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## SPATIAL VERBS ARE DEMONSTRATION VERBS *VERBOS ESPACIAIS SÃO VERBOS DE DEMONSTRAÇÃO*

Marloes Oomen<sup>1,2</sup>

### ABSTRACT

The literature has been divided over the question of whether spatial verbs should be subsumed into a single verb class with agreement verbs. The main point of contention has been that, even if the nature of the elements that these verb types agree with differs, the morphosyntactic mechanism, i.e. a path movement, appears to be the same. Contributing to this debate, this corpus-based study scrutinizes the morphosyntactic properties of a set of spatial verbs in German Sign Language (DGS). It is shown that spatial verbs display striking variability in where they begin and end their movement in space. They may align with locations or person loci, but often they simply mark arbitrary locations, which may convey meaningful yet less specific information about the (direction of) movement of a referent relative to the signer. Furthermore, null subjects are found to occur remarkably often in constructions with spatial verbs, despite the absence of systematic subject marking on the verb itself. These results stand in contrast with those reported for regular agreement verbs in DGS (OOMEN, 2020), and thus provide support for a distinction between the two types. It is proposed that spatial verbs in DGS involve a demonstration component (cf. DAVIDSON, 2015) which ensures the recoverability of referents involved in the event denoted by the verb, thus loosening the restrictions on both agreement marking and subject drop that apply to regular agreement verbs. As such, spatial verbs are argued to be somewhere in between conventionalized lexical verbs and classifier predicates.

**KEYWORDS:** spatial verbs; agreement; demonstration; null subjects; German Sign Language

### RESUMO

A literatura não é consensual quanto à inclusão dos verbos espaciais na mesma classe que os verbos com concordância. O principal ponto de discordância tem sido que mesmo se os elementos que concordam com esses verbos são de naturezas diferentes, o mecanismo morfossintático, a saber, a movimento com trajetória, parece ser o mesmo utilizado por ambas as classes. Buscando contribuir para este debate, este estudo baseado em corpus escrutiniza as propriedades morfossintáticas de um grupo de verbos espaciais na língua de sinais alemã (DGS). Mostramos que os verbos espaciais exibem uma alta variação entre o local em que eles começam e terminam o seu movimento em trajetória. Eles podem alinhar o movimento com uma locação específica ou com os *loci* referenciais, no entanto, eles frequentemente preferem locações arbitrárias, que podem atribuir informações específicas, embora menos convencionais sobre (a direção do) movimento de um referente em relação ao sinalizante. Além disso, sujeitos nulos ocorrem com relativa frequência em construções com verbos espaciais, apesar da ausência sistemática da marcação de sujeito nesses verbos. Os resultados vão de encontro com os achados sobre os verbos de concordância regular em DGS (OOMEN, 2020), e isto traz evidência para existência de uma distinção entre os dois tipos de verbos. Propõem-se, então, que os verbos espaciais em DGS envolvem um componente demonstrativo (Cf. DAVIDSON, 2015) que garantiria a recuperação dos referentes envolvidos no evento denotado pelo verbo, e isso permitiria que esses verbos enfraquecessem aquelas restrições geralmente aplicáveis aos verbos de concordância regular, que são a marcação de concordância no verbo e a possibilidade de apagamento dos sujeitos. Deste modo, os verbos espaciais devem estar, então, em algum lugar entre os verbos lexicais mais convencionalizados e os sinais produtivos.

**PALAVRAS-CHAVE:** verbos espaciais; concordância; demonstração; sujeitos nulos; língua de sinais alemã

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2 The work reported in this paper is based on parts of my dissertation (OOMEN 2020), which was carried out at the University of Amsterdam and funded by the Dutch Science Foundation (NWO) under grant no. 360-70-520.

## 1. Introduction

There has been debate in the literature about whether spatial verbs are a subtype of agreement verb or rather constitute their own class (e.g. PADDEN, 1983 vs. JANIS, 1992, 1995; QUADROS; QUER, 2008). On the one hand, spatial verbs are argued to agree with location rather than person (PADDEN, 1983); on the other hand, both agreement verbs and spatial verbs typically involve a path movement and thus appear to employ the same morphosyntactic means (QUADROS; QUER, 2008). Moreover, Quadros and Quer (2008) point out that spatial verbs may sometimes agree with person in addition to location, thus making the boundary between agreement verbs and spatial verbs even fuzzier. The Brazilian Sign Language (Libras) examples in (1) below (QUADROS; QUER, 2008, p.539) illustrate this point.

(1) a.  $\langle_{a+1}\rangle$  CARRY  $\langle_b\rangle$

‘I carry it (from here) (to there).’

b. \*  $\langle_a\rangle$  CARRY  $\langle_b\rangle$

‘(He) carries it from here (a place that does not coincide with the subject) to there.’

In (1a), the verb CARRY moves from a locus that is simultaneously associated with the subject of the sentence, which is first person (‘I’), and a location (the place from which the object is carried, indicated by Quadros and Quer with the subscript ‘a’; the place where the object ends up is represented with the subscript ‘b’). In (1b), the initial place of articulation of the verb also corresponds to the starting location of the object. However, it does not align with the locus associated with the (null) subject, which is third person (not displayed in the example). As it turns out, (1b) is ungrammatical.

Quadros and Quer (2008) argue that this ungrammaticality arises because null subjects in Libras, as in other sign languages (see e.g. LILLO-MARTIN, 1986, 1991 for American Sign Language (ASL)), are licensed by agreement marking (QUADROS, 1999). In (1a), the initial place of articulation of the verb coincides with that of the subject, thus obviating the need for an overtly realized subject – at least under an account in which this verb alignment is considered to be an expression of agreement marking. In contrast, an overt subject is required in (1b), because there is a disjunction between the place of articulation of the subject and the location in the signing space where the verb starts out. As a result, there is nothing in the sentence that can license the subject, which leads to ungrammaticality. For the sentence to be grammatical, either an overt subject needs to be present, or the initial location of the verb has to coincide with the subject locus.

This observation is a key argument which leads Quadros and Quer (2008, p.548) to conclude that agreeing and spatial verbs constitute a single category of verbs which “can agree either with locative arguments (spatial agreement), with personal arguments (person agreement), or with both”. Their analysis is close in spirit to Janis’s (1992, 1995), who also does away with the distinction between spatial and agreement verbs, offering that agreement in sign languages is controlled by the case of a verb’s arguments rather than their thematic role.

Inspired by Quadros and Quer’s study on Libras, I set out to investigate whether similar claims can be made for spatial verbs in German Sign Language (DGS), using naturalistic corpus data from the DGS Corpus (BLANCK; HANKE; ET AL, 2010; <https://www.sign-lang.uni-hamburg.de/meinedgs/ling/>) as a data source. The study explores the alignment properties of a small set of prototypical spatial verbs in DGS and scrutinizes subject-drop patterns in constructions with spatial verbs to discover whether restrictions like those described by Quadros and Quer (2008) for Libras also apply to DGS.<sup>3</sup>

As it turns out, the results of this exploratory study force a different conclusion, as they provide indication that spatial verbs in DGS form a clearly distinct class from agreement verbs. I argue that spatial verbs in DGS are more akin to classifier predicates than to agreement verbs in that they *demonstrate* (cf. DAVIDSON, 2015) certain properties of their arguments, such that grammatical restrictions that apply to agreement verbs do not hold for spatial verbs. This analysis leads to a set of clear predictions which may be put further to the test in future research on both DGS as well as other sign languages.

