

# Spatial adpositions in sign language

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## 1. Introduction

In the sign language literature, it is commonly assumed that sign languages (SLs) lack spatial adpositions and that information about the spatial location of referents is encoded within the predicate by means of a spatial modulation of the predicate sign (sometimes referred to as “preposition incorporation”). For instance, in many SLs, in order to express that an object (e.g. a book) is located on a table, the signer would generally start by articulating the sign TABLE (i.e. the Ground), followed by BOOK (the Figure) which in turn would be followed by the locational predicate. Crucially, the predicate will be modulated such that its endpoint coincides with the location in the signing space at which TABLE has been articulated, thereby yielding the complex meaning ‘be located on top of’. No overt preposition is used.

In the present paper, we argue that – despite this modality-specific peculiarity – SLs employ the same syntactic machinery for expressing spatial relations as spoken languages do. In section 2, we will briefly go into the typological variation attested in the realm of spatial adpositions in spoken languages. Aspects of the realization of locative constructions in SLs will be addressed in section 3. Here, we will focus on two types of locative predicates, viz. those expressing location and transfer of an object. In section 4, we will present a theoretical analysis that can account for locative constructions in spoken and sign languages.

## 2. Spatial adpositions in spoken languages

In many African languages (e.g., Kwa, Chadic), spatial expressions involve two adpositions (glossed here as P<sub>1</sub> and P<sub>2</sub>). These may occur on each side of the noun phrase, as in the Gungbe example in (1a), or may both precede the noun phrase, as in the Zina Kotoko example in (1b) (Holmberg 2002).

- (1) a. Kɔ̀jɔ́ zé gò lɔ́ ɖɔ́ [DP àkpótín lɔ́] mɛ́ [Gungbe, Kwa]  
Kojo take bottle DET P<sub>1</sub> box DET P<sub>2</sub>  
‘Kojo put the bottle inside the box [lit. in the inner side of the box].’

- b. Kàrtà dé a g<sup>má</sup> tábèl [Zina Kotoko, Chadic]  
 cards DET P<sub>1</sub> P<sub>2</sub> table  
 ‘The cards are on the table’

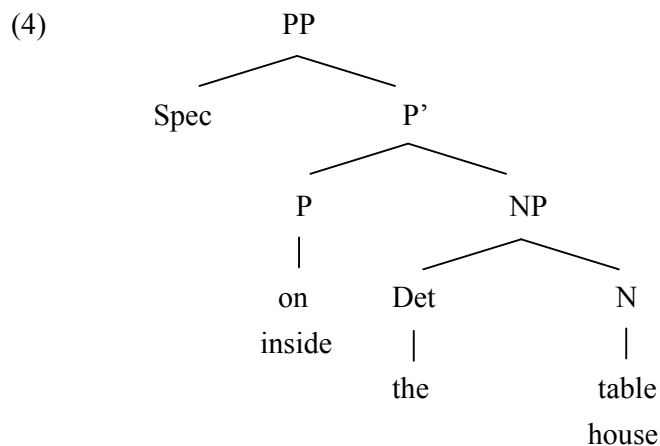
In Germanic and Romance, on the other hand, most of the bipartite adpositions found in these African languages occur as simplex particles, generally analyzed as prepositions. This is illustrated by the English, German, and French examples in (2).

- (2) a. The cards are **on** the table  
 b. Die Karten sind **auf** dem Tisch  
 c. Les cartes sont **sur** la table

Interestingly, however, even in Germanic and Romance, one also finds morphologically complex (3a) or phrasal (3b) prepositions.

- (3) a. John put the bottle **inside** the box  
 b. L’arbre est **à côté de** la maison  
 ‘The tree is next to the house.’

Traditionally, the prepositions in (2) and (3) are analyzed as heading a prepositional phrase, as represented in the structure in (4) (but see Koopman (2000), Svenonius (in press), and den Dikken (in press) for alternative recent proposals).



Morphology aside, however, the complex prepositions found in Germanic/Romance have a certain resemblance to those observed in West African languages. We suggest to take this resemblance seriously and to analyze the former on a par with the latter. In section 4, we

argue that complex spatial adpositions involve a structure where the element  $P_1$ , which generally encodes direction or goal, selects a predicative phrase inside which the element  $P_2$  is realized as a locative expression.

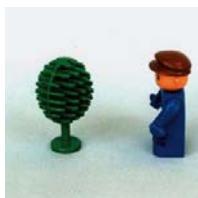
### 3. The expression of spatial relations in sign languages

In order to express spatial relations, sign languages make use of the signing space. Within the signing space, a Ground object (usually the backgrounded, bigger, and immobile entity) and a Figure object (usually the focal, smaller, and more mobile entity) can be located in various configurations with respect to each other.

