# A Distributed Morphology account of verbal inflection in German Sign Language

Susanne Glück and Roland Pfau

German Sign Language allows for quite complex patterns of verbal inflection. Verbs may show multiple agreement (with up to three arguments) and can be modified with respect to aspectual information. It has been claimed that modality-specific word formation rules have to be referred to in order to account for these inflectional patterns which are taken to be simultaneous in nature. In this paper, we shall demonstrate how the theory of Distributed Morphology allows for a modality-independent description of the data in question.

## *1. Introduction*

Within the Minimalist Program as developed by Chomsky (1993, 1995, 1998) inflected word forms are taken to be generated entirely within the lexicon prior to lexical insertion. The interface between a verb's internal morphological structure and the syntax involves a system of feature checking. As the verb raises to functional heads in the syntax, it matches and checks its features with the features of the functional heads to which it adjoins. In this view, word forms are not altered in the syntax and no particular structure is imposed on the organization of these features.

This approach has been challenged by the theory of Distributed Morphology as proposed in Halle & Marantz (1993), Halle (1990, 1994), and Marantz (1988). In Distributed Morphology, a verb stem is assumed to pick up inflectional features bundled in terminal nodes through various mechanisms that are either syntactic or rely on syntactic structure, i.e. word formation is syntactic and postsyntactic, not lexical.

In this paper, we are going to present a sketch of how the framework of Distributed Morphology can be applied to verbal inflection in German Sign Language. We will proceed as follows: First, we are going to give a short summary of the basic claims and concepts of Distributed Morphology (henceforth: DM). Then, we will introduce you to some of the quite intricate properties of verbal inflection in German Sign Language (Deutsche Gebärdensprache: DGS). Finally and most importantly, we are going to present

a syntactic structure for DGS which allows us to account for the derivation of the inflectional patterns within the DM framework. Moreover, we shall propose some Vocabulary items and readjustment rules for DGS.

## *2. Distributed Morphology*

Distributed Morphology combines properties of an a-morphous or affixless theory (e.g. Anderson 1992, Aronoff 1994) and of a lexicalist theory (as proposed e.g. by Lieber 1992). With the former DM shares the claim that the terminal elements involved in the syntax are separate from their phonological realization, while with the latter DM shares the assumption that the phonological realization of terminal elements in the syntax is governed by lexical entries. In DM the lexical entries are termed Vocabulary Items.

In this view, morphology is not restricted to one component of the grammar, but rather is distributed among several different components. Word formation may take place at any level of grammar by head movement, adjunction and merger of adjacent heads. However, on the syntactic levels of LF, DS and SS the terminal nodes that are manipulated do not have any phonological features; rather, they consist of morphosyntactic and semantic features only. The constituents are hierarchically organized, but there is no left-to-right order imposed on them.

In DM the assignment of phonological features to morphosyntactic feature bundles takes place after the syntax on the level of Morphological Structure (MS) which is the interface between syntax and phonology. The mechanism responsible for the assignment of phonological features is the Vocabulary insertion. In DM the Vocabulary includes stems as well as affixes; both relate bundles of morphosyntactic features to bundles of phonological features.

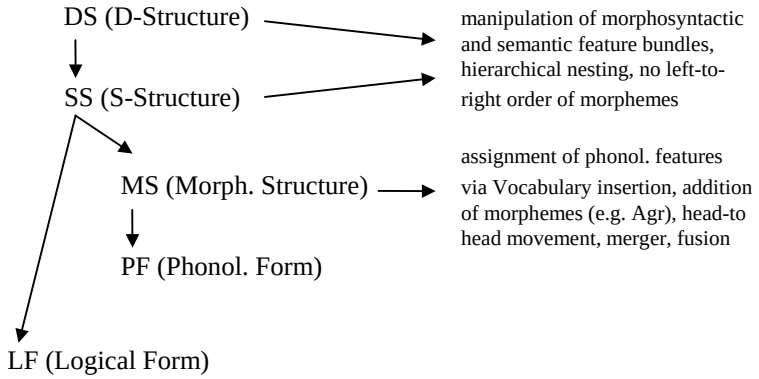
One very important characteristic is the fact that the structure on PF is not necessarily isomorphic to the hierarchical arrangement in the syntax. Mismatches are the result of operations which manipulate terminal elements on MS, DS and SS. Moreover, only at MS morphemes can be inserted; subject-verb-agreement e.g. is implemented by adjunction of an Agr-morpheme to the Tns node. Features of the subject will then be copied onto the Agr node. As we will show later on, several Agr-morphemes may be attached to terminal nodes (cf. (12)).

