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(Editors)

Trends  
in Linguistics

Visible Variation

Comparative Studies  
on Sign Language Structure

MOUTON



## Visible Variation



# Trends in Linguistics

## Studies and Monographs 188

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Berlin · New York

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Comparative Studies  
on Sign Language Structure

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Mouton de Gruyter (formerly Mouton, The Hague)  
is a Division of Walter de Gruyter GmbH & Co. KG, Berlin.

⊗ Printed on acid-free paper which falls within the guidelines  
of the ANSI to ensure permanence and durability.

*Library of Congress Cataloging-in-Publication Data*

Visible variation : comparative studies on sign language structure /  
edited by Pamela M. Perniss, Roland Pfau, Markus Steinbach.

p. cm. – (Trends in linguistics. studies and monographs ; 188)

Includes bibliographical references and index.

ISBN 978-3-11-019578-1 (hardcover : alk. paper)

1. Sign language. 2. Language and languages – Variation.  
3. Psycholinguistics. 4. Linguistic change. I. Perniss, Pamela M.,  
1974– II. Pfau, Roland. III. Steinbach, Markus.

P117.V57 2007

419–dc22

2007025689

ISBN 978-3-11-019578-1

ISSN 1861-4302

*Bibliographic information published by the Deutsche Nationalbibliothek*

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie;  
detailed bibliographic data are available in the Internet at <http://dnb.d-nb.de>.

© Copyright 2007 by Walter de Gruyter GmbH & Co. KG, D-10785 Berlin

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Cover design: Christopher Schneider, Berlin.

Printed in Germany.

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# Notational conventions

## 1. Glossing conventions for sign language examples

In the examples as well as in the text, signs are glossed in capital letters. Note that some of the contributing authors give all glosses in English, irrespective of the sign language, while others decided to gloss sign language examples in the surrounding spoken language (e.g. in German for a German Sign Language example) in order to distinguish sign languages from each other. In any case, the acronym (see section 2) for the respective sign language is given at the end of the gloss line. Consider the following German Sign Language (DGS) example for illustration.

- (1)  $\frac{\text{INDEX}_2 \text{ H-A-N-S } \text{INDEX}_{3a} \text{ ORANGE}^{\wedge} \text{SAFT } \text{}_2 \text{GEB}_{3a} \text{-CL:C}}{\text{y/n}} \quad [\text{DGS}]$   
 you Hans index orange juice give  
 ‘Will you give Hans (a glass of) orange juice?’

With respect to manual signs, the following notation conventions are used.

- $\text{INDEX}_3/\text{IX}_3$  pointing sign used in pronominalization (e.g.  $\text{INDEX}_2$  in (1)) and for localizing non-present referents in the signing space (e.g.  $\text{INDEX}_{3a}$  in (1)). The subscript numbers refer to points in the signing space: 1 = towards signer’s chest, 2 = towards addressee; 3a/3b = towards ipsi- or contralateral side of the signing space.
- ${}_1\text{SIGN}_3$  verb sign moving in space from one location to another, usually from the Source to the Goal of the action; in (1), for example, the verb sign GEB (‘give’) moves from the locus of the addressee to the locus introduced for the non-present referent Hans.
- S-I-G-N represents a fingerspelled sign.
- $\text{SIGN}^{\wedge}\text{SIGN}$  indicates either the combination of two signs in a compound (frequently accompanied by phonological assimilation and reduction processes) or a sign plus affix/clitic combination.
- $\text{SIGN-SIGN}$  indicates that two words are needed to gloss a single sign.
- $\text{SIGN}++$  indicates reduplication of a sign to express grammatical features such as plural or aspect.



CL:X classifier handshape; the letter following the colon refers to the handshape of the manual alphabet, e.g. the C-hand in (1) representing the handling of a cylindrical object.

Lines above the glosses (as in (1)) indicate the scope (i.e. the onset and offset) of a particular non-manual marker, be it a lexical, a morphological, or a syntactic marker; the following markers are relevant (note that some of the below abbreviations are based on the function of a non-manual marker (e.g. *top*, *neg*) while others are based on its form (e.g. *re*, *hs*)).

<u>    </u> /xxx/	lexical marker: a mouth gesture or mouthing (silent articulation of a spoken word) associated with a sign;
<u>    </u> <i>top</i>	syntactic topic marker: raised eyebrows, head tilted slightly back;
<u>    </u> <i>wh</i>	syntactic wh-question marker: usually lowered eyebrows, sometimes accompanied by slight forward head tilt;
<u>    </u> <i>y/n</i>	syntactic yes/no-question marker: raised eyebrows, forward head tilt (as in (1));
<u>    </u> <i>rel</i>	syntactic relative clause marker: raised eyebrows;
<u>    </u> <i>neg</i>	syntactic negation marker: usually side-to-side headshake accompanied by negative facial expression;
<u>    </u> <i>hs</i>	headshake marking negative structures;
<u>    </u> <i>hn</i>	headnod marking affirmation or focus;
<u>    </u> <i>re</i>	raised eyebrows marking topicalization, yes/no-questions, amongst others.

Notation conventions – be it for manual or non-manual aspects of an utterance – that are specific to a particular contribution to this volume will be given in an endnote or appendix in the respective contribution.

## 2. Abbreviations for sign language names

Note that some of the acronyms listed below are based on the name of the sign language in the respective country; these names are given in brackets.

