been primarily applied to the poetic language, but it is also in fact used in everyday language, both in spoken and in sign languages. In the following sections we discuss the relation between metonymy and metaphor

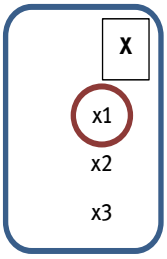
and the modality-specific property of sign languages to refer to body parts to express metaphoric relations.

9.2.1 Metonymy versus metaphor

Metonymy means that an entity stands for another related entity (Lakoff & Johnson 1980). For instance, in the sentence (a), the word *Shakespeare* stands for *the writings of Shakespeare*. The most common type of metonymy is synecdoche, when a part stands for the whole. For instance, in (b), the *face* stands for the person to whom this face belongs. Other typical instances of metonymy are PRODUCER FOR PRODUCT (c), OBJECT USED FOR USER (d), PLACE FOR INSTITUTION (e), etc. The difference between metaphor and metonymy is that the former is used to understand one thing in terms of another, while the latter is used to refer to one thing through another related thing.

a. He likes to read Shakespeare.
b. Here's a new face!
c. He bought a Ford.
d. The buses are on strike.
e. The Kremlin joined the negotiations.

Consider the following figure representing metonymy. In contrast to metaphor, we now only have one domain, X. For example, this is the domain of a car, which includes different aspects: the car's producer, Ford (x1), the car's type, sedan (x2), the car's appearance (x3), etc. When we use the phrase 'I bought a Ford yesterday', we only name one of the aspects of the complex concept of the car, namely its producer (x1), although we refer to the car as a whole. Unlike in the case of metaphor, there is no mapping between the domains, but only a selection of important aspects within one domain to stand for the whole domain.



Metonymy of the type illustrated above is also possible in sign languages. For instance, a signer can refer to an institution or people within the institution by naming the place (e.g. the Kremlin). Sometimes the signer points to a chair where a particular person usually sits to refer to this person.

Furthermore, as Taub (2001) argues, many iconic signs are inherently metonymic. For instance, the RSL sign CAT depicts the cat's whiskers, but this sign is used to refer to the whole cat, not only to the whiskers. Frozen signs based on instrument classifiers are also metonymic: for instance, in the ASL sign BASEBALL the hands only represent holding a bat, but not the bat itself, and not other aspects of the game.

Another domain where metonymy can play a role is locations used for signs related to emotions and cognition. As we discussed above, in RSL many signs referring to emotion are located on the chest, and most signs referring to cognitive actions are located near the forehead. This can be analyzed as metonymy as well, as the chest stands for the locus of emotions, and the head stands for the locus of thoughts. As Taub (2004) points out, sometimes it is difficult to distinguish metaphor and metonymy, and sometimes metaphor and metonymy are combined (see also Deignan & Potter 2004).

9.2.2 Body as metonymy

Kövecses (2000) argues that some metaphoric expressions involving emotional experience can be analyzed as metonymy. He suggests that emotional experience and physical effects of particular emotions are part of the same domain, so when the physical effect is used to refer to the emotion, it can be an instance of metonymy. For instance, the expression *to have cold feet* is metonymic, because the experience of fear is associated with the physical symptom of feeling cold.

If we accept such an analysis, many emotional signs can be analyzed as metonymic, too. For instance, the NGT sign AFRAID depicts the beating heart, and the sign NERVOUS depicts the shaking knees – these are physical symptoms often associated with the emotion of fear or nervousness.

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Chapter 10 Communicative interaction

10.0 Definitions and challenges

10.0.1 Discourse markers

Elements whose meaning is associated with the organization of texts and discourse [Pragmatics – Chapter 5] are frequently labeled discourse markers [Pragmatics – Chapter 5.1]. Discourse markers typically have specific syntactic properties (they occupy, for example, very specific syntactic positions). These elements can have various discourse functions such as structuring/connecting discourse/texts, expressing epistemic modality [Semantics – Chapter 4.1], influencing the relation between signer and addressee and consequently influencing the turn-taking [Pragmatics – Chapter 10.2] process.

10.0.2 Turn, turn-taking signals, and transition relevance place

In this section we briefly introduce some important concepts of communicative interaction that might be relevant to the grammar writer (for sign languages see Baker & van den Bogaerde 2012).

A *turn* describes the period of time in which one or more participants (cf. joined turn-construction, competitive turn-construction) keep the position of speaker/signer in an interaction. A *turn-constructional unit (TCU)* is 'the (or one) key unit of language organization for talk-in-interaction' (Schegloff 1996: 55). A TCU is characterized by the language material which a turn (or a part of a turn until a TRP) is constructed of. *Turn taking* expresses the sequence of allocating the turn between two or more dialogue partners. Turn taking can be marked by specific *turn-taking signals* [Pragmatics – Chapter 10.2.2.3]. A turn-taking signal is a single cue or a bundle of cues that occur at the end of a turn (or co-occur with a turn) and which are used by the dialogue partners to 'take the turn'. These cues are called signals (Sacks et al. 1974; Duncan 1972: 283, 1974: 162, 177), regulators (cf. Ekman & Friesen 1981: 72–102 and Baker 1977

for ASL), or cues – sometimes also devices (Ford & Thompson 1996: 138–139 and Couper-Kuhlen & Selting 1996: 16).

A *transition relevance place (TRP)* is a place in a conversation on which turn taking is possible (Sacks et al. 1974; Schlegloff 1996: 96–99). This place is characterized by specific linguistic markers, which occur at a possible turn end position ('end markers' which in literature are mainly defined as 'turn-taking signals') (cf. Baker 1977; Lackner 2007). At certain positions during a turn a bundle of end markers may occur, signaling a TRP. A turn (or the part of a turn until a TRP) can also be overtly marked, for intance with an intonation contour in spoken languages or a head position (for instance 'head turn forward') in sign languages. If a dialogue partner is taking the turn at a place where no TRP is present, the speaker/signer interprets this as an *interruption* of a turn.

Note finally that current studies on turn taking in sign languages focus on the timing of turn transition between signers (de Vos et al. 2015; Girard-Groeber 2015).

10.0.3 Back-channeling

While listening/following a speaker/signer, the addressee can give response, feedback or confirmative/refusing signals to the turn-holder. In doing so, the addressee is not willing to take the turn. This behavior is defined as back-channeling [Pragmatics – Chapter 10.3].

10.0.4 Repairs

The signer or the addressee can add a contribution during an ongoing conversation in order to repair [Pragmatics – Chapter 10.4], correct, clarify, or comment on the content of a conversation.

10.1 Discourse markers

Discourse markers [Pragmatics – Chapter 5.1] can have different functions in a discourse/text. They can support the organization of a discourse and show discourse coherence, they can express the speakers/signers attitude (see also section on expressive meaning [Pragmatics – Chapter 7]), and they can be used for communicative purposes in order to regulate the interaction between the dialogue partners.

Consider the discourse markers in the two examples below: in both cases the markers are interpreted with regard to their discourse function and not with regard to their (narrow) lexical meaning.

a. ...
t
NOW CL:FISH FISH PRO.3 TRUE STRANGE PRO.3 (ASL, Roy 1989: 449)
'Now, as for the fish, it is truly unique, it is.'
...

b. EXPEND LINK **SIMILAR** SAY YES (French Belgian SL, Gabarró-López 2014)
'It is linked to consumerism as we said, yes ...'

In the (a) example, the sign NOW does not function as a temporal marker (in this function it cannot co-occur with a topic marker), but it is used to introduce the second episode of a discourse. In (b) the sign SIMILAR in French Belgian Sign Language is interpreted in this context as a linking element.

The grammar writer should list in this section the most frequent discourse markers that are used in the sign language under investigation. Since many discourse markers have been developed from other linguistic elements such as focus particles, conjunctions or from co-speech gestures used to structure discourse, the grammar writer may also describe the origin and the ambiguity (or multifunctionality) of such markers (van Loon et al. 2014).

10.2 Turn taking

10.2.1 Types of turn-taking constructions

The sequence of turn taking can show two poles along a continuum. At one extreme we have situations in which only one person can talk/sign in a given period of time while the dialogue partner or the audience listens/watches, before the turn is allocated to another participant in interaction. At the other extreme of the continuum, we have situations in which two or more participants overlap continuously with their turns resulting in a joined turn construction or a competitive turn construction. The following turn-taking patterns are possible:

a. smooth turn taking
b. turn taking with pause
c. overlapping turns

10.2.1.1 Smooth turn taking

Only one participant in a dialogue/discussion has the turn. When finishing the turn, it is allocated to another participant without a pause or strong overlapping of the turns.