There are other processes which may disturb the one-to-one relation between terminal elements in the syntax and terminal elements at MS. Through the operation of merger two structurally adjacent terminal nodes are joined under a category node of a head, but two independent terminal nodes are maintained; Vocabulary insertion places two separate Vocabulary items under the derived head. In contrast to that, fusion reduces the number of independent morphemes by fusing two sister terminal nodes into a single terminal node; only one Vocabulary item which matches the features of the fused node will be

inserted.[1]

The diagram in (1) illustrates the five-level conception of the grammar as adopted in Halle & Marantz (1993), also indicating what operations are assumed to take place at what level:

(1)




Let us take a simple sentence like *Porcupines love chestnuts* as an example: As is well known, English main verbs do not raise to Tns. The joining of Tns with the main verb has sometimes been attributed to a lowering movement (e.g. Pollock 1989). However, DM claims that this joining is an example of merger. Being structurally adjacent, Tns and the main verb can merge by affixing Tns to V. After merger the insertion of the AgrS morpheme takes place. AgrS is adjoined to the Tns node and the appropriate features of the subject are copied onto it. Unlike in agglutinating languages like e.g. Turkish, in English the Tns and Agr nodes are fused into a single terminal node and Vocabulary insertion will insert only one Vocabulary item under the fused node.

Questions like *Do porcupines love chestnuts?* on the other hand involve the raising of Tns to C via head-to-head movement. At MS an Agr node that will pick up the features of the subject DP must be added to Tns. Whenever a Tns morpheme appears without a verbal stem to which it may attach, insertion of the dummy verb *do* will take place (even if the Tns morpheme is phonetically zero).

## *3. Verbal inflection in German Sign Language*

After this rather cursory introduction to the theory of DM, we shall now have a closer look at some of the characteristics of DGS verbs. It is a well known fact that in DGS as well as in other sign languages different verb types have to be distinguished with respect to their inflectional properties. In DGS the

[1] Another operation which may lead to mismatches is morpheme fission. Halle & Marantz (1993:116ff) discuss an instance of fission in Georgian verb forms where a plural feature is split off from a fused cluster before Vocabulary insertion and is set up as a separate terminal node (for a different analysis cf. Anderson 1992:141ff).

possibility of certain verbs to take or not to take different inflectional markings is highly intricate. In this section we are going to concentrate on person and number agreement as well as on aspectual inflection, leaving some minor distinctions aside. Note that in DGS (like e.g. in Chinese) verbs are not inflected for tense. Tense information is provided by temporal adverbs and once a specific temporal information is established it is kept until new information is given. (2) gives a list of verb types for DGS.

(2) a. **plain verbs**:
do not show person or number agreement at all;
e.g. ZAHLEN 'to pay', MÖGEN 'to like'

b. **agreement verbs**:

i. verbs agreeing with their subject and object; agreement established via beginning and ending point of the path movement;
e.g. FRAGEN 'to ask', ZEIGEN 'to show', GEBEN 'to give'

ii. classifying verbs which agree with subject or direct object; agreement established via handshape change;
e.g. ROLLEN 'to roll', GEBEN 'to give', WERFEN 'to throw'

(iii. spatial verbs which agree with a locative; agreement established via
beginning and/or ending point of the path movement;
e.g. STELLEN 'to put down', ZUWERFEN 'to throw to') [2]

Let us consider person and number agreement first (cf. Fischer & Gough 1978 and Padden 1990 for ASL data). In DGS one class of verbs does not inflect for person and number information at all; these are the so-called 'plain verbs', e.g. KAUFEN 'to buy', ZAHLEN 'to pay' and MÖGEN 'to like'. For that reason, the verb sign looks exactly the same in (3a) and (3b) (unlike e.g. ASL where LIKE belongs to the class of agreement verbs).[3]

(3) *Plain verb*

a. ICH DICH MAG
*I* *you* *like*
'I like you.'

b. DU MICH MAG
*you* *me* *like*
'You like me.'