ABSL	Abu Shara Bedouin Sign Language
AdaSL	Adamorobe Sign Language (Ghana)
ASL	American Sign Language
Auslan	Australian Sign Language

BSL	British Sign Language
CSL	Chinese Sign Language
DGS	German Sign Language ( <i>Deutsche Gebärdensprache</i> )
DSGS	Swiss-German Sign Language ( <i>Deutsch-Schweizerische Gebärdensprache</i> )
DSL	Danish Sign Language
FinSL	Finnish Sign Language
GSL	Greek Sign Language
HKSL	Hong Kong Sign Language
HZJ	Croatian Sign Language ( <i>Hrvatski Znakovni Jezik</i> )
IPSL	Indopakistani Sign Language
ISL	Irish Sign Language (in Hermann and Johnston et al.) Israeli Sign Language (in Perniss et al., Hendriks, and Steinbach and Pfau)
KK	Sign Language of Desa Kolok, Bali ( <i>Kata Kolok</i> )
KSL	Korean Sign Language
LIL	Lebanese Sign Language ( <i>Lughat il-Ishaarah il-Lubnaniah</i> )
LIS	Italian Sign Language ( <i>Lingua Italiana dei Segni</i> )
LIU	Jordanian Sign Language ( <i>Lughat il-Ishaara il-Urdunia</i> )
LSA	Argentine Sign Language ( <i>Lengua de Señas Argentina</i> )
LSB	Brazilian Sign Language ( <i>Língua de Sinais Brasileira</i> )
LSC	Catalan Sign Language ( <i>Llengua de Signes Catalana</i> )
LSE	Spanish Sign Language ( <i>Lengua de Senā́s Espanṓla</i> )
LSF	French Sign Language ( <i>Langue des Signes Française</i> )
LSQ	Quebec Sign Language ( <i>Langue des Signes Québécoise</i> )
LSSF	Swiss-French Sign Language ( <i>Langue de Signes Suisse-Française</i> )
NGT	Sign Language of the Netherlands ( <i>Nederlandse Gebarentaal</i> )
NS	Japanese Sign Language ( <i>Nihon Syuwa</i> )
NSL	Nicaraguan Sign Language (in Hohenberger and Pyers and Senghas) Norwegian Sign Language (in Nadolske & Rosenstock)
ÖGS	Austrian Sign Language ( <i>Österreichische Gebärdensprache</i> )
SSL	Swedish Sign Language
TİD	Turkish Sign Language ( <i>Türk İşaret Dili</i> )
TSL	Taiwan Sign Language
VGT	Flemish Sign Language ( <i>Vlaamse Gebarentaal</i> )

### **3. Abbreviations in interlinear translations**

In the interlinear translations of the spoken language examples and of the sign language examples glossed in the surrounding spoken language, the following abbreviations are used:

AGR	agreement
ASP	aspect
C	noun class marker
CAUS	causative
COP	copula
DUR	durative
F	feminine
FUT	future tense
HAB	habitual aspect
IMPERF	imperfective
INF	infinitive
INSTR	instrument
LOC	locative
MOD.PART	modal particle
NEG	negation
NOM	nominative
O	object
PART	participle
PERF	perfective
PL	plural
POSS	possessive
PRES	present tense
Q	question particle
REC	reciprocal
RES	resultative
S	subject
SG	singular

# Can't you see the difference?

## Sources of variation in sign language structure

*Pamela Perniss, Roland Pfau, and Markus Steinbach*

### 1. Introduction

Signed and spoken languages are produced and perceived in radically different ways. While spoken languages are produced by the vocal tract and perceived by the auditory channel, signed languages are produced by the hands, but also other non-manual articulators like the head, face, and body, and are perceived visually. Sign linguistic research in the past decades (see Section 2 for a brief overview of the history of sign language research) has proven beyond a doubt that natural language exists in two modalities, and thus, that signed and spoken languages share basic linguistic properties on the levels of phonological, morphological, and syntactic structure.

Still, modality plays an important part in shaping the expression of linguistic structure. With respect to how modality can influence linguistic structure, the role of iconicity or visual motivation is of particular importance. The visual-gestural modality affords a much higher potential for iconic representation than the auditory-vocal modality. The force of iconicity is evident, for example, in indexical reference (see Cormier, this volume), the use of space to represent location and motion of referents (see Johnston et al., this volume), and referential shift (see Pyers and Senghas, this volume). In addition to the role of iconicity, the nature of the visual-gestural modality also affects other parts of linguistic structure. For example, it provides the possibility of, and seems to favor, non-concatenative morphology (Klima and Bellugi 1979, Aronoff et al. 2005).

Meier (2002) lists three other prominent differences between the two language modalities that may cause differences in the linguistic structure of signed and spoken languages: the different nature of the articulators used for language production, the different nature of the perceptual systems used for language comprehension, and the comparative youth of signed languages. Thus, modality may affect linguistic structure, and indeed properties of the visual-gestural modality have been argued to create a homogenizing effect in sign languages, leading to less variation overall in

sign language structure compared to the variation found across spoken languages (Newport and Supalla 2000, Aronoff et al. 2005).

Until recently, research on sign languages was limited to American Sign Language (ASL) and a number of European sign languages as, for example, French, German, British, Swedish, and Danish Sign Language (cf. also Section 2). The current research climate is testimony to a surge of interest in the study of a geographically more diverse range of sign languages. This volume reflects that climate and brings together work by scholars engaging in comparative sign linguistics research. Before we can truly answer the question of whether modality effects do indeed cause less structural variation in sign languages as compared to spoken languages, it is necessary to investigate the differences that exist between sign languages in more detail and, especially, to include in this investigation less studied (often non-Western) sign languages (see Zeshan 2004a, 2004b, 2006 for pioneering work in this area).

In this spirit, the focus of the present volume is variation within the modality of sign. The various contributions concentrate not on a specific domain, but rather cover a range of different areas, including word pictures, negation, auxiliaries, constituent order, sentence types, modal particles, and role shift. One question that arises is whether the range and extent of variation differs between linguistic domains, and, if yes, whether the differences are attributable to properties of the modality. For example, modality may affect some grammatical domains to a greater extent than others. Likewise, the iconicity of signs and grammatical constructions may decline over time, and different domains may be variously affected by such processes.

Before turning to possible sources of variation at different linguistic levels in Section 3, we will briefly sketch important developments in the history of sign language linguistics in Section 2. Finally, Section 4 gives an outline of the content of this volume.