Before continuing, a note on agreement verbs and their agreement potential in DGS is in order. Corpus-based studies on sign languages other than DGS, such as British Sign Language (FENLON; SCHEMBRI; CORMIER, 2018) and Australian Sign Language (DE BEUZEVILLE; JOHNSTON; SCHEMBRI, 2009) have shown that agreement marking is optional in these languages, with only between 60-70% of tokens in their respective data sets expressing agreement. However, agreement marking in DGS appears to be considerably more systematic, occurring in a total of close to 95% of over 200 tokens in naturalistic corpus data (OOMEN, 2020). In this paper, it is investigated whether agreement marking occurs equally systematically on spatial verbs in the same language.

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3 In the descriptive parts of this paper, I use the term ‘alignment’ instead of ‘agreement’ so as to remain neutral about the status of verb-locus alignment in constructions with spatial verbs in DGS.

A total of 120 sentences from the DGS Corpus, containing six different spatial verb forms, were subjected to analysis. Further details on the data set and the annotation procedure are described in section 2. Sections 3 to 5 describe the results: section 3 discusses alignment patterns, section 4 focuses on null subjects, and in section 5, some classifier-like properties of some of the tokens in the data set are described. Together, the results lead to the conclusion that the behavior of spatial verbs in DGS is markedly different from that of agreement verbs, such that a separate account for spatial verbs is in order. The analysis is presented in section 6, and in section 7, I comment on the (un)generalizability of this account to other sign languages. I conclude in section 8.

## 2. Data and annotation

Investigated in this study are six spatial verb forms denoting five different spatial meanings, namely *go* (two forms), *leave*, *bring*, *throw*, and *send*. The verb forms were selected because they represent verb meanings that are included in the Valency Patterns Leipzig (ValPaL) list (HARTMANN; HASPELMATH; TAYLOR, 2013; <http://www.valpal.info/>). This list consists of 80 core verb meanings that are conceived of as being representative of the verbal lexicon; in other words, they are known to display distinctive syntactic behavior, such as in terms of valency, both within and across languages.

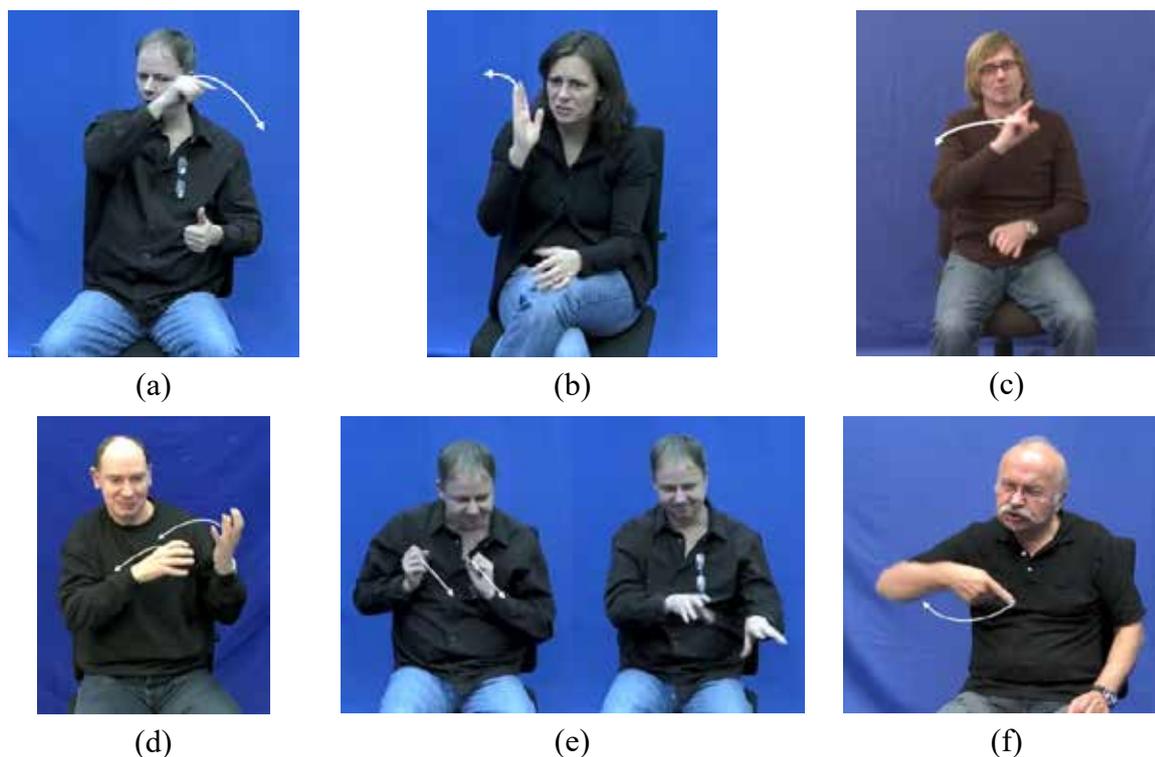
As such, selecting verb forms that represent meanings from the ValPaL list can be assumed to provide a decent picture of the range of variation – both in terms of semantic meaning and syntactic behavior – in the verbal domain in DGS. As indicated above, just five of the verb meanings from the list are expressed by spatial verb forms in DGS; the other meanings are denoted by predicates of other types, namely plain and agreement verbs, as well as classifier predicates.<sup>4</sup> The six spatial verb forms are illustrated in Figure 1.<sup>5</sup>

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4 The present study is part of a larger investigation into verbs and verb classification in DGS (OOMEN, 2020). As part of that investigation, agreement and plain verb forms were identified in the same data set as the spatial verbs in this paper and subsequently investigated for a range of semantic and morphosyntactic properties. For a detailed description, see Oomen (2020). The annotation files for the project, which include the annotations made for the present study, can be found at [https://uvaauas.figshare.com/articles/dataset/Data\\_annotation\\_files/9778556](https://uvaauas.figshare.com/articles/dataset/Data_annotation_files/9778556); see Oomen (2020) for all details on the annotation procedure.

5 All images in this article are video stills from publicly accessible video clips from the DGS Corpus. The videos are available at <https://www.sign-lang.uni-hamburg.de/meinedgs/ling/>.

**Figure 1.** The six spatial verb forms included in the study. (a) GO1; (b) GO2; (c) LEAVE; (d) BRING; (e) THROW; (f) SEND.



All tokens of the selected six verb forms were identified in a subset of 58 videos of the DGS Corpus (accessible online at <https://www.sign-lang.uni-hamburg.de/meinedgs/ling/>), in which a total of 104 deaf signers from different regions in Germany participate. While the DGS Corpus includes a range of different genre types, the 58 videos selected for the present study all involve naturalistic dialogues about a range of topics such as signers' experiences in (deaf/hearing) school, events like the 2009 Deaflympics in Taipei, or world events such as the 2001 collapse of the Twin Towers or the death of Princess Diana. The video data came with annotation files, which include German and English glosses for the manual signs as well as German and English translations at the sentence level, in two different formats. For the present study, the files suitable for ELAN Linguistic Annotator (SLOETJES; WITTENBURG, 2008) were selected and further annotated.