Schematic representation of smooth turn taking:

SIGNER 1: SIGN SIGN SIGN
SIGNER 2: SIGN SIGN SIGN

Example of smooth turn taking:

SIGNER 1: YES++ I HOBBY (ÖGS, Lackner 2007: 54)
SIGNER 2: YOU HOBBY PAINT YOU YES++ GOOD PAINT
Signer 1: 'Yes, that's my hobby.'
Signer 2: 'Your hobby is painting.' 'Yes, yes you paint good.'

10.2.1.2 Turn taking with pause

Only one participant in a dialogue/discussion has the turn. A pause follows the turn which might be filled with elements such as YES, WELL, GOOD and so forth.

Schematic representation of turn taking with pause:

SIGNER 1: SIGN SIGN SIGN
SIGNER 2: [PAUSE FILLING MATERIAL] SIGN SIGN SIGN

The following example illustrates turn taking with a pause:

SIGNER 1: ... RIGHT++ PU ...
SIGNER 2: WELL YOU HOW-ARE-YOU WORK PU
Signer 1: '... right.' 'Well, ...'
Signer 2: 'Well' 'And you, what about your work?'
(ÖGS, Lackner 2007: 50)

The example shows that Signer 2 fills the pause with the sign WELL and then, takes the turn by asking the dialogue partner a question.

10.2.1.3 Overlapping turns

For various reasons, it might happen that the dialogue partners talk/sign simultaneous resulting in overlapping turns, illustrated in the following schematic representation.

Schematic representation of joint/competitive turn construction:

SIGNER 1: SIGN SIGN SIGN
SIGNER 2: SIGN SIGN SIGN

There are various possible reasons for overlapping turns. One case is when both dialogue partners may contribute to a dialogue/discussion resulting in a joined turn construction, illustrated in the following example.

The following example is an illustration of a joint turn construction:

+gaze
SIGNER 1: HAPPY FREE NO STRESS (ÖGS, Lackner 2007: 58)
+gaze
SIGNER 2: MY TIME PROCESS FREE PU
Signer 1: 'You can be happy; you're not under stress.'
Signer 2: 'I can allot time freely.'

A rather different case is when the dialogue partners compete for the turn resulting in a competitive turn construction, as illustrated in the following example.

-gaze
WAIT (ÖGS, Lackner 2007: 50)
SIGNER 1: YOU+ SAME GROW-UP---------WHAT
/bbbbb/
SIGNER 2: BUT--- WAIT------------BUT-------NEIGHBOR ...

Signer 1: 'We grow up together. Wait! What?'
Signer 2: 'But - wait - but the neighbors ...'

One characteristic observed in the ÖGS data on turn taking is that in joint turn construction the dialogue partners tend to have more eye contact, while in competitive turn constructions at least one dialogue partner tends to avoid eye contact. This may also occur in other sign languages.

10.2.2 Turn taking signals

10.2.2.1 Different turn-taking signals

The person holding the turn may send various signals to the dialogue partner(s). First, the speaker/signer can send *turn-yielding signals*, showing that the speaker/signer is ready to allocate the turn. Second, the speaker/signer can send *attempt-suppression signals*. These signals show the dialogue partner(s) that the speaker/signer is not willing to pass over the turn. Third, the speaker/signer can show *within-turn signals*, which should evoke feedback/back-channel signals by the dialogue partner(s).

The dialogue partner who is listening/watching the speaker/signer can also send back-channel signals or turn-claiming signals. The former shows that the partner is not willing to take the turn; the latter shows that the addressee is willing to take over the turn (cf. Duncan 1972: 286–288; Baker 1977: 215–217; Baker & van den Bogaerde 2012).

10.2.2.2 Turn-yielding signals

Within this section we focus on *turn-yielding signals*, showing the dialogue partner(s) that a transition relevance place (TRP) is present. Back-channeling [Pragmatics – Chapter 10.3] is described in more detail below. Turn-yielding signals and attempt-suppression signals are not further described as there are no investigations on these signals in sign languages so far.

Investigations on turn taking in sign languages show that various manual and non-manual signals are used to indicate a TRP (cf. among others Baker (1977) on ASL; Martinez (1995) on communication between Deaf Filipinos; Fischer & Jürgensen (2000) on DGS; Coates & Sutton-Spence (2001) on BSL; Lackner (2007) on ÖGS).

10.2.2.3 Turn-taking signals

Sign languages use the following manual markers to mark a TRP: (i) rest positions of the hands (including raising/lowering the hands), (ii) manual elements such as WAVING or TOUCHING, (iii) lexical discourse particles [Lexicon – Chapter 3.11] / discourse particles such as GOOD or FINISH, and (iv) change in speed or size of signs occurring at the end position of a unit. In addition, the following non-manuals may be used to signal a TRP in sign languages: (i) blinks, (ii) change of gaze direction (including keeping eye contact or avoiding eye contact), (iii) head, and (iv) body movements (Lackner 2007). These turn-taking signals are illustrated by the following example.

| | | |

comment on a statement, to give feedback, to clarify a subject/misunderstanding, to complete an utterance, and so forth. Finally, back-channeling signals are also used to show phatic behavior, that is, to show a general social interest in the communicative interaction.

Various manuals and non-manuals are used in sign languages to show back-channeling behavior as illustrated in the following example:

	hn gaze-right	
A: ... YOU	OH-I-SEE	(FSL, Martinez 1995: 285)
gaze-left	m	
B: PRO-I THINK STUDY C-A-P COLLEGE	FINISH PRO-I	

The example of back-channeling in FSL shows that while signer B is holding the turn, signer A is simultaneously producing manual and non-manual behavior. In doing so, signer A is not taking the turn, rather signer A is expressing his/her interest and confirms the turn holder's information. This manual and non-manual behavior can be interpreted as back-channeling.

10.4 Repairs

Conversational repairs are used for various reasons and can show various patterns of correction. Typically, they correct an error while speaking/signing, and they can be implemented either by the turn-holder or by an addressee (Leuninger et al. 2004; Hohenberger & Leuninger 2012). But these repairs can also occur when a signer is not correcting himself/herself, but searching for words/signs. Possible types of conversational repairs found in sign languages are self-initiated repairs, self-completed repairs, other-initiated repairs, other-completed repairs, word-search repairs, and replacement repairs. Manuals as well as non-manuals (e.g. headshakes) are possible means for conversational repairs. Unique to sign languages seem to be repairs that are connected with (signing) space (Dively 1998).

The following example shows a conversational repair characterized by replacing the to-be-corrected phrase by a more detailed explanation of what is meant.

THAT EXACT ONE WEEK – BOMB ONE WEEK LATER (head nod)
'That week – a week after the bombing.' (ASL, Metzger & Bahan 2001: 130)

Elicitation materials

The grammar writer can elicit signals of communicative interaction by asking signers to participate in various communicative settings such as the discussion of controversial topics. In order to record 'natural signed interaction', Lucas et al. (2001), for

example, developed a method that includes Deaf signers of a community to select signers of a specific variety and to guide the recording process. Recommendations for recording and analyzing communicative interaction are to be found in Groebner (2015), Coates and Sutton-Spence (2001), and Lackner (2007). In addition, the grammar writer may use corpus data if available (see, e.g., de Vos et al. 2015).

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Chapter 11 Register and politeness

11.0 Definitions and challenges

11.0.1 What is a register?

Linguistic registers [Pragmatics – Chapter 11.1] / registers describe the relation between the (form of) language that is used by individuals and certain features of the context in which this language is used. The term *register* is used for the kind of linguistic variation that depends on the communicative situation. Every language user "has a range of varieties and choices between them at different times" (Halliday et al. 1964). A specific register is chosen according to a specific communicative situation. The focus is on the relation between specific linguistic features and a specific configuration of features of the communicative situation. According to Halliday & Hasan (1976), the following three dimensions are relevant to describe register: field, mode, and tenor.

Tenor is used to describe the interaction between the participants in a communicating event, and to refer to the participants' ...
- role within the interaction, and
- set of relevant social relations, for example, permanent or temporary status and power.

Mode is used to describe the channel ...
- code, for example, English, ASL, DTS, or mixed codes,
- modality, for example, spoken, written or sign language,
- preparation level, for example, spontaneous or planned, and
- genre and rhetorical mode, for example, narrative, didactic, phatic, persuasive.

Field is used to refer to the total event in which the text or communicating action occurs and includes matter and topic. It answers questions like the following:
- What is happening?
- What is the activity?
- What is the text/communication about?