## **2. Developments in sign language linguistics**

In order to situate the discussion below as well as the contributions to the present volume in a historical context, we will first say a few words about important developments in sign language research. Obviously, the picture sketched in this section is very much simplified. Still, we believe that the research endeavours undertaken in the area of sign language linguistics

since the 1960's can roughly be divided into three periods characterized by different theoretical objectives.<sup>1</sup>

In the first period of the study of signed language, researchers focused on the underlying identity between spoken and signed languages. Woll (2003) calls this period, which started in the middle of the twentieth century, the “modern period”. Determined to prove the linguistic status of sign languages against widely held prejudices and misconceptions that communication between the deaf was based on pantomime and gesture, early sign linguists de-emphasized the role of iconicity in sign language (see, for instance, Klima and Bellugi 1979). This was the case for lexical signs, but also notably for the system of classifiers. Studies have shown that many lexical signs are characterized by an arbitrary form-meaning mapping, and that the meanings of lexical signs cannot easily be guessed by naïve non-signers (cf. Pizzuto and Volterra 2000). The predominant sign language investigated in this period was ASL. As a consequence, there was little typological research.

In the post-modern area starting in the 1980's, researchers first turned to the issue of modality and investigated similarities and differences between signed and spoken languages. In this period, researchers were interested in the influence of modality on linguistic structure, in modality-specific properties of signed and spoken languages, and in modality-independent linguistic universals. Starting from the observation that sign languages seem to be typologically more homogenous than spoken languages, many grammatical properties of sign languages have been related to specific properties of the visual-gestural modality discussed in Section 1 above (Meier 2002). In both the modern and the post-modern period, sign language research mainly focused on the comparison of sign languages to spoken languages. Cross-linguistic studies on sign languages have been rare. However, the hypothesis that sign languages are typologically more similar than spoken languages has to be taken with caution until more (non-related) sign languages have been investigated (Woll 2003).

Only once non-Western sign languages entered the stage, it became clear that sign languages show more variation than originally predicted. This third period, which approached sign language typology more seriously, started at the end of the 1990's. Today, we can observe an increasing interest in comparative studies on sign languages at all linguistic levels that also include less studied (Western and non-Western) sign languages. In this context, researchers also develop new methodological and technological tools for the elicitation, collection, and documentation of

sign language data (see Johnston et al., this volume). Still, more comprehensive documentations and typological studies of different sign languages are necessary for a better understanding of the similarities and differences between sign languages in particular and signed and spoken languages in general. In the long term, sign language typology is expected to make an important contribution to a better understanding of the nature of human language.

### **3. Sources of variation**

Obviously, the research endeavors undertaken by the authors of this volume belong to the third of the above-mentioned periods: the documentation of similarities and differences between sign languages. In this section, we briefly sketch a number of linguistic areas in which variation has been found in order to give the reader a first impression of what forms sign language variation may take. Many of the aspects tackled in this section will be discussed in much more detail in contributions to this volume. The list of topics presented in the following sections is by no means exhaustive. However, we take the aspects we selected to be illustrative of the types of variation found across sign languages. We shall look at three linguistic levels of description in turn, considering first phonological (Section 3.1), then morphological (Section 3.2), and finally syntactic variation (Section 3.3). More examples from these three domains as well as the issue of lexical variation are discussed in Hohenberger (this volume).

#### **3.1. Phonology**

Since Stokoe's (1960) seminal work on sign language structure, it is a well-known fact that signs are not holistic units but are composed of smaller phonological units often referred to as phonological parameters ('cheremes' in Stokoe's terminology). While Stokoe himself identified three parameters – handshape, location, and movement – later research proved the importance of two further aspects, namely orientation and non-manuals.<sup>2</sup> In this section, we first discuss cross-linguistic variation in some of the phonological parameters. We then turn to a phonological rule that has been shown to be subject to language-specific constraints: weak hand drop (see

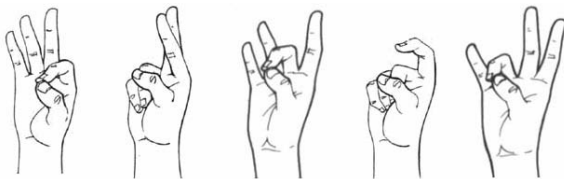
Hohenberger, this volume, for discussion of variation in minimal syllable sonority).

### *3.1.1. Phonological parameters*

Clearly, the phonological building blocks of language are modality-specific: consonants are simply not attested in sign languages and handshapes do not play a role in spoken language phonology. Still, researchers have shown that the internal and external organization of these building blocks follows modality-independent principles; see, for example, Sandler (1989) and Brentari (1998) for feature hierarchies and Perlmutter (1992) for syllable structure.

Spoken languages vary considerably with respect to their phoneme inventories. The question therefore arises: how much and what type of variation exists in the phonological parameter inventories of sign languages? In this section, we will briefly consider handshape, location, movement, as well as non-manuals.<sup>3</sup>

The hand can be in various configurations, depending on whether and how many fingers are selected, and on whether the selected fingers are extended, bent, hooked, or curved. Different sign languages have different inventories of handshapes. Variation in handshape inventories can be due to two factors. First, while all known sign languages share a number of handshapes – including at least the so-called ‘unmarked handshapes’ (cf. Sutton-Spence and Woll 1999: 162) – there are some complex handshapes that are only attested in few sign languages. Note that in this context, the notion ‘complex’ refers to featural complexity, which is defined as the number of distinctive features necessary to describe a handshape (cf. Sandler 1996). The complex handshapes shown in Figure 1, for instance, are infrequent.



*Figure 1.* Infrequent handshapes



Secondly, sign languages vary in the size of their handshape inventories. For example, compared to a sign language like ASL, Adamorobe Sign Language (AdaSL), a village sign language in Ghana, has a very small handshape inventory (Nyst 2007).