Among the verbs that do agree, several subclasses have to be distinguished. In one subclass verbs agree with their subject and their direct or indirect object. This kind of agreement is established via path movement. In (4ab) the

[2] We shall not discuss spatial verbs in this paper.

[3] All sign language examples are given in capital letters. In the examples numeral indices represent person and number agreement by referring to points in the signing space. These points either indicate the position of a present referent or they refer to NPs that have been positioned in the signing space before by means of indexing (represented in the examples as -$IND_x$). A letter index indicates what argument the classifier on the verb refers to. Please note that morphemes which are separated by hyphens do not necessarily constitute affixes; the classifier morpheme -$CL_x$ for example is not a (visible) affix but a stem internal modification.

respective verb signs start at the position of the subject (possibly having been established in the signing space before) and the movement proceeds towards the position of the object.[4]

(4) *Verb agreeing with its subject and object*[5]

a. $ICH_1$ $DICH_2$ ZEIT $_1FRAG_2$
*I* *you* *time* *ask*
'I ask you the time.'
b. $KIND\text{-}IND_3$ $MICH_1$ ZEIT $_3FRAG_1$
*child* *me* *time* *ask*
'The child asks me the time.'

Things get a little more complicated when we look at person and number agreement separately. Object agreement as explained above may involve person agreement and number agreement (singular, dual, paucal and plural); subject agreement, however, involves person agreement only, i.e. the verb signs are morphologically identical in sentences like 'I see you' and 'We see you'. However, a discussion of this asymmetry is beyond the scope of this paper.[6]

In DGS classifying verbs constitute another group of agreement verbs (cf. Glück & Pfau (1997, 1998) for syntactic and psycholinguistic arguments favouring such an analysis). Classifying verbs classify one argument - their subject or object - by means of a handshape change. In (5ab) the verb classifies its subject by using a flat B-hand (5a) and a G-hand (5b), respectively. In the examples (5cd) the verb agrees with all its arguments. Agreement via path movement (for the subject and the indirect object) and agreement via handshape change (for the direct object) can be combined in one verb. However, it is never the case that an inflected verb agrees with one argument twice via movement and handshape.

(5) *Classifying verbs*

a. $KIND_a$ $BERG_1$ $_1[ROLL\text{-}CL_a]$
*child* *hill* *roll.down*
'The child is rolling down the hill.'
b. $STIFT_b$ $BERG_1$ $_1[ROLL\text{-}CL_b]$
*pencil* *hill* *roll.down*

[4] The opposite holds for the so-called 'backwards verbs', which show an atypical agreement pattern (cf. Meir 1998). The path movement of these verbs (e.g. TAKE and INVITE in Israeli Sign Language) is from the locus of the object towards the locus of the subject. Meir (1998) claims that in these verbs two agreement mechanisms are involved; one is marked morphologically by the direction of path movement, the other by the facing of the hand(s).

[5] With agreement verbs, the pronouns may be dropped; with plain verbs (as in (3ab)), however, this option is not available (cf. the discussion in Glück & Pfau 1998).

[6] Note that at MS the feature composition of a morpheme may be changed. For example, certain features may be subject to deletion. The deletion of number information in particular contexts in DGS may be a case of what Bonet (1991) calls „impoverishment".

‘The pencil is rolling down the hill.’

c. KIND-IND$_1$ MUTTER-IND$_2$ BLUME$_c$ $_1$[GEB-CL$_c$]$_2$
*child* *mother* *flower* *give*
'The child gives a flower to the mother.'
d. KIND-IND$_1$ MUTTER-IND$_2$ APFEL$_d$ $_1$[GEB-CL$_d$]$_2$
*child* *mother* *apple* *give*
'The child gives an apple to the mother.'

