

Research Article

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A ministry of (not-so-silly) walks: Investigating classifier handshapes for animate referents in DGS

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Abstract: Across sign languages, classifier predicates depict the movement, location, or manipulation of (in-) animate entities. Each classifier predicate contains a classifier handshape that represents a referent based on one or more of its salient semantic and/or visual properties. In this article, we focus on a subset of entity classifiers in German Sign Language (DGS) that depict the movement and/or position of animate referents: The ‘1’-classifier, the ‘V’- or inverted ‘2’-classifier, and a general entity classifier. The distribution of these classifiers has been claimed to be determined by semantic and pragmatic factors in other sign languages. Looking at 16 re-tellings of the Canary Row cartoons, we perform an exploratory analysis showing that syntactic, semantic, and discourse-pragmatic factors influence the choice of one classifier over another when the basic set of entities depicted – anthropomorphized animates – is held constant.

Keywords: classifiers, argument structure, semantics, pragmatics, German Sign Language

1 Introduction

Classifier predicates are widely used across sign languages to depict the movement, location, or manipulation of an entity.¹ Each classifier predicate features a classifier handshape that represents an animate or inanimate referent based on a salient semantic and/or visual property of that referent. We distinguish three main categories of classifier handshapes based on which referents they represent and how they encode them (Zwitserslood 2012). Whole-entity classifiers represent a referent as a whole based on semantic and/or visual physical aspects of the referred entity, e.g., being a vehicle vs a human or being long and thin vs flat and wide. Body-part-classifiers zoom in on a particular body part that moves, e.g., feet or wings. Handling classifiers show how an entity is manipulated and thereby encode two referents, the handling and the handled entity (e.g., a person’s hand holding a flower looks different from an elephant’s trunk holding it, and both look different when holding a block of wood, cf. Engberg-Pedersen 1993).

¹ In the following, we use the term ‘classifier predicate’ (Liddell 1977, Corazza 1990, Schick 1987, 1990, Smith 1990, Valli and Lucas 1995) for a construction that is also referred to in the literature as ‘productive signs’ (Brennan 1992, Wallin 1996), ‘spatial-locative predicates’ (Liddell and Johnson 1987), ‘polymorphemic predicates’ (Collins-Ahlgren 1990, Wallin 1990), ‘classifier signs’ or simply ‘classifiers’ (Branson et al. 1995), ‘polysynthetic signs’ (Takkinen 1996, Wallin 1996, 1998), ‘classifier verbs’, ‘verbs of motion and location’ (Supalla 1986, 1990), ‘polycomponential signs’ (Slobin et al. 2000), ‘polymorphemic verbs’ (Engberg-Pedersen 1993), and ‘depicting verbs’ (Liddell 2003). An overview and discussion of the terminology can be found in Schembri (2003) and Liddell (2003).

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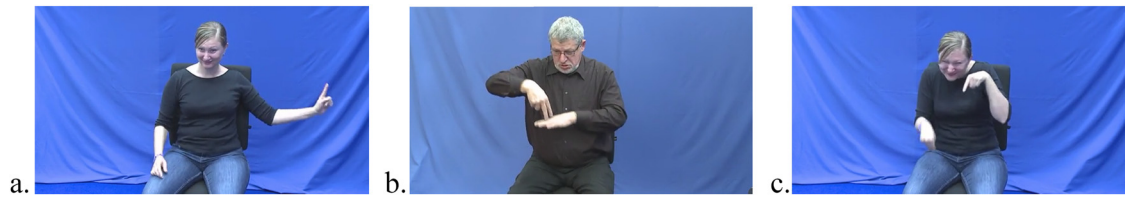


Figure 1: The three DGS entity classifiers under investigation: a) '1' classifier, b) '2' classifier, c) 'GC' classifier (illustrations from the DGS Corpus, Konrad et al. 2020, DOIs to the respective videos can be found in the references).

In this article, we focus on a subset of entity classifiers in German Sign Language (DGS) that depict the movement and/or position of animate referents. The distribution of these classifiers has been claimed to be determined by semantic and pragmatic factors in other sign languages, for example, in Sign Language of the Netherlands² (NGT) and Danish Sign Language (DTS) (Engberg-Pedersen 1993, Zwitserlood 2003). Here, we perform an exploratory analysis to answer the question which syntactic, semantic, and discourse-pragmatic factors influence the choice of one classifier over another when the basic set of entities depicted – anthropomorphized animates – is held constant. To examine what conditions classifier choice, we look at 16 re-tellings of the Canary Row cartoons. The three classifiers under investigation are depicted in Figure 1: The 1-handshape in (a) with the fingertip pointing upward has been claimed to depict the movement of animates in DGS (Happ and Vorköper 2006, 159). The inverted 2-handshape in (b) is used for static humans and, if bent and with the thumb extended, for static animals (Happ and Vorköper 2006, 159). The extended index finger in (c) may point in any direction and is called a *general entity classifier* (Zwitserlood 2003, 110), because it either represents or traces the movement of an entity regardless of its animacy or shape. We will call it 'GC' (general classifier) in this article.

Factors we discuss as potentially motivating classifier choice are the following:

- Syntactic: unergative (agentive) vs unaccusative (thematic) subjects;
- Semantic: animacy (human vs animal referent), type of event depicted (location vs motion), for motion predicates the encoding of path shape, direction, and manner;
- Discourse-Pragmatic: discourse status of the referent, presence of constructed action (CA), and interaction with other entities.

This article is structured as follows. Section 2 provides the relevant theoretical background both on classifiers in sign languages and on the syntactic, semantic, and discourse-pragmatic factors that potentially influence which classifier is selected to depict the movement or positioning of an animate entity. In Section 3, we present our dataset, annotations, and statistical analyses. The results are presented in Section 4 and discussed in Section 5 first by classifier and then by factors investigated. Section 6 concludes.

2 Theoretical background

2.1 Representing the movement or location of animate entities

Sign languages differ in both the inventories of classifier handshapes they use, and in the set of referents those classifiers can represent (Zwitserlood 2012). Before delving further into DGS, we thus provide a brief overview of which handshapes can be used to represent animate entities cross-linguistically. We begin with handshapes that refer to the whole body and continue with the ones focusing on the legs. All handshapes are depicted in Figure 2 for an overview.

² There is currently variation in the translation of the language name, a frequent alternative being 'Dutch Sign Language'. We will use the Dutch abbreviation 'NGT' throughout this article.



Figure 2: Inventory of classifier handshapes representing human referents. Handshape images are taken from the Handshape font (CSLDS, CUHK), and from Prillwitz (1989).

Based on a typological overview in Klomp et al. (2025), at least 29 documented sign languages, including DGS, use the 1-handshape for human referents, focusing on their rather long and narrow form. Often, fingers can be added to show multiple referents standing in a line or a crowd. Additionally, the 2-handshape can be used for babies in Taiwan sign language (SL). Humans or anthropomorphized animals can be depicted by the 3-handshape (but pinky pointing downward) in Taiwan SL, Hong Kong SL, and Thai SL. This same 3-handshape (but pinky pointing downward) can depict both male and female humans in Jordanian SL. It is also possible to differentiate between males and females in Jordanian SL by using the 4-handshape for males and the 5-handshape for females. This distinction is also used in Korean Sign Language and Taiwan SL. In Thai SL, the 5-handshape shows a person sitting; in Turkish SL the 4-handshape is used as an honorific. In Danish Sign Language, Indian Sign Language, Austrian Sign Language and Turkish SL, the 4-handshape can be used for humans in general.

