Semantic Fields in Sign Languages

Sign Language Typology 6

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Semantic Fields in Sign Languages

Colour, Kinship and Quantification

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Part I

Introduction

Semantic fields in sign languages – A comparative typological study

Keiko Sagara and Ulrike Zeshan

This volume is the result of a large cross-linguistic study on semantic fields in sign languages. When the study was designed, three main semantic fields were chosen for investigation: colour terms, kinship terms, and quantification, with the latter focusing on numerals. In this chapter, we cover the background of the study that has led to this volume. This includes information on the rationale for the study and its overall design, a section on the methodologies used for the study, and a summary of data we collected. We also summarise some of the generalisations that have emerged from a comparative survey of these data for each of the domains.

As with previous studies in sign language typology (Zeshan 2006; Zeshan and Perniss 2008), this volume is the result of a project conducted over several years. Our study took place between 2010 and 2014, and in the process, we worked with many collaborators and co-researchers around the world (see Section 3 and Acknowledgements at the end of this chapter). As large-scale studies in sign language typology have developed over the past 10 years since the publication of the first (Zeshan 2006), the array of methodological tools and the research context have likewise undergone important developments. This chapter explores some of these issues.

1. Design of the study

As pointed out in Palfreyman, Sagara and Zeshan (2014), one of the important considerations when designing a project in sign language typology is the choice of domain to be investigated. The present project followed a similar rationale as previous work on negatives and interrogatives (Zeshan 2004a, 2004b) and possessive and existential constructions (Zeshan and Perniss 2008) in terms of the characteristics of the research domain.

First of all, all three domains are amply documented in spoken language research. Documentation of numerals, in particular cardinal numerals, has an extremely broad coverage across spoken languages (cf. Hammarström 2010), and colour terms have been of interest to spoken language linguists

working on many different languages at least since the publication of the seminal article on the hierarchy of colour terms by Berlin and Kay (1969). Kinship terms have been of interest at the interface between linguistics and ethnography, sometimes being studied in much greater depth than was possible in our sign language data (e.g. Evans 2003 on Australian Aboriginal languages). Reviewing such studies in spoken language linguistics reveals significant linguistic diversity, in particular, the kind of patterned variation that provides interesting generalisations, such as distinguishing between different bases (e.g. Comrie 2013), or delineating a subgroup of basic colour terms (Berlin and Kay 1969).

This ground work provided a good level of confidence to expect interesting patterned variation across sign languages too. In particular, the lexical sets in these domains tend to involve a significant degree of morphological complexity, in both signed and spoken languages. Conceptually, it makes sense to think of a network of relationships and sub-groupings within any lexicon with regard to these three domains. The structure of a family tree, even as a pre-theoretical notion, lends itself to many possible subdivisions, such as maternal and paternal relations, older and younger generations, etc. Larger numerals are typically constructed out of smaller ones, resulting in sub-sets within numeral paradigms. And any system of colour terms imposes a subdivision on the colour spectrum and has the potential to differentiate linguistically between lighter and darker shades, colour saturation, and the like. Such considerations led to the hypothesis that these three domains would constitute fertile ground for investigating morphological complexity and typological patterns within the lexicon of sign languages, as this is indeed what the project has found overall. Moreover, at least some published sources are available for a range of sign languages in these domains (see a review in Chapter 2 of this volume), and this is an important additional consideration, given that documentary sources on many sign languages are still scarce.

Finally, an important consideration has been the viability of data collection from a wide range of genetically and geographically distinct sign languages (see Zeshan and Palfreyman, in press, on this issue). The three domains are central to any person's daily experience, and therefore, eliciting the requisite vocabulary was going to be much easier than in the case of semantic fields that are less central to everyday human experience, such as temperature (cf. Koptjevskaja-Tamm 2015), or less accessible to immediate conscious recall, such as levels of social hierarchy or politeness phenomena in language, or the functioning of discourse markers (cf. Schiffrin 2001). With a view to collecting data from both linguists and non-linguists, these considerations

have increased the range of data sources and collaborators that the project was able to access.

Throughout the project, continuous efforts were made to gather data on sign languages all over the world, e.g. through mailing lists, the newsletter of the World Federation of the Deaf (WFD), the website of the International Institute for Sign Languages and Deaf Studies (iSLanDS), and emails to specific sign language experts in many countries. Unfortunately due to difficulties with technological access in Africa, it has not been possible to gather as much data as we would have liked from African partners and thus the study contains little representation of this continent. However, the representation of diversity, including in developing countries, is significant here and our project includes several rural sign languages, such as Alipur Sign Language in India. In all, the data encompass semantic fields from 33 different sign languages (see full list in Section 3).

The study proceeded in three overlapping phases:

1. Recruiting a network of participants as co-researchers, who would work with the core research team on gathering information from their respective sign languages. In parallel, we developed a range of research tools to share with co-researchers.
2. In the data collection phase, this international network collaborated in collecting data, supported by our core research team. We also collected additional data directly at iSLanDS whenever possible.
3. All data were forwarded to iSLanDS for comparative analysis.

Details of methodological processes and issues are discussed in the next section.

2. Methodological issues

2.1. Project management and working with participants

At the beginning of the study, contributions were invited from both individual consultants and research groups. While consultants were not required to be professional linguists, it was stipulated that they should know their sign language very well and/or collaborate with highly skilled signers. The benefits of involvement in the project were highlighted, including a better understanding of the participants and their respective sign languages; increased knowledge about the interesting differences between sign languages;

experience in a partnership project where guidance is available for first-time researchers; many valuable international contacts; and the opportunity for the most interesting contributions to appear as a book chapter for an established series.

Contact with co-researchers was initially established through a background questionnaire that asked about their knowledge of linguistics, their relationship with the local Deaf community, the area where their sign language is used, and what dialects their language might have. It was crucial that all participants had some association with their local Deaf community in order to corroborate and substantiate their data. Where it was decided to proceed with the collaboration, research materials were sent to the informant, which consisted of questionnaires and various game activities for elicitation of data on colours, family relationships (kinship), and quantification. Participants were also asked to fill in a technical questionnaire, which enquired about their available capacity in terms of computers, internet speed, ability to produce CDs/DVDs for the transfer of data, and the like. Deaf organisations were especially targeted for this study, and all research materials were translated into International Sign to make it easy for these organisations to participate.

Participants were not required to use all of the materials: they were told to use only those they felt were appropriate in their context. Explanations of how to use the materials were made available in English and in International Sign. Both versions were accessible on the iSLanDS website, which participants were directed to in the first instance, and the research team communicated with co-researchers regularly to provide updates about the project and resolve individual queries.

The translations of research materials into International Sign allowed participants with no, or very little, knowledge of English to participate. These International Sign explanations were presented in the form of a dialogue between two researchers, as this has proved to be an interesting innovation in the context of such projects. This resulted in several contributions by Deaf organisations and research teams, who would otherwise not have been able to participate. This process also produced links between academics and local Deaf communities, encouraging a wider range of participation and cooperation than would have been possible with English-based materials only.

Another project management innovation was for the research team to try and establish mentor-mentee relationships between participants, in order to facilitate peer training and information-sharing among newer and more experienced researchers. In some cases this was a successful approach, but factors such as time constraints and technical limitations (e.g. the technical specifications required for online communication through sign language) prevented

this approach from being applied widely across the project partnership. Other difficulties included matching mentors to mentees, as there were more potential mentees than mentors, and some participants expressed concerns about the sharing of intellectual property in the context of mentoring. Nevertheless, in principle such mentor-mentee relationships could be a useful additional research tool. For the most part, deaf informants who had less familiarity with written English worked most effectively when given instructions and clarification by the research coordinator via webcam. Written communication was not suitable for these individuals and their expertise was best accessed through remote signed communication.

In terms of dissemination, we realise the difficult dilemma of the choice of language in which to make the final findings of the project available. It proved too challenging to translate the present volume into International Sign, and selecting a national sign language for dissemination would make it unintelligible to users of many other sign languages, all of whom were extremely valuable to this project.

2.2. Research tools: Questionnaires and linguistic elicitation

The combination of a typological questionnaire with stimulus materials for elicitation (as in Zeshan and Perniss 2008) was selected as an ideal method for this study, as targeted elicitation creates relevant data from which examples can be extracted to illustrate questionnaire responses. This is useful because target items from certain lexical fields such as colours are perhaps unlikely to occur frequently in spontaneous conversations. In addition, using the same materials for different sign languages is conducive to functionally more equivalent data, i.e. utterances that have arisen from similar situations (Palfreyman, Sagara and Zeshan 2014). For experienced linguists, it often proved more effective to start by filling in the questionnaire and then move on to the elicitation activities; for those with less of a research background, it was sometimes more elucidating to carry out the elicitation games first to see what sorts of structures emerged before attempting the questionnaire. In other cases, it was helpful for researchers to move back and forth between the elicitation activities and questionnaire, as the picture of the targeted structures became clearer.

2.2.1. Questionnaires

The purpose of the questionnaires was to permit an insightful analysis of structures, paradigms and inventories within the targeted semantic categories for each sign language, with separate questionnaires for each of the three domains. There were two versions each of the questionnaires for quantification and colour terms: an extended version for consultants with a professional background in linguistics and sufficient time to go through a longer task, and a shorter version for participants who either preferred a less formal approach or had time constraints preventing them from completing an extensive questionnaire. Both versions were given to all participants, so that even if they preferred one over the other, they could read the other version for improved clarity or in case of particular interest in certain items. For example, they may have used the shorter version but referred to the extended version for some items for which they had especially interesting data. For the kinship questionnaire, we did not find it sensible to create two versions because there was no natural sub-division between a core area of investigation and a more peripheral set of additional questions.

The shorter versions were colour coded, based on preliminary assumptions by the research team as to which structures might be particularly interesting or typologically rare. An example is shown in Figure 1, and colours are defined as follows:

- Options highlighted in green: An expected option for this structure, found in many sign languages; the "garden variety" among the options, and tending to be of lesser structural complexity.
- Options highlighted in yellow: Structures that are already documented across some sign languages and that present potential points of interest due to factors such as morphological or semantic complexity.
- Options highlighted in red: Typological rarities, options so far undocumented in any known sign language, modality-specific characteristics not applicable to spoken languages, or other reasons for data being of special potential interest to the study.

Q. 4. Numeral Incorporation

Numeral incorporation is the incorporation of number into lexical paradigms, when signers express the numerical value simultaneously with a lexical element resulting in one complex sign, for example, TWO#YEAR, THREE#YEAR, etc, expressed as a single complex sign. This is typically used with particular semantic domains including time units, monetary units, and educational levels. Please indicate the appropriate option(s) for your sign language.

- **There are no recorded cases of numeral incorporation in the sign language.**
- *Numeral incorporation is used for time units.*
- *Numeral incorporation is used for monetary items.*
- *Numeral incorporation is used for educational levels.*
- Numeral incorporation is used for classifiers.
- **Numeral incorporation occurs in another lexical domain. Please provide full details.**

For each available option, specify the lexical signs with which numeral incorporation occurs, provide examples, and for each lexical sign indicate the cardinal numbers which can be incorporated into the sign.

Figure 1. An example from the shorter questionnaire on numerals and quantification (red colour represented by bold font, green colour by italic font, and yellow colour by normal font)

Consultants were alerted that options with yellow or red highlights were particularly useful for our project. Thus they might start work on the shorter version and then switch to the more in-depth one for those responses that were of particular interest. This provided easy-to-use, visual optional guidance, and was designed to increase insight into the rationale for participants who were not professional linguists, such as leaders of deaf community organisations.

All versions of all the questionnaires are reproduced in full in the supplementary materials to this volume.

2.2.2 Stimulus materials

To elicit structures in the semantic fields of colour, kinship and quantification respectively, a range of stimulus materials was provided to co-researchers. Most elicitation activities are performed by pairs of signers; this ensures that,

as far as possible in this kind of environment, the data reflect actual usage of signs in communicative interaction, while also facilitating video clips of a high technical quality. For most games, co-researchers could choose (an approximation of) one of the camera set-ups shown in Figure 2, depending on whether they wanted to use one camera or two. Detailed instructions on how to use the elicitation activities were provided to all participants in English and in International Sign.

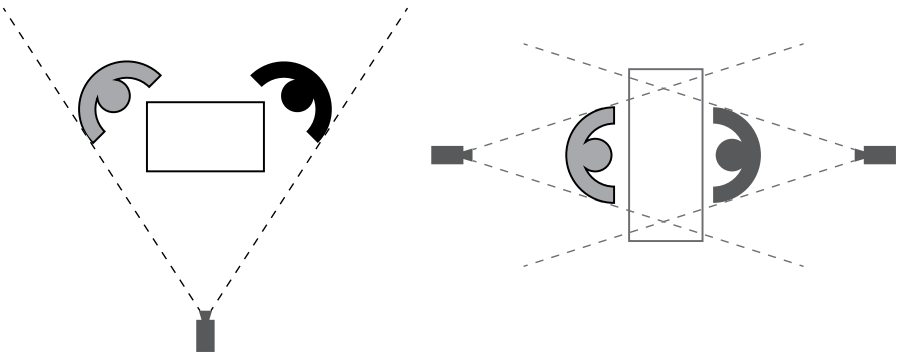


Figure 2. Camera set-up with a single camera (left) and with two cameras (right)

a) Elicitation of colour terms: Colouring game and colour naming task

The colouring game requires two players and includes 39 colour chips, pairs of 15 coloured images and 15 greyscale images (i.e. pairs of identical pictures, except that one is in colour and the other in greyscale), and a stand for holding the chips. This type of game is an instance of what has been called a 'Director-Matcher' task (cf. Gullberg, Indefrey and Muysken 2009), a type of task that has been used with sign languages in earlier studies (e.g. Özyürek, Zwitserlood and Perniss 2010; de Vos 2012). Player 1 acts as the 'Director' and has sight of the coloured image, while Player 2 is the 'Matcher' and has sight of the identical image but without colours. The Matcher should not be able to see the Director's coloured images, which each feature two to four coloured items, and the Director should not be able to see the colour chips. The Matcher must identify the correct colours based on the Director's description for each of the 15 images, by placing the colour chips on the respective items on the image. The Director confirms whether the chosen colours are correct. This game targets a comprehensive spectrum of colours including distinctions between lighter and darker shades of colours. Adequate lighting and camera angles are important, but particularly so for light-dark distinctions which may be signified through

subtle non-manual features. Figure 3 shows participants from Hungary playing the colouring game.

Figure 3. Colouring game set-up with coloured picture on the left, and black-and-white picture with colour chips on the right.

The second task targeting colours is the colour naming task, in which one to three players may participate, using the same 39 colour chips as for the colouring game described above. In this activity, players simply label all the colour chips, which are initially placed face down. The participants take turns picking up a colour chip, giving the number of the colour, and describing the colour. This also elicits a large range of colour terms but in a less interactive environment, so this type of activity would be less likely to produce the full range of colour term options on its own.

b) Elicitation of numerals: Bargaining game and arithmetic game

An activity that has proven successful in eliciting numerals with all kinds of participants, whether urban or rural, educated or non-literate, is the bargaining game. This game has two players and in addition to cardinal numerals also targets monetary terms, larger numbers above hundred, and numeral incorporation. This game may need to be adapted to local cultures and requires clear instructions from a highly competent signer conducting the elicitation session. There are no specific materials required for this game: the two players act as 'buyer' and 'seller', and the former endeavours to purchase an item for the lowest possible price from the latter. Five culturally appropriate high-value items (e.g. house, motorbike) and five low-value items (e.g. pencil, pin) should be selected for players to haggle over. Optionally, a shop-like setting can be established, with a table and pictures or objects to be

'sold'. When the players agree on a price for one item, they move on to the next until prices for all items have been settled, and can then switch roles and repeat the game if desired (see Figure 4).

Figure 4. Signers in Alipur village, India, playing the bargaining game

A second game used to elicit numerals is the arithmetic game, which targets numbers from 0 to 100 and requires two to three participants with basic maths skills as well as 40 cards with instructions for arithmetic operations to follow, such as '+2' and 'x3'. After the cards are shuffled and placed between the participants, they are asked to start with the number 10 and then take turns selecting a card from the deck and performing the operation on the card, e.g. for '+2', the participant adds 2 to 10 and signs '12', and then for 'x3', the participant multiplies 12 by 3 and signs '36'. When the resulting number is higher than 100, the participants start the game again with 10 and a reshuffled deck. Making errors in calculations does not affect data quality as the aim is to elicit linguistic responses irrespective of whether they are "correct".

This activity could not be used in contexts where participants have had limited experience of schooling, such as in some of the rural settings in our sample, and even signers in urban contexts did not always interact well with this activity. Therefore, a modified version was developed using pairs of cards where the number on one side is missing, and signers are asked to find out the missing number from the corresponding card with the numbers printed on both sides. This activity is easier but was developed too late to be used by all co-researchers, so it could only be used in one country (Japan). Figure 5 shows signers in Japan playing this game.

Figure 5. Signers in Japan using the modified arithmetic game

c) Elicitation of kinship terms: Wedding planner and family tree game

Two elicitation activities target kinship terms: the wedding planner game and the family tree game. The first of these involves one to three players making a guest list of all the family members that were at their wedding, or that would be invited to their own or a relative's wedding. To avoid this activity eliciting simply a list of names, the players must also state why each person is invited or not, e.g. 'I will invite my sister, but my brother can't make it because he lives abroad'. This game targets the kinship domain from a first person perspective, although in the case of more than one signer, the interlocutors can interact and have a dialogue about the guest lists. The dialogue format is optional in this activity.

For this game, one A3-size paper chart showing a family tree chart is needed. Two participants use a pencil and eraser to complete the chart, and four rounds are involved:

– SIGNER A asking SIGNER B about SIGNER B's own family
– SIGNER A asking SIGNER B about someone else's family
– SIGNER B asking SIGNER A about SIGNER A's own family
– SIGNER B asking SIGNER A about someone else's family

Each time, the person asking about the family is the one completing the chart, i.e. adding in the required number of siblings, uncles, grandparents, etc. Symbols are used for adding male and female family members. People take both a first person perspective on kinship, when talking about their own family, and a second or third person perspective when talking about another family. This game was originally used in the study on possession and existence

(Zeshan and Perniss 2008), where the target domain was inalienable possession. For the present project, the target was the lexicon of kinship terms.

3. Data summary

Data from 33 sign languages were included in this study, and as in previous sign language typology projects, not all sign languages are represented with the same amount of data and detail. The distribution of sign languages is shown in Table 1, revealing an over-representation of languages from Europe, which make up about a third of data. However, it is noticeable that this includes a number of less documented European sign languages, such as those from Hungary, Estonia, and the Czech Republic. Asia is also well-represented in the sample, and several rural sign languages are included. As in previous studies (Zeshan 2006, Zeshan and Perniss 2008), sub-Saharan Africa is under-represented. Moreover, there has been no participation from South American sign languages; the inclusion of translations into Spanish and Portuguese may have resulted in some participation from this region, as sign language research is quite active in some of these countries, but fluency in English for research purposes is uncommon and further translation work was outside the practical constraints of this study. In Table 1, the Middle East is shown separately to highlight a comparatively high response rate from this region.

Table 1. Regions represented

Europe	12
Sub-Saharan Africa	2
Middle East	5
Americas	4
Asia and Australasia	10

The data types fall into three main categories: video recordings of elicitation games, other video data (e.g. signed lists of lexical items, example utterances accompanying questionnaires), and questionnaire responses. The type of data used for each signed language is presented in Table 2. For the purpose of the study, we have also included data gathered at the iSLanDS Institute during a previous sign language typology project, which was a comparative linguistic and anthropological study on rural sign languages in ten different countries (Zeshan and De Vos 2012). We had collected data for this from Chican Sign

Language in Mexico, Mardin Sign Language in Turkey, and Alipur Sign Language in India, with the latter two limited to data on numerals.

In most cases, co-researchers provided both questionnaire responses and video data, as is evident from Table 2. For some sign languages, we were able to collect samples of video data, but without explicit responses to the questionnaire. Existing publications on the target semantic domains are relatively scarce, but have been consulted where possible (see Section 4 for an overview of the literature).

4. The domains of colour terms, kinship terms, and quantification

4.1. Colour terms

Most studies on colour terms in spoken languages make reference, in one way or another, to the seminal cross-linguistic work by Berlin and Kay (1969). These authors produced the implicational hierarchy of basic colour terms[1] in Figure 6:

black/white → red → yellow/green → blue → brown → other

Figure 6. Hierarchy of basic colour terms

The above hierarchy implies that if a language has a basic colour term for 'yellow', then it will also have colour terms for 'black', 'white' and 'red', but not necessarily for 'blue' or 'brown'. That is, having a basic colour term anywhere on the hierarchy implies that there are also colour terms for all colours to the left. By and large, this implicational hierarchy also applies to signed languages, as is shown in Table 3. This is particularly obvious in the case of sign languages with few colour terms. For example, Adamorobe Sign Language has only a single manual sign that expresses three basic colour terms, 'black', 'white' and 'red' in combination with mouthings from spoken Twi. Yolngu Sign Language, in use among an Aboriginal community in Australia, has six colour terms, none of which are from the far right side of the hierarchy (Adone, Cumberbatch and Maypilama 2012). The colour lexicon tends to be limited in rural sign languages, such as Kata Kolok in Bali, which only has terms for 'black', 'white', 'red', 'yellow', and 'blue/green' (Berlin and Kay 1969; there is no distinction between blue and green, and this denotation is sometimes called *grue* by linguists). Importantly, there is no case in our data of a sign language that has colour terms from the right-hand side of the hierarchy but lacks colour terms from the left-hand side.

Table 2. Data used in the typological study

Sign Language name	Region	Type of data		
		Elicitation games	Questionnaire responses	Other video data
Alipur Sign Language (APSL)	India (rural)	✓		✓ (numerals only)
Argentinean Sign Language	Argentina			✓ (numerals only)
British Sign Language (BSL)	UK	✓	✓	✓
Cambodian Sign Language	Cambodia			✓ (numerals only)
Chican Sign Language (ChicanSL)	Mexico (rural)	✓	✓	✓
Chinese Sign Language (CSL)	China	✓	✓	✓
Czech Sign Language (CZSL)	Czech Republic		✓	✓
Estonian Sign Language (ESL)	Estonia	✓	✓	✓
Finnish Sign Language (FSL)	Finland		✓	✓
German Sign Language (DGS)	Germany	✓	✓	✓
Greek Sign Language (GSL)	Greece		✓	✓
Hungarian Sign Language (HSL)	Hungary	✓		✓
Icelandic Sign Language (ITM)	Iceland	✓	✓	✓
Indo-Pakistani Sign Language (IPSL)	India and Pakistan			✓
Indonesian Sign Language	Indonesia	✓	✓	

Inuit Sign Language (IUR)	Canada (rural)		✓	✓
Israeli Sign Language (ISL)	Israel			✓ (numerals only)
Japanese Sign Language (JSL)	Japan	✓	✓	✓
Jordanian Sign Language (LIU)	Jordan			✓
South Korean Sign Language (SKSL)	South Korea			✓ (numerals only)
Mardin Sign Language (MarSL)	Turkey (rural)			✓ (numerals only)
Mexican Sign Language (LSM)	Mexico		✓	✓
Sign Language of the Netherlands (NGT)	The Netherlands	✓		
New Zealand Sign Language (NZSL)	New Zealand	✓	✓	✓
Norwegian Sign Language (NSL)	Norway			✓
Polish Sign Language (PSL)	Poland	✓	✓	✓
Saudi Sign Language (SDL)	Saudi Arabia			✓ (numerals only)
South African Sign Language (SASL)	South Africa		✓	✓ (numerals only)
Spanish Sign Language (LSE)	Spain	✓	✓	
Sri Lankan Sign Language (SQS)	Sri Lanka			✓ (numerals only)
Taiwan Sign Language (TSL)	Taiwan			✓ (numerals only)
Turkish Sign Language (TİD)	Turkey			✓ (numerals only)
Ugandan Sign Language (UgSL)	Uganda			✓ (numerals only)

The languages appearing in this volume (e.g. Spanish Sign Language, New Zealand Sign Language and Indonesian Sign Language) all have larger inventories of colour terms, but we can still observe notable differences between those higher and those lower on the hierarchy, as explained hereafter. Issues pertaining to the applicability and interpretation of the colour term hierarchy in the context of sign languages are discussed in individual chapters of this volume, taking account of different points of view from the literature.

Table 3. Colour terms from the Berlin and Kay hierarchy in Adamorobe SL, Kata Kolok, Indonesian SL and Finnish SL

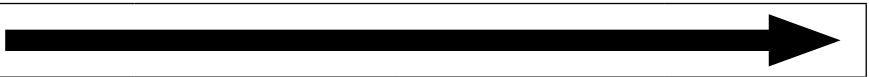
	black	**white**	**red**	**yellow**	**green**	**blue**	**brown**	**orange**	**grey**	**purple**	**pink**
AdaSL	xxxxxxxxxx										
KK	x	x	x	x	xxxx						
IndoSL	x	x	x	x	x	x	x	x	x	x	?
FinSL	x	x	x	x	x	x	x	x	x	x	x

One way in which colour terms in sign languages differ from those in spoken languages is the extent to which colour signs are iconically motivated. In Berlin and Kay (1969), one of the subsidiary criteria of a "basic colour term" is that it should be arbitrary, and this seems to be, by and large, the case in spoken languages, though there are exceptions. In sign languages, however, any colour term can be, and frequently is, iconically motivated. 'White', 'black' and 'red' have frequent iconic associations with body parts or other items, such as the lips for 'red' and the hair, or coal, for 'black'. Therefore, the absence of iconic motivation is not an overarching feature associated with basic colour terms in sign languages. Iconic motivation is pervasive particularly with colour terms that rank high on the hierarchy (i.e. those on the left side of Figure 6). Sometimes there are subtle differences between the colour terms and the signs for associated body parts or objects, while in other cases the colour sign and the sign for an associated object are simply homonyms. For example, the sign CLOUD is used to mean 'gray' in ChicanSL, and GRASS means 'green' in JSL (see Sagara and Palfreyman 2013). This also includes signs for both the fruit 'orange' and the colour 'orange', one of the relatively rare parallelisms between signed and spoken languages in terms of iconic motivation. Moreover, iconicity can be associated with culturally motivated divisions of the colour spectrum; for example in Yolngu Sign Language, there are specific signs for 'black people's skin colour' and

'white people's skin colour' (Adone, Bauer, Cumberbatch and Maypilama 2012).

Conversely, a widespread pattern appears to be that if a sign language has a colour term from lower down on the hierarchy (i.e. to the right side), it is increasingly likely that these signs have been borrowed or influenced by a spoken language, and thus are less motivated by iconicity. Alternatively or additionally, such colour terms may be borrowed from another sign language. Borrowing from spoken languages regularly takes the form of initialisation, i.e. the production of a sign with a handshape corresponding to the first letter of the colour word in the surrounding spoken language (e.g. 'O' for 'orange' and 'B' for 'beige' in Estonian Sign Language; see Hollman, this volume). We find this in a variety of regions around the world, such as the US and Indonesia (see e.g. Palfreyman, this volume). Where several colour terms have initialised handshapes, these constitute a sub-paradigm within the system of colour terms, and they may have further characteristics in common. In ASL, several initialised colour terms share the same internal movement (repeated twist of the wrist) and place of articulation (in neutral space). In Indonesian Sign Language, more than one manual alphabet is in use, and thus there is more than one sub-paradigm of colour terms based on fingerspelling, including both one-handed and two-handed variants.

Sign languages differ with respect to the degree of spoken language influence in the form of initialised colour terms. None of the rural sign languages documented so far use initialisation for colour terms. American Sign Language (ASL) has a large number of initialised colour signs, with British Sign Language and Indonesian Sign Language somewhere in the middle (see Figure 7).



Kata Kolok	Indian Sign Language	British Sign Language	American Sign Language
none	GRAY	YELLOW PURPLE GRAY	BLUE BROWN GREEN PINK PURPLE YELLOW

Figure 7. Degree of initialisation in colour terms across sign languages

Another key aspect is the degree of lexical variation, and this is addressed in several chapters in this volume (Palfreyman on IndoSL, and Báez-Montero and Fernández-Soneira on Spanish Sign Language, LSE). Again, the colour hierarchy is a helpful tool here. Colours higher up on the hierarchy (to the left in Figure 6) show less variation across each sign language, and the ones lower down (to the right in Figure 6) on the hierarchy have more variation (see Hollman, this volume). For example, JSL has two different signs for 'black' but more than five for 'pink' and 'purple' (Sagara and Palfreyman 2013). Signers may use several of the variants for a single colour in an utterance to maximise their interlocutor's understanding (see Palfreyman, this volume, on colour signs in Indonesian Sign Language).

However, not all colour signs are motivated by writing (initialisation) or iconicity; some are arbitrary or of unknown motivation, and there is evidence that signers often try to construct folk etymologies in these cases (see Hollman, this volume, for Estonian Sign Language).

Colour signs can be modified to express intensity or, in certain cases, spatial agreement. There are three known categories of morphological modification in colour signs: manual, spatial and non-manual. Colour signs that are subject to manual modification may be repeated, changed in size or produced faster or slower (see e.g. Hollman, this volume). Colour signs that are subject to non-manual modification may involve eyebrow movements and/or squinted or widened eyes as are used to indicate degrees of darkness or lightness in New Zealand Sign Language (see McKee, this volume). Such modification may also involve actions on the lower face, such as pursed lips, puffed cheeks and/or mouthing. Finally, colour terms can sometimes be modified spatially in order to show spatial agreement in possessive constructions. Example (1) from ASL is from Chen Pichler and Hochgesang (2008):

(1) BLUE1 GREEN2
'Mine is blue and yours is green.'

This option seems to be rare across sign languages and depends on the colour sign being associated with a moveable place of articulation such as neutral space, rather than for example being made somewhere on the body. Figure 8 summarises the options for the formal properties of colour sign modification across sign languages.

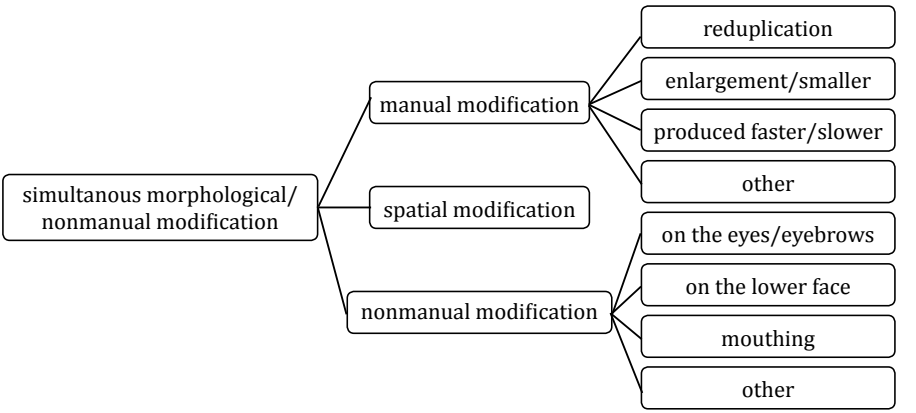


Figure 8. Formal properties of colour sign modification

4.2. Kinship terms

Unlike the domain of colour terms, kinship terms have been studied across sign languages. After an early study (Woodward 1978), a more extensive range of data is covered in Wilkinson (2009). The latter is based on dictionaries, though many of these are in fact word lists, which means that accompanying information on each sign is minimal. The present study has focused on the internal morphology of complex kinship terms, as well as revealing diachronic and regional variation, and the structure of kinship systems in terms of sub-paradigms with common semantic and/or formal characteristics.

Comparisons across the kinship lexicons in sign languages can be interpreted with several different dimensions in mind. Of particular interest is the way in which crucial distinctions in kinship systems are expressed in sign languages. Two distinctions that have been highlighted in our data are gender and relative age.

With regard to gender marking in pairs of kinship signs, we find the following options:

– Signs unmarked for gender. Some sign languages use the same manual sign for both genders of a particular kin relationship and do not differentiate morphologically between them. For instance, a sign SPOUSE is well-attested in the data from a number of sign languages. German Sign Language (DGS) uses the same manual sign for ‘brother’ and ‘sister’, but differentiates between them through mouth patterns derived from spoken German. The same occurs in one variant of Czech Sign Language, where the mouthing is said to be obligatory (Richterová, Macurová and Nováková, this volume). However, this option does not seem to

be widespread in our data, and relying on mouthing is associated with those sign languages where mouthing carries significant semantic load in other contexts too (cf. Boyes Braem and Sutton-Spence 2001).

– Distinct lexicalisation for gender. Sign languages sometimes have separate lexical signs for same-level kinship relationships of different genders. For instance, BROTHER and SISTER are two different signs in BSL, as are SON and DAUGHTER in CzSL. Distinct lexicalisation is cross-linguistically pervasive, if not universal, for MOTHER and FATHER. However, there is a typological split between languages where these signs are homonymous with the signs MALE/MAN and FEMALE/WOMAN, and those where both sets of signs are different. More rarely, homonyms only affect one of the kinship terms. For instance, in Turkish Sign Language (TİD), FATHER is homonymous with MALE/MAN, but MOTHER and FEMALE/WOMAN are different signs.
– Morphological marking of gender. This option is limited to sign languages in East Asia in our data. An interesting morphological paradigm is seen in JSL and SKSL, wherein the little finger is used in kinship signs for females, and the thumb for males (Sagara, this volume). This is a pervasive grammatical system in these sign languages which is not limited to kinship terms but also occurs in agreement verbs, sign names, and other parts of the lexicon (for instance, SKSL has several signs with a semantic component involving people of both genders and where the handshape has extended little finger and thumb, i.e. a Y-handshape). Gender is also morphologically marked in some of the kinship signs of Mexican Sign Language, which may have a suffix –FEM to mark female gender (Hendriks, this volume). This is the only instance of a sequential gender affix in our data. ASL has a sub-paradigm of paired kinship terms where the chin is touched when indicating females, and the forehead for males. This applies to both single signs such as MOTHER and FATHER and compounds such as MALE+SIBLING and FEMALE+SIBLING. However, the chin and forehead locations cannot be used on their own to indicate gender.
– Compounding. Unlike the bound morphology just discussed, compounding involves two signs that also occur as free forms to generate male-female counterparts. This is a widespread solution to gender marking and in most cases involves a sign for ‘male’ and ‘female’ preceding a sign for the kin relationship, e.g. MALE+SPOUSE for ‘husband’ and FEMALE+SPOUSE for ‘wife’. Again, this can interact with age differentiation, such as FEMALE+OLDER-SIBLING and MALE+OLDER-SIBLING in Indian Sign Language (see Figure 9). Some of the gender-marked handshapes in JSL and SKSL also occur within compounds. Interestingly, compounding also occurs in the converse situation, where monomorphemic gendered terms exist and are compounded to form hyperonyms. For instance, whereas DGS has a separate sign PARENTS (two Y-handshapes touching at the little fingers), many other sign languages use a compound of MOTHER and FATHER to express ‘parents’.

Several methods are also exploited cross-linguistically to mark the relative age and the succession of generations in kinship relations. The inventory of strategies is similar, but not identical to, the expression of gender. Distinct lexicalisation for age-marked kinship terms is not attested in our data.

Relative age is chiefly associated with sibling relationships. While in the majority of cases relative age is unmarked, some cases of morphological marking of age have been found, as well as compounding to express age distinctions. The Indian Sign Language sequential compounds mentioned above are symmetrical, as elder, younger, and unmarked terms are all expressed (see Figure 9). In this compound, age is conflated with the kin relationship term (e.g. FEMALE+ELDER-SIBLING. By contrast, in TİD there is a non-symmetrical pattern, as only seniority in age has a separate sign, but there are no special terms for younger siblings. To express 'older brother' and 'older sister' an upward movement is added to the signs for MALE and FEMALE, which could be considered an age-differentiating affix. The signs for age-unmarked 'brother' and 'sister' are compounds in TİD.[2]

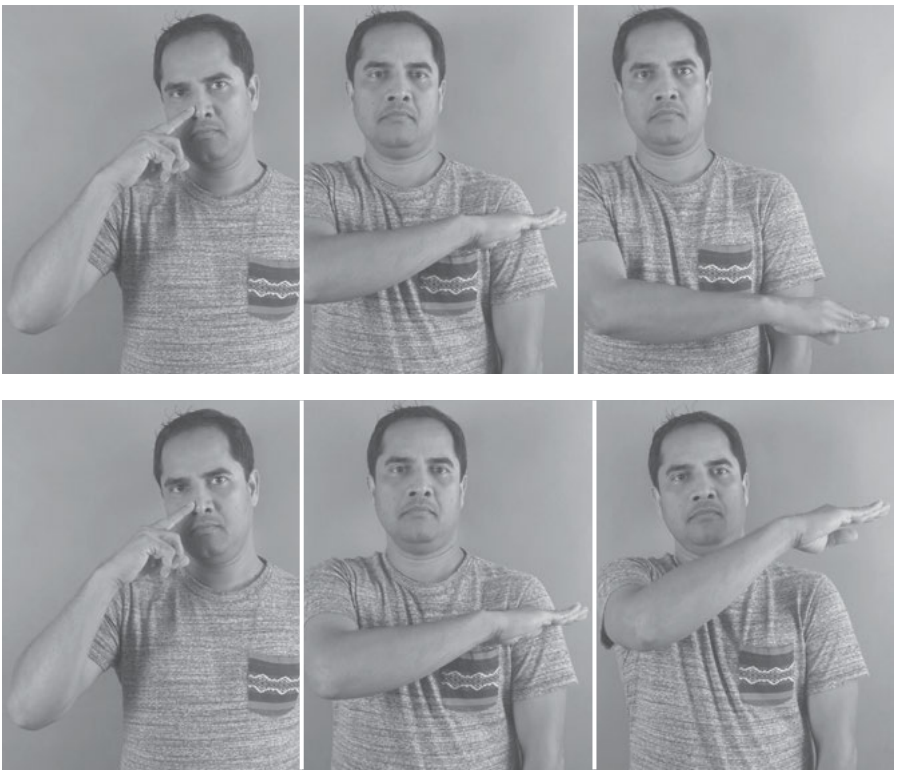


Figure 9. Symmetrical age-marked kinship terms in Indian Sign Language

Such spatial metaphors in terms of upwards movement corresponding with greater age are found across different sign languages, albeit with different morphological expression. Figure 10 illustrates the alignment of age-marked kin terms with a vertical "growth line" in Japanese Sign Language (JSL). Unlike the sequential morphology in TİD, in JSL the age-marking morpheme is incorporated simultaneously into the movement parameter of the sign, and the system is symmetrical: there is upward movement for older siblings and downward movement for younger siblings (Sagara, this volume).

Figure 10. Age-marked kinship terms in Japanese Sign Language: "Younger sister" and "elder sister"

Spatial metaphors also play a role in marking successive generations in some cases. ASL uses a horizontal movement forward from the face to show generational depth: MOTHER makes contact with the chin while in GRANDMOTHER, the hand makes forward arc movements from the initial chin location. JSL and SKSL use vertical movement (Sagara, this volume). In JSL, this is in combination with sequential compounding, so that, for instance, in MOTHER+FATHER 'maternal grandfather' the second part of the compound is articulated higher in the signing space than the first part. Moreover, JSL uses a handshape change to mark age on the MALE and FEMALE handshapes by bending the little finger/thumb (Sagara, this volume). Finally, Czech Sign Language is one example of a language using the sign space to denote close versus more distant familial relations (see Richterová, Macurová and Nováková, this volume).

Overall, the frequency and distribution of structures marking age and generational depth are less extensive than what is attested for gender marking. Interestingly, for both of these categories, the affected terms tend to

be core kinship relations. Non-core relations, such as cousins, aunts, uncles, affinal relations (in-laws), etc., generally show no distinct lexicalisation or morphological marking of age and generational distinctions or gender, unless this is part of sequential compounds consisting of core kinship terms (e.g. MOTHER+YOUNGER-BROTHER for 'younger maternal uncle'). Across all sign languages, there is a strong tendency for fewer distinctions to be made in non-core kin relationships. At the extreme end, Kata Kolok only has a single term for all non-core relationships not otherwise specified in the lexicon.

Another interesting dimension to explore is the relationship between the kinship system of a particular sign language and the surrounding spoken language. One may assume that they should be parallel, reflecting the fact that the speakers and signers live in the same local culture. However, this is not what we find in the data, and there are many differences between sign language and spoken language kinship paradigms in the same location and culture.

In fact, there are several types of relationships between the kinship system of a sign language and the surrounding spoken language(s). Again, a particular option may not apply to the entirety of the kinship paradigm, and it is possible for a part of the paradigm to use one option and another part to use a different option.

– Unrelated kinship systems. In this case, the kinship systems of the signed and spoken language are entirely different. Kata Kolok has just seven underived kinship terms, for OFFSPRING, SPOUSE (both of which can form compounds with the signs MALE and FEMALE), SIBLING (which is identical to the sign SAME), FATHER, MOTHER, GRANDPARENT and a generic RELATIVE for any other collateral or affinal relation. This is in sharp contrast with the surrounding spoken language, Balinese (Basa Biasa), which has a rich array of kinship terms including age distinctions in sibling terms, in-law relationships, and paternal versus maternal relations. The range of parental siblings in Indian Sign Language is also very different from spoken Indian languages. In Table 4, this is exemplified with Hindi, but other spoken Indian languages have similar patterns. Not only are there more dedicated terms in Hindi, but the terms also include morphological gender marking (-i for feminine, -a for masculine), while the ISL terms are compounds.
– Semantic and/or formational parallelism. A sign language and a surrounding spoken language may be semantically parallel and may have some formal features in common too. Consider, for instance, the kin terms in TİD and spoken Turkish in Table 5.

Table 4. Kin terms for 'aunt' and 'uncle' in Hindi and ISL

ISL	FEMALE+PARENTAL-SIBLING	MALE+PARENTAL-SIBLING
Hindi	*chachi* (wife of father's younger brother)	*chacha* (father's younger brother)
	mami (wife of mother's brother)	*mama* (mother's brother)
	mausi (mother's sister)	*mausa* (husband of mother's sister)

Table 5. Kin terms in Turkish and TİD

TİD	MOTHER	MALE/ MAN / FATHER	SIBLING	FEMALE+ SIBLING	MALE+ SIBLING	MALE^ OLDER-SIBLING	FEMALE^ OLDER-SIBLING
Turkish	anne	baba	kardeş	kız kardeşi	erkek kardeşi	abi	abla

It is clear from the table that the two systems are parallel in that specific terms exist for the kin relations in each language, and the terms for 'brother' and 'sister' are constructed similarly out of two sequential components for the gender and the relationship respectively, as in a loan translation or calque. However, the Turkish terms for the older siblings are monomorphemic whereas the TİD terms consist of the gender sign with an affix. Moreover, the TİD sign for 'father' is homonymous with the sign for 'male/man', which is not the case in Turkish.

Another type of parallelism is associated with the use of initialised signs; here the kinship terms in the sign language are structured under the influence of the surrounding spoken language.[3] This option is used heavily in Mexican Sign Language (LSM), where most kinship terms are subject to initialisation. Moreover, if sign languages have several historical layers of kinship vocabulary, the initialised signs are likely to be the later additions, having come about as a result of intensified language contact. In addition to initialisation, sign languages may also borrow elements from spoken language kinship terms via mouthing. The sign MOTHER in BSL exploits both methods. In Czech Sign Language, the same manual sign indicates all affinal relatives (e.g. 'brother-in-law'), and the specific meanings are distinguished solely through mouthings borrowed from spoken Czech (see Richterová, Macurová and Nováková, this volume).

To show plurality in kin terms (e.g. 'many brothers'), sign languages tend to use either spatial morphology or repetition, as does Estonian Sign Language (see Hollman, this volume). However, frequently there is no overt marking of plurality in this domain. An example of a sign language with spatial modification for a plural kinship term is Jordanian Sign Language (see Figure 11). Doubling of hands with movement repetition is used for this purpose in SKSL and JSL, i.e. the one-handed singular reference sign becomes two-handed and has a repeated movement pattern (see Figure 12). In discourse, family members are also associated with the use of list buoys (i.e. pointing to the extended fingers of the non-dominant hand, which represents the line-up of siblings) in many sign languages.

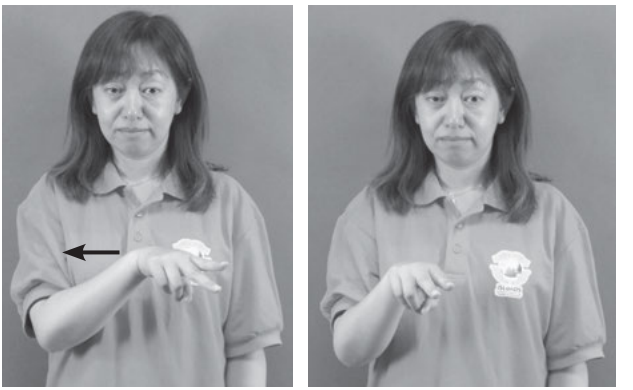


Figure 11. Plural of SIBLING in Jordanian Sign Language

Figure 12. Expressing plurality of female siblings in JSL

4.3. Quantification and numerals

Within the domain of quantification, the project aimed at collecting data on generic quantifiers such as MANY, FEW, SOME, various numeral series

(e.g. cardinal, ordinal), and numerals in combination with quantifiable units such as time or monetary units, which are typically associated with numeral incorporation. In this section, we focus on cardinal numerals, as this is the sub-topic that generated the most interesting results. A typological analysis of cardinal numerals was undertaken by Zeshan, Escobedo Delgado, Dikyuva, Panda and de Vos (2013), with an emphasis on rural sign languages. Rather than repeating some of these detailed results here, we focus on a summary of typological patterns found in numeral signs across our data.

To express 'zero', most sign languages use either the O or F handshape. However, Israeli Sign Language uses the S handshape and Chican Sign Language uses the C handshape. To count from one to five, the vast majority of sign languages in our data (30 languages) start with the index finger for 'one'. Five sign languages start with the thumb for 'one', particularly those in Eastern and Central Europe. Inuit Sign Language and South African Sign Language contain one variant that uses the little finger for 'one'.

For numbers 6-10, sign languages tend to vary between using one hand or two hands. Those that use one hand for numbers 6-9 are often based on orthographic iconicity, i.e. they exploit a manual representation of the local writing system. For example, as seen in Table 6, numbers in Ugandan Sign Language are based on Hindu-Arabic numerals; TİD numerals are based on Arabic-Indic writing of numbers; and numbers in JSL are based on Kanji (see also Sagara, this volume).

Table 6. Numerals based on writing systems

Hindu-Arabic numerals (Ugandan Sign Language)	 6	 7	 8	 9
Arabic-Indic numerals (Turkish Sign Language)	 ٦ (6)	 ٧ (7)	 ٨ (8)	 ٩ (9)
Kanji (Japanese Sign Language)	 一 (1)	 二 (2)	 三 (3)	 千 (1000)

Sign languages that use two hands tend to be based on 'number-for-number iconicity' (Taub 2001), that is, the number of extended fingers corresponds to the numerical value to be expressed.

There is large amount of variation in how the number 10 is expressed. Different sign languages employ a variety of strategies: the majority use a lexical sign to express 'ten', while some have a digital or additive system. Many sign languages express the numbers 11 and 12 using a lexical sign, but not the numbers 13-19 (cf. the distinct lexical words for 11 and 12 versus compounding for 13-19 in Germanic languages; e.g. Rischel 1996:307). Rather, 13-19 tend to be expressed using either numeral incorporation or an additive system, as in the Beijing variant of Chinese Sign Language (see Yang, this volume).

Thus for the expression of two-digit and larger numerals, sign languages use one of several strategies. The following types have been identified in our data:

- Lexical numerals: Monomorphemic signs denoting a particular number, e.g. TWELVE.
- Digital strategy: For numerals 10 and above: Signing each digit in sequence, following the written sequence, e.g. TWO FIVE ZERO for "250"
- Additive strategy: Signing numerals whose addition results in the intended number, e.g. TEN FIVE for "15"
- Multiplicative strategy: Signing numerals whose multiplication results in the intended number, e.g. THREE HUNDRED for "300"
- Subtractive strategy: Signing numerals whose subtraction results in the intended number, e.g. TWENTY TWO-LESS for "18"
- Spatial morphology: Increasing size of the signing space correlates with increasingly large numerals (see Figure 11).
- Numeral incorporation: Combining a numeral handshape with a numeral movement pattern, e.g. two-handshape signed with to-and-fro movement to mean "20"

Most of these strategies are discussed in detail in Zeshan et al. (2013).

Half of the sign languages in the survey use the digital strategy to some extent. Additive and multiplicative strategies are used by around two-thirds of sign languages to express the categories that we have looked at (1-19; multiples of 10, 100, 1000; and large numbers), but other strategies (subtraction and spatial modification) are much rarer cross-linguistically. Finally, the lexical strategy is common for the numbers 10,11 and 12 only.

In terms of numeral systems and sub-systems in individual sign languages, there is also typological diversity in terms of how many different strategies a particular sign language uses compared to another. For example, for numerals above 10, Indian Sign Language uses only two strategies (digital and multiplicative), while Mardin Sign Language uses five different strategies in various parts of its numeral system (see Table 7). Indian Sign Language is

among the simplest numeral systems found in the data, as all numerals up to 999 are digital only, and the multiplicative strategy is only used for multiples of 1,000 and above. However, many numeral paradigms use complex combinations of multiple numeral strategies.

Table 7. Numeral strategies for numbers above 10 across sign languages

Sign language	Lexical	Additive	Digital	Multi-plicative	Numeral incorporation	Subtractive	Spatial
British	+	–	+	+	+	–	–
Indian	–	–	+	+	–	–	–
Indonesian	+	+	+	+	–	–	–
Japanese	+	+	–	+	+	–	–
Turkish	+	+	+	+	+	–	–
Mardin (Turkey)	+	+	–	+	+	+	–

Some exceptional structures were found among the cardinal numeral data, for example name signs in Argentinean Sign Language (ArgSL) being used as the basis for lexical signs for the numbers 1-19 (Juan Druetta, personal communication 2013). These name signs are those of pupils in numbered dormitory beds in deaf schools for boys, and have subsequently become numerals signs (see Figure 13). This explains why Argentinean Sign Language is exceptional in that it uses lexical numerals from 13 to 19. In addition, to indicate large numbers most sign languages use additive or multiplicative strategies, but Alipur Sign Language exploits spatial modification, i.e. an iconic, metonymic means for signifying large numbers (de Vos and Zeshan 2012: 13): holding the hands further and further apart results in increasingly large numerals (see Figure 14).

Figure 13. The number '11' in Argentinian Sign Language

Figure 14. Alipur Sign Language '100', '1,000' and '100,000' (de Vos and Zeshan 2012: 14)

A relevant parameter in the categorisation of numeral systems across both signed and spoken languages is the notion of numeral base (Comrie 2013). As its name suggests, the numeral base is the numeral that is used as the basis for building up larger numerals.[4] Perhaps unsurprisingly, given the conspicuous presence of 10 fingers, sign languages are overwhelmingly decimal, that is, using the number 10 as the numeral base. Our data contain only two examples of vigesimal numerals, that is, those based on the number 20. Vigesimal numeral systems constitute a relatively smaller, but substantial, minority across spoken languages (Comrie 2013). Mardin Sign Language uses vigesimal numerals for the sub-series of 20, 40, 60 and 80 (see Zeshan et al 2013). The other case occurs in a regional dialect of Spanish Sign Language (from Galicia), where numerals 20, 30, 40, 50, 60 and 80 follow a vigesimal logic (see Báez-Montero and Fernández-Soneira, this volume). In this numeral series, 70 is a lexical numeral outside the vigesimal paradigm.

Most signed languages feature numeral incorporation to a greater or lesser extent, which refers to the occurrence of numbers within a sign, often interpreted as a number handshape appearing with another morpheme, though the phenomenon can be analysed in other ways as well (Liddell 1996:201). Table 8 illustrates the use of numeral incorporation in relation to time, money and school grades across a number of sign languages. The only known sign language not to exploit numeral incorporation in these domains is Indonesian Sign Language (Sagara and Palfreyman 2013). The indication is clearly that numeral incorporation for signs relating to time units is a feature of nearly all signed languages investigated so far, followed by a high incidence of numeral incorporation for signs relating to money and school grades, and often allowances for incorporation with various other units such as floors of buildings and event occurrences as in Finnish Sign Language (see e.g. Takkinen, Jantunen and Seilola, this volume).

Table 8. Numeral incorporation across sign languages.

sign language	time	money	grade
Britain	+	+	–
China	+	+	+
Czech	+	+	+
Estonia	+	–	–
Finland	+	+	+
Greek	+	+	+
Hungary	+	+	+
Iceland	+	–	–
India	+	+	+
Indonesia	–	–	–
Israel	+	+	–
Japan	+	+	–
Kata Kolok	+	+	+
Kosovo	+	–	+
Mexico	+	+	+
New Zealand	+	+	–
Poland	+	+	+
Spain	+	–	+
Sri Lanka	+	+	+
Turkey	+	–	+
Uganda	+	+	–

This generalisation can be summarised in the following implicational hierarchy:

Time → money/school grade

Figure 15. Implicational hierarchy for numeral incorporation

That is, if a signed language allows numeral incorporation with signs for monetary units and/or school grade, it will allow numeral incorporation with signs for time units, but not the other way around.

Some number signs can be seen to have undergone a process of lexicalisation (Johnston and Schembri 2010), which sometimes accounts for elements of variation. For example, the articulation of '25' in ASL may be non-lexicalised (using the digital strategy), i.e. formed by two separate handshapes

shown on the top left-hand side of Figure 16, or may be expressed by the fully lexicalised sign 25 shown to the right. Other examples of non-lexicalised and lexicalised signs co-existing in the numeral system are from Japanese Sign Language and Mexican Sign Language (see Figure 16). Lexicalisation is a matter of degree and can involve intermediate stages via compounding, that is, two separate signs initially form a compound, and then become further fused into a monomorphemic sign.

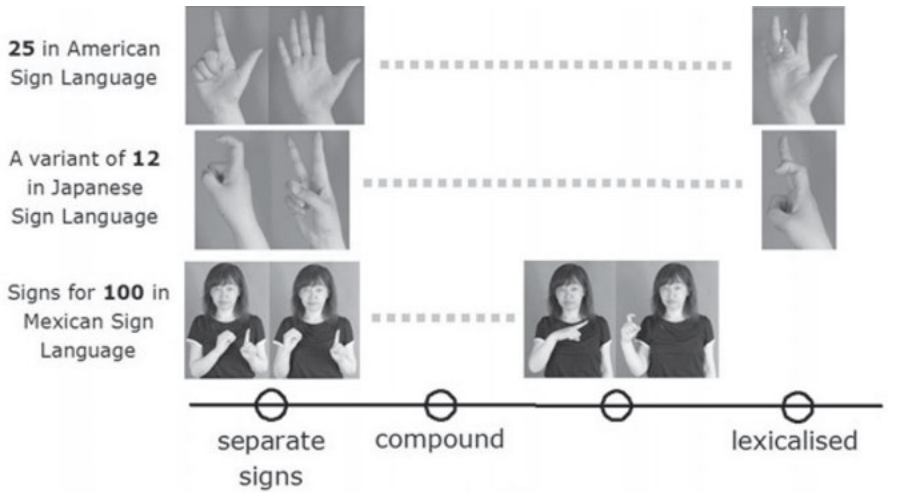


Figure 16. Lexicalisation of numerals

5. Conclusions

Similar to other previous studies in Sign Language Typology, this study has demonstrated the wide range of structures and types of complexity across sign languages with respect to the three semantic fields. The study has also innovated in terms of methodology, chiefly by making research materials available in International Sign and thus involving a larger number of participants from international Deaf communities, including those who are not professional linguists. This has broadened our data base considerably.

An important generalisation that holds across all the semantic fields investigated here is the role of sub-paradigms within the systems of numerals, kinship terms and colour terms. The organisation of the lexicon into such sub-paradigms is one of the reasons for complexity in these semantic domains. In colour term systems, this includes colour terms influenced by the manual alphabet which are the result of contact with a spoken/written language versus the "native" colour sign lexicon. In the kinship system, gender marking and

age differentiation (e.g. older and younger siblings) may apply only to a more or less restricted sub-system of kin terms. Moreover, some parts of the kinship paradigm may be compounds while others are monomorphemic or include affixes. In numeral systems, a wide range of strategies may be used in different parts of the numeral system of one and the same sign language.

In our research, discovering morphological complexity that otherwise often goes unnoticed and unreported was one of the aims of the project. Most of the lexical items discussed here feature in sign language dictionaries (or word lists) in one way or another, but most often without any structural analysis. These are also parts of the lexicon that feature prominently in many sign language courses. With this research, we aim to highlight the internal linguistic structure of the lexicon in the target domains. This leads to a wide range of new findings in relation these parts of the lexicon, for instance, that upwards or downwards movements in age-marked kinship terms constitute morphological complexity and may be considered spatially realised affixes; that like spoken languages, sign languages sometimes have vigesimal numeral systems; and that the lexicon of sign languages may develop in a layered way, with older "native" colour terms and more recent colour terms based on letters from the manual alphabet.

An area that does not feature prominently in this research is the issue of historical change in colour terms, kinship terms, and numerals. This is mainly due to the lack of historical documentation in most sign languages. A few of the chapters in this volume (on the sign languages of Spain, Japan, Indonesia, and Iceland) comment on historical change, older versus younger signers, historical contact between sign languages, or historical contact between sign languages and spoken/written languages. However, by and large the issue of historical change in the lexicon of sign languages is an under-researched area that needs further attention from linguists in future.

6. Organisation of the volume

This volume is presented in three parts: the present introduction, chapters on languages from Europe, and chapters on languages from outside Europe. This reflects the fact that sign languages from Europe are typically over-represented in cross-linguistic studies, while sign languages in some parts of the Global South remain un- or under-documented.

The volume's organisation does not follow the three target semantic domains because authors of each chapter have focussed their contributions on various combinations of the domains. Some chapters, namely those on sign

languages from Finland, Estonia, and New Zealand, cover all three domains. In addition to these three chapters, colour terms are represented in chapters on sign languages in Iceland, Spain, Indonesia, and Mexico. Kinship terms are discussed for languages from Japan, Mexico and the Czech Republic. Numerals are covered in the chapters on sign languages from Spain, China, and Japan. Thus this volume represents a substantially diverse collection of work in each of the semantic domains from around the world.

In addition, the volume includes online supplementary material with a selection of research materials used for this project, in particular from the questionnaires and the elicitation games. One of the recurring experiences in sign language typology projects is the capacity building effect that such a project has on participating teams of co-researchers. Academics and non-academics alike are introduced to research methodologies and guided through a project which they would otherwise not have been able to pursue. Publishing the research materials and details on how to use them is intended to enable other interested parties to pursue similar research in their communities, even if they have not been contributors to this study.

Acknowledgements:

We are grateful to the following individuals for the illustrations of signs in this chapter: Juan Druetta (Argentina); Masaomi Hayashi, Hitomi Akahori and Akira Morita (Japan); Sibaji Panda (India).

Notes

1. The notion of "basic colour term" is discussed in detail in several chapters in this volume (see Hollman, Palfreyman, this volume)
2. There are periphrastic expressions for younger siblings in TİD, produced by adding an open hand, palm facing downwards, at a relatively low height in the signing space.
3. Note that this applies to the historical stage when the signs first came into use, regardless of whether present-day deaf signers are aware of the connections with spoken language kinship vocabulary (see Hendriks, this volume, on this issue in Mexican Sign Language).
4. There are various more technical definitions of "numeral base"; for a detailed discussion see Zeshan et al (2013).

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Part II

European sign languages

Colour terms, kinship terms and numerals in Estonian Sign Language

Liivi Hollman

1. Estonian Sign Language

Estonian Sign Language (EVK) is a small language used by approximately 1,400–1,500 deaf people in Estonia, inhabited by 1.3 million people. EVK research only started in late 1980s and since 1994 EVK has also been used as a primary language in deaf education. Starting from 2007 EVK is a legally recognised language in Estonia, enacted by the Language Act, which defines EVK as an independent language and signed Estonian as a mode of the Estonian language (Wheatley and Pabsch 2012: 55). Considering historical relationships, it may be assumed that EVK has probably been influenced by German and Russian traditions in deaf education and by Russian Sign Language, which, in turn, on the basis of historical knowledge, is believed to be connected to French Sign Language (LSF) and ASL (Zeshan 2005: 559).

The evolution of EVK is related to the establishment of the first deaf school in 1866 in Vändra, Estonia. Although, following the German tradition, oral teaching method was used in the school, signing in student communication was also supported. Therefore, bringing together deaf students from all over Estonia and giving them the possibility to communicate created a perfect environment for EVK to develop. During the Soviet era (1940 – 1991) deaf education was mostly influenced by the Russian tradition, and communication between deaf communities in Estonia and Russia, as well as other member states of the Soviet Union was strongly supported by mutual visits and co-operation. Together with the increase of the Russian population in Estonia in general, also the number of Russian deaf people living in Estonia increased. Although currently most of the Russian deaf children living in Estonia attend Estonian schools, it is estimated that based on the total number of Russian population in Estonia (340 000 people in 2012), there are approximately 300–400 Russian deaf people living in Estonia, being part of the Estonian deaf community but using also Russian SL.

A comparison of the EVK lexicon with the Russian SL lexicon, according to Swadesh's 200-word list, shows that 61% of the signs are identical in these

two languages (Taniroo 2007: 23), confirming the assumption that these languages are related somehow or there is some influence from Russian SL on EVK through language contact.

EVK in general as well as the EVK lexicon has not been widely studied. In the late 1980s and the beginning of 1990s, three small EVK dictionaries have been published (Toom 1988, 1990, and Kivisild and Toom 1990); they contain approximately 700 signs that form the basic vocabulary of EVK. Work with the online dictionary consisting about 5,000 signs is currently in progress. Besides some general overviews more specific descriptions have focused on noun phrases (Miljan 2000), adjectives (Miljan 2001), category of number (Miljan 2003); the system of personal name signs (Paales 2011), place names (Paales 2002) and colour terms (Hollman 2010).

In the current article three domains – colour terms, kinship terms and numerals in the EVK lexicon are described and the formation of the signs is analyzed.

2. Colour terms in EVK

The first survey on colour terms in EVK was carried out in 2005 (Hollman 2010). The research consisted of three tasks, following Davies and Corbett's field method (Davies and Corbett 1994: 69–72; 1995: 25–27; Davies, Corbett, and Margalef 1995: 22–26, Sutrop 2000, 147–148; 2002, 58). The first task was the list task where the subjects were asked to name as many colours as they could. Secondly, the subjects' ability to see colour was assessed using The City University Colour Vision Test (Fletcher: 1998). The answers from the respondents who failed the test were not included in the data analysis. The third task was the colour-naming task which involved showing the subjects 65 different colour squares in random sequence. The subjects were asked to name the colours of the tiles. After the three tasks were completed, a questionnaire about the background information (i.e. age, sex, place of residence and place of origin, education, schools attended, occupation, degree of deafness, hearing status of parents and siblings, access to sign language in the family before school or kindergarten started, and if there was no access to sign language in the family, the age when EVK was learned) of the subjects was filled out. A total of 50 deaf EVK users from different regions of Estonia were interviewed for the survey.

The subjects were contacted through the local deaf clubs and were selected from the two bigger cities having deaf schools and deaf clubs – Tallinn and Tartu, the area of older and extant EVK – Pärnu, and Võru and Rakvere as small centres of the deaf where EVK is probably more influenced

by spoken Estonian. The proportion of the subjects from these different regions followed the number of deaf people living in these areas. The group of subjects included 20 people from Tallinn, 11 from Tartu, 13 from Pärnu and 6 from Võru and Rakvere. There were 24 men and 26 women between the ages of 15 and 74 participating in the survey (Hollman 2010: 58–59).

The above mentioned colour terms survey revealed that EVK possesses a rich colour vocabulary. The list task data included 109 different colour signs, among them 19 simple colour names consisting from one sign only, excluding all the compounds and longer descriptions of colours and mentioned at least by four people in the study – two different names for *red*, signs BLUE, GREEN, YELLOW, BLACK, two different signs for *white*, a sign noted here as PINK/PURPLE, covering both lighter red area and the transition area of red and orange in the colour space, GRAY, BROWN, PURPLE, three signs for *orange*, BROWN/BEIGE, BEIGE, GOLD and SILVER. The data from the colour-naming task included 696 different terms including compounds and longer colour descriptions. In this task, more compounds were used (the average designation given to a colour tile being 1.79 signs) and only 225 signs out of 696 were mentioned at least twice. It may be seen from the data that when the subjects were asked to list the colours, they mainly used simple terms excluding compounds, but when asked to name 65 different colour tiles the number of compounds increased significantly in the data and the subjects also used longer descriptions to differentiate between colours, hues and shades.

According to the research data and considering the definition of a basic colour term by Berlin and Kay (1969: 6–7), who define basic term as

> *(1) a mono-lexemic term whose meaning is not predictable from the meaning of its parts; (2) a term whose signification is not included in that of any other colour term; (3) a term whose application is not restricted to a narrow class of objects and (4) a term which is psychologically salient for subjects (having a tendency to occur at the beginning of elicited lists of colour terms, and stability of references across subjects and across occasions of use and occurrence in the idiolects of all subjects);*

it was concluded that EVK possesses nine basic colour terms – BLACK, WHITE, RED, YELLOW, GREEN, BLUE, GRAY, BROWN and PINK/PURPLE (Hollman 2010: 109). Corresponding to the criteria set by Berlin and Kay these terms were phonologically simple and their application was not restricted by the objects they describe. The salience of the terms used was analyzed using cognitive salience index (Sutrop 2001: 270, 273) which combines the tendency of a term to occur at the beginning of the lists (described by mean position of the term in the lists) and the occurrence in

the idiolects of all subjects (described by total frequency). In addition to the terms having the basic status in EVK there is also a great variety of simple signs like – PURPLE, ORANGE and their variants, and different signs for *white*, *red, brown* etc. In contrast to PINK/PURPLE, the sign covering both pink and purple area of the colour space, PURPLE for example, not having a basic term status in EVK according to the survey because of its low frequency, appeared in the transition area of red and violet and violet and blue. There was also a great variety of signs used to denote *orange*: seven different signs were named more than twice in the list task and eight different signs in the colour-naming task, although most of them occurred only once for one tile. The number of different signs used to denote the basic colour categories and their most probable origins are shown in table 1.

Table 1. Number of EVK signs denoting the 11 colour categories and their motivation

Colour category	**Number of signs in EVK**	**Probable origin of the sign**
black	1	motivation from spoken Estonian
white	2	extension of the meaning, motivation from pointing to representation of the colour
red	2	motivation from pointing to representation of the colour
yellow	1	Russian SL loan
blue	1	Russian SL loan
green	1	extension of the meaning
brown	2	extension of the meaning, motivation from pointing to representation of the colour
pink	3	motivation from pointing to representation of the colour, extension of the meaning, initialisation
purple	6	initialisation, loans, arbitrary signs
beige	3	initialisation, extension of the meaning, motivation from pointing to representation of the colour
orange	8	initialisation, loans, arbitrary signs

Especially in the colour-naming task, also complex combinations of the colour signs occurred. The most frequent attributes used in sequential constructions to describe different colours were signs LIGHT, DARK, INTERMEDIATE, NORMAL (USUAL, REGULAR), BLEND, BRIGHT, but also many other attributes like VERY, PURE, WEAK, OLD, STRONG, GENTLE, SHARP, STRANGE, TIRED, FRESH etc were used in different combinations and in different order (see examples 1–4 below). The following examples are a random selection of compounds with different modifiers. According to the present data the modifiers are ordered flexibly – they either preceed or follow the colour sign or the colour sign is bracketed by the modifier while the word order does not influence the semantics of the compound. The order of the signs in the compound did not depend on either colour word or modifier.

(1) LIGHT BLUE
light blue
(2) GREEN DARK
dark green
(3) GREEN DARK GREEN
dark green
(4) BRIGHT GREEN BRIGHT
bright green

Comparison with objects typically having the respective colour may be used to describe the colours in more detail; comparison with the sky, sea, cherries, moss, strawberries, Estonian flag, forest, eggs, grass etc have occurred in the data of the colour terms survey (see examples 5–10 below).

(5) RED CHERRY SAME
cherry
(6) YELLOW LEMON SAME
lemon yellow
(7) SPRUCE GREEN
green like spruce
(8) DARK CHOCOLATE BROWN
dark chocolate brown
(9) LIGHT BLUE SKY
light azure
(10) CARROT ORANGE LIGHT
light orange like carrot

These descriptions are not considered as colour terms but different ways to describe colour in detail and therefore the descriptions may be quite long and complex (see examples 11–16).

(11) COLOUR PURPLE TOWARDS RED
reddish purple
(12) PINK PLUS RED TOGETHER MIX DARK
dark carnation red
(13) FRESH BLUE MIX WHITE ADD
fresh whitish blue
(14) FRESH TRANSPARENT LIGHT GREEN
fresh transparent light green
(15) INTERMEDIATE RED VIOLET WEAK
slightly violet regular red
(16) LIGHT YELLOW ADD GREEN LIGHT
light greenish-yellow

EVK possesses a generic term for colour derived from the sign PAINT. In some instances however a list of colours (RED+YELLOW+BLUE for instance) is used. Pointing to the colours in the surrounding environment in combination with the colour signs or generic sign for *colour* is possible but not conventionalised.

The most dominant (having the greatest frequency and occurring at the beginning of the elicited lists) simple colour sign according to the colour survey in EVK is BLACK (figure 1). The sign has two variants: it may be articulated with one upward movement or with a repeated movement. The most probable origin of the sign is the method used to help the deaf students feel the airflow while articulating nasal sounds by touching the nose with their finger as the Estonian counterpart *must* [black] starts with nasal *m*.

Figure 1. EVK colour signs: BLACK

For *white*, there are two signs used in EVK. The more salient sign is formed on the back of the non-dominant hand with a forward movement by the dominant hand (figure 2a). It may be assumed that the formation of the sign is motivated by the white skin of the hands while the other sign for *white*, used with lower frequency according to the colour survey in EVK (figure 2b) is probably an extension of the meaning of the EVK sign CLEAN.

(a) WHITE 1 (b) WHITE 2 / CLEAN

Figure 2. EVK colour signs: WHITE 1, WHITE 2

It is interesting to note that while WHITE 2, identical to sign CLEAN, is mainly used by elderly subjects from one region in Estonia, WHITE 1 prevailed in the data given by younger subjects from different regions (figure 3), which leads to the assumption that the sign with the extension of the meaning is in all probability the older sign and is currently already disappearing from EVK.

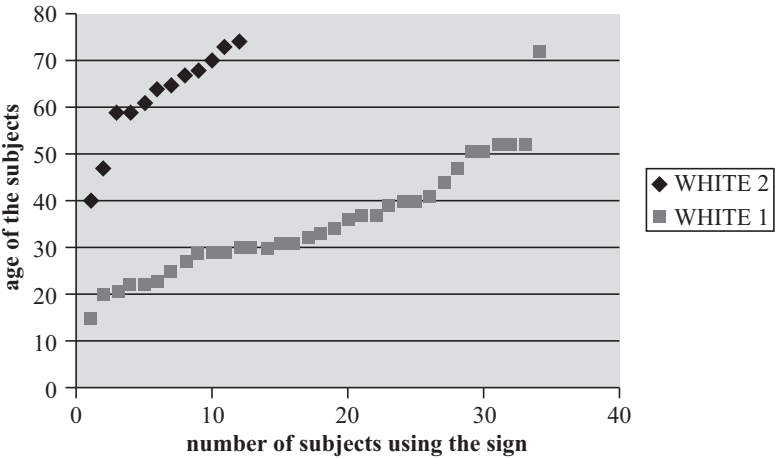


Figure 3. Age of the subjects using the signs WHITE 1 and WHITE 2 in the list task of the colour terms survey in EVK (Hollman 2010: 91)

There are also two signs for *red* used in EVK. RED 1 is articulated with a round movement on the cheek (figure 4a) probably motivated by a blushing face. The sign is very similar to the sign PINK (VAALEAPUNAINEN [PINK]) in Finnish Sign Language. There has been no considerable historical language contact between EVK and Finnish Sign Language although the two spoken languages (Estonian and Finnish) are very similar Finno-Ugric languages. Therefore, it is difficult to decide weather RED 1 is just motivated from pointing or it is a loan from Finnish SL. The other sign for *red* (figure 4b), articulated on the lips with the index finger, is similar to the sign RED in many other sign languages, including Russian SL and ASL, and is probably derived from pointing to the lips, typically representing the *red* colour, although in EVK it is difficult to say if it is derived from pointing or if it is an influence from other sign languages, for example from Russian SL.