We assume that in general a particular DGS verb is either a plain verb or an agreement verb, i.e. there's no such thing as a 'semi-agreement' verb. Once a verb is marked as agreeing, it is 'forced' to agree with all its arguments. According to that, a verb agreeing with only its subject necessarily is an intransitive verb (e.g. GEHEN 'to walk' which agrees with its subject via classification) or an unaccusative verb (e.g. ROLLEN 'to roll').[7]

The two types of aspectual modification we are going to consider are habitual and iterative. The habitual expresses the fact that a person usually or normally performs some action over a long period of time while the iterative indicates the repetition of an action within a shorter period.

(6) a. **Habitual**: to usually do something
b. **Iterative**: to do something over and over again

In this manner (7a) with ZAHLEN 'to pay' inflected for the habitual might for example take into account the very pleasant fact that whenever I go out with my dad he would pay the bill. The situation in (7b) - the verb bearing iterative marking - is less attractive because obviously on that very evening I was the only one who did bring his wallet and so it was up to me to pay every single drink we had.

(7) a. MEIN VATER ZAHL-HAB
*my* *father* *pay-ASP*
'My father always pays.'
b. GESTERN ABEND ICH ZAHL-ITE
*yesterday* *evening* *I* *pay-ASP*
'Yesterday evening I was paying over and over again.'

Leaving the phonological details aside, we just wish to emphasize that both instances of aspectual marking involve multiple reduplication. In the habitual the whole sign is repeated (possibly adding a circular movement), in the iterative the movement of the verb sign is shortened before reduplication. In general, all verbs can be inflected for aspect. In (7ab) we have chosen a plain verb but all kinds of agreement verbs can show aspectual marking, too. There may, however, exist some semantic restrictions which ban aspect inflection on verbs like STERBEN 'to die' or BEDEUTEN 'to mean'.

[7] Seemingly exceptions to that generalization, like for example ZEIGEN 'to show' which agrees with its subject and indirect object only, can be analyzed as complex signs. We take ZEIGEN to be a frozen form that already includes a lexically fixed classifier handshape.

The next example serves to illustrate how various kinds of inflections - subject/object agreement, classification and aspect - can be combined in a single verb sign. GEBEN 'to give' agrees with its subject and indirect object via the starting and ending point of the path movement. At the same time GEBEN agrees with its direct object via classification, i.e. handshape change. The complex sign with all of its agreement features is then subject to aspectual modification via multiple reduplication and the verb will be signed as sketched in illustration (9).

(8) SONNTAG MANN-IND$_1$ FREUNDIN-IND$_2$ ROSE$_a$
*sunday* *man* *girlfriend* *rose*
$_1$[GEB-CL$_a$]$_2$-ITE
*give-ASP*
'On Sunday the man is giving a rose to his girlfriend over and over again.'

(9)

Sorry; picture missing

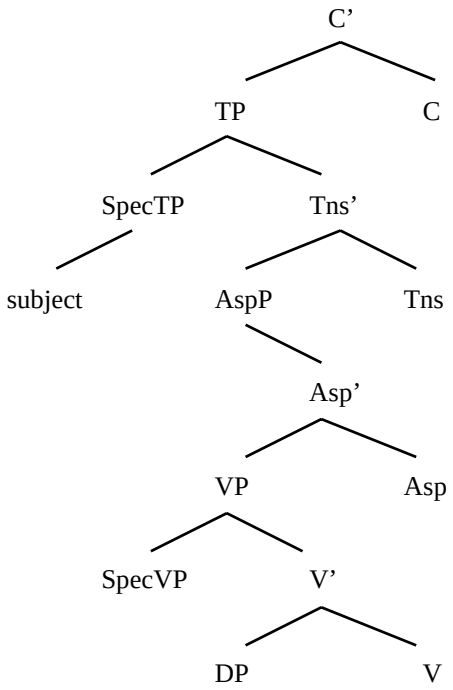
### *4. Distributed Morphology and DGS*
### *4.1. The derivation of complex forms*

We shall now have a closer look at how the DGS verbal complex can be derived within the framework of DM. The tree structure in (10) illustrates the clause structure which we assume for DGS, for now omitting the position of NegP and the structure above C', i.e. no decision is made about the position of SpecCP.[8] Although tense is not visible on DGS verbs, Tns is an active node,

[8] For American Sign Language proposals have been made concerning its syntactic structure (cf. Petronio 1991; Aarons et al. 1992; Neidle et al. 1997; Petronio & Lillo-Martin 1997, and Bouchard

with SpecTP hosting the subject DP and the AgrS node being adjoined to Tns at MS (cf. Aarons et al. 1995). Note that the structure in (10) differs crucially from former proposals in that no agreement projections are present in the syntax.