The inverted 4-handshape represents human referents by highlighting their two legs in at least 19 sign languages, including DGS. Sitting instead of standing can be shown by bending the fingers for the 4-handshape in eight sign languages and by the 5-handshape with non-spread fingers in Uruguayan Sign Language and Namibian SL. Lying instead of standing or sitting is demonstrated by the 4-handshape in, for example, American Sign Language (ASL) and Uruguayan SLs. In Catalan SL and Taiwan SL, however, the 4-handshape represents animates in general and does not focus on lying. In Venezuelan SL, two-legged entities are depicted via the 4-handshape, no matter if they are sitting or standing.

Finally, the 6-handshape can represent entities of unspecified shape, or forms that are difficult to reproduce by a classifier, e.g., in ASL or NGT. Uruguayan SL also uses the 6-handshape for this purpose.

DGS uses a subset of the classifier handshapes in Figure 2 to represent animate referents. According to Happ and Vorköper (2006, 159), the 1-handshape is used to depict the movement of animates, while the 4-handshape (but inverted) depicts their location. Papaspyrou et al. (2008, 119) add that the latter handshape also depicts the movement of legged animate entities. In our dataset, we observed 1, 4 (but inverted), 2, 3, 5, 6 and 7. Since 7 was almost exclusively used in the context of following and chasing, where DGS has a lexical sign FOLLOW that uses the 7 handshape, we did not include it in our analyses.³ The syntactic and semantico-pragmatic distribution of the other classifiers forms the focus of this article.⁴

2.2 Factors potentially influencing classifier choice

2.2.1 Syntactic factors

One principal difference between the ‘1’ and ‘GC’ classifiers on the one hand, and the ‘2’ classifier on the other, is that the ‘2’ classifier has both whole entity and body-part classifier uses. The extended index and middle fingers can either represent a two-legged entity as a whole, or they can represent its legs only. Kimmelman

³ One signer (AJ) used the 4-classifier in a wider range of contexts and as frequently as the ‘1’ classifier. Given the lack of further metadata, we are not sure if the signer was influenced by another sign language they knew natively.

⁴ As one reviewer points out, phonological factors such as pro- and regressive assimilation may also affect classifier choice. It is, for instance, possible that the ‘2’-handshape preferably occurs before or after signs with the same handshape, while ‘1’ and ‘GC’ classifiers preferentially occur in the context of signs with a ‘1’-handshape. We did not code for such phonological factors but propose to do so in a future study with a larger dataset.

et al. (2020) suggest for Russian SL (RSL) that internal movement of the index and middle fingers during the production of a ‘2’ classifier (predicate) indicates that its subject is agentive, while a lack of hand-internal movement indicates that the subject is a Theme (Benedicto and Brentari 2004, for ASL). Body-part classifiers tend to encode agentive, external arguments, while whole entity classifiers tend to encode thematic, internal arguments (Benedicto and Brentari 2004, Kimmelman et al. 2020, Gökgöz 2024). Translated into grammatical relations, an intransitive motion or location predicate could thus have either an unergative subject, i.e., an external, agentive single argument, or it could have an unaccusative subject, i.e., an internal, thematic single argument. Hence, while the ‘1’ and ‘GC’ classifiers in DGS are predicted to encode internal, thematic arguments (unaccusative subjects), the ‘2’ classifier may encode an external, agentive argument (unergative subject) if it has hand-internal movement.⁵ We will test this assumption by operationalizing agentivity and unaccusativity/unergativity via the notion of control. If an entity has control over the depicted movement, we assume they are agentive and form unergative subjects (e.g., climbing up a windowsill); if they do not have control over the movement, we assume them to be thematic and form unaccusative subjects (e.g., being catapulted into the air).

2.2.2 Semantic factors

Classifier predicates primarily describe events of motion, positioning of an entity in space, or their existence (Zwitserslood 2012). All three classifiers under investigation can express directed motion events (e.g., Zwitserslood 2003 for NGT, Engberg-Pedersen 1993 for ‘1’ and ‘2’ in DTS). Concerning positioning, NGT has been claimed to frequently use the ‘1’ classifier to localize, i.e., anchor an entity in the signing space (Zwitserslood 2003, 133), while in DTS, signers are reluctant to use ‘1’ with stative verbs. Instead, the ‘2’ classifier has been observed to contrast different positions of an entity well (e.g., sitting, lying on one’s back vs on one’s side, standing on one’s head, Engberg-Pedersen 1993, 248). One factor we investigate for DGS is thus whether classifier choice is associated with a particular event type: motion vs location of an entity. Within motion events, we further examine whether the shape of the movement path or its direction has an effect on classifier choice. For instance, movement toward the signer is preferentially expressed via the ‘1’ classifier in NGT and DTS (Zwitserslood 2003, 133, Engberg-Pedersen 1993, 248), while some DTS signers do not accept the ‘2’ classifier to depict approaching a viewpoint holder (often the signer). The ‘GC’ classifier in NGT is hypothesized to occur when the trajectory of a movement is emphasized over any particular properties of the moving entity (Zwitserslood 2003, 134).

In addition to the path and direction of a motion event, classifier predicates can also encode the manner of a movement. The concept ‘manner’ is relatively broadly defined; Geuder and Weisgerber (2008) identify the following sub-components of manner based on Levin’s (1993) list of verb types:

- Internal movement, i.e., movement of an entity around its own axis (*spin, swing, rock, oscillate, and roll*);
- Path shape (*zigzag*);
- Type of surface contact (*slide, bounce*);
- Step pattern (*run, limp, crawl, gallop*);
- Speed (*dash, hurry*).

Some manner components relate more to the path (e.g., its shape) or to movement dynamics (e.g., speed), while others concern the moving object itself, e.g., which extremities are used to propel the entity forward, or how they make contact with the ground. One might hypothesize that manners which emphasize the movement of the legs are preferably encoded by the ‘2’ classifier in DGS, an observation frequently echoed in the sign

⁵ In fact, Kimmelman et al.’s (2020) analysis of the ‘2’ classifier with hand-internal movement is somewhat more complex and argues that this classifier contains two event structures with two sets of arguments. The movement of the index and middle fingers encodes a controlled motion predicate with an agentive subject, while the path movement of the hand encodes a path movement of the entire entity, which may or may not be controlled.

language literature (e.g., Benedicto and Brentari 2004 for ASL; Engberg-Pedersen 1993 for DTS, Zwitserlood 2003 for NGT, or Kimmelman et al. 2020 for RSL). In contrast, manners highlighting the dynamics of a movement event may preferentially be encoded by ‘1’ or ‘GC’; in fact, NGT seems to prefer ‘1’ for fast movements (Zwitserlood 2003, 133). In this article, we will look at manner by coding each scene from the Canary Row cartoons with respect to the subcomponents of manner depicted therein.

2.2.3 Discourse-pragmatic factors

This section discusses three factors that relate to discourse-level phenomena: the discourse status of a referent, whether the non-dominant hand represents a second discourse referent that the dominant hand interacts with, and the presence of constructed action (CA). We list CA among the discourse-level phenomena here because it frequently occurs in narrative sequences and relates to different signing perspectives.

2.2.3.1 Discourse status

The cognitive accessibility of a referent affects what type of referring expressions are used to encode it. Cross-linguistically, referents with the highest cognitive accessibility tend to be expressed with minimal phonetic form (e.g., Ariel 1991). In sign languages, depending on whether a referent is newly introduced into a discourse, re-introduced after discussing a different referent, or maintained as a topic of discussion, signers may choose a more or less long and/or conventionalized referring expression, e.g., a lexical sign vs CA and pointing (Ferrara et al. 2023). The more known a referent becomes in the discourse, the more individuated they become, e.g., the more likely to be named. Aside from the cognitive activation level, animacy seems to interact with discourse status in determining the choice of referring expression, e.g., Auslan signers preferentially encode animate maintained referents via CA, but inanimate ones via depicting verbs (Hodge et al. 2019). Here, we ask whether new, re-introduced, and maintained discourse referents are anaphorically referenced via different classifiers on the predicate. One might wonder if one classifier is phonetically more complex than the others in that ‘2’ has two instead of one selected fingers, and bent joints are considered more complex than extended joints (Brentari 1998). With respect to individuation, the ‘GC’ classifier does not depict any characteristics of a referent and may thus be preferred for less individuated, newly introduced referents. Differences between animate and inanimate referents are discussed in Section 4.2.