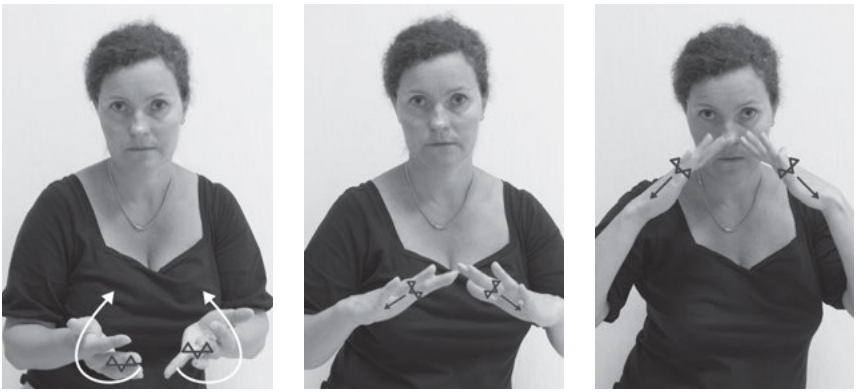
(a) RED 1 (b) RED 2

Figure 4. EVK colour signs: RED 1, RED 2

RED 2 is however quite rare in EVK; according to the data of the colour term survey the sign was used mainly by the elderly subjects, prevailing in the lists of subjects from deaf signing families, while RED 1 was used by the subjects from the hearing families, suggesting that RED 1, either a loan or a native EVK sign, is now fully lexicalised while RED 2 seems to be disappearing. The same sign RED 2 accompanied by a different mouth pattern is also used to denote both *wine* and *ruby*. According to the explanations by the EVK users, the infrequency of RED 2 might also be related to the fact that the use of the two signs for *red* is dependent on the object described and the sign RED 2 would most likely be used for fluids like wine, juice or blood.

GREEN is articulated in three different variants: with an upward arc movement in neutral space (GREEN a, figure 5a), a two-handed sign formed

with a divisive downward movement (GREEN b, figure 5b) or with a divisive downward movement in front of the face (GREEN c, figure 5c). A wiggling movement of the fingers is also characteristic of the sign in all its variants.



(a) GREEN a (b) GREEN b (c) GREEN c

Figure 5. EVK colour signs: three variants of the sign GREEN

In the EVK colour terms survey GREEN a was mostly used by the elderly subjects while GREEN b and GREEN c were used by the younger subjects (see figure 39 for the age distribution of the subjects using different variants of the sign GREEN).

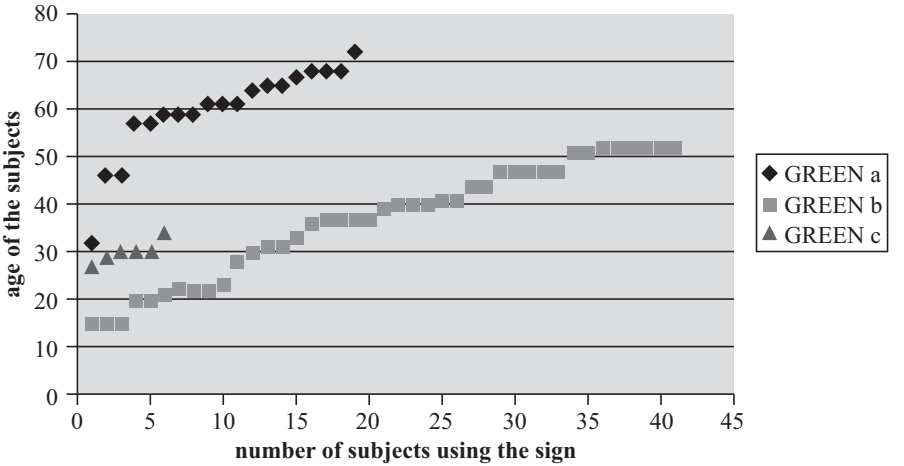


Figure 6. Age of the subjects using GREEN a, GREEN b and GREEN c in the list task of the colour terms survey in EVK (Hollman 2010: 95)

As the oldest variants of the sign are probably two-handed signs articulated in neutral space, either with an upward arc movement (figure 5a), or a divisive downward movement (figure 5b), the first identical to the sign CHRISTMAS, and the second similar to the sign SPRUCE (formed by repeated downward movement, no wiggling of the fingers), it may be assumed that the sign is motivated by the green Christmas tree. The location of the sign has moved up diachronically. The newest variant is signed in front of the face and is becoming a one-handed sign.

A comparison of the EVK lexicon to Russian SL, according to Swadesh's list mentioned above, also includes some colour terms. The study describes five colour terms – *black, white, red, green* and *yellow*. According to Taniroo (2007: 23), only the sign YELLOW (figure 7) is identical in both sign languages. There are no studies of comparing EVK vocabulary with any other sign languages than Russian SL.

Figure 7. EVK colour signs: YELLOW

In the Estonian context, the sign seems to be arbitrary, with no clear motivation or initialisation but, considering the obvious influence from Russian SL or even an implicit influence from French SL and ASL, EVK YELLOW may have originated from an initialised sign (the Y handshape from the English *yellow* or J handshape from the French *jaune* [yellow]). Although ASL YELLOW is a one-handed sign, in EVK and Russian SL the sign is definitely formed by two hands. It might be assumed that EVK YELLOW, of Russian, American or French provenance, has moved from its original location to a more central location and, characteristic of a sign formed in front of the body, has become a two-handed sign.

The EVK sign BLUE (figure 8) is also identical to the respective sign in Russian SL and is probably also a loan from Russian SL. BLUE is articulated either in the neutral space or in front of the face.

Figure 8. EVK colour signs: BLUE

GRAY (figure 9) is also very clearly a basic colour term in EVK, being in all probability a native sign, very salient and practically the only sign for *gray* in EVK. Similarly to the sign BLACK, it may be articulated with a single movement or in a reduplicated form.

Figure 9. EVK colour signs: GRAY

The EVK sign for *pink* and *purple*, here glossed as PINK/PURPLE, is also probably motivated by a blush, similarly to RED 1, the sign is articulated in many different ways: with wiggling fingers and the palm oriented either towards or away from the signer, and with still fingers and the palm oriented

either towards or away from the signer (figure 10). In some cases, the sign is even articulated in neutral space, not on the cheek.

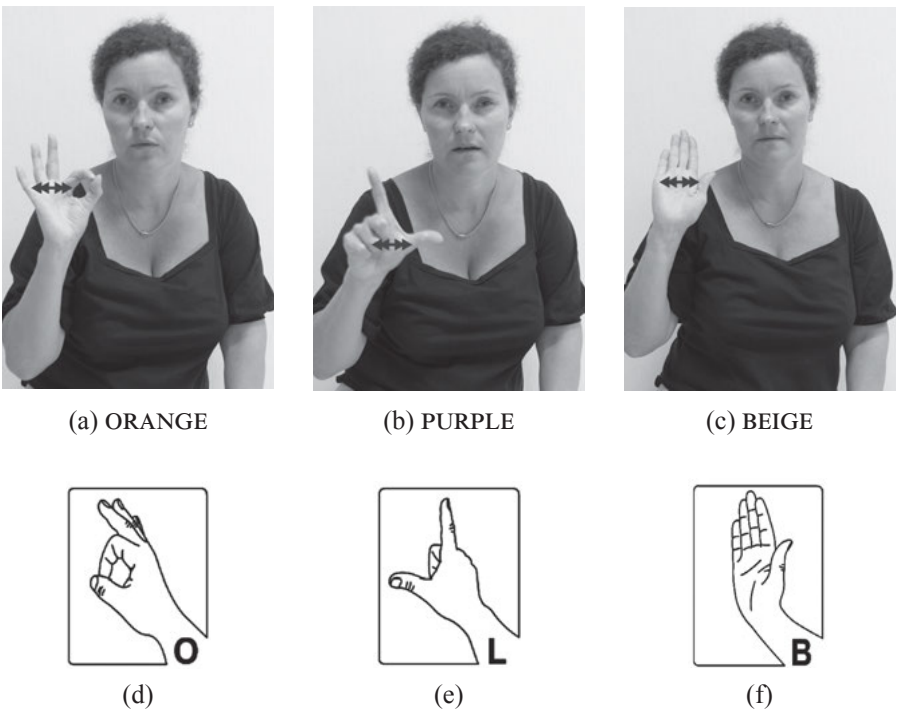
Figure 10. EVK colour signs: different variants of the sign PINK/PURPLE denoting the composite category of *pink* and *purple*

BROWN (figure 11) is probably derived from an extension of the meaning of the sign COFFEE. BROWN is articulated with two hands touching each other, while the sign COFFEE is formed with a larger movement and with no contact between the two signing hands.

Figure 11. EVK colour signs: BROWN

The sign for *coffee* is obviously motivated by the movement of coffee-grinding, but it is difficult to determine if the extension of the meaning of the colour *brown* was developed in EVK or if it is a loan or influence from another sign language having the same sign for *coffee*.

The most salient EVK sign for *orange* (figure 12a), as well as signs PURPLE (figure 12b) and BEIGE (figure 12c) are initialised signs articulated with the handshape of the first letter of the respective colour word in Estonian. The sign ORANGE is formed with the EVK O handshape (figure 12d) from the Estonian word *oranž* for *orange*. PURPLE is articulated with the same movement and in the same location, but with the L handshape (figure 12e) from the Estonian word *lilla* for *purple*, and BEIGE is articulated with a B handshape (figure 12f) from the Estonian word *beež* for *beige*.



(a) ORANGE (b) PURPLE (c) BEIGE

(d) (e) (f)

Figure 12. EVK colour signs: ORANGE, PURPLE and BEIGE

Due to the fact that the oral teaching method prevailed in Estonia for a long time, signed Estonian is also used in the Estonian deaf community, especially among older generation, and the influence from spoken Estonian may be observed both in EVK vocabulary and grammar. Estonian and signed Estonian is also used to describe colours. Estonian colour words may be used alone or they may be accompanied by the respective EVK colour sign. Sometimes a certain mouth pattern is used to distinguish the meaning of the signs referring to different colours, as the above mentioned sign PINK/PURPLE. The sign may therefore be accompanied by the mouth pattern

roosa [*pink*] for *pink*, or *lilla* [*purple*] for *purple*. Although different mouth patterns are used, PINK/PURPLE accompanied with different mouth patterns does not constitute separate lexicalised signs in EVK. To cover the transition area of red and violet, an initialised sign PURPLE is used although it doesn't have basic colour term status in EVK yet. Fingerspelling Estonian colour words may also be used although there are no lexicalised fingerspelled signs among the colour signs in EVK.

Using the methodology and research materials of the Sign Language Typology project of the International Institute for Sign Languages and Deaf Studies (University of Central Lancashire) for the data collection, besides basic colour signs and numerous compounds and longer descriptions, a wide variety of manual (speed, intensity, direction of the movement, reduplication) and non-manual (squint or raised eyebrows, head and body movements) markers used to compare different levels of darkness, lightness and saturation was also revealed. These features only become evident through the dialogues used in the latter study.

To express the quality of darkness and lightness, in EVK signs for *light* and *dark* may be used. These signs can be inflected to refer to the degree of lightness or darkness by the extent and intensity of the movement and non-manual markers.

(a) LIGHT (b) VERY_LIGHT

Figure 13. Non-manual marking of the sign LIGHT in EVK

Raised eyebrows, head and body moving backwards accompany the signs to refer to lighter shades (figure 13) while furrowed eyebrows, narrowed or even closed eyes, head and body moving forward mark the signs for darker shades (figure 14).

(a) DARK (b) VERY_DARK

Figure 14. Non-manual marking of the sign DARK in EVK

The colour signs may also be modified by reduplication and the amplitude and intensity of the movement to express the extent of saturation. A reduplicated sign formed with a slighter movement may refer to a less saturated hue of a colour while a single and more intensive movement is used to denote pure and deep hues of the same colour. A slight repeated movement in articulation of the sign GRAY (figure 15a) referres to grayish hue and the intensive single movement to pure gray (figure 9).

(a) GRAY/GRAYISH (b) BLACK/DEEP_BLACK

Figure 15. Manual marking of the colour signs in EVK

The same principle may be seen in the articulation of the sign black referring to either blakish shades or deep black (figure 15b).

Non-manual markers (raised shoulders, squint or raised eyebrows, narrowed or closed eyes) also mark colour signs to refer to the extent of saturation (figure 16).

(a) DEEP_RED (b) GREENISH

Figure 16. Non-manual marking of the colour signs EVK

Raised shoulders, furrowed eyebrows and narrowed eyes refer to more saturated and darker hues (figure 16a) while raised eyebrows denote less saturated and lighter hues (figure 16b). Other markers like pursed lips may also be observed to express saturation and darkness.

Research about the colour terms in Estonian (Sutrop 2002) shows that there are 11 basic colour terms in Estonian. Comparing colour terms in EVK with the colour vocabulary in the Estonian language it may be seen that although the number of basic terms is EVK is smaller and the colour vocabulary is not as rich as in Estonian, the same colour categories are still covered by simple colour signs.

As seen in table 1, there are only one or two signs used to denote colour categories higher in Berlin and Kay's colour terms hierarchy (Berlin and Kay 1969: 15) while the number of terms usually emerging in a language later in its development is quite high and the terms have not yet become basic in EVK.

3. Numerals in EVK

The numerals were collected using the methodology and research materials of the Sign Language Typology project of the International Institute for Sign Languages and Deaf Studies (University of Central Lancashire). Two different games were used for data collection. In the first game two

EVK signers participating in the study were asked to choose five objects with considerable value and five objects with a small value. One of the players was a seller and the other one was a buyer. The buyer was asked to bargain with the seller to buy the products. In the second game the subjects had a set of 40 cards with arithmetic instructions. The two participants took turns to take a card from the desk, sign the arithmetic instruction on it as well as the result. Both games were video recorded.

The cardinal numerals 0–10 are highly iconic in EVK, as is characteristic in many sign languages. The iconic base of the numeral signs for 1–5 is the number of extended fingers, and of the signs for 6–9, the sum of 5 fingers of the non-dominant hand and 1–4 fingers of the other hand producing the sign. Numeral signs 1–5 are therefore one-handed representations of the numbers expressed by the respective number of extended fingers, starting with the index finger, while the sign for *zero* is a representation of the shape of the digit 0 (figure 17, a–f).

(a) ZERO

(b) ONE

(c) TWO

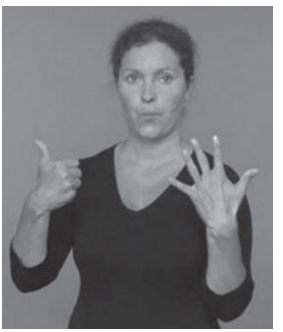
(d) THREE

(e) FOUR

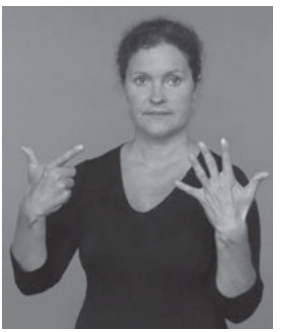
(f) FIVE

Figure 17. Numeral signs 0–5 in EVK

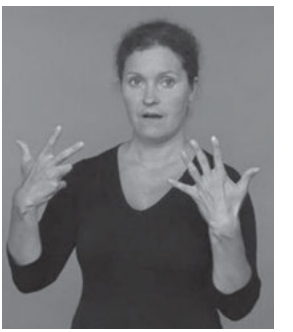
The signs for 6–9 have originally been two-handed and were formed either on the palm of or alongside with the non-dominant hand with 1–4 extended fingers respectively, starting with the thumb (figure 18). The fact that numbers 1–5 and 6–9 are formed with different fingers extended has allowed these signs to change into one-handed signs which tend to be more widespread in the usage of younger signers. This tendency has also been a reason for variation of the sign for *three*, originally formed with the same handshape as EIGHT (figure 18c), but now changing to w-handshape (figure 17d) to allow clear distinction between numerals THREE and EIGHT signed with one hand only; and the sign for *nine*, signed with the same handshape as FOUR (figure 18d) in a two-handed sign and with the different handshape (figure 18e) in a one-handed sign.



(a) SIX



(b) SEVEN



(c) EIGHT

(d) NINE a

(e) NINE b

Figure 18. Numeral signs 6–9 in EVK

The main strategy for expressing complex numbers above ten in EVK is to combine a single digit sign with a certain movement pattern. Numerals 11–15 are formed by the same handshape as numerals for 1–5 with repeated turning movement from the wrist (figure 19a) and multiples of ten are formed with the repeated movement from side to side (figure 19b). The numerals for

16–19 are more complicated, formed on the palm of the non-dominant hand as signs SIX, SEVEN, EIGHT and NINE but with an opening downward movement (figure 19c). Sequential compounds of multiples with ten are sometimes also used, but it seems to be rather an influence from other sign languages and International Sign than a construction characteristic of EVK. In educational settings often simultaneous compounds of the sign ONE formed by the non-dominant hand and numeral signs for 1–9 formed by the dominant hand with a turning movement from the wrist to represent numerals 11–19 and their written form simultaneously may be observed.

The sequential compounds are also used to express complex numbers above twenty. These numerals are signed with the iconic handshape of the respective number combined with a certain movement pattern while signing follows the written form of the number – the multiples of thousands, hundreds and tens are signed from left to right as in the written form of a certain number. Therefore, while *forty-seven* is produced by 4 handshape with repeated movement from side to side followed by the sign SEVEN next to the sign FORTY (figure 19d), the sign seventy-four starts with sign SEVENTY on the left followed by the sign FOUR moving a little right next to the previous sign.

(a) TWELVE

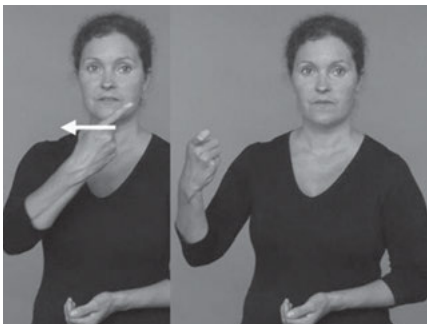
(b) TWENTY

(c) SEVENTEEN

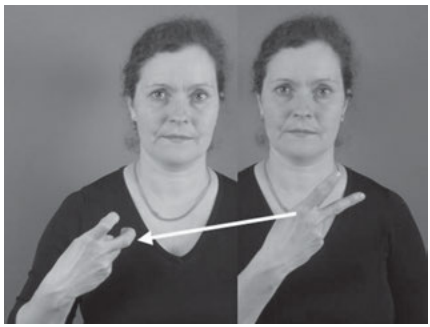
(d) FORTY-SEVEN

Figure 19. Numeral signs TWELVE, TWENTY, SEVENTEEN and FORTY-SEVEN in EVK

EVK possesses lexical signs HUNDRED (figure 20a), thousand (figure 20c), million (figure 21a) and billion (figure 21b). TEN+THOUSAND and HUNDRED+THOUSAND as well as TEN+MILLION are sequential compounds of the respective signs TEN, HUNDRED, THOUSAND and MILLION similarly to the respective compounds used in spoken Estonian.

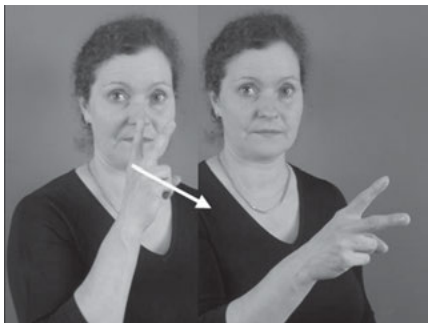


(a) HUNDRED



(b) TWO_HUNDRED

(c) THOUSAND



(d) TWO_THOUSAND

Figure 20. Numeral signs HUNDRED and THOUSAND and incorporated signs TWO_HUNDRED and TWO_THOUSAND in EVK

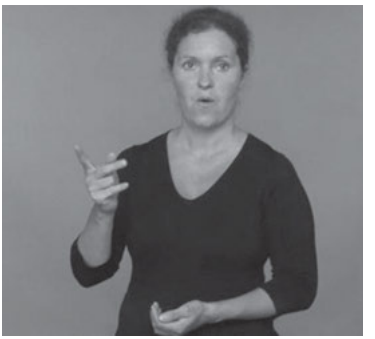
(a) MILLION

(b) BILLION

Figure 21. Numeral signs MILLION and BILLION in EVK

Multiples of hundred and thousand are expressed by numeral incorporation with the signs HUNDRED and THOUSAND (figure 20b and 20d). Numeral incorporation is also used for time units (year, month, week, and hour) as well as for classifiers (people, floors). All these signs are formed with the extended index fingers in their original form, easily allowing numeral incorporation.

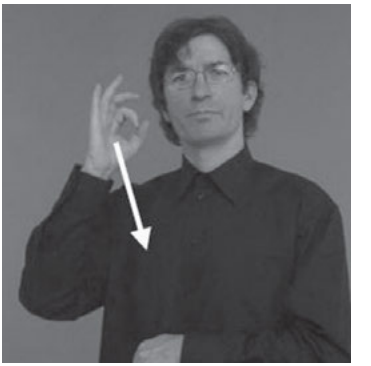
There are several strategies used to express fractions in ESL. Cutting off movement with the thumb on the second finger is used to represent one and a half. The sign may be used in different contexts referring to different quantities – time, volume, weight, length etc (figure 22a) and the same sign produced on the third or little finger is also possible although not conventionalised in EVK. Other strategies involve compounds with the signs PERCENT (figure 22d) HALF (figure 22b) or QUARTER (figure 22c). The latter however is strongly related to the sign HOUR and although sometimes also used in other contexts, mainly related to time units only.



(a) ONE_AND_A_HALF

(b) HALF

(c) QUARTER



(d) PERCENT

Figure 22. Fractions in ESL: ONE_AND_A_HALF, HALF, QUARTER and PERCENT

The most common way to indicate fractions is representation of their written form by using numerals in sequential compounds with the sign POINT or by indication of the columnar difference, forming the sign for numerator higher in the signing space and the denominator signed below it (figure 23).

ONE + THIRD

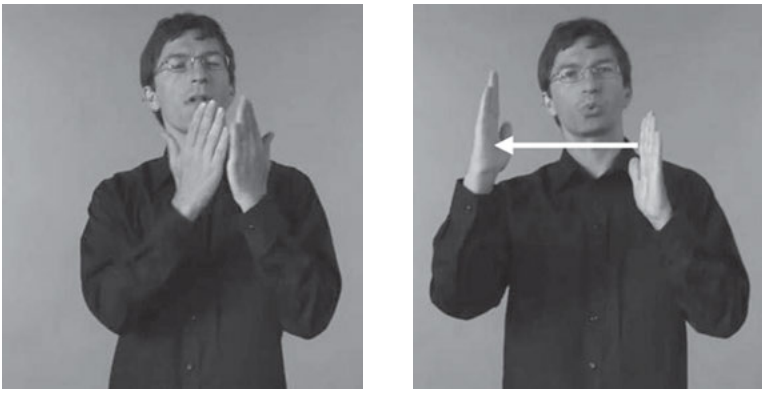
Figure 23. Fractions in ESL: ONE+THIRD

The ordinal numerals are derived from cardinal numerals with a certain movement pattern similarly to numerals above ten. The movement pattern applied is a single turn from the wrist with the hand slightly moving upward (figure 24a). Also pointing to the respective finger of the non-dominant hand is used for ordinal numerals. Both strategies are only productive for numerals up to ten.

(a) FIRST (b) TWO_YEAR

Figure 24. EVK ordinal numerals and plural marking: FIRST and TWO_YEAR

Plural marking in EVK is realised in several different ways. Besides numerals, EVK possesses a set of lexical quantifiers like ALL, EVERY/EACH, MANY, SOME, FEW, NO, NONE, NOTHING etc which can be used to express quantities. As stated above, many signs (YEAR, MONTH, WEEK and HOUR) and classifiers, also allow numeral incorporation to express dual, trial, quadruple and quintuple (figure 24b).



BOOK classifier tracing

Figure 25. Plural marking in EVK: reduplication of classifiers

Thirdly, reduplication of the sign or classifier may be used. The reduplication may be individually articulated repetition of a sign (SIBLING+++, CHILD+++, PERSON+++) in different locations, reduplication of a classifier combined with the locational modification or a tracing movement (*books*, figure 25). Reduplication and spatial inflection is also applicable to some quantifiers.

As seen from the analyses above the numerals in EVK are formed by iconic handshapes representing the number, with movement patterns related to numeral series and multiples. The location of the sign may also follow the written form as in fractions and complex numbers.

4. Kinship terms in ESL

The kinship terms were also collected using the methodology and research materials of the Sign Language Typology project of the International Institute for Sign Languages and Deaf Studies (University of Central Lancashire). Two games were used for data collection. In the first game two EVK signers participating in the study were asked to discuss and provide a list of family

members that would be invited to a wedding. The second game included a family tree chart. The player having a chart had to ask questions from another player to get to know his/her family members to fill in the chart. The game was repeated changing the roles of the players. All the discussions were video recorded for the further analyses.

EVK uses both lexicalised signs as well as pointing in the signing space to express kinship terminology and family relations.

EVK possesses simple gendered terms for *man, woman, girl, boy, mother, father, son* and *daughter* and simple non-gendered terms for *spouse, siblings, parents' siblings, fiancé/fiancée* and *cousin*. Gender distinction in the signs SPOUSE, SIBLING and RELATIVE is secondary and is performed by attributive signs MAN, WOMAN, BOY and GIRL.

Generic kinship terms are either simple lexicalised signs (CHILD, SPOUSE, SIBLING, RELATIVE) or lexicalised lists of the members of the group (MOTHER+FATHER). More specific terms are either simple lexicalised signs (GIRL, BOY, MOTHER, FATHER, DAUGHTER, SON), lexicalised sequential compounds (BOY+SIBLING, GIRL+SIBLING, FEMALE+RELATIVE for *aunt*, MALE+RELATIVE for *uncle*, OLD+FATHER for *grandfather* and, OLD+MOTHER for *grandmother*) or complex combinations describing the family relations (SPOUSE OWN GIRL+SIBLING for sister-in-law).

(a) PARENTS (b) MOTHER (c) FATHER

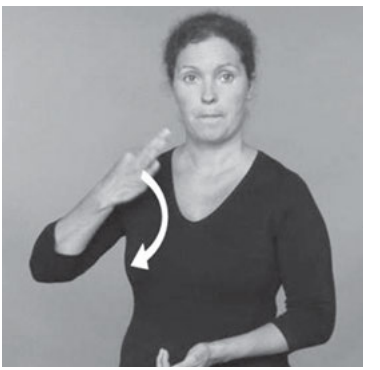
Figure 26. EVK core family terms: PARENTS, MOTHER+FATHER, MOTHER and FATHER

The generic non-gendered term PARENTS (figure 26a) is a calque from spoken Estonian and not as frequent as the sequential compound MOTHER+FATHER (figure 26b+c). In spoken Estonian the term is derived from the word *vana* (old, older) – and the EVK counterpart is an exact translation of the term, using the reduplicated sign OLD+++. Other core family terms like MOTHER (figure 26b), FATHER (figure 26c), DAUGHTER (figure 27a)

and SON (figure 27b) are gendered terms; only the main sign for *siblings* (figure 27c) does not differentiate gender. Not all the core kinship terms are phonologically distinct from each other. While MOTHER, FATHER, BOY and GIRL do not seem to share any common features, DAUGHTER and SON are formed with the same movement in the same location to indicate birth but with a different handshape. The shared handshape in MOTHER, DAUGHTER and GIRL is probably a co-incidence only.

The gender distinction is only possible by using the attributive signs BOY+SIBLING (figure 27d) or GIRL+SIBLING (figure 27e). These compounds are quite frequent to mark the gender. Gender marking may also be indicated by mouthing.

(a) DAUGHTER



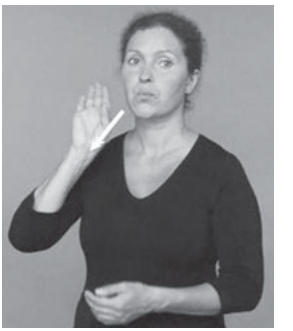
(b) SON

(c) SIBLING

+

(d) BOY

/



(e) GIRL

Figure 27. EVK core family terms: DAUGHTER, SON, SIBLING, BOY and GIRL

While MAN (figure 28b) and WOMAN (figure 28c) are gendered lexicalised signs, the signs for *spouse* (figure 28a) as well as *fiancé* and *fiancée* are non-gendered. Similarly to the Estonian language, where words *mees* [man, husband] and *naine* [woman, wife] are actually used also in the meaning of

wife and *husband*, the general terms MAN and WOMAN may also be used to denote gendered spouse.

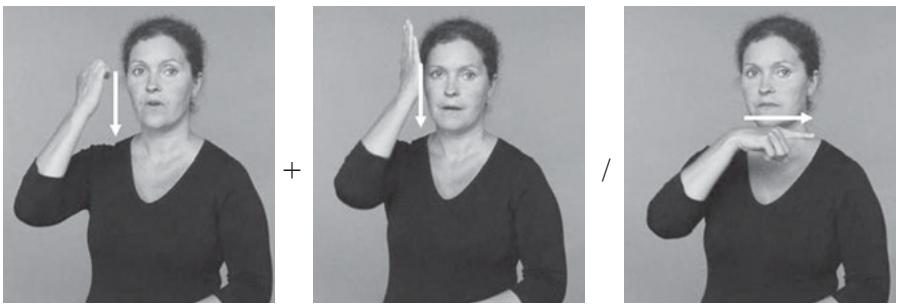
(a) SPOUSE (b) MAN (c) WOMAN

Figure 28. EVK core family terms: SPOUSE, MAN and WOMAN

Age differences among the family members can only be described through complex descriptions (see examples 17 and 18).

(17) BOY+SIBLING OLD
older brother
(18) GIRL+SIBLING SMALL
younger sister

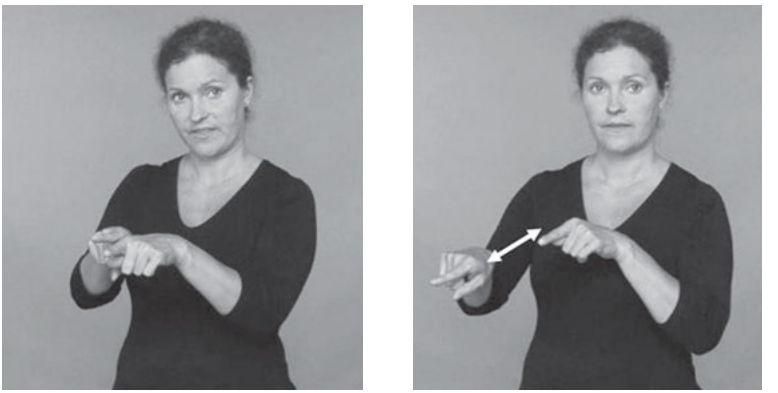
Non-core family members are indicated by lexical signs or compounds (OLD+MOTHER(figure29a+b),OLD+FATHER(figure29a+c),FEMALE+RELATIVE, MALE+RELATIVE) without any distinction in maternal and paternal relations. If needed to indicate maternal or paternal grandparents, complicated compounds MOTHER OWN FATHER or FATHER OWN FATHER etc are used. There are also signs for non-gendered same generation *cousin* and *fiancé/ fiancée.*



(a) OLD (b) MOTHER (c) FATHER

Figure 29. EVK non-core family terms: GRANDMOTHER and GRANDFATHER

It is interesting to note that the signs used to denote *siblings, aunts/uncles* and *cousins* are all produced with the same handshape in the same location but with a different movement. The sign SIBLING (figure 30a) has the same handshape as relatives in general but with the movement pattern from sign BESIDE, while COUSIN and UNCLE/AUNT (figure 30b) pattern with relatives in general sharing the same movement.



(a) SIBLING (b) RELATIVE

Figure 30. EVK family terms: SIBLING and RELATIVE

For grandchildren a compound CHILD+SMALLER_CHILD (figure 31) is used, but it is also possible to use more complex descriptions like DAUGHTER CHILD or DAUGHTER OWN SON etc. The latter are however not lexicalised terms.

(a) CHILD (b) CHILD + (c) SMALLER_CHILD

Figure 31. EVK family terms: CHILD and GRANDCHILD

Signs denoting extended family members in EVK are mainly loans from spoken Estonian. *Father-in-law* and *mother-in-law* are two of the very rare

fingerspelled signs in ESL. Signs ä-mm [mother-in-law] and ä-i [father-in-law] are short enough words in Estonian and easy to fingerspell. Of course the longer explanations like HUSBAND OWN MOTHER or WIFE OWN FATHER etc may also be observed. The only possibility to construct generic terms *parent-in-law* or *sibling-in-law* are complex combinations to describe the family relations.

Similarly to the compounds in spoken Estonian, half-siblings are referred to by the lexicalised compounds HALF+SIBLING, HALF+SIBLING+GIRL and HALF+SIBLING+BOY. There are also translated compounds for *stepfather* and *stepmother* as well as *stepparents*.

Reduplication of the kinship terms is used for three different purposes. First, the signs formed in the neutral signing space away from the body may be reduplicated for pluralisation (SIBLING+++ for brothers and sisters, CHILD+++ for children). In both cases the signs are reduplicated in different locations. To form plurals of the signs that make contact with the face or body (MOTHER, FATHER, SON, DAUGHTER etc) an attributive sign CHILD or PERSON is used for reduplication (for example MOTHER PERSON+++ [mothers] or SON CHILD+++ [sons]).

Secondly, accompanied with a facial expression, fast reduplication of a sign formed in contact with the face or body (MOTHER, FATHER) may have diminutive function. In this way the signs MUMMY and DADDY are derived from MOTHER and FATHER. These signs do not refer only to ego's parents but can be used to denote any parent.

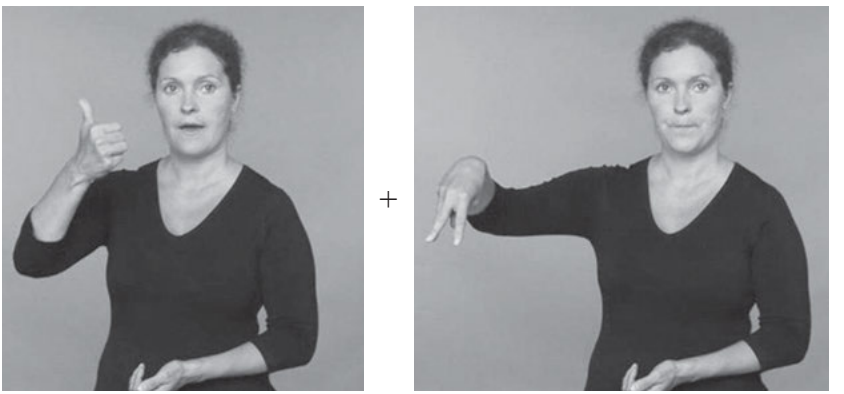
Reduplication combined with spatial modification of a sign articulated in the neutral space (GRANDCHILDREN, figure 31) or slow reduplication (MOTHER+ for maternal grandmother or FATHER+ for paternal grandfather) may also be used to show the generation level. The latter can however be rather seen as compound of two signs MOTHER and MOTHER without any spatial modification (or FATHER and FATHER) than reduplication as this is also the structure used to form the signs for other grandparents (FATHER MOTHER or FATHER OWN MOTHER and MOTHER FATHER or FATHER OWN MOTHER). The origin of these constructions is the influence from spoken Estonian where the same compounds are used to denote paternal or maternal grandparents. Spatial modification to indicate age can only be seen in the reduplicated sign GRANDCHILD where the first part of the sign is formed higher than the last part of the reduplicated sign (figure 31 b,c).

Age differences are usually not reflected in the lexicalised signs in EVK although in the sequential constructions with modifiers like YOUNG, OLD, SMALL or BIG (younger, older, smaller or bigger) SIBLING the sign SIBLING

is formed lower or higher in the signing space respectively. The difference is only comprehensible in comparison.

As mentioned above, a linker sign OWN may be seen in many constructions explaining family relations but these are not lexicalised signs in EVK.

The influence from spoken Estonian in kinship terms may be seen in fingerspelled signs, mouthing and direct translations of the compounds used in Estonian. Although there are many initialised signs, fingerspelled signs are exceptionally rare in EVK. The two rare examples are gendered terms for parents-in-law – fingerspelled Estonian words ä-mm (mother-in-law, figure 32a)) and ä-i (father-in-law, figure 32b) are fully lexicalised signs and the only terms for the parents-in-law in EVK.



(a) MOTHER-IN-LAW

(b) FATHER-IN-LAW

Figure 32. EVK family terms: MOTHER_IN_LAW and FATHER_IN_LAW

To specify the meaning of the generic terms in EVK, mouthing of the more specific Estonian term accompanies the EVK sign. This may be observed in colour terms as well as kinship terms. The signs SIBLING and AUNT/UNCLE may be used without the attributes BOY or GIRL, WOMAN or MAN but accompanied with mouthing the respective Estonian word instead to distinguish gender.

There are also some compounds among the kinship terms which are clearly direct translations of the Estonian compounds. Terms for gendered grandparents OLD+MOTHER and OLD+FATHER, although fully lexicalised in EVK, are exact translations of the Estonian words *vanaisa* (old+father) and *vanaema* (old+mother). The same is probably the case with the expression of *parents* – although MOTHER/FATHER is more frequent in EVK, there is also a reduplicated sign OLD, a translation of Estonian word *vanemad* (plural form of older) to denote non-gendered parents similarly to spoken Estonian.

Besides the reduplicated sign OLD, SIBLING without the attributive sign GIRL or BOY or respective mouthing also means *same* in EVK and AUNT/UNCLE without the attributes is a generic term for *relative*.

Diagrammatic description of the kinship terms through pointing and tracing might be used while describing family relations but they do not have conventional lexicalised meaning. While pointing or tracing is used, it is done with the index finger or an open hand, and the handshape used refers neither to gender nor age.

Comparing the kinship terms in EVK and Estonian it may be seen that while the gender distinction is secondary in some EVK terms (SIBLING, AUNT/UNCLE) the respective Estonian terms differentiate gender. There are also terms where gender distinction is secondary in both languages (cousin, spouse). As is characteristic of sign language, the list of two or three typical members of the group is preferred to a generic simple term (MOTHER+FATHER instead of the translated loan from Estonian for parents). The influence from spoken Estonian might be seen in sequential compounds describing extended family relations (grandparents, grandchildren).

Following the formation of the EVK terms in the analysed three domains it may be seen that while for the colour terms the main strategy of sign creation has probably been derivation from pointing to the representations of the respective colours (lips or cheek for *red* and *pink*, sleeves for *white* or beard for *gray*) and extension of meaning (coffee to *brown*, Christmas to *green*, or clean to *white*), the numerals are mainly iconic representations of the respective quantities accompanied with a certain movement pattern. The number of arbitrary native signs is largest among kinship terms while the influence

from spoken Estonian may be seen in initialised colour terms (*orange*, *purple* and *beige*) and fingerspelled signs among kinship terms (*mother-in-law* and *father-in-law*) as well as translated compounds like *grandmother, grandfather, stepfather, stepmother* etc. Influence from Russian SL is in the current study only observed in the domain of colour terms, but according to earlier studies (Taniroo 2007) it is evident that the similarities are common also in other domains.

Although the influence from Estonian may be observed in EVK in many aspects and there are a number of loans from Russian SL used in EVK, it may be seen that EVK has developed a rich lexicon in the analyzed domains, and among the colour terms, nine categories out of eleven are denoted with a salient basic term.

Acknowledgements

The drawings in the chapter were made by Ivo Kaunissaare, photographs by Triin Jõeveer, the signers are Maret Õun, Riina Kuusk and Riho Kurg. The pictures are taken from the Estonian - Estonian Sign Language online dictionary, compiled on the basis of the Basic Estonian Dictionary.

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Colours and Numerals in Spanish Sign Language (LSE)

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Ana María Fernández-Soneira

1. Introduction[2]

> …although slowing down or reversals of changes are possible /.../, change usually creeps on inexorably, hindered to some extent by literacy and the other social factors, but not for long.
>
> (Aitchison 2001:149)

This chapter presents an account of variation in Spanish Sign Language (Lengua de Signos Española, LSE), through a study of signs for colours and numerals. In the section on colour signs we focus on the description of variants in the form of the signs as well as in the meanings. For the former, a diachronic perspective is adopted, and, with the help of dictionaries and glossaries, we analyse variations in the articulation of existing signs for expressing colours. For the latter (variation in meaning), we analyse similarities and differences between LSE and spoken Spanish in the expression of colour-based idioms. For this part of our analysis we have relied on several deaf consultants.[3]

In the section for the study of numerals, we focus mainly on the expression of cardinal numbers, on the most frequent expressions, and on alternative systems of expression in specific geographical areas. We also deal with ordinals and fractions, and with numeral incorporation, a typical phenomenon in sign languages (cf. Valli and Lucas 2000).

First, however, a wider account of variation in LSE provides a background for the specific focus on numerals and colours. A description of the method employed is also given prior to delving into what was found regarding the range of forms within these two fascinating domains.

As all languages are dynamic systems they adapt to the expressive necessities of their speakers, and present variations, in time and space, which are sometimes consolidated into linguistic change. Variation thrives within the

language system properties, i.e. in the dynamic character of every language system. Variation is therefore an inherent property of languages and it results from the manifestation of language creativity and individual innovation. Against the natural linguistic variations in LSE which are derived from time-related change, geographical dispersion, social, situational and generational differences, and the lack of a standarised written language system, there are measures being carried out by some associations and federations for the deaf that counterbalance the diverging factors in the language of the deaf community, by trying to favour standardisation procedures.

Currently, neither research on corpus linguistics nor sociolinguistic studies have provided descriptions of those variations that would help delimit variation among the three visual-gestural languages that are today officially recognised on the Iberian Peninsula: the Spanish Sign Language, the Catalan Sign Language and the Portuguese Sign Language (official since 1997), or among the isoglosses of any of these three languages. As Amaral et al. 1994: 39 observe:

> There exists, in fact, a community of the deaf in Portugal that has, as its mother tongue, the Lingua Gestual Portuguesa (Portuguese Sign Language) ... There exist, just as in Portuguese, regional variants in Lisbon and Oporto, as well as other sociolinguistic variants, depending on the degree of literacy and on the profession of the deaf in these communities. [S[4]]

In her work on LSE, M.ª Ángeles Rodríguez (1992) writes about variation in Spain that "[t]he differences are more distinct between cities that are geographically more distant ... In Madrid and Valladolid, which are not too distant, signing is done in the same way, while it is performed differently in Barcelona". And she explains this assertion in the following way: "Such variants affect only the signed lexicon, but not the communicative-interactional context of the language" [S]. She therefore considers that the differences do not affect comprehension and that it is the geographical distance that correlates with this variation.

The publication *Apuntes de lingüística de la lengua de signos española* includes a chapter on variation in LSE by Stephen and Dianne Parkhurst. This work is divided into two main parts: the first one deals with several common methods to examine variants in sign language; the second one gives examples of types of variants as they were observed in México and in Spain. The authors' observations and impressions are expressed as follows:

> When we travelled throughout Spain and asked the deaf for their impressions with regard to their own language, we heard comments such as: "We here in Granada sign in a different manner from those in Málaga or Córdoba". When

> they referred to the manner in which "we sign in Granada", they were aware of the fact that sign language in Granada, up to a certain point, was unified. There exists a feeling of identity: "we". At the same time their sign language is different from the language in other cities.
>
> (Parkhurst & Parkhurst 2000: 222 [S])

The authors, based on factors such as geographical location, school attendance, religious faith and social class, and the signer´s gender and age, detect levels of identity and differentiation in dialect (dialect groups) which allow diversity to be reflected. However, they also conclude that even though the results are not sufficient – the study focuses only on the lexicon[5] – the signers interviewed show, to varying degrees, quite an adequate ability to understand each other without difficulties.

Also worth mentioning are the *Diccionario de neologismos de la LSE* (1999) where the geographical variants of many of the signs are listed, the *Diccionario normativo de la LSE* (2008), where is trying to establish a standard, using the regional dialect that imposes itself as a norm, and the studies on variation by Carmen Chapa (2000; 2001).

In her research on LSE variation, Carmen Chapa (2000) mentions geographical, social and contextual variation. As for regional variation in LSE, it is apparent mainly in the lexicon, and often has to do with the characteristics of the surroundings. A clear example is found in the signs for the months of the year. In Galicia (NW Spain), the sign used for JUNE makes reference to cherries (it is the time of the year when this fruit is harvested), while in other parts of Spain at least two more variants are acknowledged. Chapa (2000: 301) also refers to the geographical variants for MARCH in Valencia and Madrid.

As for social variation, one of the main factors to be taken into account is school attendance.

> Non-geographical origins of LSE variants can easily be related to the development of this language at school ... The influence of two main centres for schools, Madrid and Barcelona, which have attracted children from other neighbouring areas, must have had consequences for language variation.
>
> (Gras Ferrer 2006: 48 [S])

Currently, there are no special schools for the deaf in Spain, due to the fact that deaf children have been integrated into mainstream schools. However, among the adult deaf, we do find people who attended special schools, and the differential signs they use show, above all, lexical variation. In the case of numerals, which are analysed in this article, we shall see that some variants

of expression are connected with these Schools for the Deaf. As Morales López (2008) asserts, the Schools for the Deaf were the places where the majority of the deaf learned sign language. The schools were continued in Associations for the Deaf, which served as a vehicle of furthering the social integration initiated in the schools. Currently, young deaf people have a higher level of literacy, as they attend mainstream schools, are bilingual in many cases and participate less in the associations. A study that remains to be carried out is how the effects of these factors influence variation in LSE. Also to be analysed is the occurrence of LSE standardisation within regional variants due to its inclusion in the educational environment, the media, interpreting and, more recently, science (see Gras Ferrer 2006 for some explanations of these issues).

As for the awareness of sign language users, Gras Ferrer (2006: 48), in a study on the deaf community in Spain, asserts that some of her consultants – when talking about dialectal variants in LSE – said that there are differences not only between different schools but also between autonomous regions.

In some cases, variants motivated by the gender of the signers have been found, and also variants depending on the communicative situation in which the signers are immersed. Chapa (2000: 308) says that "informal registers present a less precise articulation of the signs, the omission of the non-dominant hand in some signs, reduced movement, less presence of spoken components and, on the syntactic level, a greater use of simultaneity" [S]. Further, in her 2001 study on situational variation in LSE, she concludes that the spoken component (a.k.a. mouthing or mouth patterns, cf. Boyes Braem & Sutton-Spence 2001) is more relevant in formal registers than in informal ones (Chapa 2001: 173–174).

Some factors related to social and contextual variation are found in the expression of numerals and quantifiers. For example, the numeral system for multiples of ten used in Galicia shows some variants depending on whether the signer is a man or a woman. Also, the handshape of some signs varies, depending on the physical distance between the interlocutors (i.e. the environment in which the conversation is carried out).

In Spain, the Associations for the Deaf used to play an important role as a factor in linguistic cohesion, as their social dynamics involved carrying out frequent cultural and sports exchanges. However, they are now facing, and even resisting, the arrival of new technologies that facilitate remote, visual exchanges of information. As the associations are not necessary as physical meeting points any more, they are losing the capacity for cohesion they have always had. Part of this role has now shifted to the recently created *Confederación Estatal de Personas Sordas* (Spanish National

Confederation of Deaf People, CNSE) and the *Centro de Normalización de la Lengua de Signos Española* (Spanish Sign Language Standardisation Center, CNLSE).

2. Methodology

For this research we have relied on consultants, and also on descriptive, lexicographical and didactic studies in LSE. The majority of our consultants are deaf, but we have also relied on LSE interpreters. Nine consultants have participated, five of whom are deaf (two of them with deaf parents). The four hearing consultants are LSE interpreters. Three consultants are male and six are female, and they are aged 20 to 40 and come from different autonomous regions (Galicia, the Canary Islands, Murcia, and Madrid). A full list of our consultants, with precise indication of their participation, is shown in the table below.

Table 1. Consultants in the two parts of the study

Consultants	**Colours**	**Numerals**
Estefanía (deaf-deaf parents)	X	
Manuel (deaf-deaf parents)	X	X
Claudia (deaf)	X	X
Juan Ramón (deaf)		X
Mónica (deaf)	X	X
Alba (interpreter)	X	X
Ruth (interpreter)	X	X
María (interpreter)	X	X
Rayco (interpreter)	X	X

Where we rely on primary data, these have been elicited from consultants on the basis of typological questionnaires covering the semantic domains of colour terms and quantification (see Sagara & Zeshan, this volume).

This chapter presents a description of colour signs and numeral/quantifier signs in LSE. The structure of these two sections is not identical. Regarding colours, we start with an analysis of the inventory of signs present in LSE for the expression of colours, and their regional and stylistic variants (Sections 3.1 and 3.2). Section 3.3 undertakes a comparative analysis

between Spanish and LSE with regard to idioms that include reference to colours.

In the case of numeral expressions in LSE, this article focuses mainly on the expression of cardinal numerals, due to their variation, and due to the existence in LSE of variants for the expression of certain units and for multiples of ten up to 90. We also focus on usage of ordinals, fractions and numeral incorporation, following the order of the items in the abovementioned questionnaires.

3. Colours

> When an object is present, it should be indicated, rather than described. When it is absent, or needs the presence of an element, it will be sufficient to indicate a similar object that has the required quality. This procedure is followed, for example, for colours, food and temperature, among others.
>
> (Marroquín 1975: 9 [S])

In this section we approach variants along the temporal axis, describing them in terms of diachronic variation. In sociolinguistics, one of the most interesting variables is "age", as it allows the researcher to observe linguistic change across several generations. As López Morales (2004:134) points out, "if a linguistic trait appears among young people but not in older generations, it is probable that it is a recent phenomenon; if it appears only in adult generations, it is most probably a phenomenon falling into disuse" [S].

As we have not been able to draw on a number of consultants of different ages, who might have been able to produce a sufficient number of samples in order to allow us to make more overreaching conclusions, we have opted for a review of publications that give information about diachronic variation, or about change in the colour vocabulary in LSE, i.e. dictionaries, glossaries and publications, such as Fernández Villabrille (1851), Marroquín (1975 and 1981) and DILSE (2008), constituting a selection of publications from the 19th century to the present.

The following results have been extracted from a small field study, and will therefore have to be viewed with caution. As shown in the table above (Table 1), the group of consultants selected for this study is made up of 4 deaf people (two of whom have deaf parents), and 4 interpreters. As for the gender, 6 are female and 2 are male, aged from 20 to 40. The control group is made up of users of sign language who are more than 40 years of age. The latter group was questioned about the results obtained in our research

among the younger signers. Furthermore, traditional lexicographical sources such as the abovementioned works by Villabrille, Marroquín, etc. have been consulted.

3.1. Articulation and variation of signs for colours

In order to describe and contrast the expressions of colour in LSE, our fundamental sources have been the lexicographical studies carried out by CNLSE, backed up by the federations and associations for deaf people in the autonomous regions in Spain (CNSE). These associations rely on the assistance of the *Real Academia de la lengua española* (RAE) and its *Diccionario normativo de la lengua de signos española* (DILSE_III)[6] updated in 2011. Previous studies have also been taken into account, such as the subsequent revisions of Pinedo Peydró (2005) in *Diccionario de la lengua de signos española*[7] and Cecilia Tejedor (2006) in the *Vocabulario Básico,* entitled *Mil palabras con las manos* (A thousand words with the hands).

Table 1 summarises which colour terms are represented in which of the available lexicographic sources.

Table 2. Colour terms included in LSE sources

	white	**black**	**red**	**green**	**blue**	**Yellow**	**orange**	**brown**	**pink**	**purple**	**grey**
Fernández Villabrille (1851)		X	X								X
Marroquín (1975)	X	X	X	X	X	X					X
Pinedo Peydró (2005)	X	X	X	X	X	X			X		X
Cecilia Tejedor (2006)	X	X	X	X	X	X	X	X	X	X	X
DILSE (2011)	X	X	X	X	X	X			X		

According to Fernández Villabrille (1851:35), the term *colores* is expressed in the following way: "The colours are, in general, indicated by rubbing the wrist of the left hand with the right hand" [S]. This does not coincide with present-day usage, which is performed by rubbing the lips with the fingertips.

Under the same heading, he writes: "There are signs for the particular colours". In addition to 'red', 'black' and 'grey', this dictionary includes signs for 'golden',[8] 'light and dark',[9] and 'shiny'.[10] Marroquín (1975:53) in his glossary, includes additional terms for 'light (colour)' and 'dark (colour)'. He also points out that for the remaining colours, "some signs are combined with others" and fingerspelling is used.

Yellow

Figure 1[11] shows the articulation of this colour term as in DILSE and the *Vocabulario Básico*. The point of contact is the lips. The fingers of the right hand are stretched out and separated, the middle finger slightly flexed close to the lips and moved up and down quickly. As for diachronic variation, it has to be pointed out that this sign is not included in Fernández Villabrille, but it appears in both glossaries by Marroquín (1975:38): "The index and the middle fingers are close to the mouth moving up and down" [S]. In the *Diccionario Mímico* (Marroquín 1981) there is a photograph showing a sign that is quite different from the one described above. As can be seen in Figure 2, the middle finger is some distance from the mouth.

Figure 1.

Figure 2.

All of our consultants signed this colour term in the same way. There is, however, another variant made with the index and middle fingers in front of the mouth, moving up and down (Figures 3–4). Sign language users on

the Canary Islands have adopted the variant which differs the most, as they draw circles with the index and middle fingers on the cheek (see Figure 5). Another Canary Island variant consists of situating the two fingers on the cheek and making a rotating movement with the forearm.

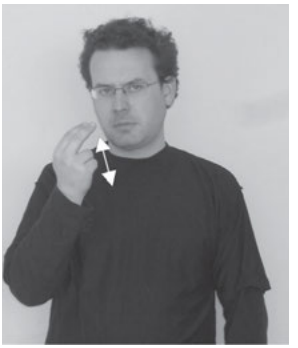

Figure 3.

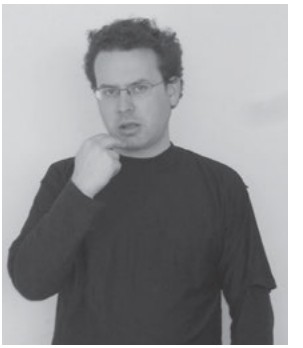

Figure 4.

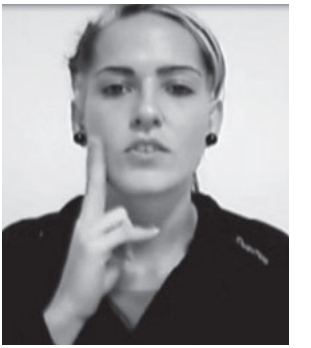

Figure 5.

Blue

According to the *Vocabulario Básico* by Cecilia Tejedor (2006), the DILSE (2011) and Pinedo (2005), the sign for the colour blue is made with one swift movement, using the letters a and z of the manual alphabet (Figure 6). Among our consultants, there is a variant of this sign which consists of the lateral movement of the hand, or moving it to the front (Figure 7). Marroquín (1981) shows another variant which can be seen in Figure 8. The movement is initiated with the extended palm facing the interlocutor and folding the fingers in a rapid movement, leaving only the little finger extended.

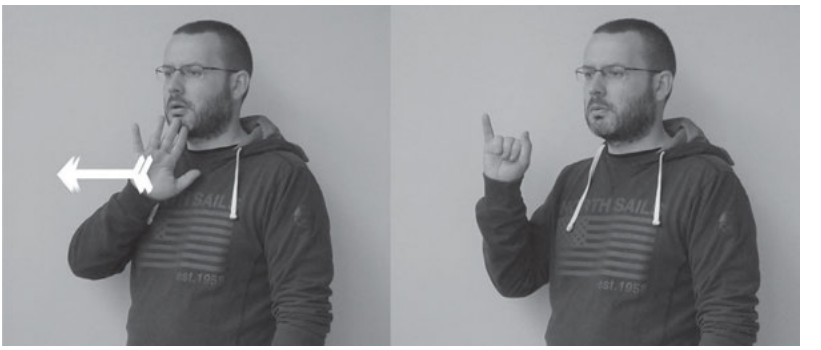

Figure 6.

Figure 7.

Figure 8.

White

Cecilia Tejedor (2006) and the DILSE (2011) describe the expression of 'white' following the photo in Pinedo (2005), and indicate that it is made by touching the tip of the thumb to the middle finger of the right hand, and holding the other fingers stretched out. The hand is then brought near to the chest and extended forward as the fingers open (see two representations in Figure 9 and Figure 10). Our consultants have presented no variants with respect to this articulation, proposed by the standardising organisations of LSE. Marroquín´s description is difficult to understand, and 'white' does not appear in Villabrille´s dictionary.

Figure 9.

Figure 10.

Grey

According to Fernández Villabrille (1851:70), in order to sign the colour grey "The right hand is lifted to the place of Q in dactylology, and shaken several times outwards, at the same time opening up the fingers" [S]. This does not match the photographs in Pinedo (2005) and Marroquín (1981), who both agree with the description in *Vocabulario Básico*: the colour grey is signed by bringing together the fingertips of the ring finger and the right thumb, and both then swipe the back of the left hand (Figure 11). As has already been pointed out, this colour does not appear in the DILSE (2011). Another variant is performed without using the left hand, making the movement in the air (Figure 12).

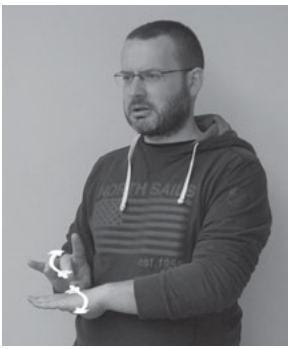

Figure 11a.

Figure 11b.

Figure 12.

Another option is to sign with the hand under the chin, moving the fingers alternatively over the throat (Figure 13). One variant from the Canaries is performed by pretending to write in the air with a pencil (Figure 14). Yet another variant is produced with the middle finger or the index finger tapping on the extended index finger of the non-dominant hand.

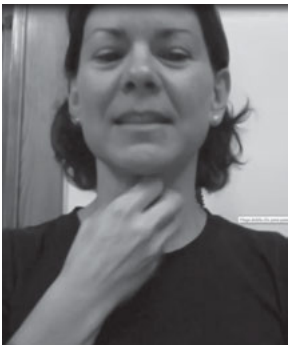

Figure 13.

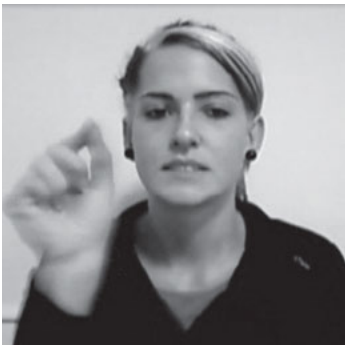

Figure 14.

Brown

This is an example of a colour term that uses the sign for an object. In the *Vocabulario Básico*, 'brown' is produced by resting the tips of the extended index and middle fingers of the right hand on the right cheek. In this position, the right hand moves up-and-down twice (Figure 15), and this is identical to the sign for 'chocolate'. It is also common to use the sign for 'chestnut' to refer to the colour 'brown' (Figure 16).

Figure 15.

Figure 16.

A variant we have detected among our consultants is a sign in which a triangle is formed, like the roof of a house (Figure 17). Finally, our consultant from the Canaries produced the sign for brown with a sideward movement of the index and middle fingers extended and V-shaped, and with the palm towards the addressee (Figure 18). There are also other two variants in the Canaries: one is the same as the sign for black, but with the dominant hand oriented diagonally to the body, and the second has a movement involving the middle finger of the dominant hand (same as the sign for 'knife').

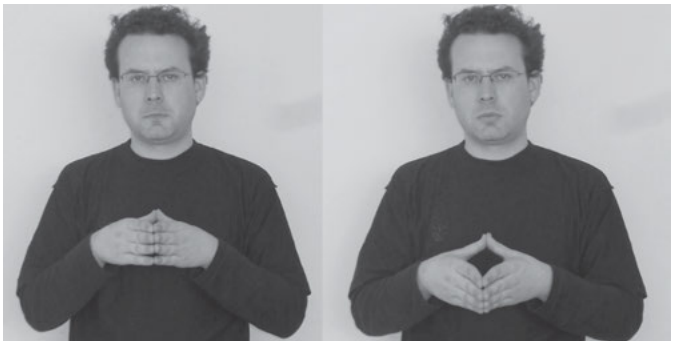

Figure 17.

Figure 17.

Morado[12] *'purple/violet'*

The colour words *purple, violet* and *morado* signify a similar colour but have slightly different tones, which in Spanish are related to the difference of colour in the objects that the colour terms refer to. It is our impression that the LSE signers are not consciously aware of semantic differences between the various signs in use that correspond to the three terms in spoken Spanish. However, several different formal variants exist in LSE.

According to Cecilia Tejedor (2006), *purple* or *morado* "are produced with the back of the right hand under the chin, whilst fluttering the fingers" [S] (see Figure 19). A variant of this sign is one in which the hand moves downwards in a curve (Figure 20).

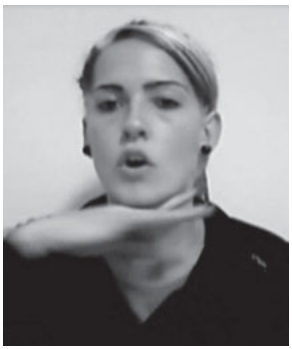

Figure 19.

Figure 20.

Our consultants have also used the sign in Figure 21, pointing under the eye with the index finger and the middle finger.

Figure 21.

Violet

Another variant based on fingerspelling is the one performed by our consultants from the Canaries (see Figure 22). Figure 23 shows another variant of 'violet' produced by extending the index and middle finger and shaking the hand next to the body.

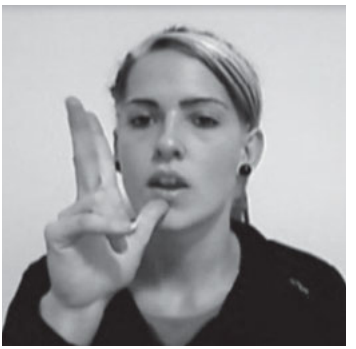

Figure 22.

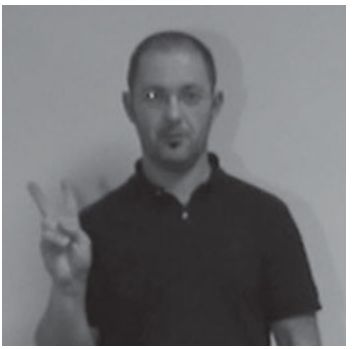

Figure 23.

Orange

The sign for 'orange' is also related to the object of the same name. Hence both, the colour and the fruit, are executed in the same way (see Figures 24 and 25), "with both hands in the shape of a claw, joining at the fingertips. In this position, hands approach and separate twice or three times" (Cecilia Tejedor 2006 [S]). This also matches the sign included by Marroquín, but a sign for 'orange' does not appear in the DILSE or the Pinedo dictionary.

Figure 24.

Figure 25.

Another common variant among our consultants is performed by brushing the back of the left hand with the fingers of the right hand.

Figure 26.

Red

Red is produced by touching the lip, two or three times, with the fingertip of the right hand index finger (Herrero Blanco 2003; see Figure 27). The term 'red' is, according to the DILSE (2011), "the first colour of the spectrum [S]". All of our consultants produced virtually the same sign, with very minor articulatory differences.

Figure 27.

In order to sign the colour 'red', Fernández Villabrille (1851:129–130) gives the following instructions: "All fingers are folded, except for the index finger which touches the lower lip" [S]. The description of Marroquín and the *Vocabulario Básico* is similar and says "the tip of the right hand index finger should brush over the lips [S]".

Pink

In Spanish, the same word *rosa* refer to two concepts, the colour 'pink' and the flower 'rose'. Nowadays, however, the colour and the flower have their own signs in LSE. In the DILSE (2011), the sign for this colour is performed with all fingers of the dominant hand folded, except for the index finger which remains extended and moves down the face (see Figure 28). A widespread variant has a different configuration of the fingers, which are all extended instead of folded (see Figure 29).

Figure 28.

Figure 29.

In the Canaries there is another variant. The sign is produced with the hand extended and all fingers pointing upwards, with a circular motion on the cheek (see Figure 30) – the same as the sign for 'young'. One of our consultants used the sign for 'rose (the flower)', which appears in Marroquín (1981) and is shown in Figures 31a and 31b.

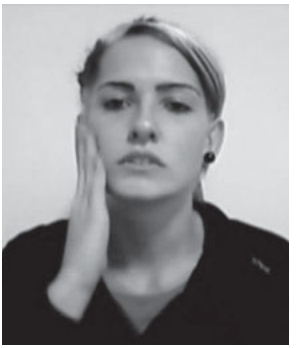

Figure 30.

Figure 31a.

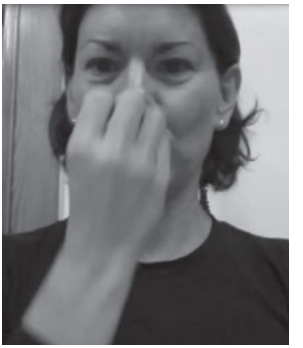

Figure 31b.

Green

In order to produce the sign for 'green', Cecilia Tejedor (2006) states: "Make a V-shape as used in the manual alphabet. Then, keeping that handshape, make two circles in the air, placing the hand almost in front of the mouth [S]". This is another case of an initialised sign (from Spanish *verde* 'green') based on fingerspelling, and it is performed in the same sign space as 'yellow', 'red' or 'colour', that is, in the lip area. Interestingly enough, in American Sign Language (ASL) and International Sign, the sign for 'green' is formed the same way, but the initial is changed into a G (from English *green*).

Figure 32.

Black

Black is one of the colour signs with the least variation; however, diachronically, it has changed substantially. Fernández Villabrille (1851:105) describes: "The index finger of the right hand strikes the left hand and, then, the same finger touches the nose"[S]. However, Marroquín (1975:52) describes that it is performed by "scratching the back of the left hand with the fingers of the right hand" [S].

Nowadays, both the *Vocabulario Básico* and our consultants signed the black colour with the index and middle fingers of both hands extended and slightly apart. All the other fingers of both hands are folded. In this position, the index and middle fingers of the right hand tap the index and middle fingers of the left hand, making a cross (see Figure 33). The variant included in the sign language dictionary of Marroquín shows the same articulation, but the point of contact is moved to the forearm, as shown in Figure 34: "the index and middle fingers touch the left forearm" (1975:52 [S]).

Figure 33.

Figure 34.

3.2. Colour terms: Summary and discussion

Several interesting generalisations emerge from the data on LSE colour terms discussed here, which are of interest in relation to other sign languages:

1. In the expression of colours, there is a degree of articulatory variation in the execution of signs, and these formational variants affect the aspects that constitute the sign, such as place of articulation, handshape, and articulatory movements. The issue of which phonological parameters are most affected by this kind of variation is not well-studied across sign languages, but it is noticeable in our data that these phonological variants differ most often with respect to the movement parameter. Variation with respect to movement is found in the signs for 'morado' (purple), 'blue', 'yellow'; in the latter two cases, orientation and place of articulation are also affected in addition to the movement. A handshape change occurs only once (with 'pink'), and in one case (for 'grey'), the non-dominant hand can be dropped, in which case the place of articulation is also shifted. In contrast, several phonological variants affecting the handshape parameter are documented in Indonesian Sign Language (Palfreyman, this volume). Such articulatory variation in terms of **how** signs are produced is discussed by Rodríguez (1992:209), who notes that "these expressive traits are continuous, and are manifested in articulatory variants on a scalar continuum, not as discrete oppositions: there are more or less well-defined handshapes, shorter or faster movements, with greater or lesser amplitude of movement at or towards the place of articulation" [S]

2. As in other sign languages, colour terms in LSE can be grouped into several subsets depending on the origin of the sign. One subset uses initialised signs, where the handshape is derived from the manual alphabet. In LSE, the signs for the colours 'green' (V from Spanish *verde*), 'violet' (V from Spanish *violeta*) and 'blue' (A-Z from Spanish *azul*) exploit the manual alphabet; interestingly, 'blue' uses a sequence of two letters from the manual alphabet in the sign. Another subset consists of colour signs that are identical to signs for objects with the same characteristic colour. In LSE, signs for the colours 'orange' and 'brown' refer to an object of that colour, sharing this characteristic with some spoken languages (e.g. the word for 'brown' in Portuguese is the same as that for 'chestnut tree'). These same types of colour signs, derived from fingerspelling and homonymous with signs for objects, are found, for instance, in Estonian Sign Language (Hollman, this volume) and in Mexican Sign Language (Hendriks, this volume).
3. Sagara and Zeshan (this volume) point out the importance of the hierarchy of colour terms proposed in Berlin and Kay (1969). Our data on colour terms show some correlation between the degree of variation of colour terms and their place in the Berlin and Kay hierarchy of colour terms. The most basic colour terms, at the far left of the hierarchy, are also among those that have the least variation in LSE, i.e. BLACK, WHITE, and RED. These three colour terms are among the signs that only have a single variant in LSE in our data.

Finally, we have noted in our research that diatopic (geographical) variants are not incomprehensible for signers coming from different areas. Evidence for this comes from our discussions with consultants. When we showed our consultants the colour signs from another region, they would comment that they also knew some people who used these signs. That is to say, signers from all regions recognised colour signs from other regions, although they might prefer to use their own variants.

3.3. Idiomatic use of LSE colour terms

In Spanish, there are many examples of colour-based idiomatic expressions such as *ponerse colorado* 'get red in the face' (lit. 'to turn coloured'), *quedarse en blanco* 'to be at a loss for words' (lit. 'be left white'), *estar sin blanca* 'to be penniless' (lit. 'to be without the white one'), *verlo negro* 'to be pessimistic' (lit. 'to see it black'), *pasar la noche en blanco* 'to spend a

sleepless night' (lit. 'to spend the night white'), *ponerse morado* 'to stuff your face' (lit. 'to turn purple'), *que te pongan verde o negro* 'to be told off' (lit. 'that they turn you green or black'), to be dressed *de punta en blanco* 'to the nines' (lit. 'in white from the point'), and to find life *de colour de rosa* 'rose-coloured' or *todo gris* 'all grey'. Also, colours are qualifiers or are lexicalised in expressions such as *viejo verde* 'randy old man' (lit. 'green old man'), *chistes verdes* 'dirty jokes' (lit. 'green jokes'), *novela rosas* 'romantic novels' (lit.'pink novels'), and *prensa amarilla* 'yellow press'.

A superficial look at LSE may produce the impression that due to its visual nature and its minority status in a country where Spanish is the majority language, it might take advantage of this resource in its idioms. However, LSE makes little use of these colour-based idiomatic expressions.

In order to study this matter, we undertook field research to investigate the characteristic which makes LSE so different from Spanish. A selected group of consultants were asked to produce the signs corresponding to the concepts 'colour', 'white', 'black', 'red', 'blue', 'yellow', 'green', 'orange', 'brown', 'violet', and 'grey'. They were also asked to explain the meanings in LSE, answering questions such as "with what object do you associate these colours?; "do you remember any expression in LSE that includes a colour adjective?"; "do you relate feelings of happiness, sadness, tiredness, confusion, fury, envy, etc. with any colour?

As has already been pointed out, in Spanish, there is a great abundance of idioms based on colour terms, especially with regards to feelings and emotions. However, a search in the *Diccionario Normativo* of LSE (DILSE)[13], produced little variety of expressions based on this creative resource. We cannot help but find it surprising that this grammatical resource, which might be easily exploited in sign languages, is so rarely used.

The DILSE defines *blanco* (white) as "the colour of snow or milk [S]" and Pinedo Peydró (2005 [S]) adds that it is "the lightest colour...which is the result of the combination of all the colours of the rainbow". Also, in the DILSE, it is "the colour of the light of the sun when it is not decomposed into the colours of the spectrum [S]". The colour *blanco* (white) stands for purity in Spanish culture; it is also said to be the colour of perfection and cleanliness, and generally has positive connotations. It is also positive in LSE. However, in our test, our consultants did not even use it in expressions as common as *marca blanca* 'store brand' (lit. 'white label') or as common or as often used as *estar sin blanca* 'to be penniless'. This phrase and *no tener blanca* (lit. 'not to have white') are two of the idioms in Spanish colloquial language that mean 'to be without money'. Instead of using this expression, both our consultants and the DILSE suggest another expression

(see Figure 35) matching a similar idiomatic expression in Spanish, which does not employ colour symbolism: *estar a dos velas* (lit. 'to find yourself between two candles').

Figure 35.

The idiomatic expression *quedarse en blanco*, meaning 'to be at a loss for words/forget what you were going to say' was translated by MENTE APAGA 'mind went out'.

Furthermore, the colour *negro* (black), which in Spanish often represents authority, elegance, or formality, and is also associated with death and mystery, was clearly related to suffering and rupture by our consultants, who repeatedly used the expression corazón + negro 'heart+black' in order to indicate the breaking up of a love relationship, but in no case associated it with expressions common in Spanish such as *futuro negro* 'dark future' or *agujeros negros* 'black holes'. Pinedo Peydro (2005) defines 'black' as the colour of coal. The expression "*dinero negro*", which, according to the DRAE (Dictionary of the Spanish Language Academy), means "*dinero clandestino e illegal*" (money earned illegally) was referred to as dinero corrupto 'corrupt money' in LSE.

The *Diccionario Normativo* (DILSE) considers that *rojo* (red) is the first colour of the solar spectrum, and defines it as a colour "similar to that of blood or a ripe tomato [S]". Colloquially, in Spanish the colour red is considered emotionally intense. It is related to energy, passion and force, and it is also the colour typically used to indicate danger. In colloquial Spanish, the expression *ponerse rojo* 'to turn red' is often used to express shame. This was the only colour-related idiom that our consultants identified in LSE, i.e. to "turn as red as a tomato". Even though this expression does not appear in the DILSE, *vergüenza* 'shame' is described as "strong feelings that tend to make a person red in the face [S]". However, when our consultants were asked an indirect question related to this idiom, they did not connect this

feeling with the colour red, nor did they associate *envidia* 'envy' with the colour yellow, as happens in peninsular Spanish. The dictionary compiled by Pinedo Peydró (2005) does not list any special semantic association, and defines red as "carmine colour". Fernández Villabrille (1851:129–130) accompanies the articulatory description of red with the comment "the same as a ruby" [S].