Signs can have fixed points of articulation on the face or body or can be executed in neutral space, that is, in the area of space in front of the body. The chest, the shoulders, the arm, the wrist, the neck, and different parts of the head and face, including the ear, the mouth, the eye, the nose, the forehead, the side of the head, and the top of the head are all places of articulation for signs. Differences between sign languages in place of articulation have been suggested by Klima and Bellugi (1979) in a comparison of signs in Chinese Sign Language (CSL) and ASL.

Some signs involve movement of the hand and/or of the fingers. The hand(s) can move in a straight or arc-shaped path and can be executed in different directions such as sideways, forwards, or contralaterally across the body. Local movements of the fingers can be, for instance, wiggling or bending, opening or closing. Klima and Bellugi (1979) also give examples of movement values, both movement of the hands and internal movement of the fingers or wrist, that differ between Chinese and ASL.

Sign languages also differ in the size of signing space, that is, in the size of the space in front of and around the body in which signs are executed. Generally, signing space is taken to extend vertically from the top of the head to the waist, and horizontally slightly past the shoulders on each side and forward to about arm's reach. Sign languages like AdaSL or Kata Kolok, a village sign language in Bali, for example, have a much bigger signing space than do Western Sign Languages. In these sign languages, the arms extend maximally to all sides, including points behind the body. This is probably related to the use of an absolute reference frame (co-opted from the surrounding spoken language and gestural systems) and a focus on the "here and now". This variability in the size of sign space is different from the expansion or restriction of sign space that is found in "shouting" or "whispering" in sign language, respectively (Crasborn 2001; Liddell 2003; Uyechi 1996).

Finally, the use of phonological non-manual elements differs between sign languages. These are typically mouthings derived from the surrounding spoken language that accompany signs.<sup>4</sup> The use of mouthings in ASL, a sign language generally considered to make only little use of phonological mouthings, is the subject of the investigation by Nadolske and Rosenstock (this volume). In contrast to what has been claimed for ASL,

German Sign Language (*Deutsche Gebärdensprache*, DGS) is known to make frequent use of mouthings. In DGS, mouthings occur obligatorily, for example, with nominal signs and can disambiguate between different meanings of an identical sign (the DGS signs for PAINT, BUTTER, and MARMELADE, for instance, differ only in the accompanying mouthed element). DGS also uses mouthings to differentiate between types of things for which the manual sign provides the basic level identification. Different types of birds, for example, can be distinguished on the basis of the mouthing alone, whereby the manual sign remains the same (Keller and Rech 1993).

### 3.1.2. Constraints on two-handed signs and weak-hand drop

We now turn to two-handed lexical signs. It has been shown that two-handed lexical signs are subject to two phonological well-formedness conditions: the symmetry condition and the dominance condition (Battison 1974). The first condition specifies that when both hands move in a two-handed sign – be it symmetrically or in alternation – they must have the same handshape (balanced sign). Conversely, the second condition states that when the two hands do not share the same specification for handshape (unbalanced sign), then one of them must be stationary/passive and, moreover, the specification of the passive hand is restricted to one of a small set, the articulatorily simple, unmarked handshapes shown in Figure 2. These phonological constraints seem to be valid across sign languages,<sup>5</sup> although they might not hold in the same way for some Southeast Asian sign languages like, for example, Korean Sign Language (KSL) (Kang Suk Byun, personal communication).

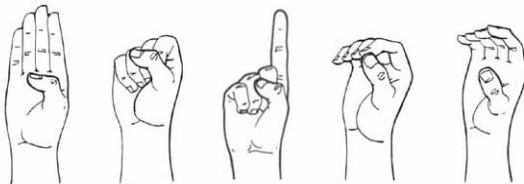


Figure 2. Frequent, unmarked handshapes

Sometimes, two-handed signs can be signed without the non-dominant (or weak) hand; this type of phonological deletion process is referred to as

‘weak drop’ (Padden and Perlmutter 1987). While this phenomenon is attested across many sign languages, recent research has shown that the types of signs that can undergo weak drop differ from sign language to sign language. Comparing the weak drop patterns of ASL and Sign Language of the Netherlands (*Nederlandse Gebarentaal*, NGT), Van der Kooij (2001) finds that two phonological specifications that block weak drop in ASL, namely [alternating movement] and [crossing] (that is, one or both hands crossing the midsagittal plane), do not always block weak drop in NGT. That is, the NGT signs in Figure 3, MATCH with alternating movement as well as AUSTRIA, in which both hands cross the midsagittal plane, do both allow weak drop. In contrast, in ASL, similar signs cannot be signed with only the dominant hand (Battison 1974).<sup>6</sup>

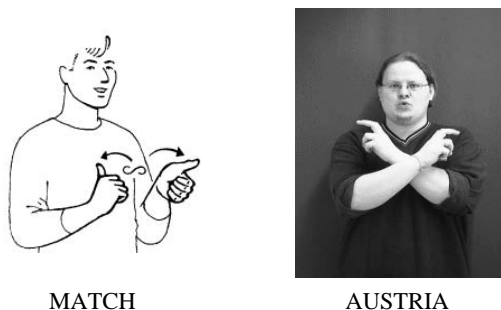


Figure 3. NGT signs that allow weak drop

Moreover, and also in contrast to ASL, Van der Kooij reports that weak drop in NGT is acceptable in most unbalanced signs. This discussion shows that a phonological rule that appears to be part of the phonological system of many sign languages may still be subject to language-specific conditions of application.