2.2.3.2 Interaction with a second referent

One hallmark of classifier constructions is that they allow not only depicting the movement or location of an entity in isolation, but with respect to other entities. We refer to this phenomenon as interaction, i.e., the Figure referent interacts with an animate or inanimate second referent mentioned in the discourse. Oftentimes, this secondary entity constitutes a background object with respect to which movement takes place. In the Canary Row cartoons, for instance, Sylvester may walk into a building, be kicked out of a building, or climb up a drainpipe, and each of these reference objects may be represented on the non-dominant hand. In other cases, the reference object is another animate, e.g., the cat Sylvester walking toward Tweety bird or running from Granny. In Section 2.2.2, we already discussed a case of interaction with the signer as a second referent, where the ‘1’ classifier seems to be preferred in NGT and DTS. For cases where a second (set of) referent(s) is expressed on the non-dominant hand, DTS prefers the -classifier, which we do not discuss here, e.g., for showing that someone lags behind another (group of) individual(s). In contrast, ‘1’ is preferred for pushing one’s way through a crowd, and meeting another individual. These observations suggest that the presence of an interaction with another animate being influences classifier choice.

2.2.3.3 Constructed action (CA)

Sometimes counted among the various classifier types, the signer’s body itself can assume the role of a referent within a stretch of discourse. This phenomenon is known variously as a body classifier, as a role shift, and as

CA, which we will use here (for an overview, see Steinbach 2021). During CA sequences, the signer can partition off a part of their body to represent another referent (Dudis 2004), which means that their body can represent one referent and their (dominant) hand another. Sometimes, body and hand can represent the same referent, a mixing of observer perspective (on the hand) and character perspective (the signer's body becomes the character) that is useful if the signer is telling a story and wants to convey a character's path movement and their affective state at the same time (Perniss 2007). Here, we examine whether the presence of CA influences the choice of classifier handshake.

3 Method

3.1 Dataset

To address the question which factors influence the classifier choice for animate entities in DGS, we analyzed 16 re-tellings of the Canary Row cartoons. Thirteen of these re-tellings were taken from the VIDI Sign space project (Zelle et al. 2002–2009), and the remaining three are from the DGS Corpus (Konrad et al. 2020). The Canary Row cartoons were chosen because of the preponderance of movement events depicted and to allow for cross-linguistic comparison with other languages in the '1 vs 2' classifier project. The cartoons consist of eight episodes, and we analyzed re-tellings of all episodes from the three DGS Corpus signers (24 total). For the VIDI Sign space project re-tellings, episodes two and eight were not available for analysis, and one participant did not provide episode 3, resulting in 77 episodes retold. In total, we analyzed 101 video clips re-telling one of eight Canary Row episodes, resulting in 83 min of data. The set of DGS signers who provided the re-tellings was balanced for gender (8 female) and covers a wide age range (19–61+).⁶ We annotated every classifier predicate which featured 'GC' or a variant of the '1' and '2' classifiers in ELAN (Version 6.8). In total, we annotated and analyzed 618 tokens.

3.2 Annotation

We followed the annotation guidelines developed within the project 'Whole-Entity Classifiers in Sign Languages: A Multiperspective Approach', the main points of which are summarized in the following subsections. The full guidelines can be accessed at: <https://osf.io/m7kt9/>.

3.2.1 Exclusion criteria

We annotated only classifier predicates containing the '1', '2', or 'GC' classifier and their respective variants whenever they were used to refer to anthropomorphic referents, i.e., humans and human-like creatures. This means that classifier predicates depicting the movements of the monkey in episode four were not annotated. It also meant excluding classifier predicates featuring a different handshake, e.g.,  (Section 2.1). Finally, it means excluding both lexical signs and CA used to describe animate movement, location, or manipulation. Some lexical signs were easy to identify as such (e.g., TAKE-OFF, RUN), but in other cases, the distinction was more difficult. Here, we list the criteria we used to distinguish between lexical signs and classifier predicates.

- Annotation as \$PROD in the DGS Corpus: The DGS Corpus annotates classifier predicates as \$PROD or 'productive' signs and we adopt their classification (this criterion applies only to the three DGS Corpus re-tellings).

⁶ More metadata on the participants can be found in Table A1 in the Appendix.

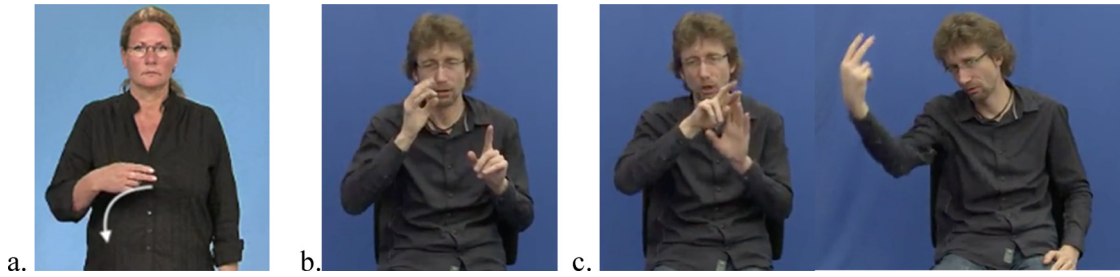


Figure 3: (a) Lexical sign *FALLEN* ‘to fall’; (b) referent ‘cat’ set up slightly to the left in signing space; (c) classifier predicate congruent with the lexical verb *FALLEN* (images from Konrad et al. 2020).

- Depictive movement: Signs with a ‘1’, ‘2’, or ‘GC’ classifier representing the actions of an anthropomorphized or human referent are considered classifier predicates (even without a \$PROD gloss) if their movement can be interpreted depictively. Take, for instance, the depictions of ‘falling’ in Figure 3. The lexical sign *FALLEN* in 3a employs the 2-handshape representing the legs of a falling human being and has an outward path movement with a wrist flip. It does not mark the start- or endpoint of a real movement event, nor its trajectory. The token in 3c, on the other hand, marks the starting point of the cat’s fall on the non-dominant hand as the open window, which is consistent with the referent’s location established in the previous frame (shown in 3b). Further, it has a larger path movement and additional wrist movement, which depict more aspects of the dynamics of the movement event. Hence, tokens like 3c but not like 3a were annotated as classifier predicates in our dataset.

3.2.2 Phonological variants

Given our primary focus on classifier choice for anthropomorphic entities, we first annotated the respective handshape on a *handshape* tier. To distinguish between ‘1’ and ‘GC’ classifiers, which share a handshape, an extended index finger was categorized as ‘1’ wherever the orientation of the handshape was compatible with the position of the depicted character (typically upright, but during fast movement sometimes almost horizontal). If the index finger was oriented palm-down or with the fingertips pointing down, the token was categorized as ‘GC’. During a character’s upward movement, ‘1’ and ‘GC’ are impossible to distinguish; in those cases, we categorized tokens as ‘1’ because it is the more specific entity classifier. Note that there were also a few tokens of the ‘2’ classifier whose orientation did not match that of the character. These were all classified as uses of ‘2’.