The colour *amarillo* is defined in the DILSE as "a colour similar to that of gold, the flower of gorse, etc [S]". In Marroquín (1981) and Pinedo Peydró (2005) the colour yellow is "the colour of gold or lemon [S]", but our consultants did not relate these items in any of their answers. They did not associate this colour with intelligence, envy or illness, as hearing people do in oral Spanish language. The expression "yellow press" was associated with "glossy papers", and pink is not connected with the expression of vitality as in *ver la vida de color rosa* (lit. 'to see life in rose colour'). Consultants recognised the association of 'pink' with the name of a TV programme where the lives of the "rich and famous" are debated. Other consultants, however, associated it with romance and even with honeymoon.

The DILSE defines the colour pink by its composition: "the colour resulting from mixing red and white" or "which is of a soft red colour" (Pinedo Peydró 2005 [S]). As already pointed out, the articulatory variations showed a clear distribution for some of the signers, who distinctly differentiated the sign for the colour from the name of the flower.

Green, in the DILSE, is "the colour similar to grass, the emerald, the green finch, etc [S]". Pinedo Peydró (2005) defines this colour by its composition, as "the colour obtained by mixing the primary colours blue and yellow [S]". The notion of 'to scold, to tell off' is expressed with a colour-based idiom in Spanish (*poner verde, lit. 'to turn green'*), but not in LSE, in which it is signed as COTILLEAR 'to gossip'. Conversely, our consultants mentioned the construction CHISTES VERDES 'dirty jokes', lit. 'green jokes' as being frequent in LSE, as it is in Spanish.

Pinedo Peydró (2005) defines *gris* 'grey' as the colour which is made by mixing black, white and blue. It does not appear in the DILSE, but some of our consultants linked the articulation in the throat with a resemblance to gargling. In both LSE and Spanish, the colour grey is used in idiomatic phrases such as *a grey day* 'a sad day', etc. Notwithstanding, in LSE 'grey' is often used as a descriptive term for e.g. an unpleasant life or a strange or boring person.

The colour blue is defined as "the fifth colour of the solar spectrum" and "the colour of the cloudless sky" by Pinedo Peydró (2005); this is the definition also found in the DILSE. According to Marroquín, 'blue' is *cielo*

sereno 'calm sky'. The modifier *azul* in the expression *príncipe azul* 'Prince Charming' seemed familiar to our consultants, but they did not consider that this was an LSE expression.

As we have seen, the LSE articulation of the colour brown is associated with two objects: the chestnut and chocolate. The DILSE points out that the chestnut is "a dark brown nut covered with thick and hard skin [S]" and the sign is performed in the same way as the colour brown, by drawing a circle with both hands. However, forms for 'brown' are not found among the dictionary entries. Our consultants sometimes used the sign for 'chestnut' (the same as in Portuguese) and sometimes the sign for chocolate. Our consultants made it clear that the colloquial expressions in Spanish, where this colour is used with the meaning of 'a conflict-ridden and unpleasant situation', do not occur in LSE.

For the colour orange, the name of the fruit is used. As already pointed out, it does not appear in Pinedo Peydró (2005), nor in the DILSE but our consultants all signed it establishing this relationship between the fruit and the colour. Some associated it with the butane gas bottle commonly used in Spanish households, which is orange. They did not appear to identify the association which is present in Spanish, between the colour and a feeling of warmth and energy.

In summary, compared to the abundance of idioms in spoken Spanish based on colour terms, such as expressions of feelings and emotions that use colour adjectives, in LSE we have not found a great variety of expressions based on this creative resource, although generally LSE uses 'black' and 'grey', in order to describe feelings and idiomatic expressions. However, 'white' is never used as part of idiomatic expressions, as it is only attested when describing feelings.

In LSE, forms for pink, purple and violet are not derived from forms meaning 'the rose', 'the blackberry', or 'the violet' respectively, as happens in Spanish. Rather, one of the signs for the colour purple (see Figure 20) is iconically associated with being hit in the face, resulting in bruising in the eye area ('a black eye'). The colours 'brown' and 'orange' are expressed as lexemes related to objects, i.e the fruit orange (for 'orange'), and the chestnut or chocolate (for 'brown).

4. The expression of quantifiers in LSE

In order to express quantity, one of the most widely adopted strategies is the use of quantifiers, though Everett (2005) asserts than in the Pirahã language

of the Amazon Basin, there are no numerals, nor the concept of counting. The quantifiers 'one', 'two' and 'many' are especially common cross-linguistically, and these terms constitute the minimal inventory of numerals/quantifiers in some languages that have only a minimum of such items (Wierzbicka 1996). The use of numeral and indefinite quantifiers constitutes the primary strategy when pluralizing nouns that do not allow reduplication (Corazza and Pizzuto 1996).

Spanish Sign Language (LSE) uses a great variety of ways to express quantity. Due to lack of space, we do not analyse indefinite quantifiers, nor the different processes used for the pluralisation of nominal signs. In Fernández Soneira (2008), there is a description of all the strategies used in LSE to express quantity. In this chapter, the focus is on ways to express quantity through numerals ('two', 'twenty'), ordinals ('second', 'twentieth') and fractions ('one-half', 'one-third'). A description will be presented of numerals in LSE and of some of the associated ways to express them, such as numeral incorporation.

Our analysis includes both signs which are considered standard and other existing variants of expressions, some of which are more widespread than others and some of which are limited to specific geographical areas. This variation is integral to sign languages, as has been pointed out in previous sections. In the case of numerals, some researchers have studied the factors influencing the selection of one variant or another. Thus, for example, the research by Stamp, Schembri, Fenlon & Rentelis (2010) on British Sign Language confirms that there are three significant factors which influence selection on the part of the signers of "non-traditional" signs for numerals: age, situation of the school and linguistic environment. This research indicated that the most relevant factor in the selection of a certain language variant is age. Younger signers habitually made use of more non-traditional signs than older signers. In the case of LSE, our consultants also assert that the use of non-traditional signs is characteristic of younger signers.

The second factor was the location of the signer's school. Those signers who went to school in their closest neighbourhood used traditional signs, as opposed to those who attended schools outside their neighbourhood, who favoured non-traditional signs. The third influencing factor was linguistic environment. The signers with hearing parents used non-traditional signs on more occasions than the signers with deaf parents. The research concluded that a change is occurring in BSL vocabulary, as younger signers are using more and more non-traditional signs. This may be due to more deaf people travelling inside their country and/or residential schools closing.

In a study by McKee, McKee & Major (2008) on sociolinguistic variation of sign language in New Zealand, the variants of numbers 1–20 were analysed. The main conclusion in their study is that the most determining factor for a certain variant is age followed by region and then gender. They also state that "[t]he contemporary numeral lexicon in NZSL appears relatively unstable, with several variants for a single number co-existing in common usage" (ibid 2008:297). LSE, on the contrary, has a rather stable numeral system; the variations in the formation of signs we have found affect the orientation or place of articulation parameters of articulation, but the other formational parameters of the sign are kept constant across variants. We have also detected that in younger signers there is a tendency towards articulatory reduction of numeral signs (such as, the use of only one hand for traditionally bi-manual signs).

In LSE, the existing variants are found in numerals from 11–15 and in the tens, hundreds and thousands. In this case, as also pointed out in the studies carried out by Stamp et al. and McKee et al., the factors of age, schooling and gender, as well as the sociocultural status of the signer, affect the selection of a certain variant.

The selection of the numeral signs analysed in this study is influenced by two factors above all else: age and the geographical location of the signer´s school. As will be seen in the following, the Galician variant of LSE has a specific numeral system for the tens, that is related to the School for the Deaf located at Santiago de Compostela, and which is used most commonly by adult signers. Some of our consultants also point out the existence of articulatory differences when performing these signs, which are motivated by the gender of the signer.

In order to obtain this data, we have relied on different sources such as dictionaries, specialised bibliographies, sign language teaching materials etc., with a view to comparing variants. We have also included information submitted by consultants, all of whom are LSE users: four deaf people and four interpreters (as stated in the Table 1) from Galicia, Murcia, Madrid and the Canary Islands. Following the model used by Fuentes (2000), the researchers asked the consultants to sign, in LSE, a series of numerals presented to them in writing with Arabic notation. The consultants were asked to sign each variant which they knew, and to explain the rules governing such variants. All of the responses in LSE were recorded by experienced researchers using a video camera and a high-definition camera against a light background, which showed the outline and the movements of the consultant clearly.

4.1. Cardinal Numerals

LSE uses a decimal system, i.e. ten basic signs for the cardinal numerals that can be counted on the fingers. This is due to the fact that the articulatory possibilities only allow the iconic expression for the numbers one through ten. These numbers are signed by extending the fingers upwards, starting with the index finger of the dominant hand. When the number five is signed, the signer moves from the active hand to the passive one and starts counting again, extending the fingers, while maintaining the handshape of the number five on the other hand.

Zero and the numbers one through ten show articulatory variants (see Figures 36 and 37 for an example). Some of them involve the changing of only one parameter, but they do not affect the comprehension of the sign. Both in the articulation of the cardinal numerals shown in the different sources, and in the signing of our consultants, there is variation in the orientation of the palm of the hand, which can be facing the signer, as occurs in the *Diccionario de la lengua de signos española* (Pinedo 2005) and in *Mil palabras con las manos* (Cecilia Tejedor 2006), or facing the interlocutor, as in sources such as Sematos (2009)[14] and in *Gramática didáctica de la lengua de signos española* (Herrero Blanco 2009). Herrero Blanco asserts that, for one through ten, the prevailing tendency is for the palm of the hand to face the signer, and she adds that the variants are regional: "Note that the variation in orientation cannot be considered incorrect, as it is used in some regions of LSE [S]" (Herrero Blanco, 2009:176). Two of our consultants indicated that, occasionally, the same signers may use both orientations depending on the context. If, in the communicative situation, the two signers are situated face-to-face, the numerals are signed using the "standard" signing, with the palm facing the signer. However, if the signers are some distance apart, the signs are made with the palm facing outwards, as this position offers a better view of the articulation.

Another variant that has been found in the signs six through ten is the alternation in orientation of the palm of the hand. That is to say, the number five is performed with the palm facing the signer, and the numbers signed with the other palm facing outwards. Among our consultants, one individual always uses this alternation, but another individual claims to have seen this same phenomenon in signers from the autonomous region of Valencia, whereas signers from Madrid perform the numeral signs mainly with the palm facing the signer.

Figure 36. ZERO (a)

Figure 37. ZERO (b)

Figure 38. ONE

Figure 39. FIVE

Figure 40. SIX

There can also be variation in the place of articulation: the signs are always performed in front of the signer, but the hand can be situated at face level, at chest level or at one side of the signer´s body.

Another possibility of articulating cardinals six through ten is with one hand only. In this case the signer uses only the dominant hand, moving the five handshape from his/her chest towards the neutral signing space and then signing the digits that must be added to five in order to indicate the intended number, e.g. one digit for 'six', as shown in Figure 41.[15]

Figure 41. SIX (one-handed form)

From number ten onwards, the articulation of the numerals is rather uniform, making use of the special characteristics of LSE, where the signs involve path movement through the sign space. First, the number corresponding to the tens is signed, and then the sign for the unit (e.g. 3 + 6 = 36, shown in Figure 42), moving the sign through the space from left to right if the signer is right-handed. Even though the orientation of the palm is facing the interlocutor in the case of ten through 15, in the subsequent numbers the orientation is not always the same.

Figure 42. Number 36

Signs for numbers 12 through 15 start out with a closed handshape and then show as many numbers as must be added to ten to form the number intended, e.g. two fingers for '12', as shown in Figure 43 below.

Figure 43. Number 12

One of our consultants claims that this is the only articulation used in some regions, such as in Madrid, whilst other regions, such as Murcia, use the form mentioned above, with path movement of the hand through the sign space.

The numbers 16 through 20 are made differently, using a strategy specific to these numbers and not present in the other tens. Figure 44 shows the sign for 16, leaving only the index finger extended (16), and for numbers 17 to 19 additional fingers are extended (Pinedo Peydró 2005; Cecilia Tejedor 2006; Herrero Blanco 2009). There is a variant, included in the Sematos dictionary, where the palm of the non-dominant hand is facing towards the interlocutor. In informal contexts, the articulation of these signs can be reduced; they then become one-handed, as can be seen in Figure 45. These non-traditional signs are typical of younger signers and have not been documented in adult signers.

Figure 44. Number 16

Figure 45. 16 (one-handed form)

From 20 through 100, the signs for multiples of ten are articulated sequentially, signing both digits with a change in palm orientation (Figure 46). One of our consultants points out that variants exist in the articulation of some of the tens. For example, in Madrid, the number 50 can be signed without changing the orientation of the palm of the hand, i.e., both the number five

and ‘zero’ are signed with the palm outwards, with a slight movement of the hand towards the right (in right-handed signers).

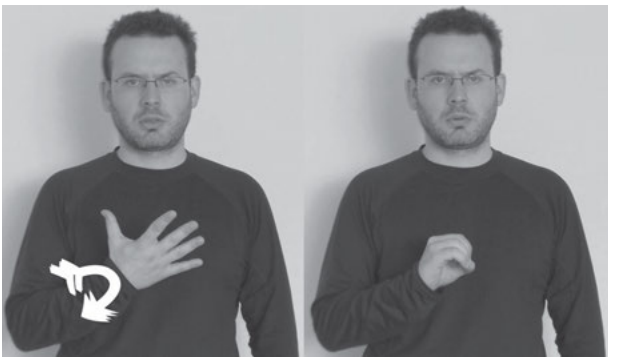

Figure 46. Number 50

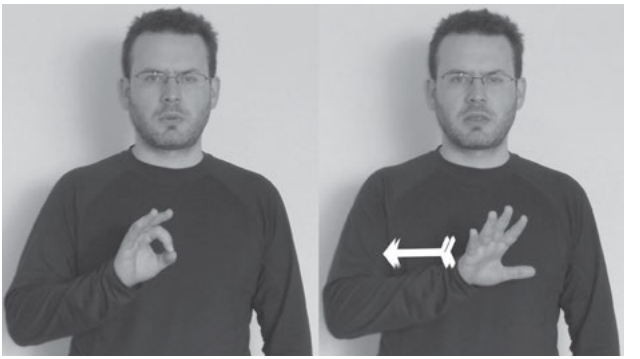

Figure 47. Number 50(b)

As for number 100, the standard articulation is with the palm outwards, firstly signing the number ‘one’ in the centre of the neutral signing space, and subsequently the hand adopts the handshape of ‘zero’, which is repeated twice, with a straight movement towards the right-hand side. We have documented two other possibilities of expression that are rather widespread among signers. One is the variant described above, but with a simplified articulation: the extended index finger is moved upwards and downwards in a straight diagonal line, changing the handshape so the hand takes on the ‘zero’ shape. The second variant consists of an initial handshape with all fingers in a fist (with the palm facing the signer), the wrist is turned, followed by a final handshape with extended index finger (palm facing downwards).

Figure 48. Number 100

The usage of these variants depends on the discourse context. The first two are used principally when the number 100 is signed, however, the third option tends to be preferred when intermediate numbers are signed (e.g. 101, 136). Furthermore, the standard sign is also more common in formal registers, in some types of discourse such as presentations, due to the fact that its articulation is clearer and more visible.

It is in this part of the numeral paradigm, with multiples of ten from 20 to 100, where we find diatopic variants. The Galician regional variant performs all the multiples of ten with a different handshape, but in all cases both hands are used and they touch each other in front of the signer´s body. This system is of great interest because it is vigesimal, and as Sagara & Zeshan point out in the introduction to this volume, vigesimal numeral systems are very rare in sign languages.

The vigesimal nature of this system is evident when we consider the several component sub-series that it consists of. First of all, in the numerals 20, 40, 60 and 80 we have full regularity in the system: 20 is the basic number, where no fingers are extended and we merely have two fists touching at the knuckles. In the next higher member of the sub-series, 40, there is one "level" of extended fingers, with index fingers and thumbs forming a ring. In 60, another "level" has been added, with the middle fingers touching too. Finally, all fingers touch at the tips in 80, which completes this sub-series. Note that when moving from 60 to 80, two sets of additional fingers are added[16], the ring fingers and little fingers, presumably because adding only the ring fingers would be hard to distinguish from adding both ring fingers and little fingers – these two formations would look very similar.

Figure 49. 20 (Galician variant)

Figure 50. 40 (Galician variant)

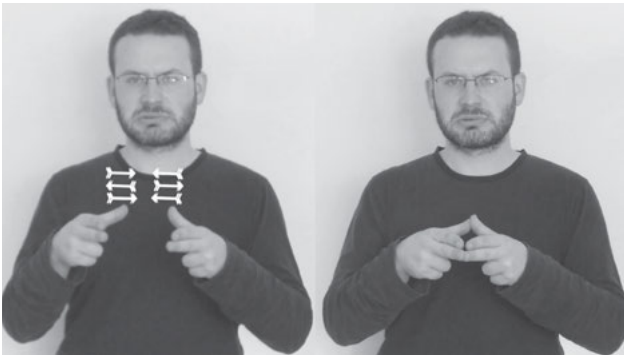

Figure 51. 60 (Galician variant)

Figure 52. 80 (Galician variant)

The sub-series consisting of 30 and 50 is characterised by a prominent finger extension with respect to the nearest lower numeral. While each additional "level" in the 20 to 80 sub-series is two-handed and adds another twenty to the number, extending an additional finger is one-handed and, conceptually, adds half of twenty. This is seen most clearly in '50', which looks much like '40' except for an additional extended finger, which adds 10 to the number 40. For '30', it seems that an additional thumb extension is made visually more obvious by index finger pointing to the extended thumb. The other fingers remain folded away as they are when signing '20'.

From '70' onwards, the regularity of the system breaks down, and in the present-day system, '70' and '90' are not part of a regular sub-series (although '70' does have index finger extension), and neither is '100'. In a sense, the hand "runs out of fingers" because once '80' is reached, no further fingers are available for the purpose of additional finger extension. Interestingly, a system consisting of several sub-series and a degree of irregularity is also characteristic of the only other attested vigesimal numeral sub-system in Mardin Sign Language from Turkey (Zeshan et al. 2012).

Figure 53. 30 (Galician variant)

Figure 54. 50 (Galician variant)

Figure 55. 70 (Galician variant)

Figure 56. 90 (Galician variant)

Figure 57. 100 (Galician variant)

Some of our consultants point to the existence of variants within this subsystem of multiples of ten, especially for '60' and '70'. The variants seem to be due to the fact that at the residential schools where they were boarders,

the signs used by men and by women are developed in a different manner. Women reverse the signs, as they used the '70' sign to indicate the number '60', and the other way round, the sign '60' to express number '70'.

Some of these aforementioned variants are also included in LSE handbooks, namely the signs for the numbers 20 (Pinedo Peydró 2005:953 and Sematos 2009), and 30 and 40 (Pinedo Peydró 2005:954). Such widespread use of these variants may be due to ease of articulation, which allows for speed in signing. They are not only used for the tens, but also for the rest of the numbers, in the case of 20 through 29.

With regard to the thousands, we have found three variants: the most common and the one which appears in all three handbooks,[17] has two parts, the numeral for the multiple of 1,000, signed with the dominant hand, followed by 'thousand' (Figures 58 and 59). There are variants of this sign where the initial handshape for the multiple (e.g. two extended fingers for '2,000') carries over to the second part of the sign, so that only the tips of the selected fingers make contact with the non-dominant hand.

Figure 58. 1000 (a)

Figure 59. 6000

Another variant, which can also be found in Pinedo Peydró (2005:956), is produced with the dominant hand only (Figure 60), and the third variant is shown in Figure 61. Both signs are instances of numeral incorporation and thus expressing the multiples of thousands involve changing the numeral handshape of the sign (see Section 4.5 on numeral incorporation).

Figure 60. 1000 (b)

Figure 61. 1000 (c)

In common usage, the signs described above are often replaced with signing a sequential series of digits in the space from left to right if the signer is right-handed. This strategy is often used with dates, mainly when referring to years (for example, '2014').

A separate lexical sign exists for the number 10,000 (see Figure 62). This variant can also be used to sign the number 5,000, in which case it is one-handed. However, our consultants believe that this is used exclusively in informal contexts.

Figure 62. 10,000

Similarly, several variants are found for 1,000,000. The standard variant is included in Pinedo Peydró (2005:956), Cecilia Tejedor (2006) and in Herrero

Blanco (2009:176) and is shown in Figure 63. Sometimes, in order to indicate just 'million', without expressing a particular multiple, the second part of the sign with the hands touching each other can be produced on its own.

Figure 63. 1,000,000 (a)

Another common sign for 'million' (Figure 64), has an emphatic variant (Figure 65). The emphatic variant is used in contexts where excitement is shown, such as situations where the earning/winning of money is involved.

Figure 64. 1,000,000 (b)

Figure 65. 1,000,000 (c)

4.3. Fractions

In LSE, the following strategies to express fractions are found:

1. There are two signs to express 'percentage'. They are similar, but one uses both hands (see Figure 67) and the other uses only one hand (see Figure 66).

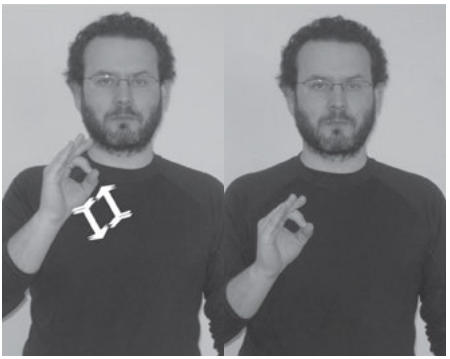

Figure 66. % (one-handed)

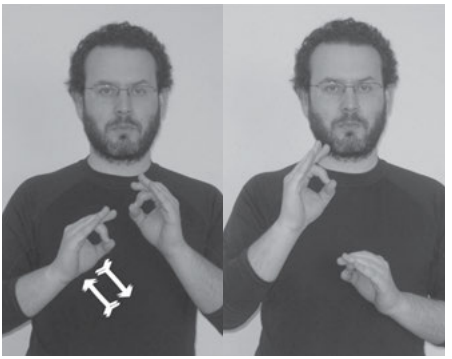

Figure 67. % (two-handed)

(a) I JUST BUY CLOTHES PRICE 50 percentage DISCOUNT
'I bought some clothes, at 50% of their usual price.'

2. There is a strategy to represent decimal numbers such as 1.5.

Figure 68. 1.5

(b) I CAR BUY BRAND PEUGEOT NUMBER 1.6
'I bought a car with a 1.6 engine.

As is the case in other sign languages, these are strategies that are strongly linked to written language. They are not very productive numeral subsystems, and they are used in highly specific contexts, such as reference to mathematical numbers.

3. Figure 69 represents the sign which is used to express 'half' or 'halved'.

Figure 69. HALF

(c) _____cejj*
I BUY CAR THIS[LOC X] CHEAP PRICE HALF ANOTHER [LOC Y] CAR
'I bought a very cheap car, for half the price I would have paid for another car.'
*cejj: lowered eyebrows

4.4. Ordinal numerals

In LSE, there are ten basic signs for the ordinal numerals from one through ten. The ordinals are normally signed in a similar way as the corresponding cardinal paradigm, but with a wrist turn. The initial orientation has the back of the hand facing the signer, and the sign finishes with it facing the speaker. From 11 onwards, it is common to sign the object which is being talked about first, and then a cardinal numeral is used.

In addition to numerical and order information, these signs can also indicate distribution. In such cases, the orientation of the hand can be changed for the ordinal number, which can be signed horizontally. When these numerals are used in the context of signs with a certain visual-spatial orientation, the orientation of the hand may vary in order to identify the objects being

referred to. This happens in the case of the signs DOOR or FLOOR. If the signer wishes to indicate, for example, the door on a specific floor where he/she lives, it will be done with the finger tips pointing upwards, but to indicate on what floor he/she lives, the hand will be kept in a horizontal position with finger tips pointing sideways.

Figure 70. FIRST-FLOOR

Figure 71. FIRST DOOR

(d) I CAR GARAGE KEEP DESCEND UNTIL [BIM] UNDER-GROUND-PARKING_THIRD [HORIZ] CL:CAR-KEEP
'I keep my car on floor -3 at the garage.'

4.5. Numeral incorporation

Numeral incorporation is a process by which two signs which exist independently in the language (a numeral quantifier and a quantified unit) are fused, giving rise to a single sign whose meaning includes the meanings of both components. The sign for the quantified unit maintains all of its parameters with the exception of the handshape, which is modified when adding the

information of numerical quantity. In LSE, numerals can be incorporated into a large number of signs, and they include numbers one through ten, which is an interesting fact as in other sign languages incorporation includes only numbers one through five.

In LSE, as in other sign languages, the use of numeral incorporation appears to correlate with the articulatory characteristics of the signs, specifically with the occurrence of a 'one'-handshape (with the index finger extended and all the other fingers closed in a fist) in citation form. Furthermore, we have verified that in LSE, most signs that allow for numeral incorporation relate to temporal concepts; this is a recurring tendency in all sign languages (Sagara & Zeshan 2013). In particular, in LSE, the temporal signs that allow for numeral incorporation are the following: SECOND, HOUR, DAY (in one of its forms), WEEK, MONTH, and YEAR. Numeral incorporation is also used with other signs, such as those used to express educational levels (ELEMENTARY and SECONDARY), and with classifiers such as person (by extending as many fingers as the number of individuals referred to).

(e) I PAST THREE#YEAR#AGO I JOB FIRED // NOW LOOK LET´S-SEE FUTURE ONE#MONTH OR TWO#MONTH FIND JOB LET´S-SEE
'I was fired three years ago. Now I´m looking for a job. I hope I´ll find something in one or two months' time.'

We have observed numeral incorporation of ordinals in very few signs in LSE. For instance the sign 'FLOOR', which is normally signed with the index finger of the dominant hand extended and facing left (in right-handed individuals). The wrist is twisted at the same time as the hand is moved to the right. If we wish to indicate the floor number, the number of fingers is increased in correlation with the number of floors (without twisting the wrist). As for signs that refer to temporality, the only one that allows for ordinal numeral incorporation is 'WEEK'. This sign is produced with the thumb of the dominant hand extended and the other fingers closed in a fist, and a straight movement parallel to the chest from left to right (if the signer is right-handed). Characteristic of this incorporation is that it happens in the passive hand, which is used as an iconic referent.

Figure 72. WEEK

Figure 73. THREE_WEEKS

Figure 74. THIRD_WEEK

4.6. Numerals: Summary and discussion

Our analysis of variation in the numeral system of LSE confirms the hypothesis that lexical change is related to the social characteristics of the deaf community. In spite of the fact that LSE has a rather stable numeral system, we have been able to document variants due to age, gender, schooling, and communicative situation. Interestingly, the status of regional variation is itself perceived in two different ways, in terms of the region or in terms of schooling. Some of our consultants associate geographical variants with different cities or autonomous communities, but not with the different Schools for the Deaf. This occurs mainly in the case of the younger consultants.

From the articulatory point of view, we have found the following possibilities of variation:

1. The change in the orientation of the palm of the hand: if the interlocutors are close, the numerals are signed with the palm facing the signer, but if they are situated at a certain distance, they are signed with the palm facing outwards, as this improves visualisation. Also, in some of the signs analysed in this study, the difference in orientation occurs systematically but not for contextual reasons. Rather, the difference occurs in some geographical regions. In other cases, as with ordinals, the changes in orientation of numeral signs are due to the orientation of the referents that are being mentioned (‘DOOR’, ‘FLOOR’).
2. The simplification of the articulation of the sign, i.e. one-handed articulation of signs that in their standard variant are bi-manual, and which is motivated both by the context of signing (for example, if one of the signer´s hands is occupied and in informal discourse), and by the age of

the signers (this weak hand drop is more characteristic of young signers than of older signers).

3. In terms of lexical variation, in addition to the standard numeral system, which is more common in formal registers, there are lexical variants, specifically in the expression of the tens, the hundreds and the thousands. The most conspicuous lexical variants are those that occur in the Galician numeral subsystem of the multiples of ten. This vigesimal sub-system is used principally by adult deaf individuals who attended the School for the Deaf at Santiago de Compostela.[18]
4. As far as the discourse level is concerned, we have documented some variants depending on the signs co-occurring with the numeral, or on the emphasis that the signer wishes to express with the information transmitted. There are variants which are preferred in colloquial contexts and others which are preferred in formal contexts, the latter generally because they are articulated in a clearer and more visible way.

5. Conclusions

In this research, we have attempted a description of colours and numerals, listing both articulatory variants and variation in meaning, making use of lexical inventories and studying the context of usage. However, for an evaluation to be extended to LSE, a larger quantity of data and a larger number of consultants (and more variety in both) would be necessary.

The diatopic variations in the signs analysed do not usually make them incomprehensible to the signers in other geographical areas. This is so in the case of colours and also in the case of numerals, although some of the diatopic variants described for the tens are found to be incomprehensible or unknown to the sign language users in other areas, or even for younger signers. Of particular interest has been the existence of a typologically rare vigesimal sub-system in the Galician variety of LSE.

No specific place of articulation has been found that would correlate with colour terms: the place of articulation of a colour term can be the face, the mouth, the neck or the upper part of the chest and the hands. However, the diachronic variants found for some colours – as in the case BLACK suggests that the linguistic changes in signs for these colours coincide with the general tendency towards phonological reduction to a limited range of articulatory locations on the hands and face, instead of the arms and the shoulders.

With respect to the iconicity and semantic motivation of the signs, it is clear that the relationship between the signifier and the signified in some of the colour terms depends on influence from the spoken language. This is evident in the derivation from fingerspelling of some signs ('green', 'violet', and 'blue') as well as in those signs that correspond to an object that exhibits this colour ('orange' and 'chestnut brown'), and where this coincides with the denomination in spoken Spanish. When it comes to using colours to express symbolic values, only 'black' and 'white', or 'grey', are used in order to express emotions or feelings in LSE.

The lack of a corpus of LSE, and the scarcity of descriptive and sociolinguistic studies on lexical variation in the Iberian Peninsula and specifically in Spain have been drawbacks that have not allowed us to establish more definite conclusions in some parts of this study. More extensive research remains to be carried out when adequate tools become available.

Notes

1. Members of the GRILES (Grupo de investigación de lengua española & lenguas signadas) Research Group at the University of Vigo, Spain. We want to give our heartfelt thanks to Lucía González Carballás and Herminda Otero Doval for their invaluable help in preparing some essential data we used in this article. They reviewed a great number of LSE dictionaries and handbooks, conducted most of the interviews with our LSE consultants, produced the photographs and participated in the recordings of the signs used as examples in this article.
2. For this research we are grateful for the support of the *Xunta de Galicia* (Galician Automous Government – Cod. 10PXIB302020PR) and the *Ministerio de Educación, Cultura y Deporte* (Ministry of Education, Culture and Sports – Cod. FFI2010–20972). We also wish to acknowledge our gratitude to our consultants (not only from Galicia but also from other areas of the Kingdom of Spain, such as Madrid and the Canary Islands) and to Marta Dahlgren, responsible for the thorough linguistic and stylistic revision of the chapter presented here.
3. We want to thank all our consultants: Manuel, Claudia, Mónica and Estefanía for their help in answering the questionnaires used for this project, and Rayco, María, Juan Ramón, Alba, and Ruth for their detailed examples.
4. The letter S is shown in square brackets to indicate where the original quotes were in Spanish, and were translated into English by the authors.

5. Lexical variation in numerals and colours that are represented are the lexical items *colores*, *blanco, negro, rojo, azul, verde,* (colours, white, black, red, blue, green) and the numbers *siete, cien, mil* (seven, hundred, thousand).
6. The *Diccionario normativo de la lengua de signos española* (2011) is the printed version of an earlier format on DVD, 2008, which has been revised and improved. It is a bilingual dictionary (LSE-Spanish) and contains 3,700 signs in the standard variety.
7. For an account of LSE dictionaries, see: Báez Montero, Inmaculada (2007).
8. (112) GOLDEN. The sign for counting money is made, elevating the right hand, and making the sign for 'shine'.
9. (109) DARK. Both hands are joined, and at the same time the eyes are closed.
10. (27) SHINE, GLOW, etc. The hand is lifted with the fingers stretched out, separate, and the hand is shaken several times in order to imitate shine and reflexes.
11. We want to thank Patricia Álvarez Sánchez for editing and processing the photographs used in this chapter.
12. *Morado* in Spanish describes a colour slightly different in tonality to that indicated by the English terms *purple* and *violet*.
13. In other Romance languages the variety of terms to express colour is scarcer than in Spanish.
14. Vídeo diccionario de LSE: Sematos. Retrieved from www.sematos.eu
15. McKee et al. (2008:302–303) refer to another possibility of expression, using the index finger to write the numbers in the air. This expression is used by older signers. We do not have sufficient data to be able to assert whether this possibility exists in LSE.
16. On the site http://www.ilsehelp.com/ there is a resource for LSE interpreters, where videos of the standard numeral system can be found, and also the Galician variant of the tens. Note that the number '80' on this site is signed by merely making contact with the finger tips, and there is no change in hand orientation. This variant is more regular, as none of the other signs in this sub-series has any hand orientation change.
17. Pinedo Peydró (2005), Cecilia Tejedor (2006) and Herrero Blanco (2009)
18. In Báez Montero and Fernández Soneira (2010) the problems brought about by the process of standarisation are discussed, and examples are given of indefinite quantification, by means of an analysis of lexical variants of the concept '*todo* (all)'.

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A typological look at kinship terms, colour terms and numbers in Finnish Sign Language

Ritva Takkinen, Tommi Jantunen, and Irja Seilola

1. Introduction

This chapter deals with Finnish sign language (FinSL). FinSL is the majority sign language in Finland's deaf community, which has about 4000–5000 deaf sign language users. In the deaf community there is also a small minority language, Finland-Swedish Sign Language (FinSSL) with about 140 users. In this paper FinSSL is not discussed. FinSL has its origin in the old Swedish Sign Language (SSL). The first deaf teacher of the deaf, Carl Oscar Malm (1826–1863), studied between 1834 and 1845 in Sweden in Manilla (formerly Manhem) school, where he learned the sign language used in the school. When he returned to Finland and started to teach Finnish deaf people, this language was then mixed with the various ways of communication already used by Finnish deaf people (Salmi 2010). It has been estimated that FinSL was a linguistically separate from the (old) SSL already by the beginning of the 20th century (Jantunen 2001).

Kinship terms, colour terms, and numbers, are often used to compare languages from the point of view of how their users categorise the world. These three domains are also the starting point of the larger Sign Language Typology project[1] to which this study participates by looking at the semantic fields of kinship and colour as well as the number system in the lexicon of FinSL. In particular, the study aims at investigating the following questions provided in the Sign Language Typology project:

1) What is the semantic and morphological structure of kinship paradigms in FinSL (core vs. non-core kinship and blended families)?
2) Are there gender and age distinctions?
3) Are the kinship terms semantically related to Finnish?
4) What are the main colour terms (lexical signs for colours) used in FinSL?

5) What other ways are there to talk about colours?
6) What is the relationship between the colour terms of FinSL and Finnish, the surrounding spoken language?
7) What is the number system like in FinSL (cardinal and ordinal numbers)?
8) How does FinSL use numeral incorporation in the lexicon?
9) What is the relationship between the number system of FinSL and Finnish?

The research questions are motivated by the questionnaires provided in the typology project. In order to answer the questions, signs referring to colours, numbers and family relations were elicited and recorded from dialogues between native FinSL signers involved in various specifically designed game activities. The game to elicit kinship terms and diagrammatic representations of kinship was a family tree game with a task to plan the guest list (including only relatives) for a wedding or other party. The material that was used to elicit the colour terms (basic and non-basic colour terms as well as distinctions between light and dark colours), in turn, consisted of coloured plastic chips and coloured pictures. One player described the colour of different things in their picture and the other player had to find that colour from among his/her coloured chips. The other task in eliciting colours was to name the colours of all the coloured chips. Finally, the material to elicit numbers (cardinal numbers from 0 to 100 as well as monetary terms and numbers above 100) consisted of cards with instructions for different kinds of sums, divisions, multiplications, etc., that the players had to follow. Another game in number elicitation was a bargaining game in which a buyer and a seller had to negotiate about a price.

Three pairs of FinSL users took part in the recorded discussions, so we have for analysis the signing of six people. After analysis of the video material the typological questionnaires were filled in. In addition, other research on colour, kinship terms and numbers in FinSL was used to get the picture of each semantic field. In particular, the study of numbers drew heavily on a dictionary of FinSL numerals and numeral expressions (Jantunen and Savolainen 2002).

In this chapter, kinship terms, colour terms and numbers are discussed in separate sections. Kinship and colour are discussed primarily in contrast to typological findings and on a lexical level whereas numbers in FinSL are approached descriptively and mainly on phonological and morphological levels. We consider our approach to be ontologically motivated: in terms of semantic domains, numbers form a more abstract, detailed and broader system than kinship and colour terms.

2. Kinship terms

In this section we deal with the kinship system of FinSL and answer the first three research questions (section 1). We begin by reviewing the cross-linguistic research done on kinship systems in spoken languages.

2.1. Typological background

Every human language and culture has ways to express family relations; the terms by which it is done vary from language to language and from culture to culture. In spoken languages kinship terminology has often been studied (e.g. Wallace and Atkins 1960, Shusky 1965, Greenberg 1966, 1990), but in sign languages few studies are found in the literature (Peng 1974, Woodward 1978, Massone & Johnson 1991, Nyst 2007, Wilkinson 2009, Geer 2011). Greenberg (1966) in his study of 120 spoken languages tried to find linguistic universals in kinship terminology and found several universal hierarchies.

Woodward (1978) wanted to test how Greenberg's universal hierarchies work in signed languages. He conducted a comparative study on kinship terms, choosing 20 sign languages that he divided according to a hypothesised relationship to six groups: a French sign language group, a British sign language group, an Asian SL group, a South American SL group, an Unknown affiliation, and Indigenous. He defined a basic kinship term as being 1) a native sign showing no evidence of borrowing from other languages (e.g. initialised signs), and 2) a monomorphemic or polymorphemic sign referring to a consanguineal kinsman or woman, i.e. those related by blood. Following his restrictions on what he considered to be proper kinship terms, he found altogether 114 terms in 20 sign languages. The number of native kinship terms varied from three to twelve in different sign languages. Nearly all sign languages had at least some primary kinship terms representing nuclear relations (mother, father, brother or sister, child). Sign languages showed variation in consanguineal kinship terms with respect to gender, age, generation and lineality.

Sign languages are minority languages that are in contact with the majority languages spoken in their countries. Research into kinship terminology in sign languages (Peng 1974, Woodward 1978, Massone & Johnson 1991, Nyst 2007, Wilkinson 2009, Geer 2011) has shown that all the languages that were studied categorised kinship terms either in descriptive or classificatory terms. Both similarities and differences have been found in the categorisation of kinship terms between sign languages and the majority languages

with which these sign languages are in contact. In addition, some interesting structural features have been shown; for example, in Japanese sign language the fingers of the hand are used in a culturally typical order to express family relations. One difference seems to be that in sign languages, kinship terms are used as referential but not as vocative terms (addressing family members) (Peng 1974, Nyst 2007). In some sign languages kinship terms can have borrowed terms from the majority spoken language by using fingerspelling or gender marking, e.g. in Argentinean sign language (Massone & Johnson 1991).

Peng (1974) found that in Japanese sign language (JSL) kinship terms can be basic signs for lineal and nuclear relationships, and derivative signs for collateral and affinal relationships. Derivative signs are constructions of two or more basic signs (e.g. father younger sister). In JSL, handshape marks gender: the thumb denotes first and second ascending male, and the little finger denotes first and second ascending female. This pattern is present also in spousal terms. Iconicity is present in grandparental terms as a bending of the thumb or little finger and also in sibling terms as an upward movement (older brother or sister) or a downward movement (younger brother or sister). Gender marking with a handshape is also found in Korean sign language (Zeshan et al. forthcoming).

Wilkinson (2009) investigated the kinship terms of 40 sign languages in North and South America, Europe, Africa and Asia. He studied the sign language dictionaries of these languages and compared the ways of expressing kinship. He found that the languages used different strategies to construct kinship terms. Most of the languages used one lexical unit in these terms, but a few of them used two or more units. Sign languages also varied in the use of initialisation in kinship terms: some of the languages used no initialisation, while others used it in more than 50 % of the terms (e.g. Irish sign language 15/16). Neither the number of lexical units nor the number of initialised handshapes was, according to Wilkinson's results (2009), a consistent definer of markedness in kinship terms. Wilkinson (2009) also found that location functions as a potential gender marker in some sign languages, when the location of a person term, man or woman, has been preserved also in the terms father or mother. In his data he found iconicity in kinship terms, but it was not similar in all sign languages. The iconicity was motivated by both universal and culture-specific properties. Thus, typological variation has been shown to exist among sign languages with respect to kinship terms.

2.2. Kinship terms in FinSL

The semantic domain of kinship in signed languages primarily includes lexical kinship terms. Here we will analyse the terms for both core and non-core family members in FinSL.

2.2.1. Core family terms

Core family terms include those for parents, children, brothers and sisters, and spouses. There is a **gender distinction** in some signs referring to core family terms: MOTHER/FATHER (Figure 1), FEMALE^OFFSPRING for daughter, FEMALE^SIBLING for sister (Figure 2), MALE^SIBLING for brother, MALE^SPOUSE for husband (Figure 3) and FEMALE^SPOUSE for wife (Figure 4). From this we also see that the terms MOTHER and FATHER are single signs but the terms for daughter, sister and brother, wife and husband are compounds.

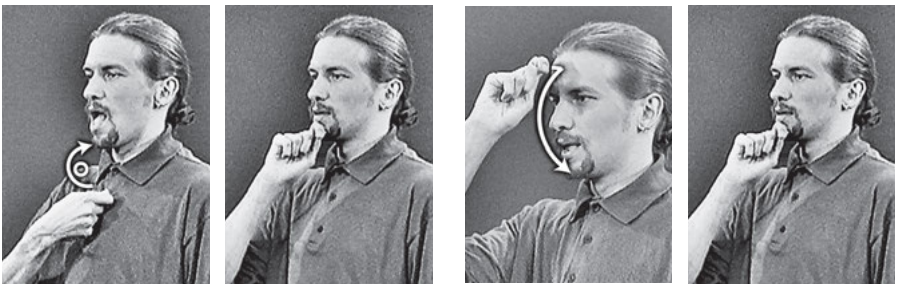

Figure 1. MOTHER, FATHER
(The images in the figures 1-4, 6-7, and 9-13 are from Malm 1998.)

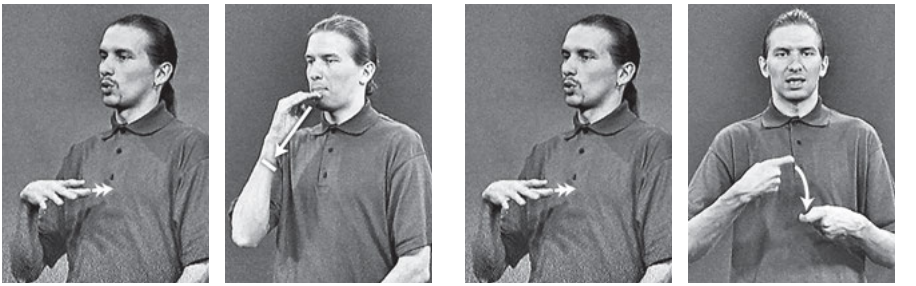

Figure 2. FEMALE^OFFSPRING, FEMALE^SIBLING

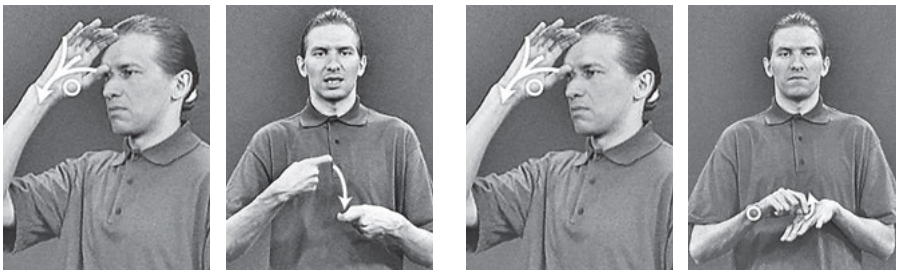

Figure 3. MALE^SIBLING, MALE^SPOUSE

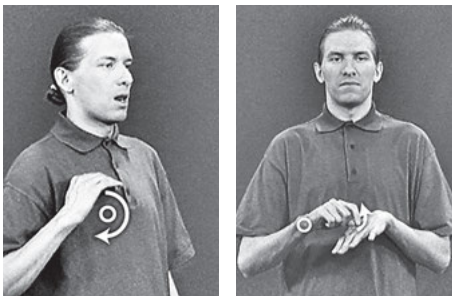

Figure 4. FEMALE^SPOUSE, FATHER^MOTHER

In addition to the gendered signs, there are also **non-gendered signs**: FATHER^MOTHER (Figure 4) for parents, a compound, and SIBLING, OFFSPRING and SPOUSE, which are single signs. Structurally the terms can vary, as seen above: some are **individual signs**, but others are **compounds**. In this context we include in the concept of a compound two-sign (or three-sign) constructions that undergo phonological processes but also those that do not. As Velupillai (2012) puts it: compounds are two words (here signs) that constitute its own phonological unit wether they are written together or not.

In core family terms FinSL makes a lexical distinction between older and younger children (OLDER^OFFSPRING and YOUNGER^OFFSPRING) as well as older and younger brothers and sisters (OLDER^SIBLING and YOUNGER^SIBLING) (Figure 5). Because FEMALE^OFFSPRING, MALE^SIBLING and FEMALE^SIBLING are already compounds, the age distinction is made by longer constructions, e.g. TALL+FEMALE^SIBLING, for older sister, not by a compound sign.

Figure 5. OLDER^SIBLING, YOUNGER^SIBLING

2.2.2. Non-core family terms

Non-core family members can be either individual signs, GRANDPAa and GRANDPAb, GRANDMA, AUNT, UNCLE, COUSIN, FIANCÉ (Figure 6), or compounds, CHILD1^CHILD2, FEMALE-FIANCÉ (Figure 7). The term GRANDPARENTS is composed of a compound including three parts BIG^FATHER^MOTHER (Figure 8). The sign for grandchild has the repetitive form CHILD1^CHILD2, in which the locations of the repeated forms follow the same time-line as the sign for generation. The gender of maternal and paternal grandparents and the distinction between them are expressed in compounds MOTHER+MOTHER (Figure 9) for maternal grandmother,

MOTHER+FATHER for maternal grandfather, FATHER+FATHER for paternal grandfather, and FATHER+MOTHER for paternal grandmother. In these signs the single signs are articulated fully, FATHER+MOTHER (Figure 9) unlike in the term PARENTS. Non-core family members show gender distinction only in the terms GRANDPA, GRANDMA, AUNT, UNCLE, FEMALE^FIANCÉ.

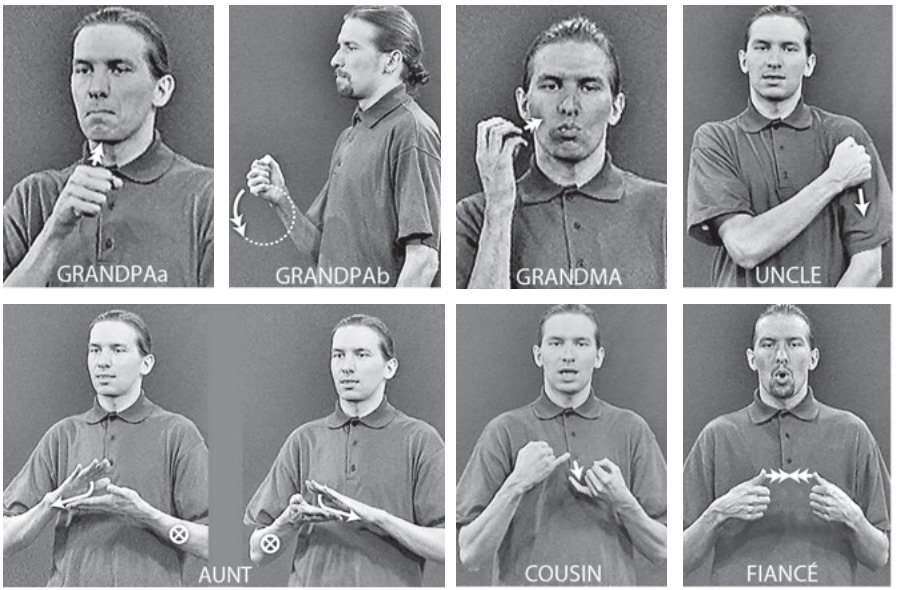

Figure 6. GRANDPAa, GRANDPAb, GRANDMA, UNCLE, AUNT, COUSIN, FIANCÉ

Figure 7. FEMALE^FIANCÉ, CHILD1^CHILD2

Figure 8. BIG^FATHER^MOTHER

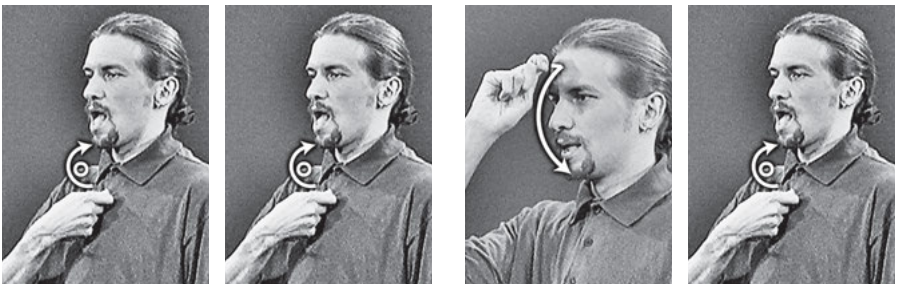

Figure 9. MOTHER+MOTHER, FATHER+MOTHER

2.2.3. Terms for blended families

In FinSL some of the single signs for the members of blended families (formed through marriage), such as FATHER-IN-LAW and MOTHER-IN-LAW, have gender distinction. These signs are also used to refer to GRANPA and GRANDMA (Figure 6). Such family relations as step-mother,

step-father, step-daughter and step-son are expressed as compounds, HALF^MOTHER, HALF^FATHER, HALF^FEMALE^OFFSPRING, HALF^OFFSPRING, HALF^SIBLING, HALF^FEMALE^SIBLING and HALF^MALE^SIBLING (Figure 10).

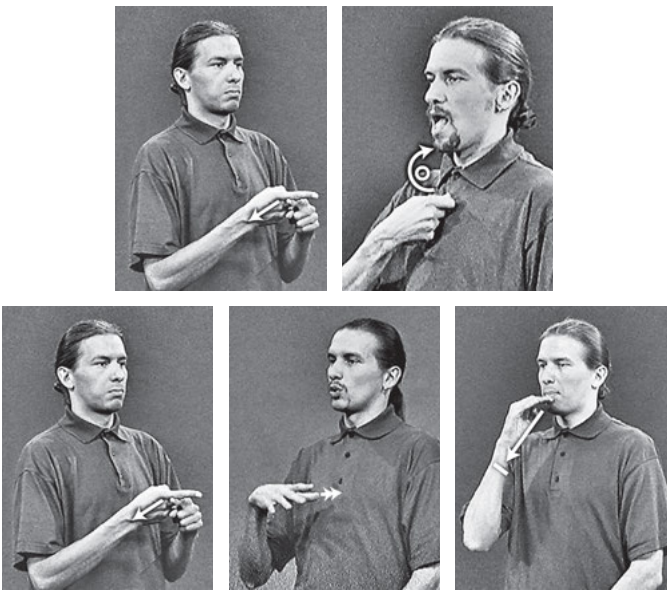

Figure 10. HALF^MOTHER, HALF^FEMALE^SIBLING

Structurally the kinship terms are formed mostly on the area of the head (forehead, chin and cheek), but they may also be formed on the chest, in neutral space, and on the non-dominant hand. In many signs the location changes: the sign MOTHER starts at the chest and ends at the chin; the sign FATHER starts at the forehead and ends at the chin; and the sign PARENTS starts at the forehead, goes to the chest and ends at the chin. In coumpounds it is common for the location to change. The forehead location is typical of signs denoting the male gender and the chest is typical of signs denoting the female gender. In these cases the location carries semantic information (cf. Wilkinson 2009). Neutral space is the location for the signs SIBLING, COUSIN, AUNT and FIANCÉ. The sign UNCLE is articulated on the upper arm of the non-dominat hand and the sign SPOUSE on the back of the hand (putting a ring on the ring finger).

2.2.4. Relation to other languages

Wilkinson (2009) found iconicity in his research on 40 sign languages but iconicity appeared in different ways in different languages. In FinSL, kinship terms also showed some iconicity e.g. in the locations of the terms denoting female and male genders, in the location, movement and handshape of the sign SPOUSE (putting a ring on the finger) and in the direction of the movement when referring to older or younger brothers or sisters. In FinSL, kinship terms do not include any initialisation signs, or loans from the written language.

Congruence on the semantic level between FinSL and Finnish is clear. The kinship system is almost the same in Finnish and in FinSL concerning the distincted categories, although Finnish has more kinship terms. For example, Finnish also makes a distinction between maternal and paternal uncle, 'eno' and 'setä', when FinSL does not. Moreover, Finnish has terms for husband's sister or brother's wife ('käly') and husband's brother or sister's husband ('lanko'), which are not found in FinSL. However, for the most part the kinship terminology is similar, which shows the languages' similar cultural base and contact between FinSL and the majority language, Finnish.

To summarise, FinSL has kinship terms for the core and non-cor as well as for blended family members. There is also gender distinction for most of the terms. Structurally the terms can be signle signs or combounds. Some iconicity is seen in the articulation places of the terms.The system of kinship terms in FinSL resembles that of Finnish language.

In the next section we move to colour terms. First we present the typological studies done in spoken language and the research what is so far done in sign languages. After that the colour terms in FinSL are discussed.

3. Colour terms

3.1. Typological background

Colour is the cultural classification of certain physical stimuli (Conklin 1973). An important landmark in typological studies of colour terms in different languages was Berlin & Kay's investigation (1969), in which they proposed a hypothesis of basic colour terms (BCTs) and the developmental

order in which they appear in languages. The researchers investigated 98 languages or dialects. They defined a BCT as follows:

1. a mono-lexemic term whose meaning is not predictable from the meaning of its parts
2. a term whose signification is not included in that of any other colour term
3. a term whose application is not restricted to a narrow class of objects
4. a term that is psychologically salient for subjects (having both a tendency to occur at the beginning of elicited lists of colour terms, and stability of reference across subjects and occasions of use in the idiolects of all subjects).

The researchers showed that the world's languages have from two to eleven basic colour terms, and concluded that they developed in a fixed order and in seven stages:

I black and white (2)
II red (3)
II green or yellow (4)
IV yellow or green (5)
V blue (6)
VI brown (7)
VII purple, pink, orange, grey (8−11).

Berlin & Kay's research (1969) has been criticised at times but it has also inspired a lot of studies that have sought to test their hypothesis in spoken languages (see e.g. Conklin 1973, Dowman 2007, Koski 1989, Kivinen 2007), and recently also in signed languages (Woodward 1989, Nonaka 2004, Hollman & Sutrop 2010). The research done on several languages has resulted in revisions of the original model. Kay & Maffi (1999) revised the model using the empirical and theoretical considerations that emerged from several studies. They recognised three kinds of universal colour categories (Kay & Maffi 1999):

1. primary colour categories (black, white, red, yellow, green, blue)
2. composite (disjunctive) colour categories (fuzzy unions e.g. grue, black/green/blue, white/red/yellow, black/blue, red/yellow, yellow/green/blue, yellow/green)
3. derived (intersective) colour categories, which are experienced as mixtures of the primaries.

There has, however, been little research into colour terms in signed languages. Woodward (1989) investigated 10 sign language from 7 different sign language groups: the French SL group (FSL, ASL), British SL group (Auslan), Japanese SL group (JSL, Taiwanese SL), Chinese SL group (CSL, Hong Kong SL), indigenous (Providence Island SL), and unknown (Saudi Arabian SL). He found that these sign languages follow the universal patterns shown in the colour terminology in spoken languages, and that they are characteristic of human language and independent of the channel of the language of expression and reception.

Nonaka (2004) investigated Ban Khor sign language, an indigenous signed language that is one of the many signed languages used in Taiwan, and is now in danger of extinction. She found that Ban Khor SL is a three-colour-term language, consistent with Berlin & Kay's (1969) hypothesis, since the colours belong to the two first phases of the BCT model, white, black and red. Other colours are expressed by pointing to an object in the environment that is the same colour; if there is no such colour in the environment, then code switching to Taiwanese SL is used. These three colours originate in pointings to the hair for black, to teeth for white, and to the lips for red, but the signs are now lexicalised. Taiwanese sign language (TSL) has a multi-term colour lexicon in which the three basic colour terms refer to body parts, an eyebrow for 'black', an upper arm for 'white' and the lips for 'red'. The other colour terms, e.g. 'pink', 'purple', 'yellow', are initialised signs that use the fingerspelled letter from the Thai manual alphabet. (Nonaka 2004.)

Nyst (2007) studied Adamorobe sign language in Ghana and found that there are methodological problems in defining basic colour terms in sign languages. Defining the basic colours depends on how strictly the criteria of Berlin and Kay (1969) are applied. For example, in Adamorobe SL the three basic colours are signed with the same manual sign (a generic sign) but the mouthing distinguishes the meaning. Yellow and green are based on the entity bearing the same colour.

The basic colour terms have also been investigated in Estonian sign language (ESL) (Hollman & Sutrop 2010). Here too the researchers applied Berlin and Kay's theory of basic colour terms in their study. They used a list test and a colour naming test in their study and tested all the participants (N=50) with the Colour Vision Test (Fletcher 1980). The results showed several colour expressions. The researchers then carried out a salience analysis created by Davies and Corpett (1995) and further developed by Sutrop (2000). From this the researchers concluded that ESL is in Stage VII (Berlin & Kay 1969) since the basic colour terms are BLACK, WHITE, RED, YELLOW, GREEN, BLUE, GRAY, BROWN and PINK/PURPLE.

Other means of expressing colours are, for example, adding the signs DARK or LIGHT to the colour term (BROWN LIGHT, RED DARK) and fingerspelling (r-o-s-a, b-e-e-ž.)

3.2. Colour terms in FinSL

As we saw in the previous section, the forms of colour terms in signed languages are often iconic or motivated. In many signed languages, body parts or objects in the environments are indicated to refer to colours. Signs may also be motivated by a link to the written language, for instance in initialised signs where the fingerspelled first letter of the written word for a colour is used.

3.2.1. The basic colour terms in FinSL

In FinSL there is an abstract sign COLOUR as a hypernym for the separate colour signs (Figure 11.). Classified according to Berlin & Kay's (1969) basic

Figure 11. COLOUR, BLACK, WHITE, RED, GREEN, YELLOW, BLUE, BROWN, VIOLET, PINK, ORANGE, GREY, TURQUOISE

colour terms (BCT) model, FinSL has lexical signs for all the eleven colours, black, white, red, green, yellow, blue, brown, purple/violet, pink, orange, and grey (Figure 11), that are mentioned in the seven phases proposed by Berlin & Kay. In addition to these terms, FinSL also has a sign TURQUOISE (Figure 11). The basic categorisation of the colour terms is similar to Finnish.

3.2.2. Complex colour constructions

In addition to the single basic colour terms, FinSL uses complex colour constructions. Single colour signs can also be combined sequentially with other signs, e.g. LIGHT+BROWN or DARK+BROWN (Figure 12). They can involve morphological modification of the manual (single) sign, e.g. !RED! for 'strong red' or SLIGHT-REDxx for a little bit red, 'slightly red' (Figure 12). In the first sign the movement is larger and faster, and in the second sign the movement is repeated and on a smaller scale than in the basic form. Colour signs can also be modified by additional facial expressions, e.g. !BLUE! for 'strong blue' and SLIGHT-BLUExx for 'slightly blue'. In the sign meaning 'strong blue' the eyes are squinted, and in the sign meaning 'slightly blue' the eyes are slightly squinted and the movement is very small and is repeated. In the sign !ORANGE! for 'strong orange'

Figure 12. LIGHT+BROWN, DARK+BROWN, !RED!, SLIGHT-REDxx

the movement is faster and more intensive and the mouth pattern is also stronger. As we can see, modification of the manual sign and facial modification often appear at the same time: the movement can be larger or smaller, repeated, and produced faster or slower. The facial modification involves narrow squinting of the eyes or movement of the mouth. Even the body position can be modified, as in the sign !YELLOW! for 'strong yellow'. Only signs that are articulated in neutral space can be spatially modified, i.e. signed nearer the referent with which the colour is associated. However, most of the colour signs in FinSL are articulated on the body and do not include special modification.

3.2.3. The semantic relations of the colour terms to objects

The colour terms in FinSL are semantically related to objects. The sign BLACK is articulated on the face, the palm put on the eye, referring to darkness when the eyes are covered. The sign WHITE is articulated near the neck, indicating a white collar. The sign RED is signed under the lips, getting its motivation from the redness of lips. FinSL has two signs for green: GREENa resembles the sign for poison, and GREENb refers to the sign for hay. The sign YELLOW refers to the lighting of matches. For blue FinSL again has two signs: BLUEa, which points to the eye (most Finns have blue eyes) and BLUEb, which points with a flat hand to the sky (Figure 13). The sign BROWN is articulated by touching the chin, so the motivation for this may be a beard. The sign VIOLET is articulated under the eye, referring perhaps to the "black" rings under the eyes that can be seen on some people's faces. The sign PINK is signed on the cheek, referring to the light red colour of the cheek. The sign GREY is articulated on the forearm in the same place as the sign sheep, so associated with sheep's greyish wool.

The only basic colour which has contact-induced motivation from Finnish is ORANGEa, (Figure 13) orange. It is an initialised sign using the O handshape. The articulation place is the same as in the sign YELLOW. There is also two other signs for orange, ORANGEb and ORANGEc (Figure 13) but the motivation for these signs is unclear. Nowadays they seem to be abstract signs. As we have seen above, for several basic colours there are (at least) two signs in FinSL. All these variants are still in use today.

Complex constructions of colours, including modification of the manual colour sign, facial modification and the modification of the body position, indicate saturation, changes in the colour spectrum, and hedging, softening the meaning. Saturation means the intensity of the colour, e.g. a bright colour is signed with a larger and faster movement. The colour spectrum

Figure 13. BLUEa, BLUEb, ORANGEa, ORANGEb, ORANGEc

can be varied by combining the sign LIGHT or DARK with the colour signs. Softening the colour expression, e.g. SLIGHT-REDxx, is produced by shortening and repeating the movement. Sometimes the different signs for the same colour can be used to specify the exact colour, e.g. SININENb, 'blue' for referring to sky blue, although the sign is also used as a general sign for blue.

3.2.4. The relationship between FinSL and Finnish colour terms

The relationship between FinSL and Finnish is close in the basic colour terms. Koski (1983) studied colour terms in Finnish and languages related to it. He also adapted Berlin & Kay's (1969) model in his etymological research. He included eight terms in the basic colour terms of Finnish: valkoinen (valkea) 'white', musta 'black', sininen 'blue', punainen 'red', keltainen 'yellow', vihreä 'green', harmaa 'grey' and ruskea 'brown'. During the 30 years since his study was conducted, the terms violetti 'violet', oranssi 'orange' and vaaleanpunainen 'pink' have stabilised their status in the lexicon of Finnish speakers. In Finnish the term 'turkoosi' is also used for the colour turquoise. Also where modifications of the spectrum are concerned, Finnish and FinSL use the same kinds of combinations of words, 'vaalea' and the

colour word in Finnish and the sign VAALEA and a colour sign in FinSL. Finnish, like FinSL, has rich morphological means of word formation (derivation) but the forms used are naturally different. The contact between the two languages is evident in the fact that the same basic colour terms are now seen in both languages. Although FinSL is a young language, it has a wide colour vocabulary.

3.2.5. Relation to universal colour categories

Looking at colour expressions from the viewpoint of the three universal colour categories proposed by Kay & Maffi (1999), FinSL has lexical signs for the primary colour categories (black, white, red, yellow, green, blue etc). For the derived (intersective) colour categories that are experienced as mixtures of the primaries FinSL uses constructions composed of several signs, e.g. RED+ORANGE+BLEND (Figure 14).

Figure 14. RED ORANGE BLEND

If we compare the colour categorisation in FinSL with that in the other sign languages that have been studied, we see that colour categorisation in FinSL quite closely resembles that used in Estonian Sign Language (ESL) (Hollman & Sutrop 2010). In ESL there are also lexical signs for eleven basic colours. For colour spectrum variation ESL uses the sequential structures of the sign for 'light' or 'dark' and the colour signs. In both FinSL and ESL it is also possible to fingerspell the name of the colour if there is no lexical sign, e.g. b-e-i-g-e.

To summarise, FinSL has 11 basic colour terms described by Berlin & Kay (1969) as well as a term for 'turquoise'. It also expresses derived (intersective) colour terms (cf. Kay & Maffi 1999), e.g. RED+ORANGE+BLEND.

The colour categorisation is similar to that of Finnish. FinSL uses also complex colour constructions: a colour term is combined with another sign (e.g. LIGHT-BROWN), or colour terms involve a morphological modification (e.g. !RED!, SLIGHT-BLUE). The colour terms in FinSL are also semantically related to objects: they are signed on the areas of a body part (e.g. RED signed near the lips) or refer other ways to objects (e.g. GREEN resembles the sign for 'hay'). It is also possible to fingerspell some colour which does not have a sign, e.g. b-e-i-g-e.

In the next section we discuss the number system of FinSL. First we introduce the typological background, after that we discuss the nominal number, cardinals and ordinals, and lastly numeral incorporation in FinSL.

4. Number

4.1. Typological background

Taking our last theme, number, every language has a way of referring to the quantity and order of objects, events etc, but number systems vary across languages. Comrie (2008) distinguishes four main types of arithmetic numeral bases in the world's languages: decimal, hybrid vigesimal-decimal, pure vigesimal, and extended body-part system. Of these, the vast majority of languages use the decimal system. The general structure of this system is *x10+y*. This means that, for example, the number 32 is constructed by multiplying the basic cardinal number 3 by the base 10 and then adding the cardinal number 2 to the outcome.

Numbers are generally divided into cardinal and ordinal numbers. Cardinal numbers are used in the attributive quantification of nouns whereas ordinal numbers identify the position a given member of a set occupies relative to other members of the same set (Stolz and Veselinova 2008). In most languages, ordinal numbers are morphologically or syntactically connected to cardinal numbers. For spoken languages that have ordinal numbers, Stolz and Veselinova (2008) have identified at least six patterns of how this connection may manifest itself: (i) the cardinal numbers may be used as ordinals without any modification; (ii) cardinal and ordinal numbers are identical except for 'one' and 'first'; (iii) ordinal numerals are derived from cardinal numerals; (iv) all ordinal numerals are derived from cardinal numerals with two alternatives for 'first' (one of which is morphologically independent of 'one', i.e. suppletive); (v) ordinal numbers from 'two' upwards are derived from cardinal numbers, 'first' being suppletive; and (vi) 'first' and a small set of consecutive higher ordinal numbers are suppletive.

In studies of spoken languages, numerals have often been approached from the perspective of their grammatical class: the goal has been the classification of numerals into grammatical categories such as adjective or substantive. This has not always been easy (e.g. Comrie 1981). With sign languages, the main approach to numbers has been different. Instead of approaching numerals as a grammatical category, the main aim - obviously motivated by the manual modality - has been the description of number systems. Up-to-date descriptions have been provided for several sign languages, including Catalan Sign Language (Fuentes and Tolchinsky 2004) and Finnish Sign Language (Jantunen and Savolainen 2002). Numbers in sign languages have also been investigated from the historical and sociolinguistic perspectives (e.g. Fischer 1996; McKee, McKee and Major 2011). Such studies have shown that number systems vary considerably, for example, according to the signers' age.

Numeral incorporation – the incorporation of cardinal numbers into lexical paradigms by producing the numerical value simultaneously with a lexical element (Sakara, de Vos and Zeshan 2012) – has been the most discussed number-related grammatical issue in sign languages. In sign languages, numeral incorporation occurs in a variety of semantic domains, the most typical one perhaps being that of temporal expressions. Liddell's (1996) bound-root analysis of the phenomenon has been widely cited. Liddell's analysis also forms the underlying analytical basis in the discussion in this paper of numeral incorporation in Finnish Sign Language (see Section 4.2).

4.2. Nominal number in FinSL

In this section we describe cardinal (4.2.1) and ordinal numbers (4.2.2) as well as numeral incorporation (4.2.3) in the lexicon of Finnish Sign Language (FinSL). Mention is made of notable overlaps with Finnish, as well as points of difference.

4.2.1. Cardinal numbers

The FinSL cardinal number system is over 160 years old. It was devised in the middle of the 19th century by the deaf founder of Finnish education for the deaf, Carl Oscar Malm. The numbers 0–5 were borrowed directly from (the old) Swedish Sign Language (SSL), the language Malm had learnt during his stay in Stockholm's school for the deaf. For numbers from 6 onwards (up to one thousand) Malm introduced a more original strategy, the

main characteristic of which was one-handedness (Hirn 1909). Today, all the numbers in FinSL are one-handed.

The FinSL number system is based on 10, that is, FinSL uses the decimal system (Comrie 2008), as does the surrounding Finnish language.

Zero

The FinSL sign meaning 'zero' is articulated on the level of the chest with the O-hand shape, the palm facing the contralateral side. The sign may be produced either as a hold or with a short straight (epenthetic) movement forwards (Jantunen and Savolainen 2002). The hold form is used in sequences, whereas the form with the movement usually occurs as an isolated sign (Jantunen and Takkinen 2010). However, also the hold form may be used as an isolated sign.

Numbers 1–10

FinSL numbers 1–9 are shown in Figure 15. The number 1 is signed with an upwards pointing extended index finger (palm facing the signer on the

Figure 15. FinSL numbers 1–5 (upper row), 6–8 (bottom row left) and 9 (bottom row right). The number 9 is produced by oscillating the thumb-up hand shape from the wrist and forearm.

level of the chest; this is the standard palm orientation and place for cardinal numbers in FinSL, unless otherwise noted), and then extending and spreading the middle, ring, and little fingers produces numbers 2, 3, and 4, respectively. The number 5 is produced with all the fingers extended and spread. For the numbers 6–8, the finger count is begun anew from the ulnar side of the hand: the number 6 is associated with an extended little finger, 7 with the extended and spread little and ring fingers, and 8 with the extended and spread little, ring, and middle fingers. Like the sign for 0, so too the signs for 1–8 may be articulated either as holds or with a short forwards-directed (epenthetic) movement (Jantunen and Savolainen 2002).

The sign for 9 is signed by oscillating the humb-up hand shape from the wrist and forearm. Historically, the oscillation is considered to be a late addition to the structure of the sign although the extended upwards-pointing thumb has signalled the number 9 since the time of Malm (Jantunen 2001).

FinSL has independent lexemes for the names of the numbers 1–9 (Jantunen and Savolainen 2002). In these lexemes, the finger configuration is the same as in the corresponding basic number sign but the palm orientation is reversed (i.e. the palm faces mostly away from the signer; also, in the name for the number 9, the thumb points to the contralateral side, not upwards) and the hand oscillates from the elbow joint either diagonally or vertically. The existence of name signs for numbers in FinSL is considered to be partially motivated by Finnish, which distinguishes between the words for the numbers as such (e.g. *yksi* '1') and their names (e.g. *ykkönen* 'the name of number 1'). There are no name signs in FinSL for numbers higher than 9.

The number 10 has two main variants, displayed in Figure 16. In TEN-A, the hand shape is the extended index finger (as in 1) which at the beginning of the sign points upwards (palm facing the contralateral side) and at the end, after the ulnar flexion of the wrist, is directed forwards. In TEN-B, the hand shape is also the extended index finger but this time it is directed to the

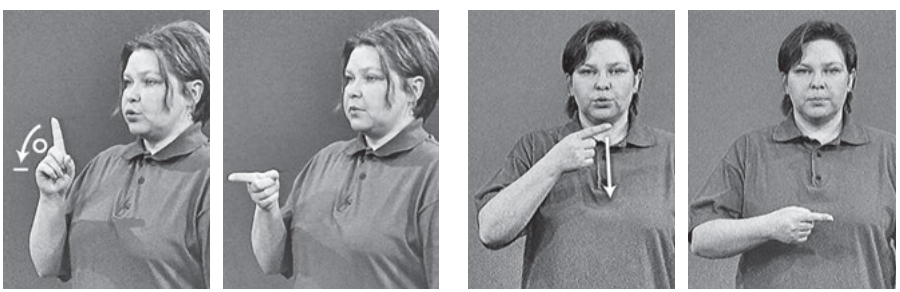

Figure 16. TEN-A (left) and TEN-B (right) (Images from Jantunen & Savolainen 2002).

contralateral side, palm facing the signer. The movement of the sign TEN-B is a straight downwards pivot movement executed from the elbow joint.

The two variants for 10 differ in their use (Jantunen and Savolainen 2002). TEN-A is the more typical form, which is reflected also in the fact that it (but not TEN-B) may be converted into a plural ('tens') by rapidly repeating the wrist movement and, at the same time, moving the hand along a straight path to the ipsilateral side. TEN-B is used in situations that require special clarity (e.g. when signing for a camera or in front of an audience). However, historically, TEN-B corresponds to the form devised by Malm (Hirn 1909).