### 3.2. Morphology

In sign languages, the phonological and the morphological component closely interact, since virtually every phonological parameter can function as a morpheme by itself. That is, morphological processes tend to involve stem-internal changes rather than affixation. In the domain of inflection, handshapes can function as classifier morphemes (Section 3.2.1), movement alterations can express aspectual meaning, and with some verbs

changes in orientation and/or direction of movement can indicate the Source and Goal of the action expressed the verb (see Section 3.3.2 below). Moreover, non-manual markers (e.g. puffed cheeks, pursed lips) are capable of supplying adjectival or adverbial meaning. Besides these stem-internal changes, reduplication has been shown to be a productive morphological process in sign languages. Interestingly, in sign languages, reduplication expresses the same meanings as it does in spoken languages (Moravcsik 1978; Pfau and Steinbach 2006): aspectual modification (e.g. habituality and iteration), plurality (see Section 3.2.2), and reciprocity (Pfau and Steinbach 2005a). As far as derivation is concerned, for instance, conversion processes have been described that only affect the movement component (manner and frequency) of a stem (see Section 3.2.3). In addition to pluralization, classification, and derivation, we will also highlight some cross-linguistic differences in pronominalization (Section 3.2.4)

### *3.2.1. Classifiers*

Classifier predicates are complex predicates that consist of handshape and movement morphemes that combine in certain (morphosyntactically constrained) ways to express information about the size and shape, handling, location, and motion of referents. The handshape reflects salient visual-geometric properties of a referent, and thereby ‘classifies’ the referent with respect to inherent properties of size and shape or, in some cases, semantic class. Two main types of sign language classifiers are entity classifiers, where the hand represents a referent as a whole and encodes salient features of the entity’s size or shape, and handling classifiers, where the hand represents the handling or manipulation of a referent (e.g. Engberg-Pedersen 1993; Emmorey, 2003).

The use of classifier predicates has been described for the majority of sign languages studied so far (see Schembri (2003) for a comprehensive overview). However, the existence of classifier predicates seems to hold primarily for urban sign languages. AdaSL, for example, exhibits a limited use of handling classifiers, and does not use entity classifiers, at all (Nyst 2007).

Though classifiers are used in similar ways in the sign languages in which they exist, the specific classifiers themselves differ between sign languages. The correspondences between classifier handshape and visual-

geometric properties of the referent exist per convention, and thus vary from sign language to sign language. For example, in DGS, a B-hand (see Figure 4 below) held horizontally with the palm down is used to represent the semantic class of four-wheeled vehicles such as cars, buses, and trucks; two-wheeled vehicles such as bikes and motorcycles, on the other hand, are represented with a vertically-held B-hand. In ASL, an even broader semantic class of vehicles, including water vehicles, is represented with a single handshape (see Figure 4). Finally, a third, altogether different handshape is used in Jordanian Sign Language (*Lughat il-Ishaara il-Urdunia*, LIU) for the semantic class of vehicles (Hendriks 2004).



Figure 4. Entity classifiers for vehicles

In general, there is more variation between entity classifiers across sign languages, as they tend to be more arbitrary, and more strongly conventionalized. Handling classifiers tend to be more iconic, representing the relevant action (i.e. the handling of the relevant object) more directly. Cross-linguistic evidence suggests that across sign languages, the subsystem of entity classifiers is more strongly grammaticalized than that of handling classifiers (see Zeshan 2003 for Indopakistani Sign Language, IPSL).

Finally, some sign languages, especially Asian sign languages, have classifiers that mark gender (see Fischer and Osugi 2000 on Japanese Sign Language – *Nihon Syuwa*, NS). In gender classifier systems, a separate handshape is used for male and female referents. In NS, like in other Asian sign languages, an extended upright thumb is the classifier form used for males, while an extended upright pinky is used for females (cf. also Section 3.2.4).

### 3.2.2. Pluralization of nouns

Browsing through some of the available grammatical descriptions of sign languages, we find striking similarities when it comes to the pluralization

of nouns. In most of the studies, reduplication is mentioned as a common pluralization strategy. One possible exception in this respect is IPSL where – according to Zeshan (2000) – only the sign CHILD is reduplicated with some frequency, while for other nouns, no morphological distinction is made between singular and plural forms.

In a typological study on pluralization, Pfau and Steinbach (2006) show that while reduplication is indeed a common strategy in pluralization, it is subject to a number of phonological constraints (see Hohenberger, this volume, for details). The nature of these constraints, however, may differ from sign language to sign language. In DGS, for instance, body-anchored nouns cannot be reduplicated. That is, the plural form of a body-anchored sign like GLASSES (Figure 5) is realized by zero marking and the plural interpretation either has to be inferred from the context or has to be expressed by a numeral or quantifier.



*Figure 5.* The DGS body-anchored noun GLASSES

It appears that in NGT and ASL, the application of plural reduplication is less constrained. In both these sign languages, the sign GLASSES (which is phonologically similar to the sign given in Figure 5) can be reduplicated. While in NGT, this is done with only the dominant hand performing a short repeated movement towards the body location, in ASL, the reduplication can be performed with both hands moving in alternation.

In other words: a brief look at nominal plurals might lead us to conclude that they are realized in a similar way across sign languages. Closer inspection, however, reveals that while the basic means of realizing plurality (reduplication and zero marking) may be the same, their applicability is clearly subject to language-specific phonological constraints.

### 3.2.3. Derivation

While various inflectional processes in sign languages, such as aspectual, number (see Section 3.2.1 above), and spatial inflection (see Section 3.3.2 below), are well-described, comparatively little is known about derivation in sign languages. From the available research, it appears that derivational processes – in particular, sequential ones – are scarce in general.

Aronoff et al. (2005) describe some sequential derivational processes in ASL and Israeli Sign Language (ISL). For ASL, they report an agentive suffix grammaticalized from the noun PERSON that may attach to various verbs as, for example, in TEACH<sup>AGENTIVE</sup> ('teacher'). They point out that although the suffixed forms may reduce to a single movement contour (which corresponds to one syllable), "the hand configuration and place of articulation of each of the two morphemes are usually retained" (Aronoff et al. 2005: 312).<sup>7</sup> In ISL, they discovered a set of 'sense prefixes' which consist of pointing to a sense organ (or the head or mouth). Many of the resulting prefixed forms can be glossed as 'to X by seeing (eye)/hearing (ear)/thinking (head)/intuiting (nose)/saying (mouth)'. An example given by the authors is the combined form EYE<sup>SHARP</sup> meaning 'to discern visually'. This derivational process appears to be unique to ISL.