It is important to note that, in determining whether the six spatial forms should be categorized as classifier predicates or conventionalized lexical verbs, I followed the annotations made by the DGS Corpus team in Hamburg: all six forms were given a lexical ID-gloss instead of a general annotation that is used for classifier predicates (\$MAN). In other words, the six verb forms were judged by the DGS Corpus team as being lexical in nature, i.e. conventionalized forms showing predictable (grammatical) behavior, as opposed to classifier predicates, which are used productively to convey gradient information about location and movement. This is relevant, because the observant reader might remark that the forms BRING (Figure 1d) and THROW (Figure 1e), in particular, appear rather

classifier-like in certain respects. I will come back to this matter in sections 5 and 6; in fact, this observation has a pivotal role in the analysis I lay out in section 6.

Table 1 shows the token frequency per verb form. The tallies exclude verbs that occur in impersonal constructions, because (a) such constructions typically involve a null subject in DGS, and (b) verbs that can express agreement in the form of locus alignment tend to use the center of the signing space as a default in the case of an impersonal subject (OOMEN, 2020). Since the tokens will be analyzed both for their alignment properties and for subject drop, the inclusion of impersonal constructions could unintentionally skew the results.

**Table 1.** Spatial verb forms and their number of tokens in the data set (total N = 120).

Cat.	Verb form	# of tokens	Tot.
1	GO1	51	87
	GO2	5	
	LEAVE	31	
2	BRING	18	33
	THROW	12	
	SEND	3	

As indicated in Table 1, I divided the six spatial verbs in the data set over two basic categories based on their valency: GO1, GO2, and LEAVE take a single core argument, a subject, while BRING, THROW, and SEND may occur with both a subject and an object.<sup>6</sup> Of course, all spatial verbs can also optionally occur with locative constituents. It is unclear whether such constituents can have argument status in DGS, and an exploration of this matter falls outside the scope of the present paper. However, it will be discussed in detail in section 3 whether spatial verbs in DGS systematically align with (previously introduced) locations at the beginning and/or end of their path movement. If they do, then that could be a possible indicator of such locations enjoying argument status in DGS.

The 120 tokens were annotated in ELAN for two main properties: (i) alignment of the beginning and end points of the spatial verb forms in each construction, and (ii) characteristics of the subject in the clause. As for the former, for the initial and final places of articulation of the verb, it was indicated whether or not these aligned with a previously introduced person locus (subject/object) or a previously introduced location. A number of different annotation values were used, where two main categories can be distinguished.

Firstly, there were three annotation options for constructions in which the referent(s) or location(s) that the verb could be expected to align with had previously been localized. The label ‘agreeing’ means that there was clear alignment between the place of articulation of the verb and a

<sup>6</sup> The verb that is glossed as SEND appears to have the more specific meaning of ‘sending away’. As such, it is a (mono-) transitive verb which takes a sending entity and a sent entity as its core arguments.

person locus or a location. ‘Congruent’ indicates that there seemed to be alignment, but it was difficult to establish with certainty for one of two reasons. Either the place of articulation of the verb could have been influenced by the immediately preceding or following sign articulated at the same location, or the verb – like the person/location it appeared to align with – was articulated rather close to the center of the signing space, which is also used as a default place of articulation in DGS. ‘Incongruent’ cases involved a clear mismatch between the verb’s place of articulation and the argument/location it was expected to agree with. Suffixes to these three basic annotation values were added to reflect whether a place of articulation aligned with a person locus or a location. In case there was more than one option, more than one suffix was added to the annotation.

Secondly, if candidates for alignment had not previously been assigned a locus, there were two possible annotation values. When the verb was articulated in the center of the signing space while the referent/location it was expected to agree with had not been localized at all, the annotation ‘unclear’ was made. When the verb was clearly *not* articulated in the center of the signing space, its alignment pattern was annotated as ‘new’, to reflect that a new locus was introduced by the verb.

As for the annotations for subject properties, it was indicated whether (i) the subject was overt or non-overt in the sentence; (ii) the subject was first, second, or third person; (iii) the subject was singular or plural; (iv) there was role shift involved. In the latter case, the subject in the reported context may be different from the subject in the utterance context; the properties of the subject in the utterance context were annotated.

Finally, tokens were also qualitatively inspected, and striking properties such as a diverging movement or handshape were noted down.

### 3. Verb alignment

In this section, I describe the alignment properties of the spatial verb tokens in the data set. Due to the large extent of variation in the data as well as there being quite a few examples that display ambiguity in terms of whether they align with person or location, the discussion in this section will proceed in mostly qualitative fashion. The forms GO1, GO2, and LEAVE are discussed first, followed by THROW, BRING, and SEND.

GO1, GO2, and LEAVE (N=87) frequently start from a locus close to the signer and end at a locus further away from the signer, which may occur in any possible direction. Indeed, this pattern can even be observed in cases in which the subject is not the signer, as in (2) with a third-person subject.<sup>7</sup> Thus,

<sup>7</sup> All DGS examples are glossed according to the following glossing conventions. Signs are represented by English glosses in small capital letters. INDEX refers to a pointing sign, with the subscript referring to its location: INDEX<sub>1</sub> refers to a first-person pointing sign, while non-first person pointing signs with a clear pronominal function are labeled with a

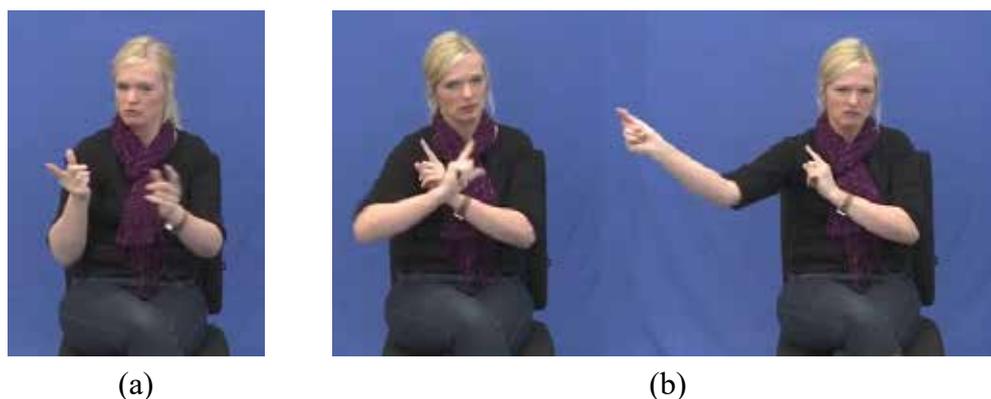
there is no consistent subject agreement marking on these verbs. Figure 2 illustrates the articulation of the third-person pronoun and the spatial verb *LEAVE*. As can be observed, the verb starts from a location near the signer's body and ends at a location at the edge of the signing space (see footnote 7 for glossing conventions).

(2) INDEX<sub>3a</sub> *LEAVE*<sub>b</sub>

'He left.'