Of the three classifiers under investigation, the 1- and 2-classifiers in our dataset show some form variation, which we annotated in the ELAN tier *handshape*. Both classifiers have variants with extended vs slightly bent knuckles (bent variants are represented in Figure 4a, b, and d). The 2-classifier furthermore appears in a variant where the index and middle finger contact each other. We annotated this variant as ‘N’ for ‘non-

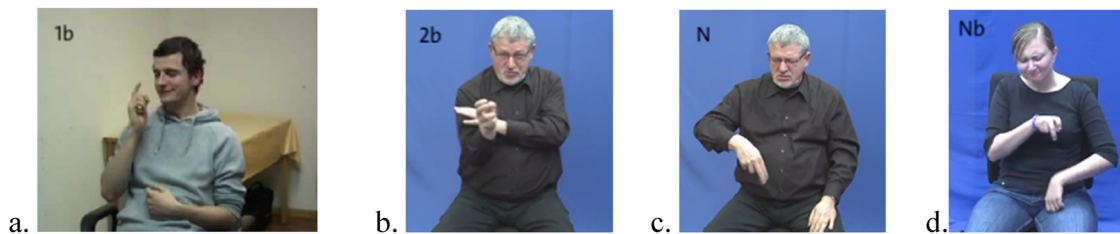


Figure 4: Handshape variants of classifiers ‘1’ and ‘2’ (Image (a) is from the VIDI Sign Space project; (b–d) are taken from Konrad et al. 2020).

spreading’ and illustrate the extended variant in 4c and the bent variant in 4d. Further, both ‘2’ and ‘N’ can move the index and middle fingers independently (annotated as 2m or Nm). Finally, finger bending and moving can occur simultaneously, which is notated as 2bm or Nbm.

3.2.3 Syntactic, semantic, and pragmatic factors annotated

Given the exploratory nature of this investigation, we annotated 15 different factors to obtain a broader overview of which aspects potentially influence classifier choice. The factors are listed in Table 1. Note that this investigation focuses on linguistic factors constraining the use of the different classifiers only. Sociolinguistic factors such as gender, region, age, or age of acquisition of the signers were not taken into consideration.

The entity referenced by the classifier is annotated in the *entity* tier. Possible values are Sylvester (the cat), Tweety bird, the monkey, Granny, or the receptionist.

In the *event* tier, we annotated whether the predicate depicts the motion of the referent or its location in space. For movements, there are more detailed annotations in the following tiers. The shape of the movement, for example straight, arc-shaped, or complex, is annotated in the *movement* tier. The *direction* then indicates where the hand moves along the transverse, vertical, and sagittal axes. Given the discussion in Section 2.2.2, we also annotated movement toward or away from another character (including the signer).

In the *congruence* tier, we noted whether a classifier predicate has the same shape as a lexical verb (congruent) or not. For example, if two people walk toward each other in a straight line and meet, this event will likely be represented by the hands with extended index fingers meeting in front of the torso. This form is identical to that of the lexical verb *TREFFEN* ‘meet’ and thus congruent with it, but it also depicts the event iconically, as a classifier predicate does. Such cases are annotated as ‘congruent’ with a lexical sign. At 79.3%, most of the classifier predicates we analyzed were depictive (490/618 tokens), and only 128 (20.7%) were annotated as congruent. Since Pearson’s chi-square test revealed that congruence does not have a significant association with classifier handshape choice ($p = 0.2784$), we assume that congruent forms behave like classifier predicates for all intents and purposes and include them in the analysis.

For motion predicates only, we annotated whether the classifier predicate describes the path of the motion (e.g., when the cat moves from A to B), or the manner of the motion (e.g., when the cat jumps) on the tier *manner*. Manner and path can also be combined. Whether a motion predicate depicted a manner of motion was determined on the basis of several factors. On the one hand, variants of the ‘2’ classifier that featured the index and middle fingers extending and flexing were considered to depict a walking or running manner. On

Table 1: Annotated factors

Elan tier	Values
Handshape	1, GC, 2, N + modifiers b (bent); m (internal movement)
Entity	Cat, bird, grandmother, monkey man, receptionist
Event	Motion, localization, unclear
Movement	List is not fixed. Possible values: straight, spiral, arc, circular, complex
Direction	Toward/away from a character, inward, outward, up, down, right, left, circular, complex, back-and-forth sagittal/transverse/vertical, in place
Congruence	Congruent, depictive
Manner	Only for motion events: manner, path, both, unclear
Controlled	Only for motion events: controlled, uncontrolled, unclear
Discourse	Introduced, reintroduced, maintained, unclear
CA	Yes, no
Mouth movements	Annotated if there is a clear mouthing or mouth gesture
Interaction	Yes, no
Second hand	Human (including anthropomorphic animals), animate, inanimate
Perspective	Character, observer, both
Scene	Number of episode and sub-episode in the Canary Row cartoons

the other hand, wrist flexion and extension in the ‘2’ classifier and shoulder flexion and extension in the ‘1’ classifier were interpreted as a bouncing or hopping manner. Following Levin (1993), ‘fall’ is not characterized as a manner verb, while ‘jump’ and ‘zigzag’ are.

The last tier pertaining only to motion events is the *controlled* tier, where we differentiate between a controlled motion, such as walking, and an uncontrolled motion, such as falling down, being catapulted upward, or crashing into a wall. Importantly, we focus only on the action itself and not on the context of the cartoon. This means that an incident where Sylvester runs on an electric cord and Tweety and Granny are behind chasing him, although the situation as a whole is not under Sylvester’s control, his running action is still considered a controlled motion.

The *discourse* tier records the discourse status of a referent as introduced for the first time (usually at the start of the re-telling of an episode), as reintroduced after at least one clause (i.e., predicate) featuring a different discourse referent, or as maintained. If the preceding clause was about the same referent as the current one, we count the referent as maintained.

If the classifier predicate on the one hand interacts with another referent represented on the second hand, we annotated this in the *interaction* tier. Whether the second referent was inanimate, animate, and/or human was specified in the *second-hand* tier. Inanimate referents are, for example, Tweety bird’s cage, a pipe, or a catapult. We did not annotate interactions with default surfaces on which someone moves, e.g., the street or the pavement. An animate referent would be the monkey, whereas human-like referents are the cat, the bird, the grandmother, and the receptionist.

We also annotate if a classifier predicate is accompanied by CA to depict the emotions or bodily actions of a referent in the *CA* tier. A related tier, *perspective*, recorded whether an event is portrayed from an observer’s perspective, from a character’s perspective, or from both. Observer perspective was annotated if a referent is only represented via a classifier on the hand, while character perspective was annotated if the signer uses CA and/or a handling classifier on the non-dominant hand to portray the same character that is represented as ‘1’, ‘2’, or ‘GC’ on the dominant hand. The value ‘both’ was chosen if the signer represents one entity via ‘1’, ‘2’, or ‘GC’ on the hand and another entity on the signer’s body (via CA and/or a handling classifier).

We also sorted the classifier predicates into the episodes or *scenes* they appeared in and the lexical *meaning* they convey. Finally, accompanying mouthing or mouth gestures were recorded in the *mouth movements* tier. They were used to aid in the distinction between classifier predicates and lexical verbs, as the latter tend to be accompanied by mouthing, while the former tend not to be.

3.3 Data analysis

After completing the annotation process, the data were exported from ELAN as a .csv file and further processed and analyzed in R (version 4.2.0; R Core Team 2022). For statistical analyses, we relied primarily on the *gmodels* package (Warnes et al. 2024). Given the exploratory nature of this investigation, we first visually inspected potential associations between each of the annotated factors and classifier choice using cross tables. Whenever possible, we conducted inferential statistical analyses appropriate for categorical data, using Pearson’s chi-square test or, with expected frequencies below five, Fisher’s exact test (Fisher 1922, Pearson 1900). However, this was not always possible due to the relatively small dataset, the large number of potential factors we coded for, and the large number of levels within some of the factors. We are aware that generalized mixed models would have been preferable in that they take into consideration variation between signers,⁷ but here we opted for simpler frequency distribution tests as a more intuitive first approximation to identifying factors that influence classifier handshake choice in classifier predicates.