(10)




In the syntax, the verb will raise via head-to-head movement to Asp and then to Tns. Each time the verb raises, it adjoins to the next head in the tree yielding a complex structure under the Tns node like the one in (11). Remember that in the syntax terminal nodes contain morphosyntactic and semantic features only and that these features also comprise an affix's status as prefix or suffix. The Tns node e.g. is marked as prefix while Asp constitutes a suffix.[9]

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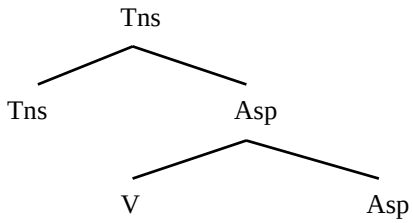
1997), but on the one hand these proposals differ from each other in important respects (e.g. concerning the position of SpecCP and direction of wh-movement) and on the other hand one thing we know for sure is that German Sign Language and ASL have distinct syntactic properties, the former e.g. being a verb final language, the latter being verb second.

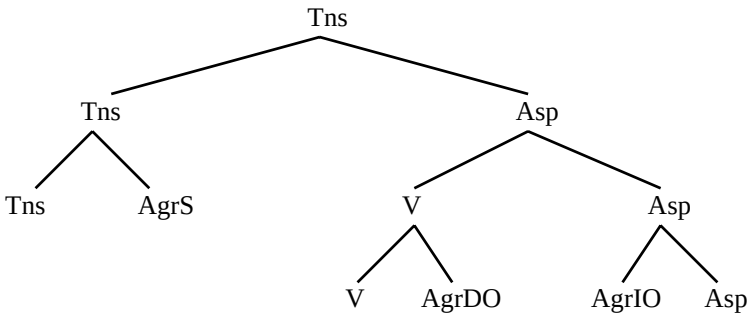
[9] Note that the derivation of the complex verb involves the mixing of left and right adjunction. However, we take the choice of adjunction site to be driven by the feature composition of the respective functional head. Whenever information associated with a functional head present in the syntax (like e.g. Tns, Neg, and Asp) appears on the left and the right of the verb stem, mixed adjunction has to be assumed; cf. Ouhalla (1990) who takes the structure of French finite verbs to be [[Neg [[V] Tns]] Agr]; cf. Baker (1988) and Marantz (1984) for relevant examples from Chichewa and Kinyarwanda, respectively, in which Tns and Asp appear on different sides of the verb stem.

(11)




At MS Agr nodes will attach to heads within this complex to pick up the features of DPs governed by these heads: AgrS attaches to Tns, AgrDO to V, and AgrIO to Asp. The insertion of Agr morphemes transforms tree (11) into tree (12).

(12)




Tns being a phonologically null morpheme, it will subsequently fuse with its sister node AgrS. Thus, the number of terminal nodes will be reduced and only one Vocabulary item will be inserted once Vocabulary insertion takes place. After the operations taking place on the level of MS, the derived structure of the DGS verb is maximally [[AgrS [[[V] AgrDO] AgrIO]] Asp]; this, as we take it, being the appropriate structure to be filled with Vocabulary items. Of course, the insertion of Vocabulary items depends on the paradigmatic dimension the respective verb belongs to.

### *4.2. Vocabulary items and readjustment rules*

Having shown how complex DGS verbs can be derived within a given syntactic structure we shall now turn to the question of how a verb's phonological realization is established. We shall first make you familiar with a basic distinction of morpheme types. Subsequently, we are going to propose a selection of Vocabulary items for agreement and aspect morphemes in DGS, some of which trigger readjustment rules.

In DM morphemes are defined as complex symbols relating an identifying index to a set of grammatical markers. These grammatical markers include – as mentioned above – information about the morpheme's meaning and its grammatical and syntactic idiosyncrasies.