For both ASL and ISL, Aronoff et al. (2005) describe a negative suffix. Form and use of the two suffixes, however, differ between the two sign languages. The ASL suffix ZERO probably originates from the phonologically similar sign NOTHING; it is signed with one hand in which the fingers form the shape of a zero and it usually attaches to verbs (SEE<sup>ZERO</sup> 'not see at all'). In contrast, the ISL suffix NOT-EXIST attaches to adjectives (INTERESTING<sup>NOT-EXIST</sup> 'of no interest') and has two allomorphs – a one-handed and a two-handed one – the choice of which depends on the form of the base sign (see Hendriks, this volume, for discussion of a similar suffix in LIU).

From this brief discussion, we can conclude that some variation is attested in the few sequential derivational processes described to date. The same holds for simultaneous processes. While diminutive formation by means of non-manual marking (pursed, rounded lips), for instance, is probably found in all sign languages, other processes appear to be sign language-specific. A case in point are the ASL 'characteristic adjectival rule' and the 'ISH adjective rule' described in Padden and Perlmutter (1987) both of which involve a change in movement pattern such as repetition of movement and/or tense movement.

Supalla and Newport (1978) found that in ASL, a change in movement pattern also characterizes a fair amount of noun-verb pairs. In particular, they show that verbs can have simple or repeated movement and moreover, the movement may either end in a hold or be continuous. The noun-verb pair SIT is an example for the former, while FLY is an example for the latter. In the corresponding nouns, however, movement is repeated and tense ('restrained' in their terminology), as can be seen in the noun signs CHAIR and PLANE in Figure 6.

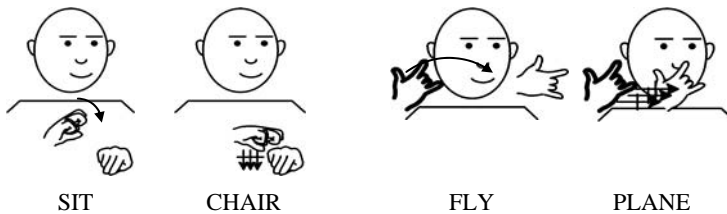


Figure 6. Verb-noun pairs in ASL

Recent research into noun-verb pairs in NGT has shown that in NGT the patterns are not as clear as in ASL (Schreurs 2006). Many verbs and corresponding nouns appear to be identical in form. Interestingly, for the few standardized signs for which a systematic difference was found (for example CIGARETTE/SMOKE and PLANE/FLY), the pattern is exactly the opposite of the one described for ASL: the movement of the verb is tense and repeated while the noun has continuous movement.<sup>8</sup>

### 3.2.4. Pronominal systems

As opposed to pronominal systems in spoken languages, pronominal systems in sign languages seem to be quite uniform (McBurney 2002). The pronominal systems of sign languages are determined to a large degree by iconicity in the sense of indexicality, or actual pointing to their referents. In the case of physically present referents, pronominal or indexical signs do literally point to their referents, e.g. the signer points to her/his own chest to indicate "I" and points to her/his interlocutor's chest to indicate "you", and can likewise point to other animate or inanimate referents in the physical context of the utterance. Non-present discourse referents can be pronominally referred to by associating them with, and then pointing to, particular locations in sign space.



In Western sign languages, singular pronominal reference seems to be made with an index finger point. These sign languages do not mark gender on pronouns. By contrast, gender distinctions can be found in the pronominal system of Asian sign languages, which incorporate gender classifiers to distinguish between female and male pronouns (cf. McBurney 2002 and Section 3.2.1 above). In addition, the paradigms of plural pronouns seem to show variation across sign languages with respect to the degree of indexicality, the number and type of plural pronouns that exist, and the types of plural inflection, i.e. movement modifications such as a sweeping arc, that exist (see the comparison of first person plural pronouns in ASL and British Sign Language (BSL) by Cormier (this volume)).

In addition to variation in the systems of personal pronouns, sign languages also appear to exhibit considerable variation in their paradigms of possessive pronouns. Again, variation exists in the number and type of possessive pronouns that exist, in their syntactic distribution, as well as in marking such distinctions as alienable vs. inalienable (cf. Neidle et al. 2000 and Sutton-Spence and Woll 1999).

### 3.3. Syntax

Not surprisingly, variation amongst sign languages is most striking when we enter the realm of syntax. After all, the merging of a syntactic phrase structure is highly abstract and independent of phonological properties of the items to be inserted – no matter whether your theory involves movement operations or not. Still, in this area, too, there are intriguing similarities such as, for instance, the use of space for establishing syntactic relations and the use of non-manual markers to distinguish sentence types. In this section, we will discuss variation in constituent order (Section 3.3.1), in the use of agreement auxiliaries (Section 3.3.2), in the expression of sentential negation (Section 3.3.3), in the realization of questions (Section 3.3.4) and relative clauses (Section 3.3.5), and in the use of signing space (Section 3.3.6).

#### *3.3.1. Constituent order*

It is a well-known fact that many of the sign languages investigated so far allow for a fairly flexible constituent order. This has led some researchers

to claim that constituent order in sign languages is relatively free (see Friedman 1976 for ASL) or even that sign languages in general are not characterized by an underlying hierarchical phrase structure (Bouchard and Dubuisson 1995).

Others, however, have argued that once the existence of clause-external material, such as topics and right-dislocated pronominals, and null arguments is taken into consideration, it is very well possible to identify an underlying, unmarked sign order. Consider, for instance, the examples in (1). In the ASL example (1a), the object has been topicalized (as indicated by the non-manual marker) and the resulting sign order is OSV (Neidle et al. 2000: 50). In the NGT example in (1b), the surface sign order is OVS; this order, however, is due to pronominal right dislocation of the subject pronoun accompanied by pro drop. Crucially, full arguments cannot appear in post-verbal position.