#### 3.1 Canonical locative constructions

In her study on space and iconicity in German SL (DGS), Perniss (2007) points out certain regularities with respect to the (canonical) expression of Figure and Ground in locative relations across SLs. First, in both spoken and signed languages, referents are typically introduced before information about them is predicated. This tendency, she claims, is due to a general modality-independent discourse property (i.e. Topic-Comment articulation). Secondly, she observes that the mention of Ground usually precedes the mention of Figure in the locative construction (also see Engberg-Pedersen (1993) for Danish SL and Emmorey (1996) for American SL, among others). Third, it is commonly the case that the classifier handshape that represents the Ground is held in place while the other hand is positioning the Figure in relation to the Ground. That is, the locative construction is depicted by a simultaneous classifier construction. For the sake of illustration, consider the DGS example in (5b) (Perniss 2007: 78; glosses slightly adapted). The stimulus picture which elicited this utterance is given in (5a). For clarity of exposition, we adopt the convention of glossing the right (rh) and left hand (lh) on separate lines.

(5) a.



b.



rh: MAN BROWN SASS(hat) CL(man)<sub>loc(r)</sub>  
 lh: TREE CL(tree)<sub>loc(l)</sub>-----  
 ‘A man is standing next to a tree, facing the tree.’

This locative construction is canonical in the sense that (i) both referents precede the predicate, (ii) the Ground entity is mentioned before the Figure entity, and (iii) a classifier handshape representing the Ground is held while the other hand localizes the Figure in relation to the Ground – as indicated by the broken line. Note that the classifier on the left hand also encodes orientation information about the Figure, i.e. the fact that the man faces the tree; in the following, we will be concerned only with location information while neglecting the relative orientation of localized Figures.

All of the static scene descriptions analyzed by Perniss (2007) depict entities that are localized next to each other, e.g. a man and a tree, two men, or two cones of different color. In particular for those scenes which contain two identical entities, it cannot be determined which of the two functions as the Ground (for (5a) it can be argued that the tree is the Ground because it is the less mobile entity). We will therefore start our discussion with situations in which the Ground entity can be unambiguously identified. Note that in the examples to follow, we will neglect the classifier handshapes which frequently constitute a part of location predicates and which specify certain semantic and/or physical properties of the located entities (Supalla 1986; Zwitserlood 2003). That is, we will not gloss the predicate as e.g. CL(tree), as in (5b), but rather as BE-LOCATED (location) or TRANSFER (transitive motion, e.g. PUT-DOWN), with further information about the predicate’s location feature(s).

### 3.2 The locational predicates BE-LOCATED and TRANSFER

Let us consider the predicate BE-LOCATED first. We will use examples from Sign Language of the Netherlands (NGT) for illustration, implicitly assuming that other SLs express comparable situations in a similar way (but see Özyürek, Perniss & Zwitserlood (2009) for discussion of cross-linguistic variation). In (6a), the feature [location] of the predicate expresses the location of the figure CUP in relation to the ground TABLE. As before, both entities precede the predicate and the Ground precedes the Figure. In these examples, however, we do not observe a simultaneous classifier construction. In (6b), this might be due to the fact that the Figure

CAT is a two-handed sign. It appears, however, that generally in this type of construction, the Ground is not localized by a classifier. In principle, the Ground TABLE in (6a) could be followed by a one-handed surface classifier (a Size-and-Shape Specifier) which is held in space while the Figure and the predicate are signed; such a configuration, however, is hardly ever observed.<sup>1</sup>

- (6) a. rh: TABLE<sub>loc(x)</sub> CUP BE-LOCATED<sub>top-of-loc(x)</sub>  
 lh: TABLE<sub>loc(x)</sub>  
 ‘A cup is standing on (top of) the table.’

b.



- rh: CHAIR<sub>loc(x)</sub> CAT BE-LOCATED<sub>top-of-loc(x)</sub>  
 lh: CHAIR<sub>loc(x)</sub> CAT  
 ‘A cat is sitting on (top of) the chair.’

In (6b), the Figure CAT is localized in relation to the Ground CHAIR. As before, the predicate is articulated at the same location as the Ground, as is evident from the accompanying pictures.

In contrast, in (7), transfer of a Figure towards a Ground is expressed by the predicate glossed as TRANSFER. What distinguishes TRANSFER from BE-LOCATED is the movement component which is longer in the former predicate.

- (7) a. rh: CHAIR<sub>loc(y)</sub> MAN BOOK TRANSFER<sub>top-of-loc(y)</sub>  
 lh: CHAIR<sub>loc(y)</sub> BOOK  
 ‘The man is putting a book on (top of) the chair.’

<sup>1</sup> Alternatively, the non-dominant hand of TABLE could be held in space (constituting a so-called perseveration or fragment buoy) while the other signs are articulated. Again, this strategy is uncommon, which may also be due to the fact that in TABLE, both hands perform an outward movement in front of the signer’s body. That is, at the end of the sign, the non-dominant hand is located in the left periphery of the signing space.