Furthermore, we have to distinguish two types of morphemes with respect

to their identifying index, namely concrete vs. abstract morphemes (cf. Halle 1990, 1994). For many morphemes the identifying index is a sequence of phonemes whose realization is phonologically invariant; these are termed "concrete morphemes". As it is a matter of debate how to define the concept of phonemes for sign languages, we will not refer to the notion of "phoneme" for signs (cf. e.g. Sandler 1989, Perlmutter 1992, Brentari & Goldsmith 1993). Rather, we will take a concrete morpheme to be one whose phonological form is invariantly filled by the sequential or simultaneous appearance of properties which are clearly phonological.

For a minor set of morphemes the identifying index is marked as "Q". These are the so-called „abstract morphemes", which are characterized by the lack of a fixed phonological representation in their Vocabulary entries. This accounts for allomorphic variation like e.g. the plural in English nouns which has various phonological manifestations (cf. Halle 1990:153).

| | | | | | |
|---|---|---|---|---|---|
| (13) | a) | sheep | fish | deer | moose |
| | b) | radi-i | mag-i | alumn-i | sarcophag-i |
| | c) | ox-en | childr-en | brethr-en | |
| | d) | dog-s | cat-s | fox-es | |

Although it is tempting to state that abstract morphemes (e.g. subject-verb-agreement, case marking etc.) are "more directly involved" in syntactic processes than concrete morphemes, the distinction between concrete and abstract morphemes does not equate the distinction between derivation and inflection, as e.g. the German nominalization with *–heit* or *–keit* shows. This nominalization is a clear instance of allomorphic derivation with the two affixes being contextual variants of one type of nominalization (cf. Wiese 1996:98ff. for a detailed analysis of this allomorphy). Furthermore, not all inflectional morphemes are subject to allomorphy; the Spanish first person plural verb inflection *–mos* e.g. clearly constitutes a concrete morpheme (cf. Halle 1990).

The identifying index "Q" of abstract morphemes is interpreted by a special set of morphophonological rules, namely Spell-out rules. Another set of morphophonological rules are readjustment rules which account for stem changes caused by affixation, e.g. umlaut in German plural nominals or ablaut in English and German past tense formation. Note that readjustment rules may not only change the phonological form of a given word (or morpheme) but are also capable of changing feature specifications (cf. Halle 1994, and below for examples). Thus, all readjustment rules must be ordered before Spell-out rules and Vocabulary insertion.

Let us now have a closer look at relevant examples from DGS. In order to analyze the structure and derivation of complex inflected verbs in DGS, we first have to qualify the morphemes involved as concrete vs. abstract. In a second step, we need to identify the rules which are involved in the derivation of a MS for DGS. Finally, we must check whether the types of rules which generate complex forms in spoken languages are comparable to those we need to refer to in the derivation of verbs in sign languages.

With respect to verbal inflection in DGS, we have been considering features of the agreement nodes as well as aspectual inflection. Turning now to the respective rules, there are two verb classes which are of major interest, namely the subclasses (i) and (ii) of the agreeing verbs listed in (2b). The first class comprises the verbs agreeing with their subject and direct object via the beginning and ending point of the path movement. The layer we assume for this subclass is the one in (14a) below. The second class we are considering are the classifying verbs. In (2b.ii) no distinction was made between verbs that classify their subject and those that classify their direct object. For the moment, we shall concentrate on the latter set; the layer we assume for those is given in (14b).

(14) I. [[AgrS [[Verb] AgrDO]] Asp]
(e.g. SEHEN „to see“, FRAGEN „to ask“)
II. [[AgrS [[[Verb] AgrDO (=CL)] AgrIO]] Asp]
(e.g. GEBEN „to give“, ZUWERFEN „to throw to“)

For matters of completeness we have also included aspect in the layers (14ab), aspect - as mentioned above - being outside of the verb+agreement complex. (15) gives a list of some of the relevant Vocabulary items for the affixes under discussion:[10]