In terms of their iconicity, the numbers 0–5 are iconic in that the sign 'zero' represents the round shape of the number 0 and the signs for 1–5 correspond to the number of fingers extended. However, from 6 onwards the iconicity is lost. A contributory factor in this has obviously been the fact that the system for expressing numbers above 5 was devised by Malm with the deliberate intention of keeping the numbers expressible with only one hand.

Cardinal numbers above 10

Simple multiples of ten

The simple multiples of ten (20, 30, etc.) up to 80 are constructed by replacing the hand shape of the sign(s) for 10 with the hand shape of the numbers 2–8. The strategy is the same with both of the variants of 10. As was the case with TEN-A, the forms of the numbers 20, 30, 40, 50, 60, 70, and 80 produced from the wrist are considered to be more common today; they may, for example, be modified for plurality in the same way as TEN-A (Jantunen and Savolainen 2002).

Figure 17. NINETY-A (left) and NINETY-B (right) (Images from Jantunen & Savolainen 2002).

The sign for 90 also has two variants (see Figure 17). The basic mechanism of constructing NINETY-A and NINETY-B is the same as with the other full tens. In contrast to the basic sign for 9, NINETY-A and NINETY-B do not contain the oscillating wrist movement. Neither of the two forms allows modification for plurality (Jantunen and Savolainen 2002).

Numbers 11–99 excluding full tens

All the numbers from 11 to 99, excluding full tens, may be produced as shown in Figure 18. The strategy that is used to construct these numbers resembles sequential compounding, in which the two parts are further fused together with an orientation change and a hand shape change (except numbers 11, 22, 33, 44, 55, 66, 77, 88, and 99, which only include an orientation change). Note that the first part of the signs, indicating full tens, is neither of the signs for 'ten' or their simple multiples ('twenty', 'thirty', etc.); rather, it is an independent form in which the movement resembles that in TEN-A (and its simple multiples) and the orientation that in TEN-B (and its simple multiples). The features of the hand shape are derived from the basic numbers.

There are several other strategies that may be used to form various subsets of the numbers 11–99. For example, for numbers 12–18, maybe even a more common strategy than that described above is that illustrated in Figure 19. Alternatively, the numbers 12–18 may also be formed with the strategy described in Figure 20. The main difference between the two strategies is that the first is based on supinating the wrist and the second on flexing the wrist radially.

Figure 18. Number 12.

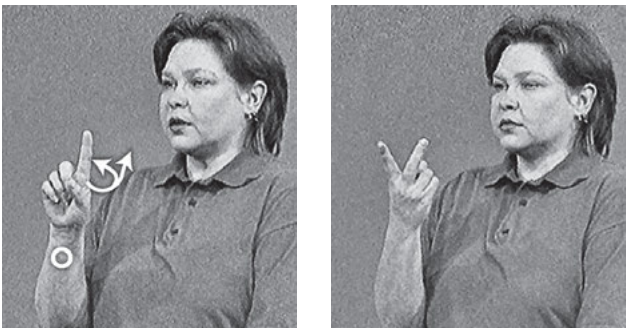

Figure 19. Number 12 constructed with a supinating wrist movement (Images from Jantunen & Savolainen 2002).

Figure 20. Number 15 constructed with a flexed wrist movement.

Also a very common strategy used to form number 19 is based on supinating the wrist. This is shown in Figure 21. Note that the latter part of the sequence indicating the number 9 is produced, again, without the oscillating wrist movement.

Figure 21. The sign for 19 produced by supinating the wrist (left) and the sign for 11 produced with an oscillating movement from the elbow (right) (Images from Jantunen & Savolainen 2002).

The number 11 may be produced with an oscillating movement from the elbow joint, as in Figure 21. Some FinSL users also use this paradigm to produce the numbers 22, 33, 44, 55, 66, 77, and 88 (Jantunen and Savolainen 2002).

Hundreds

FinSL indicates the numbers 100, 200, 300, 400, 500, 600, 700, 800, and 900 with a strategy shown in Figure 22. The base for the strategy, also historically (Hirn 1909), is the sign 100. All the subsequent full hundreds are formed by changing the hand shape features according to the base number system. The sign 100 may be modified for plurality ('hundreds') by rapidly iterating the sign and, at the same time, moving the hand along a straight path to the ipsilateral side (Jantunen and Savolainen 2002).

Figure 22. FinSL sign for 100 (left) and 900 (right).

Thousands

The most common way to sign the numbers 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, and 9000 is illustrated in Figure 23. As with full hundreds,

Figure 23. FinSL signs for 1000 (left) and 7000 (right).

the base for the strategy is the sign for the lowest number, 1000, and all the subsequent full thousands (up to 9000) are formed by changing the hand shape. The sign 1000 may be converted into a plural by iterating the end part of the original pivot movement. At the same time, the hand typically moves slightly to the ipsilateral side (Jantunen and Savolainen 2002).

All the thousands (also those above 9000) may be formed with the strategy illustrated in Figure 24. The linguistic means underlying this strategy is sequential compounding. In the strategy, the sign for the basic numbers 1–9, tens or hundreds is compounded with a T-initialised lexeme meaning ’thousand’ or ’ton’ (Jantunen and Savolainen 2002).

Figure 24. Number 8000 constructed by compounding sequentially 8 and T-initialised lexeme meaning 'thousand' or 'ton'. The T-initialised lexeme is produced with a straight forwards directed movement.

Millions

The basic sign for ’million’ (MILLION-A) is shown in Figure 25. The sign is produced with a fist hand shape, the palm facing away from the signer. The

Figure 25. FinSL sign MILLION-A. The sign includes a repeated rotating wrist movement.

movement of the hand is a complex movement involving a straight upwards path movement and a repeating rotating movement produced from the wrist joint. The sign may be modified for plurality (’millions’) in the same way as has been described for 10, 100, and 1000 (Jantunen and Savolainen 2002). The signs for millions from two million upwards are produced by means of compounding: the first part of the compound is the number sign 2–999 and the second part is the sign MILLION-A.

The sign MILLION-A has a variant MILLION-B that is produced without the wrist movement. MILLION-B cannot be modified for plurality (Jantunen and Savolainen 2002).

Billions

FinSL has two signs meaning ’billion’, both described in Figure 26. Subsequent billions are constructed through sequential compounding. Note that the sign BILLION-B resembles the two signs for ’million’, the non-manual feature as well as the amplitude and strictness of the movement being the key distinguishing factors.

Figure 26. FinSL signs BILLION-A (upper row), including finger wiggling, and BILLION-B (bottom row), including nonmanual emphasis (images from Jantunen & Savolainen 2002).

Fractions

Fractions of numbers may be constructed in several ways in FinSL, depending partly on the context. Of the different ways mentioned by Sakara, de Vos and Zeshan (2012), FinSL employs them all: written language-based strategies, the sign HALF and its derivatives, and the spatial arrangement of numbers.

Concerning written language-based strategies, FinSL uses both the sign PERCENTAGE as well as the signs COMMA and DOT to indicate fractions (e.g. 5 PERCENTAGE for 5% and 3 COMMA 5 for 3½). However, the use of these strategies outside the formal and written domain is relatively rare.

The FinSL sign for HALF is produced by ”cutting off” the index finger of the non-dominant hand with the index finger of the dominant hand. The sign HALF may be compounded with any cardinal number to produce the relevant ’halves’ (e.g. 3 HALF for 3½).

FinSL also has independent one-handed lexemes for the fractions 1½, 2½, and 3½. These are illustrated in Figure 27. These fractions may also be produced with two-handed forms in which the sign HALF is used as a basis. In these forms, however, unlike in the basic form of the sign HALF, the ”cutting off” movement of the dominant hand is repeated; the non-dominant hand has the configuration corresponding to signs 2–4 (with a diagonal orientation).

Figure 27. FinSL signs for 1½, 2½, and 3½.

The spatial arrangement of numbers may be used in different ways to indicate fractions. For example, producing a number 1–8 a bit higher than the level of the chest, then rotating the wrist so that the palm faces forwards while at the same time moving the hand a bit downwards, and producing another number 1–8 (palm facing forwards), constructs fractions such as 1/3, 4/5, and 7/8. Moreover, especially in the field of mathematics, all the fractions may be constructed by producing any number sign above any other (no orientation changes) as long as there is a line drawn between the two levels;

the line may be drawn either with the dominant hand index finger or represented with the arm of the non-dominant hand.

4.2.2. Ordinal numbers

FinSL has independent lexemes for the ordinals 1–9. This paradigm is demonstrated in Figure 28.

Figure 28. FinSL ordinals 1st (left) and 9th (right).

The FinSL ordinal number system follows the pattern (iii) of Stolz and Veselinova's (2008) typology, that is, the ordinals are derived from the cardinal numbers. The use of the pattern differentiates FinSL from the surrounding Finnish language, which employs the pattern (vi) (i.e. 'first', 'second', 'three-th'…). The main reason for the difference between FinSL and Finnish in this case is historical: like the FinSL cardinals, so too the FinSL ordinals (1–8) were devised by Carl Oscar Malm in the middle of the 19th century (Hirn 1909)

The FinSL ordinal number system is a closed system: it does not extend beyond 9. For its construction, the system is based on adding to the cardinal number a short downwards movement and changing the orientation of the hand so that all the numbers are produced with the palm facing forwards. Similar characteristics have also been identified in other sign languages (Sakara, de Voss and Zeshan 2012).

Ordinal numbers from 1 to 5 may also be expressed by pointing with the fingers of the non-dominant hand. However, this option is restricted only to specific semantic domains, most notably to that concerning the number of brothers and sisters (Sakara, de Voss and Zeshan 2012).

Ordinal numbers from 10 onwards may be expressed in FinSL with the Finnish written language-based strategy of compounding the cardinal sign with the sign DOT. For example, the notion of "20th" is signed by producing the cardinal sign 20 followed by DOT.

4.2.3. Numeral incorporation

In FinSL, numeral incorporation has been documented in various semantic domains including time units, monetary units, and educational levels. It is also used when talking about which floor something is located on, how many times an event has occurred and when stating, for example, the number of objects (Jantunen and Savolainen 2002). Numeral incorporation also occurs with classifier hand shapes that correspond to the numeral hand shapes 1 to 5 (Rissanen 1998). All the instances will be dealt with in more detail below.

Time units

The generic time-referring lexemes HOUR, WEEK, and MONTH (see Figure 29) all allow numeral incorporation in FinSL. The (dominant) hand configuration of these lexemes may be replaced with the hand configuration of the cardinal signs 1–8 (i.e. signs without movement) in order to produce signs that refer to the specific number of hours, weeks, and months (e.g. FIVE#HOURS, TWO#WEEKS, EIGHT#MONTHS).

Figure 29. FinSL signs WEEK and MONTH (top and middle row, images from Malm 1998) and TWO#WEEKS and EIGHT#MONTHS (bottom row).

The generic lexemes DAY and YEAR (Figure 30) do not allow numeral incorporation for the purpose of referring to the number of days or years. Instead, in order to refer to these temporal concepts, FinSL uses the paradigms illustrated in Figure 30 (bottom row). The forms in both paradigms may be considered to be based on the lexemes DAY and YEAR, and the change of the hand shape features between different forms may be analyzed as a form of numeral incorporation. When speaking about the age of people or animals, the movement of the YEAR-based forms tends to be produced only from the wrist joint (Jantunen and Savolainen 2002).

Figure 30. FinSL signs DAY and YEAR (upper and middle row, images from Malm 1998) as well as EIGHT#DAYS and FIVE#YEARS (bottom row, images from Jantunen & Savolainen 2002).

Semantically all the past and/or future directed signs TOMORROW, YESTERDAY, NEXT-WEEK, LAST-WEEK, EVERY-WEEK, NEXT-YEAR, LAST-YEAR, and EVERY-YEAR (see Figure 31) also allow numeral incorporation. The highest number that may be included in these signs is, again, 8 (e.g. EIGHT#WEEK-AGO, EIGHT#YEAR-FROM-NOW). However, with the lexemes TOMORROW and YESTERDAY, the count does not typically surpass 4 (e.g. FOUR#DAY-AGO).

Figure 31. FinSL signs TOMORROW and LAST-WEEK (top row) as well as FOUR#DAYS-FROM-NOW and THREE#WEEKS-AGO (bottom row) (images from Malm 1998 and Jantunen & Savolainen 2002).

In addition to the temporal expressions described above, FinSL has a rich system for referring to the time on the clock. This system is highly iconic in that it is based on the circular face of the clock. The system has been described in detail in Jantunen and Savolainen (2002).

Monetary units

The currency of Finland is the Euro. To express small amounts of euros, the sign EURO may be incorporated with the numbers 1–4. However, it appears that the more common strategy to express even these smaller amount of euros is to use sequential compounding (i.e. 3 EURO for ’3 euros'). The sign for CENT (a hundredth of a euro) does not allow numeral incorporation.

Educational levels

FinSL uses numeral incorporation to express educational levels in primary and secondary school. The forms in the paradigm resemble closely the names for the numbers 1–9. However, in the signs for educational levels, the movement is more horizontal (Jantunen and Savolainen 2002). The paradigm

extends to the number 9. Year ten (optional in the Finnish school system) is constructed sequentially by producing the signs TEN and CLASS.

Floors of buildings

The fact that something is located on the third or seventh floor may be expressed with the paradigm illustrated in Figure 32. With these forms, the location of the hand rises with the number of floors (Jantunen and Savolainen 2002). The paradigm extends to the number eight, after which a sequential strategy ("number" plus FLOORS) is used.

Figure 32. The sign AT-THE-FOURTH-FLOOR.

Number of occasions

To say, for example, how many times an event has occurred, FinSL uses either the sign OCCURRENCE-A or OCCURRENCE-B (Figure 33). Of these, OCCURRENCE-A is used only in sequential structures (e.g. SEVEN OCCURRENCE-A for 'seven times'). OCCURRENCE-B, however, may be incorporated with numbers 1–4 to produce meanings 'one time'–'four times'. From 5 onwards, also OCCURRENCE-B is used only sequentially.

Figure 33. FinSL signs OCCURRENCE-B (left, images from Jantunen & Savolainen 2002) and THREE#OCCURRENCE-B (right).

There is also another paradigm in FinSL to express the fact that something has occurred 1–8 times (Figure 34). In this paradigm, the form with the meaning 'once' is suppletive whereas the forms 'two times'–'eight times' are formally connected and analyzable as being formed through numeral incorporation.

Figure 34. FinSL signs ONCE (left) and TWO#TIMES (right) (images from Jantunen & Savolainen 2002).

Number of objects

Two variants of the FinSL sign meaning 'piece' are given in Figure 35. Both forms allow numeral incorporation up to the number 8.

Figure 35. FinSL signs (upper row:) PIECE-A, PIECE-B, and (bottom row:) EIGHT#PIECE-A (images from Jantunen & Savolainen 2002).

Numeral incorporation with classifiers

The classifier (CL) hand shape that refers to the standing human figure allows numeral incorporation in FinSL (Rissanen 1998). As in most sign languages (Sakara, de Vos and Zeshan 2012), an upright index finger (G-hand) signals 'one upright person' in FinSL but an upright index and middle finger (V-hand) signal 'two upright people'. For example:

(1) WOMAN CL-G-"walk past"-right-left
'A woman walks past.'
(2) TWO WOMAN CL-V-"walk past"-right-left
'Two women walk past.'

The hand shape may be changed to correspond to the numbers 3, 4, or 5, in which case the meaning of the corresponding utterance changes to 'three people', 'four people', or 'five people'. The hand shape for ‘five’ can also be used for uncountable quantities, as in the following, where the addition of the non-dominant hand further emphasises the uncountable plural reading:

(3) PEOPLE both_hands:CL-5-"go past quickly"-right-left
'People went past quickly.'

The G-hand shape and its quantity-expressing derivatives may also refer to long solid inanimate oblong-shaped objects such as pencils or knitting needles. Also other classifier hand shapes (e.g. G-hook) based on extending fingers from the hand may be modified for quantity (e.g. V-hook for 'two hook-like objects').

5. Conclusions

The basic categorisation of colour terms and (cardinal) numbers in FinSL is similar to Finnish, the majority spoken language in Finland. The kinship system is also similar to the Finnish system, although some terms are missing in FinSL terminology.

With regard to kinship terms, FinSL includes terms for both core family members and non-core family members, as well as terms for blended

families. For some terms there is a gender distinction, similarly to Finnish. Structurally, the terms can be single signs or compounds, which mostly resemble the structure of Finnish kinship terms. FinSL kinship terms also sometimes exhibit iconicity, but not necessarily in the same way as in other sign languages.

In addition to single colour signs, FinSL uses complex colour constructions and morphological modification of the manual sign along with additional facial expressions indicating saturation, changes in the colour spectrum and hedging. The colour terms in FinSL are semantically related to objects, as in many sign languages, but they do not have contact-induced motivation from Finnish. Although FinSL is a young language it has a wide colour vocabulary, as does Finnish, which is evidence of the contact between these two languages.

The FinSL number system has been specially devised and - perhaps partly because of this - it resembles, in its arithmetic basis, the system used in the Finnish language. However, decimal systems are widely used in the world's languages, and the underlying similarity between FinSL and Finnish should not be over-emphasised. The main differences between FinSL and Finnish numbers are found in the systems used to express ordinals: the two languages belong to different types. Moreover, the use of numeral incorporation distinguishes FinSL from Finnish, which does not allow such a process.

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Notes

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   https://www.uclan.ac.uk/schools/journalism_media_communication/islands/typology/index.php

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Summary of the symbols used in the text

-	one sign (FATHER-IN-LAW)
+	a compound (two sign form a concept e.g. FATHER+MOTHER for 'father's mother')
^	a compound (made up of two signs which undergo phonological processes)
!	a sign modified by an intensified movement (!RED! for strong red)
xx	iterated movement (SLIGHT-REDxx for slightly red)
#	an incorporated number
CL-G	A *CL-"letter"* notation in the beginning of the gloss indicates that the corresponding sign contains a classifier handshape.
-"come to a stop" -right-left	The end part of the gloss in classifier signs describing the signs' movement. The written sequence in between the quotation marks describes the overall manner of the movement. Labels "right" and "left" describe the relative direction of the movement.

Kinship terminology in Czech Sign Language[1]

Klára Richterová, Alena Macurová, and Radka Nováková

1. Introductory remarks

Little is known about Czech Sign Language outside the Czech Republic. The purpose of this chapter is to describe kinship terms used in Czech Sign Language (abbreviated as CzSL; in Czech *český znakový jazyk*). After the introduction (section 1), this paper provides, firstly, background information on the Czech sign language linguistics, the stratification of CzSL, and approaches to deafness (section 2); secondly, an outline of general characteristics of the kinship system in CzSL (section 3); and thirdly, an overview of appellative signs for members of the family: consanguineal relatives in the nuclear family (section 4.1), consanguineal relatives in the extended family (section 4.2) and affinal relatives (section 5). Within these three divisions, generations are used as the main criterion to establish subdivisions, with particular kin terms analysed in the following order: ascending kin terms – descending kin terms – horizontal kin terms. Fourthly, general findings concerning the forms of the data are suggested (section 6) and superordinate terms are discussed (section 7). Lastly, we focus on kin terms of CzSL from a diachronic viewpoint (section 8).

In addition to the repertoire of terms for relatives, their formal makeup is also taken into consideration (especially to accentuate formal relations among them, which is why signs for the members of opposite-sex pairs, such as FATHER and MOTHER, are discussed together), as well as their origin (indigenous signs vs. borrowings from other languages) and their motivation (e.g. signs motivated by other signs, visually motivated signs). Since no relevant historical data are available at present, we have resorted to recording the widely known explanations of motivation provided by members of the deaf community. We are fully aware of the tendency toward folk etymology, that is, the fact that the users of all languages tend to "interpret, search for and clarify meaningful connections, and to find them even where there are none" (Rejzek 2009: 22). Some of the recorded visual "motivations" probably are of

this nature, so some reservation is necessary in accepting them, especially if folk etymology is understood in the broader sense (i.e. as etymological reinterpretation *with no change* of the form of the lexeme; cf., for example, Jeffers and Lehiste 1979) or if associations, lying at the roots of most folk etymologies, are understood as including both associations with another lexeme and associations with an entity, action, etc. from extralinguistic reality.

The core of the material for this study has been gathered through controlled elicitation performed in a group of five native users of CzSL,[2] and part of the data published in a bachelor thesis (Vojtechovský 2012) has been used as a supplement to broaden the spectrum of variants in our material. The bachelor thesis is focused on comparing kinship terms used in Slovak and Czech Sign Languages. Only data elicited from twelve deaf or seriously hearing-impaired second-generations users (eight of them from Bohemia, four from Moravia) have been utilised in this paper. All the gathered data have been validated by two native deaf users of CzSL (descended from deaf parents) through comparison with signs used in spontaneous and semi-spontaneous communication (in particular, the multimedia DVD *Multimediální cvičebnice pro předmět Český znakový jazyk* [Multimedia exercises for the course of Czech Sign Language], by Macurová and Nováková et al. 2011, proved as a valuable source).

Generally, we will leave aside the relation of kinship terms in CzSL to their equivalents in other sign languages, even though it would be possible to quote a number of formal and motivational parallels (compare, for example, a widespread cross-linguistic correlativity of the signs BROTHER and SISTER with the sign SAME, or the motivation of FATHER or GRANDFATHER by the metonymic concept of *beard* or *moustache*; for more detail see e.g. Wilkinson 2009). However, like other contributions in this book, our paper implicitly refers to these relations.

2. General background

Czech linguistics started focusing on languages and communication of the deaf only in the mid-1990s. Deafness was (in the former Czechoslovak Socialist Republic and in the subsequent Czechoslovak Federal Republic) in the hands of medicine, special pedagogy and logopaedia. Even in the Czech Republic (established in 1993), deafness was often approached (and, sadly, sometimes is even today) as a deficiency, a defect which may be cured, remedied, removed. The official attitude of the Communist regime, prior to 1989, was strictly uniform and dominated by what has been called

the "demutisation"[3] of the deaf, that is, the endeavour to teach the deaf to talk and to lip-read (if not hear) at the very least. If the opinion that human beings can develop a complex system of communication not based on sound existed at all, it was strictly a minority belief before 1989. In the early 1990s, the only institution opening new approaches towards deafness and towards the deaf as a linguistic and cultural minority (and thus initiating the interest of linguistics) was the *Federace rodičů a přátel sluchově postižených* (Federation of Parents and Friends of the Hearing-Impaired)[4] and its (now defunct) counterpart, the *Institut pro neslyšící* (Institute for the Deaf).[5]

On the institutional level, the interest of Czech linguists in deafness was manifested in the creation of the programme *Čeština v komunikaci neslyšících* (Czech in the Communication of the Deaf, accredited 1998) at the Faculty of Arts of Charles University in Prague (since 2013 at its Institute of Deaf Studies).[6] While realizing the dilemma of sign language linguistics (Brennan 1986), the programme focuses both on theoretical and applied fields, especially (1) the specificities of the lingual and communicative situation of Czech deaf people; (2) Czech Sign Language, and its structure and use; (3) the written Czech of the Czech deaf people, and in the applied field; (4) the current state of affairs in educating children with hearing impairments (profoundly deaf children in particular); and (5) interpreting between spoken Czech and Czech Sign Language.[7] The linguistic approach to these fields and research is intrinsically linked with a certain amount of "edificatory" work.[8] Still at the dawn of the new millennium there existed, even among deaf education professionals, the opinion that sign language has "a small vocabulary" and "little grammar", and that early acquisition of sign language impairs the ability of children to learn the majority language, etc. Among the repeated arguments ranking Czech Sign Language as an non-natural language is also that of its "dis-unity". There can be no doubt that Czech Sign Language (as any other language) is stratified, socially and geographically; its geographic stratification (pronounced particularly in the area of vocabulary), as in the rest of the world, is determined by the regions where there are schools for deaf or hearing-impaired pupils/students. The variants of Czech Sign Language signs are even more determined by the historical division of the Czech lands into Bohemia (the western part) and Moravia (the eastern part). This type of regional stratification (Bohemia vs. Moravia, or Bohemian signs vs. Moravian signs) is markedly reflected – among others – in the area of kinship terminology.[9]

The following diagrams (1 and 2) provide a general idea about regional differences among kinship terms in CzSL. All elicited single and compound forms are divided here into three groups: forms only used by Bohemian signers, forms only used by Moravian signers and forms used by both. It

is to be stressed that in this overview, each form counts as one item, i.e. the boundaries between phonological and lexical variants – which are not quite clear-cut in many cases – are ignored. The comparisons among the three sets of kin terms (Bohemian vs. Moravian vs. Bohemian/Moravian) indicate that the Bohemian and Moravian signers share less than 50 per cent of kin terms: 40 % single kin terms and 21.7 % compounds.

Diagram 1. Geographic distribution of single kin terms

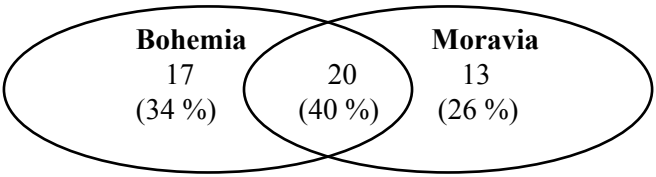
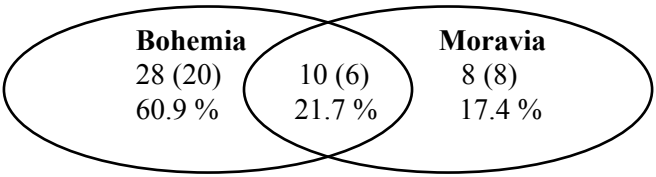


Diagram 2. Geographic distribution of compound kin terms
note: The numbers in brackets denote the number of the compounds that have also been recorded in the reversed order of their parts. Thus, for example, 10 (6) means that six out of ten compounds exist as two variants differing in the order of their parts.



3. Kinship system in CzSL

This section attempts to provide a glimpse into the general structure of CzSL kinship terminology and the functions of these terms. In more detail, we describe which relatives are distinguished in CzSL and what the distinctions indicate from the point of view of anthropology. We will also outline the main types of signs of kin terms and add a short note about typical situations in which they are used. Concrete forms of the signs will be introduced and analysed in the following sections.

The kinship system in CzSL is primarily based on a detailed classification of ***consanguineal relatives***. Within this category, lineal and collateral relatives are distinguished. In some classical anthropological typologies, this is characterised as a *lineal* terminology or the *Eskimo/Inuit* system. The lineal terminology, in Lowie's classification, takes into consideration the terminological distinctions in the generation of the Ego's parents (cf. Lowie 1928).

The Eskimo/Inuit system is part of Murdock's typology based on terminological distinction in the Ego's generation (cf. Murdock 1949). As Skupnik (2010: 348) points out, in the Eskimo system, kinship laterality (bifurcation of terms) is not distinguished, and bilaterality is emphasised: patrilateral and matrilateral relatives are equal both in their status and terminology. This system, which is also used in Czech, is mostly associated with societies in which the nuclear family plays an important part. Typically, these are societies for which mobility is vital, i.e. societies which can also be found in contemporary Western culture.

Another significant criterion is the generation and, in most cases, also the gender of the person who is related to the Ego and is usually denoted as *referent* or *alter*.[10] Two relatively clearly defined types of signs can be distinguished from the point of view of their forms:

1) **signs with different manual parts**, which includes most terms for consanguineal relatives: FATHERb, m1, m2, MOTHERb, m, SON, DAUGHTER, CHILD, GRANDMOTHERb, m, GRANDFATHERb, m, UNCLEb, m, BROTHERb1–b5, SISTERb2, NIECEb, MALE-COUSINm and FEMALE-COUSINm and the following borrowings (especially from Czech): NEPHEW (SON^-C-), MALE-COUSINb, MALE-COUSINb (BROTHER^-C-), MALE-COUSINb (BOY^-C-), FEMALE-COUSINb and FEMALE-COUSINb (SISTER^-C-);
2) **signs with an identical manual parts**, only distinguished through mouthings of the Czech spoken words or their parts (in the well-known Brennan classification from 1992, these belong to multi-channel signs). Manually identical signs can be found in the following three sets of terms, with each of the sets having a manual part different from the other two sets: (A) GRANDSON, GRANDDAUGHTER and GRANDCHILD; (B) BROTHERm and SISTERm/b1; (C) AUNT, NIECEm, and PARENTS. Moreover, the manual part present in the last three signs for consanguineal relatives (AUNT, NIECE, PARENTS) can also be found in the general term RELATIVES (including both consanguineal and affinal relatives) and in signs for affinal relatives BROTHER-IN-LAWb and SISTER-IN-LAWb.

Unlike the consanguineal signs, mentioned in the previous two paragraphs, signs for ***affinal relatives*** belong to a formally homogeneous group. All these signs, sharing the same semes with the exception of the distinctive feature of sex, have identical manual parts and are only distinguished by mouthings. The group includes the kin terms BROTHER-IN-LAWb, m, SISTER-IN-LAWb,

m, HUSBAND, WIFE, SPOUSE and MARRIED-COUPLE. Particularly, these signs are characterised by three different manual parts: one of the parts is found in the abovementioned pair BROTHER-IN-LAWb and SISTER-IN-LAWb, one in BROTHER-IN-LAWm and SISTER-IN-LAWm, and one in signs for immediate relatives (HUSBAND, WIFE, SPOUSE and MARRIED-COUPLE).

Periphrastic expressions are used for other relatives, such as 'son-in-law', 'father-in-law' etc., as well as for a more detailed classification of affinal and consanguineal relatives, especially for distinguishing patrilateral and matrilateral affinal and consanguineal relatives. Such expressions usually include concepts for at least two referents (mostly kin terms) and possessive pronouns, for example HUSBAND + POSS-1 + FATHER + POSS-3 'father-in-law'.[11]

All the following general comments in this section refer to terms for both consanquineal and affinal relatives. Plurality is mostly expressed lexically, with a quantifier such as a numeral or an adverb (for example FOUR, MANY), or less often with mouthing (in the cases when mouthing is also used to indicate gender; see, for example, the abovementioned HUSBAND vs. WIFE vs. MARRIED-COUPLE or SPOUSE). If kinship terms for members of both sexes have the same (or, less often, a similar) manual part, the gender is sometimes expressed explicitly, with the signs MAN, WOMAN, BOY or GIRL, which are usually placed behind the kinship term. Also, expressions denoting individuals may combine to signify more general meanings, e.g. MOTHER^FATHER 'parents', BROTHER^SISTER 'siblings'.

All kinship terms could be modified in two ways: a reduction of speed or the addition of a certain facial expression, especially the narrowing of one's eyes or frowning. Both patterns, which often co-occur in one sign, modify meanings of the signs, indicating the closeness of the signer to the referent.

The use of kin terms in CzSL is either ***referential*** (as in YESTERDAY + INDEX-1 + MEET + **MOTHER** + POSS-2 'I met your mother yesterday') or ***predicative*** (like in INDEX-3 + **MOTHER** + POSS-1 'She is my mother'); the *vocative use*[12] is absent, with other means being used to address members of the family. The referential and predicative uses are common in all kin terms in CzSL; up to now, no case has been recorded of an exclusive referential use or exclusive predicative use of any CzSL kin term. However, it has to be emphasised that the accentuation of the two uses of kin terms, as well as the absence of the vocative use, are of a more general character – apparently, they belong to general tendencies in sign languages, as has been pointed out for example by Nyst (2007: 98).[13] An even more general tendency may be found in the background, a tendency which seems to manifest itself across

sign languages, namely the absence of (noun) lexemes in addressing people, of which kinship terms are just one example (so-called name signs could represent another example).

Finally, some kinship terms in CzSL also serve to denote persons who are not relatives but have similar characteristics, similar behaviour, and/or similar social roles as the referents of the corresponding kinship terms. Such uses are sometimes (see, for example, Dahl and Koptjevskaja-Tamm 2001) called ***improper kin terms*** (as opposed to ***proper kin terms***). Examples of such improper kin terms in CzSL are CHILD ('immature/prepubescent person'), GRANDMOTHER ('old woman') and GRANDFATHER ('old man').

4. Consanguineal relatives

4.1. Nuclear family

4.1.1. Father, mother

The repertoire of expressions for 'father' and 'mother' in CzSL includes altogether five single (non-compound) terms, namely one formally "unpaired" sign for 'father' and two variant pairs (each of them being an expression for both parents), the members of which are connected both with a semantic relation and a major *formal* similarity. One of the pairs is used by Bohemian signers (see figures 1 and 2), while the other pair (figures 3 and 4) is dominant in Moravian signers' use, so that the signs can be, in a simplified way, called Moravian forms/signs. The unpaired sign for 'father' (figure 5) is also typical of Moravian signers' use, especially in the Brno area.

Figure 1. FATHERb

Figure 2. MOTHERb

Figure 3. FATHERm1

Figure 4. MOTHERm

Figure 5. FATHERm2

Bohemian and Moravian paired signs FATHERb, m1 and MOTHERb, m share one common feature, namely the handshape (the X handshape in the signs FATHERb and MOTHERb, and the G handshape in the signs FATHERm1 and MOTHERm). The signs FATHERb and MOTHERb also share the chin as the final location of the sign, or more generally, the head, if just the so-called major body areas/regions (the head, trunk, arm and hand; cf. for example Battison 1978) are considered.[14] Also, the head as the location of the sign is present in the paired signs FATHERm1 and MOTHERm and the "unpaired" sign FATHERm2.

An open question remains as to whether the forms of the Bohemian and Moravian pair variants denoting one of the parents should be regarded as two phonological variants of one lexeme or as two expressions with different forms, that is, two synonymous lexemes, i.e. lexical variants.[15] In addition to somewhat ambiguous theoretical delimitation of phonological and lexical variants,[16] the main reason may be an incomplete phonological description of Czech Sign Language (for example, it is uncertain whether the X and G handshapes, found in FATHERb, m1 and MOTHERb, m, represent two phonemes or two variants of one phoneme).

In the case of handshapes included in the signs MOTHERb, m and FATHERb, m1, one could hypothesise about their origin in a similar way as in a number of spoken languages. For example, Jakobson (1962 [1960]: 538–545), analyzing and commenting on Murdock's (1957, 1959) data from more than 1,000 (spoken) languages, argues that the use of nasals in words denoting 'mother' in many languages may be largely based on the first meaningful units emerging in infant speech, more specifically on the "slight nasal murmur" accompanying breast feeding. Analogically, it could be argued that the G handshape (an easy handshape from the physiological point of view, cf. Ann 1996: esp. p. 172) in the signs MOTHER and FATHER, used both by

Bohemian and Moravian infants, could be connected with one of the earliest pointing gestures (Boyes Braem 1990: 111–112). Also, the pointing towards the corners of the mouth in the sign MOTHERm is sometimes associated with "the smiling mouth" as a typical feature of the mother.

4.1.2. Son, daughter, child

The pair of the kinship terms SON (figure 6) and DAUGHTER (figure 7) is also characterised by a similar phonemic structure. Even in these regionally unspecific signs, used both by Bohemian and Moravian signers, two features are identical, namely the F handshape with the straight thumb and index finger and the location of the sign or, to be more precise, the location of the initial contact (chest).

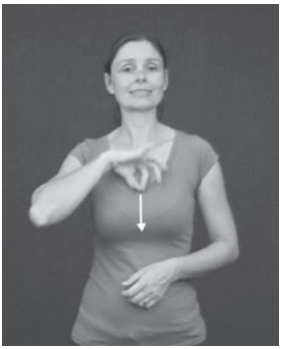


Figure 6. SON

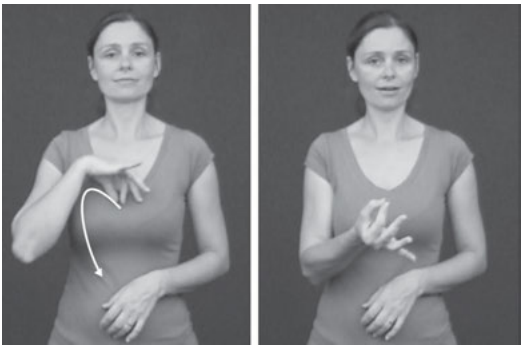


Figure 7. DAUGHTER

The meanings 'son' and 'daughter' can also be expressed with compounds consisting of one of these signs and a sign specifying the gender, i.e. BOY (figure 8) or GIRL (figure 9), but at present, these compound signs are rather rare.

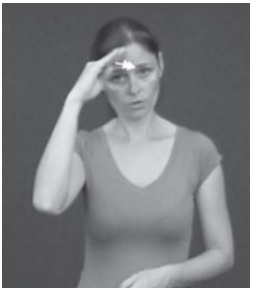


Figure 8. BOY

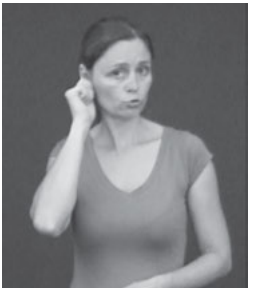


Figure 9. GIRL

The concrete form of the compound lexemes is characterised by considerable variation in the order of the parts of the compound (BOY^SON or SON^BOY ‘son’). However, to express the concept of ‘daughter’, two different signs are combined with the sign GIRL: the resultant compound may consist not only of the sign DAUGHTER (GIRL^DAUGHTER or DAUGHTER^GIRL ‘daughter’) but also of the manual part identical with single sign SON (figure 6).[17] It follows from this example that the manual component of the sign shown in figure 6 has both the meaning ‘son’ and ‘(lineal) descendant’, the distribution of the concrete meanings being partly determined by the type of the sign: while the single sign always means ‘son’, the gender-neutral meaning ‘descendant’ is only found in compounds, for example in DESCENDANT^GIRL ‘daughter’. This means that the compound sign for ‘son’ could be interpreted either as SON^BOY (analogically to DAUGHTER^GIRL ‘daughter’) or as DESCENDANT^BOY (analogically to DESCENDANT^GIRL ‘daughter’). Thus the most adequate gloss should arguably be SON/DESCENDANT^BOY.

As to the motivation of the single signs DAUGHTER and SON, it is claimed by some deaf people that it might be the meaning ‘person close to the (parents’) hearts’ that inspires the present forms of the two signs, accompanied by a common formal change to approach the line of bilateral symmetry (cf. Frishberg 1979: 73–75; in ASL, for example, SWEETHEART moved from a location over the heart to the centre of the chest). This interpretation may have been influenced by an association with the sign FRIEND (figure 10), the motivation of which is often explained in the same way. However, this motivation is not quite as obvious as the motivation of the gender-neutral sign denoting a descendant, namely CHILD (figure 11), which is placed near the ‘growth line’ and indicates a child’s height in CzSL and many other sign languages, for example American, British, Finnish and Japanese.

Figure 10. FRIEND

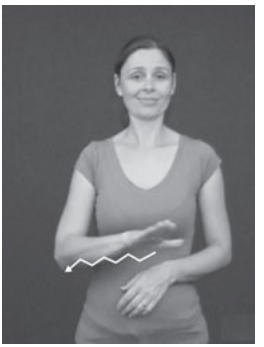


Figure 11. CHILD

4.1.3. Brother, sister

The single signs denoting ‘brother’ and ‘sister’ fall into the group of pairs of kinship terms connected with formal and semantic relations, but compared to the abovementioned cases (FATHERb and MOTHERb, FATHERm1 and MOTHERm, DAUGHTER and SON), this pair is different in that the manual components of the signs for ‘brother’ and ‘sister’ are linked with the manual component of the sign SAME (figure 12), which thus could be regarded as their motivator. The relation between the manual components of the signs for siblings and the manual component of the sign SAME could be specified e.g. with the number of common formal features. Considering all existing formal variants of the signs for ‘brother’ and ‘sister’ (altogether eight of them: two for ‘sister’, six for ‘brother’), the correspondence with the sign SAME ranges from one to all parameters. The signs with an equivalent manual component, in which disambiguation is through obligatory mouthings – <bra(tr)> ‘brother’, <ses(tra)> ‘sister’, <ste(jný)> ‘same‘[18] – are used by Moravian signers, and to a lesser extent by Bohemian signers (only the sign denoting ‘sister’, not ‘brother’).

Figure 12. SAME

Figure 13. BROTHERb1

Figure 14. SISTERb2

On the other hand, the use of the signs with a non-equivalent manual part is limited to the Bohemian region. Two of these Bohemian signs are shown in figures 13 and 14 above; the characteristics of the abovementioned additional four Bohemian variants for ‘brother’ are as follows: in two of them, the hands are in the V (BROTHERb2) or H shape (BROTHERb3), with other parameters being as they are in the sign SAME; the other two variants (BROTHERb4, BROTHERb5) differ from SAME not only in the handshapes V or H, but also in the type of movement (a circling movement of the wrist with forefingers in contact).[19] Although much formal variability can be found in the Bohemian variants for ‘brother’, all of them

have one common formal feature, which is also the feature distinguishing them from lexemes for the opposite sex. The distinguishing feature is the number of extended fingers – two extended fingers in BROTHERb1–b5 (V or H handshape), and one extended finger in SISTERm/b1 and SISTERb2 (G handshape).

The examples analyzed above show that the repertoire of single variants for 'brother' and 'sister' currently represents a sort of continuum of forms, the manual components of which are more or less closely related to the manual component of the sign SAME. We can only surmise if the partial differentiation of the variants (Bohemian vs. Moravian) only reflects the limitations of our data, or if it is a manifestation of a process of a natural stabilisation (in the course of which, for example, some variants will prevail over others). A fact to be mentioned in connection with this is that during our research, a receding use of the following compounds was recorded: BOY^SAME 'brother', GIRL^SAME 'sister', BOY^BROTHER 'brother', and GIRL^SISTER 'sister'.[20] In the latter two compounds, any Bohemian or Moravian variant of SISTER or BROTHER can be used, and the signs BROTHER and SISTER can be, if rarely, used first.

It is in the domain of 'sibling' and 'children' that, arguably, an indication of birth order is the most frequent. It is expressed lexically, by means of YOUNGER or OLDER, with the hand moving from the shoulder upwards (OLDER, figure 15) or downwards (YOUNGER), as in BROTHER (any of the variants introduced above can be used in such collocations) + OLDER. In the case of 'child', ordinal numerals (1st, 2nd etc.) are used, being localised, in descending order, in neutral space (cf. figure 16).[21]

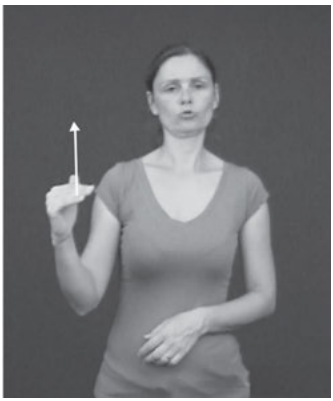


Figure 15. OLDER

Figure 16. 1st, 2nd, 3rd (child)

4.2. Extended family

4.2.1. Grandfather, grandmother

In a number of signs for the members of the extended family, one can observe not only a striking similarity of formal structures of pair signs for family members of both sexes, but also a close formal relation with the sign(s) for the member(s) of the nuclear family. Bohemian signs for 'grandparents' and 'parents' represent one such case: the members of the pairs GRANDFATHERb (figure 17) and FATHERb (figure 1), and GRANDMOTHERb (figure 18) and MOTHERb (figure 2) differ minimally from each other, in only one parameter, namely the handshape (with the 5>S handshapes used for 'grandparents', and the X handshape for 'parents'). On a general level, the common features of GRANDFATHERb and GRANDMOTHERb are the same as in FATHERb and MOTHERb; that is, they share a common handshape (5>S)

Figure 17. GRANDFATHERb

Figure 18. GRANDMOTHERb

and location (face), more specifically the final location of the sign (chin). Figures 19 and 20 show an identical location (chin again), present in the pair of Moravian signs.

Figure 19. GRANDFATHERm

Figure 20. GRANDMOTHERm

The users of CzSL tend to interpret most of the signs for 'grandparents' as being visually motivated. Thus, the sign GRANDMOTHERb is associated by some signers with the headscarf tied in the knot under the chin, a one-time attribute of old women; the location of the signs for GRANDFATHERb and GRANDFATHERm (the chin) is associated with a beard. If the interpretations are correct, the signs are of metaphtonymic (metaphorical-metonymic, cf. Goossens 1990) origins.

4.2.2. Grandson, granddaughter, grandchild

The signs for 'grandson' and 'granddaughter' share the manual component, a case of the same component being used in signs for persons of both sexes, similar to the signs BROTHERm and SISTERm mentioned above. Moreover, the manual component of the signs for 'grandson' and 'granddaughter' (figure 21) is part of a gender-neutral noun ('grandchild'). Linguistic means employed to differentiate the individual meanings include mouthing, though to a limited extent because all the three Czech words have the same stem with an indistinct sound alternation so that distinguishing the words (*vnuk* 'grandson', *vnučka* 'granddaughter', and *vnouče* 'grandchild') may be rather difficult for deaf people. This may be why in 'grandson' and 'granddaughter', a sign indicating the sex (BOY or GIRL) is added for differentiation.

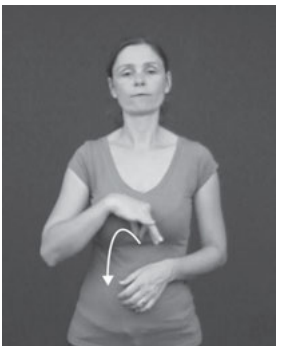


Figure 21. The manual part in GRANDSON, GRANDDAUGHTER, and GRANDCHILD

There is a noticeable similarity between GRANDSON, GRANDDAUGHTER, and GRANDCHILD on the one hand and the manual components of the sign denoting '(lineal) descendant' and the single sign SON (cf. figure 6) on the other hand.[22] Arguably, the two manual components ('descendant'/SON and GRANDSON/GRANDDAUGHTER/GRANDCHILD) could be interpreted as a case of spatial metaphors (probably the only case in all CzSL kinship terms), in which the location in relation to the point of reference (the signer's body) is a metaphorical expression of semantic distance: the sign for a closer kin referent (SON/'descendant') is placed closer to the signer's body than the sign for a distant referent (GRANDSON, etc.).

4.2.3. Uncle, aunt

The members of the pair UNCLE and AUNT are characterised by a rather uneven regional distribution: while the meaning 'aunt' is expressed with the sign AUNT (figure 22; sometimes signed with the variant handshape H) both by Bohemian and Moravian signers, two area-specific signs are used for the

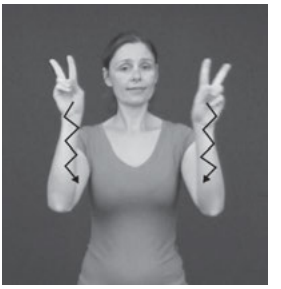


Figure 22. AUNT

meaning ‘uncle’ (figures 23 and 24). The forms used for ‘uncle’ and ‘aunt’ are also specific from the point of view of the relation between paired signs, i.e. the signs for individuals of male and female sex. Unlike the rest of the paired kin terms, neither UNCLEb – AUNT nor UNCLEm – AUNT share any fully identical common element.

Figure 23. UNCLEb

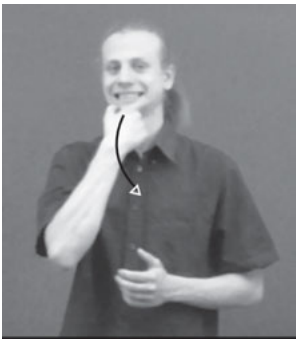


Figure 24. UNCLEm

Information about the motivation of UNCLEb, UNCLEm and AUNT is sporadic. With certainty it can only be stated what was mentioned in the introduction, i.e. that the manual component of AUNT can also be found in other kinship terms, for example in RELATIVE(S) or NIECEm. To give an example of hypothetical interpretations, the sign UNCLEm supposedly has a parallel motivation: the location of the sign at the chin is sometimes associated with the beard or goatee and the C handshape is sometimes connected with the last letter in the Czech word ***stýc*** ‘uncle’ (this, as will be shown in sections *4.2.4* and *4.2.5*, could be supported with the handshapes used in some other kin terms). Also, from the synchronic view, the manual part of UNCLEb seems to be opaque.

4.2.4. Nephew, niece

As has been mentioned in the previous paragraph, Moravian signers express the meaning ‘niece’ with a two-handed sign using the V handshape, or alternatively the H handshape. One of its Bohemian variants (figure 25) includes another frequent pattern – a combination of the F handshape with a location near the chest (cf. SON, DAUGHTER, GRANDCHILD). If a sign should be selected which would formally be the closest to the Bohemian NIECEb (perhaps because of possible motivation), the choice would most likely be

the sign DAUGHTER, which shares with NIECEb the movement from the chest. In fact, the manual component present in the sign DAUGHTER is sometimes also used, with a different mouthing, by both Czech and Moravian signers to express 'niece'.

Figure 25. NIECEb

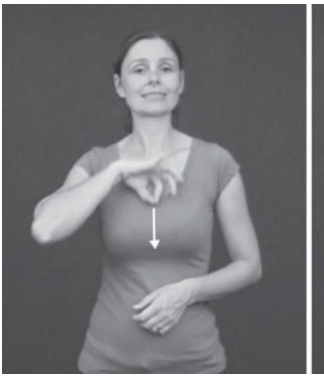


Figure 26. NEPHEW

Analogically, in connection with the area-neutral sign NEPHEW (figure 26), one can point out that it is not only related to one of the nuclear family signs (SON) but in fact includes it. However, what seems to be even more important is the fact that NEPHEW is a *sign^single manual letter compound* (SON^-C-).[23] The first signed segment of the compound (SON) corresponds to the first part (the root) of the Czech equivalent (***syn****ovec* 'nephew', *syn* 'son') and the fingerspelled -C- is the final letter of the Czech word (*synove****c***). The letter -C- is produced with one hand in neutral space with internal wrist movement; as a rule, the two-handed alphabet is preferred among the signers of CzSL, but even in this alphabet -C- is one of the few letters produced with one hand only.[24]

4.2.5 Male cousin, female cousin

Generally, the sign^single manual letter compounds represent a rather limited type in the word-formation of CzSL, but the following three Bohemian signs denoting 'male cousin' and 'female cousin' belong to it as well. Our data show that the structure of these sequential compounds tends to vary, particularly with respect to (1) the relation of the sign to its Czech equivalent, and (2) the position the letter found in the compound has in the Czech equivalent.

From the first point of view (the relation of the sign to its Czech equivalent), one can distinguish:

A) Compounds in which – as in the case of SON^-C- 'nephew' – the signs reflect the first parts (roots) of their Czech equivalents, as in BROTHER^-C- 'male cousin' reflecting the Czech ***bratr**anec* 'male cousin' (*bratr* 'brother'), and in SISTER^-C- 'female cousin' reflecting the Czech ***sestř**enice*[25] 'female cousin'; any Bohemian Czech variants of BROTHER and SISTER (introduced above in section *4.1.3*) can be used in these compounds.
B) Compounds in which the signs have more general meanings than their Czech equivalents, as in BOY^-C- 'male cousin'[26] (no analogical compound denoting the female counterpart, i.e. *GIRL^-C-, has been recorded).

From the second point of view (the position the letter found in the compound has in the Czech equivalent), one should distinguish between BROTHER^-C- and BOY^-C- (where C is the final letter in Czech *bratranec*) on the one hand and SISTER^-C- (where C is the second-to-last letter in Czech *sestřenice*) on the other. There may be several reasons why the sign denoting 'female cousin' includes a letter from a rather unusual (neither the first, nor the last) position in the word. One explanation might be a tendency to systematicity (the letter -C- is present in all other kin sign^single manual letter compounds, but this does not mean that the use of -C- is limited to kinship terms; cf. for example the CzSL sign RED^-C- for *červenec* 'July'). Another factor could be that the letter -C- (unlike e.g. -E-, the final letter in *sestřenice* 'female cousin') is produced with one hand only, but, again, this does not mean that in CzSL there exist no compounds including letters produced with two hands. Last but not least, one should consider a possible borrowing from ASL, in which the sign for (both female and male) 'cousin' is an initialised sign with a C handshape.

The C handshape appears in two more rather remarkable Bohemian variants – FEMALE-COUSINb (figure 27) and MALE-COUSINb (figure 28). The manual component in FEMALE-COUSINb has the same location and a very similar movement as the manual component of SAME or one of the variants of SISTER (namely, the variant which has identical manual features as SAME), which puts the sign in a comparable position to initialised signs. What makes it remarkable is the fact that this seems to be one of the only

Figure 27. FEMALE-COUSINb

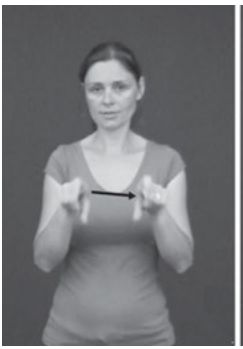


Figure 28. MALE-COUSINb

two instances of this type in the contemporary CzSL. The other instance is (a part of) the sign MALE-COUSINb in which the manual component of the signed first part only differs from the manual parts of SAME and two variants of BROTHER[27] in the handshape and in the unrepeated movement. However, unlike the abovementioned sign^single manual letter compounds (BROTHER^-C- etc.), the first signed part does not have any meaning in itself.

In the signs MALE-COUSINm and FEMALE-COUSINm (figures 29 and 30), which share – as most paired signs do – some formal features (movement and location of the sign), the characteristic worth mentioning is the relationship between the number of extended fingers and the referent's gender. The relationship is very similar to the one found in the Bohemian signs BROTHER and SISTER: both BROTHER and MALE-COUSINm include a handshape with two extended fingers, while SISTER and FEMALE-COUSINm share one extended finger.

Figure 29. MALE-COUSINm

Figure 30. FEMALE-COUSINm

5. Affinal relatives

5.1. Husband, wife, spouse, married couple

In CzSL, signs for persons directly related by marriage (WIFE, HUSBAND, SPOUSE, MARRIED-COUPLE) are characterised by the manual component shown in figure 31, which in some contexts means ‘married’ or ‘to marry’.

Figure 31. Manual part in WIFE, HUSBAND, SPOUSE, MARRIED-COUPLE

The manual part is mostly used as a multivocal sign, the particular meaning of which – as in all language units with multiple meanings – is understood from the linguistic or extralinguistic context. It is only rarely that the particular meaning, or rather the difference among ‘person(s)’ and ‘marital status’ or ‘marital act’, is indicated with different mouthings: <man(žel)> ‘husband’, <man(želka)> ‘wife’, <man(želé)> ‘married couple’ vs. <že(natý)> ‘married’ (used about men), <že(nit)> ‘to marry’(about men), <vda(ná)> ‘married’ (about women), <vdá(t)> ‘to marry’ (about women)[28]. Unsurprisingly, explicit signs MAN/WOMAN (i.e. MAN/WOMAN^SPOUSE etc.) are rarely used to specify the gender because, in most cases, it is clearly determined by the context.

The form of the manual part in which both hands clap together (see figure 31) is usually understood as possibly representing a joint state between the married couple, or the symbolic tying together of the bride’s and groom’s hands performed in some Christian wedding ceremonies.

5.2. Brother-in-law, sister-in-law

The meaning ‘in-law’ is most often indicated with an indirect phrase in CzSL. In the case of ‘brother-in-law’ and ‘sister-in-law’, there also exist alternative means of expression, using the multivocal single manual forms. While the

contemporary usage of Moravian signers includes one more specific manual sign for this pair of concepts (figure 32), the signers from Bohemia use the manual form (figure 33) which with the accompanied appropriate mouthings also refers to other relatives, such as the above mentioned AUNT etc. With an increasing number of related meanings assigned to one manual form the context inevitably ceases to be sufficient for their differentiation. Thus, it is not surprising that mouthings are obligatory in these Bohemian signs. Specifically, BROTHER-IN-LAWb and SISTER-IN-LAWb are distinguished from other kin terms through the mouthed component <šva(gr)> that is present in both of the Czech words *švagr* 'brother-in-law' and *švagrová* 'sister-in-law'. The gender distinction between 'brother in-law' and 'sister-in law' is expressed by all signers, as in other cases where the same manual part functions as a base for paired signs (compare the above WIFE and HUSBAND). More explicitly, the gender of one's sibling-in-law is usually made quite clear through the context; sporadically, through different mouthings (<švagr> 'brother-in-law'; <švagrová> 'sister-in-law'); or, alternatively, through the explicit signs MAN or WOMAN.

It should be noted that both the origin of the signs BROTHER-IN-LAWm and SISTER-IN-LAWm, and the extralinguistic motivation of their Bohemian equivalents are unknown.

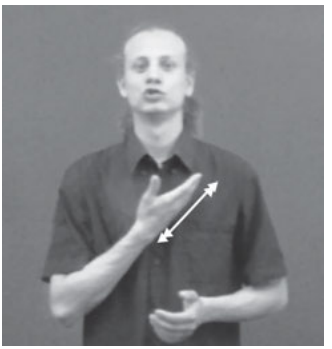


Figure 32. Manual part in BROTHER-IN-LAWm, SISTER-IN-LAWm

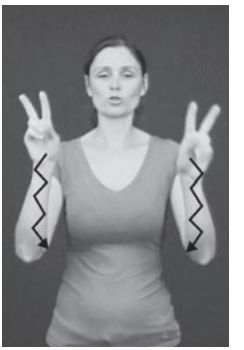


Figure 33. Manual part in BROTHER-IN-LAWb, SISTER-IN-LAWb

Interestingly, one more sign for 'brother-in-law' was still used in the Czech Republic approximately 20 years ago. The sign originated from the surname of a well-known interpreter *Švagr* (literally 'Brother-in-law') and its form referred to a visual characteristic, his beard. (The surname *Švagr* is not exceedingly rare in Czech: according to a report of the Ministry of the Interior, *www.mvcr.cz*, about 200 men with that name lived in the Czech

Republic in 2011, its frequency ranking *Švagr* 4,136th out of more than 60,000 surnames used across the country.) The contemporary rare usage of this name sign as an appellative, most probably, is a result of extralinguistic circumstances, one of them being the fact that members of the Czech deaf community now increasingly perceive this interpreter, who is still active, as using manual (signed) Czech, not CzSL.

6. General tendency

Before bringing the focus to superordinate terms, it might be useful to summarise at least one general tendency shown in the above analysis of kinship terms for individual members of the family. The data suggest that manual signs referring to some relatives usually share similar or even identical formal features. Leaving aside cases of manually identical signs distinguished by mouthings, table 1 sums up these shared phonological properties of single signs as well as of the signs included in the compounds consisting of single kin term and a manual letter (for transparency, we have disregarded less-used compounds formed from a kin term and a sign denoting gender, e.g. MAN or WOMAN, because the kin terms encompassed in the compounds are identical with the single signs). We have always examined signs belonging to one variety (Bohemian signs or Moravian signs) and analysed them from the point of view of three major manual parameters – handshape, location and movement. The movement, arguably the most complex component, is only characterised as same or different; with the other two components, more specific values are given.

The table shows several interesting interrelations. For example, most kin terms share two identical formal features, either handshape and location (if the signs share the same handshape, they usually also correspond in the parameter of location) or movement and location (if the kin signs share the same movement, they always correspond in the parameter of location, too). These shared features are significant in two specific semantic domains: in the naming of paired family members with respect to the two genders (*paired signs, signs for paired members*), and in the naming of family members with respect to a certain generation from Ego's point of view, distinguishing kin terms of the *same*, the *previous* and the *following* generations. For example, signs for family members of the two following generations are articulated, with a few exceptions, with the F handshape and contact on the chest region; signs for family members of the two previous generations are articulated on the head area, usually with contact on the chin, and with one

more shared parameter. While the members of the paired signs share the head region and the same handshape but their movement varies (FATHERb – MOTHERb; GRANDFATHERb – GRANDMOTHERb; FATHERm1 – MOTHERm), Bohemian signs for relatives of the same gender belonging to different generations share an identical location, and thus also movement, but their handshape varies (MOTHERb – GRANDMOTHERb; FATHERb – GRANDFATHERb). Identical location and movement but different handshapes are also typical of some paired signs for the same generation (MALE-COUSINm – FEMALE-COUSINm; BROTHERb1, b2, b3 – SISTERb1, b2, and possibly also the signs MALE-COUSINb – FEMALE-COUSINb respectively including the signs BROTHER and SISTER).

The fact that a certain set of semantically related signs can be represented by some identical phonological features is well known and has been documented in many sign languages. A brief mention should be made at least of the study of Fernald and Napoli (2001) who investigated morphological processes and units in ASL and, among others, analysed kin terms. Some of them – like in CzSL – share some phonological features; for example, in ASL, FATHER and MOTHER have the same handshape, movement and orientation (while location varies), and FATHER and GRANDFATHER have the same handshape, location and orientation (while movement varies). Moreover, Fernald and Napoli introduced specific linguistic units, *ion-morphs,* described as having "three components, one representing phonological form, another indicating the meaning associated with the form, and a third stating the restriction on the form/meaning association" (2001: 33).

For example, in the abovementioned case of ASL FATHER and MOTHER, the sense 'parent' is derived from a combination of specific handshape (5 handshape), orientation and movement (repeated contact with location) with a restricting combination of specific locations. The specific location is either chin and lower cheek (carrying the sense 'female', as also in ASL AUNT, NIECE) or forehead (carrying a sense 'male', similarly to ASL UNCLE, NEPHEW). A concept similar to the ion-morph has been also introduced by Johnston and Schembri (1999), the *phonomorpheme.* Fernald and Napoli (2001: 41) suggest that ion-morphs could also be identified in spoken language in *phonaesthemes* and other similar units; for example, in English, within a specific set of words the form *-ere* at the word-final position has the meaning 'location' if it combines with one of a certain set of forms (*h-, th-, wh-*), as in *here, there* or *where*.

Table 1. Shared formal features of signs for individual family members *(Symbol ✓ indicates a common value of movement in the signs on the line; HS, MOV abd GEN stand respectively for handshapes, movements and generation from Ego's point of view)*

same HS	same locations	same MOV	CzSL signs	GEN
F	chest point of contact on centre of chest		SON DAUGHTER GRANDSON/GRAND-DAUGHTER/GRANDCHILD NIECEb NEPHEW (SON^-C-)	*following*
X 5>sA	head final contact on chin		FATHERb MOTHERb GRANDFATHERb GRANDMOTHERb	
	head initial contact on fore-head + final contact on chin	✓	FATHERb GRANDFATHERb	*previous*
	head initial contact near ear + final contact on chin	✓	MOTHERb GRANDMOTHERb	*previous*
G	head		FATHERm1 MOTHERm FATHERm2	
	head repeated contact on chin		GRANDFATHERm GRANDMOTHERm	
	neutral space	✓	BROTHERb1, b2, b3 SISTERb1, b2 MALE-COUSINb (BROTHER^-C-) FEMALE-COUSINb (SISTER^-C-)	*same*
	non-dominant hand	✓	MALE-COUSINm FEMALE-COUSINm	*same*
C			MALE-COUSINb FEMALE-COUSINb	*same*
	neutral space		BROTHERb4, b5 SISTERb1, b2	*same*

7. Superordinate kin terms

7.1. Basic notions

Superordinate kin terms are more general in meaning than those of the basic concept level and are usually further specified by the terms *hypernyms* or *holonyms*.[29] In the following, two groups of the signs are introduced in more detail. Firstly, the signs will be described that generally denote people related by birth or by marriage, i.e. the signs for the concepts 'relative(s)' and 'family'. Secondly, we will discuss the signs that encompass gender paired kin terms such as 'parents' or 'siblings', and are compounds at the same time, or alternatively exist as compounds and single signs. It follows from the bi-gender essence of compounds such as FATHER^MOTHER 'parents' that they are not used to denote single family members. The inclusion of both genders in these compounds puts them in the vicinity of the gender-nonspecific single signs GRANDCHILD, SPOUSE and CHILD mentioned in sections 4 and 5 above, but unlike the compounds, the single signs can be used as terms for individuals.

7.2. Family, relative(s), parent(s)

Two signs in CzSL express the meaning 'family' (figure 34 and 35), with their movement patterns referring metaphorically to a circle arguably representing a strong relationship among the members of the family. Moreover, the handshapes in the sign FAMILY1 might be interpreted as referring to a close-knit group.

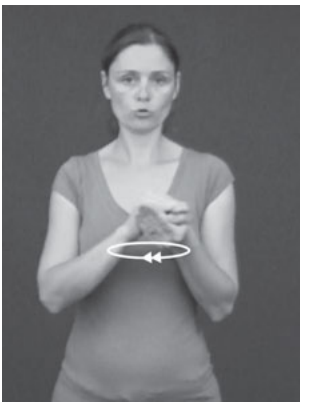


Figure 34. FAMILY1

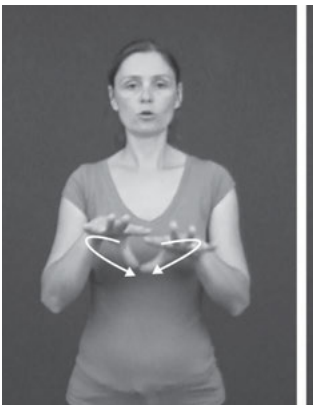


Figure 35. FAMILY2

Depending on the contexts, FAMILY1 and 2 may denote a nuclear family (consisting of a pair of adults and their children) or an extended family (comprising three or more generations). In CzSL as well as in a number of spoken languages, FAMILY1 and 2 are collective nouns both from the semantic and syntactic points of view and may combine with both singular and plural forms of verbs and proforms. Thus, for example, the meaning 'My family visited me in the hospital on Sunday' is signed as FAMILY + POSS-1 + VISIT-ME (...) or FAMILY + POSS-1 + EACH-MEMBER-OF-FAMILY-VISIT-ME: with repeated movement of both hands (…). Unlike e.g. the English *my **family are** very religious* (or *my **family is** very religious*), the plural in CzSL explicitly refers to the members of the family.

The different number of referents, one vs. more than one in this case, is indicated with the sign RELATIVE(S), as seen in figure 36. As in other kinship terms, the plural can also be expressed with an added quantifier. Predictably, preliminary analyses show that the use of plural 'relatives' is more frequent in communication; if one were talking about a single individual, one would simply give the specific kinship term, e.g. 'aunt' or 'grandfather'. As to the motivation of RELATIVE(S), it is not quite clear which of the two well-known semantic changes initiating the formation of new signs (namely, specification and expansion of the meaning) is relevant for the relationship between RELATIVE(S) and other kinship terms with the same manual component, such as the abovementioned AUNT, NIECEm, BROTHER-IN-LAWb and SISTER-IN-LAWb. However, a comparison of contemporary signs with those listed in the CzSL dictionary of 1988 seems to indicate that specification of the meaning is more probable in these cases than expansion since the sign AUNT is described here as a "compound of relative and female gender" and the sign UNCLE as a "compound of relative and male gender". The rest of the abovementioned signs (NIECE, BROTHER-IN-LAW and SISTER-IN-LAW) are completely absent from the dictionary.

Figure 36. RELATIVE(S)

All three manual components shown in figures 34–36 are sometimes used in the meaning 'parent(s)'. In such cases obligatory mouthing is added, the form of which largely depends on whether the distinction to be expressed is 'parent(s)' vs. 'relative(s)' (figure 36) or 'parents' vs. 'family' (figures 34 and 35). The distinction is important because the Czech expressions *rodič(e)* 'parent(s)' and *rodina* 'family' are related words sharing the same root (*rod-*). As a result, the concrete mouthing may have several forms. If the meaning 'parents' is expressed with the manual component shown in figure 36, the mouthing usually consists of the first syllable or more letters: <ro(diče)>. On the other hand, if one of the manual components shown in figures 34 and 35 is used for 'parents', the mouthing usually is <rodič(e)>. A fact worth mentioning is that the manual components in figures 34 and 35 are sometimes used with the mouthing including just the first syllable *ro-* but in that case the meaning tends to be 'family'.

7.3. Compounds

The following compounds are found among kinship terms in CzSL: MOTHER^FATHER (less often FATHER^MOTHER) 'parents'; BROTHER^SISTER (SISTER^BROTHER) 'siblings'; infrequently GRANDMOTHER^GRANDFATHER (GRANDFATHER^GRANDMOTHER) 'grandparents'; and AUNT^UNCLE (UNCLE^AUNT) 'parents' siblings'. It should be noted that the parts of the compounds may be represented by any regional variant of the signs. From the semantic and syntactic viewpoints the compound signs are sequential hyperonymic coordinate compounds, i.e. coordinate combinations of two consecutive kinship terms, in which the referent of the compound has a superordinate relationship to the meaning of the parts. Within the framework of Wälchli's (2005) semantic subclassifications of hyperonymic coordinate compounds, termed *co-compounds*, the above mentioned structures would fall into one of the basic types called *additive co-compounds*, in which "the meaning of the compound as a whole is simply the sum of the meaning of the parts, such as the ... Japanese example *fū-fu* 'husband and wife' or the Korean word *son-pal* 'hand and foot'" (Arcodia, Grandi and Wälchli 2010: 185).

The classification of the CzSL signs MOTHER^FATHER, BROTHER^SISTER, GRANDMOTHER^GRANDFATHER and AUNT^UNCLE as (co-)compounds has both semantic and formal reasons. From the semantic viewpoint these are compounds expressing *natural coordination.* According to Wälchli (2005: 5), natural coordination is

> "coordination of items which are expected to co-occur, which are closely related in meaning, and which form conceptual units, such as 'father and mother', 'husband and wife', 'hands and feet', 'eat and drink', and 'read and write', rather than 'the man and the snake', 'toe and belly', 'knife and hammer', 'eat and read', and 'read and swim', which are instances of accidental coordination, coordination of items which are not expected to co-occur and which do not have a close semantic relationship".

From the formal viewpoint the abovementioned compounds are characterised by some well-known formal changes (e.g. Klima, Bellugi et al. 1979: 210–224; Brennan 1990). In the signs MOTHER^FATHER, BROTHER^SISTER, GRANDMOTHER^ GRANDFATHER and AUNT^UNCLE the production of both parts of each compound is faster and the transition between them is more fluent. A more specific example is that the repetition of movement found in BROTHER (BROTHERm, b1, b2, b3) and SISTER (SISTERm/b1 and SISTERb2) is missing in the compound 'siblings'. Also, the movement in MOTHERm is sometimes shortened in the compound by means of a change of the end point (in the single sign MOTHERm, the hand moves from the right cheek to the left cheek, while in the compound MOTHERm^FATHERm1 or MOTHERm^FATHERm2 the hand moves from the right cheek to the chin). As to the variability of the order of parts, compare Wälchli (2005: 104): "... order need not necessarily be fixed in co-compounds. Lezgian has both *dide-buba* 'mother-father' (the more frequent order) and *buba-dide* 'father-mother' for '> parents'... Thus it follows that fixed order is certainly neither a sufficient nor a necessary criterion for co-compounds."

8. Diachronic perspective

The last topic discussed in our paper – changes in CzSL signs for relatives over time – could undoubtedly be a valuable and interesting addition to the synchronic description of the repertoire of CzSL kinship terms, but it is necessary to stress that the available data are very limited, so that the following is hardly more than a brief preliminary summary of problems. Despite the fact that several historical film recordings of CzSL have been found recently (the oldest from 1928, some more from the 1950s, and most from the 1960s onwards) the abovementioned 1988 *Slovník znakové řeči* (*A Dictionary of the Sign Speech* by Gabrielová, Paur and Zeman) remains the only available source of older forms, the films still being technically processed. The dictionary lists about 2,700 Czech glosses with their corresponding signs

("Prague variants", according to its authors), and most signs are illustrated by black-and-white photographs with occasional simple Czech descriptions.

The kin terms in the dictionary can be roughly divided into two groups: (1) **signs corresponding** with a contemporary variant (allowing for the different order of parts in compounds), and (2) **signs differing** from contemporary variants. Two more groups could also be formed, namely (3) **signs missing** from the dictionary (i.e. headwords for some kinship terms are missing but the signs are attested in contemporary CzSL) and (4) signs for some relatives which are absent in contemporary usage but are found in the dictionary. The fourth group, however, remains just a theoretical possibility, because no such case has been attested. The remainder of this section considers the two groups in turn, with a brief comment on some signs of group three.

1) Dictionary signs with identical formal equivalents in contemporary CzSL

Before we deal with these signs it is important to point out that in spite of their formal and semantic identity they often are glossed in different ways in the rather loose system employed in the 1988 dictionary and in the more precise and explicit approach applied in this paper. As can be seen in Table 2, the general lexeme FAMILY and signs for the gender-specific closest relatives, with most of them belonging to the nuclear family, are the most stable in their forms. However, it is noteworthy that only three of the dictionary single signs (FATHER, GRANDMOTHER and FAMILY) have a high frequency of use in contemporary communication. The six remaining signs, all obsolescent, seem to show that there is a strong tendency to use single signs to the detriment of compounds distinguishing gender-paired terms.