[hb06-A-07:28.00]

**Figure 2.** A third-person pronoun (a) followed by the verb *LEAVE* (b), from example (2). The non-dominant hand in (b) holds the third-person pronoun referring to the subject throughout the verb's articulation.



In fact, there are no tokens of *GO1*, *GO2*, or *LEAVE* in the data that show unambiguous alignment with a *non*-first person subject. While there are some congruent examples, these all involve cases in which the subject is associated with a locus rather close to the signer, such that it is not entirely clear whether there is actual alignment or not. This is not to say that it is impossible for these three verbs to express agreement, but it is evident that subject marking is certainly not the default. Indeed, almost all tokens of *GO1*, *GO2*, and *LEAVE* start from the exact same place of articulation, namely somewhat toward the signer's ipsilateral side (i.e. the signer's right for right-handed signers, and the signer's left for left-handed signers), apparently for reasons of articulatory ease.<sup>8</sup>

subscript that combines a number to indicate person and a letter abstractly representing a particular location in the signing space, as in INDEX<sub>3a</sub>. Spatial verbs are also accompanied by subscripts to indicate their beginning and end locations. Because these locations can be, and often are, ambiguous between representing person or location, only letter subscripts are used, as in *GO1*<sub>b</sub>, unless the sign is articulated on or near the signer's body, in which case the subscript '1' is used, as in *BRING*<sub>1</sub>. *POSS* is a possessive pronoun. A '+' following a sign means that the sign is reduplicated, where each + represents a reduplication cycle. *CL* stands for classifier and is followed by a compact description of its meaning. '/' represents a clause boundary.

Codes in square brackets refer to the video files in the Corpus DGS in which the examples can be found. It is made up of a code referring to the region (e.g. 'hb' = Bremen) and the signer pair, followed by the letter A or B referring to one of the two signers, and a time stamp.

<sup>8</sup> It has been suggested, based on ERP data, that (right-handed) DGS signers employ a default strategy in assigning loci to third-person referents: the preferred locus assigned to the first referent introduced in a discourse is to the signer's ipsilateral side, and that of the second referent to the contralateral side of the signing space (WIENHOLZ; NUHBALAOGLU; ET AL, 2018). As such, one might wonder whether the spatial verbs *GO1*, *GO2*, and *LEAVE* make use of a similar default mechanism in establishing their initial place of articulation. However, I wish to emphasize again that

There are two clear instances in the corpus data in which a spatial verb does start from a clearly distinct place of articulation to align with a previously introduced location in the signing space; one of these examples is illustrated in (3). In this example, the second instance of GO1 marks a location which was introduced earlier on the fly by the final place of articulation of the first instance of the verb (subscript ‘a’). The location the signer refers to is Africa.

(3) INDEX<sub>1</sub> AFRICA <sub>1</sub>GO1<sub>A</sub> / TELL / <sub>A</sub>GO1<sub>B</sub> / INDEX<sub>1</sub> SLIDE EXPERIENCE

‘If I were to go to Africa, then, when I’d come back, I could talk about my experiences.’

[koe19-A-06:12.60]

As for the final place of articulation of the instances of GO1, GO2, and LEAVE in the data set, there is more variation, with signers using so many different locations that – when put together – these locations more or less form an arc in the signing space. Strikingly, in 66 out of 87 examples (76%), signers refer to a location in space that had not been previously introduced in the discourse. Moreover, the final place of articulation often occurs toward the far edge of the signing space, as with LEAVE in (2) earlier (see Figure 2 for illustration). In just 16 examples (18%), the signer clearly marks a location that was introduced earlier in the discourse. The remaining examples were annotated as ‘unclear’ because the place of articulation occurred close to the center of the signing space, such that it was difficult to ascertain whether this locus was (implicitly) associated with a particular location or simply used as a default location.

From the data presented above, we can conclude that the spatial verbs GO1, GO2, and LEAVE generally end their trajectory at a non-default yet previously unintroduced location, even when it is unclear from the context what location the final place of articulation would semantically correspond to. (2) is a clear example of this. It is possible that signers use geographical knowledge about locations to determine the end locus of a spatial verb, although this does not seem to be a necessity.

The verb forms BRING, SEND, and THROW (N=33) often start their trajectory at a locus which can be associated with a patientive object. This is noteworthy in itself, since it clearly contrasts with the behavior of regular agreement verbs. A theoretical possibility, of course, would be that these spatial forms are actually backward verbs, which mark their object at the beginning of the path movement, and the subject at the end of it. However, this seems implausible given the fact that the final place of articulation of these spatial verbs, as will be discussed below, does not frequently correspond to the subject locus. An example with BRING, showing alignment with the object at the beginning of the verb’s path movement, is shown in (4) and illustrated with video stills in Figure 3.

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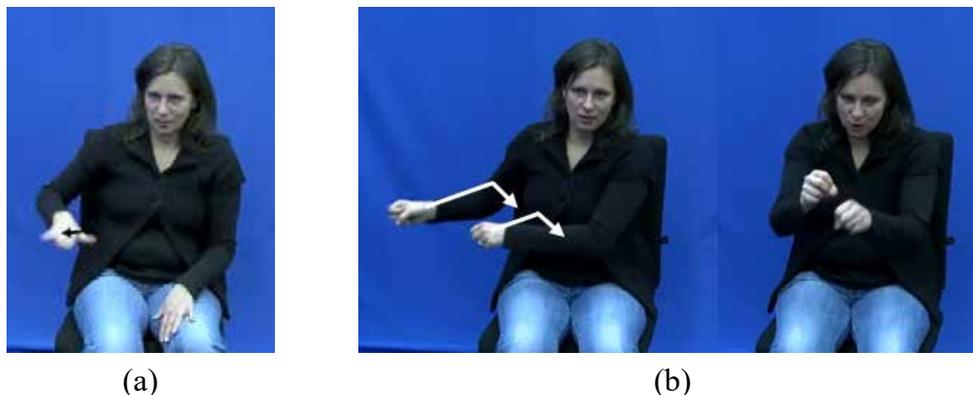
the three verb forms typically start out from a location which is very close to the signer’s body (see Figure 2). Although a location toward the signer’s ipsilateral side is favored, this simply appears to have to do with articulatory efficiency. In other words, there is no clear indication that the three spatial verbs systematically mark agreement with their subject, nor that they use a particular default mechanism to do so.

(4) WITH POSS<sub>1</sub> CHILD<sub>+++</sub><sub>3A</sub> CLEAR POSS<sub>1</sub> **BRING**<sub>B</sub>

‘[I] would take my children with me.’