### 3.3 *The non-dominant hand as Ground*

In the above examples, we observe prototypical situations where the Figure is located on or transferred to the (upper part of) the Ground, e.g. the surface of a table. In these cases, it may be that the part of the Ground encoding location is left unexpressed. This could indicate that the relative position of the Figure with regard to the Ground is inferred from context. However, there are good reasons to believe that the final hold that is part of the movement component of both predicates is indicative of the part of the Ground that is functioning as location.

In particular, we take the observation that occasionally, the part component can be overtly realized by the non-dominant hand as evidence that an analysis along these lines is on the right track. Consider the two examples given in (8).

- (8) a. rh: TABLE<sub>loc(x)</sub> BOY BE-LOCATED<sub>top-of-loc(x)</sub>  
lh: TABLE<sub>loc(x)</sub> SURFACE<sub>(x)</sub>  
'A boy is standing on (top of) the table.'
- a. rh: CHAIR<sub>loc(x)</sub> CAT BE-LOCATED<sub>under-loc(x)</sub>  
lh: CHAIR<sub>loc(x)</sub> SURFACE<sub>(x)</sub>  
'A cat is sitting under a chair.'

From the above discussion, it appears that a common pattern found in both spoken and sign languages is that locative expressions require a relation between a Figure and a Ground. Following Talmy's (2000) theory of cognitive semantics, we assume that a preposition establishes a relation between a Ground and its part. In this regard, Talmy (2000: 196f) further argues that

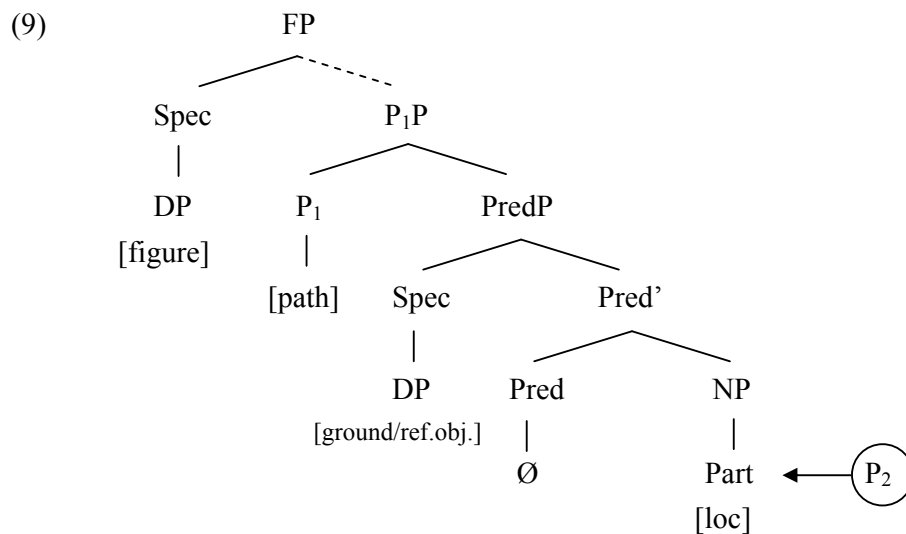
“a major group of space-characterizing linguistic forms makes appeal to a Ground object's having some form of asymmetry, or biasing in its structure. Either it has structurally distinct parts—parts that in themselves are distinguishable from one another and can form a basis for spatial discriminations—or it has some kind of unidirectionality.”

Building on this, we assume that the Ground may be complex in that it involves a *Reference Object* whose part is used to localize the Figure. Literally, this would imply that a sentence like “The book is on the table” could be paraphrased as “The book is on the top of the table”. Interestingly, this is exactly what we find in Kwa and Chadic languages as well as in some SL examples. In the following section, we would like to propose that in both sign and spoken

languages, the expression of location and transfer is realized by  $P_1$  while the part of the Ground encoding location is expressed by  $P_2$ .

#### 4. Analysis

For the analysis of the locative constructions introduced above, we adopt Aboh's (in press) idea that spatial expressions involve a complex predicate phrase embedded under a preposition  $P_1$  which encodes path (direction/goal). Cross-linguistically, it has been shown that  $P_1$  often derives from verbs. In contrast, the Part-NP within PredP encodes location and may grammaticalize into  $P_2$ . This explains why these adpositions commonly derive from nouns (Heine & Kuteva 2002).