Table 2. Comparison of older and current kin terms in CzSL I: identical forms

Dictionary signs	**Equivalent present variants**
FATHER	FATHERb
GRANDMOTHER	GRANDMOTHERb
SON: MALE-GENDER^SON *comment under the headword* male gender: "is usually signed as BOY"	SON: BOY^SON/DESCENDANT a rather rare present CzSL variant *a compound with reverse order of the parts also exists at present (SON/DESCENDANT^BOY), but is rather rare*

DAUGHTER: FEMALE-GENDER^SON *the sign which in contemporary CzSL may indicate 'girl' (cf. figure 9) or 'woman' is mentioned under the headword* female gender, female	DAUGHTER: GIRL^DESCENDANT a rather rare present CzSL variant *a compound with reverse order of the parts also exists at present (DESCENDANT^GIRL), but is rather rare*
BROTHER: BOY (MALE-GENDER)^SAME	BROTHER: BOY^SAME a receding CzSL variant (for Moravian signers the manual compound BOY^SAME is equivalent to BOY^BROTHER) *a compound with reverse order of the parts also exists (SAME^BOY = BROTHER^BOY) at present as a receding Moravian variant*
SISTER: SAME^FEMALE-GENDER	SISTER: SAME^GIRL a receding Moravian variant (manual compound SAME^GIRL is equivalent to SAME^SISTER) *a compound with reverse order of the parts (GIRL^SAME) is also receding, but is used more often than the dictionary compound (for Moravian signers GIRL^SAME is equivalent to GIRL^SISTER)*
HUSBAND: HUSBAND^MAN *under the headword* husband, marriage, *the second part of the compound is described as* "MAN or FEMALE-GENDER; BOTH are added to convey the meaning 'married couple'"	HUSBAND: MAN^SPOUSE a rather rare present CzSL variant
WIFE: HUSBAND^FEMALE-GENDER	WIFE: WOMAN^SPOUSE a rather rare present CzSL variant
FAMILY	CzSL variant FAMILY 1

2) Dictionary signs without identical formal equivalents in contemporary CzSL

Table 3 below shows the formal features distinguishing the single dictionary signs from contemporary forms, all of which are single signs as well. If several variants with the same meaning are used at present, with one of them showing a higher degree of formal similarity to the dictionary sign, the older sign is only compared with this most similar contemporary form.

Table 3. Comparison of older and current kin terms in CzSL II: different forms of single signs in the dictionary

Description of dictionary signs (with respect to present variants)			
single signs in dictionary	**features different from present variants**		**specification of changes** (parameters in dictionary signs → parameters in contemporary signs)
	variants	**features**	
MOTHER	b	handshape	G handshape contacts face below ear and then moves down to contact chin →
		initial location	MOTHERb: X handshape first contacts cheek
	m	final location	MOTHERm: handshape moves to opposite corner of mouth
		movement	
GRAND-FATHER	b	initial handshape	C handshape → 5 handshape with thumb extended
CHILD	CzSL	secondary movement	hand moves away from signer in small arcs → reduced movement: nodding hand moves away from signer
RELATIVE	CzSL	movement location orientation of palms	hands in front of chest, with palms towards each other, repeatedly approach each other → hands with palms facing away from signer move downwards from position near head

Some changes in the form of the signs MOTHER and GRANDFATHER seem to be related to the tendency toward systematicity or, more precisely, to correlation between meaning and formational elements, called *generalisation of meaningful parameter values* by Frishberg (1979: 81–82). In the case of present Bohemian variants of these two kin terms, formal convergence with their gender pair signs appears to be most significant: in the sign MOTHER, the G handshape has changed to an X handshape which is a component of the sign FATHERb; in the sign GRANDFATHER the initial C handshape has changed to a 5 handshape with the thumb extended which is a component of the sign GRANDMOTHERb. *Reduction* could be considered another typical, not only historical, change, illustrated in the changed movement in the sign CHILD.

In comparison with single signs, greater complexity of compounds naturally leads to a more extensive variety of changes found in their forms. As shown in Table 4, the dictionary compound signs (a) have remained structurally the same but the forms of their elements have changed (PARENTS), (b) have been reduced to single signs (as in MARRIED-COUPLE), (c) have been reduced to single signs and their forms have changed (as in AUNT, UNCLE), (d) have remained compounds and one member of the compound has been replaced with a present sign (GRANDSON, GRANDDAUGHTER), (e) have been replaced with present single signs or compounds (MALE-COUSIN, FEMALE-COUSIN) or (f) the meaning of one sign included in the dictionary compound has been changed (dictionary ^MALE-COUSIN ‘male cousin’ vs. ‘female cousin’ in FEMALE-COUSINb). Formal diversification of kin terms for individuals seems to be the most significant general tendency. Thus, the older underspecified dictionary forms have been replaced in present CzSL with more specific signs such as SON vs. GRANDSON, DAUGHTER vs. GRANDDAUGHTER, and paired signs AUNT vs. UNCLE and FEMALE-COUSIN vs. MALE-COUSIN.

One example illustrating how the diachronic perspective can help to illuminate motivations of signs is that the present sign UNCLEb (figure 37), seems to be unmotivated and unrelated to other existing kin terms from a synchronic perspective, as briefly mentioned in section *4.2.3*. However, if we consider the compound RELATIVE^MALE-GENDER ‘uncle’, found in the 1988 dictionary, UNCLEb as well as the present AUNT appear to have been derived from the dictionary form RELATIVE, shown in figure 38.

Table 4. Comparison of older and current kin terms CzSL III: different forms of dictionary compounds

Dictionary compounds	Comparison with contemporary signs
PARENTS: FATHER^MOTHER *comment under the headword* parents: "alternatively, the sign FAMILY can be added"	same present CzSL compounds FATHER^MOTHER, also with reverse order MOTHER is changed in the present compound PARENTSb; both MOTHER and FATHER are changed in the present compound PARENTSm
MARRIED-COUPLE: HUSBAND^BOTH	present CzSL MARRIED-COUPLE is a single sign without BOTH
AUNT: RELATIVE^FEMALE-GENDER	present CzSL AUNT is a single sign without FEMALE-GENDER present single sign AUNT shares the manual component with the present sign RELATIVE
UNCLE: RELATIVE^MALE-GENDER	contemporary Czech and Moravian variants are single signs the manual component of which is found neither in the two contemporary signs included in the dictionary compound (RELATIVE, MALE-GENDER) nor in any other contemporary kin terms
GRANDSON: SON/CHIEF^MALE-GENDER *comment under the headword* grandson: "compound SON, CHIEF and MALE- or FEMALE-GENDER"	contemporary CzSL compound is GRANDCHILD/GRANDSON^BOY SON vs. GRANDSON/GRANDCHILD are now distinguished with a different movement
GRANDDAUGHTER: SON/CHIEF^FEMALE-GENDER	contemporary CzSL compound is GRANDCHILD/GRANDDAUGHTER^GIRL DAUGHTER vs. GRANDDAUGHTER/GRANDCHILD (and also DAUGHTER vs. SON) are now distinguished with a different movement
FEMALE-COUSIN: FEMALE-GENDER^MALE-COUSIN	present single signs or the compound FEMALE-COUSIN (SISTER^-C-), a borrowing from Czech present FEMALE-COUSINb corresponds with the dictionary single sign MALE-COUSIN which is included in the dictionary compound FEMALE-COUSIN, the only difference being the orientation of the palms and of the fingers
MALE-COUSIN: BOY (male gender)^MALE-COUSIN	present single compounds, mostly borrowings from Czech sign BOY only used in the present compound MALE-COUSIN (BOY^-C-) on the dictionary single sign MALE-COUSIN (see above FEMALE-COUSIN)

Figure 37. UNCLEb

Figure 38. older RELATIVE (1988)

Finally, we will briefly turn our attention to group 3, i. e. the **concepts missing from the dictionary**, but expressed with single signs or compounds in current CzSL. The following signs belong to this group: NEPHEW, NIECE (NIECE, NIECEb, m), BROTHER-IN-LAWb, m, SISTER-IN-LAWb, m, GRANDCHILD and SIBLINGS (BROTHER^SISTER), GRANDPARENTS (GRANDMOTHER^GRANDFATHER) and PARENTS'-SIBLING'S (AUNT^UNCLE). This list of the kin terms suggests that general terms, typically compounds, are lexicalised in CzSL later than terms for single individuals. Also, it indicates that the new signs (lexical innovations) for individual distant relatives tend to be affected by the surrounding spoken language, in this case Czech: cf. the abovementioned sign^single manual letter compound SON^-C- 'nephew', or the significant role of mouthings distinguishing the signs NIECEm and RELATIVE; BROTHER-IN-LAWb/SISTER-IN-LAWb and RELATIVE, or NIECE and DAUGHTER. One more sign (SPOUSE) could be added to the above examples of the terms belonging to group 3, but it is different from the other signs in that the corresponding Czech word is rather uncommon.

It should be stressed that the lack of signs for some kin terms in the dictionary does not necessarily mean that such relatives were unknown or unimportant to signers; it may just suggest that different, perhaps periphrastic, expressions were used at the time.

9. Conclusion

In this paper we have explored kinship terminology, one of the most essential and universal sets of concepts in all cultures and languages. In spite of this universal character, the sets found in individual languages and cultures are largely different in their sizes as well as in their structural, semantic and

formal characteristics. Our focus has been on Czech Sign Language, with the current terms being interpreted against the background of pronounced language changes in the last 25 years (no older records of CzSL being available at the present time).

Based on the comparison of the current repertoire of signs with the older forms found in the first dictionary of CzSL (1988), the following two changes have been identified as the most important:

(a) increase in the repertoire of kin terms, sometimes through specification of older forms (e.g. the use of older SON for 'son', 'daughter', 'grandson', and 'granddaughter' has been replaced by the use of four specific forms; new signs have been created for 'nephew', 'niece', 'brother-in-law', and 'sister-in-law');
(b) gender-specific compounds, mostly formed from a gender-specific sign (FEMALE-GENDER or MALE-GENDER) and a kin term, have been replaced by single signs. The gender of the relative may be an integral part of the signs, some of which have been newly created (e.g. SON vs. DAUGHTER; BROTHERb1–b5 vs. SISTERb1, b2; UNCLEb, m vs. AUNT); it may also be implied by the context or, less often, by mouthings. The newly created single gender-specific signs also become bases for lexicalised superordinate compounds (BROTHERb1–b5^SISTERb1, b2 'siblings', AUNT^UNCLEb, m 'parents' siblings').

As a partial result of these changes, CzSL kinship terms represent a rich system from the viewpoint of both word-formation processes connected with motivation, and the types of signs. Manual single signs distinguish most consanguineal (blood) relatives from affinal (by marriage) relatives and, within consanguineal relatives, they also distinguish lineal from collateral, as well as the members of different generations; in many cases they also distinguish the gender of consanguineous relatives. The distinction of gender, namely in offspring, is the main difference from the results of Woodward's well-known study (1978) analysing kin terms for consanguineous relationships that were not borrowings from spoken languages, in 20 sign languages, including some historical ones. While in CzSL there exist the signs SON and DAUGHTER, no paired offspring terms distinguishing gender were attested in any of the sign languages included in Woodward's study. Within the framework of manual signs, another significant finding has emerged from our study, namely that in kin terms belonging to some semantic paradigms (e.g. signs for pair relatives distinguished by gender only, signs for two relatives distinguished by generation only, and signs for groups of family

members of the same generation), the affiliation to a paradigm – and thus the relation(s) to other members of the paradigm – is manifested in the formal characteristics of kin terms. For example, terms for relatives of following generations are mostly articulated with the F handshape on the chest; the subset of signs for pair relatives are located on the head region and have the same handshapes (FATHERb – MOTHERb; FATHERm1 – MOTHERm; GRANDFATHERb – GRANDMOTHERb); and some terms denoting female relatives are produced with a handshape of one extended finger (SISTERb, FEMALE-COUSINm) in contrast to signs for their male counterparts with two extended fingers. On a rather general level, the data from CzSL convincingly show that lexical items sharing meaning component(s) tend to share some formal component(s). The tendency has been considered an important attribute of the lexicon of sign languages, characterising more than just kin terms, and being more widespread than in spoken languages (e.g. Klima and Bellugi 1979, Brennan 1990, Fernald and Napoli 2000, Zeshan 2000).

We have also seen that some CzSL kin terms are borrowings from spoken Czech. Most of these signs represent recent lexical innovations and include lexical items consisting of either mouthings (accompanying manual signs) or manual letters. Mouthings are obligatory components in the signs sharing one single manual form (with V handshapes moving from head downwards), which can have the general meaning 'relative' or more specific meanings ('parents', 'aunt', 'niece', 'brother in law' or 'sister in law'). The latter structural type of borrowings (with the inclusion of manual letters), rather rare in CzSL, encompasses primarily sign^single manual letter compounds (e.g. 'nephew', 'male cousin' and 'female cousin'). Interestingly, two other forms for 'female cousin' and 'male cousin' are very similar to initialised signs; to our knowledge, no other instances of this type have been documented in contemporary CzSL.

Our limited data only allowed us to outline one type of variation, namely regional differences (Bohemian vs. Moravian signs). The geographic stratification, however, needs to be explored in greater depth in the future. Much work remains to be done in the area of influence of other factors driving sociolinguistic variation, such as age, gender, socio-economic status of signers and addressees, and stylistic factors. Further phenomena to be explored in this domain are syntactic aspects of the use of kinship terms or, even more generally, aspects of the use of CzSL kin terms in communication, such as their frequency or formal changes resulting from the influence of neighbouring signs.

Notes

1. We would like to thank our two reviewers for their helpful constructive comments to this chapter.
2. The group included 3 women and 2 men, all aged 20-40 years, 3 of them being deaf, and 2 seriously hearing-impaired; 3 had deaf parents, and 2 had hearing parents; 3 of the respondents came from Bohemia, and 2 from Moravia; 2 of them had secondary education and 3 had university-level education (in linguistics). "The effort to demutise the deaf is not a short-term goal, nor the curriculum of one or several school subjects. It sets the overall aim of the school envi-ronment in education and upbringing throughout school attendance. Therefore language education becomes the principle of schoolwork in the widest possible sense of the term" (Sovák 1987: 95).
3. Civic association founded in 1990 aiming at expressing and defending the interests of hearing-impaired children and their parents.
4. The Federation of Parents and Friends of the Hearing-Impaired was engaged (in cooperation with Czech linguists) in initiating and enacting the *Zákon o znakové řeči* (Act on Sign Speech) in 1998; it was amended in 2008 (The Act on Communication Systems of Deaf and Deaf-Blind Persons).
5. One of the official objectives of the programme is to linguistically educate deaf and hearing-impaired persons. The possibility of secondary-school degrees including the *maturita* (secondary school-leaving examination) became available for them after 1989 when new special secondary schools opened.
6. The interest in Czech Sign Language and communication of the Czech deaf people is inevitably coupled with the interest in new findings in sign language linguistics globally reflected in reviewed work, cf. e.g. monograph reviews (Emmorey 2002; Hoza 2007; Johnston and Schembri 2007; Ladd 2003; Liddell 2003; Meir and Sandler 2008; Reagan 2010; Scheetz 2004; Steinberg, Nagata and Aline 2001; Stokoe 2001; Taub 2001; Zeshan 2000) or proceedings reviews (eds. Baker, van den Bogaerde and Crasborn 2003; Chamberlain, Morford and Mayberry 2000; Dively, Metzger, Taub and Baer 2001; Emmorey and Lane 2000; Gregory, Knight, McCracken, Powers and Watson 1998; Lucas 2001; Meier, Cormier and Quinto-Pozos 2002; Perniss, Pfau and Steinbach 2007; Pizzuto, Pietrandrea and Simone 2007; Roy 2011; Schick, Marschark and Spencer; Zeshan 2006; Zeshan and Perniss 2008).
7. As to the "edificatory" work aiming at the majority society cf. also activities of organisations like *Pevnost – České centrum znakového jazyka* (Pevnost – Czech Centre for Sign Language, initiated in 2000 by deaf students of the Czech in the Communication of the Deaf programme) or *Česká komora tlumočníků znakového jazyka* (The Czech Chamber of Sign Language Interpreters).

8. The regional variants of the same meaning discussed below are represented with lower case letters *b* (for Bohemian) and *m* (for Moravian) following the gloss e.g. FATHERb, FATHERm. In a list of more variants, gloss is usually not repeated, thus, e.g., FATHERb, m is the same as FATHERb and FATHERm. For the sake of brevity, if a sign is used both in Bohemia and Moravia, the gloss is not specified with any letters, e.g. AUNT. If more variants exist within one language variety, single signs are marked with numbers, e.g. nationwide FAMILY1, FAMILY2 or Moravian FATHERm1, FATHERm2; compounds are not numbered and glosses of their parts are given in brackets, e.g. NEPHEW (SON^-C-). The rare situation when a sign is typically used by signers in one region while in the other region it is just one of the variants is indicated by slash marks, e.g. SISTERm/b1.
9. Thus, for example, in the English sentence *My son is 8 years old, son* is the referent (alter) and *I* (or, in this case, *my*) is the Ego, sometimes also called *anchor* (Dahl and Koptjevskaja-Tamm 2001). For more details on the terminology used here see e.g. Johnsson (2001).
10. To further differentiate patrilateral and matrilateral relatives, reference to an extralinguistic distinguishing feature is often made in many languages, among them Czech. In CzSL the person's place of residence, deafness, etc, is often mentioned; compare, for example, the CzSL sentence 'Do you like your grandfather from Brno more than your grandfather from Prague?'
11. While *referential use* as well as *vocative use* (as in the English *Mum, I am hungry*) are standard distinctions recognised in both linguistic and anthropological literature, *predicative use* of kinship terms has only been mentioned recently; see Johnsson (2001: 1204).
12. Nyst, however, only mentions the two most frequent cases – the referential use and the absence of the vocative use.
13. A similar phonemic or morphological structure in kinship terms can also be found in spoken languages; compare e.g. the widely known example of the Indo-European suffix *-*ter*- used in words for 'mother', 'father', 'daughter' and 'brother' in a number of Indo-European languages (see e.g. Pokorny 1959-1969; Frisk 1954-1972; Kluge 2002; Rejzek 2001); compare, for example, the English *sister* or *brother* and their Czech equivalents *sestra* and *bratr*.
14. The terms *phonological* vs. *lexical variants* are used in harmony with e.g. Lucas, Bayley and Valli (2001) or Cormier et al. (2012: 9). However, there exist other approaches – see for example Čermák (2010: 38).
15. Compare, for example, the definitions in Lucas, Bayley and Valli (2001), Cormier et al. (2012: 9), and König, Konrad and Langer (2008: 394).
16. The first tentative dictionary of CzSL, published in 1988, provides a somewhat illogical description of the sign DAUGHTER: "Compound female gender and son" (Gabrielová, Paur and Zeman 1988: 37), but it de facto aptly expresses the structure of the sign GIRL^figure 6.

17. Structurally analogical cases are sometimes counted among *manual homonyms*, cf. for example Crasborn, van der Kooij, Waters, Woll and Mesch (2008: 48): "... manual homonyms (the manual components of the NGT signs BROER and ZUS are formally identical) are disambiguated by mouthings of the words 'broer' (*brother*) or 'zus' (*sister*)". In view of the evident link between the meanings 'brother' and 'sister', the correspondence of their forms can hardly be considered coincidental; one could even think about characterizing such cases as (manual) polysemy. The meanings 'brother' and 'sister' are metonymically connected with the meaning 'same' and in CzSL, all the three Moravian signs share an identical manual part.
18. Variants with a circling movement are mostly used by elderly signers.
19. Apart from optional mouthing, the two types of compounds de facto merge in the Moravian variants, e.g. in GIRL^SAME=GIRL^SISTERm/b1.
20. As indicated by the use of + in the notation of the example (BROTHER + OLDER), we are inclined to think that, in contemporary CzSL, these are frequent collocations rather than sequential compounds, or one could perhaps think of a transitional word-formation type – a juxtaposition. One argument is that no formal change occurs in these cases, with the only exception of the smooth transition between the signs which, however, is fully comparable with attributive combinations such as 'skilful brother' BROTHER + SKILFUL). Moreover, the signs OLDER/YOUNGER/ordinal numeral can be used, without any change, as stand-alone signs (e.g. in elliptical utterances such as the answer to the question 'Is your brother older or younger? – Older.'), or they can be employed in other contexts, especially predicative ones (e.g. 'I am older' I + OLDER).
21. An etymological comment about the situation in the Czech language can be made in this context. For an overwhelming majority of Czech speakers the word *vnuk* is an unmotivated word, but its etymology links *vnuk* (and the derived words *vnučka, vnouče*) with another kinship term through the mediation of the Indo-European root **an*- 'ancestor, grandparent', cf. Machek (1997 [1971]: 696), Rejzek (2001: 717-718). The explanation is that "the connection between grandparents and their grandchildren was very strong for the Indo-Europeans: it was believed that the soul of a deceased ancestor passes to the body of his grandson, who was often named for his grandfather" (Rejzek 2001: 717-718).
22. Compare examples of analogical structures, with a different order of the components, found in other sign languages, e.g. in BSL: place-name 'Shebfield' -S-^FIELD (Sutton-Spence 1994: 327) or NZSL -M-^WIFE 'midwife' (McKee and Kennedy 2005: 290). This pattern is sometimes called "initialisation" (with the inverted commas being part of the term, indicating that the process is not initialisation in the strict sense); cf. Sutton-Spence and Woll (1999: 229), Cormier, Schembri and Tyrone (2008: 14).

23. Examples from CzSL are in harmony with the statements found e.g. in Sutton-Spence (1994: 321, 394) or in Cormier, Schembri and Tyrone (2008: 14) who point out that the pattern single manual letter^sign "... occurs in two-handed systems but has not been documented in one-handed systems..."
24. The form *sestř-* is a variant of the root *sestr-*, cf. the dative/locative singular form *sestř-e* (as opposed to the nominative singular *sestr-a*, the genitive singular *sestr-y*…) or the possessive adjective *sestřin*.
25. Examples of similar structures of sign^letter compounds, with a different order of the components, can also be found in other sign languages; compare for example, -S-^PRAY 'Sunday' in Auslan (Johnston and Schembri 2007: 181) or -H-^LONG-AGO 'history', and -G-^LAND-AREA 'geography' in BSL (Sutton-Spence and Woll 1999: 229).
26. Particularly, the two variants in which the V or H handshape is used and other parameters are the same as in the sign SAME.
27. The Czech language also has two words expressing a meaning close to 'spouse'. Formally, the words only distinguish the masculine and feminine genders in some forms, while sharing the same identical forms in others; for example, in the nominative singular, the identical form is *chot'* (cf. the sentences *To je můj chot'* 'This is my husband' and *To je má chot'* 'This is my wife'). However, these words are rather bookish expressions and are not practically used as mouthings.
28. Compare, for example, the classification of some English kinship terms at WordNet (http://wordnet.princeton.edu): (direct) hypernym *parent* (in relation to *father, mother*...); (direct) hypernym *relative* (in relation to *sibling, cousin, spouse*...); (direct) hypernym *family* (in relation to *married couple*...); holonym *family* (in relation to *child, sibling, parent*) etc.

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Why is the SKY BLUE?
On colour signs in Icelandic Sign Language

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ICELANDIC SIGN LANGUAGE[2]

Icelandic Sign Language (ÍTM, Íslenskt táknmál) is the first language of approximately 300 Deaf signers in Iceland. ÍTM is an autonomous language that obtained legal status as the first language of Deaf people in Iceland in 2011. At the same time, Icelandic, ÍTMs surrounding language, obtained legal status as Iceland´s official language. There is a Deaf Association in Iceland, established in 1960, that serves as a venue for social gatherings as well as being the headquarters for the fight for Deaf rights in Iceland.

Most of ÍTMs speakers live in or around the capital (Reykjavík) and therefore there is no geographical variation between speakers. No gender variation has been attested in ÍTM but there is significant lexical, morphological and syntactic variation between age groups (see Sigurbjörnsdóttir 2011, Thorvaldsdóttir 2011, Brynjólfsdóttir 2012 and Brynjólfsdóttir and Thorvaldsdóttir 2014).

In the years 1820 to 1867 Icelandic deaf children were sent to school in Denmark (Benidiktsson and Gíslason 1869:113–114). There are no reliable resources available on deaf people or sign language in Iceland before that time. The first school for the deaf in Iceland was established in 1867 by Reverend Páll Pálsson. Pálsson had been sent to a school for the deaf in Copenhagen since he lost his hearing at a young age. There he learned to sign, presumably he learned Danish Sign Language (DTS, Dansk tegnsprog). He then regained his hearing and returned to Iceland. Later he was asked by the Icelandic government to go back to Denmark to learn the basics in teaching deaf children. When he returned yet again from Denmark he established a school for the deaf at Prestbakki rectory. His goal was to teach the children the basics of Christianity and he did that through both

writing and what was called "finger language" which was presumably the predecessor of ÍTM (Pálsson 1867, 1874a, 1874b; see also Thorvaldsson 2010). None of Pálsson´s students studied in Denmark before they attended the school in Iceland and there was no Deaf Association in Iceland at that time.

It is therefore likely that influence from DTS, if any at that time, came from the language Pálsson used. Pálsson´s successors also studied in Denmark and brought with them various techniques for teaching deaf children, e.g. Mouth-Hand system (Thorvaldsson 2010:46). Today there is no Deaf school in Iceland but many deaf children attend Hlíðaskóli, a mainstreaming school, with a sign language department.

Due to various language contact situations over time, ÍTMs relation to DTS can be seen quite clearly in a lexical comparison between ÍTM and DTS. According to Aldersson and McEntee-Atalianis (2008) there is a significant similarity between the two languages in some semantic categories, e.g. country signs, colour signs and kinship signs. Their inventory consisted of 270 signs, including 6 colour signs (*blue*, *green*, *black*, *yellow*, *red* and *white*), 12 kinship signs and an additional list of 30 country signs. They conclude that 37% of all the signs are different, 16% similar and 47% identical according to their analytic categories. No other research has been undertaken to investigate similarities between the two languages in other fields, e.g. on the syntax. When comparing the lexicon in the oldest DTS dictionary (DTS 1871) to contemporary ÍTM in the latest ÍTM dictionary (ÍTM 2012), for the purpose of the research described in this paper, there is a striking resemblance between the languages. It is therefore highly likely that this lexical relation can be traced back to the language used in the first school for the deaf in Iceland in 1867. It is also possible that the resemblance is due to other language contact situations over time, and in some cases the similarities between the languages could be due to iconicity.

In the sixties and seventies the Nordic Council of the Deaf (DNR, Døves Nordiske Råd) supervised a standardisation of signs in the Nordic sign languages; Icelandic Sign Language, Danish Sign Language, Swedish Sign Language (STS, Svensk teckenspråk), Norwegian Sign Language (NTS, Norsk tegnspråk) and Finnish Sign Language (SVK, Suomalainenviittomakieli).[3] In that time research on sign languages was at its infancy and Deaf people had no knowledge of their sign languages being real languages with a grammatical structure and their own lexicon. Some of the results of this work were published in a dictionary in 1967, Handbook for Sign Language(s), which was heavily influenced by signs from DTS (DTS 1967).[4] Iceland joined this collaboration at a later stage but ÍTMs lexicon

was influenced by this standardisation. However, this influence was not only from DTS but also from the other Nordic sign languages. Due to various language contact situation, including but certainly not exclusively the standardisation, the other Nordic sign languages have been influenced by each other (Bergman and Engberg-Pedersen 2010).

Influence from DTS is also obvious at a later stage. Signs from DTS were printed in the second ÍTM dictionary (ÍTM 1987). In the foreword, a Deaf member of the committee that worked on collecting signs for the dictionary claims that some signs in the dictionary are signs that the DNR chose as Nordic signs during the standardisation. She also states that the Danish-Sign Dictionary (DTS 1979) was used to fill in the gaps, so to speak (Gudjónsdóttir 1987). This ÍTM dictionary (ÍTM 1987) was used by parents and teachers of deaf children, most of whom did not have any knowledge of ÍTM before it was published. It can therefore be argued that the dictionary has had considerable influence on the language the children acquired.

Research on ÍTM began when the Communication Centre for the Deaf and Hard of Hearing was established in 1991 and when Sign Linguistics became a subject at the University of Iceland in 2001, research increased. Nevertheless ÍTM is still, like many other sign languages, an understudied language and only a few aspects of ÍTM grammar have been examined (see e.g. Sverrisdóttir 2000 on simultaneous events in ÍTM, Thorvaldsdóttir 2008 on the use of space in ÍTM, Thorvaldsdóttir 2011 on plain verbs and agreement verbs in ÍTM, Brynjólfsdóttir 2012 on *wh*-questions in ÍTM and Gudmundsdóttir Beck 2013 on the meaning and origins of descriptive words in sign language). For a recent overview of the grammar of ÍTM, see Brynjólfsdóttir et al. (2012).

Overview

This study focuses on colour signs in Icelandic Sign Language. In the introduction we will first discuss Berlin and Kay's (1969) model on basic colour terms in spoken languages and its applicability to sign languages. Secondly, we will address the issue of language contact and standardisation since this study reveals a clear influence from other Nordic sign languages. In section 2 we will first discuss the methodology applied in this study followed by a description of all the basic colour terms that have signs in ÍTM. In each of the colour sign subsections we will give special attention to the colour signs etymology concerning language contact and standardisation. Before

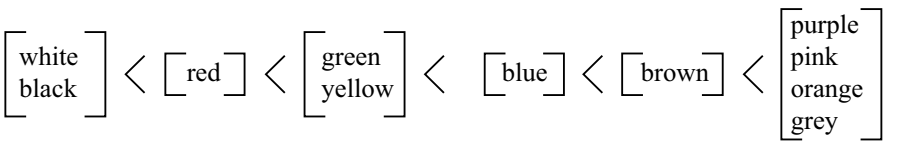
summarising section 2 we will briefly discuss how colour signs in ÍTM can be modified. In section 3 we will discuss the applicability of Berlin and Kay´s (1969) model to ÍTM colour signs, considering revisions and criticism on their model from other scholars. We will discuss further the colour signs etymology since, for the newer colour signs, the present study reveals a clear influence from the Nordic sign languages, in particular DTS. In section 4 we will conclude.

1. Introduction

1.1. Basic colour terms in spoken and sign languages

In their well-known study on colour terms, Berlin and Kay (1969) claim that there are universal tendencies and implicational hierarchies in colour terms in spoken languages. From their inventory, any given language draws its eleven or fewer colour terms. These eleven colour terms are *white, black, red, green, yellow, blue, brown, purple, pink, orange* and *grey*. Berlin and Kay's (1969:2) model claims that there are strict limitations on which categories a language encodes, if it encodes fewer than eleven basic colour categories. Their implicational hierarchy can be seen in (1).

(1) *Berlin and Kay´s (1969) implicational hierarchy*



According to Berlin & Kay, each basic colour term should exhibit the following characteristics (1969:6):

1) it should be monolexemic, the meaning should not be predictable from the meaning of its parts,
2) its signification cannot be included in that of any other colour term,
3) its application must not be restricted to a narrow class of objects,
4) it must be psychologically salient for informants.

Should there be any doubtful cases Berlin & Kay (1969:6–7) give some subsidiary criteria. These criteria are the following:

5) the doubtful form should have the same distributional potential as the previously established basic terms,
6) colour terms that are also the name of an object characteristically having that colour are suspect,
7) recent foreign loan words may be suspect,
8) in cases where lexemic status is difficult to assess, morphological complexity is given some weight as a secondary criterion.

In their reformulation of Berlin and Kay‘s model, Kay and McDaniel (1978) use fuzzy set theory to model the structure of individual colour categories. They analyse *brown, purple, pink, orange* and *grey* as derived from the other six colours, e.g. *brown* from *black* and *yellow* and *purple* from *red* and *blue*. Since the derived colour terms are not, according to Kay and McDaniel, fuzzily contained in the colours they are derived from, their signification is not included in that of any other colour term as Berlin and Kay's criterion 2) states (see further discussion in Kay and McDaniel 1978).

Not everyone agrees with Berlin and Kay's model. Wierzbicka (2008) criticises it and states that it is not correct to talk about language universals as not all languages do have the concept of colour and therefore do not have colour terms in the language. Wierzbicka argues that in Warlpiri, an Australian aboriginal language, there is no word for colour and speakers of the language do not think about colour terms when talking. Instead they describe things in terms of what they look like, like *yukuri* is 'what the earth looks like after rain'— something an English speaking person would call *green* (2008:410-411).

Some scholars have discussed how to define basic colour terms in sign languages and whether Berlin and Kay's model is in fact universal. Woodward (1989) was the first to systematically investigate colour terms across sign languages. The sign languages he examined exhibit between two and nine basic colour terms. Woodward´s conclusion is that colour signs in sign languages follow the same universal pattern found in spoken languages (1989:150).

Nyst (2007:91–97), on the other hand, claims that Berlin and Kay's model faces a methodological problem in the case of sign languages, even though she claims that Woodward (1989) might be right by saying that colour terms in sign languages follow a universal pattern. According to her there are five ways to form colour terms in sign languages; 1) derivation, 2) pointing, 3) mouthing, 4) initialisation and 5) then there are arbitrary colour signs.

Colour terms made by pointing can be said to be derived and signs made by mouthing and initialisation are influence from spoken languages, therefore non-native. Nyst (2007:92) claims the following:

> Strictly applying Berlin and Kay´s criteria, only the arbitrary colour signs (type 5) should be considered basic colour terms, as all other types of colour signs are either derived (type 1 and 2) or non-native (type 3 and 4). Yet, arbitrary colour signs are rare in sign languages and tend to refer to colours low in the hierarchy, e.g. the signs PURPLE and BROWN in NGT.

Derived colour signs in sign languages are often also the name of an object characteristically having that colour and should, according to Nyst therefore be excluded by the subsidiary criteria in Berlin and Kay's model. Hollmann and Sutrop (2010:135) argue that Nyst has taken the original definition of basic colour terms too literally. They point out that the subsidiary criteria should only be applied in situations when the status of a term is not clear after analysing it with the help of the four primary criteria (2010:135). That is, derived and non-native colour signs are only excluded by the subsidiary criteria and arbitrary signs can be excluded by the primary criteria. Hollmann and Sutrop claim that Berlin and Kay's (1969) model holds for colours terms in Estonian Sign Language as they follow their universal hierarchy. They conclude that nine colour terms in Estonian Sign Language meet the primary criteria and are basic (2010:148–149).

Colour terms in ÍTM and the applicability of Berlin and Kay´s (1969) model to colour terms in ÍTM will be discussed in section 3.1.

1.2. Language contact and standardisation

As in other languages, ÍTM´s lexicon changes over time. Generational variation in ÍTM has been attested; lexical, morphological and syntactic (Sigurbjörnsdóttir 2011, Thorvaldsdóttir 2011, Brynjólfsdóttir 2012 and Brynjólfsdóttir and Thorvaldsdóttir 2014).

Some signs in ÍTM are known as *the old signs* and are or have only been used by older signers. An example of this are the two signs for Christmas tree where one is older than the other. The older sign refers to a handmade ornament made from wood that look like a pine (see figure 1a). The newer sign and the most commonly used today is a compound of the signs CHRISTMAS and TREE and the sign CHRISTMAS refers to the outlines of a pine (see figure 1b).

a) CHRISTMAS-TREE (old sign)

b) CHRISTMAS^TREE (new sign)

Figure 1. Signs for Christmas tree in ÍTM

The terms *old* and *new* are also frequently used by signers when talking about colour signs in ÍTM and variation between older and younger signers is obvious when looking at colour signs. Most of the basic colour terms, in the terms of Berlin and Kay (1969), that have signs in ÍTM, have one new sign and one old sign. *Black*, *red* and *yellow* only have one sign each and have, according to our resources, never changed. *Pink, grey* and *orange* have more than two signs (see further discussion and figures in section 2.2).[5]

The language contact between ÍTM and DTS dates back to the nineteenth century and could have influenced the colour signs in ÍTM, both the old and the new. One explanation for the diversity of colour signs in ÍTM is the formerly mentioned standardisation of signs in the Nordic sign languages

the DNR supervised in the sixties and seventies. Before the standardisation, ÍTM had its own colour signs (the old signs) that were for the most part quite different from the Nordic colour signs. Today, some of the colour signs in the Nordic sign languages are identical or similar and that can be due to the standardisation.

The first ÍTM dictionary was published in 1976 (ÍTM 1976) and only the old ÍTM colour signs were printed in that dictionary, nearly ten years after the standardisation dictionary was published (DTS 1967). But a second ÍTM dictionary published in 1987 (ÍTM 1987) both included the old and the new colour signs. In the foreword of the second ÍTM dictionary it said that the 1979 DTS dictionary was used to fill in the gaps (Gudjónsdóttir 1987). It is quite obvious that it didn't simply do that as the DTS signs were added to the previously existing lexicon for colour terms in ÍTM. In the latest ÍTM dictionary (ÍTM 2012) only the new colour signs appear. It is therefore reasonable to maintain that DTS had quite an influence on ÍTM colour signs.

1.3. Summary

In section 1 we have introduced Berlin and Kay´s (1969) model on basic colour terms in spoken languages and how it applies to sign languages according to Woodward (1989), Nyst (2007) and Hollmann and Sutrop (2010). We then explained ÍTMs language contact situation and that the colour signs in ÍTM could have been influenced by the other Nordic sign languages, in particular DTS, pre, post and during the standardisation lead by the DNR. In the next section we will start with a methodology discussion and then account for all the basic colour terms that have signs in ÍTM and compare them with colour signs in the other Nordic sign languages.

2. Colour terms in ÍTM

2.1. Methodology

The aim of this study is to inventarise the colour signs in ÍTM, both old and new, to interpret our descriptive findings in the context of Berlin and Kay's model, and evaluate the role of language contact, in particular, the influence of DTS.

This study started with a questionnaire on kinship terms, colour terms and numerals from the iSLanDS Centre. We used the data elicited for that

purpose in our present study but we also added both naturalistic and elicited data. The data used in this study is from 21 speakers of ÍTM, 10 women and 11 men, ranging from 28 to 84 years of age. Not all 21 speakers contributed to all of the following data.

The elicited data for the questionnaire is from two Deaf informants. They were set various tasks concerning colour terms and were also asked to produce the colour sign for 40 different colours after looking at different colour cards (colour naming task). We then asked two other Deaf informants to do the colour naming task for the same 40 colour cards.

We came across a recently videotaped interview with a Coda in her eighties, the only hearing person in her family, where she produced the colour signs she and her family used when she was a young girl. We then undertook interviews with three Deaf informants on colour signs, to find out how they distinguish between old and new colour signs and to consult them on the colour signs applications concerning Berlin and Kay´s (1969) model. We also had 16 Deaf informants do a list task, that is, to produce all the colour signs they could, within 2 minutes, to check which colour terms were psychologically salient for the informants and what colour term they would name first. Some of them were also asked to point to a colour card when asked about a specific colour sign to check if informants thought of the same colour when using the old and the new sign for that colour. Eleven of those were asked by a Deaf interviewer whilst the other five met with Thorvaldsdóttir.

To evaluate the role of language contact, in particular the influence of DTS, we compared both the old and the new colour signs in ÍTM to colour signs in DTS in various dictionaries from both languages. We also used dictionaries from the other Nordic sign languages to be able to assess the extent of the standardisation and possible influence on ÍTM from Nordic sign languages other than DTS.

Comparing entries in dictionaries can be a questionable methodology due to many factors, e.g. it matters whether the Deaf community actually used the signs in the dictionaries, whether the editors of the dictionaries were hearing or Deaf, and what the purpose of the dictionaries was. All these factors have to be taken into account but this method can be justified by the fact that signs from other dictionaries influenced the ÍTM dictionary, as stated by the committee member in the foreword of the second ÍTM dictionary (ÍTM 1987). It is therefore interesting to compare dictionaries from all the Nordic sign languages.

We used the three published ÍTM dictionaries (ÍTM 1976, 1987, 2012) and five DTS dictionaries (DTS 1871, 1907, 1926, 1979, 2008). We also

used the standardisation handbook that was influenced by DTS (DTS 1967).[6] We then used online NTS, STS and SVK dictionaries (NTS 2011, STS 2013, SVK 2013). They only contain contemporary language and can therefore not tell us anything assertive about how old the signs are and if they were used both pre and post the standardisation.[7]

To compare the colour signs in ÍTM to other Nordic sign languages we used Aldersson and McEntee-Atalianis´ (2008) analytic categories. They focused on three parameters; hand configuration, location and movement. They included the orientation of the hand in the hand configuration and excluded the mouthing since it had little or no weight in the comparison. According to them, a sign from one language is identical to a sign from the other language if all three parameters are the same.[8] Similar signs share two parameters in common but differ in the third and different signs are signs where two or all parameters are different (2008:57–58).

2.2. Basic colour terms

Berlin and Kay (1969) claim that no language has more than eleven basic colour terms. ÍTM has signs that stand for each of these eleven colour terms and we claim that they are all basic (see further in section 3.1). In the following subsections we will inventarise the colour signs of ÍTM and describe their semantic relation to other signs in ÍTM or the real-world, e.g. the new sign for blue is identical to the sign for sky. In section 3.1 we will interpret our descriptive findings in the context of Berlin and Kay´s model.

Most of the colour terms have both old and new signs in ÍTM. All the old ÍTM colour signs appear in the first ÍTM dictionary (ÍTM 1976). Both the old and the new ÍTM colour signs appear in the second ÍTM dictionary (ÍTM 1987) and only the new ÍTM colour signs appear in the latest ÍTM dictionary (ÍTM 2012).[9]

No data is available to confirm the origin of the old colour signs. We will therefore describe all the ÍTM colour signs, both old and new, but only speculate on the origin of the new signs and the signs that have never changed.[10] To evaluate the role of language contact, in particular the influence of DTS, we will compare the ÍTM colour signs to colour signs in various DTS dictionaries using Aldersson and McEntee-Atalianis´ (2008) analytic categories (see also section 2.1). We will also compare the ÍTM signs to signs in NTS, STS and SVK dictionaries to evaluate the influence of the Nordic sign language standardisation (see also section 1.2).

2.2.1. WHITE

There are two signs for the colour *white* in ÍTM. The older sign is two-handed and that sign is identical to an old sign for snow in ÍTM, see figure 2. The semantic relation between those two older signs is that snow is white. The newer and more commonly used colour sign is a one-handed sign that is non-iconic and has no semantic relation to another sign in ÍTM, see figure 3.

Figure 2. WHITE and SNOW in ÍTM (old signs)

Figure 3. WHITE in ÍTM (new sign)

The DTS dictionaries show that the sign WHITE in DTS has stayed the same, at least since 1871 (DTS 1871, 1907, 1926, 1979, 2008). According to Aldersson and McEntee-Atalianis´ (2008) analysis, the sign WHITE in DTS is different from the new sign WHITE in ÍTM, see figure 4 (DTS 2008).

Figure 4. WHITE in DTS[11]

The origin of the new sign WHITE in ÍTM is unknown but it may have originated in the making of the second ÍTM dictionary (ÍTM 1987). It first appears in that dictionary, the dictionary that is claimed to have been influenced by DTS. The old sign is also in that dictionary but it does not appear in the latest dictionary (ÍTM 2012) and is only used by a few old speakers of ÍTM today. In the 1907 DTS dictionary it states that the DTS sign refers to a white collar or the chalk that a teacher would dust of his/her clothes (DTS 1907:16). The new ÍTM sign's place of articulation is the same as in the DTS sign but the other parameters are different. Some signers use a repeated movement but others use a single movement. The former is the same movement as in the sign WHITE in DTS and makes the signs similar according to Aldersson and McEntee-Atalianis´ (2008:63) analysis. The ÍTM sign could have been borrowed from DTS and then changed phonologically but nevertheless it is not a clear example of a borrowing from DTS.

Figure 5. WHITE in STS and SVK[12]

Figure 6. WHITE in NTS[13]

The new sign WHITE in ÍTM is similar to the sign WHITE (or one of the signs for *white*) in NTS, STS and SVK (NTS 2011, STS 2013, SVK 2013), see figures 5 and 6.

Since ÍTM had an old sign for *white* before the standardisation it is likely that the new ÍTM sign for *white* was borrowed from any of the Nordic sign languages and then changed phonologically. No documentation is available to confirm which language influenced another during the standardisation.

2.2.2. BLACK

There is only one sign for the colour *black* in ÍTM and no other sign has been used for that colour in ÍTM. The sign BLACK in ÍTM is a one-handed sign that is semantically and phonologically related to the signs NIGHT and DARK in ÍTM, see figures 7–9.

Figure 7. BLACK in ÍTM

Figure 8. NIGHT in ÍTM

Figure 9. DARK in ÍTM

Those three signs are all articulated in a very similar way. NIGHT and BLACK are the same except NIGHT is a two-handed sign. DARK is a two-handed sign as well but with a slightly different handshape (5 instead of B). Informants say that the colour sign is derived from either of the other two signs.

The contemporary signs DARK and EVENING in DTS and DARK and NIGHT in NTS and STS are identical to the sign NIGHT in ÍTM (DTS 2008, NTS 2011, STS 2013).The sign for BLACK in ÍTM is identical to the sign BLACK in DTS in all the DTS dictionaries except for the latest one (DTS 1871, 1907, 1926, 1979, 2008). There are three signs for the colour *black* exhibited in the 1979 DTS dictionary (DTS 1979), one of those is identical to the sign BLACK in ÍTM, the others are different.[14] The identical sign is not commonly used in contemporary DTS and is not in the latest DTS dictionary (DTS 2008)[15] but since the origins of the DTS sign can be traced all the way back to 1871 it is possible that Reverend Pálsson brought this sign with him from Denmark. The ÍTM sign is also identical to the sign BLACK in contemporary NTS and STS, but different from the SVK sign (NTS 2011, STS 2013, SVK 2013). Another possible explanation for this similarity is that the iconic and semantic relation between darkness, the night and the colour *black* in the Nordic sign languages,[16] which could easily have originated in each language independent of the other.

2.2.3. RED

There is only one sign for the colour *red* in ÍTM and no other sign has been used for that colour in ÍTM. The sign RED in ÍTM is a one-handed sign, see figure 10. The signs place of articulation is just below the lower lip and the sign is semantically related to the sign MOUTH, see figure 11. There is an iconic relation between the sign RED and the colour of the lips.

Figure 10. RED in ÍTM

Figure 11. MOUTH in ÍTM

The sign RED in DTS and NTS is similar, almost identical, to the sign RED in ÍTM, the movement is slightly different, see figure 12.[17] In the ÍTM sign the hand moves from its contralateral side to its ipsilateral side, in the DTS and NTS signs the hand moves the other way around, it moves from its ipsilateral side to its contralateral side (see e.g. DTS 2008 and NTS 2011). According to the dictionaries, the DTS sign RED has stayed the same since 1871 (DTS 1871, 1907, 1926, 1979, 2008).

Figure 12. RED in DTS and NTS

Figure 13. RED in STS

Figure 14. RED in SVK

The signs for *red* in many other sign languages, e.g. STS, SVK, ASL and BSL, have the same initial place of articulation and the same or similar initial handshape as the ÍTM sign, but different orientation and movement depending on the language (STS 2013, SVK 2013, ASL 2008, BSL 2011), see figures 13 and 14 for the STS and SVK signs.

Even though the ÍTM sign could have been borrowed from DTS in late nineteenth century or from either DTS or NTS during other contact situations though time it is far more likely that the similarity is an artefact of iconicity since the signs for *red* in other sign languages seem to have the same semantic relation to the colour of the lips as the ÍTM sign.

2.2.4. GREEN

There are two signs for the colour *green* in ÍTM. The older sign is a one-handed sign with a circling movement, see figure 15. The new sign GREEN is a two-handed sign with one hand active, see figure 16.

Figure 15. GREEN in ÍTM (old sign)

Figure 16. GREEN in ÍTM (new sign)

As for the old sign, informants do not recall any semantic relation to another sign or an iconic relation to the real-world. The new sign is iconic in that way that it literally means 'to cut grass' and is derived from how grass was cut with a scythe. The present sign TO-CUT-GRASS is similar to the new sign for *green*, see figure 17. The semantic relation lies in the colour of the grass that is typically green.

Figure 17. TO-CUT-GRASS in ÍTM

Both the old and the new sign are used in contemporary ÍTM but the old sign is mostly used by older or middle aged signers whereas the new sign is used by younger generations and middle aged signers.

There are three signs for the colour *green* in DTS, see figure 18. The sign in 18c is the most commonly used in contemporary DTS but first appears in a dictionary in 1979 (DTS 1979, 2008).[18] That sign is different from the new ÍTM sign and has no obvious relation to it.[19] The new ÍTM sign is different from the sign in 18a but similar to the sign in 18b.[20] One of the signs for *green* in STS and SVK are identical to the new ÍTM sign. The other STS and SVK signs and the NTS sign are different from the new ÍTM sign (NTS 2011, STS 2013, SVK 2013).

(a) (b) (c)

Figure 18. GREEN in DTS

The sign in figure 18a is the only sign for *green* in the three oldest DTS dictionaries (DTS 1871, 1907, 1926). A change in palm orientation and movement of the sign GREEN in DTS, as can be seen in the signs in 18a and 18b, occurred sometime mid-twentieth century. The sign in 18b appears in the Handbook for Sign Language(s) (DTS 1967) and in the Danish-Sign Dictionary (DTS 1979). This change in the DTS sign could be a result of the standardisation and a possible loan from STS or SVK. The new ÍTM sign first appears in the second ÍTM dictionary (ÍTM 1987) and could therefore have entered ÍTM during the standardisation as a loan from STS or SVK. It could also have been borrowed from DTS after DTS borrowed it from another Nordic sign language during the standardisation. It is nevertheless noteworthy to mention that informants say that the new sign GREEN in ÍTM is derived from the act of cutting grass and therefore originated in ÍTM.

2.2.5. YELLOW

The sign YELLOW in ÍTM is a two-handed sign with one hand active, see figure 19. Informants say that the sign YELLOW is derived from the sign CHEESE because the articulation of the sign refers to cutting cheese, see figure 20.

Figure 19. YELLOW in ÍTM[21]

Figure 20. CHEESE in ÍTM

The signs YELLOW and CHEESE have the same movement, the same handshapes and the same location but different orientation. The semantic relation lies in the fact that cheese is typically yellow.

There is no older sign for *yellow* in ÍTM and the present sign YELLOW was therefore a part of the ÍTM lexicon before the standardisation of Nordic signs and the making of the second ÍTM dictionary (ÍTM 1987). It is then noteworthy to mention that the sign CHEESE in DTS is similar to the sign CHEESE in ÍTM (DTS 2008). On the other hand the signs for *yellow* in all the DTS dictionaries are different from the sign YELLOW in ÍTM.[22] The DTS signs are said to be related to the act of squeezing a lemon (DTS 1907, 1926, 1967).[23] The signs for *yellow* in NTS, STS and SVK are also different from the ÍTM sign (NTS 2011, STS 2013, SVK 2013).

Due to the similarity found in the signs for cheese in ÍTM and DTS the sign CHEESE in ÍTM could have been borrowed from DTS prior to the seventies, possibly in the nineteenth century. But the dissimilarity between the signs for *yellow* in ÍTM and the other Nordic sign languages indicates that the sign YELLOW originated in the productive lexicon of ÍTM itself. Since there is a semantic relation between the signs YELLOW and CHEESE in ÍTM, unlike DTS, the sign CHEESE could be an artefact of iconicity in ÍTM itself and the sign YELLOW derived from that sign due to the semantic relation to the colour of the cheese.

2.2.6. BLUE

There are two signs for the colour *blue* in ÍTM, one old and one new, see figures 21 and 22. The new sign is far more frequently used, only older signers use the old sign. Both signs are one-handed. The old signs place of articulation is around the eyes, see figure 21. The new signs place of articulation is in neutral space, see figure 22.

Figure 21. BLUE in ÍTM (old sign)[24]

Figure 22. BLUE in ÍTM (new sign)

There is an iconic relation between the old sign and the colour of the eyes and our informants say that the semantic relation lies with the stereotype of Northern-Europeans commonly being blond and blue eyed. The same could also be true for STS and SVK as the initial place of articulation in the signs for *blue* in those languages is also around the eyes (STS 2013, SVK 2013), see figure 23.

Figure 23. BLUE in STS and SVK

ÍTM has an old and a new sign for sky, see figures 24 and 25.[25] Informants say that the new sign for *blue* is derived from the either of those signs. According to Aldersson and McEntee-Atalianis´ (2008) analytic categories the old sign for sky is similar to the new sign for *blue* and the new signs for sky and *blue* are identical. The semantic relation lies in the fact that the sky is typically blue.

There are two signs for the colour *blue* in DTS and one of them is found in all the DTS dictionaries except the latest one (DTS 1871, 1907, 1926, 1979). That sign and the sign SKY in DTS are identical to the new signs for sky and *blue* in ÍTM (see figure 22 and 25). The other DTS sign for *blue* is different from the new ÍTM sign but it is more commonly used in contemporary DTS (DTS 2008).[26]

There are also two signs for *blue* in NTS where one is identical to the new ÍTM sign for *blue*, the other is different. The sign for sky in NTS is similar to the old ÍTM sign for sky.

The fact that ÍTM had old signs for *blue* and sky before the standardisation of Nordic signs and the making of the second ÍTM dictionary (ÍTM 1987) could indicate that the new ÍTM signs were borrowed from DTS during or after the standardisation. It is also possible that the sign for *blue* was borrowed from NTS during the standardisation. The fact that ÍTM had an old sign for sky, similar to the DTS and NTS signs for *blue* could have made the borrowing semantically and phonologically easier. But the fact that there is an iconic and semantic relation between the signs for sky and *blue* in all the three languages, the signs for *blue* could easily have originated in each language independent of the other.

Figure 24. SKY in ÍTM (old sign)

Figure 25. SKY in ÍTM (new sign)

2.2.7. BROWN

There are two signs for the colour *brown* in ÍTM. The new sign is more commonly used but the older one is used by older and some middle aged signers. Both are two-handed signs with an A-handshape on the dominant hand but the handshape of the non-dominant hand is different in the

two signs. The old sign is identical to the sign COFFEE in ÍTM (see figure 26) whereas the new sign is identical to the sign for COCOA (see figure 27).

Both coffee and cocoa are typically brown, and there lies the semantic relation. Informants say that both signs for *brown* and the sign COCOA are derived from the sign COFFEE.

There are also two signs for the colour *brown* in DTS and they are identical to the two signs in ÍTM. The sign that is identical to the sign in figure 26 is found in dictionaries from 1871, 1926 and the latest one (DTS 1871, 1926, 2008). The other sign is found in the 1979 dictionary and in the Handbook for Sign Language(s) (DTS 1967, 1979), see figure 27. The signs for coffee and *brown* in NTS are identical to the old ÍTM sign for *brown* in figure 26 and the signs for cocoa are similar in NTS and ÍTM (NTS 2011), see figures 27 and 28. The signs for *brown* in STS and SVK are different from the ÍTM sign (STS 2013, SVK 2013).

Figure 26. BROWN (old sign) and COFFEE in ÍTM

Figure 27. BROWN (new sign) and COCOA in ÍTM

Figure 28. COCOA in NTS

It is unlikely that the old ÍTM sign (that can also mean coffee) was borrowed from either DTS or NTS since the sign for coffee in many other sign languages is identical to the ÍTM sign, e.g. in STS, SVK and ASL (STS 2013, SVK 2013, ASL 2008). The new sign for *brown* (that can also mean cocoa) is on the other hand likely to have been borrowed from DTS during or after the standardisation. The reason for the DTS sign changing is unknown but the NTS sign for cocoa could have had an influence on the Nordic sign chosen for the standardisation handbook (DTS 1967), and therefore influenced ÍTM and DTS.

2.2.8. PURPLE

The colour term *purple* in ÍTM has two signs, both one-handed, see figures 29 and 30. The place of articulation in both signs is around the eyes and informants say that there is a semantic relation between the colour signs and a black-eye (or possibly periorbital circles). The iconic relation is that black-eyes are commonly purple, even though they can surely take on other colours, like the English term implies. One informant says that there is also a semantic and phonological relation between the old signs for *purple* and *blue*, see figures 21 and 29. The old sign is only used by a few older signers.

Figure 29. PURPLE in ÍTM (old sign)

Figure 30. PURPLE in ÍTM (new sign)

The sign for *purple* in the standardisation handbook (DTS 1967) is a compound of the signs for *blue* and *red* and is different from the current sign for *purple* in all the Nordic sign languages. Nevertheless the current signs for *purple* in ÍTM, DTS, NTS and SVK (ÍTM 2012, DTS 2008, NTS 2011, SVK 2013) are identical and the sign could therefore be a neologism made by the

DNR during the standardisation but after the handbook was published. The sign for *purple* in STS is on the other hand different (STS 2013).

2.2.9. PINK

There are three signs for the colour *pink* in ÍTM, one new and two older, all one-handed signs, see figures 31 and 32. The place of articulation of the older signs (figure 31) is the lower lip or just below the lower lip and like the sign RED they are semantically related to the sign MOUTH and they also refer to the colour of the lips, see figures 10 and 11. These signs are rarely used for the colour *pink* in ÍTM today.[27] The new sign (figure 32) is articulated on the cheek and the semantic relation is that the cheeks become pink when blushing.

(a)[28] (b)

Figure 31. PINK in ÍTM (old signs)

Figure 32. PINK in ÍTM (new sign)

The new sign is identical to the sign PINK in DTS, NTS[29] and SVK and seems similar to the sign PINK in STS, but according to Aldersson and McEntee-Atalianis´ (2008) analytic categories they are different, see figure 33 (DTS 1979[30], 2008, NTS 2011, STS 2013, SVK 2013).

Figure 33. PINK in STS

There is no sign for *pink* in the standardisation handbook (DTS 1967) but since the current signs for *pink* in all the Nordic sign languages are identical or similar the sign could be, like the sign PURPLE, a neologism made by the DNR during the standardisation but after the handbook was published.

2.2.10. ORANGE

There are three signs for the colour *orange* in ÍTM. They are all one-handed and are articulated near the lower face, see figures 34–36.

Figure 34. ORANGE in ÍTM (old sign)

Figure 35. ORANGE in ÍTM (old/new sign)

Figure 36. ORANGE in ÍTM (new sign)

The sign in 34 is the oldest and it appears in the first two ÍTM dictionaries but not in the latest ÍTM dictionary (ÍTM 1976, 1987). This sign was both used to refer to the fruit orange and the colour of the fruit. Most signers that use it, use it with a different place of articulation (on the cheek instead of the chin), it is rarely used the way it appears in the dictionaries.

The sign in 35 only appears in the second ÍTM dictionary (ÍTM 1987) and is considered younger than the sign in figure 34 but is only used by a few middle aged signers today. It cannot refer to the fruit but it can refer to the colour and a specific orange coloured soda drink. This sign is similar to the DTS colour sign ORANGE (DTS 1979, 2008), the place of articulation differs, see figure 37.

Figure 37. ORANGE in DTS

The sign in figure 36 is the youngest of the three. It first appears in the latest dictionary (ÍTM 2012) but it is considered much older than that. This sign can refer to both the fruit and the colour, the same as the old sign in

figure 34. This sign is different from the signs for *orange* in all the Nordic sign languages (DTS 1979, 2008, NTS 2011, STS 2013, SVK 2013) and cannot have been borrowed.

The semantic relation between the fruit and the colour, in both the new sign in 36 and the old sign in figure 34, lies in the fact that oranges are orange. Their origin is most likely an artefact of iconicity. The semantic relation between the fruit and the sign in 35 on the other hand cannot be found in ÍTM. It can be found in DTS since the DTS sign can both refer to the fruit and the colour.[31] The ÍTM sign in figure 35 is therefore a clear example of a borrowing from DTS. Interestingly, today all the ÍTM signs are articulated on or near the cheek, the oldest signs place of articulation has changed from the chin to the cheek and the sign borrowed from DTS changed its place of articulation from the eyes to the cheek.

2.2.11. GREY

There are three signs for the colour *grey* in ÍTM, all two-handed, see figures 38–40. Their place of articulation is similar, that is the non-dominant hand (figures 39 and 40) and the arm of the non-dominant hand (figure 38). According to our informants the signs for *grey* in ÍTM have no semantic relation with objects or body parts.

Figure 38. GREY in ÍTM (old sign)[32]

Figure 39. GREY in ÍTM (old/new sign)

The sign in figure 38 is used by old signers. It appears in the first two ÍTM dictionaries (ÍTM 1976, 1987) but not in the latest dictionary (ÍTM 2012). This sign is different from all the signs for *grey* in all the other Nordic sign languages.

The sign in figure 39 does not appear in any of the ÍTM dictionaries but in the interviews our informants mentioned this sign when asked to sign the old colour signs and in the list task some informants used this sign. It is not commonly used in ÍTM today. It is identical to one of the two DTS signs for *grey* in the 1979 dictionary (DTS 1979) and one of the two signs for *grey* in STS. It is similar to the sign for *grey* in SVK[34] and the sign for *grey* in the standardisation handbook (STS 2013, SVK 2013, DTS 1967).[35]

The sign in figure 40 is the most commonly used sign for *grey* in ÍTM today. It first appears in the latest dictionary (ÍTM 2012) but it is considered much older than that. This sign is similar to the other sign of the two for *grey* in DTS and STS (DTS 2008, STS 2013), see figures 41 and 42, but different from the signs for *grey* in SVK and NTS (SVK 2013, NTS 2011).

Figure 40. GREY in ÍTM (new sign)[33]

Figure 41. GREY in DTS

Figure 42. GREY in STS

Even though there is no data to confirm it, the lack of it tells us that the ÍTM sign in figure 39 is clearly a borrowing, either from DTS or STS. The

movement, in case of DTS, and the orientation, in case of STS, is different from the ÍTM sign in figure 40. That sign is obviously influenced by either or both languages but not a clear example of borrowing. A sign for *grey* could have been made during the standardisation and then changed phonologically in each language.

2.3. Modifications of colour terms

The results of the colour naming task, the list task and the interviews show that modifications of colour terms in ÍTM are articulated with additional signs and non-manuals or only non-manuals.

To describe brighter, stronger, paler, lighter or darker colours the adjectives BRIGHT, STRONG, PALE, LIGHT or DARK, according to the data, appear either before or after the basic colour term, depending on signers, independent of their age and gender. Some signers also add the sign A-LITTLE before one of these adjectives if the difference in shade of colour is slight e.g. A-LITTLE DARK BLUE. In some cases informants use two additional adjectives to describe the colour, e.g. STRONG BRIGHT BLUE, PALE BRIGHT BLUE, BRIGHT LIGHT GREEN and PALE LIGHT YELLOW. The order within the AP is unclear in the data but when informants use two of the adjectives mentioned above they both appear before the basic colour term. In cases where STRONG appears with BRIGHT it seems to emphasise the brightness of the colour. In other cases, informants use the signs BRIGHT and STRONG to describe the same modification of a colour. Informants also use the same adjective for different purposes, e.g. PALE and LIGHT can be used for the purpose of describing a pale or light colour that is neither strong nor bright but they can also be used to describe a pale or light colour that is either strong or bright.

When articulating the colour term or the additional adjective, the movement can be modified. With the signs BRIGHT, STRONG and DARK the movement is speeded the brighter, stronger or darker the colour is. With the signs LIGHT and PALE the movement is slowed down.

When a colour is compared with another colour the basic colour referred to is articulated before the colour it is being compared with, e.g. GREEN BLUE refers to a colour that is 'bluish green' but BLUE GREEN refers to a colour that is 'greenish blue.'[36]

According to the data, four basic colour terms can be modified by a preceding noun to compare a colour with the colour of a specific object. These are modifications of the colour terms *red, green, blue* and *pink*. The

colour 'red like wine' is signed either with the sign WINE before or after the basic colour term. The colour 'green like moss' is signed by finger spelling the Icelandic word *mosi* (moss) and then signing the basic colour term GREEN. The colour 'blue like the sea' is signed by articulating the sign SEA before the basic colour term. Only a small group of signers describe a specific kind of the colour *pink* by comparing it to the female genitalia. As in M-O-S-S GREEN and SEA BLUE the noun also precedes the colour term. Like with basic colour terms the adjectives BRIGHT, STRONG, PALE, LIGHT and DARK can either appear before or after the colour term, e.g. LIGHT M-O-S-S GREEN or RED WINE PALE.

The citation forms of the basic colour terms have neutral non-manuals. According to the data, when a basic colour term is modified, informants add non-manuals that describe the degree of the modification. The brighter or stronger the colour is, the more informants will widen their eyes,[37] the lighter or paler the colour is the more informants squint their eyes and the darker the colour is the more informants frown. According to the data, the non-manuals can be added to the basic colour terms but if an additional adjective is used the non-manuals usually only accompany that.

2.4. Summary

In section 2 we discussed the methodology used in this study on colour terms in ÍTM. We described all basic colour terms that have signs in ÍTM and compared them with their equivalents in the other Nordic sign languages. Each subsection ended with a discussion on the signs etymology.We also discussed the modifications of colour terms according to our data. The etymology will be discussed further in section 3. Section 3 will start with a clarification of what colour terms in ÍTM meet Berlin and Kay´s criteria and a discussion on the models applicability to ÍTM.

3. Discussion

3.1. Basic colour terms in ÍTM

As discussed in section 1.1 Berlin and Kay (1969) claim that any given language has eleven or fewer basic colour terms that follow an implicational hierarchy. As we have shown in section 2.2 ÍTM has signs for all these eleven colour terms, in most cases both old and new signs. According to the

colour naming task and interviews with Deaf informants (see section 2.1 on methodology) all the signs for the eleven colour terms, both the old and the new, meet the first three criteria of Berlin and Kay's model. All the signs are monolexemic, their signification is not included in that of any other colour term and the colour terms are not restricted to a narrow class of objects.

The saliency of the colour terms was tested with the list task. Sixteen informants named altogether 291 colours, 222 of them were monolexemic signs. All informants named the same colour more than once and some named a variant of the same colour (see section 2.3 for modifications of colour terms). Indices of psychological salience include among others, according to Berlin and Kay (1969:6), "a tendency to occur at the beginning of elicitated lists of colour terms." All the monolexemic colour terms, except for *grey* and *brown*, appear as one of the first three colour terms named by the informants. The colour term *red* is most often named first in the list task and it is also the most frequent of first three colour terms named by informants, see table 1:

Table 1. The first three colour terms informants named in the list task

	1st	**2nd**	**3rd**	**First three colour terms, total**
Red	8	3	5	16
Blue	3	5	1	9
Black	2	3	1	6
White	2	3	1	6
Yellow	1	2	1	4
Green	0	0	3	3
Purple	0	0	2	2
Orange	0	0	1	1
Pink	0	0	1	1
Brown	0	0	0	0
Grey	0	0	0	0

The colour terms *black, yellow* and *blue* were named by all the sixteen informants, *white, red, green, brown, purple* and *grey* were named by all except one informant (different informant in each case), *pink* was named by twelve informants and orange by eleven.

Even though *brown* and *grey* were not the first three colour terms named by informants they are nevertheless named by fifteen informants, like the colour term *red*, which had the tendency to occur at the beginning of the list.

Therefore *brown* and *grey* are salient for informants along with the other nine colour terms. According to the first four criteria of Berlin and Kay's model (1969) there are eleven basic colour terms in ÍTM.

According to Nyst (2007:92) only arbitrary signs should be considered basic colour terms and she claims that arbitrary colour signs are rare in sign languages. Four of the eleven (basic) colour terms, *white, green, orange* and *grey,* have arbitrary signs and should according to Nyst's claims, be the only basic colour terms in ÍTM.[38] All other colour signs in ÍTM are derived and should therefore be excluded by the subsidiary criteria.[39] Nyst also claims that arbitrary colour signs tend to refer to colours low in the hierarchy. The colour terms *white, green, orange* and *grey* appear in different stages in the hierarchy. Nyst´s claims do therefore not hold for ÍTM.

Following Hollmann and Sutrop (2010) we argue that only in situations when the status of a term is not clear after analyzing it with the help of the four primary criteria, the subsidiary criteria should be applied.

3.2. Influence from Danish Sign Language

ÍTM is an autonomous language, separate from DTS. Nevertheless it has clearly been influenced by DTS as the present study reveals (see also Aldersson and McEntee-Atalianis 2008). There is a clear influence on colour signs from the Nordic sign languages, in particular DTS, at least for the newer colour signs in ÍTM.

Several factors in the history of ÍTM may have had an influence on language contact. The standardisation of the Nordic sign languages is obviously a factor, but the reason for DTS being our main focus in the comparison of ÍTM colour signs to their equivalents in other sign languages is the language contact between the two languages since mid-nineteenth century. Before 1867 deaf Icelanders were sent to school in Denmark, among them Pálsson who was the first teacher of the deaf in Iceland. None of the students that were sent to Denmark later became students at the first school in Iceland and are therefore unlikely to have had an influence on the language spoken in the school. On the other hand Pálsson can easily have brought some signs from DTS when he returned from Denmark and they then influenced the language emerging at the school, presumably the predecessor of ÍTM.

In their overview of the transmission of the Nordic sign languages, Bergman and Engberg-Pedersen (2010) imply that a possible genetic relation is between DTS and the sign languages spoken in Iceland, Greenland and the Faroe Islands due to the fact that children from all those countries

were sent to school in Denmark in the nineteenth and twentieth century. DTS is also said to have had an influence on NTS. The history of the first years of Deaf education in Norway is practically identical to the first years of Deaf education in Iceland. The first teacher of deaf children and the founder of the first school for the deaf in Norway, Andreas Christian Møller, studied in Denmark. In Schröder´s (1993) overview of the history of Norwegian Sign Language he assumes that the origin of Norwegian Sign Language is of three sources; from the manual communication between Deaf Norwegians before the establishment of the school, from Danish Sign Language through Møller and from Swedish Sign language through a Swedish Deaf teacher at the school. Bergman and Engberg-Pedersen (2010:94) conclude that the relationship between DTS and NTS is one of borrowing rather than a genetic relation.

Aldersson and McEntee-Atalianis´ (2008) study shows that DTS has had an influence on ÍTM´s lexicon. The historical facts about Deaf education in Iceland and its similarity to the history of Norwegian Sign Language support that the relationship between ÍTM and DTS is one of borrowing, like with DTS and NTS. The present study also reveals a clear influence from DTS on ÍTM colour signs, but since the influence is only apparent in the new signs, it is clearly an influence in terms of borrowing and not a genetic relation.

In this study we compared entries in various dictionaries to be able to estimate when influence from the other Nordic sign languages appears in ÍTM. The study reveals that the old signs in ÍTM are unlikely to have been borrowed from DTS. Nevertheless we cannot leave out the fact that due to language contact in the early and mid-nineteenth century, the language used in the first school for the deaf in Iceland may have been influenced by DTS. Therefore the significant intelligibility between the old sign for *brown* and the signs BLACK and RED (that have never changed) in ÍTM and their equivalents in DTS can, in theory, be traced back to DTS. Nothing in the history of ÍTM and its contact with the other sign languages leads to any influence from the other Nordic sign languages on the old ÍTM colour signs. Nevertheless all these signs are intelligible to their equivalents in the other Nordic sign languages, as well as other sign languages. Our conclusion is that this is an artefact of iconicity and the signs could easily have originated in each language independent of the other. For the newer signs, things are a bit more complicated.

There are eight basic colour terms that have new signs in ÍTM and two of them have a third sign where their time of origin is unclear (later called "*middle aged*" signs). All those signs are either identical or similar to various DTS colour signs found in the DTS dictionaries. In some of the

DTS dictionaries there is more than one colour sign for some colour terms. In the charts in 1) and 2), in cases where there is more than one sign for the same colour term, we only include the sign that has the most resemblance to the ÍTM signs. The chart in 1) shows the resemblance between all the colour signs in ÍTM and DTS except for ORANGE, PURPLE and PINK since signs for *purple* and *orange* first appear in the 1967 DTS dictionary and a sign for *pink* first appears in the 1979 DTS dictionary (DTS 1967, 1979).

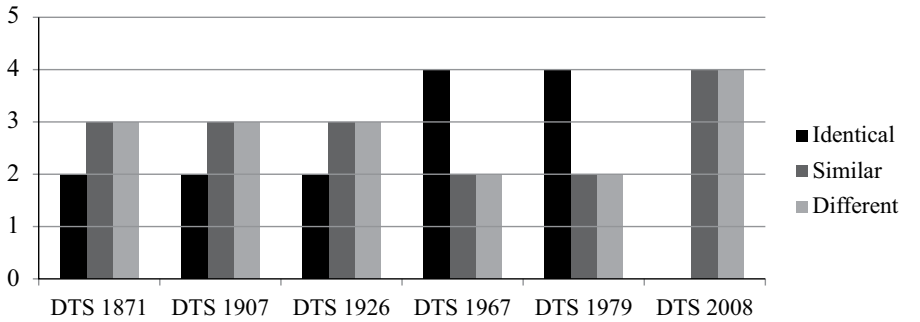


Chart 1. Eight colour signs in DTS dictionaries compared with new and middle aged signs in ÍTM.

What the chart in 1) shows is that the new and middle aged signs in ÍTM resemble the DTS signs more in the nineteenth and twentieth century than today. The standardisation period seems to have had the most impact on the borrowing of colour signs in ÍTM. The DTS colour signs seem to have changed after the 1979 DTS dictionary was published (DTS 1979) and today none of the eight ÍTM colour signs in question are identical to their equivalents in contemporary DTS.

In the chart in 2) the colour terms *orange, purple* and *pink* have been added. This chart shows an even more resemblance between ÍTM and DTS colour signs in the standardisation period that continues on to the twentieth century.