[koe20-A-04:35.60]

**Figure 3.** (a) Localization of the object CHILD<sub>+++</sub>; (b) articulation of the verb BRING from example (4).



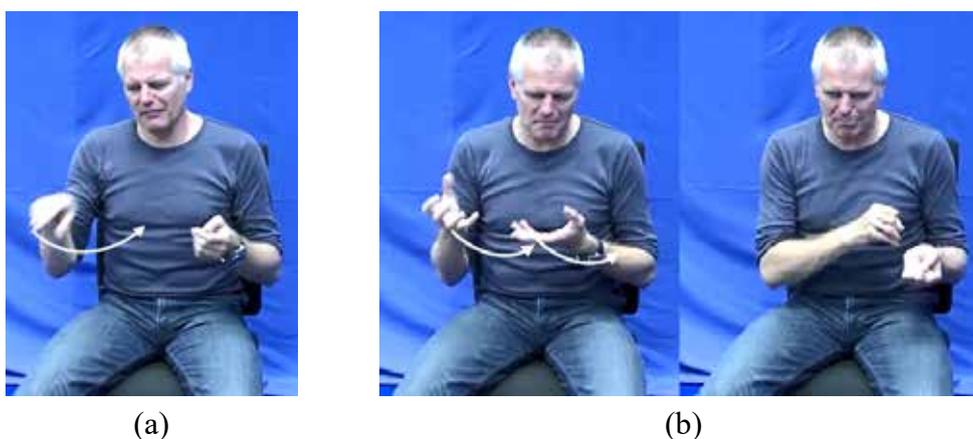
Interestingly, there are several examples in which the spatial verb appears to start out from the subject locus rather than the object locus. One of these examples is shown in (5) and illustrated with video stills in Figure 4. The subject pronoun INDEX<sub>1pl</sub>, with which BRING appears to align at its initial place of articulation, was signed a couple of clauses before (5). It is a plural form articulated with an arc movement resulting in contact with the signer’s chest (see Figure 4a). There is no plural marking on the verb, but the verb starts out from a location which corresponds to the middle of the arc movement of the pronominal sign.

(5) NONE MEDAL **BRING**<sub>B</sub>

‘[We] didn’t bring any medals home.’

[ber04-B-02:39.55]

**Figure 4.** (a) A first-person plural pronoun; (b) articulation of the verb BRING from example (5).



Note also that the phonological realizations of BRING in examples (4) and (5), in particular pertaining to their movement, are different; this observation is discussed further in section 5.

There is at least one clear example in which the verb shows alignment with a previously introduced location at the beginning of its path movement, while there are nine instances where the utilized place of articulation does not align with a previously introduced locus at all. Although further experimental testing would be welcome to determine all the different possibilities, it is evident that quite some flexibility is allowed in terms of the type of locus the spatial verbs BRING, SEND, and THROW may align with at the beginning of their trajectory.

This flexibility is also evident when we consider the final places of articulation of instances of BRING, THROW, and SEND. As with the verbs GO1, GO2, and LEAVE, signers tend to end the path movement of these verbs at a seemingly random location toward the edge of the signing space, which has typically not been previously introduced into the discourse (N=19; 58%). Two examples are displayed in (6), with the final places of articulation of the verb tokens illustrated in Figure 5.

(6) a. DRESS **THROW**<sub>A</sub>

‘I put away the dress.’ [koe17-A-01:46.55]

b. POSS<sub>1</sub> FATHER WANT / INDEX<sub>1</sub> **SEND**<sub>A</sub> HIGH SCHOOL

‘My father wanted to send me off to college.’ [mst16-B-01:41.85]

**Figure 5.** The final place of articulation of (a) THROW from (6a); (b) SEND from (6b).



(a)



(b)

The final place of articulation of BRING, THROW, and SEND can also align with a location (7a) or a referent (7b) representing the goal or recipient of the event denoted by the verb, although just a handful of such cases were attested in the data set. In (7a), the final place of articulation of BRING corresponds to the locus assigned to ‘America’, referred to by means of the pointing sign at the end of the clause. As can be observed in Figure 6a, this location is rather high up in the signing space, as if to represent the large distance relative to the signer. It is possible that the signer also takes geographical knowledge into account, but this is difficult to establish based on corpus data alone. Of interest to note in this context is that Perniss (2007) demonstrates that DGS signers tend not to use an absolute (i.e.

geocentric) frame of reference when making reference to spatial relations. Example (7b) looks similar to (7a): the final place of articulation of the verb SEND aligns with a locus in the signing space that had previously been associated with a location, namely China. However, it appears that this locus is being re-used as a referent locus in the first clause in (7b) by means of a mechanism that Schlenker (2018) refers to as ‘locative shift’.<sup>9</sup> As such, the final place of articulation of SEND can be said to align with a locus which doubles as both a location (‘China’) and a referent (‘the Chinese’). Figure 6b illustrates the final place of articulation of the sign, which is again higher up in the signing space than usual.

(7) a. INDEX<sub>3A</sub> BRING<sub>B</sub> INDEX<sub>B</sub>

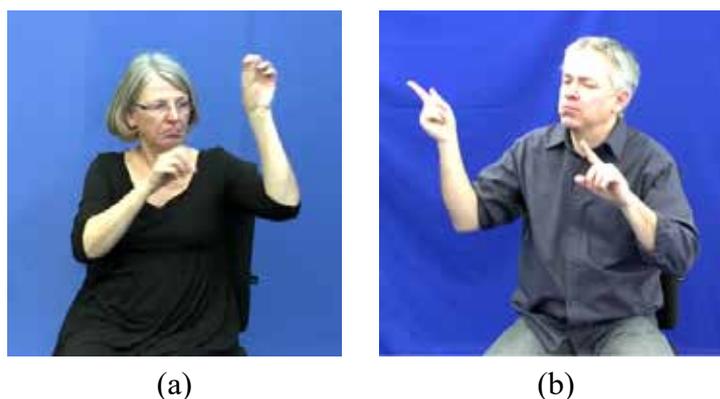
‘He took [everything] with him to there [America].’ [koe05-A-03:39.10]

b. INDEX<sub>3A</sub> PRODUCTION DONE / <sub>A</sub>RETURN<sub>B</sub> [...] INDEX<sub>3A</sub> WITH <sub>A</sub>SEND<sub>B</sub>

‘When they [Chinese] were done with the production, they returned [the products] [...] They [Germans] sent them back to China/the Chinese again.’

[goe05-A-12:46.90]

**Figure 6.** The final place of articulation of (a) BRING from (7a), and (b) SEND from (7b).



(a)

(b)

To sum up, the corpus data show a considerable amount of variation in the sorts of locations in the signing space that spatial verbs may align with, both at the beginning and at the end of their path movement. For all spatial verbs, most variation can be observed at the final place of articulation of the sign, where it was found that many different locations can be utilized with apparently many different motivations. However, often, the final place of articulation does not align with a previously introduced person locus or location. In those cases, it seems that more general spatial information relative to the signer is conveyed; e.g. that a location is (very) far away from the signer. As for the

<sup>9</sup> For consistency, the single-letter subscripts ‘a’ and ‘b’ are used in (7b) as an abstract representation of the initial and final places of articulation of the spatial verb SEND as well as RETURN, which is also a spatial predicate. Note, however, that the initial place of articulation of both verbs coincides with the locus of the pronominal pointing sign INDEX<sub>3a</sub>. See footnote 7 for a description of the glossing conventions, and section 6 for discussion of why I think we should consider this example *not* to be a case of genuine grammatical agreement, despite there being alignment between the pronoun and initial place of articulation of the verb.

initial place of articulation, the verbs GO1, GO2, and LEAVE tend to start from a point close to the body of the signer, even when the subject is not the signer. BRING, THROW, and SEND tend to start from the object locus, but examples with subject and location alignment – or no alignment with a previously introduced locus at all – have also been attested. Clearly, then, spatial verbs allow for quite some flexibility in terms of their alignment properties. This stands in contrast with the behavior of agreement verbs in DGS, which systematically mark agreement with both their subjects and their objects (OOMEN, 2020).