11.0.2 What is politeness?

Politeness [Pragmatics – Chapter 11.2] / Politeness has been defined in different ways:
- "a battery of social skills whose goal is to ensure everyone feels affirmed in a social interaction" (Foley 1997)
- "the expression of the speakers' intention to mitigate face threats carried by certain face threatening acts toward another" (Mills 2003: 6)
- "the means employed to show awareness of another person's face" (Yule 1996)

In the study of politeness, it may be helpful to use the term *face* introduced by Goffman (1955, 1967) and expanded by Brown & Levinson (1987). *Face* is the sociolinguistic term for the public self-image that every individual tries to protect. *Positive face* refers to our self-esteem. Positive face is our desire to be liked, admired, ratified, and positively related to. Ignoring someone would threaten his/her positive face. *Negative face* refers to our freedom to act and can be characterized by our desire not to be imposed upon or treated as inferior. Saving our face is our way to avoid that others or ourselves are disgraced or humiliated. It implies that we will not be disrespectful to others in public, and that we take preventive actions so that we will not lose face in the eyes of others.

11.1 Register

Variation according to register can be registered at multiple levels of a language:
- Phonological variation, for example, differences in signing space [Pragmatics – Chapter 8], duration of signs, role shift form, and amount of assimilation
- Lexical and morphological differences, for example, the amount of iconicity and non-manual marking
- Syntactic differences, for example, the amount of topicalization [Syntax – Chapter 4.3.3.3] and the use of lexical discourse markers / discourse particles [Lexicon – Chapter 3.11.3]

Most research on register variation focuses on settings that differ according to the formality scale (what is also called style differences), but other differences in the communication settings may also prompt variations in the register, for example, shouting/whispering, persuading/orders, deaf signers communicating with deaf signers/ deaf signers communicating with hearing signers etc.

The International Organization for Standardization (ISO) has defined standard ISO 12620 on Data Category Registry and can serve as a guide on exploring register:
- bench-level register
- dialect register
- facetious register
- formal register
- in house register
- ironic register
- neutral register
- slang register
- taboo register
- technical register
- vulgar register

The grammar writer should identify and list manual and non-manual properties of different registers at the lexical, syntactic, and discourse level. It may be helpful to start with a comparison of informal with more formal registers since data elicitation seems to be easier in this case (for sign languages see Baker & van den Bogaerde 2008, 2012).

11.2 Politeness

What are considered face-threatening actions differs from country to country, culture to culture, language to language, and even from situation to situation, and so do face-saving strategies. In ASL, it is impolite to impair communication, for example, to hold someone's hands to stop some signing or to turn your back on somebody while he/she is signing. Strategies to mitigate this behavior can be using signs such as TIME-OUT in the following example.

TIME-OUT ('short break') (ASL, Hall 1989)

Mindess (2006) describes strategies in ASL that are used to avoid being impolite when passing between two individuals who are signing: just walking right through and trying not to attract attention, perhaps signing 'excuse me' with a very tiny articulation (Pfau et al. 2012: 503–504).

Hoza (2007: 141ff) has identified non-manual markers in ASL that are associated with politeness strategies, for example, tight lips which appears to be a general default politeness marker for most requests of moderate imposition and which has both involvement and independence function (Baker & van den Bogaerde 2008, 2012 ; Pfau et al. 2012: 504).

An interesting aspect is that Deaf cultures [Socio-historical background – Chapter 2.3] can be very different from the surrounding culture(s) of the hearing community. What may be impolite in the hearing culture and the respective spoken language, may be acceptable in a sign language used in the same country and vice versa. Hoza (2007) found that negative face (to be independent, not to be imposed on) is more important for hearing Americans than positive face (to be approved, to be involved), whereas the Deaf American community seems to value positive face over negative face. This difference in politness between the two communities is reflected in various linguistic politeness strategies.

Saving face strategies also involve avoiding taboos. Subjects, which are considered taboo as well as other face issues, differ from culture to culture, and must be explored for each language.

The grammar writer should identify manual and non-manual strategies of politeness at the lexical, syntactic, and discourse level. He/she should focus on specific lexical items used to express politeness or distance, on indirect speech acts, specific non-manual (prosodic) markers, and other face-saving strategies. The grammar

writer may also compare the strategies used in the sign language under investigation to strategies used in the spoken language of the surrounding hearing community.

Elicitation materials

Hoza (2007) is a broad cross-linguistic empirical study on politeness in English and ASL. The grammar writer should use the elicitation materials as a starting point for his/her own empirical investigation. Further elicitation materials can be found in the framework of empirical intercultural pragmatics. A helpful tool is the Discourse Completion Test (DCT) developed in the Cross-cultural Speech Act Realization Project (CCSARP), cf. Blum-Kulka & House (1989) and Blum-Kulka, House & Kasper (1989).

Grein (2007) offers a broad comparative empirical study on directives and denials in German and Japanese. Finally, relevant studies published in the *Journal of Politeness Research* and the *Journal of Pragmatics* can also be used as a source of inspiration for the grammar writer. For the description of register variation, the grammar writer may also use corpus data if available.

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Glossary

Action role shift
Also called constructed action, action role shift is a construction where the signer takes the role of another character. Under action role shift, the signer may shift his/her body toward the position associated to the character and his/her facial expressions indicate how the character feels and his/her gestures reproduce those produced by the character.

Adjective
An adjective is a lexical element that typically specifies a property and that can modify a noun (e.g. *clean*, *red* in English).

Adjunct
An adjunct is an optional constituent that is not selected by any other word present in the sentence. Rather, an adjunct is attached to some other constituent of the sentence, modifying its meaning. As such, adjunct is opposed to argument. An adjunct can be a word or a phrase (including clauses). For example, in the sentence "Ada left quickly at five because she was tired", 'quickly' is an adverbial adjunct; 'at five' is a PP adjunct (or an adjoined prepositional phrase), and 'because she was tired' is an adjoined clause. Besides their category, adjuncts are also distinguished according to the constituent they attach to. For example, the sentence 'Ada prefers to look at boys with glasses' is ambiguous due to the constituent the PP adjunct 'with glasses' is attached to. It can either be attached to 'boys', or to some larger constituent including the verb.

Adposition
Prepositions and postpositions, together called adpositions, are a class of words expressing spatial or temporal relations or marking semantic roles. They typically combine with a noun phrase or a pronoun. A preposition comes before its nominal complement; a postposition comes after its complement. In sign languages an adposition marks the (usually spatial) relation between two items.

Adverbial
An adverbial is a constituent that is simplex or complex in form and that functions as an adverb; sometimes used interchangeably with simplex adverb.

Affirmative sentence
An affirmative or positive sentence is a declarative sentence used to express the validity or truth of a basic assertion. As such, it is opposed to a negative sentence. This dimension is often referred to in grammar as polarity.

Affixation/affix
Affixation is a word formation process by which a base (a stem or root) is extended by additional bound material; the items attached in this way are called affixes, they may come before or after a base, break up the base, or appear suprasegmentally.

Agreement
Agreement is an asymmetric relation between two or more constituents, by which one inherits the formal features of the other. For example, in the sentence 'Girls now are moving forward', the copula BE agrees with the subject 'girls' in number (plural) and person (third). This syntactic relation is morphologically expressed in English through verbal inflection, hence the form 'are'. In sign languages, agreement is often expressed through spatial modification.

Agreement verb
An agreement verb is a verb that is lexically defective (i.e. unspecified for one phonological feature) in that it requires syntactic agreement with a person or a locus to be realized.

Alignment
Alignment refers to the temporal coordination of different articulations; e.g. alignment of a non-manual marker with a string of signs, or alignment of various non-manual markers with each other.

Allomorph
Allomorphs are affixes or stems that are identical in meaning but have different phonological forms and are in complementary distribution; allomorphs are variants of the same morpheme.

Allophone
Variants of the same underlying phoneme that are either in complementary distribution or in free variation.

Anaphora
Expression that is referentially dependent on another expression previously mentioned in the context (i.e. the antecedent). In the following example, the pronoun *he* is co-referent with the antecedent *a man*: 'Mary saw *a man*. *He* was walking home.' Typical anaphoric expressions are pronouns or definite noun phrases.

Antecedent
The antecedent is the expression an anophora is co-referent with, i.e. the anaphora refers back to the referent of the antecedent.

Argument
An argument is a constituent that completes the meaning of a predicate. Most predicates take one, two, or three arguments. For example, the verb 'to run' takes one argument (the subject, as in 'Ada runs'); the verb 'to destroy' takes two arguments (the subject and the object, as in 'the typhoon destroyed the beach'); the verb 'to send' takes three arguments (the subject, the object and the indirect object, as in 'Ada sent a present to her brother'). Arguments are often associated to verbs, but other syntactic categories can take arguments as well, or select them. For example, the noun 'destruction' can be said to select two arguments, as in 'the destruction of the beach by the typhoon', or the Adjective 'proud' can be said to select two arguments, as in 'Nico (is) proud of Ada'. Arguments must be distinguished from adjuncts, which are never selected and thus optional.