- |     |  |       |
|-----|--|-------|
|     | —top   |       |
| (1) | a. JOHN <sub>i</sub> , MARY LOVE <i>t</i> <sub>i</sub> | [ASL] |
|     | ‘John, Mary loves.’                                    |       |
|     | b. <i>pro</i> BOOK BUY INDEX <sub>3a</sub>             | [NGT] |
|     | ‘He buys a book.’                                      |       |

Other factors that have been shown to have an impact on the order of signs in a sentence are the semantic reversibility of arguments (Coerts 1994) and morphosyntactic characteristics of the verb, such as aspectual and spatial inflections labelled “reordering morphology” by Chen Pichler (2001).

Once the influence of these factors is acknowledged, it turns out that ASL has an underlying SVO-order while the basic order in NGT is SOV. That is, sign languages may obviously differ from each other with respect to constituent order. Other sign languages that are claimed to display SVO-order include Brazilian Sign Language (*Língua de Sinais Brasileira*, LSB), Hong Kong Sign Language (HKSL), and Swedish Sign Language (SSL); other sign languages of the SOV-type are DGS, IPSL, and Italian Sign Language (*Lingua Italiana dei Segni*, LIS) (see Johnston et al., this volume, for discussion of constituent order in Australian Sign Language, Flemish Sign Language, and Irish Sign Language; see Hohenberger, this volume, for comparison of ASL and LSB). Note that so far no sign language with an underlying VSO-order has been found – in contrast to spoken languages where this order is not uncommon (Tagalog and Irish are two examples for VSO-languages).<sup>9</sup>

Moreover, even within the SVO- and SOV-group, sign languages may differ from each other with respect to constituent order at the clause level. Two sign languages that are both SOV, for instance, may display differences in the positioning of modals (second position vs. post-verbal), negative particles (see Section 3.3.3), or wh-signs (see Section 3.3.4).<sup>10</sup>

### 3.3.2. Agreement auxiliaries

Virtually all sign languages studied so far make a basic distinction between agreement verbs (also called directing or indicating verbs) and plain verbs (Padden 1988).<sup>11</sup> Verbs of the first type can change phonological properties (orientation and/or direction of movement) in order to signal which participant is subject and object of the sentence (or, in terms of thematic roles, Source and Goal of the action described by the verb). This option is not available for verbs of the second type which are incapable of adapting their form to the location of participants in that way.

In many sign languages, constituent order can be indicative of what argument is the subject or object of the clause in case the clause contains a plain verb. Some sign languages, however, have developed an alternative strategy for indicating the grammatical role of arguments: they make use of an auxiliary-like element that expresses the grammatical relations whenever the lexical predicate is not capable of doing so. Consider the two examples in (2) for illustration. The Taiwan Sign Language (TSL) verb LIKE is a plain verb; in (2a), the auxiliary AUX2 moves in space from the locus of the subject WOMAN towards the signer (Smith 1990: 220). Similarly, in the DGS example (2b), the auxiliary glossed as PAM (person agreement marker) accompanies the adjectival predicate ANGRY, thereby showing who is angry with whom.

- (2) a. THAT FEMALE <sub>3</sub>AUX2<sub>1</sub> LIKE [TSL]  
 ‘That woman likes me.’
- y/n
- b. YESTERDAY INDEX<sub>2</sub> TEACHER INDEX<sub>3b</sub> ANGRY <sub>2</sub>PAM<sub>3b</sub> [DGS]  
 ‘Were you angry with the teacher yesterday?’

Other sign languages that make use of similar auxiliary elements include Catalan Sign Language (*Llengua de Signes Catalana*, LSC), Argentine Sign Language (*Lengua de Señas Argentina*, LSA), and Greek Sign

Language (GSL), while ASL, HKSL, and BSL are examples of sign languages that do not have such an element available to them (see Steinbach and Pfau, this volume, for details on the form, use, and grammaticalization of agreement auxiliaries across sign languages).

### 3.3.3. Negation

As is true for other properties discussed in previous sections, the similarities amongst sign languages are quite conspicuous when it comes to the expression of sentential negation. A characteristic that has been noted repeatedly in the literature is the combination of a manual negation sign with a non-manual marker, viz. a side-to-side headshake. Based on this observation, some researchers have argued that from a typological point of view, these sign languages exhibit split negation where one element is a particle and the other one a non-manual affix (Pfau 2002; Pfau and Quer, this volume).

More recently, some interesting differences between sign languages have been noted (Pfau and Quer 2002; Zeshan 2004a). On the one hand, the position of the manual negative sign in the clause may vary from sign language to sign language. It appears that, to some extent, the position of this element is influenced by the basic sign order: in SOV languages, there is a strong tendency for the manual negator to occupy the post verbal position.<sup>12</sup> On the other hand, and this is the more intriguing observation, sign languages may also differ from each other with respect to the co-occurrence of the manual and the non-manual element. Two aspects are relevant here; since both of these are addressed in more detail in papers in this volume, we will only mention them briefly.

First, the exact position of the headshake, its spreading characteristics, is subject to different constraints across sign languages. For instance, while in some sign languages, it is possible to have headshake on the manual negative sign only, as illustrated in the HKSL example in (3a), in others the headshake must at least extend over the predicate (for example, DGS; see Pfau and Quer, this volume). Secondly, while in many sign languages, it is possible, and actually quite common, to drop the manual sign and to negate a proposition by means of a headshake only, in other sign languages, the reverse pattern is observed: the manual negator is obligatory while the headshake is optional. HKSL, LIS, and Turkish Sign Language (*Türk İşaret Dili*, TİD), for instance, have been claimed to make use of such “manual-

dominant” (Zeshan 2006) systems. For that reason, the HKSL utterance in (3b) with non-manual negation only is ungrammatical (Tang 2006: 217; also see Hendriks, this volume).