⁷ Participants provided on average 40 classifier predicate tokens, ranging from 22 to 60 classifier predicates per participant.

Table 2: Token numbers of ‘1’, ‘2’, and ‘GC’ classifiers in the dataset

Classifier	Tokens (#)	Tokens (%)
1	117	18.9
2	414	67.0
GC	87	14.1

4 Results

Here we present the results of our exploratory study of classifiers for animate entities in DGS. After discussing the general distribution of the three classifiers (4.1) and the type of entity they can depict (4.2), we go through each factor discussed in Section 2.2 starting with syntactic factors (4.3), then turning to semantic ones (4.4), and finally to discourse-pragmatic factors (4.5).

4.1 Distribution of the three classifiers and their variants

We found 618 uses of ‘1’, ‘2’, and ‘GC’ altogether. As Table 2 shows, two thirds of the overall classifier uses involve a variant of the ‘2’ classifier, followed by the ‘1’ classifier at 18.9%. The ‘GC’ classifier occurred less frequently, in 14.1% of all classifier predicates in our dataset. These findings are in line with data on, e.g., NGT, where the ‘2’ classifier is also more frequent (Zwitserslood 2003, 132).

While the ‘GC’ classifier does not show phonetic variation with respect to hand configuration, ‘1’ and ‘2’ exhibit variation in terms of finger spreading, bending of the joints, and/or hand-internal movement. As already mentioned in Section 3.2.3 and visualized in Figure 4, we found eight different variants: The ‘1’-classifier has a straight (100 tokens, 85.5%) and a bent (17 tokens, 14.5%) variant, but does not exhibit internal movement at any of the finger joints. As for the ‘2’-classifier, the index and middle finger may either be spread (216 tokens, 52.2%) or together (198 tokens, 47.8%); the distribution is fairly balanced here. In terms of flexion of the knuckles, the bent variants of ‘2’ occur more often than non-bent ones (271 tokens, 65.5% vs 143 tokens, 34.5%). The spread variant may have bent joints (116 tokens, 53.7%) and internal movement of the index and middle finger (4 tokens, 1.9%). The non-spread variant can also be realized with bent knuckles (86 tokens, 43.4%) and internal movement (13 tokens, 6.6%). Joint flexion and internal movement sometimes co-occur (spread variant: 38 tokens, 7.6% vs non-spread variant: 30 tokens, 15.2%). Note that overall, only a fifth of the ‘2’ variants have hand-internal movement (85 tokens, 20.5%).

Comparing ‘1’ and ‘2’ variants with respect to flexion of the finger joints, we find an association between classifier handshape and the presence of flexion ($\chi^2(1) = 95.33$, $p < 0.001$). The joints of the 1-handshape are extended significantly more often than expected ($z = 6.35$) and the joints of the 2-handshape are bent more often than expected ($z = 3.1$).⁸

The attested phonetic variation can be summed up as follows: Out of the three classifiers under investigation, ‘2’ shows the most variation. ‘GC’ has only one variant, ‘1’ occurs mostly with an extended index finger and does not exhibit hand-internal movement, but ‘2’ occurs almost equally often with and without spread fingers and with or without joint flexion, and only sometimes with hand-internal movement.

4.2 Type of referent depicted

As our goal is to describe the distribution of the ‘1’, ‘2’, and ‘GC’ classifiers when the motion or location of an animate entity, we first need to clarify if a particular handshape is limited to a particular type of animate

⁸ Within the ‘2’ classifier handshape, we also found a significant association between finger spreading and flexion ($\chi^2(1) = 6.81$, $p = 0.009$). The association is driven by the non-spread variant of ‘2’ (‘N’ in our annotation scheme), which occurs more often than expected with extended fingers ($z = 1.56$). The spread variants of ‘2’ are tendentially more often bent than expected ($z = 1.06$).

being, namely the cat Sylvester, the bird Tweety or the human beings depicted in the cartoon (the grandmother, the owner of a monkey and the receptionist of a hotel). Recall that Happ and Vorköper (2006, 159) claim that while ‘1’ may represent any animate entity, a ‘2’ with extended fingers represents static humans and a ‘2’ with bent fingers represents static animals. In the Canary Row cartoons, we are dealing with anthropomorphized animals and some humans (usually marginal to the plot).

By far most of our 618 classifier tokens depict the cat ($n = 538$, 87.1%), while the bird was depicted 51 times (8.3%) and human beings were depicted 29 times in total (4.7%). A chi-square test revealed that there is a significant association between entity type and classifier choice. A closer look at the standardized residuals shows that humans were preferably represented by the ‘1’-classifier ($z = 3.63$). Neither Sylvester nor Tweety showed a clear preference for depiction via the ‘1’ or ‘2’ classifier, although there is a slight trend for the bird to be represented via the ‘GC’ classifier ($z = 1.80$). Even if we group Tweety and Sylvester together as ‘non-human’, no preference for any particular classifier handshape arises. These findings qualify Happ and Vorköper’s claims about DGS: While ‘1’ can represent both humans and other (anthropomorphized) animates, there is a clear preference to depict human movement with this classifier. For ‘2’, no association was found across motion and location events between joint flexion and human vs non-human animate referent, i.e., both variants of the classifier are used for human and animal referents.⁹

4.3 Syntax: Agentive vs thematic arguments

To distinguish between agentive and thematic arguments of intransitive classifier predicates, we annotated the factor control for every classifier predicate that depicts a movement ($n = 565$). In total, 71.2% of the annotated classifiers showed a movement controlled by the depicted entity ($n = 402$), while only 28.9% encoded uncontrolled movements ($n = 163$). Looking first at all three classifiers, we detected a significant association between control and classifier choice ($\chi^2(2) = 33.67$, $p < 0.001$). Contrary to expectation, neither the ‘1’ nor the ‘GC’ classifier occurs more frequently than expected with uncontrolled, Theme-like movements. The standardized residuals indicate that ‘1’ occurs significantly less frequently than expected with uncontrolled movements ($z = -4.17$), and ‘GC’ exhibits no preference either way. The ‘2’ classifier in general occurs more often than expected in uncontrolled movements ($z = 2.54$), but this distribution can be broken down further into ‘2’ classifiers with or without internal movement. There is a significant association between the presence of controlled movement and the choice between a ‘2’ classifier with or without internal movement ($\chi^2(1) = 27.31$, $p < 0.001$). When internal movement is present, it represents controlled movement significantly more frequently than expected ($z = 2.68$) and uncontrolled movement significantly less often than expected ($z = -3.80$). Without internal movement, the ‘2’ classifier only shows a tendency to depict uncontrolled movement ($z = 1.95$) but no clear dispreference for controlled movement. These findings differ from analyses of the ‘2’ classifier (without internal movement) for other sign languages, where this classifier is more clearly associated with non-agentive arguments. We will return to this issue in the discussion section.

4.4 Semantic factors

4.4.1 Motion or location

We wanted to know whether there is a connection between the choice of the ‘1’- vs ‘2’-classifier handshape with the type of event that is depicted: the motion of an entity or its positioning/location in space. Since

⁹ Happ and Vorköper (2006) base their claim only on ‘static’ humans and animals. There are only 48 pure location events in our dataset where an entity is ‘static’, and they rarely feature a human ($n = 5$). In line with Happ and Vorköper, the humans are only represented by the ‘2’-classifier with extended fingers, but contra the authors, the animals are equally often represented with or without finger flexion (23 vs 20 tokens).

locations can never be depicted by ‘GC’, we excluded it from the analysis. From a total of 527 tokens, the majority of classifiers depicted motion events ($n = 479$ or 91%), while 48 (9%) depicted the location of the entity (one token was unclear). A chi-square test revealed a significant association between event type and classifier choice ($\chi^2(1) = 8.05$, $p = 0.0046$). The standard residuals show that while there is no significant difference in handshape choice in motion events, events of positioning an entity in space are significantly less often than expected represented by the ‘1’ classifier ($z = -2.53$).