Argument structure
Argument structure refers to the syntactico-semantic frame of predicates (typically verbs, but also nouns, adjectives or prepositions) and indicates the participants in the action or state denoted by that predicate. Argument structure typically includes the number of arguments a lexical item takes (e.g., the participants in the event denoted by a verb), their syntactic category, and their semantic relation to this lexical item.

Article
An article (or determiner) is a functional element that combines with nouns and that specifies features such as number, gender, definiteness, and closeness/distance (e.g. *the*, *a*, *that* in English).

Aspect
Aspect describes the internal temporal structure of an event or situation as reflected in a sentence or verb (e.g. repeated occurrence of an event).

Assimilation
Assimilation is a phonological process whereby the form of a phoneme is influenced by properties (features) of an adjacent phoneme; if the source of assimilation precedes the target, we speak of progressive assimilation, if it follows the target, we speak of regressive assimilation.

Atelic
Atelic eventualities do not contain an end point as part of the event description.

Attitude role shift
Attitude role shift, also called constructed discourse, is a construction where the signer reports utterances or thoughts of another person (the character) and typically does so by rotating his/her body toward the position associated to the character. Attitude role shift is usually accompanied also by a change in head position and eye gaze.

Auxiliary
An auxiliary is a semantically weak verb that combines with a lexical verb and expresses grammatical features like tense, aspect, and agreement (e.g. *have* and *be* in English); the lexical verb usually appears in a fixed (e.g. infinitival or participial) form.

Back-channeling
Back-channeling is a discourse strategy by which an addressee provides feedback without interrupting the speaker's/signer's flow; back-channel signals can be manual/vocal (e.g. *hmmm*) or non-manual (e.g. head nod).

Blend
A blend is a word formation process by which two otherwise independent stems or words merge by losing some of their phonological features to form a new item with a new meaning, e.g. English *smog* is a blend of *smoke* and *fog*.

Borrowing
Borrowing refers to the integration of a lexical item or expression from one language into the lexicon of another language (e.g. German borrowing English *computer*); borrowed elements may undergo certain phonological changes.

Boundary marker
A boundary marker is a linguistic signal that marks the start or end of a (mostly syntactic or prosodic) domain; can be manual or non-manual.

Buoy
A buoy is a sign articulated by the non-dominant hand, which may be held in space while the dominant hand continues signing; a buoy may be referred to (e.g. pointed at) by the dominant hand.

Calque
A calque is an item which in its entirety, or part-by-part, is borrowed directly from the donor language; Calques are verbatim translations of simplex or polymorphemic forms and are modeled on the constructions of the donor language.

Causative
A causative is a construction that indicates that an agent causes someone or something to do or be something, or causes a change of state. Prototypically, it brings a new argument, the causer, into a clause, with the original subject becoming the object, as in 'John makes Mary cry' vs. 'Mary cries'. All languages have ways to express causativization, but they differ in the means they employ. Many have lexical causative forms, such as English 'raise' vs. 'rise'; Other languages have morphological inflections that change verbs into their causative form. Other languages, and sign languages among them, employ periphrasis with the use of an auxiliary.

Citation form
A citation form is the basic form referring to the dictionary entry of a lexeme. As lexemes are abstract objects, citation forms make it possible to refer to a lexeme.

Classifier
Generally, a classifier is a morpheme that reflects certain semantic properties of a referent; for sign languages, a classifier is a visually motivated (iconically based) lexical/grammatical category, mostly a handshape that combines with certain types of predicates.

Classifier construction
A classifier construction is a complex sign that encodes information about spatial localization and (manner of) motion and that is part of the non-core lexicon.

Classifier predicate
A classifier predicate is a complex predicate made up of a classifier and a verb.

Clause
A clause is the smallest grammatical unit that can express a complete proposition (i.e. a statement that can be either true or false). Typically, it consists of a subject and a predicate, which in turn is prototypically a verb phrase, a verb and its internal arguments.

Cliticization
Cliticization refers to a process whereby a functional element phonologically attaches to a lexical element such that a single prosodic word is created (e.g. English *can't* and French *j'aime*); the functional element is referred to as a clitic.

Coalescence
Coalescence refers to a special type of cliticization; most commonly, cliticization of an indexical sign to a preceding symmetrical two-handed sign, such that a single prosodic word is created.

Code-switching
Code-switching refers to a (usually bilingual or multi-lingual) language user's switching between two languages or registers during communicative interaction.

Coherence
Coherence is the semantic continuity of a text or discourse which is determined by semantic and conceptual relations between its parts.

Cohesion
Cohesion are grammatically realized relations in a text or discourse that are used to explicitly link different parts of discourse. Cohesive devices make it possible for the addressee to keep track of the discourse referent.

Common noun
A common noun is a noun that denotes a class or type of entity; a common noun can be a count noun (e.g. *book* in English) or a mass noun (e.g. *rice* in English).

Comparative/comparison
Comparison introduces orderings between two or more objects with respect to the degree to which they possess some property. In the prototypical case, a comparison involves two objects that are explicitly expressed ('John is taller than Mary'). However, comparison can be more implicit (in 'John is tall' John's height is evaluated with respect to a contextually determined degree of tallness). Many languages have one or more syntactic constructions specifically encoding a comparison.

Complement clause
A complement clause, or object clause (also called completive) is a subordinate argument clause carrying the syntactic function of an object, as 'that she would do it' in 'Ada promised that she would do it'.

Complementizer
A complementizer is a functional word or a particle introducing a subordinate clause, such as *that* in English as in "John knows that he is lucky." It is often abbreviated as C.

Complex movement
A complex movement is a movement composed of a change in more than one phonological parameter (e.g. simultaneous change of location and handshape).

Compounding/Compound
Compounding is a word formation process by which two otherwise independent stems or words come together to form a new item with a new meaning; the result is a compound.

Conjunction
A conjunction is a functional element that links phrases, clauses, or sentences; coordinating conjunctions (e.g. English *and*, *but*) have to be distinguished from subordinating conjunctions (e.g. English *that*, *because*).

Constituent
A constituent is a word or a group of words which function(s) as a single unit within a given syntactic structure. The constituent structure of a sentence can be identified using constituency tests. Typical constituents phrases that can be distinguished according to their category in noun phrases (NP), verb phrases (VP), Adjectival phrase (AP), Adverbial Phrase (AdvP) and the like.

Constituent negation
Constituent negation refers to a type of negation whereby a constituent smaller than the clause is negated, e.g. negation of the verb in *I didn't steal the book, I borrowed it*.

Contact (in the sense of language contact)
Language contact refers to the circumstances determined by two language communities living side-by-side that allow linguistic patterns and words from one to be used in the other.

Contact (in the sense of phonology)
Contact refers to an articulator physically touching another articulator, a body part, or the torso, or the appearance of an articulator in a location.

Context
The context of an utterance consists at least of the speaker, the addressee, the time and the place of the utterance. Broader definitions of context may also include information about the previous discourse and the communicative situation, shared background knowledge and shared world knowledge among other kinds of information.

Contralateral
Contralateral refers to a location/area on the side opposite of the active articulator.

Control verb
The term control refers to the constructions in which the understood subject of a non-finite embedded clause is determined by some expression in the main clause.

Control verbs (such as promise, order, try, ask, tell, force, yearn, refuse, etc.) obligatorily determine which of their arguments in the main clause controls the embedded clause. Some of them qualify as subject control verbs. 'Promise' is an example, as in 'Ada promised to leave', where the understood subject of 'leave' is obligatorily interpreted as the main subject. Some are object control verbs. An example is 'order', in 'Ada ordered Auguste to leave', where the understood subject of the infinitive is obligatorily interpreted as the object of the main verb, 'Auguste'. Arbitrary control occurs when the controller is understood to be anybody in general, as in 'Running is good for health'.

Conversion
Conversion (also called zero affixation) is a category-changing process, where the input and output categories are phonologically identical, i.e. where there is no overt affix that bears the information of category change (e.g. *walk* (N) and *walk* (V), *put* (present tense) and *put* (past tense) in English).

Coordination
Coordination is a non-hierarchical combination of at least two constituents belonging to the same syntactic category, such as noun phrases, verb phrases or clauses, either through conjunction or juxtaposition.

Copula
A copula is a word used to relate the subject of a sentence with a non-verbal predicate, such as the word 'is' in the sentence 'Ada is nice'. It is often a verbal element, but it can also be pronominal in nature or suffixal. Many languages have one main copula, others have more than one, and some (including many sign languages) have none.