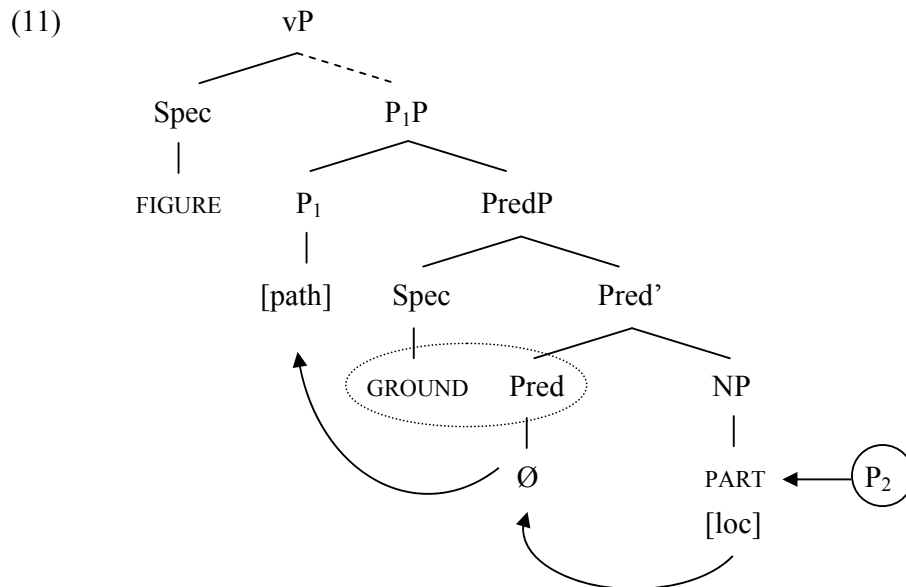
Let us consider again the examples in (1), repeated here as (10) for convenience. In Gungbe,  $P_1$  *dó* encodes direction/path/goal and selects a predicate phrase inside which the reference object *àkpótín lɔ́* (DP) is the subject, and its part expressing location represents a bare noun phrase headed by *mê*, derived from a noun meaning 'inner part'. The latter subsequently incorporates into Pred° and surfaces as  $P_2$ . This derivation yields the sequence  $P_1 > DP > P_2$ , as in (9).

In contrast, the Zina Kotoko example (10b) involves predicate (head) inversion where  $P_2$  moves past the reference object DP *tábàl* to a position in the vicinity of  $P_1$  (Kayne 1994; den Dikken 1998). This results in the pattern  $P_1 > P_2 > DP$ .

- (10) a. K̀̀j́o zé g̀̀ò ĺ́' d̀̀ó [DP àkpótín ĺ́] m̀̀è  
 Kojo take bottle DET P<sub>1</sub> box DET P<sub>2</sub>  
 'Kojo put the bottle inside the box [lit. in the inner side of the box].'
- b. K̀̀artà dé a g̀̀má táb̀̀l  
 cards DET P<sub>1</sub> P<sub>2</sub> table  
 'The cards are on the table'

We further claim that the fusion of P<sub>1</sub> and P<sub>2</sub> in some languages may give rise to morphologically complex adpositions like English *inside* and *in front of* or French *à côté de*. The proposed analysis extends to these cases, too, under den Dikken's (1998) proposal that predicate (head) inversion relates to spelling out the linker (i.e., *of* and *de*) (Aboh, in press).

Let us now apply this analysis to the SL examples. In the syntax, the head of the PART-NP raises to the (zero) predicate head, where spatial agreement with the GROUND is established under Spec-head agreement (indicated by the broken circle). Subsequently, PART adjoins to P<sub>1</sub>. The latter movement produces morphological fusion comparable to English complex prepositions (e.g. *inside*).



With this representation in mind, let us reconsider examples (6a) and (6b). We argue that in both examples, PART (P<sub>2</sub>) is spelled out by a hold-morpheme. P<sub>1</sub>, on the other hand, is realized by either a zero movement (BE-LOCATED) or a transfer movement (TRANSFER). In the former case, a default movement is inserted to allow for spell-out. This analysis leads us to assume that there is no lexical posture verb (e.g. 'lie', 'stand', etc.) in these constructions (cf. the Zina Kotoko example in (1b)). Hence, what we previously glossed as BE-LOCATED/TRANSFER is just a short-hand for a fused P<sub>1</sub>-P<sub>2</sub>-Agreement complex. As shown above, PART may



occasionally be spelled out by a lexeme (e.g. SURFACE, SIDE) which is articulated simultaneously by the non-dominant hand.

Finally, we interpret the fact the Ground precedes the Figure as resulting from a general Topic-Comment articulation, where the Ground acts as topic. Consequently, we assume that the GROUND moves to a topic position within the left periphery of the clause.

## 5. Conclusion

In conclusion, this paper shows that when it comes to spatial expressions, sign languages are not exceptional despite the fact that they have a potential to make use of the signing space. If our analysis is on the right track, this would mean that the apparent iconic properties of locative constructions in SLs are an artifact of the syntax of spatial expressions. Iconicity thus reduces to a spell-out phenomenon and is not part of the computational system. As such, it is comparable to surface effects in spoken languages.

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