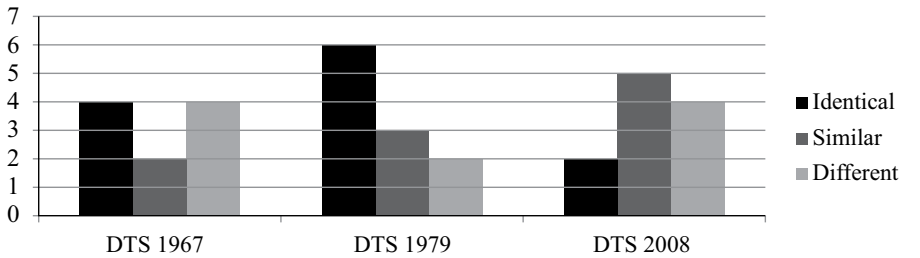


Chart 2. Eleven colour signs in DTS dictionaries compared with new and middle aged signs in ÍTM[40]

Some of the colour signs that are identical or similar to the DTS signs are also identical or similar to colour signs in NTS, STS and SVK. Since ÍTM had old signs for all these colour terms before the standardisation we cannot conclude that the new ÍTM colour signs are solely influenced by DTS but they can also be neologisms made by the DNR or influence from the other Nordic sign languages, during the standardisation.

The new signs WHITE, PURPLE, PINK and GREY and the middle aged sign for *orange* are clear examples of borrowing, either from DTS for the purpose of the second ÍTM dictionary (ÍTM 1987) or from the other Nordic sign languages during the standardisation. The middle aged sign for *grey* does not appear in any of the ÍTM dictionaries and is therefore not a clear example of a borrowing from DTS for the purpose of the second ÍTM dictionary (ÍTM 1987). It might nevertheless be a borrowing from DTS, or possibly STS, during other language contact situations. As for the new signs GREEN, BROWN and BLUE the question still remains as to whether they were borrowed from DTS for the purpose of the second ÍTM dictionary (ÍTM 1987), if they are a result of the standardisation or if their origin lies in other ÍTM signs due to their iconicity. Whether the signs RED and BLACK are borrowed or not is unclear, but their semantic relation to the real-world is the same as in many other sign languages. The sign YELLOW and the new sign ORANGE are iconic and are clearly originated in ÍTM.

4. Conclusion

Icelandic Sign Language has eleven basic colour terms that fit Berlin and Kay´s (1969) model. The fact that they are not all arbitrary signs does not change the fact that they are basic as they all meet Berlin and Kay's primary criteria.

A language contact between ÍTM and DTS over the last centuries is likely to be a strong factor in the process of borrowing or at least for the permanence of the borrowed signs in ÍTM but iconicity also has to be taken into account.

ÍTM has both old and new signs for eight of the eleven of these colour terms. The present study reveals that the eight new signs and the two middle aged signs are either borrowed from DTS for the purpose of the second ÍTM dictionary (ÍTM 1987), the result of the standardisation lead by the DNR or they are originated in other ÍTM signs due to their iconicity.

The new sign for *orange* is originated in ÍTM but the middle aged sign is a clear example of a borrowing from DTS. The new signs for *white, purple,*

pink and *grey* are also clear examples of borrowing, either from DTS or as a result of the standardisation. In the case of BROWN, GREEN and BLUE, iconicity is just as likely an explanation for the resemblance between the colour signs in the Nordic sign languages —because even in Iceland coffee is brown, the grass is green and the sky is blue!

Notes

1. The names are mentioned in alphabetical order. Rannveig Sverrisdóttir is a lecturer in Sign Language Linguistics at the University of Iceland and Kristín Lena Thorvaldsdóttir is a sign language researcher at the Communication Centre for the Deaf and Hard of Hearing in Iceland.
2. We would like to thank a number of people for their cooperation and contribution to this chapter. We would like to thank Dr. Roland Pfau, Assistant Professor at the Dept. of General Linguistics at the University of Amsterdam for his thorough review and advice, Elísa Guðrún Brynjólfsdóttir, Dr. Sigurlína Davíðsdóttir, Jette Kristoffersen, Asger Bergmann, Britta Hansen, Dr. Elisabeth Engberg-Pedersen, Dr. Päivi Rainò, Júlía Guðný Hreinsdóttir and Russell Aldersson for their comments and advice, Tómas Ásgeir Evertsson and Uldis Ozols for picture processing, Svava Jóhannesdóttir for being the face of ÍTM colour signs, and Dr. Ulrike Zeshan and Keiko Sagara for their cooperation. Last but not least we owe a debt of gratitude to all of our informants for their contribution to this chapter.
3. In this chapter we use the acronyms STS and SVK even though they are not commonly used.
4. Personal communication with Britta Hansen, former director of the Communication Center for the Deaf in Denmark (KC) and Asger Bergmann, former president of the Danish Deaf Association.
5. Here we talk about different lexical signs of the same colour term. We leave out the fact that some of them could be phonological variants of the same sign.
6. The first two ÍTM dictionaries (ÍTM 1976, 1987) were published by the Deaf Association in Iceland and the latest dictionary (ÍTM 2012) is an online dictionary hosted by the Communication Centre for the Deaf and Hard of Hearing. Both hearing and Deaf people have worked on all the dictionaries. Little or no information is available on the editing of the oldest DTS dictionaries and whether the Deaf community actually used the signs in the dictionaries. Our informants in Denmark claim that the DTS dictionary from 1979 (DTS 1979) mainly includes signs that were generally used in DTS at that time and the online DTS dictionary from 2008 (DTS 2008) only contains signs in general usage in DTS today (personal communication with Britta Hansen,

former director of the Communication Center for the Deaf in Denmark (KC), Dr. Elisabeth Engberg-Pedersen, professor at the University of Copenhagen and Jette Kristoffersen, the main editor of the online DTS dictionary (DTS 2008).

7. The Norwegian dictionary project was led by the Møller-Trøndelag Competencecenter (NTS 2011) and the Swedish dictionary is hosted at the Sign Language Department at the University of Stockholm (STS 2013). The Finnish dictionary is based on an older book (Basic Dictionary of FinSL) published by the Finnish Deaf Association and Institute for the Languages in Finland (personal communication with Päivi Rainò, University of Applied Sciences HUMAK Helsinki). Both hearing and Deaf people have worked on all the dictionaries.
8. A one-handed and a two-handed sign that have all the same parameters are considered identical.
9. With the exception of one sign for *orange* and one for *grey*.
10. With one exception, the old sign for *brown*.
11. An ÍTM signer articulated the signs from the other Nordic sign language dictionaries for the purpose of this chapter.
12. The movement is repeated in the SVK sign (SVK 2013).
13. There are two other signs for *white* in NTS (NTS 2011).
14. Aldersson and McEntee-Atalianis (2008:68) conclude that the signs for *black* in contemporary ÍTM and DTS are different. That is in accordance with the signs found in the latest dictionaries (DTS 2008, ÍTM 2012).
15. Personal communication with Jette Kristoffersen, main editor of the Danish Sign Language Dictionary (DTS 2008).
16. This semantic relation can also be found in other sign languages, according to an online dictionary for German Sign Language (DGS, Deutsche Gebärdensprache) the DGS sign for NIGHT and BLACK are also identical to their equivalents in ÍTM (http://www.sign-lang.uni-hamburg.de/alex/lemmata/s_lemma/schwarz.htm).
17. That is in accordance with Aldersson and McEntee-Atalianis´ (2008:63) comparison of contemporary ÍTM and DTS.
18. Personal communication with Jette Kristoffersen, the main editor of the online DTS dictionary (DTS 2008).
19. Aldersson and McEntee-Atalianis (2008:68) conclude that the signs for *green* in contemporary ÍTM and DTS are different. That is in accordance with the signs found in the latest dictionaries (DTS 2008, ÍTM 2012).
20. According to Aldersson and McEntee-Atalianis (2008) a one-handed and a two-handed sign that have all the same parameters are considered identical. We argue that the place of articulation is different in the new ÍTM sign and the DTS sign in 18b. The ÍTM signs place of articulation is the non-dominant hand but the DTS signs place of articulation is neutral space.

21. Some signers, mainly male signers, articulate this sign with a different handshape on the dominant hand.
22. Aldersson and McEntee-Atalianis (2008:68) conclude that the signs for *yellow* in contemporary ÍTM and DTS are different. That is in accordance with the signs found in all the dictionaries (DTS 1871, 1907, 1926, 1979, 2008, ÍTM 2012).
23. Personal communication with Jette Kristoffersen, the main editor of the online DTS dictionary (DTS 2008).
24. Some signers articulate this sign with a different handshape.
25. Some signers articulated these signs as two-handed signs.
26. According to Aldersson and McEntee-Atalianis (2008:60-61) the signs for *blue* in contemporary ÍTM and DTS are identical. That is not in accordance with the signs found in the latest dictionaries (DTS 2008, ÍTM 2012). Also, personal communication with Jette Kristoffersen, the main editor of the online DTS dictionary (DTS 2008).
27. Today the sign in 31a is a modification of the sign RED.
28. The mouth movement is the only difference between RED and this old sign for *pink*.
29. There are two signs for *pink* in NTS and the other one is different from the ÍTM sign.
30. The sign PINK first appears in the 1979 dictionary.
31. A sign that is similar to the ÍTM sign in 35 first appears in the 1926 DTS dictionary, under the entry appelsin which means the 'fruit orange' (DTS 1926). An entry for the colour *orange* first appears in the standardisation handbook (DTS 1967) saying that the colour term is a compound of the signs for *red* and *yellow* but an entry for a monolexemic sign for the colour *orange* first appears in the DTS dictionary from 1979 (DTS 1979). That sign is the same sign as the sign for the fruit, see figure 37.
32. Some signers us a different handshape on the dominant hand and some articulate the sign on the upper arm.
33. Some signers use a different handshape on the dominant hand.
34. The movement differs.
35. There is an inconsistency between the figure and the text below the figure in the standardisation handbook (DTS 1967), the sign could therefore also be considered identical to the ÍTM sign in figure 39.
36. According to the data, only three signers use the signs TURQUOISE BLUE to refer to a bluish green or a greenish blue colour. TURQUOISE never appears without the colour term BLUE and is therefore not monolexemic. It does not meet all of the four primary criteria of Berlin and Kay´s (1969) model. It is therefore not a basic colour term in ÍTM (see further discussion on the basic colour terms in ÍTM in section 3.1).

37. Also, signers can squint their eyes when a colour is extremely bright.
38. These are the new sign for *white*, the old sign for *green*, one of the signs for *orange* and all the signs for *grey*.
39. There are no non-native colour signs in ÍTM.
40. The sign PINK in DTS first appears in the 1979 DTS dictionary (DTS 1979).

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Part III

Non-European sign languages

Numeral signs and compounding in Chinese Sign Language (CSL)

Junhui Yang

1. Introduction

Chinese Sign Language is a natural language in the visual-gestural modality used by the Deaf community in Mainland China. It is also used as an umbrella term to cover all signing systems, regional varieties, and manual alphabet (to fingerspell the sounds of Chinese characters) used by deaf people and hearing signers (Yang and Fischer 2002, Fischer and Gong 2012).

In the current Chinese political context, CSL is declared and documented by the China Disabled Persons' Foundation (CDPF) as the national Sign Language of China, and it is commonly used in teaching, media, and public places by deaf and hard of hearing people, and by other people who work with them or are related to them. CSL is often learned along with oral/written Chinese Language in schools. There is an official publication entitled Chinese Sign Language (1987 edition, 1992 supplement, 2003 edition) which collects the signed forms of over 5000 Chinese words in common use in Beijing and Shanghai (representing the northern and the southern varieties). There is a volume of Basic Signs of Chinese Sign Language (2009), which has rearranged these signs according to the handshape and location order. This is used as a national standard (coded GB/T 24435-2009, project director Yu Lianjia).

Main dialectal varieties of CSL are usually identified by the city names: for example, Beijing, Tianjin, Shanghai, Yangzhou, Chongqing, Chengdu, and other large and middle-size cities where well-established deaf communities exist and where schools for the deaf have been established for more than 60 years (Fischer and Gong 2012).

In general, there are two regional varieties of CSL: the Northern regional variants (e.g., Beijing) and the Southern regional variants (e.g., Shanghai). In the west of China, their variants (except Tibet) are more similar or relevant to the South because there has been a great deal of deaf connection between the western and southern deaf communities in the past due to people travelling

from Shanghai to the west via the Yangtze River. There is a remarkable mixing between the Northern and Southern regional varieties in the centre of China (near the Yellow River). The main difference between all regional varieties are at the lexical level. Lexical signs (e.g. names of objects, colour, number, and kinship terms) are created by local deaf people who use different signs to express the same meaning. The Northern regional varieties use more Chinese mouthing and borrowed signs based on Chinese word sounds and are influenced by Chinese word order, more so than the Southern regional varieties. The Southern varieties use more visually-motivated signs than the Northern varieties.

2. The study

This study aims to analyse and describe the phonological and morphological structure of number signs in CSL including cardinal and ordinal numbers, fractions, and numeral-incorporated forms. It is a part of the sign language typology project led by Zeshan and Sagara (2009–2013) based on questionnaires and research methodology guides. The eliciting materials used are the number questionnaire (Zeshan, DeVos and Sagara 2010), number games and animal pictures developed by the sign typology project team at iSLanDS, University of Central Lancashire.

Six deaf adults (30–50 years old) from Beijing (3) and Shanghai (3) voluntarily participated in this study. They were either deaf since birth or became deaf before the age of five. They attended schools for the deaf and began signing at an early age. The informants also were asked to provide a biographic narrative of their lives (topics including family and educational background, at what age they became deaf and began signing, jobs and travel). A total of 120 minutes of video recordings were collected.

3. The phonological description of cardinal numeral signs in CSL

3.1. Handedness

All signs of cardinal numbers in CSL are one-handed. Some regional variants use the non-dominant hands to support or clarify, for example, the non-dominant hand is used in signs for 70,80, 90 in the Shanghai variation. When expressing the year of 2001 to 2009, the non-dominant hand holds the number- 2- handshape, while the dominant hand signs three other

digits "001" or "009". The use of two hands in numeral signs usually results in a morphologically complex sign, which is discussed further in the section on morphology below.

The signers from Shanghai sometimes sign for one hundred and hundreds in the double handed form, that is, the non-dominant hand simply copies the dominant hand, but this signing pattern does not change the meaning of the sign. If the second hand is dropped, the meaning of the hundred sign does not change. This Shanghai variation exemplifies the phonological level that one can use either use one hand or two hands to represent multiples of 100 from 100–900.

3.2. Handshape and orientation

The handshapes used to articulate cardinal numbers need to be precise but the orientation of the signs is less important and minor changes to this parameter do not affect the meaning of the numeral sign.

Simple numbers from 0 to 10 are identified by handshapes. The signs for 1–9 and 0 are one-handed and illustrated in fig 1.

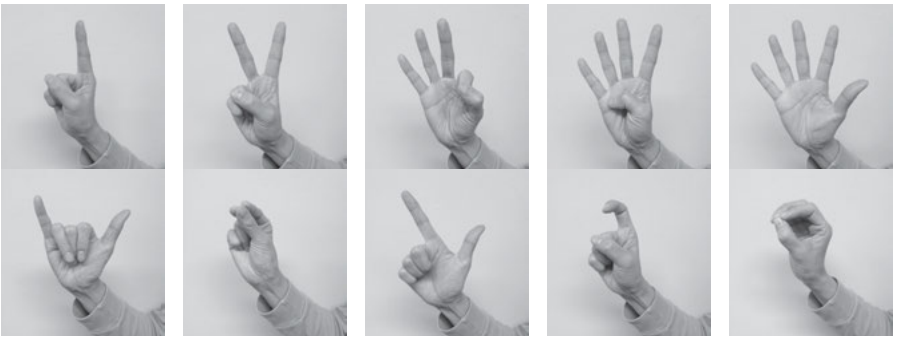

Figure 1. CSL numbers 1-9 and 0

In the signs 1 to 6 and 8, extending fingers must be straight, and with the signs 0 and 9, fingers must be bent. In the articulation of the sign for 7, fingers can either be straight or bent, and the sign 3 can be produced using either the W or F handshape. Both are dependent on the phonological context (other signs used before and after this sign, or units of measurement).

There are two variants of the sign TEN. In Beijing, signers cross the index and middle finger (R handshape, see figure 3a), but signers in Shanghai cross the thumb and index fingers (+ handshape). Both imitate the Chinese character 十 for ten in different ways. The Beijing variation for TEN can be

compounded with the numbers 1–9 to show teens, whereas the Shanghai variant for TEN is not possible to compound with other number signs to show teens and tens.

The editorial board of the Chinese Sign Language Dictionary decided to depict the TEN sign from Beijing for the dictionary and the number sign chart, and promoted this sign variant to be the common sign used nationwide. In the same dictionary, the Shanghai variant TEN is used for RED CROSS, additional mark in Mathematics, or as a passive mark "+", but not for TEN.

The handshape is the most important element in number signs to identify different numbers. There is no standard rule on the palm orientation as with Japanese Sign Language (Sagara 2013). The palm orientation of these signs 0–9 is flexible and the meaning is the same with the palm towards or away from the signer. The direction of fingers can be either upwards or sideways. When they are used in ordinal numbers, the fingers pointing in a sideward angle (see figure 2) are more visibly indicative than the fingers pointing upwards (see figure 1).

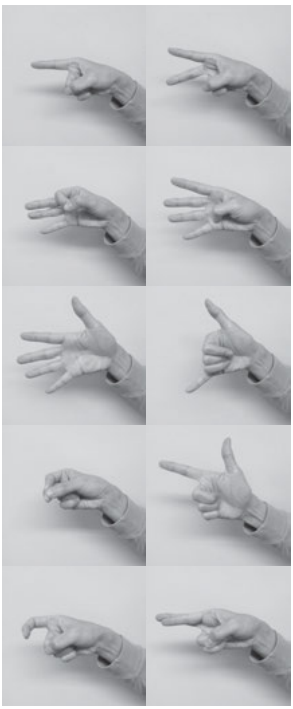

Figure 2. Basic numbers

The sign O is always used in the middle of a multiple digit number, for example, 201, 1006, and at the beginning of a number less than 1 (e.g., 0.9, 0.85, 0.5). The sign 0 in the end of a number (e.g., the year of 1990, 2000, 2010) can be left out. For example, there is not a sign for 0 at the end in the signs for the numbers 210, 350, 4600, or 180000, because their last signs are TEN, FIFTY, SIX-HUNDRED, and EIGHT-THOUSAND, which are single signs without a gesture for 0.

3.3. Movement and location

Numbers other than ten are a combination of two or more than two sequential number signs and are sometimes, modified with movement of the hand. For example, the sign for 100 is a one-handed sign that uses the index finger with a right-side movement.

The number system in CSL has characteristics of a 10-based system. When expressing the numbers of eleven and twelve all CSL signers produce signs like TEN^ONE and TEN^TWO in a sequential compounding format. There are two different variants for TEN in CSL; therefore, the signs for teens and tens are two different paradigms. In Beijing (N), the signs for 11–19 sequentially combine two signs: the number TEN and a single number (1–9), for example , the handshape TEN (see Figure 3a) followed by the handshape SEVEN, becomes "SEVENTEEN"(see Figure 3c)

Figure 3a. TEN

b. from 10 to 7 (in transition)

c. SEVEN

In Shanghai (S), individual digits may be used in a columnar format, resulting in a sequential compound, e.g., signing 1–3 to produce 13. The sign for 11 consists of repeating the number 1 handshape while the hand moves from

left to right, and 12–19 are two single numbers combined: the number 1 (represents TEN) and the number 2–9, ONE^TWO … ONE^NINE. There is an alternative articulation for 11–19 where a movement (twisting) follows the number 1 hand and leads into the second numeral. The palm orientation of the two parts of the number sign is opposite.

There are lexical signs for the names of digits (unit), such as: hundred (*bai* 百), thousand (*qian* 千), and ten-thousand (*wan* 万), based on Chinese character shapes (strokes). The formational patterns of signs for hundreds, thousands and ten-thousands involve a numeral sign or handshape (a free morpheme) and a tracing movement (a bond morpheme) which is a modification after borrowing from the Chinese character. The following table 1 shows a summary of paradigms.

Table 1. Hundreds, Thousands and Ten-thousands paradigms

Units	**Values (numeral handshape)**	**Movement path (tracing movement)**	**Tracking part of the character for a unit**
Hundreds	1–9	Move right-sideward (Beijing); Move forward (Shanghai)	The first stroke '*heng*' "--"of the character 百
Thousands	1–9	Move to right and down (completed movement); Move down (uncompleted movement)	The whole strokes of the character 千; The last stroke only
Ten-thousands	1–9	Move to left down	The second stroke of the character 万

4. The morphological description of other numbers

When expressing the multiples of ten, both Beijing and Shanghai variants use simultaneous compounding structures. Signing from twenty to ninety, the fingers of the number hands (2–9) are bent like hooks in the Beijing variance (this pattern is also found in Japanese Sign Language, Ktejik 2013), but in the Shanghai variance, the articulation of numbers is more phonologically complex: the fingers of the number hands 2–4 and 7 in multiples of ten flip downwards; the numeral handshapes 5–9 close downwards to form a fist for 50 to 90. The table 2 below shows a summary of morphological analysis of 10 to 99.

Table 2. Ten, Teens and Tens paradigms

	Number / value	Beijing	Shanghai	Morphological structure
Ten	10	R hand	+ hand	One-handed
Teens	1–9	{TEN}+{number} (The location and palm orientation are not changed)	{ONE}+{number} (The location or/ and orientation are changed	Sequential compound
Tens	2–9	{number} # {fingers bent} ={TENS}	{number}# {fingers flip down}	Simultaneous
21–29 31–39 … 91–99		{TENS}+{number} Different from the teens	{number}+{number} The same as the teens	Sequential compound

4.1. The use of space showing fractions, ratio and date

Fractions are indicated by a columnar difference, e.g. ONE produced above THREE for 'one-third'. In ASL the sign order is top-down, ONE is signed first then the hand moves down to show THREE. In CSL the sign order is bottom-up, THREE is signed first and then the hand moves up to show ONE (see the Figure 4). The non-dominant hand is used to form a horizontal bar to separate the two number sign spaces in the fraction paradigm.

Figure 4. Two-handed sign showing one third (1/3)

There are two signs meaning "percentage": the index finger drawing a "/" mark and tracing the symbol "%" in the air to show the unit 'percentage'. The percentage sign "%" is then followed by a number sign to indicate what percentage the signer is talking about.

In the ratio and score paradigms, two hands show numbers at the same time to display the ratio (scores) between two parties. Two hands are finger-vertical and in different locations related to possession (e.g., my score or my team's score vs. your score or your team's score):

(1) one hand is on the left side and the second hand is on the right side to show two opposite groups' scores;
(2) one hand is inward to show my group's score and the second hand is outward to show your group group's score ,
(3) one hand is inward in which the syntactical space represents the first person, on my side's score, and the second hand is located on the other side, in which the syntactical space represents the third party.

In the date paradigm two hands are finger-horizontally arranged: one hand is up and the second hand is underneath. The number hand on the top represents the month (e.g., May); the second number hand on the bottom represents which day of the month (the third day of May).

4.2. Other morphological paradigms

The cardinal number signs occurring in high frequencies are one to the ten. All ordinal numbers are bi-morphemic and two-handed signs, with each hand representing a morpheme:

{Free morpheme: number} {Bound morpheme: semantic unit}

The dominant hand with a number handshape touches on the non-dominant hand, either on the thumb (the Beijing variance) or the back of hand (the Shanghai variance). The ordinal numbers in CSL are fully productive, and any ordinal number can be expressed. The bound morpheme for the order mark (e.g., the number hand touching on the non-dominant hand) can sometimes be omitted. If they are translated into Chinese, a morpheme for the numerical order "Di~" (similar to the morpheme ~th in English) needs to be added. Sometimes ordinal numbers are formed by pointing at the fingers of the non-dominant hand when giving a list or explaining items point by point.

When numbers combine with a semantic unit (e.g., months of the year, days of the week, school names, grade levels, floors of a building), the number sign touches on a specific location (e.g., a part of the signer's body or the non-dominant hand). The following Table 3 shows some details.

Table 3. Time, Age, Ordinal, Size and Money paradigms

Paradigms	Value (number handshape)	Semantic unit (Beijing variation)	Semantic unit (Shanghai variation)
months of year	1–12	on the index finger of the non-dominant hand	Marking a moon shape
days of the week	1–7	on the palm of the non-dominant hand	Taking the number hand out of the armpit
Age	1–99	on the back of the non-dominant hand (fist)	On the palms
Years	1–99	On the non-dominant hand (fist)	On the palms
Months	1–12	Making a moon shape	On the index finger of the non-dominant hand
Weeks	1–4	On the number 7 hand	Brushing over the nose
Days	1–10, 20, 30, 40…90	On the top of the head	On the side of the head
O'clock	1–12	On the wrist of the non-dominant hand	On the wrist of the non-dominant hand
Hours	1–12	On the wrist of the non-dominant hand	On the palm of the non-dominant hand
Deaf School sign names	1–4	brushing from ear to mouth	On the shoulder
grade levels	1–9	on the chin	In front of the signer
row (seats)	1–90	on the index finger side of the B hand	
places in a line	1–10	on the chin	On the back of the non-dominant hand (fist)
People	1–10	On the index fingertip of the non-dominant hand	On the index fingertip of the non-dominant hand
Size (HAO)	1–10, 20, 30, 40…90	On the corner of the mouth	Circle around the lips
Seconds FEN / money JIAO (1/10 yuan)	1–60	On the chin and twisting the wrist	On the non-dominant hand (O handshape)
CN Yuan (RMB)	1–10	In front of the signer	Under the chin

Signs belonging to some paradigms (e.g., size, time, age, row, person, deaf school sign names) have originated as a base lexical sign then, over a period of time, a numeral sign has been incorporated sequentially and, eventually, the two elements have become articulated together, resulting in simultaneous compounding. They can go through the three steps of morphological process, and their two morphemes can be separated and compounded. Some other paradigms do not have the base lexical signs, for example, 'week' or 'month', but use 'one-week' or 'one-month' to express the same concept of 'week' or 'month'. Similar patterns are described in Zeshan's study of Indo-Pakistan Sign Language (Zeshan 2000). These lexical signs are used with number incorporation; their morphemes have to be compounded simultaneously and cannot be separated into two individual signs.

Two-handed number signs (e.g. in the 'date' paradigm and the 'ratio' paradigm) do not have any base signs. For example, two-handed number 1 signs for January 1st or 1:1 cannot be used to express the general concept of "date" or "ratio", but rather they depict one specific date or ratio. When using number incorporation with two hands the location of each hand is important because the individual location becomes a morpheme that represents a unit of measurement, semantic unit or a pronoun.

5. Syntactic description of number signs and quantity markers

There are strategies for marking nominal plurals and analysis of the data indicates that such strategies exist with regular frequency. Number signs may be marked for an exact amount or for an unspecified quantity. The strategies available in CSL include the following:

1. Combining a nominal sign with a cardinal number. The number signs are shown either before the nouns (for a long sentence) or after the nouns (for a short sentence). If the noun is the sentence topic, the number sign is a comment to depict the quantity of the objects. The nominal sign often does not repeat if it is shown before the number sign. For example,

   BIRD FIVE

   'Five birds'

   CAT THREE
   'Three cats'

   THREE CAT ONE BIG (shoulder shift) TWO SMALL SMALL
   'There are three cats; one is large, and the other two are small'.

2. Repeating a nominal sign in a following or connected clause and pointing in different areas in the signing space (2 or 3). This is illustrated by the example:

   CAT ONE MOTHER (pointing-to-the-left) CAT TWO CHILDREN (pointing to the right) 'One cat is the mother, and the other two are her kittens'.

3. Repetition/reduplication of the lexical sign indicates plurality. It usually repeats twice and the location of the hands is slightly changed as a result of the sideward movement. For example, TREE+, CHAIR+.
4. Repetition of an entity classifier with some spatial modifications. Individually articulated repetitions of the classifier at different locations in the signing space (e.g., flowers). Sometimes a definite number is given before the classifier predicate. The repetition will be as exact as the given numbers (2– 5). For example,

   Rh: ROPE (CL:R) FIVE BIRD CL:Y CL:Y CL:Y CL:Y CL:Y
   Lh: ROPE (CL:R) ---------- (CL:R)
   'There are five birds on a long rope".

5. Using indefinite number signs, for example, A FEW / SEVERAL/ SOME, that is the one-handed open-5 finger-wiggling without interrogation facial expression (see figure 5). The one-handed sign MANY does not require the wiggling of fingers but is defined by the flicking of the wrist. The double-handed sign MANY can often be used to show the extent of something, as the use of two hands adds extra quantification. Facial expressions and the sideward movement of the hand (i.e. larger use of the signing space) are adjective functions thus giving emphasis and increasing the degree of quantity even further.

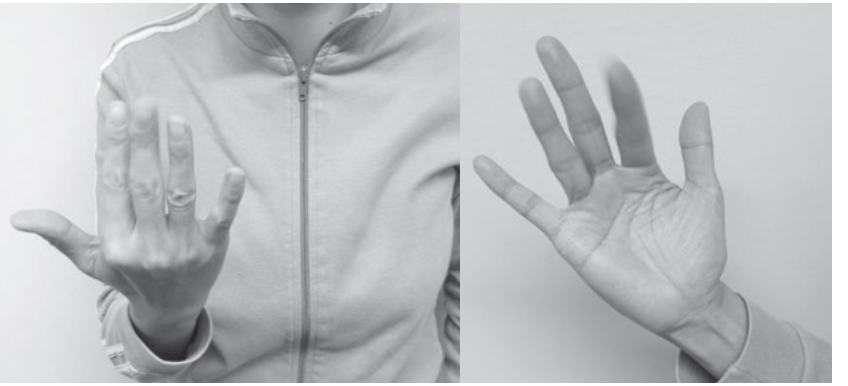

Figure 5. The one-handed open-5 finger-wiggling without interrogation facial expression

6. There are suppletive plural forms, e.g. PERSON vs. PEOPLE; YOU vs. ALL-OF-YOU, where the additional sweeping movement of the original sign represents a plural morpheme. Pluralisation in this instance is not accompanied by a descriptive adjective to indicate there are MANY or LOTS of people – the sweeping movement is an independent indicator of lexical plurality, serving as a plural morpheme.

Distinguishing general quantifiers from "none" or "several" to "all /whole"

There are some quantifiers that are used to make generic statements, from none, or a little to all. For instance: NONE /NOTHING/ HAVE-NOT is produced by the one-handed O handshape placed in front of the signer or on the mouth of the signer; ONE TWO 'one or two' is extended the index finger and the middle finger one by one; TWO THREE 'two or three' is sequentially combined the number sign 2 and 3; A LITTLE / A FEW is produced by the thumb touching on the tip of the index finger and then moving up.

There is a one-handed sign for HALF in CSL (see figure 6) which begins with the placement of the thumb half way down the extended index finger (at the second knuckle), forming a similar handshape to the + sign in CSL. The thumb is moving in a downwards motion, and this motion can be singular or repeated without changing its meaning. The HALF sign is often combined with the number signs in the age, time, year, weight and other units of measurement paradigms. For example, in CSL, if signing about someone's age HALF YEAR-OLD or time of day HALF DAY, the thumb is drawn down once over the second knuckle of the index finger to represent the 'half' element.

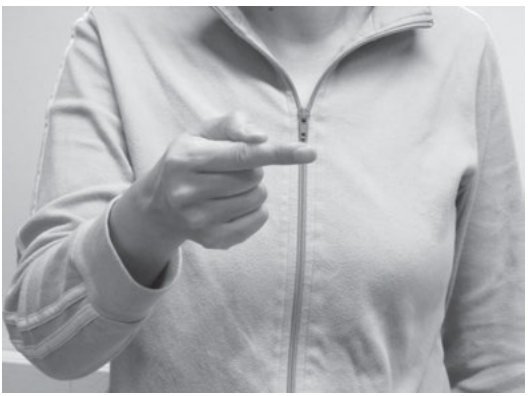

Figure 6. HALF

Alternatively, denoting "some parts" in CSL, the thumb can be repeatedly flicked downwards over the second knuckle of the index finger, SOME PEOPLE COME, SOME PEOPLE GO 'some people came and some people left'.

Other quantifiers indicate an amount that is more than half. For the following signs, the use of two hands may be stylistic or may be used to add extra meaning:

MANY (one-handed, figure 7)

MANY (two-handed, figure 8)

VERY MUCH/MANY (one-handed)

VERY MUCH/MANY (two-handed)

ALL /WHOLE (two-handed)

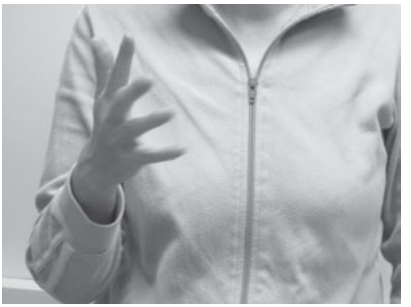

Figure 7. MANY (one-handed)

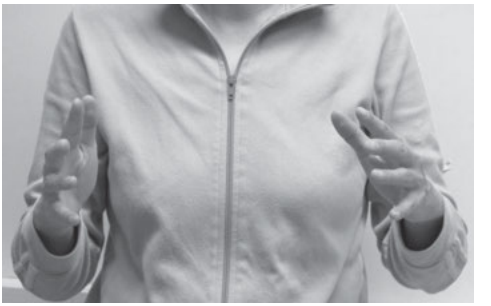

Figure 8. MANY (two-handed)

These listed signs are used as adjectives or predicates to describe nominal signs. They are often used to show different quantities, mass or levels of something. Alternatively, when explaining the intensity of colour or the degree of pain, for example, the index finger is used as a measurement unit. The contact point between the tip of the thumb and the index finger indicates different levels or quantities. For instance:

– The tip of the thumb touches on the tip of the index finger: A LITTLE / A BIT
– The tip of the thumb touches on the first knuckle of the index finger: LESS THAN HALF
– The tip of the thumb touches on the second knuckle of the index finger: HALF or more
– The tip of the thumb touches on the third knuckle of the index finger: VERY

This approach is used in one-on-one conversations and informal settings, it is rarely used in formal settings (except for instructional purposes).

6. Extent Paradigms

The number signs in all paradigms can be replaced with an indefinite number sign (the open-5 hand wiggling fingers) to show 'a few'. If the interrogative facial expression is simultaneously combined with the open-5 hand wiggling fingers – meaning HOW-MANY – this will form a question. For example, 'what date' (see figure 9) in CSL and Hong Kong Sign Language (ref. Tang 2006:211).

Figure 9. 'what date?'

Some number paradigms can be modified to become interrogative paradigms where the interrogatives are characterised by finger wiggling HOW-MANY are listed following Table 4.

Table 4. Extent paradigms

Paradigm	Number compounds with the number 2 used as an example	Interrogative signs with Wh-sign (finger wiggle)	Indefinite number compounds with "several"
Age	2-years-old	how-many-age 'how old'	No
Person	2-person	how-many-person	Yes
Row	2-row	how-many-row	No
Size	size-2	how-many-size	Yes + 个 (borrowing Chinese classifier)

Deaf	2nd-deaf-school	what-number-of-deaf-schools	No
Time	2 o' clock	what-time	No
Date	2nd Feb.	what-date	No
Day / One-day	2-day	how-many-day	Yes
Days of the week	Tuesday	what-day-of-the-week	No
One-month	2-months	how-many-month	Yes + 个 (borrowing Chinese classifier)
Months of the year	February	what-month-of-the-year	No
Yes /One-year	2-year	how-many-year	Yes
Hour/ One-hour	2-hour	how-many-hour	Yes
Hundred / One-hundred	200	how-many-hundred	Yes
Thousand / One-thousand	2000	how-many-thousand	Yes
Grade-one	GRADE-TWO	what-grade	No
The First (place in the line or on list)	2nd	how-many-in-order	Yes

The table 4 above shows that simultaneous morphology in number signs and compounding patterns are productive and flexible in the CSL lexicon.

7. Conclusion

This study shows that the one-handed number signs and quantifiers offer a great advantage to CSL phonology and morphology, as they enable a high level of flexibility of articulation and possibilities for incorporation. The comparative/contrastive analysis of the Beijing and Shanghai variation in number signs and compounding patterns demonstrates that the Beijing variation has a clearer articulation path and morphological process, and is preferential to a large number of CSL users. For example, the number sign TEN in the Beijing variety has a clear and distinct handshape and location but

the Shanghai variant is almost homonymous with the other signs, hence the preference for the Beijing variant. This variance is more in keeping with a standard variety and as it has been adopted for the CSL dictionary, may develop as a standard variance that sees further geographical distribution in future years.

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Colour terms in Indonesian sign language varieties: A preliminary study.

Nick Palfreyman

1. Introduction

As more research is conducted on sign language variation, it is becoming clear that the semantic domain of colour terms often exhibits lexical variation cross-linguistically. Recent studies report that Italian Sign Language has at least eight lexical variants for 'brown' and 11 for 'blue' (Silver-Swartz 2012), while British Sign Language has no fewer than 14 lexical variants for 'grey' and an astonishing 22 lexical variants for 'purple' (Stamp 2013:238). Other sign languages that are reported to exhibit variation in this domain include Australian Sign Language (Johnston 1998), German Sign Language (Eichmann and Rosenstock 2014) and Japanese Sign Language.[1]

This chapter is concerned with Indonesian sign language varieties, which also exhibit phonological and lexical variation in the semantic domain of colour terms. The findings presented here are based primarily on data collected from six sign language users in Solo (Central Java) and six in Makassar (Sulawesi), using the elicitation activities for colour terms described in the Introduction. Details concerning Indonesian sign language varieties, the sign community, deaf schools, and the method used to collect and analyse data are presented in sections 1.1 and 1.2.

In the data, participants produce 39 mono-lexemic variants for eleven colour terms. These include 29 lexical variants, which are further categorised according to whether or not they are initialised. Initialisation is a phenomenon common to many – though not all – sign languages, whereby signs include the handshape of the initial letter of the word in a corresponding written language (see section 3). This is an example of the impact that language contact has had on the expression of colour terms. Language contact can also, perhaps, explain changes that have taken place in the inventory of colour terms (section 4).

Within the semantic domain of colour terms, there are multiple sets of lexical variants from which signers may choose in both the Makassar and

Solo varieties. The question of how signers cope with this variation is considered further in section 5, alongside examples of intra-individual variation. Sets of lexical variants ('lexical sets'), and the factors that can explain this phenomenon, are discussed in section 6.

Findings presented here are based on data collected from the sign language varieties of Solo and Makassar. References are made to other urban varieties as appropriate, including varieties on the islands of Java (Jakarta, Surabaya, Yogyakarta), Borneo (Banjarmasin) and Sulawesi (Manado), as illustrated in Map 1.

The overview of colour term variants in this chapter is necessarily preliminary, in that the analysis is confined to what can be deduced from the variants that 12 informants produced during elicitation activities. Additionally, just two urban sign language varieties are included, although colour terms were also elicited from two signers in Jakarta in order to contextualise the main findings. Further, a Solonese informant who now works in the city of Surabaya was able to give examples of what he perceives as typical Surabayan variants; this is particularly interesting because of anecdotal reports that the Surabaya variety has borrowed heavily from American Sign Language (ASL) in the domain of colour terms. Contact with Surabayan variants has led to the adoption of some, but not all of these variants by Solonese signers (4.2).

Map 1. A map of Indonesia with urban centres mentioned in this chapter.

As with other sign languages, examples can be found of variation *between* urban centres in Indonesia, but variation *within* each urban centre is often considerable. Some contributory factors are described in section 1.1, where the history of the urban sign community is sketched. The method used to collect and analyse data is described in section 1.2, and colour terms are then detailed in the subsequent sections.

1.1. A brief history of the sign community in Indonesia

Sign language varieties in Indonesia are severely under-documented. A notable exception to this is Kata Kolok, a 'village sign language' variety used in the Balinese village of Bengkala. Kata Kolok is relatively well-documented (e.g. Marsaja 2008, de Vos 2012) and is thought to have a time depth of around five generations (de Vos 2012:47) but not known to be related to any other varieties. For urban sign language varieties, several lexicographical studies have recently been conducted for varieties in Jakarta (Wijaya & Satryawan 2013) and Yogyakarta (Sukmara 2014, Bharoto 2013a), alongside preliminary studies of classifier constructions (Bharoto 2013b) and sign names (Chu and Wijaya 2013). Isma (2012) presents a basic comparison of the Jakarta and Yogyakarta varieties focusing on 'core' lexicon and word order, and Suwiryo (2013) compares mouthings in the same varieties. Aside from Palfreyman (2013, 2015), no studies have included urban sign language varieties outside of Java.

The number of sign language users in Indonesia has not been reported, and is not easy to establish. Using figures provided by the Ministry for Social Affairs and the Central Body for Statistics, Gerkatin (the Indonesian Association for the Welfare of the Deaf) believes that the number is likely to fall somewhere between 600,000 and three million, although it is not likely that all of these deaf people communicate using sign language. More recently, data from the 2010 census have been made available, which suggest that the number of severely or profoundly deaf Indonesians is at least half a million, and almost certainly much higher (Palfreyman 2015).

Given the dearth of linguistic and sociolinguistic research on sign language varieties in Indonesia, it is too early to say whether it is more appropriate to refer to a single 'Indonesian Sign Language', or to several different sign languages, either on linguistic or socio-political grounds. With that in mind, I refer here to sign language *varieties* rather than to 'X Sign Language'. The shared experiences of deaf people in different urban centres, and the language contact between them (described in 1.1.1–1.1.3) are good

reasons for referring to the existence of an Indonesian sign community that comprises a network of sub-communities of sign language users in most, if not all urban centres across Indonesia. However, while a minority of deaf people have travelled extensively within Indonesia, the experiences of most urban sign language users are very much local, and the majority of deaf people are not well-travelled.

1.1.1. Deaf schools

The history of deaf education is often very important when seeking to detect and explain variation in sign languages. A good example of this is the existence in Britain of several schools for deaf children, which is key to explaining historic variation in British Sign Language (Stamp 2013). Deaf schools, as centres of language transmission, are often crucial to the persistence of sign language varieties (Quinn 2010), and the existence of several schools is well known to produce lexical differences. This is what happened in Dublin, where the segregation of deaf children at Catholic schools led to considerable gender variation in Irish Sign Language during the twentieth century (Le Master and Dwyer 1991, Leeson and Grehan 2004).

In the archipelago that is now known as Indonesia, the foundation and existence of several deaf schools can help to explain similarities and the differences both between and within different sign language varieties. The first Indonesian school for deaf children was founded in 1930 in Bandung by a Dutch expatriate. In 1938, a second school was founded in Wonosobo, Central Java (marked by an asterisk on Map 1) and staffed by Catholic sisters, the Daughters of Mary and Joseph. Both of these schools closed for a period following the Japanese occupation in 1942, but re-opened in the 1950s, and a third school (Don Bosco) was set up, also in Wonosobo, by Catholic brothers. All three had links with deaf schools in the Netherlands, where oral teaching methods were favoured at the time, which is how oralism was introduced to Indonesia. Interviews with nuns who taught in Wonosobo show that the use of sign language was forbidden (see Palfreyman 2015), but despite this it seems that sign language was often used socially by deaf children.

All of these schools were privately-run, and attracted deaf pupils not only from the surrounding area but from further afield, and increasingly from other Indonesian islands. For example, between 1970 and 1980, 49 out of 342 pupils (14.3%) who registered at the Don Bosco school in Wonosobo

came from outside of Java, including six from Papua, some 3,000 km away. Most deaf children seem to have returned to their region of origin once they had finished school.

Elsewhere in Indonesia, a school for deaf children was founded in Makassar in 1958 by a woman who had trained in Bandung. Other schools for deaf children were founded in Solo in 1961, and Medan, Sumatra, in 1965. Interestingly, the first deaf school in the Indonesian capital, Jakarta, was not established until 1970. Another school opened in Indonesia's second largest city, Surabaya, in 1977. In the 1980s and 1990s, the Indonesian government started to establish state schools for deaf children. There are now government-run schools for deaf children in most of Indonesia's 34 provinces, and some of these provinces have several such schools.

1.1.2. Contact between sub-communities of sign language users

Besides schools, deaf organisation has been one of the main reasons for language contact between sub-communities of sign language users in Indonesia. Organisations of deaf people developed slowly from the 1950s onwards, emerging first in Java as alumni associations. The first of these were established in Bandung (1958, 1960), and others appeared in Jakarta (1965), Yogyakarta (1974, 1980), Semarang (1976) and Surabaya (1979).

Through this network of smaller organisations, the national Indonesian Association for the Welfare of the Deaf ('Gerkatin') emerged in 1981. To date, Gerkatin has held eight national congresses. The earliest of these did not include representation from many provinces without Java. However, two of the most recent three congresses have taken place in Bali (2002) and Makassar (2006), and as of 2013, regional bodies of Gerkatin exist in some shape or form in all but seven of Indonesia's 34 provinces.

Language contact between different sub-communities of sign language users has also taken place at regional and national gatherings for sports meetings, cultural competitions and scouts jamborees. These events have taken place intermittently since the 1960s, organised by bodies such as government departments, deaf sports organisations, and Disabled People's Organisations. Another factor that has led to language contact between sub-communities within Indonesia is internal migration, where sign language users have moved in order to find employment, to get married, or to escape from conflict (see Palfreyman 2015 for examples of this).

1.1.3. The introduction of manually coded systems

In the early 1980s, signs from American Sign Language (ASL) and the philosophy behind Signed Exact English (SEE) were introduced to schools in Jakarta and Surabaya in the form of manually coded language systems. These systems seek to represent the grammar of spoken language on the hands, and in theory hearing teachers and parents can speak and sign simultaneously, although the systems vary in the amount of grammatical information that is conveyed. By the 1990s, the Indonesian government had endorsed the version that had developed in the schools of Jakarta and Surabaya, which came to be acronymised as SIBI (the Indonesian Sign System).

SIBI aims to represent the national spoken language of Indonesia – Bahasa Indonesia – morpheme by morpheme, and several editions of the SIBI dictionary have been published and disseminated by the Indonesian government since 1994 (see Palfreyman 2015 for a critique of SIBI).[2] The manual alphabet that is promoted by SIBI, and which forms the handshapes for its many initialised signs, is identical to that of ASL, with the exception of the sign that represents the letter 'T'. SIBI is not used at all in some schools (Branson and Miller 2004: 18), but others place a strong emphasis on its acquisition by deaf children.

Contact with SIBI in school has undoubtedly had an effect on the sign language varieties used in the wider sign community. In many urban centres, the one-handed alphabet is readily used as well as, or instead of, the two-handed alphabet, especially by younger signers. SIBI has had more influence on the sign language varieties of some sub-communities than others, even on the same island. For example, SIBI seems to have influenced the forms used in Manado more than those in Makassar. The existence of an older generation who have had no exposure to SIBI, along with the patchy implementation of SIBI and the selective use of SIBI signs by younger signers, all contribute to the variation described in this chapter.

1.2. Method

1.2.1. Data collection and analysis

The descriptions in this chapter are based on linguistic data obtained through elicitation and from spontaneous conversation. Three hours of natural conversational data collected from Solo (in 2010) and Makassar (2011) have been used to create an organised corpus (see Palfreyman 2015 for details). Searches of

this corpus show how terms from a target domain are expressed in the Solo and Makassar varieties, including examples of real constituent order and variation.

Spontaneous conversation does not usually generate many examples of colour terms, most of which do not occur in the corpus at all. Even in large corpora, complete sets are not always available, and so corpus methods have been supplemented by elicitation, observation, and introspection from my research assistants Muhammad Isnaini, Jayeng Pranoto and Oktaviani Wulansari. Elicited data have been collected in Solo and Makassar in 2011 using the games described in Sagara & Zeshan, this volume.

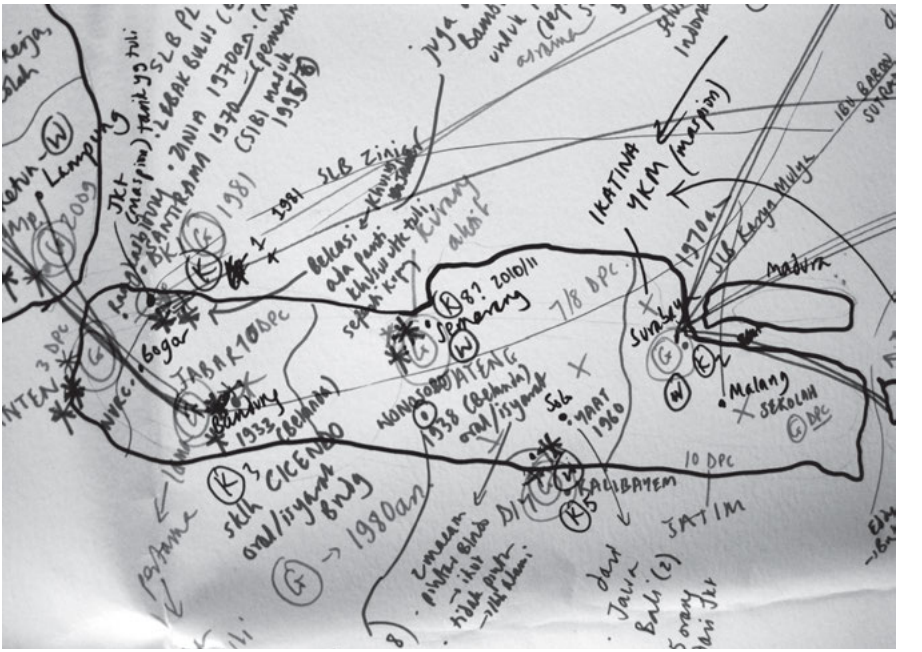


Figure 1. A section of the sociolinguistic map (December 2010).

Examples from other urban centres were noted during preliminary field visits in 2010 (Banjarmasin) and 2011 (Jakarta and Manado). Several sign language users in Solo have previously worked in Surabaya, and some have a good knowledge of variants that are particular to that city. In any case, more research is needed in these and other cities before a more complete picture is available. In addition, socio-historic data have been collected which shed light on the history of the sign community. These have been collected in different ways, including a sociolinguistic mapping exercise (Figure 1), collection of documents, and interviews with participants in all urban centres mentioned above.

1.2.2. Describing variation at different levels of linguistic organisation

As with spoken languages, variants in sign languages can be found at different levels of linguistic organisation. Recently, sign language sociolinguists have made distinctions between phonological variants and lexical variants (Cormier et al. 2012). According to the use of these terms in the literature, phonological variants generally vary from each other in one parameter – typically handshape, orientation, location, movement, or handedness – and have several formal elements in common.[3] The implication is that phonological variants derive either from each other, or from a common original source, through processes associated with morpho-phonological variation and change. As per the concept of ID glossing (Johnston et al. 2011) these signs are grouped as a single lemma with the same gloss, and their status as phonological variants is shown with lower-case letters in the variant code to the right of the gloss (GLOSS:a, GLOSS:b).

Lexical variants differ from each other in more than one parameter, and have few, if any formal elements in common. The status of 'lexical variant' is indicated by numbers in the variant code (GLOSS:1, GLOSS:2). I assume that lexical variants either derive from different sources or have diverged from each other beyond recognition due to an accumulation of phonological changes. It is therefore necessary to consider the known or likely derivation of a sign when glossing. Inevitably, the determination of variants as phonological or lexical is not always clear, and in-between cases occur because the distinction is based on the *degree* of formal similarity. Nonetheless, the attribution of glosses should be motivated as far as possible by semantic and structural principles. The glossing process is often cyclical, especially when a language is being documented for the first time, and it may be necessary to revise glosses in light of new information.

In section 2 I aim to show that variants for colour terms are sometimes organised in a predictable way, united by similar motivations. The term 'lexical variant' does not in itself sufficiently describe this organisation, and so the notion of 'lexical sets' is introduced to describe lexical variants that relate to a particular semantic domain and share a common motivation or derivation. The forms of members of a lexical set are not arbitrary, but are united by an element of systematicity in their provenance or formal properties. An important corollary of this is that a variant should ideally be labelled in a way that highlights the distinct identity of its lexical set. If, for example, a set of variants for colour terms are derived in the same way from the same manual alphabet, they are given the same code (GREEN:init, BLUE:init etc.).

An advantage of this is that glosses become easier to interpret, since the subscripts hold some clue as to the form of the respective variant.

2. Non-initialised variants

Of the 29 lexical variants produced by informants, 16 are initialised and 13 are not. There are reasons to believe that many non-initialised variants may be older than initialised ones. Whereas the use of initialised variants is motivated by written forms of colour terms and strongly associated with the education system (see section 3), the motivation for non-initialised variants is largely iconic, and these signs may therefore have emerged before most signers had access to education. A small number of non-initialised variants are common to both Makassar and Solo varieties (2.1), but most variants are particular to one variety or the other (2.2).

One of the ways in which colour terms may form is derivation, whereby 'the meaning of the sign for an entity with a typical colour is extended to include reference to the typical colour' (Nyst 2007:91). For some of the non-initialised variants described here, the iconic motivation is still apparent, but for others, it is no longer identifiable. In the following sections, when the motivation of a form is sufficiently clear, it is specified. The absence of such comments should be taken as indicating that the motivation is unknown.

2.1. Variants common to both varieties

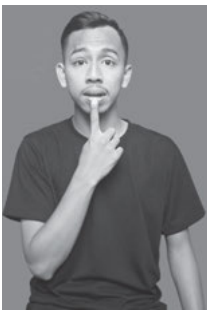
Only three of the non-initialised variants produced by informants are common to both Makassar and Solo. These are HITAM ('black'), MERAH ('red') and COKLAT:1 ('brown'), shown in Figure 1 along with phonological variants. HITAM exploits the fact that Indonesians typically have black hair, and is used regardless of whether a signer has hair of a different colour (or no hair at all). MERAH and COKLAT:1 refer to the lips and the skin for the colours red and brown respectively.

All three lexical variants shown in Figure 1 are clearly motivated by iconicity, which explains why it is that these forms also occur in other, unrelated sign languages. For example, forms that are similar to HITAM and MERAH are found in Ban Khor Sign Language in Thailand (Nonaka 2004:750) and Kata Kolok (de Vos 2011:71). Although these variants derive from indexical signs that point to parts of the body, which are of course always available to

the signer, they have become fully lexicalised, as indicated by their use alongside intensifiers, creating meanings such as ‘very red’ and ‘quite red’.

HITAM:a
(‘black’)

HITAM:b
(‘black’)



MERAH:a
(‘red’)

MERAH:b
(‘red’)

COKLAT:1
(‘brown’)

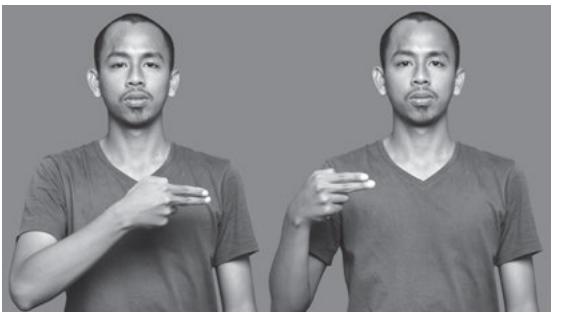
Figure 1. Variants for the colours black, red and brown.

2.2. Variants used in only one of the two varieties

Ten of the non-initialised lexical variants are used by informants in only one of the two varieties. It seems that not all of these variants are known or used by all members of the sub-community in question. Some variants are older, while others are associated with a particular school, or have been introduced to Solo through contact with sign language varieties elsewhere in Indonesia.

Only one non-initialised sign was used in Makassar but not Solo: this is PINK:2 (‘pink’), shown in Figure 2a. This variant is homophonous with another iconic sign, INDONESIA, which represents the red and white Indonesian flag, and PINK:2 seems to refer to a mix of these colours. Reference to a mixing strategy also occurs in Italian Sign Language, where some variants for ‘pink’ use the handshape of WHITE with the movement and location of RED (Silver-Swartz 2012:27).

The variants PUTIH:1 (‘white’) and KUNING:1 (‘yellow’) are shown in Figure 2b. PUTIH:1 is used across the Solo sub-community, while KUNING:1, an older and less prevalent variant, is produced by the middle finger quickly and repeatedly rubbing against the thumb. The origins and motivations of these signs are unknown. The prevalence of PUTIH:1 stands in marked contrast to the variant for ‘white’ listed in SIBI (PUTIH:sibi), which was not produced by any respondent in Solo or Makassar. This shows that, even in locations and for lexical domains where SIBI variants are sometimes produced, the impact of SIBI upon the active lexicon of sign language users is unpredictable, and for some signs, negligible.



PINK:2 (‘pink’)

Figure 2a. A variant for ‘pink’ which is used in Makassar.

PUTIH:1 (‘white’) | KUNING:1 (‘yellow’) | PUTIH:sibi (‘white’)

Figure 2b. Solo variants for ‘white’ and ‘yellow’, and the SIBI variant for ‘white’.

An older variant used in Solo for the colour ‘green’ is discussed in 4.1. Meanwhile, two phonological variants for this colour that have emerged more recently are shown in Figure 3. These signs may be articulated below the nose, or under the chin. The orientation and internal movement also vary. One option is to flick the middle finger away from the thumb (HIJAU:1a), and another entails

flicking the index finger away from the thumb, while keeping the other digits closed (HIJAU:1b). These variants are used by some signers in Solo, but are reported to have come from the city of Surabaya in East Java (see Map 1 above).

Another variant that informants described as a Surabayan variant for 'black', glossed HITAM:asl, does not seem to be used extensively in Solo, but is included here to show that colour terms from ASL have been borrowed, in this case exactly (Figure 3). Further evidence of this influence is presented in 3.2.

HIJAU:1a ('green') HIJAU:1b ('green') HITAM:asl ('black')

Figure 3. Variants reported to occur in the Surabaya variety; HIJAU:1a and 1b also occur frequently in Solo; HITAM:asl does not.

Several other variants were produced in Solo for the colours grey, orange and purple (Figure 4). ORANYE:1 and UNGU:1 are reported to have been used in the schools YAAT and YRTRW respectively. ORANYE:1, ABU-ABU:1 and PINK:1c (Figure 10b) are very similar in terms of their phonological specifications, and it may be that this is essentially a generic sign with mouthings used to differentiate between them.[4] In practice, non-initialised variants for the colours pink and grey seem to be notably unstable, and this is discussed further in section 6.

ABU-ABU:1 ('grey') ABU-ABU:2 ('grey') ORANYE:1 ('orange') UNGU:1 ('purple')

Figure 4. Idiolectal/school-based variants in Solo.

3. Initialised and single manual letter variants

Initialisation has been attested in the colour terms of several sign languages, including ASL (Woodward 1989), Estonian Sign Language (ESL) (Hollman and Sutrop 2010) and New Zealand Sign Language (NZSL) (McKee, McKee and Major 2011). Initialised signs emerge in slightly different ways. Machabée (1995:34) notes that they may result from reducing a word spelt manually, or a change of handshape to an existing non-initialised sign. Initialised variants enter the lexica of sign languages as a result of contact with written language, usually through the education system.

This can be shown with respect to Kata Kolok, whose signers have only recently had access to formal education (de Vos and Palfreyman 2012). Prior to this, deaf signers in Bengkala were illiterate, and hence not in a position to make use of a manual alphabet. The international one-handed manual alphabet was only introduced for the education of deaf children in the village in 2007, and so initialised signs are not a part of the Kata Kolok lexicon (de Vos 2012:94).

In cases where language planners or educators introduce a set of initialised signs from one sign language to another, and the written language of the target community is different from that of the source community, the handshapes of initialised signs often change. This process is noted by de Garcia (1990:271) in Dominican Republic Sign Language for days of the week, where the handshapes used for signs in ASL, such as Monday and Friday, have changed from 'M' and 'F' to 'L' and 'V', for the Spanish *lunes* and *viernes*. This process has been used to create expressions for colour terms in SIBI, with handshapes used for initialised signs in ASL (such as 'G' for *green*) changed to match the corresponding word in Standard Indonesian ('H' for *hijau*) – see 3.2.

Manual alphabets belong to one of two types, one-handed and two-handed (Branson et al. 1995), and where a sign language uses a two-handed alphabet, initialisation is rare (Adam 2012:849). Instead, *single manual letter signs* are usually produced, whereby only the initial letter of the corresponding written word is signed (Sutton-Spence 1994). For the urban varieties of Indonesia, these are nearly always accompanied with a mouthing for the colour term in Standard Indonesian.

The existence of one-handed and two-handed alphabets in both sign language varieties means that some colour terms have two initialised variants, and so there are two lexical sets for initialised colour signs. Initialised variants based on the two-handed alphabet are presented in 3.1, and variants based on the one-handed alphabet in 3.2. However, not all of the letters in a so-called two-handed alphabet are actually represented with two hands, which leads to some ambiguity about which lexical set an initialised variant belongs to. This is discussed further in section 3.3.

Technically, single manual letter variants are not initialised signs proper; they are, however, often referred to as almost a counterpart to initialised signs for varieties that use two-handed alphabets (Adam 2012:849). Additionally, in the data there is variation in the movements that are used to accompany 'initialised' signs. For variants in section 3.2, for example, the movement that properly distinguishes an initialised sign from a single manual letter variant seems to be optional, making it difficult to categorise these signs. With the similarities in mind, it makes sense here to consider single manual letter forms as 'initialised' in a loose sense.

It is usually difficult to tell whether an initialised variant has displaced an older, non-initialised sign. As Berlin and Kay (1969:44) point out, borrowing foreign forms for colour terms can either encode a colour term that was previously uncoded, or replace an existing form. In some cases, however, initialised variants persist alongside non-initialised variants that are described in section 2. See section 5 for a brief discussion of how informants cope with these variants.

3.1. Variants based on the two-handed manual alphabet

Three initialised variants occur in both the Makassar and Solo varieties that are based on the two-handed manual alphabet (Figure 5). Note that, in this and subsequent figures that show initialised signs, letters that are represented manually are indicated in the gloss in bold type. init2 refers to variants based on the two-handed alphabet, and init1 to the one-handed alphabet.

KUNING:init2 ('yellow')

ABU-**A**BU:init2 ('grey')

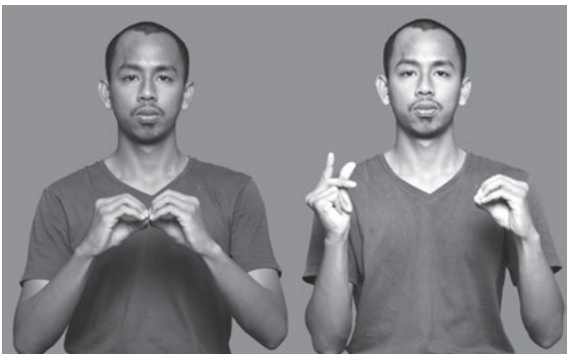
UNGU:init2 ('purple')

Figure 5. Single manual letter variants used in both Makassar and Solo.

Conversely, the variants in Figure 6 are produced only by Makassarese informants. Although it is possible in theory for these to occur in Solo, which shares

the same manual alphabet, non-initialised alternatives are produced in Solo in each case (see 2.2). **BIR**U:init2 ('blue') is exceptional in that two separate letters – B, a two-handed form, and R, a one-handed form – are blended by means of a hold in one of the hands, making it a 'two manual letter' variant. **K**UNING:init2m is notable for using a variant for the letter K that occurs in Makassar but not in Solo. While this form looks more similar to **K**UNING:init1 (Figure 7), it is actually closer, in terms of its origin, to **K**UNING:init2 (Figure 5).

PUTIH:init2
('white')



BIRU:init2
('blue')

HIJAU:init2
('green')

KUNING:init2m
('yellow')

Figure 6. Single manual letter variants observed only in Makassar.

3.2. Variants based on the one-handed manual alphabet

The variants for 'blue,' 'yellow,' 'green' and 'grey' all use handshapes from the one-handed manual alphabet for the initial letters of the corresponding words in Standard Indonesian (B, K, H and A respectively). This supports the notion that these comprise a distinct lexical set of colour variants. **B**IRU:init1

and **K**UNING:init1 (Figure 7) have a fixed location and usually feature a twisting movement, while **H**IJAU:init1 and **A**BU-**A**BU:init1 tend not to feature any internal movement, but often have a small forward movement (twice, in the case of **A**BU-**A**BU:init1). In all cases, however, these signs are sometimes articulated *without* movement.

The same colour terms are also represented in SIBI as one-handed, initialised signs. The committee that drafted SIBI seems to have tried to create a lexical set of colour terms by using a method similar to l'Epée and Sicard in eighteenth-century Paris, who added a distinguishing movement to an alphabetic handshape (Stokoe 1987:9). This has not been entirely successful, because in practice, informants do not add the wavy downward movement that is specified for these colour signs in SIBI.

HIJAU:asl ('green') and PINK:asl – also shown in Figure 7 – are formally very similar to the equivalent signs in ASL. For HIJAU:asl, the initial handshape (G) in the source language has been retained in the target language (i.e. from the ASL sign GREEN). The retention of this sign, which is at odds with the initialisation strategy – given that *hijau* does not begin with 'G' – may be due to the stronger influence of ASL in the Surabayan variety, with which the Solonese variety has had contact. The occurrence of PINK:asl in the Solo dataset can also be explained in this way.

HIJAU:init1 ('green') **B**IRU:init1 ('blue') **K**UNING:init1 ('yellow')

HIJAU:asl ('**g**reen') **P**INK:asl ('pink')

Figure 7. Initialised signs based on the one-handed manual alphabet.

3.3. Indeterminate variants

The term 'two-handed alphabet' is itself somewhat misleading, given that nine letters in the Indonesian manual alphabet (C, I, J, L, O, R, U, V, Z) are represented with one-handed forms, and others (E, K) have both one- and two-handed variants. The one-handed forms shown in Figure 8 are usually articulated with a circular movement. ORANYE:init-o and COKLAT:init have handshapes that can represent the letter 'O' in both the one-handed and two-handed alphabets, which means that this variant could belong to either lexical sets of initialised variants. However, ORANYE:init-f can only belong to the two-handed lexical set, since this handshape represents the letter 'F' in the one-handed alphabet.

ORANYE:init-o ('orange') | ORANYE:init-f ('orange') | COKLAT:init ('brown')

Figure 8. Initialised signs based on letters identical in form in both alphabets.

4. The impact of language contact on the inventory of colour terms

It is far from inevitable that a sign language will possess the same inventory of colour terms as its surrounding spoken language. For example, colour terms in Kata Kolok differ considerably from Balinese. Whereas Balinese has 11 colour terms, Kata Kolok has just four lexical signs: WHITE, BLACK, RED, and GRUE – the latter describes the colours blue and green (de Vos 2011). As with the lack of initialised signs in Kata Kolok, however, this is perhaps due in part to the fact that deaf signers in Bengkala did not have access to formal education until very recently, and de Vos suggests that the use of a sign language in formal deaf education 'might accelerate the calibration of colour signs to the colour words of the surrounding spoken language' (de Vos 2011:75).

For urban sign language varieties in Indonesia, which are used by sub-communities that have had access to formal education for some time, the inventory of colour terms seems to correspond more closely to the range of terms in Standard Indonesian. There are indications in the data of two changes that are currently underway in the inventory of colour terms, and in each case, the evidence comes from co-existing variants. In section 4.2, variability in the expression of the colour pink is discussed. Before that, I examine a single variant that informants produce in response to colour tiles for both green and blue.

4.1. Variants meaning 'blue' and 'green'

When asked for variants for the colour green, three informants in Solo produced HIJAU/BIRU:a and HIJAU/BIRU:b (Figure 9), and my research consultants identify these variants as older signs. The two variants that were produced are nearly identical, but have different orientations. The same pair of variants was also given by two informants in Jakarta. However, two Solonese informants produced similar forms (HIJAU/BIRU:a and HIJAU/BIRU:c) for the colour blue. These informants usually used an alternative variant, HIJAU:2a, for green. In each of the cases described above, informants reinforced the meaning of the sign that they were producing by using an appropriate mouthing from Standard Indonesian.[5]

HIJAU/BIRU:a HIJAU/BIRU:b HIJAU/BIRU:c

Figure 9. Phonological variants for green and blue. Variants *a* and *b* differ in orientation (in b the hand is almost perpendicular to the wrist); variants *a* and *c* differ in handshape (in c the thumb is tucked in front of the palm).

This phenomenon could be linked to changes in the inventory of colour terms in the dominant spoken language. At the beginning of the twentieth century,

Javanese was dominant in most of Java, but by the end of that century the dominant language had shifted to Bahasa Indonesia. In his dictionary of Old Javanese, Zoetmulder (1982) translates *ijo*/*hijo* as 'green, also blue', although there seems to have been another distinct term for blue which may or may not have been a borrowing from English or Dutch (see Berlin and Kay 1969:88). The conflation of blue and green is also noted by Bartlett (1929:16), who reports an 'underlying tendency to confuse blue with green', as seen in the 'use of *idjo toewo* (dark green) for a distinctly bluish grey'. While the Javanese term for green seems to have included the colour blue, Standard Indonesian now encodes blue and green as separate colour terms.

It may be that a similar process has taken place in the inventory of colour signs, with distinct forms meaning blue and green having replaced an earlier form meaning 'blue-green'. Interestingly, while there are other non-initialised variants for green (see 2.2), HIJAU/BIRU is the only non-initialised variant for blue that occurs in the data, and other variants for blue in Makassar and Solo rely on borrowing/initialisation (3.1 and 3.2). This means that an older form could have narrowed semantically in different ways, with some signers now using it to correspond with 'green' (using another sign for 'blue') and some signers using it to correspond with 'blue' (using another sign for 'green'). This is still a hypothesis, and more research is needed to test it.

4.2. Variants meaning 'pink'

A more incontrovertible example of language contact affecting the inventory of colour terms can be seen in variation for the colour pink. Berlin and Kay (1969:44) report that Malay/Indonesian lacks a term for 'pink', and Indonesian speakers commonly use *merah muda* or *merah jambu*, which include and modify the term *merah* ('red').[6] However, many younger speakers now borrow the English term *pink*, which is regarded as being more prestigious than the Indonesian equivalents (Noor Malihah, personal communication, January 2014). This is in line with positive evaluations of other borrowings from English (Lamb and Coleman 2008).

Following Malay/Indonesian, several signers express the colour pink with two manual signs MERAH MUDA and the mouthing 'merah muda' – see Figure 10a. However, some of the informants who know of the borrowing *pink* use 'pink' as the mouthing instead. The manual lexical variants that this mouthing accompanies are monolexemic. Two phonological variants are shown in Figure 10b, and lexical variants can be seen in Figures 2a and 7 (the latter is initialised). It seems that contact with Malay/Indonesian – and the

different possibilities that it offers for expressing ‘pink’ – has had a notable effect on manual signs and mouthings in both sign language varieties.

There is still confusion among some signers concerning expressions for ‘pink’. Even though the variants and mouthings described above are produced by signers in response to the same colour tile, one Makassarese signer insisted that MERAH MUDA and PINK:2 are not interchangeable, but that MERAH MUDA means ‘merah muda’ and PINK:2 means ‘pink’. This shows that caution must be taken when using written languages as stimuli for elicitation, and is also another indication of how some signers may perceive variation in the colour signs of sign language through variation in spoken language. These perceptions arguably raise methodological questions for sign linguists working on colour terms that are not easily answered.

MERAH MUDA

Figure 10a. An expression for the colour pink (meaning ‘light red’).

PINK:1a PINK:1c

Figure 10b. Mono-lexemic variants for the colour pink in Solo.

5. Coping with variation

How do sign language users cope with the different variants for colour terms described in sections 2–4? In some cases, it is clear that informants have a passive knowledge of variants other than the one(s) that they usually produce. For example, one of the Solonese informants, aged 36, was able to list all of the four variants for 'green' that have been found for the Solo variety. However, his 21-year-old friend had never seen one of these variants (HIJAU/BIRU:a) before, and initially mistook this for a sign with a similar form that means 'don't understand'.

In other words, while some informants know and use more than one variant, other informants may know only a limited selection of variants, and seem to have a clear preference as to which variant they use. This in turn points to considerable diversity in the constellations of variants that constitute the active and passive lexicons of sign language users, regardless of how large the pool of variants is in the city where they live.

When dealing with the challenges posed by multiple variants, or lexical sets, one of the strategies that signers sometimes use in the data entails stacking variants one after another, presumably to maximise the chances that the other signer will recognise one of these variants (see Palfreyman, 2015 for more discussion of this strategy). This can be seen in (1) where an informant uses two different variants for the colour yellow.

(1) [Solo]

	kuning	kuning		kuning
PINTU	**KUNING:init1**	**KUNING:init2**	**MUDA**	**KUNING:init2**
door	yellow	yellow	light	yellow
'The door is yellow.'		It is light yellow.'		

Another strategy is to fingerspell a variant using one of the two manual alphabets. Informants seem to use this strategy either when they are unsure of the form that they feel they should use, or are uncertain that their interlocutor will understand it:

(2) [Mksr]

kucing	abu-abu
KUCING	**FS:ABUABU**
cat	grey

The cat is grey.

The use of mouthing is reported to have a role to play in facilitating the intelligibility manual variants for colour terms. Stamp (2013) notes that British Sign Language (BSL) users seem to rely heavily upon mouthings in order to understand regional variants for colour terms. Without mouthings, the average participant in her dialect comprehension task was able to correctly identify only 38% of colour sign meanings in British Sign Language (Stamp 2013:178). Almost all colour terms in the Indonesian data occur with a mouthing, but there are nevertheless occasions where mouthing fails to prevent the inaccurate comprehension of a colour term variant.

Example (3) describes an example of a misunderstanding that occurs between two friends during an activity designed to generate tokens of colour terms. This incident seems to occur because they do not have – or at any rate, do not happen to use – a mutually intelligible term for 'pink'. Even once the mistake has been identified, they continue to use several different variants. Over the next fifteen minutes of the game, a further 31 tokens of variants for 'pink' are used, with five different variants, and only then do the signers synchronise fully, henceforth using MERAH:a for pink and MERAH:b for red.