Correlative
Correlatives are conjunctions that are separated in a sentence but coordinate the constituents they introduce, which have thus the same function. Examples of correlatives in English are. 'both… and', or 'either ..or'. The same term can also be used to refer to the constituents themselves that are coordinated in a correlative structure. For example, 'Ada' and 'Maya' are two correlative noun phrases in 'Both Ada and Maya love to play'. Similarly in 'Either you call or you write a letter", the two clauses can be referred to as correlative clauses. Correlative constructions can also be found in some languages as the functional equivalent of relative clauses: 'the boy was late, that boy called' meaning 'The boy who was late called'.

Co-speech gesture
A body movement, executed by the hand(s) or another body part, that accompanies speech, often to illustrate, supplement, or accentuate the message conveyed in speech; e.g. pointing gesture, thumbs-up gesture, headshake, shrug.

Count noun
A count noun is a noun that can appear in the plural and that may combine with numerals like *three* but not with quantity expression like *much* (e.g. *book*, *horse*).

Declarative
Declaratives are the most common type of sentences in any given language. They are used to express statements, to make something known, to explain or to describe. As a sentence type, they are usually opposed to interrogatives, imperatives and exclamatives. The corresponding declarative force is specialized to provide new information. Declaratives are typically used to realize assertional speech acts.

Definiteness/Indefiniteness
Definite expressions are noun phrases that denote referents that have the property of being unique ("The book is on the table", where there is just one relevant book in the context of utterance) or the property of being familiar both to the signer and to the addressee. Indefinite noun phrases denote referents that are not known to the signer but can be known to the addressee.

Deixis
Deixis is a strategy to refer to objects present in the actual context of utterance. Deictic expressions can refer to concrete entities ('I', 'you', 'that (one)') as well to the spatiotemporal coordinates of the context of utterance ('here', 'now', 'yesterday').

Demonstrative
A demonstrative is deictic word (a type of determiner) that specifies which entity a speaker refers to and distinguishes this entity from others; they may e.g. be used for spatial deixis (e.g. English *this* vs. *that*).

Deontic modality
Deontic modality refers to the speaker's attitude towards the possibility or necessity of an event, embodied in the notions obligation, permission, prohibition, wishing, desiring, etc.

Derivation
Derivation is a lexical word formation process that creates a new lexeme, mostly by combining a stem and an affix.

Derivational affixation
Derivational affixation is a type of affixation whose function is to create a lexeme associated with an already existing lexeme (e.g. *-er* in *swimm-er*); derivational affixation contrast with inflectional affixation which exists solely for grammatical purposes (e.g. agreement morphology).

Determiner
A determiner (or article) is a functional element that combines with nouns and that specifies features such as number, gender, definiteness, and closeness/distance (e.g. *the*, *a*, *that* in English).

Discourse
A discourse is formed by a sequence of logically united utterances, which are also connected to the context.

Discourse marker
Discourse markers are cohesive devises between two utterances (such as connectors or discourse particles) that establish coherence.

Discourse structure
Discourse structure describes the relations between grammatical elements and their effects beyond the sentence level.

Ditransitive
A ditransitive verb is a verb which takes a subject and two objects corresponding to a theme and a recipient. These objects may be called direct and indirect, or primary and secondary. An example of a ditransitive verb in English is 'send', as in 'Ada sent a letter to her friend'.

Domain marker
A domain marker is a phonological signal that spans over an entire prosodic or syntactic domain; can be manual or non-manual.

Dominance reversal
In a dominance reversal, a signer uses his non-dominant instead of his dominant hand for signing; a dominance reversal may be phonologically (e.g. articulatory constraints) or pragmatically motivated.

Dominant hand
The dominant hand is the preferred hand of a signer, i.e. the hand s/he would normally use to articulate one-handed signs.

Doubling (syntactic)
Syntactic doubling refers to the repetition of a morpho-syntactic constituent within a sentence; e.g. doubling of a wh-sign.

Dual
One of the values of the feature number that indicates 'two' of an entity.

Ellipsis
Ellipsis refers to the omission from a clause of one or more words that are nevertheless understood in the context of the remaining elements. There are numerous distinct types of ellipsis, according to the nature of the omitted constituent and to the syntactic context where it occurs. Some of the most common types are briefly described below.

Gapping occurs in coordinate structures: material that is present in the first conjunct can be omitted, i.e. 'gapped', from the second conjunct. The gapped material usually contains a finite verb, as in 'Nico plays the piano and Phil the trumpet'.

VP ellipsis omits a non-finite VP. The ellipsis site must be introduced by an auxiliary verb or by the particle *to*, as in 'Phil played today, and Ada will tomorrow'.

Sluicing elides everything from a direct or indirect question except the question word, as in 'Ada will call someone, but I don't know who'.

Embedded clause
An embedded, or dependent, clause is a clause that is dependent from another clause in a given sentence. It can be an argument clause or an adjunct (or adverbial) clause.

Embodiment
In the context of role shift, embodiment is understood as a phenomenon whereby the actual signer (i.e. the narrator) of a text or discourse uses his/her body as one of the interlocutors or agents in the narrated discourse.

Entity classifier
An entity classifier (also called whole entity or semantic classifier) is a classifier (handshape) which reflects shape properties of the subject of an intransitive clause (e.g. a car moving).

Epistemic modality
Epistemic modality refers to the speaker's belief or knowledge about an event, embodied in the notions of knowing, believing, assuming, etc.

Ergativity
Ergativity refers to a system of marking grammatical relations in which intransitive subjects pattern together with transitive objects, and differently from transitive subjects. Ergativity may be manifest, for example, in terms of morphological case marking on nominals, or patterns of agreement on the predicate. An example of an ergative language is Basque.

Event structure
Event structure or situation type refers the internal temporal structure of eventualities and it is also known under other denominations like Aktionsart, actionality or inner aspect.

Evidentiality
Evidentiality is a grammatical category used to mark the source of information. Evidential markers typically distinguish between the following sources of information: (i) visual, (ii) sensory, (iii) inference, (iv) assumption, (v) reported and (vi) quotative.

Exclamative
An exclamative is a grammatical form specialized to convey surprise, denoting that all or some part of the utterance is unexpected, as in 'What a beautiful day!'. It is one of the four well-recognized sentence types, together with declaratives, interrogatives and imperatives. The corresponding exclamative force is specialized to convey a surprise. Declaratives are typically used to realize assertional speech acts. Unlike the other assertions, questions or commands, exclamations are expressive speech acts that are not used to ask the speaker to do something.

Exhortative
An exhortative construction is a construction used to express an order or an invitation including other participants other than the addressee, and typically the first and third person ('Let us go!').

Existential clause
An existential clause is a clause that refers to the existence or presence of something. Examples in English include the sentences 'There is bread in the kitchen' and 'There are three pencils on the desk'. Many languages form existential clauses without any particular marker, simply using forms of the normal copula, the subject being the noun (phrase) referring to the thing whose existence is asserted.

Expressive meaning
Expressive meaning is the meaning that is conveyed but not actually said, i.e. expressive meaning is typically due to some kind of pragmatic enrichment. Expressive meaning does not contribute to the truth-conditional meaning of an utterance.

Extended exponence
Extended exponence is a concept related to morphology whereby two markers occurring in different places in a word or phrase belong to the same morpheme; i.e. two separate units realizing a single function.

Extraction
Extraction refers to any syntactic operation responsible for the displacement of a word or a constituent from the position within a larger constituent where it is interpreted. For example, we can say that 'who' is extracted from the object position of the embedded clause in 'Who do you think Ada will call?'.

Extraposition
Extraposition is a mechanism of syntax altering word order in such a manner that a relatively "heavy" constituent appears in a position other than its canonical position, usually to the right. The relative

clause 'which was addressed to Ada' is extraposed in the following sentence: 'A letter arrived yesterday which was addressed to Ada'.

Fingerspelling
Fingerspelling refers to the use of handshapes from the manual alphabet to represent (part of) a word, often because no sign exists for the concept; in fingerspelled sequences certain reduction and assimilation phenomena may occur.

Finite clause
A finite clause is a clause with a finite verb.

Floating quantifier
A floating quantifier is a quantifier that is not immediately adjacent to the NP it quantifies. French 'tous' (all) in 'les étudiants ont tous lu ce livre' (the students have all read this book) vs 'Tous les étudiants ont lu ce livre' (all the students have read this book) is an example.

Focus
A focus is an item that is presented as a new piece of information in the context of utterance. Entire sentences can be a focus, for example when they are used as opening lines in a conversation. In other cases, only a part of the sentence is new information, for example the constituent *War and Peace* is a focus in the following question-answer pair: "Which book did you read? I read War and Peace". Focus can be contrastive or emphatic, as the constituent *Anna Karenina* in the sentence "I am not reading War and Peace, I am reading ANNA KARENINA".