4.4.2 Movement shape and direction

We checked whether there was an association between the types of movement paths an entity performed as well as the direction of movement, and the choice of classifier. Given a lack of pre-specified categories for movement type, this factor had a wider range of annotation values (straight, arc-shaped, circular, zigzag, spiral, hopping, and complex) and cannot be analyzed statistically. Still, looking at the absolute numbers for each annotation value, we note that ‘1’ encodes mostly straight and arc-shaped movements, as well as zigzag (12/29 tokens) movements. ‘1’ was not used for spiral, hopping, or complex movements. ‘GC’ does not encode spiral or hopping movements but can sometimes encode complex movements combining more than one movement type (3/11 tokens). No clear (dis-)preference for a movement type is observable for ‘2’.

Turning to the direction of movement, we looked at both absolute direction and direction relative to another character in the event. This character could either be represented by the body (2 tokens), or by the other hand (25 tokens). For absolute directions, we coded movement along the transverse (left or right), the vertical (up or down), and the sagittal (toward or away from body) axes. An association with classifier choice was found ($\chi^2(4) = 27.20$, $p < 0.001$) that was driven by the distribution of the ‘GC’ classifier: It occurs more often than expected in sagittal movements ($z = 2.93$), all of which move away from the body (36/36 tokens), and it occurs less frequently than expected with vertical movements ($z = -3.40$).

Turning to relative movement, we observed an association between relative movement (absent, present and toward a character, present and away from a character) and classifier choice (Fisher’s exact test, $p < 0.001$). This association was mostly driven by the ‘1’ classifier occurring significantly more often when encoding movement toward another character ($z = 4.03$) and a trend against using either ‘2’ ($z = -1.51$) or ‘GC’ ($z = -1.51$) for this purpose. More generally, the ‘1’ classifier is used somewhat more often when describing movement relative to another character; it also encodes movement away from a character tendentially more often than expected ($z = 1.89$).

4.4.3 Manner and path

To show whether a given classifier is preferentially used to encode the path of a movement, the manner in which it is performed, or both, we coded each classifier predicate depicting a motion event ($n = 555$) for the presence of manner and/or path. Only six classifier predicates did not encode a path (five of them using the ‘2’-classifier), while 414 (74%) encoded only path, and 135 (24%) combined path and manner. In the following, we thus focus on comparing classifier predicates that do express a manner with those that do not. The association between the presence/absence of manner encoding and the type of classifier selected was significant ($\chi^2(2) = 80.90$, $p < 0.001$). Based on an inspection of the standardized residuals, the ‘2’-classifier occurs significantly more often than expected ($z = 4.65$) when manner is depicted, while the ‘1’ and the ‘GC’ classifiers occur significantly more often than expected ($z = 2.38$ and $z = 2.74$) when only path is encoded.

4.4.4 Influence of different manner components in the depicted event

Each re-told scene from the Canary Row cartoons was coded for the presence of one or more of Geuder and Weisgerber’s (2008) manner components: type of surface contact, step pattern, path shape, and speed. Given

the nature of our dataset, we also checked whether the salient use of extremities other than the feet (wings, front paws) had an impact on classifier choice. In the following subsections, we show that neither manner of surface contact nor step pattern was associated with a particular classifier handshape, whereas path shape, speed, and the salient use of front paws and wings impacted classifier choice.

4.4.4.1 Type of surface contact

We coded whether the moving entity engaged in a particular type of contact with the ground surface, including sliding (e.g., down a wall) and bouncing (e.g., stealthy tippy-toe movements, bounding across a street). No significant association between type of surface contact and classifier use was found ($\chi(2) = 1.62$, $p = 0.445$).

4.4.4.2 Step pattern

No association was detected between whether an event highlights an entity's step pattern (e.g., running, limping, and galloping) and the classifier chosen to represent the event ($\chi(2) = 0.77$, $p = 0.679$).

4.4.4.3 Prominent use of other extremities

We further coded movements that were saliently performed with extremities other than the feet, i.e., via the bird's wings or the cat's front paws (when climbing or moving on all fours). A significant association was found between the representation of movement not saliently featuring feet and classifier choice ($\chi(2) = 19.18$, $p < 0.001$). Looking at the standardized residuals, the '2'-classifier is used less often than expected when extremities other than the feet are involved ($z = -2.33$), while '1' and 'GC' are used more often than expected ($z = 2.79$ and $z = 1.96$). More specifically, '1' often represents the cat's front-and-back-paw movement (15/19 tokens), and 'GC' typically represents the bird's flight (9/11 tokens). In summary, then, the ubiquitous '2'-classifier occurs less frequently when the movement of the (hind) legs is either not present or backgrounded, and a flying entity is often represented by the 'GC' classifier.

4.4.4.4 Path shape

Here, we checked whether an event containing a zigzag path, often categorized among manner of movement attributes, was more likely to be represented by a '1', a '2', or a 'GC'. Fisher's Exact Test suggests a significant association ($p = 0.031$), with standard residuals revealing that the effect is driven mostly by a significantly higher than expected occurrence of '1' in representations of zigzag-shaped paths. Note that signers only chose a zig zag-shaped hand movement once on the '1'-classifier to represent a zig zag-shaped movement of an entity. Note also that 'GC' was never used to represent a zigzag path.

4.4.4.5 Speed

We detected a significant association between speedy vs non-speedy movements (e.g., Sylvester being catapulted into the air vs walking back and forth while scheming) and the type of classifier selected ($\chi(2) = 6.79$, $p = 0.034$). Based on an inspection of the standardized residuals, the '1'-classifier contributes most to this effect, in that it occurs less in speedy event descriptions than expected ($z = -1.62$). The '2' and 'GC', respectively, seem to occur equally often in speedy and non-speedy movement.

4.5 Discourse-pragmatic factors

4.5.1 Discourse status

About 77.2% of the classifier predicates had a maintained discourse status (477/618 tokens); 126 times the entity was reintroduced (20.4%) and 14 times the entity was first introduced at the beginning of the narrative (2.3%). One token was unclear. Keeping in mind the small number of occurrences for discourse-new referents, Fisher's exact test nonetheless attested a significant association between discourse status and the handshape of the classifier ($p = 0.0016$). The standardized residuals reveal that if an entity is first introduced into the discourse, signers use '1' more often than expected ($z = 3.29$).

4.5.2 Presence of CA

Since sign languages allow the simultaneous encoding of one entity via more than one articulator (body partitioning, see e.g., Dudis 2004), a sizeable number of tokens in the Canary Row re-tellings involve a character being represented at the same time on the hand via '1', '2', or 'GC', and on the signer's face and body via CA. The question arises whether a given classifier exhibits a preference for occurring with or without CA. Looking only at cases where the same character is represented via a classifier and CA, we find an association between the presence of CA and classifier choice ($\chi^2(2) = 7.66, p = 0.022$). The association seems to be driven primarily by the 'GC' classifier, which tends to occur less often than expected with CA ($z = -1.64$). The association persists if we take into consideration all uses of the classifier and CA, including those where hand and body represent different characters ($\chi^2(2) = 10.24, p = 0.0006$). Here, 'GC' is significantly less frequently used with CA ($z = -2.28$).