(15) a. [+1sg] → [$X_{\text{prox.body-central-neutral}}$]
(where X is a point in the signing space)
b. [+2sg] → [$X_{\text{dist.body-central-neutral}}$]
(where X is a point in the signing space)
c. [+2pl] → [$_{\text{X-weak}}\text{ARC}_{\text{X-dominant}}$] / [Y ____$_{\text{Obj}}$]
(weak/dominant determined by signer’s handedness,
X is a point in the signing space, and Y = verbs of class I or II)
d. [+3sg] → [$X_{\text{dist.body-dominant-neutral}}$]
(where X is a point in the signing space)
e. [+3sg] [$\alpha$] → [$X_{\text{dist.body-}\alpha}$]
(where $\alpha$ is a position between the central and the left or right neutral points in signing space)
f. [+Cl-F] → ∅
g. [+iter] → ∅
h. [+habit] → ∅

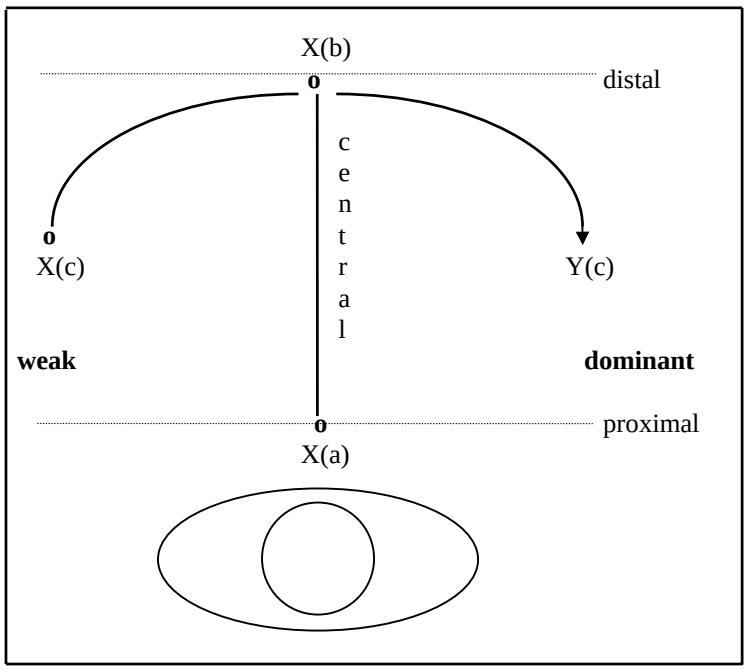
The items (15a-d) constitute person agreement morphemes; they show no variation in their phonological material. The Vocabulary item for the first person singular (subject or object) affix (15a) e.g. is a point in the signing space which is near (proximal to) the signer’s body in a central neutral position

[10] We assume that the beginning and ending points of a verb sign are real agreement affixes containing person and number features. However, this assumption is not uncontroversial. Keller (1998) e.g. claims that these points do not constitute person marking but rather are affixed pronouns.

(cf. (16) below). (15e) is a special case because it contains a variable in the feature description, namely [α]. This variable is determined syntactically by indexing and represents a position between the central and the left or right neutral points in the signing space. Although the position of the index point may vary, we took its specification to be part of the feature description of the Vocabulary item. This seems to contradict the above mentioned invariance in phonological material which is a property of concrete morphemes. But this variance is highly restricted; note that it is only the place of the distant point which may vary, while the other phonological material remains unchanged. Even the point of articulation is fixed because it can only be between the central neutral point and the left or right neutral point. The feature [α] must therefore be part of the feature description of the Vocabulary item because all non-neutral points have to be specified. This specification - though morphologically highly restricted - depends on syntactic processes.

The picture (16) serves to illustrate some of the above mentioned Vocabulary items (unintentionally discriminating left handed signers):

(16)




The small letters in the picture (e.g. X(a)) relate to the points in the signing space mentioned in the Vocabulary items (15a-c). Consider e.g. again the Vocabulary item (15c) for second person plural object agreement (no matter if it's a direct or indirect object): this agreement affix is realized by adding an arc-shaped movement to the verb stem; the movement proceeds from X(c) on the weak hand side in a curve to the dominant hand side of the signer. Consequently, in a sentence like $ICH_1$ $EUCH_2$ $_1SEH_2$ 'I see you(pl.)' the movement of the verb sign proceeds from the proximal point X(a) (for first

person singular subject) towards X(c) and then along the arc to the dominant side. In the sequence $DU_1$ $MICH_2$ $_1SEH_2$ 'You(sg.) see me', however, the movement goes from the distal point X(b) (for second person singular arguments) towards X(a). Remember that with agreement verbs the pronouns are optional.