Free relative
A free relative clause is a relative clause not containing any (overt) antecedent, or head, as 'what you will read' in 'I will read what you will read'. In many languages, free relatives are introduced by a wh-element, as 'what' in the English example.

Functional element/category
A syntactic category that has grammatical meaning rather than lexical or encyclopedic meaning and that fulfills a syntactic function (e.g. negation, tense, number).

Gapping
Gapping is a type of ellipsis occurring in coordinate structures: some material that is present in one conjunct is omitted, i.e. 'gapped', from the other conjunct. The gapped material usually contains a finite verb, as in 'Nico plays the piano and Phil the trumpet'.

Gender
Gender is a grammatical (morphosyntactic) category that classifies nouns in terms of their (real or assumed) semantically shared properties in some languages; in others, the classification can be somewhat arbitrary.

Gloss
Explanation/rendering of a morpheme or word in a text by means of providing a literal translation in another language.

Grammatical function
Grammatical function refers to the syntactic role of a constituent in a given syntactic structure, such as subject or object. It is independent from the category of that given constituent and rather depends on its position in the structure.

Grammatical word
A grammatical word is a free form composed of a root and morphosyntactic features (inflection), which enables it to be used in a syntactic context; the morphosyntactic features can have overt expressions, or they can be phonologically null.

Grammaticality judgment
A grammaticality judgment is a metalinguistic assessment of the acceptability of a given utterance by a native speaker. Grammaticality judgments are typically used in linguistic research to gather negative evidence about what the grammar *cannot* generate, alongside with what is actually produced.

Grammaticalization
Grammaticalization refers to a process by which an independent lexical form diachronically develops into a free or bound functional (grammatical) element; e.g. in English development of future tense marker from the verb *go*.

Head of a word
The head of a word is the element which provides the label for the categorial status of a word or compound, thus determining whether it is a noun, verb etc. The concept of head presupposes asymmetrical (head-complement or head-modifier) structures.

Headedness
Headedness is the property that distinguishes symmetrical from asymmetrical constructions in morphology, used usually in compounding. Symmetrical constructions are usually considered headless, while asymmetrical constructions have a syntactic head (and a complement or modifier).

Homonym
Two or more words that are phonologically identical but have different meanings, causing lexical ambiguity.

Iconicity
Iconicity implies a non-arbitrary (motivated) relation between form and meaning, i.e. a phonological form reflects in some way the assumed visual (or auditory) characteristics of the entity or event it refers to; the form of the category/construction is then iconic.

Illocutionary force
The illocutionary force of an utterance depends on the speaker's intention in producing that utterance and the corresponding syntactic structures he/she uses to reach this goal. Declarative, interrogative, imperative and exclamative sentences are linguistic structures that are typically used to perform the illocutionary acts of making an assertion, eliciting information from the addressee, eliciting a behavior from the addressee and conveying a surprise.

Imperative
An imperative is a grammatical form that is specialized to elicit a (possibly non-linguistic) behavior from the addressee, as in 'Go away!'. It is one of the four well-recognized sentence types, along with declaratives, interrogatives and exclamatives. The corresponding imperative force is specialized to elicit a specific behavior of the addressee. Imperatives are typically used to realize commands or requests.

Impersonal verb
An impersonal verb is a verb whose argument structure does not include an external argument. For example, 'seem' in 'It seems that Ada is growing' does not assign any interpretation to 'it', which is a pure place holder, or expletive subject.

Implicature
Implicatures are context-dependent pragmatic aspects of the meaning of an utterance that do not contribute to the truth-conditional meaning of an utterance (what is said) but to the pragmatic meaning of this utterance (what is meant). Conversational implicatures are calculated on the basis of conversational maxims.

Incorporation
A complex verb formed by the syntactic combination of a verb with a noun (noun incorporation) or another verb; in sign languages often used for the combination of a verb and a classifier or of a noun and a numeral (numeral incorporation).

Indefinite pronoun
An indefinite pronoun is a pronoun that stands for an entity without specifying any grammatical (morphosyntactic) features such as number (e.g. *someone* in English).

Indirect question
An indirect question is a question, or interrogative, sitting in an embedded position, as 'when she should leave' in 'Ada asked me when she should leave'. An indirect question is typically embedded under a declarative.

Inflection
Inflection is a type of word formation which is to some extent dependent on a syntactic structure and involves morphosyntactic features such as e.g. person, number, and tense.

Information structure
The term information structure refers to the way in which information is packaged within a sentence. For example, the information conveyed by an utterance can be divided in old vs. new information and within a sentence it is possible to identify a constituent that is a topic and a constituent that is focus.

Initialization
Initialization is a sign language-specific type of word formation (compounding) whereby the handshape of a lexeme is the handshape of the manual alphabet representing the first letter of the corresponding word in the spoken language (e.g. the sign lemonade with a C-handshape).

Interrogative
The term interrogative refers to a grammatical form that is specialized to elicit information from the addressee, as in 'What have you done?', or to report a doubt or a similar attitude towards a given propositional content, as in 'I wonder what you did'. The corresponding interrogative force is specialized to elicit information from the addressee. Interrogatives are typically used to realize a question.

Intonation
Intonation refers to the totality of the prosodic phenomena that accompany the segmental part of strings (i.e. stress, pitch, and pause), marked mostly through non-manual articulations (such as facial expressions) in sign languages.

Intransitive verb
An intransitive verb is a verb that only takes one argument, as 'telephone' and 'arrive'. Intransitive verbs can be distinguished between unaccusatives, that only take an internal argument, such as 'arrive', and unergatives, whose only argument is the external argument, such as 'telephone'.

Ipsilateral
Ipsilateral refers to a location/area on the side of the active articulator.

Irreversible predicate
An irreversible predicate is a predicate that selects for two arguments associated with different semantic features, such as animacy. For example, typically 'eat' is an irreversible predicate, because its external argument is animate and its internal argument is inanimate. Only 'Ada eats a salad' is a meaningful sentence, while the reverse, 'A salad eats Ada' is semantically odd. Irreversible predicates are opposed to reversible predicates.

Isomorphic
The term isomorphic refers to the equivalence between the values of two sets of entities, rules etc.; e.g. in isomorphic use of space, signs are produced in a spatial configuration that corresponds to (i.e. is isomorphic with) a real-world configuration.

Juxtaposition
Juxtaposition is a kind of coordination not involving any overt conjunction, such as *and, or, but* or the like. Two constituents that are juxtaposed usually belong to the same syntactic category and perform the same grammatical function.

Layering/layer
In sign language linguistics, layering refers to the simultaneous (i.e. layered) use of various manual and non-manual articulators, e.g. a string of signs accompanied by a body lean, a head movement, and a specific eyebrow position.

Lexeme
A lexeme is a (semi-)abstract unit of meaning which corresponds to the basic forms in the lexicon; the actual realization of these units in language use are called 'word forms' (or sometimes simply 'words').

Lexical item
A lexical item is any item that is part of the vocabulary of a particular language, and that has to be learned in order for the language to be used.

Lexicalization
Lexicalization refers to the adoption of a particular form into the lexicon of a language; the form can be a completely novel form, or might be based on previously existing items.

Lexicon
The lexicon is the mental repository of all the vocabulary items of a language.

Loan sign
A loan sign is a sign that is of foreign origin, influenced by the spoken language or taken from another sign language.

Local lexicalization
Reduction of a fingerspelled sequence that is repeatedly used within a discourse; the phonological changes (e.g. dropping of letters, creation of movement contour) are characteristic of lexicalization.

Locus
A locus is a point in space used for grammatical purposes (e.g. pronominalization, agreement); it either is the actual location of a present discourse referent or an arbitrary location established by means of pointing or some other strategy.

Main clause
The main clause of a sentence, also called the independent clause, is a clause that is syntactically and semantically autonomous. It is thus opposed to the subordinate clause, which is syntactically and semantically dependent on the main clause.

Mass noun
A mass noun is a noun that does not usually appear in the plural and that cannot combine with numerals like *three*; however, it may combine with quantity expression like *much* (e.g. *rice*, *milk*).

Measure phrase
Measure phrases are constructions containing a noun referring to a measure of time, capacity, weight, length, temperature, currency. For example 'five months' in 'I will leave in five months', or '4 kilos' in 'I bought four kilos of strawberries'.

Metaphor
Metaphor is a general cognitive mechanism, which is important for the constitution of meaning of many expressions in everyday language. In a mataphor, two different concepts can be mapped on each other and one (typically abstract) concept is being understood through the other (typically more concrete) concept.

Metonymy
In a metonymy, one entity stands for another related entity such as a part (face) for a whole (person), a writer for his writing, a place (Paris) for an institution (French government).