#### 4. Subjects and subject drop

From the previous section, it can be concluded that subjects are sometimes marked on the verb by means of locus alignment, but certainly not always. It is therefore of interest to investigate whether null subjects are common in spatial verb constructions, especially in those constructions where verb alignment is absent. If they are, it can be concluded that null subjects must not be licensed via agreement in DGS spatial verb constructions (cf. QUADROS; QUER, 2008 for Libras).

The properties of the subject in the examples with the verbs GO1, GO2, or LEAVE are tabulated in Table 2. As can be observed, subjects are often overt (N=56; 64%), but they are also frequently null (N=31; 36%), independent of the person of the referent. This is despite the fact that, as described in the previous section, these three spatial verbs do not consistently mark subject agreement. In fact, there are seven clear examples with a null *third*-person subject and a spatial verb which starts from a location close to the body; an example is illustrated in (8).

**Table 2.** Overt and null subjects in clauses with the spatial verbs GO1, GO2, and LEAVE (N=87) in DGS.

	Overt		Null	
	No role shift	Role shift	No role shift	Role shift
<b>First</b>	34	0	21	1
<b>Second</b>	3	0	1	0
<b>Third</b>	18	1	7	1

(8) CL:lift-up / LEAVE<sub>a</sub>

‘[He] took [his things] and left.’

[lei04-B-06:10.00]

The results for clauses with the spatial verbs THROW, SEND, and BRING are shown in Table 3. Again, it can be observed that subject drop is commonly permitted, even though hardly any of the verb tokens mark their subject. In fact, there are more examples with (N=21; 64%) than without (N=12; 36%) subject drop. Admittedly, the data set is somewhat on the small side and so quantitative conclusions must be drawn with caution, but it is evident that subject drop is allowed with verbs of this type – again, despite the fact that these verbs typically do not mark their subject.

**Table 3.** Overt and null subjects in clauses with the spatial verbs THROW, BRING, and SEND (N=33) in DGS.

Person	Overt		Null	
	No role shift	Role shift	No role shift	Role shift
First	6	0	14	1
Second	0	0	0	0
Third	6	0	6	0

To conclude, subject drop is permitted with spatial verbs of both types, despite the fact that these verbs do not mark their subjects in the same way or to the same extent that regular agreement verbs do in DGS. As such, different mechanisms that ensure the recovery of the subject's identity must be at work for spatial verbs than for agreement verbs. The analysis laid out in section 6 builds on this observation.

## 5. Some further observations

As mentioned earlier in section 2, some of the verb forms in the data set – BRING and THROW in particular – have characteristics that are reminiscent of those of classifier predicates. Here, I discuss a number of observations attested for these forms in the corpus data which underscore this finding.

Firstly, THROW and BRING both involve handling handshapes. While there are also many lexical verbs that involve a handling handshape, some instances of handshape change were attested in the data. A hallmark of handling classifiers, of course, is that their handshape may change depending on the shape and size of the handled object; indeed, the examples in the corpus data show that the aperture of the hands at the beginning (BRING) or end (THROW) of the articulation of these forms is modifiable. Variation is also attested in hand orientation. The verb BRING, for instance, is variably articulated with the hands directed upward, downward, or facing each other. Figure 3b, presented earlier in section 3, features an instance of BRING in which the hands have a downward orientation, while the hands are oriented upward in Figure 4b in the same section.

Furthermore, the corpus data show that the movement trajectories of the two forms may be modified in ways that are more characteristic of classifier predicates than of lexical signs. This is clearly illustrated by the instance of BRING in Figure 3b: as indicated by the arrows, the signer's hands move from the signer's right toward her chest, and then slightly away from the signer. Lexical verbs would be expected to show a single straight path movement.

Thus, the observations above provide indication that BRING and THROW may lean more toward being productive signs akin to classifier predicates than conventionalized lexical forms. This is the point of departure for the analysis set out in the next section.

## 6. Spatial verbs are demonstration verbs

In this section, I propose that DGS spatial verbs fall somewhere in between fully conventionalized lexical signs – which in DGS would include plain verbs and regular agreement verbs – and fully productive signs, which would be classifier predicates. BRING, THROW, and (possibly) SEND would occur more toward the productive end of the scale, while GO1, GO2, and LEAVE fit somewhere in the middle (see section 7 for further elaboration on this point). As I explain below, the degree of demonstration involved and the strength of grammatical rules, which trade off with each other, determine the positioning of the different verb types.

In section 3, it was shown that there are many competing options available to signers when determining the beginning and end points of the path movement.<sup>10</sup> As it happens, Quadros and Quer (2008) describe similar patterns for Libras; the observation that (some) spatial verbs may sometimes align with person loci in fact leads them to conclude that there is no clear-cut distinction between agreement and spatial verbs. An important argument in support of their claim is that it is not possible in Libras to drop an argument when the spatial verb does not align with its referent locus. However, it is clear that the same restriction does not apply to DGS: in the corpus data, seven examples with the verbs GO1, GO2, and LEAVE include a null non-first person subject even though the spatial verb has an initial place of articulation near the signer and thus does not align with the subject. As for the verbs BRING, THROW, and SEND, it is even more evident that Quadros and Quer's (2008) conclusion does not apply: these three verbs hardly ever align with the locus of the subject, yet subjects of any person are regularly dropped.

I arrive at the opposite conclusion to Quadros and Quer's: the flexibility that spatial verbs in DGS show, indicates that the path movement does not have a grammatical function, but rather serves to *demonstrate* movement from one place to another (following DAVIDSON, 2015; discussed further below).<sup>11</sup> The path movement in agreement verbs, on the other hand, has the purely grammatical function of marking agreement. In fact, a similar perspective is expressed by Padden (1990, p.123), who claims for ASL that “agreement verbs have certain spatial restrictions that do not apply to spatial verbs”, and it is also in line with Pfau, Salzmann, and Steinbach (2018, p.18), who state: “As for

10 In fact, it is not clear if the beginning and end points necessarily need to convey anything overly semantically specific. It has previously been argued by many that spatial verbs express agreement with semantically meaningful locations; specifically, locations that correspond to the source and goal of motion (FISCHER; GOUGH, 1978; MEIR 1998, 2002). However, almost all tokens of GO1, GO2, and LEAVE start from the same place of articulation – somewhat toward the signer's ipsilateral side – thus making it implausible that this location is necessarily semantically meaningful in this way. In many other cases, and across all six spatial verb forms, the final place of articulation did not appear to be clearly motivated other than that it represents a location being (far or less far) away from the signer.

11 In fact, the story is somewhat more nuanced, as the concept of ‘demonstration’ should be considered a gradient notion. That is, verb types, or indeed individual verb forms, can be placed on a scale based on the strength of their demonstration component. The demonstration component in spatial verbs in DGS would be of moderate strength, but this might be different in other sign languages; see section 7 for further discussion.

unifying spatial verbs with agreement verbs, while a unification may surely seem attractive, it must be pointed out that path movement has very different meanings in the two verb classes: with spatial verbs, it denotes actual movement of a referent from one location to another ... [I]nterpreting the path movement in agreement verbs as literal movement frequently fails, namely in those cases where the verb does not denote transfer”.