There are a few more words to say about the status of the above mentioned Vocabulary items. Vocabulary items are – as mentioned before – listed in the lexicon. Every morpheme has its own lexical entry which consists of a set of grammatical markers and the identifying index. The present examples contain concrete morphemes only, so we do not need to refer to any Spell-out rules which are responsible for the morphophonological realization of abstract morphemes.

As you can see, the Vocabulary items for classifier agreement (15f) and for aspectual modification (15gh) are null morphemes which trigger the readjustment rules in (17a-c).

(17) a. movement → movement / [+iter]
|
[reduce]
[redupl]

b. movement → movement / [+habit]
|
[ARC]
[redupl]

c. handshape → $\text{handshape}_{\text{CL-F}}$ / Y ___ $[\text{+Cl-F}]_{\text{AgrDO}}$
(where Y = verbs of class I)

d. [+1pl] → [+1sg]

e. [+3pl] → [+3sg]

The readjustment rules (17abc) account for stem modifications in case of the affixation of aspect and classifier morphemes. In (17ab) the aspectual inflection is accomplished by changing the movement properties of the respective sign: (17a) reduces and reduplicates the movement while (17b) adds an arc movement and reduplicates the movement, too. In (17c) classifier agreement shows up as a handshape change. Moreover, readjustment rules may change features as the examples in (17de) demonstrate. This feature change occurs because there is no morphological difference between the realization of the first and third person singular and plural.

The presented list is far from being complete but in our opinion this first sketch proves that it is possible to give an account for sign language phenomena within the framework of Distributed Morphology.

## *5. Conclusion: Rethinking simultaneity*

In the previous sections, we discussed the possibility of accounting for the morphological structure of complex verbs in DGS within the framework of DM. Focusing on the structure of agreement verbs, we presented a syntactic and morphological structure for DGS. Furthermore, we showed how Vocabulary items in DGS can be represented and how to account for stem changes involving empty morphemes and readjustment rules. Although this analysis in terms of DM focuses only on two out of four verb classes found in DGS - which implies that there is still a fair amount of research to be done - we take the proposed analysis to be on the right track in highlighting the similarities between spoken and signed languages rather than their apparent differences.

The theory of DM has originally been proposed for spoken languages (explaining phenomena from languages as diverse as English, Russian, Georgian, and Potawatomi). The present investigation shows that DM is also capable of capturing data from DGS, a signed language. Of course, the proposed Vocabulary items and readjustment rules look somewhat different. But this difference can be reduced to differences in the phonological vocabulary used; the basic properties of the formal apparatus are exactly the same. Not surprisingly, a stem change in a spoken language (e.g. umlaut) looks different from a stem change in a signed language (e.g. handshape change).

Many properties of the morphological component of signed languages have traditionally been described as being simultaneous in nature; classification e.g. was taken to involve the simultaneous realization of a classifier morpheme. At the same time it has been claimed that many sign languages do not exhibit linear affixation but prefer nonconcatenative morphological processes (e.g. Sandler 1993 for Israeli Sign Language, Emmorey 1995).

Our analysis is a first step into another direction in proposing a linear account for complex verb signs. Our claim is that the morphological representation for sign languages is not fundamentally different from the one displayed in spoken languages. The processes we have discussed involve linear affixation. What looks like nonconcatenative morphological processes in fact can be accounted for by readjustment rules. We take this proposal to be attractive because it allows us to describe phenomena from spoken and signed languages in a uniform way.

We believe that further examination of the grammatical structure of signed languages will reveal that the differences due to the use of different modalities are minimal. As our analysis of (some of) the syntactic and the morphological structures makes clear, there is no need for a modality-specific theory to describe the properties of sign languages. And this, of course, is exactly what we would expect if we take the concept of Universal Grammar seriously.

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