Minimal pair
Two lexemes that differ from each other only in terms of a single distinctive feature, a single phoneme in spoken languages (e.g. *bat* and *matt* in English) or a single parameter in sign languages.

Modal particle
A modal particle is a particle that expresses (logical/semantic) modality (e.g. *doch*, *ja*, etc., in German).

Modal verb
A modal verb is a verb – mostly an auxiliary – that expresses (logical/semantic) modality (e.g. the verbs *can*, *must*, etc., in English).

Modality
A functional feature that indicates the speaker's level of commitment to the actuality of an event, or its desirability, necessity, possibility, etc.

Modality differences
Differences between signed and spoken languages that are due to or related to the difference in communication channel (visual-gestural vs. oral-auditive).

Morpheme
A morpheme is the smallest linguistic unit that bears meaning; it can be free (i.e. standing on its own) or bound (i.e. morphologically dependent on a stem/base and unable to be used on its own).

Morphosyntactic feature
Morphosyntactic features (also called grammatical features) are the categories of declension and conjugation (e.g. number, tense, etc.) which carry grammatical information and enable a word to be used in a particular syntactic context.

Mouth gesture
A mouth gesture is a configuration of the mouth that may accompany a sign or signs and that is not related to a word of the surrounding spoken language.

Mouthing
A mouthing is the (mostly silent) articulation of (a part of) a word from the surrounding spoken language that is either related to the sign it accompanies or specifies its meaning; occasionally, a mouthing may spread over a string of signs.

Nativization
Nativization implies the adoption of a foreign word into the native lexicon such that it conforms fully to the native phonology.

Negation
Negation is a semantic notion which is encoded by dedicated morphemes. Negation systematically changes the meaning of expressions by introducing various kinds of oppositions. Negating a proposition has the effect of reversing its truth value, i.e. of the two clauses *Tim is at home* and *Tim is not at home*, only one can be true. By contrast, constituent negation only affects the constituent in the scope of negation.

Negative suppletion
Negative suppletion refers to a process whereby a negative morpheme is phonologically different from its affirmative form.

Neologism
A word (sign) or phrase that is newly formed, usually for naming new objects or states of affairs.

Neutral word order
Every language has a neutral word order, an ordering of main constituents that is pragmatically neutral and syntactically unmarked. Typically, the neutral word order for a given language is established following the following criteria: it corresponds to the ordering of constituents in declarative main clauses; both the subject and the object are nominal; it is pragmatically neutral; no element is emphatic or topicalized.

Non-concatenative morphology
The part of morphology that is about non-affixal word formation processes (such as stem modifications or templatic morphology).

Non-dominant hand
The non-dominant hand is the non-preferred hand of a signer, i.e. the hand s/he would normally only use in the articulation of two-handed signs.

Non-finite clause
A non-finite clause is a dependent clause whose verb is non-finite. Many languages can form non-finite clauses with infinitives, participles and gerunds. Like any embedded clause, a non-finite clause depends on another clause in the sentence.

Non-manual (marker)
A non-manual marker is a lexical or information-bearing unit which is expressed by articulators other than the hands; non-manual markers can have phonological, morphological, syntactic, and prosodic functions.

Non-native lexicon
The non-native lexicon is the repository (mental dictionary) of the forms that are borrowed from other languages and, in the case of sign languages, from co-speech gesture.

Number
An inflectional feature (functional category) that indicates whether an expression refers to a single entity or to more than one entities. The most common values of the category number are singular and plural, but intermediate values such as dual and paucal also exist.

Numeral
The term 'numeral' indicates an item specifying the number of the entities referred to by a noun.

Numerals can be classified into three main categories: cardinals (which answer the question 'how many?'), ordinals (which answer the question 'which in order?'), and distributive numerals (which answer the question 'how many each?').

Numeral incorporation
Under numeral incorporation, a polymorphic form (a compound) is created by simultaneous combination of a numeral and a syntactically adjacent noun.

Parameter
Parameters are the phonological components (building blocks) of a sign: handshape, orientation, location, movement, and non-manuals.

Particle
The term particle is typically used for items that cannot be inflected (e.g. conjunctions), but it is also applied to formally dependent items (e.g. clitics) and functionally dependent items (e.g. adpositions and auxiliaries).

Parts of speech
The lexical and functional categories that are the building blocks of syntax: verb, noun, adverb, adjective, conjunction, etc. (see also *syntactic category*).

Passive
In a passive construction the patient (or theme) argument of a transitive or a ditransitive verb is in the subject position, the agent argument is absent or expressed optionally, and the verb or the verb phrase is marked in a special way.

Perspective
Perspective refers to the viewpoint from which an event is described. The event can be described from an external viewpoint (observer or narrator perspective) or from an internal viewpoint (character perspective).

Plain verb
A sign language verb that cannot be spatially modified to agree with (indicate) one or more of its arguments; plain verbs contrast with agreement verbs and a spatial verbs.

Plural
One of the values of the category number, indicating that there is more than one of an entity.

Polar interrogative
Polar interrogatives are sometimes called yes/no interrogatives because they ask whether a certain state of affairs holds or not, so they are naturally answered by 'yes' or 'no'. A direct polar interrogative in English is 'Are you sick?' while an indirect polar interrogative in English is the embedded clause in 'I wonder whether you are sick'.

Politeness
The linguistic expression of the intention of a speaker to save the face of the addressee (or some other person) in communicative interaction. To express his/her intention, the speaker uses various linguistic strategies.

Possession
Possession can be viewed as the realizations of a – typical asymmetric – association or relationship between two referents. Possession comprises kinship relations, whole-part relations, ownership relations and more general associations beween possessor and possessum.

Possessive
A possessive construction is typically a noun phrase expressing a possession. It is usually articulated into the *possessor* (someone who possesses something) and the *possessed* (often referred to as *possessum* or *possessee* as well).

Postposition
See adposition

Predicate
In traditional grammaticography, a predicate combines with a subject to form a sentence, and ascribes a property to the subject referent (e.g. 'Socrates' is the subject in the sentence 'Socrates is mortal' and 'is mortal' is the predicate). Predicates combine with a certain number of dependents or participants in order to express a complete predication to refer to a particular event or situation.

Preposition
See adposition

Presupposition
A presupposition of an utterance is some additional information that the speaker or signer assumes (or acts as if he/she assumes) in order for the utterance to be meaningful in the current context. In the sentence 'Peter stopped smoking', the use of the verb *stop* presupposes that Peter used to smoke.

Pronoun
A syntactic category that takes the place of a noun phrase (e.g. English *I*, *him*, *mine*, etc.)

Personal pronouns are pronouns that are associated primarily with a particular grammatical person – first person (as *I*), second person (as *you*), or third person (as *he*, *she*, *it*). Personal pronouns may also take different forms depending on number (usually singular or plural), natural gender, case, and formality. Semantically, pronouns are used as cohesive devises to establish co-reference between the referent of the pronoun and the referent of its antecedent.

Proper noun
A subgroup of the syntactic category noun; proper nouns denote individuals (e.g. persons: *Noam Chomsky*, places: *Europe*).

Prosodic word
A prosodic unit that consists of at least one syllable and that may or may not be a lexical word; cliticization or compounding may yield a prosodic word.

Prosody
Elements of speech or signing that determine how we say what we say, e.g. the pauses, the prominent parts, the rhythmic chunks, tones, etc.

Purpose clause
Purpose clauses are subordinate clauses expressing the purpose of the event expressed by the main clause, as in 'We stopped driving to work in order to save money'.

Quantifier
A syntactic category that indicates quantity (excluding numerals), e.g. *some, many, never*. Semantically, quantifiers are operators that quantify over a set of individuals, with different interpretations depending on the meaning of the quantifier.

Reason clause
Reason clauses are subordinate clauses expressing a reason for the event expressed by the main clause, as in 'I called you <u>because I missed you</u>'.

Reduplication
Under reduplication, a morphological process is realized by repeating (part of) a stem.

Reference
Reference is the symbolic relationship between a linguistic expression and a concrete or abstract entity that it represents. The reference of an expression is the set of entities that the expression denotes.

Reference tracking
Reference tracking has to do with specifying the referents' identity in a text or discourse, i.e. with signaling which discourse referent we are talking about. Languages use various morphosyntactic devises such as pronouns or verbal agreement and pragmatic principles such as accessibility and salience to specify a referent in a discourse context.

Reflexive
A construction where the agent and another thematic role bearing argument refer to the same entity (e.g. *He washes himself*); a reflexive pronoun is a pronoun that refers to the agent (e.g. *himself*).

Register
The term register describes all kinds of linguistic variation that depends on the communicative situation or the specific purpose of communication.