Thus, I argue that spatial verbs demonstrate movement from *a* to *b*, where *a* and *b* represent more or less specified locations. The loci in the signing space representing these locations may be determined randomly or (partially) based on geographical knowledge, but they might also simply reflect a position relative to the signer (close by or far away), or represent a location previously assigned to a discourse referent (i.e. an R-locus).

Two questions have to be addressed:

- (i) What does demonstration mean in linguistic terms?
- (ii) How do signers choose which aspects of meaning to demonstrate?

I adopt Davidson’s (2015, p.513) definition of demonstration as a context-dependent event modification, where “demonstrations are performed so as to convey whatever aspects of an event are relevant within a given context of speech”.

Davidson (2015) argues that demonstration is involved in quotation in spoken language, but also in (quotative as well as action) role shift and classifier predicates in sign languages. As illustrated by the compositional semantics in (9), both quotations (9a) (DAVIDSON, 2015, p.487) and classifier predicates (9b) (DAVIDSON, 2015, p.495) are argued to take a demonstration component, which is calculated through a pragmatic, iconicity-based, component (see below). Classifiers additionally take an event argument (*moving*) and one or two thematic arguments, depending on classifier type. Since (9b) involves a whole-entity classifier, just a single argument is involved. As Davidson (2015) points out, this account preserves the iconic properties of classifier predicates, yet they are made formalizable within the framework of event semantics.

(9) a. John was like “I’m happy”.

$\exists e. [agent(e, John) \wedge demonstration(d_p, e)]$

b. BOOK CL:MOVE-DOWN (‘The book fell down.’)

$\exists e. [theme(e, book) \wedge flatobject(book) \wedge moving(e) \wedge demonstration(d_p, e)]$

Davidson’s (2015) account seems readily applicable to spatial verbs in DGS. Indeed, as pointed out in the previous section, the verb forms BRING and THROW, which involve classifier handshapes,

look very much like classifiers already.<sup>12</sup> But the analysis applies equally well to the other verb forms: just like classifiers in Davidson's account, these verb forms can demonstrate properties of the movement of a referent. Aspects of movement that may be conveyed iconically include the type of trajectory (e.g. a straight line or an arc movement) and the beginning and end points of the movement. As discussed extensively in section 3, there are multiple options available regarding the type of locations utilized.

How can a signer choose among the various options available? Here, I again follow Davidson (2015) by proposing that the event aspects that are selected for demonstration are determined pragmatically. More specifically, signers are predicted to respect the Gricean Maxim of Quantity (GRICE, 1975), which states that a speaker should be as informative as possible, while at the same time providing no more information than strictly necessary. For instance, if a signer only deems it relevant to convey that a particular referent visited a certain place, e.g. a bar, but not so much (i) which location that person came from, or (ii) what the absolute location of the bar is, then the spatial verb will probably be articulated with a path movement from somewhere close to the signer to a location further away from the signer. If the initial location is relevant, then the verb is more likely to start out from a locus in the signing space which had already been associated with a location. And since referent loci, once they have been set up, become part of the division of the signing space within the context of that discourse, a spatial verb might as well align with them whenever that is informative.

I argue against analyzing instances like the latter as expressions of agreement: under the assumption, following Schlenker (2018), that person loci are a fusion of both a spatial location and a more abstract grammatical element, it can be argued that these loci simply represent locations in the eyes of a spatial verb. Indeed, classifier predicates can also align their initial and final places of articulation with person loci, e.g. in order to express that a human entity walks from one referent to another, but this phenomenon would generally not be analyzed as agreement marking. I do not see why this should be different for spatial verbs.

If the movement of spatial verbs is indeed a demonstration, then it should also be possible for this movement to be adapted to the situation. Indeed, the token of the verb BRING depicted earlier in Figure 3 involves a movement that goes from a location on the signer's right to a location on her left via a location close to her body, as if to demonstrate that the bringing event occurs in two steps. Several similar instances were attested in the corpus data; further experimental work is needed to verify that the spatial verbs GO1, GO2, and LEAVE may also alter the trajectory of their path movement for demonstration purposes.

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12 SEND involves a hand-to-hand mapping, and could thus be analyzed as having a body-part classifier handshape..

The view that spatial verbs are demonstration verbs is compatible with the observation that the restrictions on subject drop are seemingly less strict with spatial verbs than with other verb types. It has previously been suggested in the literature that classifier morphology can license argument drop (see GLÜCK; PFAU, 1998, for DGS and KIMMELMAN, 2018, for Russian Sign Language). Building on Davidson (2015), Kimmelman (2018) proposes specifically that grammatical restrictions that usually apply with respect to the identification of referents are relaxed with classifier predicates, because the signer enters demonstration mode. As a result, referents become recoverable even when the usual licensing conditions do not apply.<sup>13</sup> The demonstration aspect may then allow for the recovery of this agent even if there is no agreement marking.

I propose that a similar analysis is applicable to spatial verbs in DGS. Recall that the verbs GO1, GO2, and LEAVE occur with null subjects less often than the verbs THROW, BRING, and SEND. I suggest that for the former three verbs, which do not have classifier handshapes, there is less iconic information to rely on to identify a referent, thus making null subjects less common. Still, the demonstration of a spatial movement nonetheless offers some clues to facilitate agent identification, such that subjects may be dropped even when the verb does not align with the subject locus.

Since the verbs THROW, BRING, and SEND involve an additional demonstration component in the form of a classifier handshape – they do not only demonstrate spatial movement, but also the handling of an object (BRING; THROW) or a hand movement (SEND) – there are more clues available to identify the subject when it is not overtly expressed in the sentence. As such, null subjects are more common with this subtype of spatial verb.

Of course, the present study only includes a small set of six prototypical spatial verb forms; further work is needed to study the properties of a larger set of spatial verb forms in DGS, in particular in order to establish whether they indeed also involve the sorts of demonstration components described above, as well as demonstrate a relaxation of the rules on subject drop.

To sum up, I have argued that spatial verbs involve a demonstration component which loosens the restrictions both on locus alignment and subject drop. That is, demonstration of certain properties of the referent(s) involved in the denoted event ensures the recoverability of these referents – even in the absence of overt arguments or the overt marking of these arguments on the verb.<sup>14</sup> As such, spatial verbs are positioned somewhere in the middle between conventionalized lexical verbs and productive signs more akin to classifier predicates. In the next section, I reflect on the wider implications of this proposal.