4.5.3 Interaction with other entities

Sylvester, Tweety & co. were depicted as interacting with another animate (33 tokens) or inanimate entity (273 tokens) in about 50% of all their occurrences. Inanimate entities depicted on the non-dominant hand included the source or goal of movement as well as non-default surfaces such as a windowsill or a plank of wood. There was a significant association between interaction (absence, interaction with animate entity, interaction with inanimate entity) and classifier choice (Fisher's exact test, $p < 0.001$). The '1' classifier was used significantly less frequently than expected with inanimate objects depicted on the non-dominant hand ($z = -3.02$). A trend was also observed to use the 'GC' classifier more often than expected with inanimates ($z = 1.87$), which may be due to the frequency of a predicate congruent with the lexical verb *ENTER* (illustrated in Figure 5a). Interactions with other animate referents were less frequent, in most cases the second referent was depicted on the non-dominant hand, but in four tokens, it



Figure 5: (a) Sign *ENTER* in DGS; (b) interaction with a second animate referent mapped onto the signer's body: Sylvester ('1' classifier) is chased and beaten by Granny (CA) (both images are taken from Konrad et al. 2020).

was mapped onto the signer's body (as shown in Figure 5b). An inspection of the standardized residuals shows that '1' occurs significantly more often than expected in depictions of interactions between two animates ($z = 4.30$), while '2' tendentially occurs less often than expected ($z = -1.72$).

5 General discussion

After organizing the presentation of the results by the factors influencing classifier choice, we start the discussion with a short profile of the three classifiers under investigation before moving on to some more general remarks. Note that all three classifiers are used in our data to depict human and anthropomorphized referents but, as expected, each shows different preferences of occurrence.

5.1 Profile of the '1' classifier in DGS

The '1' classifier shows phonological variation in the degree of bending at the interphalangeal joints but does not occur with repeated bending at the metacarpophalangeal joint (i.e., internal movement of the index finger to show an entity's movement). Syntactically, it exhibits a dispreference for depicting uncontrolled movement, which we interpret as a dispreference for encoding unaccusative arguments. In terms of its semantics, '1' preferentially encodes humans and the interaction between two humans or anthropomorphized entities, specifically moving toward another human(oid) entity. Looking more closely at the movements that the '1' classifier depicts, we see that they are mostly straight or arc-shaped, tend to encode motion rather than positioning events, and within those, preferentially encode only path (rather than manner and path) and non-speedy motion. Furthermore, '1' is used when a movement saliently involves articulators other than the legs, e.g., when Sylvester climbs a drainpipe using his front and back paws. Finally, from a discourse-pragmatic perspective, '1' tends to introduce discourse-new referents (although this finding is based on only 14 tokens of discourse-new referents and therefore should be backed up by additional data).

5.2 Profile of the 'GC' classifier in DGS

We found little phonological variation in the general entity classifier, but a clear preference for sagittal movements away from the body and a dispreference for downward vertical movements. We cannot speak more generally of a dispreference for vertical movements because all upward vertical movements of the extended index finger were classified as tokens of '1' rather than 'GC'. As for syntax, the type of thematic role assigned to the argument of a motion event does not impact the choice of 'GC' over one of the other classifiers. A number of semantic factors, however, do. 'GC' generally only encodes motion events, not localization, and within motion events, preferentially encodes path (rather than path and manner), though never zigzag-shaped paths. Furthermore, 'GC' preferentially encodes motion events that saliently feature extremities other than the legs, e.g., when Tweety bird is shown flying. Finally, the general entity classifier occurs less often than expected with CA, which is in line with our previous observation in Section 2.2.3 that 'GC' does not encode any properties of the entity whose movement it represents. We will return to this point in Section 5.4.3.

5.3 Profile of the '2' classifier in DGS

The '2' classifier shows the highest degree of phonological variation in that it can occur with or without spread fingers, with or without bending at the interphalangeal joints, and with or without alternating movement of the index and middle fingers at the metacarpophalangeal joints. This formal flexibility goes hand in hand with

a great variety of different uses, as evidenced by the large number of tokens of this classifier in our dataset (414 tokens or 67%). Despite the almost ‘default’ status of this classifier for the representation of animate entities, some (dis-)preferences can be observed. In terms of syntax, the ‘2’ variants with the alternating movement of the index and middle finger (2m, Nm, 2bm, and Nbm) exhibit a clear preference for depicting controlled movement, which we take to mean a preference for encoding unergative arguments. The ‘2’ variants without internal movement of the index and middle finger, on the other hand, were not always associated with uncontrolled movements, although they showed a slight preference for occurring with this type of movement and, hence, for encoding unaccusative arguments. Turning to semantic factors influencing classifier choice, ‘2’ was clearly preferred when encoding manner of movement, and clearly dispreferred when representing movement that was not saliently executed by the feet. Finally, we found a discourse-pragmatic trend in ‘2’ classifiers not to occur in the depiction of interactions with an animate second referent.

5.4 Which factors influence the choice between ‘1’, ‘2’, and ‘GC’ classifiers for animate entities in DGS?

5.4.1 Syntactic factors

Syntactic factors were shown to influence classifier choice in DGS. The type of thematic role assigned to the argument of a movement verb impacted the choice between ‘1’, ‘2’, and ‘GC’, but not always in the way we predicted. Our study confirms findings from other sign languages (Benedicto and Brentari 2004, Kimmelman et al. 2020, Gökgöz 2024) suggesting that body part classifiers align with agentive, external arguments. Whenever ‘2’ is used as a body part classifier in our DGS data, i.e., when it has internal movement, it shows a clear preference for encoding arguments whose referents perform a controlled movement and are, hence, agentive. However, we cannot confirm proposals that whole entity classifiers generally show a preference for encoding internal arguments. In the DGS data, ‘1’ shows a dispreference for encoding entities involved in uncontrolled movements (i.e., internal arguments), and ‘GC’ showed no preference either way. Only ‘2’ tendentially occurred more often with internal arguments when used as a whole entity classifier (i.e., without internal movement).

5.4.2 Semantic factors

We showed that classifier choice was associated with event type in that the ‘GC’ classifier only occurred in motion events and the ‘1’ classifier was dispreferred in positioning events, leaving the ‘2’ classifier for events of locating or positioning an entity in space. This is in line with previous findings on DTS (Engberg-Pedersen 1993) but differs from NGT (Zwitserlood 2003), where the ‘1’ classifier occurs with stative localizing verbs more often. Within movement events, we showed the direction of movement relative to another entity to affect classifier choice. Similar to DTS and NGT, the ‘1’ classifier was preferred for movements toward the signer, but we observed a more general tendency for ‘1’ to be used for movement in relation to another animate entity (mostly toward them). We did not replicate DTS signers’ dispreference for showing movement toward the signer with the ‘2’ classifier, but we did observe a more general dispreference for depicting interaction between animate entities using the ‘2’ classifier.

Concerning manner of movement, DGS aligns with many other sign languages in preferentially encoding different manners of movement (in addition to a path) by the ‘2’ classifier. However, it turned out useful to break down manner into Geuder and Weisgerber’s (2008) more nuanced sub-components. We showed that what is intuitively considered ‘manner’, i.e., types of surface contact and step patterns, had no impact on classifier choice, while movement dynamics and typical vs atypical manners of (human) motion did have an impact. Only when manners not involving salient bipedal motion were depicted (flying, crawling, and climbing) did signers prefer ‘1’ or ‘GC’. Likewise, movement speed was found to affect classifier choice, in that ‘1’ was slightly dispreferred for fast movements. Note that this finding differs from NGT, where ‘1’ is

preferred for fast movements (Zwitserslood 2003). In sum, at least for classifier constructions in DGS, it is helpful to consider the different components of the rather heterogeneous concept ‘manner’ separately, in turn validating Geuder and Weisgerber’s distinctions.