Resumptive
A resumptive pronoun is a pronoun that refers back to a previously realized item within the same syntactic structure. Resumptive pronouns are often found in relative clauses, where they refer back to the relative pronoun, as in 'This is the toy that Ada thinks that we should definitely buy <u>it</u>'. The use of resumptive pronouns is marginal in standard English, but completely acceptable in colloquial varieties and in many languages.

Reversible predicate
A reversible predicate is a predicate that selects for two arguments that are not necessarily associated with different semantic features such as animacy. An example of a reversible predicate is 'kiss', because both its external argument and its internal argument are indistinct with respect to animacy. Both 'Ada kissed Nico', and 'Nico kissed Ada' are thus meaningful.

Role shift
A construction where a signer assumes the characteristics of another person/animal (the character) and linguistically marks his/her utterance accordingly, commonly by rotating his/her body towards the position in space associated to the character (and by other non-manual markers); role shift is

typically used in narration to report someone else's utterance (attitude role shift, also called constructed discourse) or action (action role shift, also called constructed action).

Root
A root is the part of a word that carries the main conceptual meaning expressed by that word and that cannot be segmented any further.

Scope
Scope refers to the domain over which a certain feature – be it semantic or phonological – has an effect; e.g. negation can have semantic scope over part of a sentence or the whole sentence (sentential scope), and a non-manual marker like headshake can have scope (i.e. can extend) over part of a sentence or the whole sentence.

Secondary movement
Movements of the hand that are not path movements; articulator-internal movements: handshape changes, orientation changes, and hand-internal movements like finger wiggling.

Secondary predication
A secondary predicate is an expression that attributes a property to a nominal phrase (that can be the subject or another argument of the main verb) but it is not the main predicate of the clause. In 'The boys arrived home exhausted', for example, the underlined element expresses a secondary predication on the main subject.

Sentence
A sentence is a unit in which words are grammatically linked to make a statement or to describe something (typically via a declarative sentence), to express a command (typically via an imperative sentence), to elicit information from an addressee (typically via an interrogative sentence) or to convey surprise (typically via an exclamative sentence).

The typical sentence contains at least a predicative nucleus consisting of a subject and of a predicate (for example, in "John is smart" the property of being smart is predicated of John and in "Mary thinks that John is smart" the property of thinking that John is smart is predicated of Mary). However, there can be elliptical sentences with a minimal structure.

Serial verb construction
The serial verb construction, also known as (verb) serialization or verb stacking, is a syntactic phenomenon by which two or more verbs or verb phrases are put together in a single clause. Serial verb constructions are often described as coding a single event.

Shared sign language
A sign language that emerged in a village community, due to an increased likelihood of deafness; often a considerable proportion of the hearing population also knows the sign language (also known as village sign language or rural sign language).

Signing space
Space in front of the signer that plays a role at different linguistic levels: phonology (location specification of lexical signs), morphology (e.g. agreement), semantics (e.g. topographic descriptions), pragmatics (e.g. reference tracking, contrast).

Simple movement
A simple movement is a movement that consists of a change in only one phonological parameter (e.g. location or orientation).

Simultaneity
The combined expression of two (or more) signs – be they manually or non-manually articulated – at the same time (by the same person).

Size-and-Shape-Specifier (SASS)
A Size-and-Shape-Specifier is a classifier(-like) item that expresses the size and shape of an entity, usually by outlining its boundaries.

Sluicing
Sluicing is an ellipsis phenomenon which elides everything from a direct or indirect question except the question word, as in 'Ada will call someone, but I don't know who'.

Small clause
A small clause is a construction that has the semantics of a clause, with its typical subject-predicate divide, but it lacks either a verb or the markers of (verbal) inflection typically associated with finite clauses. An example is 'Ada smarter' in 'I consider Ada smarter'.

Spatial agreement
Sign languages have the option of exploiting space for agreement: the sign encoding the lexical verb is modified to include agreement with the locus in space associated with the argument(s) of the verb. Typically, the orientation and the direction of movement is modified and oriented towards the point in space associated with the external argument, the internal argument or both. Not all verbs agree in space.

Spatial verb
A verb that can be spatially modified to indicate the locative source and/or locative goal of an event, e.g. WALK (from a to b), PUT-DOWN.

Specificity
Indefinite noun phrases can specific and non-specific. An indefinite is specific when the signer, but not the addressee, knows the referent of the noun phrase. An indefinite is non-specific indefinite when neither the signer nor the addressee know its referent.

Speech act
A speech act is a linguistic act that is performed by a speaker while uttering a sentence. Speech acts can either be explicit performative or implicit performative and they are typically performed to make an assertion, a question, a command or to convey surprise.

Spreading domain
A spreading domain is a prosodic domain over which a manual or non-manual articulation is extended.

Stem
A stem (also called a base) is the morphological unit to which inflection and derivation applies.

Stem modification
A stem modification (also called stem-internal change or base modification) is a word formation process which affects the phonological form of the stem (e.g. English *sing – sang – sung*); stem modification may combine with affixation.

Subordination
Subordination is a principle of hierarchical organization of linguistic constituents. More precisely, the constituent A is said to be subordinate to the constituent B if A depends on B.

Subordination conjunction
See complementizer.

Suppletion
Suppletion refers to a word form which is associated with another form but has a completely or partially different phonological form, also called base allomorphy (e.g. *go – went* and *bad – worse* in English).

Suprasegmental features
Phonological or prosodic features that associate with the segmental layer of a word/sign; e.g. tone in spoken languages, non-manual features in sign languages; suprasegmental features constitute a layer on top of the segmental layer.

Syllable
A prosodic unit that is composed of a sequence of segments and that is the domain for stress assignment; in spoken languages, a syllable consists minimally of a vowel, in sign languages minimally of a movement.

Syntactic category
Building blocks of syntax; e.g. lexical categories such as noun, verb, etc., functional categories such as tense, number, etc., and phrasal categories such as Noun Phrase, Tense Phrase, etc.

Telic
Telic eventualities are conceptualized as involving a change of state that amounts to the end point of the event described by the predicate.

Temporal clause
A temporal clause is a type of adverbial clause expressing a temporal relationship between two clauses. The time of the event in the adverbial clause can be before, after or simultaneous with the time of the event in the main clause.

Tense
Tense is a morphosyntactic category that refers to the reference time of an event with respect to utterance time. The reference time can either be identical to the utterance time, precede the utterance time (past) or be located after the utterance time (future).

Thematic role
Thematic roles encode the general semantic interpretation of an argument as a specific participant in an event/action described by the predicate. Typical thematic roles are agent, stimulus, experiencer, patient, theme, benefactive, recipient or instrument.

Topic
If the content provided by the sentence can be divided in old information and new information, a topic is the constituent that the rest of the sentence talks about. A topic can be a constituent familiar from the previous sentence but it can be a new argument of conversation. The latter case involves so-called topic shift and is a way to switch to another topic in discourse.

Transitional movement
A movement that is phonetically required to move the hand from the end point of one sign to the beginning point of the next sign, i.e. a movement that is not part of the lexical specification of either of the two adjacent signs.

Transitive
Refers to argument-taking properties of a verb; a transitive verb requires an internal and an external argument (e.g. *visit*, *love*).

Turn-taking
Turn-taking refers to a change in the role of discourse participants: from addressee to active speaker/signer, and vice versa; turn-taking signals are used to initiate turn-taking.

Unaccusative
An intransitive verb whose only argument is assigned the thematic role patient or theme instead of agent (e.g. *melt*, *fall*).

Unergative
An intransitive verb whose only argument is assigned the thematic role agent (e.g. *run*, *swim*).

Voice
The voice of a verb refers to the relation between the event expressed by the verb and the participants identified by its arguments. Typically, when the subject is the agent or experiencer, the verb is in the active voice; when the subject is the patient or undergoer, the verb is said to be in the passive voice.

Wh-phrase
The wh-phrase is a constituent of a clause that is characterized as a question operator. A wh-phrase can be a word, as 'what' in 'What do you see ?' or an entire phrase, as 'which girl' in 'Which girl do you see?'.

Wh-question
Content interrogatives or wh-questions are used to ask the addressee to fill in some specific missing information and thus elicit a more elaborate answer than just 'yes' or 'no'. In many languages, they contain a specialized set of interrogative words or phrases that have a common morphological marking (*what*, *which*, *who*, *why*, *when* etc.). Since in English this marking is the morpheme *wh-*,

these interrogative phrases are called wh-phrases, and content interrogatives are often called wh-questions.

Word

Word is a term which is sometimes used interchangeably with ‘word form’; otherwise it has to be qualified by the terms ‘phonological’ and ‘grammatical’.

Word form

A word form is the realization of a lexeme in a grammatical context; word forms carry grammatical information and are inflected for number, tense, etc.