(3) An example of inaccurate comprehension of colour term variants.

Ari describes the colours of a picture. Muhammad cannot see the picture, but must select a matching colour tile, based on Ari's description, from a set of tiles.

Ari describes a shade of pink using MERAH:a ('red') and a mouthing 'jambu, jambu' (see section 4.2, and note 6).

Muhammad interprets MERAH:a as a variant for grey, and repeats it with the mouthing 'abu-abu' (meaning 'grey'). With no negative feedback from Ari, he selects a grey tile.

Later they compare the picture with the tiles that Muhammad has selected.

Muhammad notices that the colour Ari had been describing was pink, not grey.

Ari points out that Muhammad has selected grey (**A**BU-**A**BU:init1) which is different from pink (MERAH:a). In reaffirming that Muhammad has selected a grey tile, he clarifies the signs that he would have used for grey had he intended to describe grey (using both **A**BU-**A**BU:init1 and **A**BU-**A**BU:init2).

It seems that 'pink' is a particularly problematic colour term at the moment, and this may be because of the array of different options for manual variants and mouthings discussed in 4.2.

Other colours that occur during the course of the activity do not present this kind of problem. When Muhammad produces a variant for 'blue' (HIJAU/BIRU:a) that Ari does not recognise, Ari seems able to identify the sign successfully from the mouthing that Muhammad uses. However, Ari corroborates this, responding questioningly with HIJAU:2a and **B**IRU:init1 in order to see which colour is intended, and Muhammad responds by repeating **B**IRU:init1. Later on, Muhammad produces a hitherto unused variant for 'green' (HIJAU:asl) and Ari uses the same strategy as before, confirming the meaning by using HIJAU:2a in reply. Importantly, **B**IRU:init1 and HIJAU:2a are now 'stable' variants in this conversation – they have already occurred in the dialogue, and both signers understand what these variants signify. Consequently, Ari's corroboration strategy is successful.

To summarise, several strategies are used to cope with variation, including fingerspelling, and the production of more than one variant in the same utterance. Mouthings play a key role in the disambiguation of manual variants for colour terms. Some signers also corroborate their understanding of a certain variant by producing, in response, a different variant for the same colour term, often with interrogative facial expressions. Questions of intelligibility and strategies for coping with variation are discussed further in Palfreyman (2015).

6. Discussion

As with other semantic domains, such as numerals (Palfreyman forthcoming), lexical variants for colour terms are organised as sets. Three lexical sets have been found: non-initialised variants; single manual letter variants based on the two-handed indigenous alphabet; and initialised variants based on the imported one-handed alphabet. This is summarised in Table 1. Within the first set, a further class of variants can be found that are motivated by canonical colours typically associated with body parts (HITAM, MERAH and COKLAT:1).

The Solo data exhibit more lexical variation than the Makassar data, but both datasets usually contain at least two variants per colour term, one of which is more recent – usually an initialised sign – and one of which is older. Initialisation is the most common strategy for colour terms in Makassar, but the use of the indigenous two-handed manual alphabet creates a strong contrast with the lexical set that is based on the one-handed manual alphabet. Although there are differences in the precise constellation of variants for colour terms that occur in Makassar and Solo, all three lexical sets are evident in both varieties.

Table 1. Lexical variants for colour terms in the sign language varieties of Makassar and Solo.

	non-initialised variants (section 2)		initialised variants (section 3)			total number of variants	
			two-handed alphabet (init2)		one-handed alphabet (init1)	lexical	phonological
	Solo	**Mksr**	**Solo**	**Mksr**			
black (hitam)	HITAM:a/b					1	2
white (putih)	PUTIH:1			PUTIH:init2		2	2
red (merah)	MERAH:a/b					1	2
green (hijau)	HIJAU:1a-d			HIJAU:init2	HIJAU:init1 HIJAU:asl	5	10
	HIJAU/ BIRU: a-c						
blue (biru)				BIRU:init2	BIRU:init1	3	5
yellow (kuning)	KUNING:1		KUNING:init2		KUNING:init1	4	4
			KUNING:init2m				
brown (coklat)	COKLAT:1		COKLAT:init			2	2
orange (oranye)	ORANYE:1		ORANYE:init-o			2	3
			ORANYE:init-f				
grey (abu-abu)	ABU-ABU:1 ABU-ABU:2		ABU-ABU:init2		ABU-ABU:init1	4	4
pink (pink)	MERAH MUDA*				PINK:asl	4	6
	PINK:1a-c	PINK:2					
purple (ungu)	UNGU:1		UNGU:init2		UNGU:init1	3	3

* This is not a mono-lexemic colour term (see section 4.2).

The issue of lexical stability has emerged several times, both in terms of the number of idiolectal variants (section 2.2) and the difficulty that occasionally arises when expressing some colour terms (section 5). Further, while at least four lexical variants are produced for 'yellow', 'grey' and 'pink' – and five for 'green' – two colour terms ('red' and 'black') exhibit no lexical variation, and both of these are highly motivated by iconicity. Where the representation of a semantic item is strongly motivated by a clear iconic source, it seems less likely that there will be other variants with which it competes, and this seems to be typified cross-linguistically by the colour terms 'red' and 'black'.[7]

There is evidence to suggest that a shift is taking place towards initialised signs for colour terms. Older sign language variants are sometimes referred to by Indonesian signers as *isyarat lama*, or 'old signs'. According to the research consultants, many of the non-initialised signs described in section 2 are *isyarat lama*, not used or known by some younger signers. This is exemplified by the 21-year-old signer who did not recognise the sign HIJAU/BIRU:a (mentioned at the beginning of section 5).

Instead, it seems that younger signers tend to produce initialised variants for most colour terms that draw upon the one-handed alphabet (section 3.2), though expressions for 'red' and 'black' are not disposed to initialisation. Further, use of the two-handed alphabet remains strong in Makassar. With these points in mind, it is hypothesised that – for the Solo variety – the expression of many (though not all) colour terms is changing in favour of initialised signs, and quantitative research is now needed to test this hypothesis.

6.1. Variation and lexical sets

Lexical sets do not only occur in the semantic domain of colour terms. Another example in the corpus is signs for Javanese cities, where two sets currently coexist. The older set comprises signs that are based on the first letter(s) of vehicle registration plates which in Indonesia denote where the vehicle is registered. For example, Jakarta is signed as 'B', Yogyakarta is 'AB' and Surabaya is 'L'. This lexical set is in the process of being displaced by a new set, where cities are represented by signs that refer to their most prominent statue.

There are several descriptions in the literature of other instances of lexical sets, such as weekdays in NZSL. According to McKee and McKee (2011:505) one lexical set is based on naming the days by a routine domestic activity, while a second set, introduced in 1979, uses initialised signs. Coincidentally,

at least three lexical sets for weekdays in the Makassar and Solo varieties have very similar motivations to those in NZSL.

Semantically, lexical sets of variants share certain characteristics. They develop around groups of semantically-related items that can be represented metonymically in different ways. These items tend to have either several possible iconic sources, as is the case with Javanese cities, or no clear iconic sources, as with weekdays. Lexical sets often emerge in schools through a process of 'schoolisation', and schools are also an important influence on the spread of initialised signs.

I would argue that the playfulness and inventiveness of sign language users also has a role to play in the origin and development of lexical sets, perhaps along with the satisfaction evoked by an extensive lexical set that can be extended to represent a group of semantic items. In some cases, it is likely that the longevity of a lexical set of variants can be explained by social identity. The indexical value of lexical sets that are linked to certain schools or social networks can help to explain both the persistence of older sets and, in some cases, the need for new ones.

6.2. Further research

The investigation presented in this chapter is far from exhaustive, and there is little doubt that further research on these and other varieties across Indonesia will uncover many more variants for colour terms. Given the sheer size and population of the Indonesian archipelago, there is every reason to suppose that, when other urban centres are added, the overall pool of colour term variants will be considerably larger than the 29 lexical variants reported here. Only after extensive documentation will it be possible to examine the way in which these variants pattern regionally.

Further documentation is time-sensitive because older variants for colour terms are disappearing, to be displaced by more recent variants. In particular, the Surabayan variant has been mentioned several times. In addition to borrowing signs from ASL in the 1980s, other variants such as those for 'green' (HIJAU:1a–d) appear to have emerged since. The chance to identify *isyarat lama* that pre-date the introduction of ASL signs will soon be lost.

Several hypotheses have been proposed here, concerning changes to the inventory of colour terms for 'green' and 'pink', and the shift towards the lexical set of one-handed initialised variants in the Solo variety. Both of these require testing with further data elicitation and quantitative analysis in order to establish which changes are taking place in the lexicon.

Another area where research is needed concerns the hedging or modification of colour terms. Several such expressions have been observed, including signs that mean 'young', 'old', 'light', 'dark', 'strong', 'soft', 'little' and 'average'. While some of the terms are also used in Standard Indonesian, others are not. Further research is needed in order to ascertain the use and distribution of these terms.

Finally, more research is needed on the intelligibility of colour signs across regional varieties. Several strategies are observable in the way that signers deal with lexical variation in this semantic domain, including fingerspelling, mouthing and the stacking of different variants. Thus far, however, the analysis has been limited to signers in the same urban centre, and the intelligibility of colour terms between Makassarese and Solonese signers has not yet been investigated.

7. Summary

The vast majority of colour terms in the sign language varieties of Makassar and Solo may be expressed using several lexical variants, and this appears to be typical of sign languages cross-linguistically. Twenty-nine signs for colour terms produced by signers from Makassar and Solo are analysed as belonging to three lexical sets of variants: two of these sets feature initialised signs, and one does not. The two varieties contain at least two variants per colour term, and it is hypothesised that younger signers may prefer initialised signs that draw upon the one-handed manual alphabet. Several older, non-initialised signs, which are motivated by iconicity and derivation, tend to be known and used only by older signers.

Some signers use the same lexical variant (HIJAU/BIRU) to express both 'green' and 'blue', and it is possible that signers may originally have made no distinction between the two. It is also reported that expressions for 'pink' have changed, with signers using mono-lexemic variants rather than MERAH MUDA ('light red'), and the likely explanation for this is contact with Standard Indonesian. It seems that urban sign language varieties of Indonesia are more inclined to correspond with colour terms in the surrounding spoken language than are rural sign languages such as Kata Kolok.

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Notes

1. Variation is evident in the data on colour terms on the website of the Corpus Project in Colloquial Japanese Sign Language, which is available at http://research.nii.ac.jp/jsl-corpus/en/ (accessed 12 June 2014).
2. This is not the place for a lengthy critique of SIBI, but briefly, it does not exhibit the affordances of natural sign language varieties used by members of the deaf community, and its lexicon and grammar are largely unintelligible to deaf people. Even in schools where SIBI is heavily used, deaf children who are able to render a written sentence in manual form, and vice versa, do not always understand the meaning of the sentence.
3. Thus far, more attention has been paid to differences between parameters as they are produced, and the question of how these differences are perceived has yet to be seriously considered.
4. It is intriguing to note that so many signs for colour terms are located on the chin (see the variants shown in Figure 4, for example). Almost all variants for the superordinate term 'colour' also have this location.
5. All of the forms shown in Figure 9 are older signs, and are not produced at all by some of the other informants in Solo. These signs are not used at all by Makassarese informants.
6. Merah muda is equivalent in English to 'light red'. Jambu is a pink-coloured fruit called a rose apple, and merah jambu is named after this.

7. 'Red' features no lexical variation in recent studies on German Sign Language (Eichmann and Rosenstock 2014), and Italian Sign Language (Silver-Swartz 2012), which accords with the findings here on Indonesian sign language varieties. In the same studies, the colour term 'black' is also typified by remarkably few variants.

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Aspects of number and kinship terms in Japanese Sign Language

Keiko Sagara

Introduction

Japanese Sign Language (JSL) is used by approximately 57,000 people (Ichida 2001), although the Japanese government states that there are 343,000 deaf people, including hard of hearing and deafened people (Ministry of Health, Labour and Welfare 2012). JSL has probably been used in Japan for hundreds of years, but prior to the founding of the Kyoto Deaf-Blind School in 1878, there is little evidence of what JSL was like, who used it and where it was used.

The Japanese Federation of the Deaf (JFD) was established in 1947, and produced the first book about JSL, called *Our Sign Language*, in October 1969. The JSL Research Centre was later set up as part of the JFD in 1987, focusing on the teaching of JSL. Scholarly research into the linguistics of JSL was first carried out by the Sign Language Society of Japan (Tanokami & Peng 1976), and the first JSL dictionary was published by the Japanese Federation of the Deaf (JFD 1997); another more comprehensive dictionary has recently been compiled (JFD 2011). To date, no reference grammar has been produced for JSL, but Kimura and Ichida (1995) show that JSL has its own grammar, distinct from that of spoken Japanese. Morgan (2005) provides a whole-language typology of JSL, while Oka & Akahori (2011) give an overview of several grammatical domains.

This chapter focuses on two semantic areas, numerals (section 1) and kinship terms (section 2), and gives a comprehensive description of JSL's complex ordinal number system, as well as an update on changes in the morphology of its kinship signs, which was last studied in depth by Peng (1974). The information presented here is based on two sources of data: introspective judgments and elicited data. The introspective judgments were made by the author and four teachers at Meisei Gakuen School for the Deaf in Tokyo, who are all deaf JSL users. The elicited data were collected using elicitation activities developed by the International Institute for Sign Languages

and Deaf Studies (iSLanDS), with informants from the Kanto region and the Kansai region. This enables some discussion of regional variation relative to the two areas of Honshu, the largest and most populous of Japan's islands (see Tanokami & Peng 1976; Morgan 2008; Sagara forthcoming).

1. Numerals

Several researchers have examined the number system of JSL. Mori (2005) and Ichida (2005) both study the phonological (but not morphosyntactic) structure of cardinal numbers in JSL, including variants, while Ktejik (2013) focuses on numeral incorporation. Osugi (2010) looks at sign variation in JSL using a word list of 31 different lexemes covering a wide range of semantic areas, including number signs associated with money. Osugi's data suggest that there is considerable variation in JSL numbers, especially among older signers.

The following sections cover cardinal numbers, ordinal numbers, numeral incorporation, and quantifiers, including regional variation.

1.1. Cardinal numbers (0 to 19)

The JSL sign for 'zero' has two phonological variants that differ in handshape, as shown in Figure 1 below. The first of these seems to occur more frequently in everyday conversation and is more common; the second variant tends to be used by older deaf people from the Kansai region.

Figure 1. Two phonological variants for 'zero'

JSL uses a base 10 number system. Consequently, the numbers from 1 to 9 are particularly important, since they constitute the basis for the forms of larger numbers, and provide the handshapes for numeral incorporation paradigms. The numbers 1 to 4 are the same as the gestures that hearing people tend to use (Ichida 2005), and are usually expressed with the palm facing away from the signer; however, a palm-inward orientation can also be found, for example when incorporating numbers (see Ktejik 2013:191, 195) and more research is needed to find out why this might be. However, the sign FIVE is different from the gestures of hearing people, using a closed fist instead of a spread '5' handshape (Figure 2 below). The numbers from 6 to 9 have a palm-inward orientation, with the digits orientated horizontally. It is possible that the signs 5 to 9 derive from the use of an abacus, which had vertical columns of five beads, and multiples of five indicated at the top of each column (Maruyama 1984).

Expressing dates and school years requires the articulation of numbers with fingertips pointing sideways, which may be due to influence from written Kanji forms.

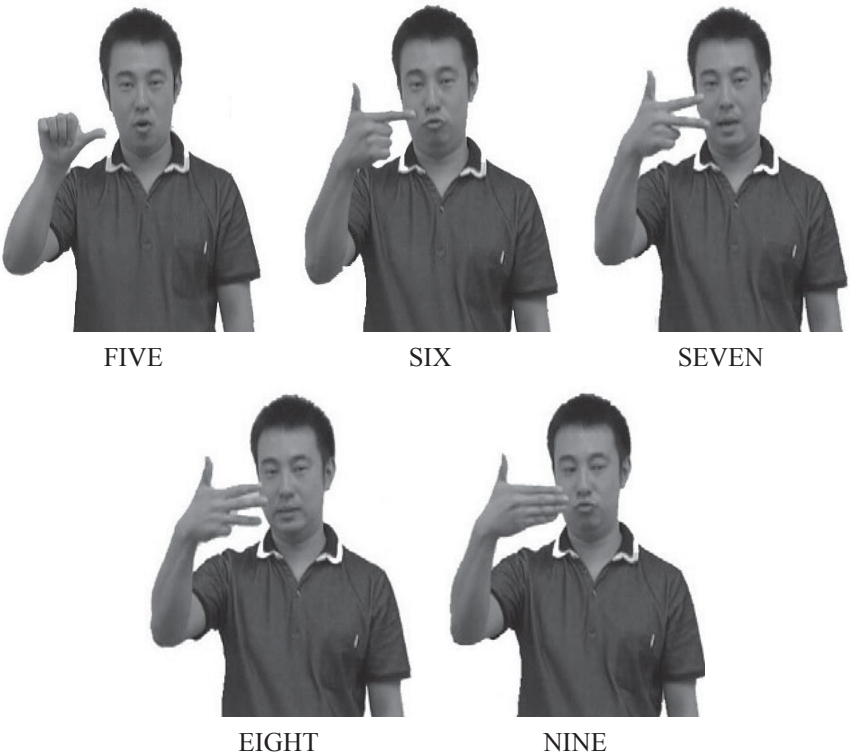


Figure 2. Cardinal numbers from 5 to 9

Variants exist for some, though not all cardinal numbers. Regional variation is evident, as in the signs for '10' (see Figure 7 in section 1.2 below), where some signers from the Kansai and Hokkaido prefectures use a different variant to those from other areas. 'Eleven' has at least three different variants (see Figure 3) which seem to pattern according to age (rather than region), with the second variant used by younger signers and the third variant used by older signers. The first variant is most frequently used now.

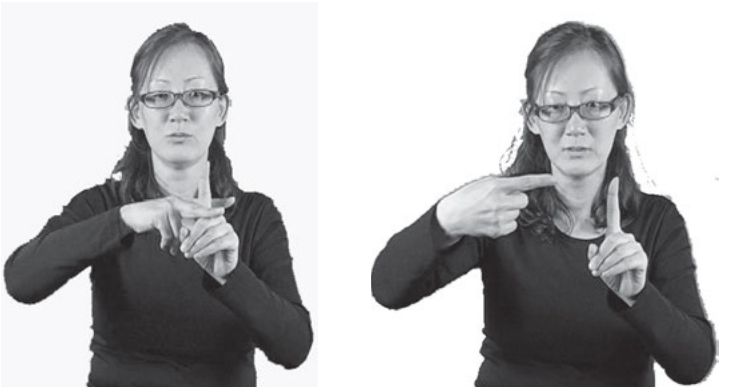
ELEVEN/1 ELEVEN/2 ELEVEN/3

Figure 3. Three phonological variants for eleven

The numbers 11 to 14 and 16 to 19 are compounds comprising two separate morphemes, i.e. TEN^ONE (11), TEN^TWO (12), and so on. The number 15 is a special case: its citation form is also based on TEN and FIVE, but is usually phonologically reduced to a trilled form, with rapid movement of the index finger (see Figure 4). Additionally, 11 to 14 may be articulated with a twist of the wrist, changing the orientation of the second number from palm-outward to palm-inward.

Figure 4. FIFTEEN (trilled form)

The realisation of cardinal numbers in JSL sometimes appears to be influenced by written forms. Fischer and Gong (2011) give several examples of how written characters such as Kanji have influenced JSL, either as symbols, depicted character signs, or traced character signs, and the writing system in Japan appears to have had an influence on the articulation of numbers. For example, the sign ELEMENTARY-SCHOOL is based on the first character of the Kanji for 'elementary school' (小学校), and when this sign is followed by a cardinal number (to indicate school grade), the form of this number appears similar to the Kanji number; thus, instead of pointing upwards, the fingertips point sideways. The same is true of the signs for junior school and high school grades (see Figure 5).



小一
Structure meaning 'elementary grade one'

中二
Structure meaning 'junior grade two'

Figure 5. Influences from written forms

Most JSL users also use mouthings when articulating numbers, as shown in example (1). Mouthings are mouth patterns that are borrowed from spoken languages (Boyes-Braem and Sutton-Spence 2001).

(1)

‘ringo’	‘puff’	‘go’	‘aru’
RINGO	IPPAI	GO	ARU
APPLE	MANY	FIVE	EXIST

‘There are five apples.’

1.2. Multiples and larger cardinal numbers

JSL uses numeral incorporation to express multiples of tens, hundreds, and thousands. Typically, each paradigm has a location and a movement with values from 1 to 9 incorporated as handshapes. For simple multiples of ten (20–90) there is an added movement, whereby the hand is shaken slightly from side to side with the digits in a bent position, or alternatively the selected digits are bent once, though this is less common. In some cases the selected digits may be bent several times – this is particularly noticeable among older signers. For 60 to 90, the thumb may bend along with the selected fingers, or may be held straight (i.e. the bending of the thumb for these number signs appears to carry no additional meaning).

For numbers 100 to 900, the hand begins with a different orientation (the fingertips point sideways), and is flicked in an upward motion. 'For multiples of 1,000, the same orientation is used but with a sweeping motion, like that of the Kanji character ‘thousand’ (千). This has become simplified, and now traces a shape more similar to (𠂉) or, when articulated quickly, simply a brief side-to-side movement from the wrist (Figure 6).

TWENTY TWO #HUNDRED TWO #THOUSAND

Figure 6. Movement variation in cardinal numbers



Kansai variants: 10 100 1,000



Kanto variants: 10 100 1,000


Kansai variants: TEN-THOUSAND HUNDRED-MILLION


Kanto variants: TEN-THOUSAND HUNDRED-MILLION

Figure 7. A comparison of signs in the Kansai and Kanto regions

For numbers 10,000 and above, a strategy different to incorporation is used. To construct these large numbers, discrete lexical signs for TEN-THOUSAND and HUNDRED-MILLION are used with signs for multiples and it is not possible to use numeral incorporation with these signs.

In the Kansai region, an alternative system exists for the numbers 10, 100, 1,000 and 10,000, based on forms that represent the number of zeroes in the number. For each '0', a finger makes contact with the thumb, starting from the index finger and working down to the pinky. It is very rare to use these signs to express multiples (e.g. 20, 30), but more common to use them as discrete lexical signs to express a more complex number (for example, '1,500' may be shown by articulating the Kansai variant for '1,000' and a numeral-incorporated sign for '500'). See Sagara (forthcoming) for an analysis of the distribution of the variation (shown in Figure 7).

1.3. Fractions

The sign HALF is shown with the blade of the dominant hand striking 'in half' the flat palm of the non-dominant hand (Figure 8). Another variation of 'half' in JSL, which has more of a meaning of 'split in half', is the dominant flat blade striking between a V shape made up of the index and middle finger on the non-dominant hand. Other fractions are shown using a columnar format, with the numerator and denominator articulated one on top of the other in the signing space. Similar strategies can be found in many other sign languages, but unusually in JSL the denominator is signed first with the non-dominant hand, and the dominant hand draws a 'line' over the denominator and forms the numerator, so that both numbers can be seen at the same time (see Figure 8). For example, 'one-third' is signed with the denominator THREE and then a line and the numerator ONE above it. This is probably due to influence from spoken Japanese, which states the denominator first.

1.4. Ordinal numbers

At least six incorporation paradigms show ordinal numerals, that is, numerals which identify the position occupied by a given member of a set in terms of the set's other members (Stolz & Veselinova 2011). None of these paradigms is general, since all refer to specific kinds of members, and to describe the order of a set, it is necessary to select the most appropriate paradigm. It

HALF

SPLIT-IN-HALF

ONE-THIRD

Figure 8. Fractions

is interesting to note that most of the paradigms are also used in spoken Japanese, where ordinal numbers are derived from cardinal numbers, with various morphemes (e.g. *ban, me* and *kyu*) added to the cardinal number words (some before and some after) to form ordinal numbers (cf. Stoltz & Veselinova 2011). This suggests that these paradigms derive conceptually and semantically from language contact, and they are referred to below accordingly using relevant Japanese words as labels.

As Ktejik (2013:198) reports, the maximum number that may be incorporated is not always clear. Numerals such as 1, 2 and 3 are regularly incorporated; situations that require the use of higher ordinal numerals, such as 7, 8 and 9, are so rare that the acceptability of such incorporation is ambiguous. For numbers larger than 10, numeral incorporation is not used. Of these six ordinal incorporation paradigms, three (*dai, i* and *ban*) are described by Yonekawa (1984:150) and three (*me, i* and *ban*) by Ktejik (2013). To the best of the author's knowledge, *kyu* and *kodomo* have not yet been described fully in the literature. The paradigms are as follows (and see Figure 9):

- For the ***me* paradigm**, the relevant number is articulated on the cheek, as if pointing to the eye (*me* means 'eye' in Japanese). Ktejik (2013:198) describes this as denoting 'one's place in a line', although this concept may be extended to include other types of members, such as occurrences, or the order of published works.
- The ***dai* paradigm** is articulated with a change in the orientation of the hand. It refers to an item on paper or on a list, such as an agendum, a rule, or one in a series of conferences. This is referred to as the *dai* paradigm after the Japanese word *dai*, which means 'order of things or events'.
- The ***i* paradigm** is described by Ktejik (2013:199) as one's place in a competition; it is articulated in the neutral signing space on the non-dominant hand, which assumes the shape of a fist. 1, 2 and 3 are the most common numerals to be incorporated in the *i* paradigm. This is referred to as the *i* paradigm because this word (pronounced 'ee' in Japanese) is used to denote first place.
- The ***ban* paradigm** refers to the same meaning as *i*, and is articulated on the opposing shoulder to the dominant hand. The name of this paradigm comes from the use of *ban* as a classifier in spoken Japanese, as in *ichi-ban* ('the first one'), *ni-ban* ('the second one'), and so on. As with the *i* paradigm, 1, 2 and 3 are the most common numerals to be incorporated. This paradigm is also associated with competitions such as marathons where participants finish in first, second and third place, and may derive from the tape that crosses the finishing line of a race (Yonekawa 2011: 96).
- The ***kyu* paradigm** is used to refer to the level of proficiency that someone has in a certain skill or language. The most common numerals to be incorporated are 1–4, where 1 refers to a high level of ability or skill, and 4 to a lower level. Interestingly, the same paradigm can be used to refer to a person's level of hearing, where 1 is 'very deaf' and 4 is akin to 'hard of hearing'. The paradigm is articulated to one side of the neutral signing space, with the fingertips facing forward; the hand is then moved slightly toward the signer.
- The ***kodomo* paradigm** has no equivalent in spoken Japanese, but the word *kodomo* ('children') is used because this paradigm refers to children, or siblings. This paradigm is described in more detail in Section 2.

Figure 9. Ordinal number paradigms

1.5. Numeral incorporation of other units (time, money, age, people)

For the numeral incorporation described in Section 1.2, compatible values usually, if not always, have an upper limit of 9. For other paradigms, such as time and age, however, it is sometimes possible to incorporate numbers larger than 9. However, only numeral handshapes that do not feature internal movement can be incorporated (see Ktejik 2013:207). This means that it is not grammatical to incorporate numbers such as ELEVEN/1 (see Figure 3). Interestingly, where variants for these numbers do *not* include internal movement, it is permissible to use these instead. For example, ELEVEN/2 (see Figure 3 above) and TWELVE/2 (see Figure 10) have a single handshape, and may be incorporated, although the use of TWELVE/2 is largely restricted to Hokkaido.

Figure 10. TWELVE/2 (in Hokkaido)

JSL uses numeral incorporation to express the number of hours and minutes, but not seconds. For number of hours, the dominant hand moves in a circular pattern as if on a wristwatch, while articulating the relevant number, or multiples of ten up to 90. To indicate numbers of minutes, the dominant hand shows a number from 1 to 10 or a multiple of ten up to 50, twisting at the wrist.

Numeral incorporation is also used to show the number of days, weeks, months and years. The sign meaning 'day' is performed across the chest, with the hand using the shape of the relevant number. For numbers of days from 1 to 5, as well as 10, 20 and sometimes 6, the hand touches the chest once on each side. For numbers from 6 to 9, the hand moves in a similar direction but is held out from the chest and does not touch it; this may be because '7 days' means the same as 'week', and the sign for 'week' is also articulated further away from the chest.

The sign for 'week' also uses numeral incorporation, and takes values from 1 to 3 (perhaps because, for higher numbers, it is possible to use a larger unit, such as 'one month' as opposed to 'four weeks'; see also Ktejik 2013:208). The sign for 'month', which is located at the cheek, can incorporate numbers from 1 to 11. Higher numbers are too difficult to articulate in this location due to the internal movement involved. There is some variation seen in this form, as some signers twist the hand when moving it away from the cheek. Numeral incorporation of the sign for 'year' is seen for numbers from 1 to 10, and multiples of 10 up to 90. The sign involves the non-dominant hand in a fist, with the dominant hand forming number handshapes and moving around the non-dominant hand in a circle, then touching the fist. A popular story of this sign's etymology holds that the fist represents a tree trunk with the annual growth rings visible from above.

To express money in terms of yen, the numbers from 1 to 9 can in theory be incorporated in a movement whereby the hand twists outwards in a sweeping

motion. Since numbers greater than 10 cannot be incorporated into this paradigm, incorporated forms are seldom used for money now; through time, the value of the yen has gone down due to inflation, and while it was possible in the past to buy something substantial for 5 yen, this amount is now worth very little in real terms. Incorporation is still used to express multiples of 100 and 1000 (see section 1.2), and it is usually clear from the context that this refers to money, without the need for a separate marker (although there is a sign YEN in cases where explicit reference is required). There is a sign meaning '100 yen', which uses a flick of the index finger against the thumb, but this movement does not commonly take other number handshapes.

It is possible to use numeral incorporation to refer to a certain number of people. In these cases, the numbers from 1 to 10 (and also possibly for multiples of 10 up to 90) are articulated with a movement that traces the shape of the Kanji sign for person (人), although as with several other examples of numeral incorporation described above, the movement may be reduced. Although rarely used, ages from 1 to 4 years are sometimes incorporated with a movement forward from the chin to express a person's age. Interestingly, 20 can also be incorporated in the same fashion, as this is considered the year of entry into 'adulthood', and the form has therefore perhaps become lexicalised. Other numbers, such as 30 and 40, are not incorporated in this way. The majority of JSL users express age sequentially as a compound of the sign AGE and the requisite number of years.

1.6. Plurals

All languages have a way to distinguish singular from plural entities (Steinbach 2012). The plural is usually marked, while the singular is unmarked (ibid). In JSL, many noun signs show zero marking for number, e.g. EARRING and BIKE (cf. German Sign Language in Steinbach 2012:115). Gender categories are formed by using MAN with a selected thumb and WOMAN with the pinky (see section 2.1), and these signs are modified by a circular movement to show plurals. Singular ('man') becomes plural ('men') by tracing the outlines of an imaginary 'group' with this handshape in the sign space, with both hands.

Another way to mark plurals in JSL is to use reduplication. When describing the number of sugars going into tea, the singular act of tipping a spoon of 'sugar' into a cup shows one sugar. When this motion is reduplicated once (SUGAR+) the meaning is 'two sugars'. For numbers greater than two, however, reduplications are not counted literally. Instead, the

motion is reduplicated quickly two or three times, and supported by non-manual features on the face (a slightly wrinkled face and a mouthing ‘shishi’, meaning ‘many’); this may be followed by a cardinal number to show how many spoons of sugar are added.

1.7. Lexical quantifiers

The JSL quantifying sign ALL is articulated by holding out flat hands moving downward in a circular shape, so when meeting again at the bottom the palms are facing upwards. JSL also has a sign meaning ‘some people, places or things’, glossed here as NANNINKA (or SOME/1 in English). This is articulated by repetition of the pointing sign, pointing in various positions in the sign space. (This does not appear in JFD 2011; however, it does appear to be a lexical sign, as the sign space does not necessarily have to have been set up with loci and associated referents.) An example sentence is as follows:

(2)

		rh-q		hn	
ROU	KAZOKU	IRU	/	IRU	NANNINKA
DEAF	FAMILY	HAVE	/	HAVE	SOME/1

‘There are some deaf families.’

The other sign denoting ‘some’ is glossed here as IKURAKA (SOME/2 in English), and uses a list-buoy type construction. The fingers of the non-dominant hand close into a fist one by one, starting with the index finger, while the dominant hand points to the closing fingers in a sweeping motion. An example sentence is as follows:

(3)

		rh-q		hn		
NOMIMONO	NOKORI	ARU	/	IKURAKA	NOKORI	ARU
DRINK	LEFT	HAVE	/	SOME/2	LEFT	HAVE

‘There is some drink left.’

There are two ways to sign the concept of ‘a small amount’. For the sign glossed here as SUKUNA (FEW in English), the thumb of the dominant hand is positioned at the chin, and a short <pth> or <pea> mouth pattern is articulated. For TARINAI (NOT-ENOUGH in English), which is more negative, the dominant index finger points and brushes across the palm of the non-dominant hand (held palm-up) in a short repeated motion. The following example sentences show how these signs are used in context:

(4) KYURYO SUKUNA
SALARY FEW
'My salary is small.'

(5) KAMI TARINAI/
PAPER NOT-ENOUGH
'There is not enough paper.'

The sign MANY uses a similar construction to IKURAKA (SOME/2); both hands operate symmetrically and close into a fist one digit at a time, starting with the index fingers. While this is happening, the hands may move apart or both to the right.

NAI/1 ('not, none') is expressed with the fingertips pointing upward, the palms facing each other, and a slight shake (see Morgan 2008). This is primarily a negation sign, but it is conceptually related to number, as notions of 'zero' are often expressed using forms associated with negation (Greenberg 1987:255). An example sentence is:

(6) INDEX1 PEN NAI/1
INDEX1 PEN NONE
'I don't have a pen.'

Another sign with the same meaning is glossed here as NAI/2. This sign begins with the hand in the 'zero' handshape described in Figure 1b; the thumb and index finger then flick apart in front of the mouth, which has an <oo> mouth pattern. The flick may also be reduplicated. There seems to be some regional variation in the use of these signs; i.e. NAI/1 is more common in some parts of the country while NAI/2 is used in others. However, further research is necessary to confirm this.

For NAI/3 ('empty'), the hands are held flat, perpendicular to the floor, with the fingertips pointing away from the signer, the palms facing each other and one hand slightly higher in the sign space than the other. The hands wave toward and away from each other one or two times. This sign may vary depending on the context. For example, to say 'there is nobody in the house', the non-dominant hand is held still with the palm facing down, representing a roof, while the dominant hand waves back and forth in the manner described above, indicating emptiness. For 'there is no money', the non-dominant hand forms an open C handshape, representing part of a container (in this case a wallet), and the flat dominant hand taps the palm of the non-dominant

hand (i.e. the middle of the 'wallet') a few times. An example sentence is as follows:

(7) REIZOUKO-OPEN NAI/3
FRIDGE-OPEN EMPTY
'The fridge was empty.'

For NAI/4 (shown in Figure 11), one hand – not necessarily the dominant – takes the same form as the number 0, while the other hand makes a sign representing two underscores. These underscores are drawn by teachers under the mark that a person has been awarded for her/his work. Therefore NAI/4 derives from a form meaning '0 marks', but its evaluative meaning is not obligatory, for NAI/4 is now used in other contexts (see sentence example 8).

Figure 11. NAI-4

(8) KAIGAI RYOKO INDEX1 NAI/4
ABROAD TRAVEL INDEX1 NONE
'I have no experience of travelling abroad.'

1.8. Summary

Section 1 has described several strategies that are used to express number in Japanese Sign Language. Two distinct types of structures can be observed: in some cases number is expressed using productive morphology, while in other

cases number is expressed lexically. Examples of productive morphology include all of the paradigms for ordinal number described in section 1.4 (except for the *kodomo* paradigm), and the 'people' paradigm, which incorporates the numerals 1 to 9 and multiples of 10 as far as 90. Conversely, numbers from 11 to 19 are expressed lexically, using an additive strategy, and are realised as compounds, while very large numbers (TEN-THOUSAND and HUNDRED-MILLION) are also expressed lexically, as part of a multiplicative strategy.

It is particularly interesting to note that sometimes both types of construction co-exist as variants in JSL, which is suggestive of diachronic language change (cf. Ashby 1981). All multiples of 100 and 1,000 can be expressed using numeral incorporation in JSL (section 1.2), but there are a few alternative lexical forms that appear to be remnants of a morphologically productive system that was used in the past. In particular, the lexical signs TEN/2, HUNDRED, THOUSAND, TEN-THOUSAND and HUNDRED-MILLION all show the number of '0's in the sign, and Sagara (forthcoming) presents evidence from JSL and Taiwan Sign Language that points to the existence of a productive system that was once used widely in Japan, from which these remaining lexical signs derive.

In other cases, alternative lexical variants appear to co-exist with signs from morphologically productive systems because of certain affordances that only the lexical variants can offer. For example, signs that themselves include internal movement cannot be incorporated into paradigms such as that for 'hour', which means that the lexical signs ELEVEN and TWELVE can be incorporated where the compound signs TEN^ONE and TEN^TWO cannot.

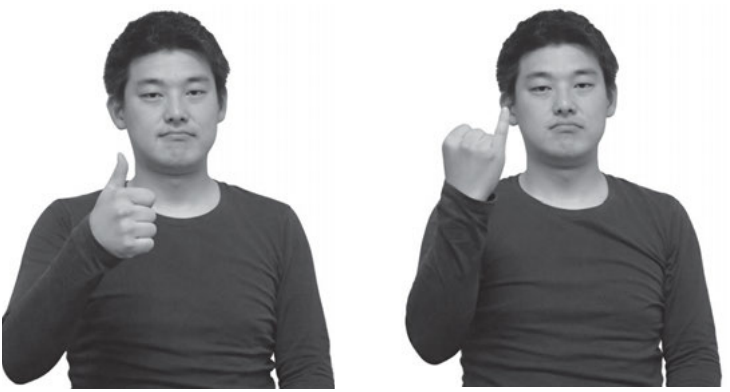
2. Kinship terms

Kinship in Japanese Sign Language was first studied by Peng (1974), and later by Sasaki (2007). Wilkinson (2009) draws upon these studies in her typological survey of kinship terms, which includes JSL. Kinship signs in JSL refer explicitly to relative age and gender. For example, a pinky finger moving upwards denotes an older sister. The kinship terms of JSL are distinct from those of spoken Japanese, showing that two languages within the same culture can have different ways of expressing kinship (Peng 1974). For example, there is no single lexical item in JSL meaning 'nephew' or 'niece', while there is in spoken Japanese. However, over time, some signs similar to spoken Japanese terms have come to be used in JSL, such as a single lexical

sign for ‘cousin’. Peng (1974) found that JSL has 36 derivative kinship signs, i.e. structures formed from multiple basic signs, and only 11 basic signs (in Wilkinson 2009). These basic signs are all described below, and the derivative processes are also explained. In addition, this section includes core and non-core family terms, and observations on diachronic changes in this domain.

2.1. General strategies for expressing kinship/family relations

JSL uses a highly productive morphological system of gender incorporation and spatial modification to talk about kinship and family relations. The JSL signs for ‘man’ and ‘woman’ are particularly significant because although they occur as free morphemes, they constitute basic handshapes that are used in many other kinship signs. There are differences between ‘man’/‘father’ and ‘woman’/‘mother’ but the signs FATHER and MOTHER both incorporate gendered handshapes. MAN is a selected thumb, while WOMAN is a selected pinky (see Figure 12).



MAN / male handshape WOMAN / female handshape

Figure 12. The core handshapes used to refer to ‘male’ and ‘female’

These handshapes can be incorporated to create lexical kinship terms, but they have other roles too. They may be used as size and shape specifiers to trace the perimeter of gendered groups of people (‘group of women’, ‘group of men’), and they can function as person classifiers in possessive constructions, such as HIS-WIFE or HER-HUSBAND.

MY^HUSBAND

HER-HUSBAND

Figure 13. Signs meaning 'my^husband' and 'her-husband'

Through a process of lexicalisation, these classifiers have also entered the lexicon to create signs such as FAMILY, RELATIVE, PEOPLE, MARRY, DIVORCE and MARRIED-COUPLE. They can also be used idiomatically to express power relations between men and women in marriage or society. As an additional function, these handshapes can be used to designate gender status, for example to children on the *kodomo* paradigm (see section 1.4).

MARRY DIVORCE

Figure 14. Two formally-related signs meaning 'marry' and 'divorce'

2.2. Core family terms

Most of the signs for core family members – parents, offspring, siblings and spouses – use gendered handshapes, and those for siblings can also differentiate between age relations. Some of these signs are single signs, whereas others are formed as conventional compounds. MOTHER and FATHER both include a bound morpheme – an index finger touching the cheek, which functions as a consanguineal marker (Wilkinson 2009:19) – and differ only in terms of final handshape. Interestingly, this marker also occurs in some other kinship signs, such as for 'grandparents' and 'cousin' (see Figure 21 and section 2.4).

Figure 15. MOTHER

Use of space is important for creating signs, since certain movements constitute paradigms, in a similar way to numeral incorporation. For example, SON and DAUGHTER have the same movement – representing birth – and differ only in terms of handshape. For the sign meaning 'grandparents', the movement is longer, and the gendered handshapes are articulated higher in the signing space, which is perhaps a visual representation of a timeline (see Figure 16).

YOUNGER-SISTER OLDER-BROTHER

Figure 16. Signs using spatial modification to mean 'younger sister' and 'older brother'

Although signs for 'sister' use the generic 'female' handshape, signs for 'brother' use a different handshape – a selected middle finger. Through use of space, these signs can inflect to distinguish the relative age of the sibling, by moving the required handshape upwards (OLDER-SISTER, OLDER-BROTHER) or downwards (YOUNGER-SISTER, YOUNGER-BROTHER) through the sign space. Similarly, the signs can be articulated in an age-neutral fashion by using both hands, with one moving up as the other moves down; the use of both hands tends to indicate plurality (i.e. BROTHERS, SISTERS).

SISTERS BROTHERS

Figure 17. Signs with the use of both hands to indicate plurality of 'brothers' and 'sisters'

For ‘siblings’, a non-gendered term is created by compounding the two gendered terms (BROTHER^SISTER). Alternatively, some signers may use the sign BROTHERS to refer to all siblings (as in Example 9).

(9) q
INDEX2 BROTHERS HAVE INDEX2
‘Do you have any siblings?’

A similar combination of gendered handshapes is used for the non-gendered sign PARENTS (see Figure 18 below), but in this case the male and female handshapes are fused into one (as a Y handshape) and thus appear simultaneously rather than sequentially. Interestingly, therefore, it seems that age-related signs become non-age-related by including both the older and younger variants. Similarly, gendered signs become non-gendered by including both gendered handshapes, either simultaneously (as in PARENTS) or sequentially (as in BROTHER^SISTER). CHILD (one-handed) and CHILDREN (a two-handed version) are non-gendered single signs (see Figure 18 below); note that, again, two hands are associated with plurality.

PARENTS CHILD

CHILDREN

Figure 18. Non-gendered single signs meaning ‘parents’, ‘child’ and ‘children’

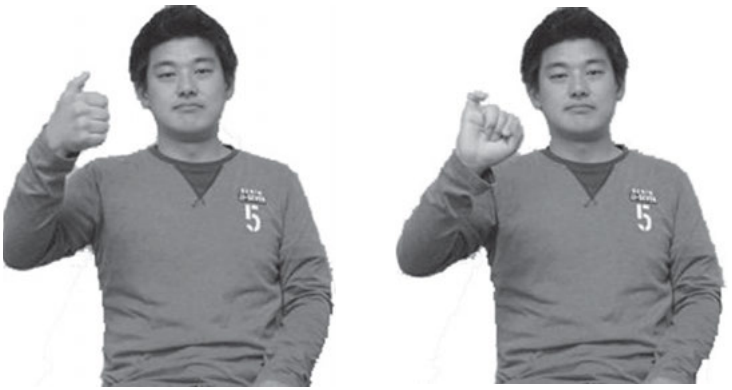
However, there is no gender-neutral lexical sign for 'spouse' or 'partner' in JSL – only HUSBAND and WIFE are available, and again, these incorporate gendered handshapes; this time, these handshapes move away from the chest slightly. BOYFRIEND (LOVE^MAN) and GIRLFRIEND (LOVE^WOMAN) are compound formations. The compounds IX1^MAN and IX1^WOMAN may refer to either husband/wife, boyfriend/girlfriend or, more generally, 'partner'. Table (1) shows which kinship terms include gender and age differentiation.

Table 1. Core family members in JSL, indicating which show gender and age differentiation through handshape incorporation and spatial modification

Sign	**gender differentiation through handshape incorporation**	**age differentiation through spatial modification**
MOTHER	✓	×
FATHER	✓	×
PARENTS	×	×
OLDER-SISTER	✓	✓
OLDER-BROTHER	✓	✓
YOUNGER-SISTER	✓	✓
YOUNGER-BROTHER	✓	✓
BROTHERS	✓	×
SISTERS	✓	×
BROTHER^SISTER ('siblings')	×	×
CHILD	×	×
CHILDREN	×	×
DAUGHTER	✓	×
SON	✓	×
WIFE	✓	×
HUSBAND	✓	×

2.3. Non-core family members

JSL uses lexical signs and compounds to refer to non-core family members such as grandparents, aunts, uncles, cousins, nephews and nieces. Some of these signs build upon and utilise elements that have already been discussed, while others introduce new elements.



OLDER-MAN OLDER-WOMAN

Figure 19. Signs to refer to older men and women in JSL, indicating kinship

The signs for 'grandfather' and 'grandmother' used to be expressed using the consanguineal marker, followed by signs for OLDER-MAN and OLDER-WOMAN (Figure 19). These latter two signs are produced by modifying the respective gendered handshape, as if to reference the stereotypically 'stooped' posture associated with ageing. However, the consanguineal marker is now only used by a few older signers. The sign OLDER-MAN for example can refer to a grandfather, an uncle, or to an older man of no relation. In situations where it is necessary to specify a relationship exactly, most signers use one of the compound formations described below.

Compound formations for 'grandparents' enable distinctions between paternal and maternal grandparents. For a paternal grandparent, the sequence is FATHER^FATHER^{up} or FATHER^MOTHER^{up}, where the final position of the second sign in the compound is higher in the space than that of the first sign. Maternal grandparents can similarly be shown by signing MOTHER^FATHER^{up} and MOTHER^MOTHER^{up} (see Figure 20).

Differences between maternal and paternal relations are also made when referring to parental siblings (such as 'uncle' and 'aunt'). JSL uses compound constructions to express these terms. These are marked to show i) the gender of the parent; ii) the gender of the parent's sibling; and iii) the age of the sibling relative to the parent (i.e. older or younger). For example, one's aunt might

be expressed as MOTHER^OLDER-SISTER or FATHER^YOUNGER-SISTER. In total, there are eight possible combinations for parental siblings (see Table 2).

Figure 20. 'Maternal grandfather' (MOTHER^FATHER^{up})

Table 2. JSL expressions meaning 'aunt' and 'uncle'

		man 父		woman 母
older 伯	spoken:	oji	spoken:	oba
	Kanji:	伯父	Kanji:	伯母
	JSL:	MOTHER^OLDER-BROTHER or FATHER^OLDER-BROTHER	JSL:	MOTHER^OLDER-SISTER or FATHER^OLDER-SISTER
younger 叔	spoken:	oji	spoken:	oba
	Kanji:	叔父	Kanji:	叔母
	JSL:	MOTHER^YOUNGER-BROTHER or FATHER^YOUNGER-BROTHER	JSL:	MOTHER^YOUNGER-SISTER or FATHER^YOUNGER-SISTER

It is interesting to compare these JSL forms with the way in which parental siblings are expressed in spoken Japanese and Kanji. Following Greenberg's concept of markedness (1966), Wilkinson (2009:55) suggests that the term 'marked' is used 'when a kin term specifies properties such as gender, relative age, and so forth', leading to a more marked level of morphological complexity. It is expected, then, that kinship terms expressing relations who are more distant to oneself (Ego) will be more marked. Comparing the expression of parental siblings in written Japanese (particularly Kanji), spoken Japanese and JSL, it is evident that kinship terms are more marked (more morphologically complex) in Kanji than in spoken Japanese and even more marked (more morphologically complex) in JSL. As can be seen in Table 2, spoken Japanese has two terms for 'aunt' and 'uncle', Kanji has four and JSL has eight. This is both in terms of structural coding, and in terms of the semantic distinctions that are made.

JSL can be described as bifurcate collateral in type because, in the case of 'uncle' for example, it distinguishes between 'mother's brother' and 'father's brother'. Conversely, Kanji does not make this distinction (it is lineal in type,

because the two collateral relatives are merged in a single 'uncle' term). Both Kanji and JSL make an age distinction, since a difference is marked between 'mother's older brother' and 'mother's younger brother'. However, the spoken Japanese terms *oji* and *oba* do not make this distinction. In terms of parental siblings, therefore, markedness is as follows:

spoken Japanese < Kanji < JSL

For 'nephew' and 'niece', two signs (*oi* and *mei* respectively) have been borrowed from spoken Japanese. However, it is also possible to use a compound construction to specify exactly which collateral line the family member inhabits, for example YOUNGER-SISTER^SON for 'nephew'. There is an interesting contrast here between JSL, which specifies parental siblings and their children in great detail, and British Sign Language (BSL), which uses the same manual sign for 'aunt', 'uncle', 'nephew' and 'niece', and distinguishes between them using mouth patterns (Sutton-Spence and Woll 1999:84).

COUSIN

GRANDCHILD

Figure 21. Signs for blood relationships using the cheek location (COUSIN) and spatial modification (GRANDCHILD)

The sign COUSIN appears to have emerged relatively recently in JSL (see Section 2.4). COUSIN and another sign, RELATIVE (which has extended pinky fingers), can be used to refer to any relative, but can also take on the more specific meaning of 'cousin'. The sign GRANDCHILD is articulated by holding the hand at a higher and then lower level (see Figure 21), indicating 'children's children', which is another example of the use of space in kinship signs. As with grandparents, it is possible to use a compound structure to specify exactly which grandchild one is referring to (for example SON^DAUGHTER refers to a son's daughter, as opposed to a daughter's daughter, or a son's son).

2.4. Diachronic changes in JSL kinship terms

It is worthwhile to compare the forms described by Peng (1974) with the varieties of JSL that are currently in use, because several diachronic changes appear to have taken place over the intervening 40 years. Firstly, the use of the consanguineal marker appears to have weakened. Peng (1974:34) notes that BROTHER and SISTER both include a consanguineal marker before the signs described in Section 2.2 above. These are no longer in use.

Some older signers do use the consanguineal marker in the formation of certain signs meaning 'grandfather' and 'grandmother', and this may be because, in this case, the marker is not redundant – it serves a purpose in distinguishing an older person (male or female) from a grandparent. However, its use by younger signers is rare or absent. Additionally, the handshape used for SISTER has changed from the ring finger, as described by Peng, to the pinky. This is likely because phonologically, the selected ring finger is a particularly marked handshape, and a selected pinky is much easier to articulate.

Interestingly, there are kinship signs – COUSIN and GRANDCHILD – that Peng does not describe, and this may be because these signs were not used at the time of his research. Nakamura (2006) describes how a committee has created new signs in order to fill perceived lexical gaps in JSL, and this is a potential source for these new signs. The signs for 'nephew' and 'niece', which are rendered using manual finger spelled signs to reflect the two syllables of each respective spoken Japanese word, *oi* ('nephew', pronounced 'oh-ee') and *mei* ('niece', pronounced 'may-ee'), are also not mentioned by Peng, and may be recent developments.

2.5. Summary

With regard to the expression of kinship terms, then, JSL incorporates gender, and uses the spatial modification of signs to signify relative ages. Movement of signs upwards or downwards in the signing space, for example, enables the distinction between OLDER^SISTER and YOUNGER^SISTER. Section 2 has shown how a highly productive morphological system enables the manipulation of free and bound morphemes in order to express a range of different kinship terms.

The incorporation of gender is particularly prevalent, with the exception of some signs such as for 'children', 'nephew' and 'niece'. Signs for both core and non-core family members may also be produced by a process of compounding, resulting in compound signs such as BROTHER^SISTER for 'siblings' and FATHER^MOTHER^{up} for 'paternal grandmother'. It seems that language change is also evident since, for some signs, younger signers are now omitting a consanguineal marker (a sign located on the cheek) that was used by older signers to indicate blood relations.

3. Conclusion

In both of the domains explored in this chapter – number and kinship terms – it is clear that morphological processes play a key role in these lexical paradigms in JSL. In both cases, a small set of handshapes interact with certain movements and locations, producing a range of different meanings. In the case of numerals, these are the numeral handshapes 1–9 that participate in numeral incorporation, while the kinship system is built around the 'male' and 'female' handshape. The parallel role of morphological processes in these two lexical sub-systems is particular to JSL and the JSL family and is, to the best of our knowledge, not found in other sign languages. Movement in number signs generally consists of circling or flicking motions, which provide additional meaning. Likewise, kinship signs also consist of distinct handshapes that can be spatially modified. The addition of movement of kinship signs provides additional meaning in these signs as well.

Diachronic changes have been observed for the younger generation of JSL users, who are now not using the consanguineal marker for some kinship signs. The dropping of previously bound morphemes from signs like GRANDMOTHER/OLDER-WOMAN and GRANDFATHER/OLDER-MAN seems to have created signs with a broader meaning, and it

will be interesting to review the use of kinship signs in future to ascertain any further changes like this. Diachronic changes have also been taking place in the domain of number, especially for signs meaning 'ten', 'hundred' and 'thousand.' More research is needed to try and understand the precise nature of these changes.

In conclusion, JSL has a complex system of numerals and kinship signs with a distinct morphological make-up. Study of number and kinship signs has illustrated the use of spatial modification, i.e. changes to the movements of signs, that is fundamental to this language and has highlighted the changes that continue to occur across the generations.

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Kinship and colour terms in Mexican Sign Language

Bernadet Hendriks

1. Introduction

Mexican Sign Language (Lengua de Señas Mexicana, LSM) is a natural sign language used by an estimated 100,000+ Deaf people in Mexico. It is used mainly in urban areas. There are large Deaf communities in the three biggest cities of Mexico (Monterrey in the North with over 1 million inhabitants, Guadalajara in the West with 4,5 million inhabitants, and Mexico City, which is considered Central Mexico, with over 20 million inhabitants). In rural areas many Deaf people do not know LSM nor any other sign language, instead using a kind of home sign system. In the extreme South and East of the country (Yucatán peninsula and Chiapas, areas in which Maya is the traditional language), an indigenous Mayan sign language can be found. This sign language is referred to as Lengua de Señas Maya (LSMy) and is totally unrelated to LSM (cf. Shuman 1980; Shuman & Shuman 1981; Johnson 1991; Fox-tree 2009).

LSM has little regional variation. Faurot, Dellinger, Eatough and Parkhurst (1999) conclude that LSM is one unified language, although not completely uniform. Their conclusion is based on lexical studies by Bickford (1991) and Smith-Stark (1986) which give a lexical similarity rate of 80–90% between various parts of the country, as well as their own personal interviews with Deaf Mexicans who told them that they had no difficulty understanding Deaf people from other cities. On the other hand, considerable variation between generations can be found in LSM, in particular in Mexico City (Bickford 1991). The difference in signing between older and younger signers may be such that they have problems understanding each other.

LSM is said to be derived from Old French Sign Language, like its neighbour ASL, albeit via a different route. The first mention of education for the Deaf in Mexico is found in a newspaper advertisement from 1821, announcing the intention of "a Spanish subject" who wants to receive Deaf and mute people from both sexes into his house to teach them "writing, intelligence and speaking" (Jullian 2001:52). Nine years later, in 1830, the official register of the government of the United States of Mexico mentions the arrival

of a French man called P.J. Roger "deaf and mute from birth" who intended to establish the first school for the Deaf in Mexico (Jullian 2001:52–53). Although almost nothing is known about these two people and their work, these records indicate that there was both Spanish and French influence in the very early stages of education for the Deaf in Mexico.

The person who is traditionally credited with bringing Deaf education and sign language to Mexico, however, is Edouard Huet, another Deaf man from France. He had been educated in the school of Abbé de L'Epée and had directed a school for the Deaf in Bourges, France. Subsequently he had emigrated to Brazil where he founded the "Imperial Institute for Deaf-mute" in Rio de Janeiro. He then moved to Mexico, where he arrived in 1866 to become the first director of the Escuela Municipal de Sordomudos (Municipal School for Deaf-mute), later known as Escuela Nacional de Sordomudos (National School for Deaf-mute). This school opened in June 1866 with three students (Jullian 2001:64). Until 1886 the curriculum was taught in sign language. The school closed in 1967, but is still considered to have been foundational in the establishment of a Deaf community in Mexico and in the development of LSM.

LSM, then, appears to be related to French Sign Language (LSF) and ASL. Indeed, a number of cognates in basic vocabulary can be found between these sign languages (cf. Smith 1986, 1990; Guerra Curry, Meier and Walters 2002 for LSM and LSF; Quinto-Pozos 2008 for ASL and LSM). According to Smith 1990 there is also a clear relationship between Brazilian Sign Language (LIBRAS) and LSM, which can be attributed to the fact that the same person was responsible for the foundation of the first national institute for the Deaf in both countries. It would seem, then, that the influence of Edouard Huet was indeed considerable in the development of LSM. Despite these relationships, however, LSM is not mutually intelligible with either modern LSF (cf. Smith 1990), ASL (cf. Smith Stark 1986, 1990; Faurot et al. 1999; Quinto-Pozos 2008) or LIBRAS. Likewise, although the influence of Spanish in LSM is relatively strong (as can be seen by the frequency of initialisation, see below) and the very first person who was apparently involved in Deaf education in Mexico was Spanish, LSM and Lengua de Señas Española (LSE) are mutually unintelligible. Indeed, Guerra Curry, Meier and Walters (2002) find no clear examples of borrowing from LSE into LSM.

Although a fair number of linguistic studies into LSM have been undertaken over the past decades, most of these have been in Spanish, and are not very well known on an international level (e.g. Smith 1986, Cruz 2008). An exception is a doctoral thesis in English by Fridman, published in 2010, dealing with tense and aspect inflections in LSM. The present chapter will

describe some aspects of the lexical domains of kinship and colour in LSM, focusing on the influence of Spanish in these domains.

Data for this chapter was collected from published dictionaries of LSM, as well as two Deaf Mexicans (a mother and her daughter from Mexico City), who were videotaped using the elicitation materials described in Sagara & Zeshan, this volume.[1]

2. Lexical families of kinship terms in LSM

Kinship terms in LSM are to a large extent influenced by Spanish, both lexically and phonologically. In particular, the gender system of Spanish is to a certain degree reflected in the LSM kinship system. Spanish has inherent gender; all words are either masculine (as a rule[2] ending in *–o* for singular and *–os* for plural) or feminine (as a rule ending in *–a* for singular and *–as* for plural). The masculine ending is also the unmarked form. For instance, if a person is pregnant and wants to refer to the baby without knowing its gender, the word *niño* 'child' (masc.) is used. Similarly, a mixed gender group of people is referred to with the masculine plural ending. LSM differs from Spanish in not having inherent gender. Instead, most kinship terms in LSM are unspecified for gender. Semantically, however, these unspecified forms resemble the unmarked masculine form in Spanish. Thus, LSM has signs for *HIJO* 'offspring', *HERMANO* 'sibling', *SUEGRO* 'parent-in-law', *ABUELO* 'grandparent', *NIETO* 'grandchild', *ESPOSO* 'spouse' etc., a few examples of which are shown in Figures 1–3.

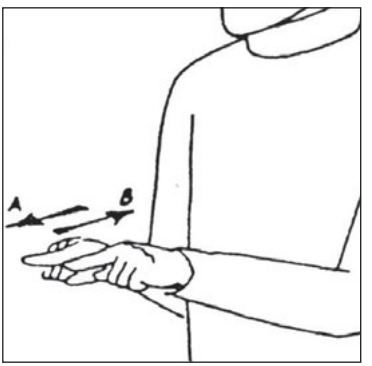

Figure 1. HERMANO

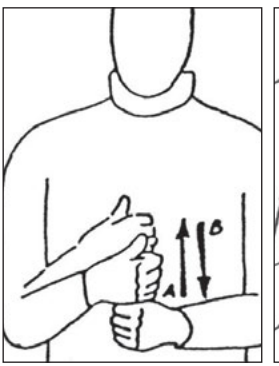

Figure 2. ABUELO

Figure 3. HIJO

These unmarked forms can be used to refer to either males or females, depending on the context. However, if reference is made to a female,

and this cannot be inferred from the context[3], the sign *MUJER* 'woman' (cf. Figure 10) or a special feminine suffix *–FEM* (a B-hand with the palm down making a downward movement in neutral space) is often added. In such cases the unspecified sign on its own would normally be interpreted as being masculine. There are a few exceptions to this rule. In particular, the signs for *MAMÁ* 'Mom' (also used in the sense of 'mother' although there is a separate sign for the word *madre*) and *PAPÁ* 'Dad' (also used in the sense of 'father') do inherently express gender, as shown in Figures 4 and 5. The concept of *mother*, then, cannot be expressed by signing *PAPÁ* and using the word *MUJER* or the feminine suffix.

Figure 4. MAMÁ

Figure 5. PAPÁ

In Spanish, equally, the words for *mamá* and *papá* and the words *padre* 'father' and *madre* 'mother' express gender within the stem, rather than by means of a suffix. Similarly, signs that are morphologically related to these forms, such as *MADRINA* 'godmother' and *PADRINO* 'godfather' (both important pseudo-kinship terms in Catholic Mexico) also express gender within the stem.

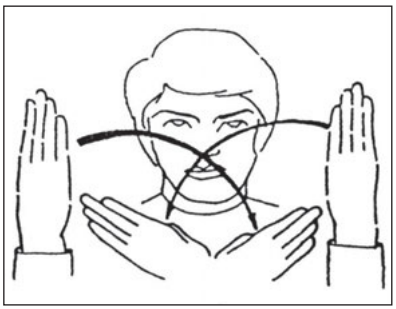

Figure 6. MADRINA

Figure 7. PADRINO

A difference between Spanish and LSM in these terms is that Spanish uses the plural of the masculine word *padre*, namely *padres* to refer to both parents, whereas LSM uses a compound made up of the two signs *PAPÁ^MAMÁ*.[4]

Within the paradigm of members of the extended family, there is one more pair of kinship terms with inherent gender in both Spanish and LSM, namely the pair *NUERA* 'daughter-in-law' (Figure 8) and *YERNO* 'son-in-law' (Figure 9), for which there is no encompassing term meaning 'spouse of offspring'. The fact that this idiosyncrasy in the paradigm of the extended family occurs both in Spanish and in LSM demonstrates the influence of Spanish on the LSM paradigm.

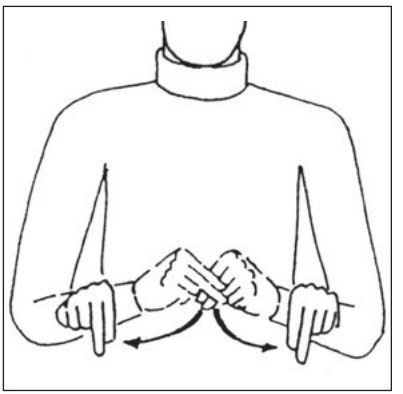

Figure 8. NUERA

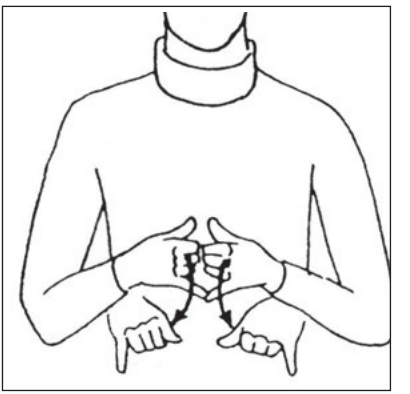

Figure 9. YERNO

A difference between the gender system of Spanish and LSM within the kinship paradigm is the way in which the feminine marker is expressed. Whereas in Spanish the masculine/ unmarked suffix is replaced by a feminine suffix for every occurrence of the word, in LSM the specification *MUJER* 'woman' (cf. Figure 10) is usually added after the sign is introduced. If a person has already been introduced and his or her gender can be inferred from the context, it is not necessary to keep adding *MUJER* every time the sign occurs. The unmarked form can take on feminine meaning if the context requires. The same goes for the feminine marker which I have glossed *–FEM*. This marker is treated here as a suffix because it cannot occur on its own. According to an unpublished paper by Dufoe (2008) the *–FEM* suffix appeared in the early eighties and seems to be based on the second part of the sign *SEÑORA* 'Mrs.', which is *SEÑOR* 'Mister' followed by something very similar to the feminine suffix, as shown below in Figures 11 and 12. The sign *SEÑORA* is certainly older than the *–FEM* suffix, and in contrast to it, is used by Deaf children of Deaf parents and Deaf people of 50 years

and older, most of whom do not use the *–FEM* suffix and do not consider it acceptable LSM. Among young signers, however, the *–FEM* suffix is in frequent use, and for some signers has largely replaced the older construction using *MUJER*. According to Cruz (2008:483), on the other hand, the feminine suffix is mainly used in the educational system and is replaced more and more by the compounded form with *MUJER*. Dufoe (2008) also mentions that the feminine suffix cannot be used with all animate nouns and is used almost exclusively with kinship terms. The feminine suffix in Spanish, on the other hand, is not only used for animate beings, but also with inanimate nouns, and is a general feature of Spanish grammar since all nouns in Spanish are either masculine or feminine.

Figure 10. MUJER

Figure 11. SEÑOR

Figure 12. SEÑORA

Phonologically, most kinship terms use a handshape derived from the LSM fingerspelling alphabet (which is shown in Figure 13)[5] representing the first letter of the corresponding Spanish word. This is referred to as *initialisation*.

Initialisation is an extremely pervasive phenomenon in the LSM lexicon. A count of initialised signs in various LSM dictionaries shows that about 30% of the LSM basic lexicon is initialised.[6] Initialisation being so pervasive, it is not viewed negatively by signers, as has been reported for ASL (cf. Padden 1998). Uneducated LSM signers with little knowledge of Spanish are often not aware of the fact that signs are initialised. More educated signers, although they are aware of initialisation, often comment that "this is simply the sign in LSM" (Shelley Dufoe: personal communication). Hendriks and Dufoe (2014) argue that initialised signs form part of the core vocabulary of LSM. In LSM, many lexical families of initialised signs can be found. *Lexical families* is a term used for "groups of signs with a common correspondence between phonological form and meaning" (Fernald and Napoli 2000:5), involving variation in only one of the four

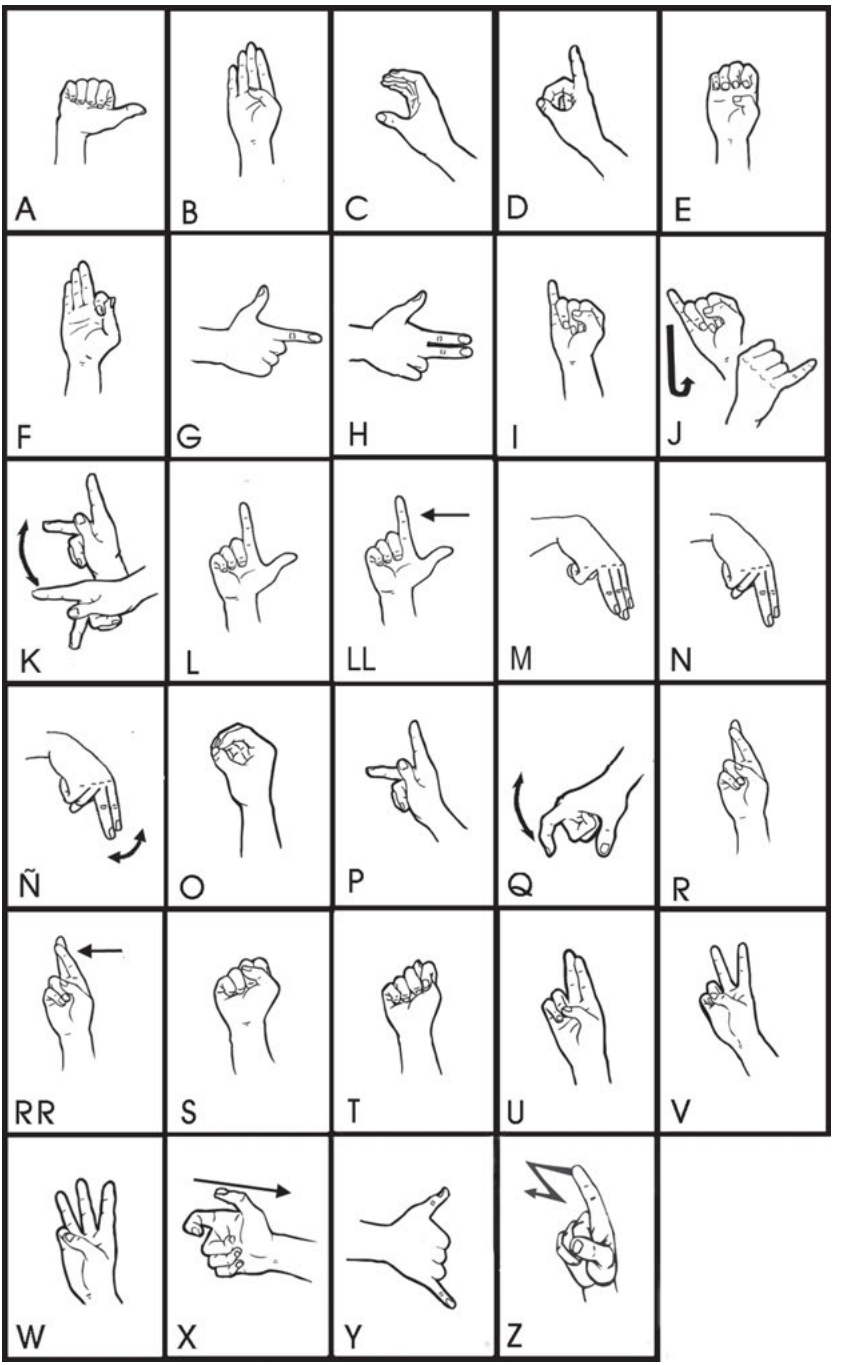

Figure 13. The fingerspelling alphabet used in Mexico

parameters of handshape, place of articulation, movement or orientation. Lexical families based on initialisation are groups of signs that share the same place of articulation, movement and orientation, but differ in the (initialised) handshape.

There are four basic kinship terms for in-laws in LSM, which are shown in Figure 14. The signs *SUEGRO* 'parent-in-law' and *CUÑADO* 'sibling-in-law' are gender-neutral, the signs *YERNO* 'son-in-law' and *NUERA* 'daughter-in-law' are specified for gender, as indicated above. These four signs form a lexical family based on initialisation. All four signs are two-handed and have the same orientation, movement and place of articulation. Only the handshapes differ, and these represent the first letter of the corresponding Spanish word.

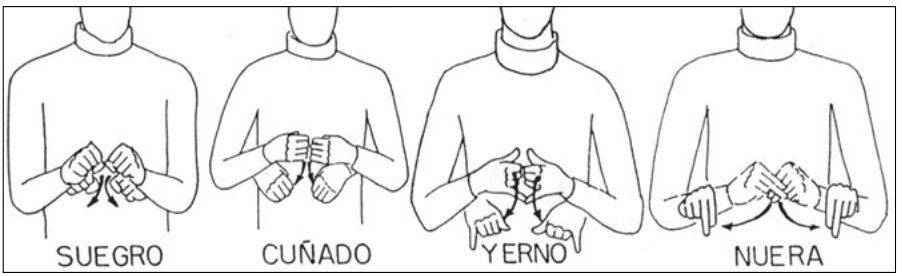

Figure 14. lexical family of in-laws

In the same way, the signs for *PAPÁ* and *MAMÁ* (cf. Figures 4 and 5) and the signs *PADRINO* and *MADRINA* (cf. Figures 6 and 7) make up lexical families of two members. In fact, so strong is the tendency in LSM to create lexical families based on initialisation that most dictionaries of LSM, including the López et al. (2006) dictionary, which usually tries to avoid initialisation, show both *MAMÁ* and *MADRINA* as initialised signs using the modern M-handshape. However, a number of middle aged and older signers have commented that these were originally made with a B-handshape, as shown in Figures 5 and 7, and that they feel initialisation has been imposed on them. In fact, the original M-handshape in the LSM alphabet (just as in the modern LSF fingerspelling alphabet) was very similar to a B-handshape. Thus, it would seem that these signs in their original form were already initialised, but since the initialisation was no longer apparent after the handshape in the fingerspelling alphabet changed, they have been *re*-initialised using the newer handshape, although the older form is also still in use.

The kinship terms for the non-core family members *PRIMO* 'cousin', *SOBRINO* 'child of sibling', a variant of *TÍO*[7] 'sibling of parent' and

NIETO 'grandchild' also form a lexical family (cf. Figure 15), although the movement of *NIETO* tends to be slightly different to that of the other three members of the family. Thus, *NIETO* can be said to form an *extended family* with the other three terms (cf. Section 3 for an explanation of the term extended family). In fact, the only basic kinship term for a non-core family member that does not fit into the lexical family is the sign *ABUELO* 'grandparent', shown in Figure 2.