When only paths were encoded, ‘GC’ and ‘1’ were observed more frequently than expected given their absolute frequency in the dataset (the same was proposed for ‘GC’ in NGT by Zwitserslood 2003).

5.4.3 Discourse-pragmatic factors

While discourse status had some impact on classifier choice, the findings did not align with our predictions: New referents were introduced into the discourse with either of the three classifiers, but preferentially with ‘1’. The ‘1’ classifier is less phonologically complex than the ‘2’-classifier and should thus be preferred for discourse referents with high cognitive accessibility (i.e., maintained referents), but that is not the case. Given the double duty of ‘2’ as a whole entity and a body part classifier, we propose that ‘1’ is nonetheless the more likely choice for discourse-new referents as it presents a more holistic introduction of the referent, not focusing on its legs. For the same reason, our prediction that ‘GC’ should be preferred for new discourse referents was also not borne out; ‘GC’ might easily encode less individuated referents, but since it does not depict any properties of a referent, it is unlikely to be able to introduce a new referent into the discourse at all (with one exception).

Observations from DTS had led us to predict that interactions with another entity should influence classifier choice, and we did find that whenever another animate entity is present in the discourse (encoded on the signer’s body or second hand), DGS signers prefer ‘1’ and disprefer ‘2’. On the other hand, the presence of CA had no impact on the choice between ‘1’ and ‘2’; each occurred in accordance with their absolute frequencies when signers partitioned off a part of their body to represent an entity on their hand and (another or the same one) on their torso/face. However, we did find the ‘GC’ classifier to be dispreferred when CA is present. This seems odd at first, given that there’s a clear division of labor between ‘GC’ representing a movement trajectory and CA individuating the moving entity. If we assume, however, that a classifier needs to introduce enough properties of an entity to anchor a referent in the discourse and make them available for anaphoric reference, and that CA constitutes a form of anaphoric reference, then perhaps it is not surprising that GC should tend not to occur with CA. This behavior would align with ‘GC’ not introducing new discourse referents.

6 Conclusion

In the present study, we looked at the distribution of 618 tokens of classifier handshapes representing animate and/or anthropomorphized entities in DGS classifier predicates. Two-thirds of them (414 tokens) were instances of the ‘2’ classifier, which also exhibited the fewest occurrence limitations (described above as dispreferences for occurring in a particular linguistic context). It seems to occupy a default status for representing animate entities in the language. DGS shares this preference for the ‘2’ classifier with other sign languages, including NGT and RSL. To some extent, the double function of ‘2’ as a whole entity and a body part classifier may contribute to its ubiquity in representing the movement and positioning of an animate, legged entity. We were also able to tease apart the ‘1’ and ‘GC’ classifiers and their different preferences especially with respect to individuating referents and here especially when it comes to depicting new discourse referents and those co-referenced via CA. Overall, we analyzed 13 linguistic factors (out of a total of 15 factors annotated) to see if they impacted which of the three classifiers ‘1’, ‘2’, and ‘GC’ signers choose to depict a particular entity.

Previous research on classifier constructions draws a clear line between classifier handshapes and locations and movements in these constructions: While movements and locations form part of a more analogue, gestural system provided by human spatial cognition, classifier handshapes have linguistic status: Their inventory is language-specific, they are acquired later than other components of classifier constructions, and they are interpreted categorially (for an overview, see Emmorey 2003 and Zwitserslood 2021). Our study

provides further data from DGS confirming the linguistic status of classifier handshapes, in that classifier choice is driven by a number of syntactic, semantic, and discourse-pragmatic factors. Clearly, classifier use has been largely conventionalized in DGS, and cross-linguistic differences in the factors that influence classifier choice confirm that their linguistic properties/distribution is language-specific.

Our findings further have implications for the study of argument structure and prominence marking in DGS, as classifier choice is influenced by the degree of agentivity of a subject (among others). We know that prominence marking in DGS is multidimensional and uses a number of morphosyntactic cues to mark atypical subjects and objects (de Souza Santos et al. 2025). While these cues have mostly been explored at the level of lexical signs (e.g., *AUF*, a differential object marker in DGS), less attention has been paid to the choice of different classifiers to mark, say, a non-agentive subject or an animate, volitional object. Our work suggests that non-agentive subjects are less often represented by the '1'-classifier and tendentially more often by a '2'-classifier without hand-internal movement.

Our findings also have implications for the study of event structure and information packaging within verb stems. We corroborate Kimmelman et al. (2020) finding for RSL that the '2'-classifier is internally complex and contains two event structures – the '2'-classifier in DGS occurs with and without hand-internal movement, and when hand-internal movement is present the subject receives an agentive interpretation. Hence, the classifier predicates with a '2'-classifier featuring hand-internal movement encode both manner (via hand-internal movement) and path (via translational movement of the entire hand) simultaneously. Supalla (1990) posited that at least ASL encodes manner and path in sequential predicates due to a potentially universal constraint on information packaging in verbal roots/stems that militate against encoding both meanings in one verb. The '2'-classifier seems to represent a true counterexample to this constraint, and it holds across several sign languages. Our findings thus confirm that single verbs may package event-structural information more densely than previously assumed.

Given the exploratory nature of our study and the limited amount of tokens especially for the 'GC' classifier, a more fine-grained statistical analysis of all linguistic factors under investigation was not possible for this article. We hope to conduct further analyses of a larger dataset in the future to take into consideration, for instance, the influence of phonological processes such as assimilation on classifier choice, differences in the representation of human vs non-human animates (e.g., using narrations that include more human referents), as well as inter-individual differences in the choice of near-synonymous classifiers.

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Appendix

DOIs for figures taken from the DGS corpus are as follows.

Figure 1:

(a) https://www.sign-lang.uni-hamburg.de/meinedgs/html/1419124_de.html

(b) https://www.sign-lang.uni-hamburg.de/meinedgs/html/1984213_de.html

(c) https://www.sign-lang.uni-hamburg.de/meinedgs/html/1419126_de.html

Figure 3:

(a) 10.25592/dgs.corpus-3.0-type-14562

(b) and (c) 10.25592/dgs.corpus-3.0-text-1413232

Figure 4:

(b) https://www.sign-lang.uni-hamburg.de/meinedgs/html/1984210_de.html

(c) https://www.sign-lang.uni-hamburg.de/meinedgs/html/1431490_de.html

(d) https://www.sign-lang.uni-hamburg.de/meinedgs/html/1419124_de.html

Figure 5:

(a) https://www.sign-lang.uni-hamburg.de/meinedgs/html/1418858_de.html#t00040934

(b) 10.25592/dgs.corpus-3.0-text-1419126

Table A1: Metadata of the signers

	Abbreviation	Gender	Age	DGS acquisition	Other information	Number of episodes	Number of CL
1	AF	M	25	Native		6	29
2	AJ	F	20	Age of 7	Born deaf, also knows ISL	6	36
3	CB	F	20	Age of 6	Born deaf, also knows ISL	6	24
4	CD	F	32	Native		6	32
5	CF	F	21	Age of 2	Turned deaf	6	23
6	DB	M	31	Native		6	50
7	DW	M	19	Age of 12	Turned deaf, parents hearing	6	42
8	EK	M	33	Age of 2–3	Born deaf, also knows TID and ISL, parents deaf	6	54
9	LP	M	35	Age of 4	Born deaf	6	47
10	MS	F	28	Age of 7	Also knows PJM	5	28
11	MaS	M	20	Native	Born deaf, parents deaf	6	29
12	NK	F	21	Age of 2	Born deaf	6	41
13	SM	F	20	Native	Born deaf, parents deaf	6	22
14	BER	F	18–30			8	60
15	KOE	M	61+			8	50
16	STU	M	31–60			8	51