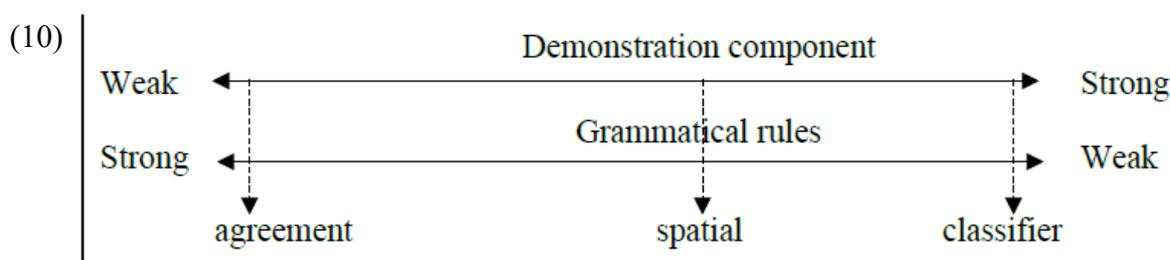
13 I should note that both Glück and Pfau (1998) and Kimmelman (2018) make the claim about relaxation of the identification rules specifically for the object rather than the subject. However, I do not see why the same would not apply to subject identification. The use of a handling handshape, after all, implies the involvement of an agentive referent in the event (although that does not necessarily mean that this referent is present as an argument in the argument structure; see KIMMELMAN; DE LINT; ET AL, 2019).

14 Remember that this behavior contrasts with that of agreement verbs in DGS; see Oomen (2020) for a detailed description of the morphosyntactic properties of agreement verbs.

## 7. A demonstration continuum

While the account presented in the previous section has been proposed specifically for spatial verbs in DGS, it may apply to spatial verbs in other sign languages as well. It is important to note in this regard that every sign language must be investigated on an individual basis, since the properties of spatial verbs, as well as agreement verbs, may differ from language to language, thus possibly leading to different overall conclusions. Let us therefore entertain here which circumstances would argue for or against the analysis presented here for spatial verbs in DGS, so as to facilitate future work into the matter.

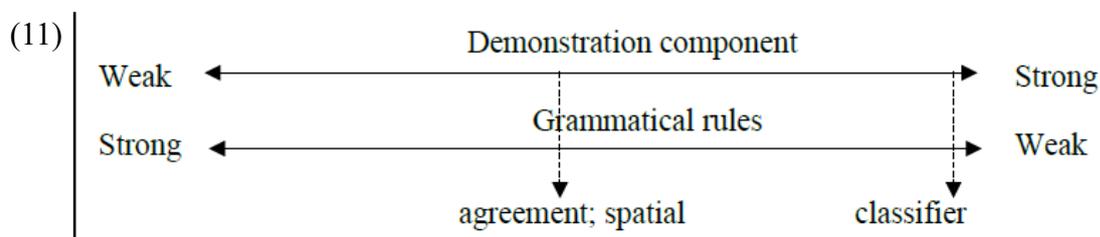
The situation in DGS can be visualized as in (10).



I have argued that spatial verbs in DGS have a fairly strong demonstration component while they do not appear to be constrained by strict grammatical rules when it comes to agreement marking or null subject licensing. As visualized in (10), these two factors are inversely related to one another: predicates that demonstrate more, are less constrained in their grammatical behavior; rather, their form is to a greater extent determined pragmatically. Conventionalized lexical predicates would be situated on the left side of the continuum. Now, in DGS, agreement verbs have been demonstrated to virtually always align with their arguments, such that a case can be made that agreement marking on these verbs licenses subject drop in DGS (OOMEN, 2020). This justifies a positioning of agreement verbs on the left side of the continuums in (10). Classifier predicates, which may productively adapt their movement, location, and, to a lesser extent, handshape, would be situated on the opposite end of the scale. Finally, as argued extensively in this paper, the properties of the spatial verbs in the data set indicate that they are somewhere in the middle between lexical verbs and non-conventionalized classifier predicates, with the forms BRING, THROW, and SEND having a somewhat stronger demonstration component than GO1, GO2, and LEAVE.

While a distinction between agreement verbs and spatial verbs is warranted for DGS, this might not necessarily be appropriate for other sign languages. For instance, as mentioned before, it has been shown for languages such as Australian Sign Language (DE BEUZEVILLE; JOHNSTON; SCHEMBRI, 2009) and British Sign Language (FENLON; SCHEMBRI; CORMIER, 2018) that agreement marking on agreement verbs is only optional, such that a distinction between agreement and spatial verbs in these languages might be less well motivated. For those languages, it could be

investigated whether there are additional qualitative differences between the two verb types, such as (lack of) licensing restrictions on subject drop, or the extent to which verb forms can be modified in classifier-like ways, as discussed above for spatial verbs.<sup>15</sup> In other words, it is possible that in some sign languages, agreement verbs have a stronger demonstration component than they do in DGS – perhaps even to the extent that they can be grouped together with spatial verbs. This situation is visualized in (11).



Of course, it is equally possible that there are sign languages in which spatial verbs have a weaker demonstration component, and demonstrate more conventionalized grammatical behavior, than they do in DGS. For such languages, it may then be argued that spatial verbs lean more strongly toward the lexical side of the scale. In other words, such languages would have a broader class of lexical predicates. It is presently unclear whether such sign languages exist, given that the properties of spatial verbs have generally not been studied as thoroughly as those of agreement verbs, but it seems that Libras is a potential candidate.<sup>16</sup> Quadros and Quer (2008) provide evidence that null subjects in spatial verb constructions in Libras are licensed through agreement, which is in direct opposition to what I propose in this paper for DGS, based on the results of the corpus study. Thus, studying both alignment and the (lack of) constraints on argument drop is vital to assess whether and to what extent spatial verbs in other sign languages also involve demonstration. In general, the principle that is proposed to apply is that the less constrained the behavior of (spatial) verbs is in a sign language, the more compatible it would be with a demonstration account.

As a final note, let me point out that I have talked about verb classes as if they can be so rigidly defined. However, it may very well be the case that there are differences between individual verb forms within a presumed verb class. Consider the differences between GO1, GO2, and LEAVE vs. BRING, THROW, and SEND that were described in sections 3 to 5: it seems reasonable to argue that the former three verbs lean more toward the left side of the continuum presented in (10), while the latter, behaving rather more classifier-like, lean more toward the right. I see much potential for further study in this domain.

<sup>15</sup> For DGS, I did not find such classifier-like properties in the agreement verb tokens in my data set (see OOMEN, 2020).

<sup>16</sup> Let me point out here that Padden (1990) makes a number of observations for ASL which seem in line with the situation I describe for DGS.

## 7. Conclusion

To conclude, I have argued that spatial verbs in DGS should be treated as a distinct verb category (contra QUADROS; QUER, 2008 for Libras), even though they have some overlapping properties with agreement verbs. I proposed that spatial verbs demonstrate spatial movement between locations or referents. This does not constitute a conventionalized grammatical system because there is considerable freedom with regard to which locations in the signing space the spatial verb marks through alignment – and what these locations represent – and there also do not appear to be any constraints on subject drop (see PADDEN, 1990, for a similar perspective on spatial verbs in ASL). Following Davidson (2015), I argued that spatial verbs begin and end their trajectory at locations which are determined pragmatically, respecting the Gricean Maxim of Quantity. That is, signers will only provide information about locations or referents relevant to the discourse. Otherwise, they will opt for less specified places of articulation, e.g. locations in the signing space that have not been overtly associated with real-world locations or referents.

In principle, the analysis should be applicable to all verbs that show flexible behavior in their specifications for movement and location, as well as handshape. For verbs that qualify as such, it is then also predicted that they put looser restrictions on subject drop, as well as potentially other grammatical constraints that would normally be expected to apply. Further research would be welcome in this domain.

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