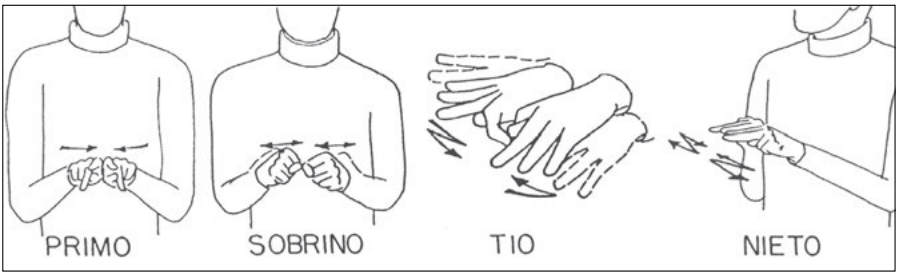

Figure 15. Lexical family of non-core family members

Apart from the signs that have been shown so far, there are also compound signs that denote non-basic non-core family relations, such as *BIS^ABUELO* 'great-grandparent', *TARTA^ABUELO* 'great-great-grandparent', *BIS^NIETO* 'great-grandchild', *CON^CUÑO* 'spouse of sibling-in-law', *CON^SUEGRO* 'parent of son/daughter-in-law'. The signs for *BIS* and *TARTA* are initialised, and occur only as the first component part of kinship terms. The sign *CON* is a sign that is also used outside of the kinship paradigm and is not initialised.

LSM, then, shows a great deal of Spanish influence on the kinship system, both lexically and, more indirectly, phonologically because of initialisation. Lexically, LSM uses the same kinship terms as Spanish, including irregularities, such as the fact that all terms for in-laws have non-gendered stems except for *YERNO* 'son-in-law' and *NUERA* 'daughter-in-law'. Although not all kinship signs are initialised, and most core family terms, such as sibling and offspring (as shown in Figures 1 and 3) are uninitialised, initialisation is extremely common in kinship terms, and there are several lexical families of kinship terms. In some cases (re-)initialisation has been forced on kinship terms that albeit originally initialised no longer appeared initialised because of a handshape change in the manual alphabet, to make them fit better into a lexical family based on initialisation, as is the case with *MAMÁ* and *MADRINA*. In these cases, however, the older, uninitialised variant continues to be used as well. For older signers and most native signers (Deaf children of Deaf parents) in particular, these older signs are more acceptable.

3. The influence of Spanish on colour terms in LSM

Like kinship terms, colour terms in LSM have been influenced by Spanish, both in the distinctions made between colours, as well as in the form of many of the signs. LSM has signs for the basic colours that occur in Spanish, such as green, blue, yellow, red, orange, brown, purple, pink, grey, as well as black and white. Signs denoting metals with a specific colour, such as bronze, copper, gold and silver can also be used to signify the corresponding colours, just as in Spanish. Moreover, some modifications that are used to describe colours in more detail are the same as those used in Spanish. Thus, the sign *VERDE* 'green' can be modified by the sign *MILITAR* 'military' to describe the colour used in military uniforms. Likewise, the sign for *AZUL* 'blue' can be modified by the sign *REY* 'king' to describe the colour royal blue, and *ROJO* 'red' can be modified by *VINO* 'wine' to describe the colour wine-red. The latter colour can also be signed as *COLOR* 'colour' *VINO*. Moreover, in LSM, just as in Spanish, the sign for the colour *CAFÉ* 'brown' is a homonym with the drink *CAFÉ* 'coffee' and the sign for the colour *NARANJA*[8] 'orange' is the same as the sign for the fruit *NARANJA* 'orange'. The modifiers *CLARO* 'light' and *OSCURO* 'dark' are used in LSM and Spanish in more or less the same way as well, although one of the LSM informants appeared to use the sign *CLARO* in two different ways depending on her facial expression. She signed *CLARO* with a neutral facial expression to indicate a light colour, but signed *CLARO* with her tongue protruding to denote a bright colour. Indeed, in Spanish the word *claro* can mean both bright and light, but in the context of colours normally has the meaning 'light'.

As far as the phonological form of colour signs is concerned, most colour signs, like most kinship terms, are initialised. There are only a few basic colour signs that are not initialised. These are *ROJO* 'red', which is iconic in that it denotes the red of the lips (Figure 16)[9], *NARANJA*, which is a homonym with the sign for the fruit, as in Spanish (Figure 17) and *MORADO* 'purple', which appears to be an arbitrary sign in that it is non-iconic and not related to Spanish (Figure 18).

The signs *VERDE, NEGRO, AZUL, AMARILLO, BLANCO, ROSA*, *GRIS* and *CAFÉ* are all initialised and have the non-dominant hand as place of articulation.

The initialised basic colour terms in LSM are all part an *extended lexical family*. This term is used by Fernald and Napoli (2000) for signs that are semantically related but differ in more than one phonological parameter. There are four colour signs that share the same place of articulation and the same movement, namely a back-and-forth rubbing movement on the palm

Figure 16. ROJO

Figure 17. NARANJA

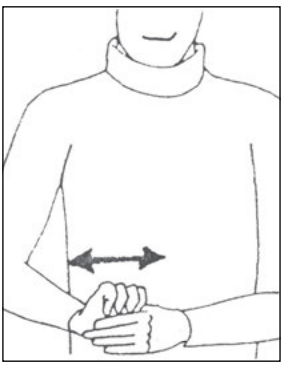

Figure 18. MORADO

of the non-dominant hand (*VERDE* 'green', *ROSA* 'pink', and *GRIS* 'grey' and one variant of *BLANCO* 'white'). However, the orientation of these signs may differ, *VERDE* being produced with the palm down (Figure 19), *ROSA* and *GRIS* with the palm to one side and *BLANCO* with the palm up. Other items that belong to the same extended family have a slightly different movement. *NEGRO* 'black' and another variant of *BLANCO*, for instance, have only a single rubbing movement towards the fingertips of the non-dominant hand, as shown in Figure 20. *AZUL* 'blue' is also made with a rubbing movement on the non-dominant palm, but this sign is made by most people with a circular movement, apparently to produce a greater contrast with *AMARILLO* 'yellow' which has the same handshape but is made with a back-and-forth rubbing movement on the back of the non-dominant hand, cf. Figure 21. Similarly, yet another variant of *BLANCO* is made on the back of the non-dominant hand. The colour *CAFÉ* 'brown' which is both initialised and a homonym with the drink *CAFÉ* 'coffee' is made on the side of the index of the non-dominant hand with either a back-and-forth or a circular movement (cf. Figure 22).

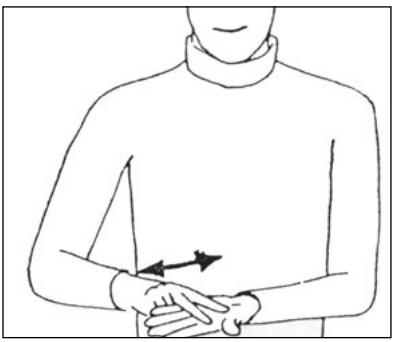

Figure 19. VERDE

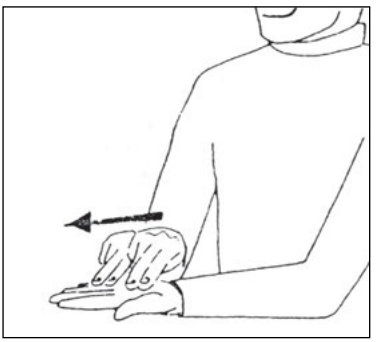

Figure 20. NEGRO

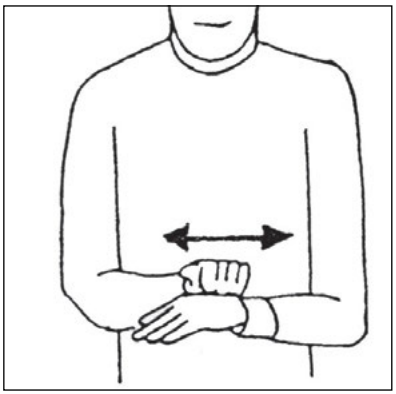

Figure 21. AMARILLO

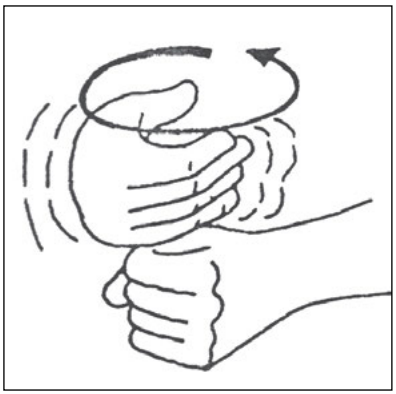

Figure 22. CAFÉ

Thus, although *VERDE* and *CAFÉ* differ from each other in handshape and orientation, as well as the orientation of the non-dominant hand, which functions as the place of articulation, they can still be considered members of the same extended family, because of their semantic relatedness and because of the other colour terms with which they share phonological parameters. *CAFÉ*, for instance, shares its orientation with *GRIS*, which in its turn shares the orientation of the non-dominant hand with *VERDE*.

When it comes to describing colours, especially colours that only differ slightly, in detail, Deaf informants use different strategies than hearing Mexicans. Two hearing informants who were asked to describe the colour strips in the elicitation materials were more likely to use a particular colour term with a modifier and hardly ever used more than two words to describe a particular colour, whereas two Deaf informants used longer descriptions likening the colour to a certain object, or described a specific colour as a mix of two different more basic colours. Thus, whereas the hearing informants described a specific colour brown (colour strip 6) as simply *café claro* 'light brown' or *ocre* 'ocher', two Deaf informants likened the colour to that of furniture. Their descriptions are given in (1) and (2):

(1) *COLOR CAFÉ IGUAL MESA SILLA CAFÉ MÁS CLARO*
colour brown same table chair brown more light
'the colour brown, like a table or chair, a lighter brown'

(2) *COLOR CAFÉ SIEMPRE CARACTER COLOR MESA*
colour brown always characteristic-of colour table
CAFÉ CLARO NO, COMO OSCURO NO, CAFÉ CLARO
brown light no like dark no brown light

MAS-O-MENOS *COMO* *PARECER* *MIRAR* *CATÓLICO*
more-or-less like appear look Catholic
IGLESIA *MISA* *ALTAR* *COLOR* *CARACTER* *IGUAL*
church mass altar colour characteristic-of same
ADENTRO *CAFÉ* *ESO* *IGUAL* *COLOR*
inside brown that same colour
'It's the colour brown characteristic of tables, it's not light or dark, a little light maybe, like the colour you also characteristically see inside a Catholic church at mass, of the altar, that same colour brown.'

Likewise, a specific colour dark yellow (colour strip 27) was described by both hearing informants as *amarillo mostaza* 'mustard yellow', but the two Deaf informants both said it was a mix of yellow and orange:

(3) *AMARILLO* *PARECE* *NARANJA* *MITAD* *MÁS* *ABRIR-NARANJA*
yellow appear orange half more open-orange
POCO *ESO-Y-ESO* *NARANJA* *MÁS-O-MENOS* *MITAD*
a-little this-and-that orange more-or-less half
ABRIR-NARANJA *NARANJA*
open-orange orange
'It's yellow but it looks like the inside of an orange, it's more or less orange, a little of this and a little of that, more or less orange, like the inside of an orange.'

(4) *COLOR* *AMARILLO* *PERO* *MÁS* *OSCURO* *CON* *POCO* *NARANJA*
colour yellow but more dark with a-little orange
OSCURO *AMARILLO* *POCO* *IGUAL* *SOL* *MAÑANA* *AMANECER*
dark yellow a-little same sun morning rise
PARECE *SALIDA-SOL* *SOL* *ESO* *COMO* *COLOR* *AMARILLO*
similar-to sunrise sun that like colour yellow
MÁS-OSCURO *MÁS-O-MENOS*
more-dark more-or-less
'It's the colour yellow, but darker with a little bit of orange, dark yellow, a little like the sun when it comes up in the morning at dawn, that sun is more or less like this colour yellow, a bit darkish.'

Thus, apart from the Deaf informants being more specific in their descriptions than the hearing informants, it seems that LSM has fewer standard expressions to describe nuances in colour terms than Spanish and lacks some of the non-basic colour terms that Spanish has such as *ocre* 'ocher' and *violeta* 'violet'. Deaf informants do fingerspell the non-basic colour term *L-I-L-A* ('lilac'), usually in combination with the sign *MORADO* 'purple'.

As far as colour terms are concerned, then, LSM shows influence of Spanish both at the lexical and the phonological level. Phonologically, most colour terms are derived from their Spanish equivalent by means of initialisation. For basic colours terms there is a one-to-one correspondence between Spanish words and signs in LSM. If we take a more detailed look, however, we do find differences. Thus, LSM lacks some of the more precise colour terms that Spanish uses (or at least they are not standardised) and signers tend to use elaborate descriptions to distinguish colours that are similar.

4. Conclusion

Although LSM is a well-developed natural sign language, that appears to go back at least to 1866, when the first school for the Deaf was established in Mexico City, it shows strong influences from Spanish, both at the lexical and the phonological level. At the lexical level, there is a one-to-one correspondence between the kinship system in LSM and its Spanish counterpart. The same is true for basic colours in LSM and Spanish, although Spanish has more specialised words to express non-basic colours than LSM. The most striking influence of Spanish, however, is the quantity of initialised signs within the LSM lexicon. A complete analysis of initialisation in LSM is beyond the scope of this chapter, but cf. Hendriks and Dufoe (2014) for a more in-depth study of initialisation and the position of initialised signs in the LSM lexicon. This chapter has focused on initialisation in the kinship and the colour system. In both these systems the majority of signs have handshapes derived from the fingerspelling alphabet, expressing the first letter of the corresponding Spanish word. Both kinship and colour terms in LSM can be grouped into lexical families based on initialisation. In fact, initialised basic colour terms all form an extended lexical family, as defined by Fernald and Napoli (2000). Although some initialised signs have uninitialised counterparts and initialisation appears to have been imposed on these signs over the last decades (usually by hearing people), most initialised signs do not have uninitialised counterparts and are completely accepted by Deaf people. This suggests that initialisation is a phenomenon that has been part of LSM since the origins of the language.

Notes

1. Because no permission was given to use the videotaped materials in this book, only illustrations from published dictionaries could be used. All illustrations in this article, except for the fingerspelling alphabet in Figure 13, have been taken from Miranda (1997), with permission.
2. This is a general rule for adjectives, and it also holds for many nouns, but there are many exceptions in the nominal system.
3. The context can either be real life context or discourse internal context. If a signer stands next to her sister she can sign IX MI HERMANO 'that is my sibling' without specifying gender, because the gender is visible to the observer, and is therefore clarified by the real life context. Similarly, in the story of Little Red Riding Hood, when the grandmother is first introduced, she may be referred to as ABUELO MUJER 'grandmother woman' or ABUELO –FEM but once her gender is established, she is subsequently referred to simply as ABUELO 'grandparent'. In this case it is discourse internal context that renders further gender specifications redundant.
4. Normally both MAMÁ and PAPÁ are made with a double contact on the chin, but the movement in the compound is reduced; both parts of the compound only contact the chin once.
5. Apparently, the original LSM fingerspelling alphabet was largely derived from the Old French fingerspelling alphabet, with some Spanish letters added. Over the years, however, certain handshapes, such as the H-handshape, the M-handshape, and the T-handshape have changed. LSM has both examples of initialised signs using the older handshapes, and initialised signs using the newer handshapes. Thus, for example, the sign TRABAJAR 'work' uses the old T-handshapes, whereas the sign TÍTULO 'title' uses the new T-handshape. This indicates that TRABAJAR is an older sign than TÍTULO, which apparently has been adopted into the language more recently (cf. Hendriks and Dufoe, forthcoming).
6. The percentage is an average taken from three different dictionaries (33% in Serafín 1990, 31% in Miranda 1997, and 28% in López, Rodríguez, Samora and San Esteban 2006).
7. There is another variant, namely fingerspelled T-Í-O 'uncle' or T-Í-A 'aunt'. Note that the initialised form uses the old T-handshape with non-selected fingers extended, which is no longer used in fingerspelling and has been replaced by the modern T-handshape shown in the fingerspelling alphabet in Figure 13 (cf. also note 5).

8. Note that this colour can be referred to as both naranja and anaranjado in Spanish. LSM has only one sign.
9. One of the informants, a Deaf child of Deaf parents, signed this sign with the R-handshape the very first time she produced it during the elicitation session. Afterwards she went on to use the non-initialised sign in Figure 16. ROJO is not depicted as an initialised sign in any of the dictionaries of LSM, and I have not seen it used on any other occasion.

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Number, colour and kinship in New Zealand Sign Language

Rachel McKee

1. NZSL and its lexicon

The domains of number, colour and kinship in New Zealand Sign Language (NZSL) highlight diachronic variation and change in the lexicon. A brief outline of NZSL's history provides context for this variation.

Overlap in the lexicons of NZSL, Auslan and BSL evinces a close dialectal relationship between these varieties of the 'BANZSL' family (Johnston 2003; McKee and Kennedy 2000; Schembri et al. 2010; Woll 1987). But the relationship between them is not a straightforward divergence from a common mother language (BSL) through time and geographical separation. External intervention via the deaf education system, and ongoing contact between deaf nationals of these three nations have also had an effect. Although some 'early' NZSL signs are clearly of BSL origin, possibly brought by adult deaf immigrants from the UK, contact with BSL in the period following colonisation of New Zealand from the 1860s onwards was probably limited by the distance between northern and southern hemispheres. In the late 19th century, before a deaf school was established in the new colony, some New Zealand children were sent abroad to residential deaf schools in Australia, in which British and Irish sign languages were used, (Collins-Ahlgren, 1989; Fitzgerald 1999). It is known that at least one British-trained, hearing teacher of the deaf was employed as a tutor to a large family of deaf children in New Zealand during the 1870s, and used British signs with them (Collins-Ahlgren, 1989). But to a large extent, it seems that the early generations of deaf people in New Zealand created their own signs in the context of oralist residential schools dating from 1880 onwards.

Convergence between NZSL and Auslan vocabulary increased sharply with the introduction of Australasian[1] Signed English (ASE) into deaf education in both countries from the 1970s (1979 in New Zealand). The consensus among educators at the time was that the New Zealand sign lexicon was not extensive enough for use in education (Dugdale 2000). Vocabulary was

drawn mainly from Auslan, which included some BSL-origin signs that were also in the NZSL lexicon. Sets of number, colour and kinship signs (among others) selected for the ASE system were adopted from Auslan used in the state of Victoria (Jeanes, Jeanes and Reynolds 1982), much of which had historical origins in BSL (Johnston & Schembri, 2007).

At the time that ASE was introduced, NZSL lexicon in these domains was limited. Polysemous or generic manual signs were used to indicate semantic categories such as colour, month, relative, and city, with reference specified by the mouthing of an English word (Levitt 1985, McKee and McKee 2001, McKee and McKee 2007). The early lexicon of NZSL has similarities with systems described for other small-scale or emerging languages. A paradigm of context-dependent, polysemous signs is also described by Hoyer (2007) in the emergent variety of Albanian Sign Language, and Nyst (2007) reports 'simultaneous manual-mouthing' constructions using generic signs in Adamorobe Sign Language in semantic domains such as colour, shape, size or kin. Fox (2007) notes the progressive differentiation of colour terms through time, in the lexical system of Al-Sayyid Bedouin, a young sign language with few specific colour signs. Washabaugh (1986) observed that highly context-dependent lexicon is characteristic of a sign language that exists in conditions of limited diffusion and limited inter-generational depth – descriptors which fit the demographic conditions for NZSL in the century preceding the introduction of ASE in 1979.

The domains of number, colour and kinship were substantially relexified post-1979. Recent analysis of lexical variation shows that signs from the earlier paradigm are retained, particularly by older signers, and that some local innovations have also appeared (McKee, McKee and Major 2011). The NZSL number system today is similar to, but distinct in certain respects from the neighbouring language Auslan. Colour and kinship terms have also converged with Auslan in the last 30 years. The typology of number, colour and kinship domains described here for NZSL therefore reflects hybridity between an original paradigm that was not highly specified, and a modern lexicon that is more specified and morphologically elaborated.

2. Number

Expression of number concepts in NZSL exhibits considerable sociolinguistic variation, for the reasons outlined above. A dictionary of NZSL published in 1997 (Kennedy, Arnold, Dugdale, Fahey and Moskovitz 1997) records thirty forms representing the numerals zero to twenty. A previous dictionary

(Levitt 1986) records a further seventeen signs for numbers between one to twenty that are not in the 1997 dictionary – practically an entire alternate set, including an 'air-writing' (tracing) form for numbers eleven to twenty. The strategy of tracing letters and numbers (above ten) is still used by some elderly signers rather than conventional fingerspelling or number systems (Collins-Ahlgren 1989; Forman 2003). A third scholarly description of NZSL (Collins-Ahlgren 1989) describes yet other number signs that appear in neither of the other two publications. The only numbers that are identically represented in these three lexicons are one, two, four and five, although all publications were based on reliable informant data collected within approximately one decade of each other. Air-writing (or tracing), and some earlier two-handed forms of numbers 6 to 10 found in the 1986 and 1989 publications that are now considered rare or archaic are not included in the 1997 dictionary. All entries in the 1997 dictionary were validated by ninety individuals from a representative cross-section of the deaf community (Kennedy, Arnold, Dugdale, Fahey and Moskovitz 1997); this suggests that at the time of that research, earlier expressions of number (those recorded in Levitt and Collins-Ahlgren's preceding work) were no longer regarded by the community as signs in common use.

2.1. Cardinal numbers

The NZSL cardinal number system reflects number concepts in the English language, including a base ten structure in the ordering of larger and smaller units (as also described for BSL by Skinner 2007:60). A 'zero' sign expresses negative number and quantity and is also used to express negative existence or to negate a predicate. As in most varieties of BSL and in Auslan, cardinal numbers are formed with extended digits, starting from the extended index finger as one, and index and middle finger for two. Number three has variant forms using three different combinations of adjacent extended fingers; the most frequent is the index, middle, ring finger combination.

Cardinal or counting numbers are made with the palm facing the signer, except for a variant of 10 which flicks the fingers palm outwards. For numbers 1–5, the fingers point upright, while in numbers 6 - 9 and 11 -19, the blade is down, fingers pointing sideways to the left (except earlier variants of 11 and 12 which have a different form).

Numbers six to ten are also produced with one hand, palm facing the signer, although an older variant of ten uses two 'five' hands. Numbers zero to ten are shown in figure 1.

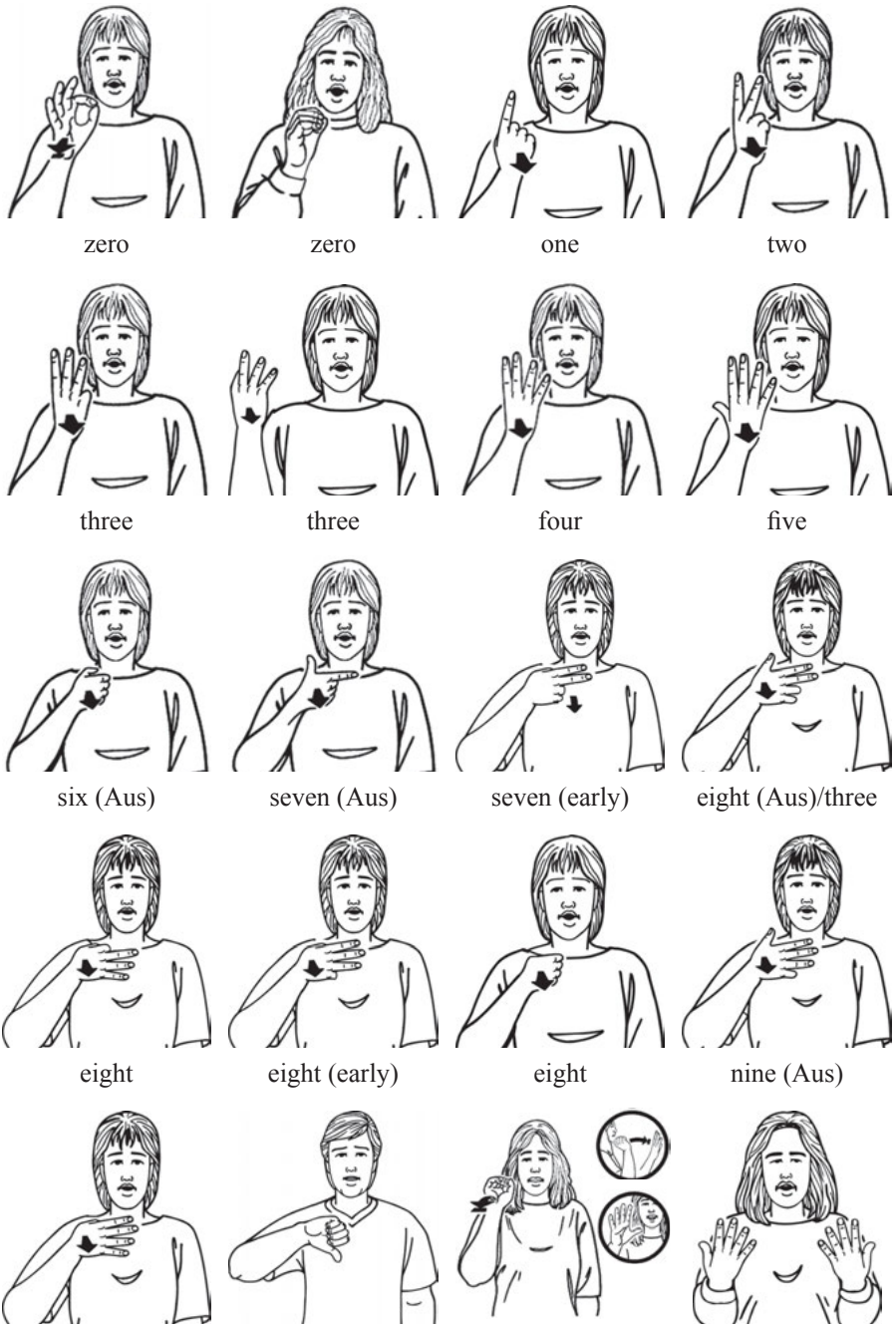


Figure 1. Cardinal numbers 0-10 (including variants)

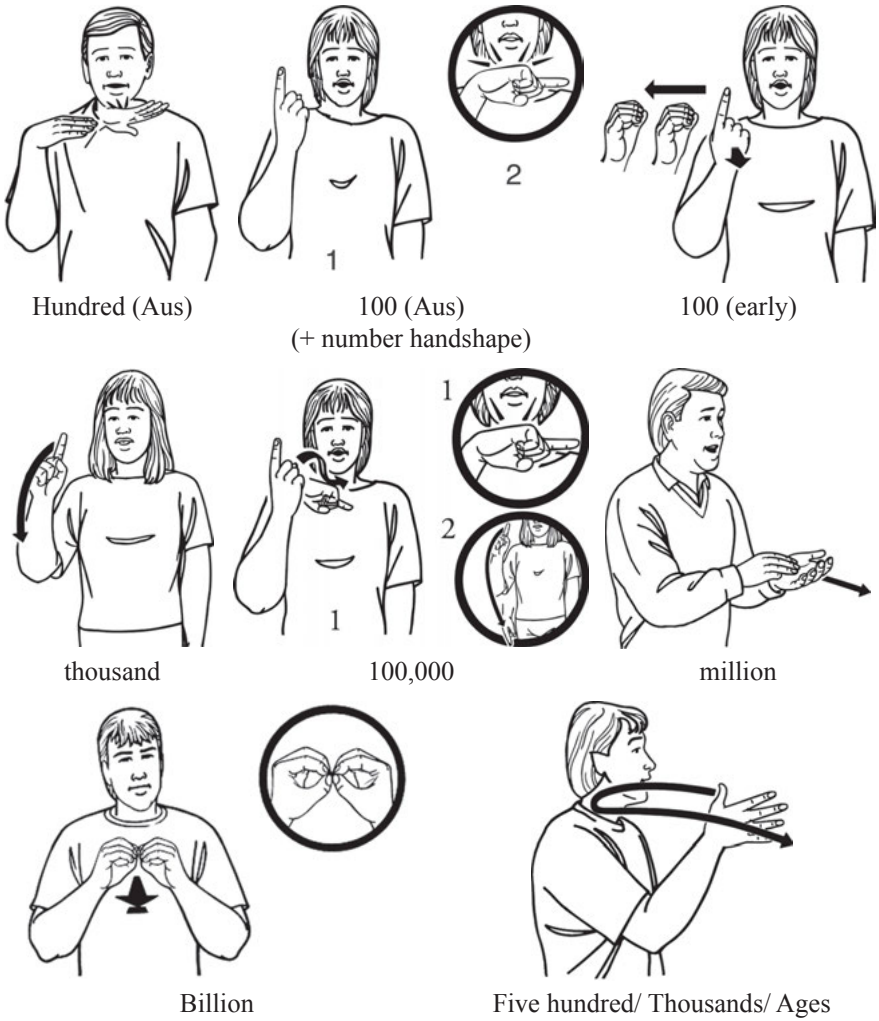
2.2. Iconicity in cardinal numbers

The number of extended fingers in signs for one to five, and the two-handed ten iconically represent number meaning. These signs are transparent to non-signers and overlap with counting gestures used by hearing people in New Zealand. Two-handed forms of six to ten (non-dominant five hand, plus extended digits on dominant hand), used more by signers over the age of 65, are also transparent in this way. However, representation is not entirely literal for numbers above five: for example, an optional 'five' non-dominant hand may be overtly expressed or dropped in some variants of numbers between six and ten (cf. Skinner 2007). The handshapes of modern forms of six (Auslan), seven (Auslan), a variant of nine ('thumb down'), and a variant of eleven (two fingers tracing vertical lines, see figure 3) have an element of iconicity possibly motivated by the shape of written numerals. Whether the handshapes of numbers six and seven are actually motivated by written numbers is unclear, since they also fit into a sequence of 'five plus-one-digit', and 'five-plus-two-digit' structure, followed by eight and nine in the same format.

As seen in figure 1, homophonous variants of three and eight exist; that is, the same three fingers used by some signers to mean 'three', may be used by other signers to mean 'eight', and vice-versa. Some signers maintain a distinction in meaning between three and eight through finger orientation - three points upwards, while eight points sideways (following the two-handed system for dominant hand digits in 6–9); some individuals are observed to use identical manual forms for three and eight, specified by mouthing.

2.3. Cardinal numbers above 10

NZSL has lexical signs for large number units above ten: hundred, thousand, and million (see figure 2). These can be combined with cardinal numbers to create complex numbers such as 400, 10,000, 100,000, expressed in the same word order as English. Multiples of a hundred are formed by moving a number handshape, (one to nine), under the chin, palm down. This form of number incorporation is borrowed from Auslan (Johnston and Schembri 2007). Number incorporation is not applied to the unit, thousand.



Hundred (Aus) 100 (Aus) (+ number handshape) 100 (early)

thousand 100,000 million

Billion Five hundred/ Thousands/ Ages

Figure 2. Large number units

Most of the signs shown in figure 2 were introduced with ASE, and correspond with Auslan signs. Earlier forms of hundred and thousand used a sequential compound of a cardinal number followed by reduplicated zero handshapes (eg, ONE-ZERO-ZERO), or a zero handshape moved laterally, or tracing zeros in the air. Some older signers do not express the zeros manually, but sign a cardinal number combined with mouthing to indicate a large number unit or nominal phrase, such as FIVE/ “thousand”, or ONE/ “hundred yards"; in this system, meaning is retrieved from mouthing and context. Finally, one unique early sign expresses the sense 'thousands' or an

unspecified huge number, as well as the temporal meaning of many years ('ages'). An almost identical form is used exclusively by older signers to mean 'five hundred' specifically. (Both are illustrated in Figure 2).

2.4. Strategies for constructing cardinal numbers

2.4.1. Simple multiples of ten

Multiples of ten comprise a sequential compound of a number plus zero; e.g., twenty is expressed as TWO-ZERO, thirty as THREE-ZERO, etc, up to ninety (see examples in figure 3). Both closed and open-hand '0' handshapes are used; the open-hand zero (ASL 'F') is an earlier form. The structure of ten multiples differs from that found in Auslan, in which a number handshape is combined with a change in orientation from palm towards the signer to 'palm-away' (outward rotating) movement. Older signers might alternatively trace two digit numbers in the air with the index finger.

20 50 90

Figure 3. Multiples of ten

2.4.2. Complex numbers above ten

Single digit numbers between one and nine combine with a vertical shaking movement to express numbers 11–19 as used in Auslan (see examples in figure 4). NZSL therefore has a mixed paradigm that has adopted an Auslan system for expressing '-teen' numbers (including 11 and 12), but retained a sequential NUMBER ZERO structure for multiples of ten rather than the movement seen in Auslan (Johnston and Schembri 2007).

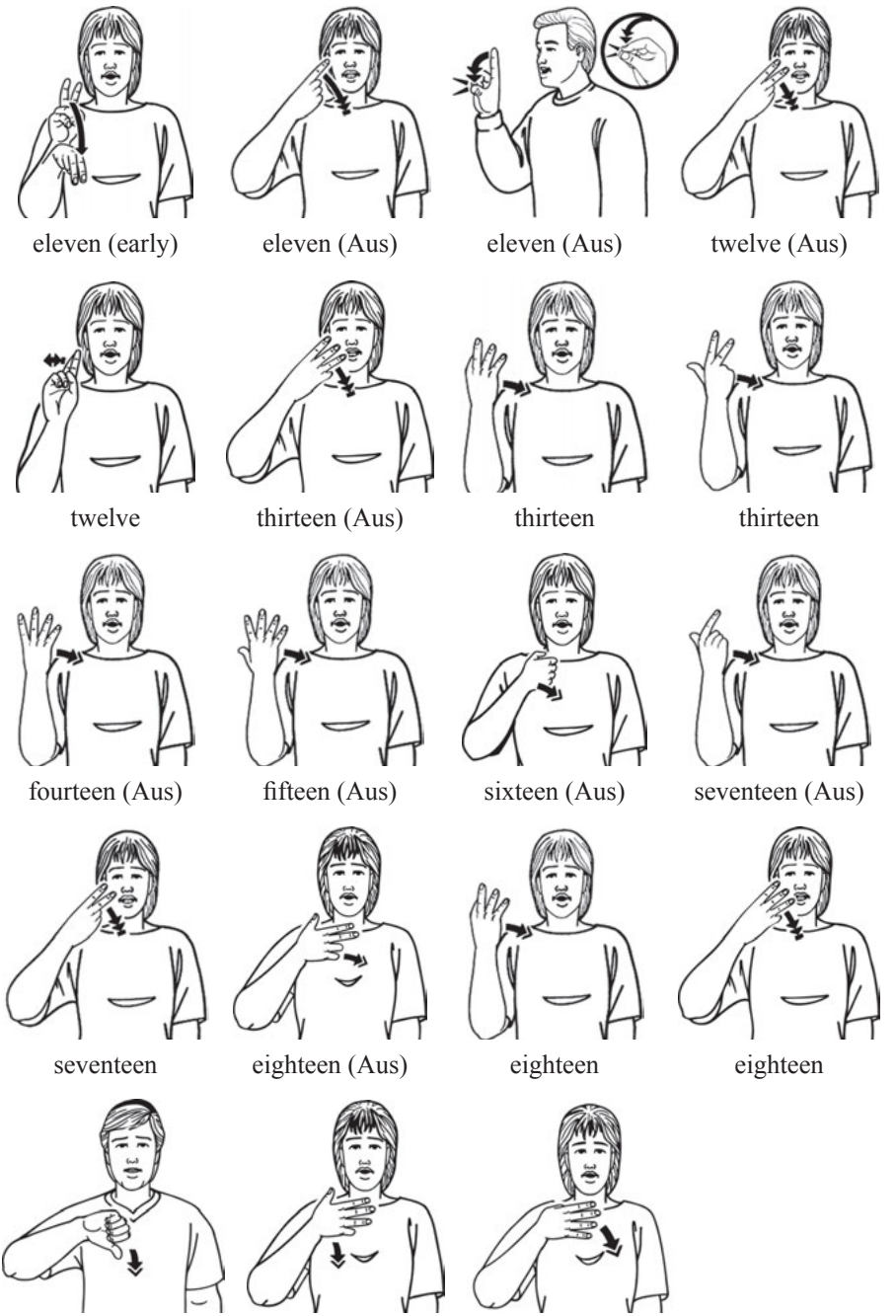


Figure 4. eleven - nineteen

Two-digit numbers (21, 22, etc.,) use a compound sequence, moving in an outward direction from centre to dominant side.

Figure 5. Two digit number (twenty five)

2.4.3. Fractions

Several strategies are used in NZSL to express fractional numbers and quantities. Lexical signs for half and quarter are the most longstanding terms for fractions; these are shown in figure 6. These signs are also used with reference to clock time (half past, quarter past, quarter to); the sign 'quarter' is apparently motivated by reference to a horizontal line between three and nine on a clockface (a quarter before or after the hour). 'Half' has variant forms: (a) a flat blade drawn across the open palm, (b) a horizontal index finger drawn across an upright index finger at the middle knuckle (which has a secondary translation of 'quarter' in a dictionary entry), and (c) a flat blade drawn across the signer's midriff (an older form not recorded in NZSL dictionaries). An early sign for 'three-quarters' corresponds with the (b) form of 'half' – in which the index finger is drawn across the vertical index below the middle knuckle.

Half (a)/'half-past' Half (b) one-quarter

Figure 6. Fractions

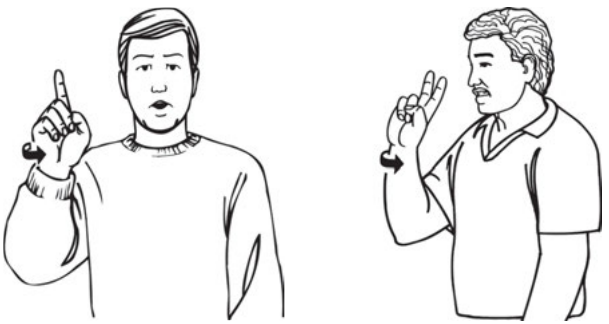
Since signing has been used in the education system from the 1980s, signs motivated by mathematical orthography have been developed in the school system, and disseminated into community use. Columnar (a sequence of two numbers formed in a vertical arrangement) and decimal (number-POINT-number) forms of fractions have emerged in this lexicon, (see figure 6). Established signs for percent are motivated by the symbol, as seen in figure 7.

Percent 1 Percent 2 Percent (early)

Figure 7. Percent - variants

2.4.4. Ordinal numbers

Ordinal numbers 1st - 10th are formed by a movement inflection of a cardinal number: a single inward-facing twist or rotation of the wrist (see figure 8). Numbers above 10 are not inflected in this way, and the inflection is variably applied to 10 (also depending on the variant of ten used: the 'flicking' variant is more awkward to combine with a twisting movement than the 'two-handed-five' form). Ordinal meaning for numbers above ten (e.g., 'He came 12th') is understood by context and sometimes mouthing.



First Second

Figure 8. Ordinal number examples

For definite anaphoric reference to a member of an ordered set, ordinal meaning can be expressed by touching, or lightly grasping, the horizontal fingertip of non-dominant hand list buoys to express 'the first one', 'the second one', etc, (up to fifth), of an identified set. (See figure 9).

(the) second(one) secondly | (the) fifth (one) fifthly

Figure 9. Ordinal list buoys

2.5. Numeral Incorporation

Cardinal numbers can be combined with movement and location inflections in semantic categories of personal pronouns, age, time, and money.

2.5.1. Personal pronouns

Number of persons between two and five can be specified in personal pronouns; these forms comprise the relevant number handshape moved in an alternating or circling pattern to indicate a grouping of persons. Inclusive or exclusive (of the signer) reference is indicated by proximity of the sign to the signer's body, as shown in figure 10.

two of them | three of them/us

Figure 10. Numbered pronouns

A classifier handshape (typically an upright index finger representing humans, horizontal index for animals) representing a body moving or a spatial arrangement can incorporate number up to five, by extending extra fingers.

2.5.2. Age numbers

Age numbers (for whole years) are made with the index finger of the number handshape touching the tip of the nose and moving outwards from the face (see figure 11). This originates in a compound of the sign AGE (located on the nose) with a number sign, and translates as 'x-years-old'. This number incorporation is most frequently seen with numbers up to ten (excluding the thumb-down 'nine' variant, which is awkward to articulate at a nose location), but is also possible with two digit numbers. The age of infants stated in number of weeks or months does not use this system; these are stated in a lexical phrase such as AGE SIX MONTH, or ELEVEN WEEK AGE.

one year old

Figure 11. Years of age

2.5.3. Clock time

'O'clock' (on the hour) times are formed with a small swivelling movement of a number handshape in neutral space, made by rotating the wrist back and forth quickly (see figure 12). There are separate signs for fractional clock time – expressing 'quarter past', 'half past', 'quarter to', and 'minutes past' the hour; when these signs are used in a phrase (e.g., HALF SIX, QUARTER-TO FOUR, TEN PAST TWO), the hour number in the phrase does not take the swivelling 'o'clock' movement.

One o'clock

quarter past

Quarter to

Figure 12. Clock time expressions

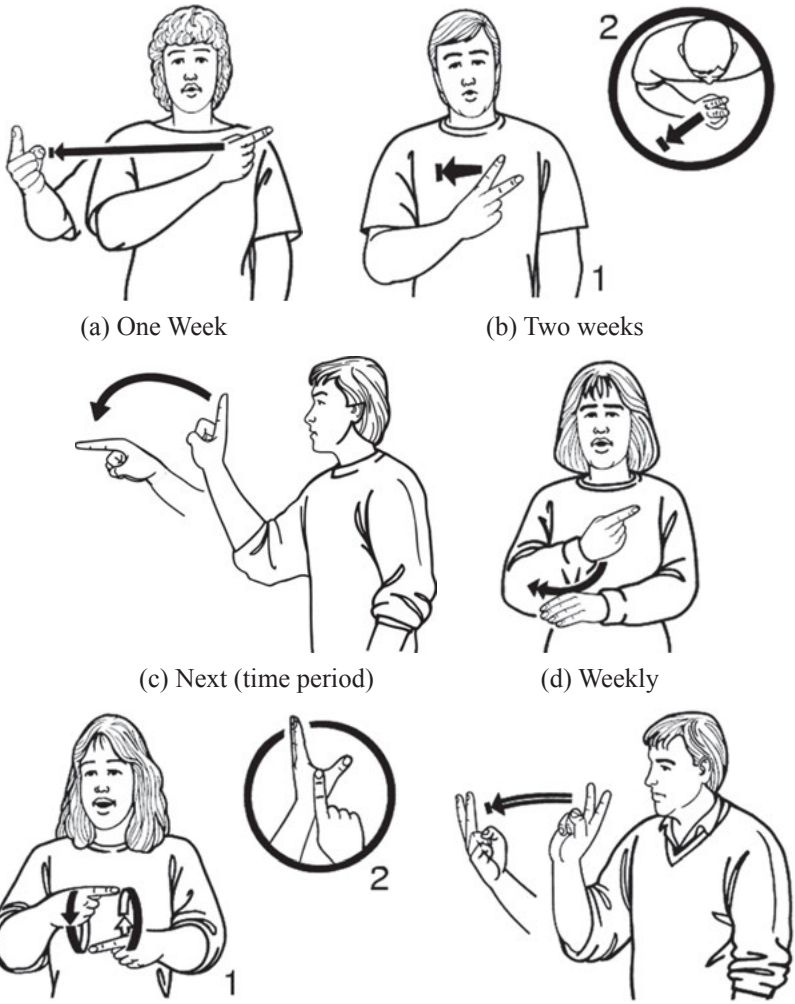
The phrasing of analogue clock time expressions are influenced by NZ spoken English, as seen in the use of signs meaning ‘half past’, ‘quarter to’, ‘five to’, ‘ten past’ etc. Digital time expressions (such as ‘one forty five’, or ‘six fifteen’) can also be signed in corresponding form - with a 'point' between the hour and minute numbers, reflecting a digital clock display; for example, ONE POINT FORTY. The digital format is increasingly common among younger signers, parallel with the same trend in spoken NZ English.

One variant of ‘hour’ (an extended upright index, palm back, moved in a clockwise circle in front of the signer’s face) can incorporate a number handshape up to five. Signs for ‘minute’ and ‘second’ do not regularly incorporate number in NZSL.

2.5.4. Calendar time

Number handshapes can be combined with certain units of calendar time, including signs for WEEK (see figures 13a and b), YEAR, a sign that means future-time-period (week, month or year) (see figure 13c), past-WEEK/

YEAR, WEEKLY (see figure 13d) and YEARLY (see figure 13e). These can incorporate the handshape of numbers one to four, and rarely, five. Numbers between six to nine are occasionally combined with signs WEEK or YEAR, but are not generally combined with the movement morpheme signalling future or past time reference. Number incorporation is not used with signs for DAY or MONTH. Recurring time intervals (e.g., every two weeks, every three years) can incorporate a number between one to five into the movement of the sign week or year. A twisting movement inflection expresses the concept of 'once' and 'twice' (see figure 13 f).



(a) One Week (b) Two weeks

(c) Next (time period) (d) Weekly

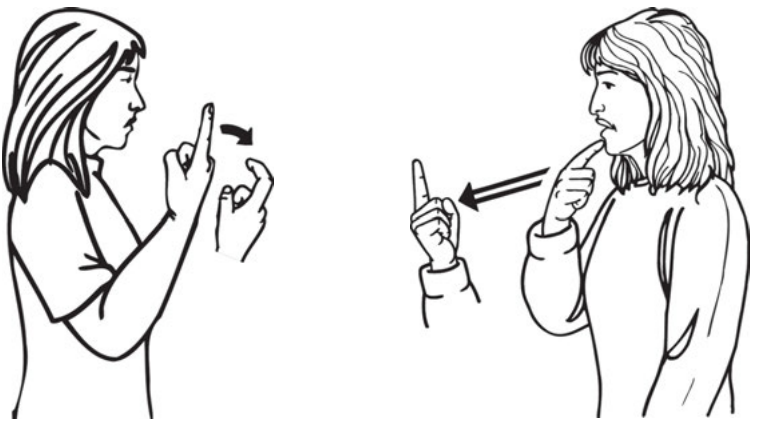
(e) Yearly (f) Twice

Figure 13. Number incorporation in time units

2.5.5. Money numbers

The expression of money numbers varies. In the traditional (still widely used) paradigm, money expressions use lexical phrases, such TEN DOLLAR, or the unit term (e.g., 'dollar') might be signalled in the mouthed phrase accompanying a number sign. Dollar and cents amounts can either be signed in full, such as FIVE DOLLAR SEVENTY C(ent), or FIVE DOLLAR SEVENTY, or, in decimal point form, as FIVE POINT SEVENTY.

Among younger signers, two number incorporating systems for whole dollar amounts are becoming established. These comprise (i) a movement modification of a number handshape (below ten), in which the extended fingers of a number handshape (between one and five) are flexed (see figure 14a), and (ii) a location modification in which a number handshape (below ten) contacts and moves out from the chin (see figure 14b). The first is apparently a local innovation, and the second appears to be a borrowing adapted from either contemporary BSL, which utilises this system for quantifying British pounds, or an earlier (pre-decimal) usage of this form in Auslan.[2]



one dollar (a) one dollar (b)

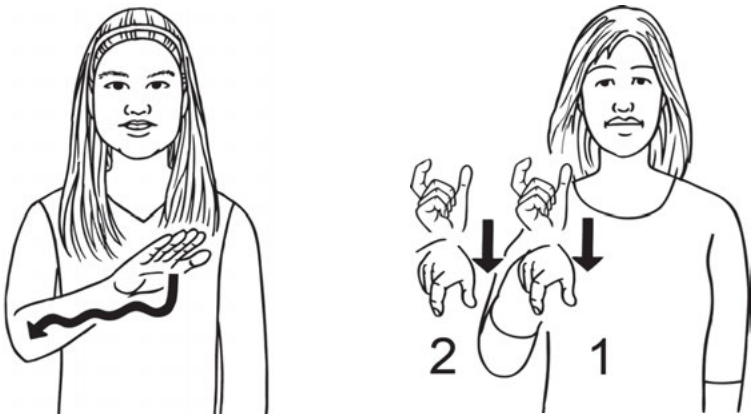
Figure 14. Number incorporation in money units

2.6. Quantification

2.6.1. Nominal plurals

A few nouns can be marked for pluralisation by individually articulated repetitions of the sign at distinct locations in the signing space. The conventionalised plural 'children' is one of few examples of this process in

NZSL (figure 15). Reduplication for pluralisation is applied to few conventional nouns, and apparently only those articulated in neutral signing space, usually without body contact (e.g., PERSON – figure 15b, or PROBLEM). The most common strategy for quantification is use of lexical modifiers such as SOME, MANY, FEW, DIFFERENT, or relying on context to imply plural reference.



children people (persons)

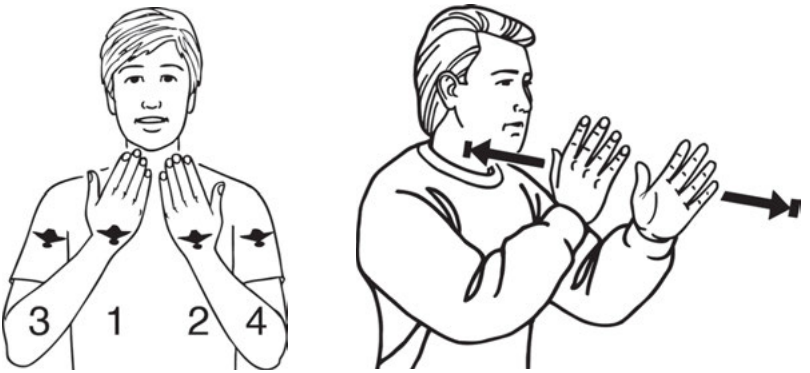
Figure 15. Lexicalised plurals

Productive (classifier) signs representing entities or shapes can be reduplicated in neutral space or on the body to express plurality, or placed more deliberately to convey specific number – e.g., a pattern of spots on a garment, a cluster of high-rise buildings (as illustrated in figure 16).

spots (multiple) buildings

Figure 16. Reduplicative pluralisation in productive signs

Some productive forms have become lexicalised as signs with internal pluralisation – e.g., 'exhibition' (multiple items on a wall), and 'queue' (multiple people); (see figure 17).

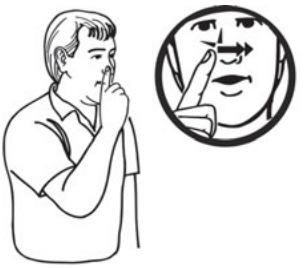


Exhibition Queue

Figure 17. Lexicalised internal reduplication

The only identified suppletive plural form is person/people, (figure 18), for which neither of the plural forms is formally related to the singular form.

Person People 1 (early)



People 2 (Aus)

Figure 18. Suppletive plural

2.6.2. Inventory of quantifiers

As mentioned above, lexical quantifiers can be used in nominal phrases. These are shown in figure 19.

Figure 19. Lexical quantifiers

Negative quantifiers can be located in the signing space to indicate negative quantity or existence in relation to a discourse referent. Signs that are regularly translated as 'empty (place)' and 'no-one' are conventionalised examples of spatial modification; (see figure 20).

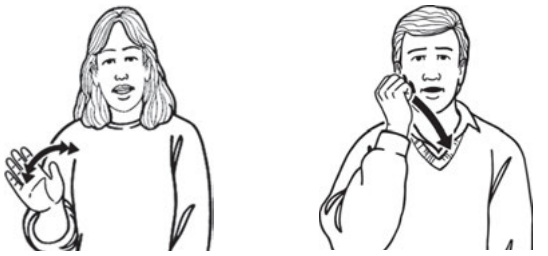
Empty, unoccupied (place) No-one

Figure 20. Negative quantifiers, spatially modified.

Quantifiers - some, few, and many - can be shifted in the signing space to index discourse referents in the signing space.

3. Colour

All available evidence indicates that the early (pre-ASE) paradigm for colour signs in NZSL comprised two manual signs: black (corresponding with the BSL and Auslan sign), and a generic sign that indicated any colour, specified by mouthing an English colour name illustrated in figure 21. In the first dictionary of NZSL (Levitt 1985), a signer of the older generation (in his mid-seventies at the time) is pictured modelling the generic colour sign in entries glossed as white, blue, yellow, red, green, brown, and interestingly, also black (suggesting that he and perhaps his peers actually used a single colour term). In this paradigm, colour reference requires knowledge of spoken English colour words, although mouthed articulations are not necessarily identical with those of hearing speakers.[3] The generic sign also expresses the abstract category, colour. It is listed in the 1997 NZSL dictionary (Kennedy et al, 1997:196) with the translation, 'colour, shade', noting that the lip pattern is either "colour, or the name of a colour".



Colour(s) - generic Black

Figure 21. Early colour signs

As with numbers, the adoption of ASE (Auslan) vocabulary in 1979 brought an elaborated set of colour signs borrowed from Auslan, and a decline in the use of the generic colour sign. A current dictionary of NZSL (McKee et al, 2011) records 15 different colour signs, including some with two variants, as follows: black, blue, brown, green 1 and 2, grey, pink, purple, red 1 and 2, silver, white, yellow, colour, grey, orange 1 and 2. To the best of our knowledge, all of these except colour, black and one variant of green were introduced via ASE. These are illustrated in figure 22 (excluding close phonological variants of red and orange).

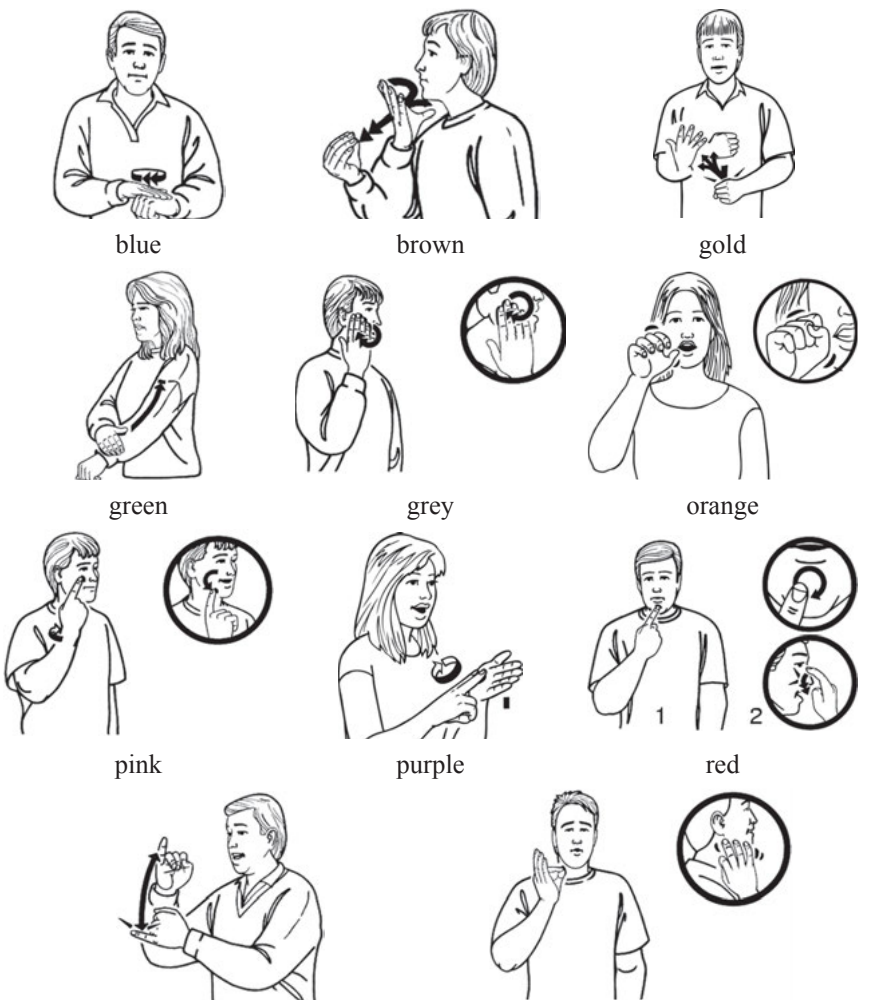


Figure 22. Modern colour signs (borrowed from Auslan)

Colour signs disseminated via ASE were readily adopted not only in the school system, but also by the adult language community, as they supplemented an under-specified domain of the native lexicon. A study of sociolinguistic variation in NZSL confirms that use of the generic colour sign persists, but is confined largely to older signers; it was produced by most signers over 65 years old in response to six different colours shown in an elicitation task (McKee and McKee 2011). Among younger signers the meaning of the generic sign is restricted to the category term, 'colour', and is also used as a modifier following another colour sign to indicate an indeterminate or approximate shade, such as 'brownish'.

Even in the modern paradigm, the number of colour signs is small compared to English colour vocabulary; there are no established terms for intermediate colours such as turquoise, mauve, khaki, beige, maroon, nor for naming shades within a colour range that are distinguished in English, such as sky blue, royal blue, French blue, navy blue.

In Berlin and Kay's (1969) hierarchical typology of language and cultural complexity according to the extent of colour terms, a two-way colour distinction would place early NZSL as a Stage 1 language. Applying Berlin and Kay's typology to colour systems in signed languages can be problematic; firstly, many colour signs derive from reference to physical objects for colour identity (e.g., lips/red, teeth/white), a form of secondary reference which is excluded from their criteria for forming basic colour terms, and secondly, the conceptual and formational characteristics of colour terms in signed languages may be strongly shaped by contact with spoken language(s), (cf. Nyst 2007, and Hollman and Sutrop 2011). Contact notwithstanding, Stokoe (1987:10) points out that it cannot be assumed that a deaf community living within a society that has a more highly specified lexicon will necessarily develop a vocabulary and set of cultural referents that parallel the surrounding spoken language, since this may be inaccessible to deaf people. The limited set of early NZSL vocabulary in three core domains illustrates this point. Expression of colour concepts in NZSL was restricted for approximately a century in terms of native manual lexicon, but has interacted productively with the semiotic systems of other languages: initially, through mouthing of English words, and later, via adoption of a larger repertoire of Auslan signs, which parallel the main colour names in English.

3.1. Colour sign combinations and modifications

To express intermediate or mixed shades, colour signs can be used in sequential combinations – such as BLUE GREEN, RED BROWN. Intensity of hue can be expressed by lexical modifiers DARK, BRIGHT and LIGHT, preceding or following a colour sign. As mentioned above, the generic colour sign may be used as a post-modifier to indicate an approximate shade ('-ish').

Colour signs are also modified for intensity (of saturation and brightness) by simultaneous non-manual signals. Degrees of darkness or lightness can both be signalled by eye-narrowing, more pronounced and with more brow frown for darkness. Eye-widening is associated with brightness. As colour signs are typically accompanied by a mouthed word (like most nouns and adjectives in NZSL), mouth modifiers are less consistently observed. Non-manual modifers are shown in figure 23. Movement of a colour sign may be tensed and slowed to express intensity of hue (e.g., 'very red'). Observation suggests that these non-manual modifications are not consistently applied by all signers; as with other morphological features, their use seems to vary by individual factors of fluency, nativeness, and age-group.

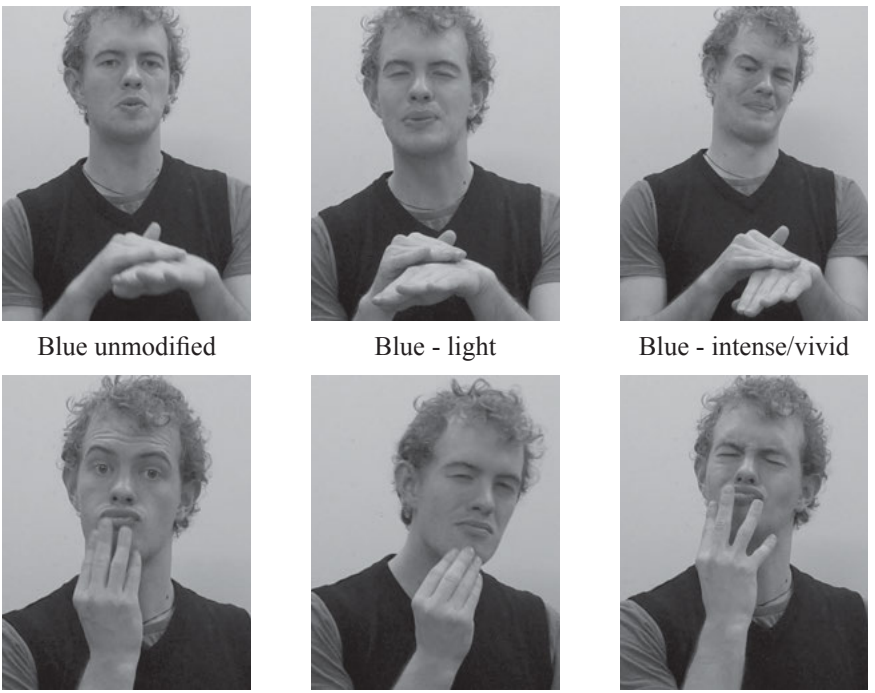


Figure 23. Non-manual modification of colours

3.2. The semantic origin of colour signs

The generic NZSL colour sign is not transparently motivated. Folk etymology would suggest that contemporary colour signs borrowed from Auslan (with roots in BSL) are semantically motivated by reference to coloured objects, as follows: Blue – originally veins on the underside of wrist, later shifted to back of hand (Woll 1987); Black – associated with dark skin colour, and perhaps cleaning dirt/coal off the face; White – shirt collar (perhaps originally neck garments); Yellow – gold earring or blonde hair; Red – lips; Brown – beard; Orange – the sign also names the fruit, which is squeezed; Green – may derive from BSL signs 'park/field' and 'grass' which are formationally similar; Grey – possibly the colour of a man's cheek with 'five o'clock shadow'. There is little empirical evidence available to verify these speculations about etymology, but they seem plausible.

NZSL has no colour signs that are initialised or based on orthography, except possibly one archaic variant of green, which appears to depict the hook of lower case 'g' (see figure 24).

Green (early)

Figure 24. Green (early form)

NZSL signers do not use pointing to real objects as a regular strategy for colour reference. However, the locatability of signs allows for the association of colour terms with a specific location or object. NZSL signs for hair colours, blonde and grey, contain a deictic location feature, being produced at the head. Blonde has two variants, both located 'on' the hair: an earlier form (fingertips of a bent-five hand stroke the hair downwards, twice) and a modern (Auslan) variant that is apparently a compound of YELLOW^HAIR. 'Grey-hair' is made by spreading the open fingers back over the hair in a movement starting from the temple, suggesting the spread of grey hair from the temples,

(see figure 25a). The concept of 'grey (overcast) sky' (see figure 25b) is expressed by the open hands depicting sky as if it were a coloured surface; the handshape corresponds closely with the general sign for colour, also used in 'weather' (figure 25c), located iconically towards the sky.

(a) grey haired

(b) grey, cloudy

(c) weather

Figure 25. Object colour reference

The deictic element of location in hair colour signs is also present in signs for skin shades, blush and pale, which are produced in contact with the cheek where these shades are normally observed.

4. Kinship

Relationships between kin are expressed through conventional lexicon in NZSL, rather than in diagrammatic signing space. A search in *NZSL Online* under the semantic domain 'family' returns 56 entries; the relatively large number of signs tagged to this domain in the dictionary is expanded partly by the inclusion of family-related concepts such as 'adopt', 'foster', 'divorce',

'twins', 'wedding', 'family history'. The number is also increased by the existence of variants for many kin terms. 'Dad', for example, has three phonological variants, all modifications of a borrowed sign formed with a one-handed (ASL) 'D' handshape which originates in American Signed English. 'Nephew' also shows three variants, of which two are phonological variants of a non-native sign with initialisation from a fingerspelling system.

Like number and colour signs, diachronic variation in kinship vocabulary is differentiated by pre- and post-Australasian Signed English eras in education. The earlier paradigm utilised a generic sign indicating a relationship, with reference specified by mouthing a kinship word, (see 'Relation' in figure 26). This sign also means 'same', 'friend', 'girlfriend', 'boyfriend' (in pre-ASE lexicon), 'relative', and serves as the dual person pronoun. These meanings are specified by mouthing and context. Older signers use this generic relationship sign to refer to all family members (including husband/wife), except mother and father, which had distinct signs in the early lexicon. In this paradigm 'parents' is expressed by a compound of MOTHER^FATHER. The early paradigm sign for 'family' is also a polysemous form that refers more generally to a group. The early paradigm of kinship signs is shown in figure 26.

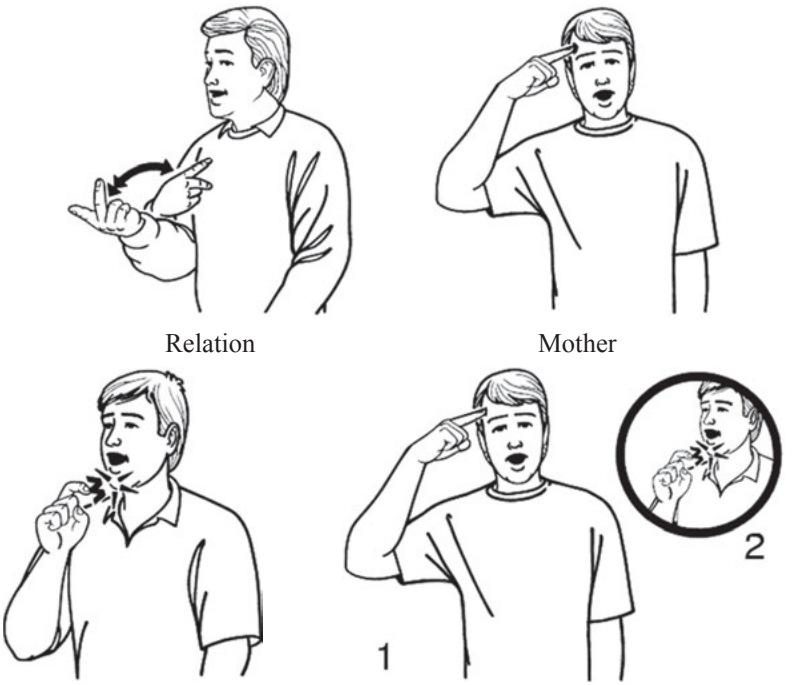


Figure 26. Early kinship signs

A new set of kinship signs entered NZSL via ASE from 1979, as illustrated in Table 1. These are now established in NZSL and almost universally used by signers below the age of about 55 years (and many above). Analysis of variation in the use of kinship signs across three age cohorts of NZSL signers, shows that use of the generic 'relative' sign, however, is not entirely confined to older signers, but is rather in a state of progressive semantic change. Whereas older signers, on the whole, favour this form to express nearly all kin (and friend) relationships, middle-aged signers still commonly use it for niece, nephew, aunt and uncle, while younger signers use it regularly only to mean 'relatives' and as one variant of son. The semantic scope of the sign is thus progressively narrowing, as more formally and semantically distinct alternatives have been added to the language (McKee and McKee 2011).

The current paradigm of family terms is conceptually consistent with that of English speaking cultures (see Table 1); there are no lexical distinctions between older/younger or paternal/maternal relatives. Gendered signs correspond with gender-specified terms in English: grandmother/grandfather, mother/father, daughter/son, sister/brother, aunt/uncle, niece/nephew. However, the manual sign for husband/wife is not gender differentiated except by mouthing of the relevant word (not always correctly selected; indeed, on a visit to the Deaf club on the day of this writing, the married female author was asked in NZSL (with mouthing), "Is your 'wife' here tonight?").

Fingerspelling features prominently in the formation of modern (ASE/Auslan-origin) signs for family members. Several core terms are single manual letter signs; e.g., M for mother, F for father, D for daughter, S for son, G-F for grandfather, G-M for grandmother. Except S for son, these are also found in BSL. Others (family, aunt, uncle, cousin, niece, nephew, in-law) are formed with initialised handshapes in signs that were introduced with ASE. Of the core terms in this set, only brother, sister and spouse do not include a fingerspelled element. (See illustrations in Table 1.) The presence of fingerspelling handshapes in this modern lexicon sets it clearly apart from the earlier system of kinship reference in NZSL, in which mouthing (contextualised by the 'relationship' sign) was the mode of borrowing English terms. Prior to the introduction of ASE into schools in 1979, fingerspelling was not generally used in the deaf community except by individual immigrants from the UK or Australia, and it had no presence in the early lexicon.

A collective term for parents is a compound MOTHER^ FATHER; the concept of siblings is expressed by juxtaposed signs BROTHER, SISTER but the combination is neither highly frequent nor has phonological reduction typical of a lexicalised compound. Half, step, and in-law relationships are identified with multi-sign phrases that correspond in structure with English

terms – e.g., HALF BROTHER, STEP FATHER, MOTHER IN-LAW, (see Table 2). Complex constructions expressing relationships such as 'father's sister' or 'wife's cousin' can be expressed as juxtaposed signs (FATHER SISTER), or linked by the possessive pronoun (FATHER HIS SISTER); both strategies are common.

In discourse, signs for family members may be indexed to loci in the signing space for anaphoric reference, but morphological strategies of reduplication or spatial modification to express meanings of pluralisation, or generational or age-related hierarchy are not encoded in the formation of signs.

Sibling birth order is conveyed by modifiers 'older' (literally TALL) and 'younger' (literally SHORT), or by indexing ordinal list-buoys on the extended fingers of the non-dominant hand.

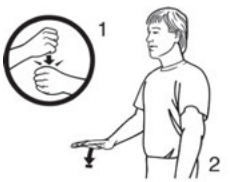
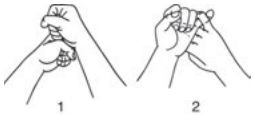
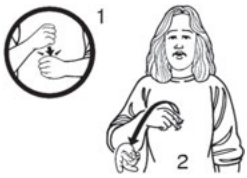
Table 1. Core family signs: modern paradigm

Category	Gloss	Picture
Non-gendered parent(s)	Compound of gendered terms: MOTHER^FATHER	
Gendered parent	MOTHER	
Gendered parent	FATHER	
Non-gendered offspring	CHILD	
Gendered-offspring	DAUGHTER	

Gendered-offspring	SON	
		 early variant
Gendered sibling	BROTHER	
Gendered sibling	SISTER	 
Non-gendered spouse	SPOUSE (gender specified by mouthing)	

Table 2. Non-core family terms: modern paradigm

Term	Sign gloss	Picture
Gendered grandparent	GRANDMOTHER	
Gendered grandparent	GRANDFATHER	

Non-gendered grandchild	GRANDCHILD	
Gendered grandchild	GRANDSON	 
Gendered grandchild	GRANDDAUGHTER	
Non-gendered aunt/ uncle (ego's parents' siblings)	RELATIVE used by older signers for aunt, uncle, specified by mouthing	
Gendered ego's parents' siblings	AUNT	
Gendered ego's parents' siblings	UNCLE	

Non-gendered cousin (same generation)	COUSIN	
Non-gendered niece/ nephew (children of ego's sibling)	RELATIVE used by older signers for aunt, uncle, specified by mouthing	
Gendered children of ego's sibling (female)	NIECE	
Gendered children of ego's sibling (male)	NEPHEW	
Non-gendered engagement relation	ENGAGED, FIANCE(E)	

5. Conclusion

Major cultural and linguistic change within signed languages is often precipitated by macro and micro developments in deaf education. In relation to signed languages, Stokoe (1987:9) notes that "the fact of major cultural change may be approximately dated by the extent of colour vocabulary". The hybrid character of the three semantic domains surveyed in this chapter, number, colour and kinship reflects an abrupt change in the linguistic resources available to deaf people in New Zealand, dating from the 1979 switch from oralism to the use of Australasian Signed English in education. This intervention differentiated the core vocabularies of younger and older generations of signers, and has resulted in progressive decline in the use of signs from an earlier paradigm of NZSL.

Both early and contemporary systems of colour and kinship terms contain non-native elements: earlier, through the mouthing of English words to specify reference with generic signs, and in the modern paradigm, through Auslan signs imported via Australasian Signed English. In the domain of kinship, new vocabulary introduced alphabetic handshapes in initialised signs, previously absent in NZSL phonology. In the case of numbers, systems of morphological inflection have been extended, and appear to be still developing among signers of middle and younger generations. Thus, the adoption of Auslan vocabulary for number, colour and kinship concepts has altered the size and the formational parameters of the NZSL lexicon. The intended purpose of introducing ASE in New Zealand education was to increase parallelism between a signed lexicon and spoken English, which was achieved to some extent; a less intentional, but significant outcome in cultural and linguistic terms, was setting NZSL on a path towards increasing convergence with its historical relatives, Auslan and BSL.

Acknowledgements

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Notes

1. The term ‘Australasian’ refers jointly to Australia and New Zealand.
2. The earlier Auslan usage was pointed out to me as a possible source by Adam Schembri. Pounds were replaced with decimal currency (dollars) in Australia in 1966 and 1967 in New Zealand. While this 'pound' incorporating form reportedly still occurs in some older Auslan users, there is no documented evidence of it in a similar generation of NZSL users, although it is possible that it entered NZSL via contact with older Australians. Borrowing from current BSL seems more likely since this form is seen more among young generation NZSL signers, some of whom have worked and lived in the UK.
3. For example, a hearing daughter of deaf parents of the generation who used this colour system reported that one of her parents consistently mouthed something like ‘ruthuh’ with the generic colour sign, to mean ‘red’. Her other parent would always point to the nose for ‘red’, which she only discovered as an adult was a 'family sign', not a conventional NZSL sign.

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