- (3) a. INDEX<sub>3</sub> TOMORROW FLY NOT <sup>hs</sup> [HKSL]  
 ‘It is not true that he is flying tomorrow.’
- b. \*YESTERDAY NIGHT FATHER FAX FRIEND <sup>hs</sup>  
 ‘Father didn’t fax his friend last night.’

Note finally that, while the use of a negative headshake – be it obligatory or optional – has been attested in all sign languages investigated so far, some sign languages also make use of backward head tilts to signal negation (Zeshan 2004a; Hendriks, this volume). Clearly, we are dealing with the grammaticalization of a culture-specific gesture here.

### 3.3.4. *Question formation*

Just as sentential negation discussed in the previous section, questions also combine manual and non-manual marking (Petronio and Lillo-Martin 1997; Neidle et al. 2000). Again, manual marking seems to show more variation than non-manual marking. This is confirmed by Zeshan’s (2004b) extensive cross-linguistic study on question formation in thirty-five sign languages. While the use of non-manual markers in questions is very similar across all sign languages investigated in this paper, the use of manual markers (question particles), the structure of question-word paradigms, and word order in interrogatives show more variation.

Let us turn to non-manuals in interrogatives first. Sign languages use various non-manual means to indicate interrogatives, for instance eyebrow position, eye contact with the addressee, and change in head and body posture. Although all sign languages seem to use non-manuals to indicate polar and *wh*-question, we also find some variation in this area. First, different sign languages may use different kinds of non-manuals in questions (see, for example, Šarac et al., this volume). Second, in many sign languages, the non-manuals used in polar questions differ from the non-manuals used in *wh*-questions. DGS, for example, uses raised eyebrows for polar questions and lowered eyebrows for content or *wh*-

questions. However, some sign languages, as for example HKSL, use the same facial expression for both kinds of questions (Zeshan 2004b: 22). Third, sign languages may differ in the scope of non-manuals. Both examples in (4) are *wh*-questions without a *wh*-expression. Similar examples can be found in many sign languages. In the NGT example in (4a), the non-manual marker takes scope over the whole clause (Coerts 1992). By contrast, the NS example in (4b) shows that NS uses a specific non-manual marker in clause-final position (Fischer and Osugi 1998).

- (4) b.  $\frac{\text{wh}}{\text{MY SUITCASE}}$  [NGT]  
 ‘Where’s my suitcase?’
- a.  $\frac{\text{wh}}{\text{COLOR LIKE}}$  [NS]  
 ‘What color do you like?’

Note finally that variation also results from the fact that some sign languages do not only use non-manual means but also manual question particles, while others have only non-manual question means at their disposal. Zeshan’s study shows that between a fourth and a third of all sign languages use question particles.

Question particles lead us to the issue of manual question markers in sign languages. In a number of sign languages, a palm-up gesture is used as a question particle. However, some sign languages have developed other kinds of question particles. Spanish Sign Language (*Lengua de Senāš Espanōla*, LSE), for example, uses the question particle SI/NO, which is performed with an extended index finger signing first SI and then NO. Some sign languages have even more than one question particle. HKSL, for instance, distinguishes between the existential question particle HAVE-NOT-HAVE and its non-existential counterpart GOOD-NOT-GOOD. While most sign languages that have question particles use them only in polar questions, some sign languages, like NGT, use them also in *wh*-questions. The NGT question particle PALM-UP optionally appears in sentence-final position in yes/no-questions (5a) and *wh*-questions (5b) (Coerts 1992; Aboh and Pfau, in press).

- (5) a.  $\frac{\text{y/n}}{\text{INDEX}_3 \text{ PARTY CANCEL INDEX}_3 \text{ PALM-UP}}$  [NGT]  
 ‘Is the party cancelled?’

- \_\_\_\_\_ <sup>wh</sup>
- b. MARKET BUY WHAT **PALM-UP** [NGT]  
 ‘What did you buy at the market?’

According to Zeshan (2004b), cross-linguistically the preferred position for this particle is the clause-final position, but in some sign languages, it may also appear sentence-initially or in both these positions.

A similar range of variation can be found in the syntactic distribution of wh-expressions. In most sign languages, wh-words can appear in clause-initial position, in clause-final position or in both positions simultaneously (see also Šarac et al., this volume). By contrast, in IPSL, the placement of the general question word is much more restricted. The general wh-sign G-WH only occurs in sentence-final position (cf. Aboh et al. 2005).

Wh-word paradigms are another source of variation ranging from very simple paradigms to highly complex ones. Interestingly, even sign languages with complex wh-word paradigms usually have a general wh-sign basically meaning ‘what’. Zeshan (2004b) therefore distinguishes three different types of languages: (i) the general interrogative covers the whole wh-word paradigm (type A), (ii) the general interrogative covers part of the wh-word paradigm (type B), and (iii) the general interrogative exists alongside a complex wh-word paradigm (type C). IPSL belongs to type A since it has only the general wh-sign G-WH, which can be combined with non-interrogative signs to derive more specific complex wh-expressions such as, for example, FACE + G-WH meaning ‘who’. LSB is a type B language with three specific wh-signs (‘how’, ‘why’, and ‘how many’). Finally, type C languages with complex wh-word paradigms are, for example, ASL and DGS.

### 3.3.5. *Relative clauses*

In spoken languages, relative clause constructions are known to show considerable variation (Keenan 1985; Lehmann 1986). Among others, the following parameters distinguish relative clauses across languages: (i) position of head: externally vs. internally headed relatives, (ii) type of relative construction: relative clauses vs. correlatives, and (iii) the use of specific markers: relative pronouns, relative complementizers, or resumptive pronouns.

Although so far, relative clauses have only been investigated in detail for three sign languages, ASL, LIS, and DGS, the same range of variation has been found as in spoken languages. While in all three sign languages, a non-manual marker (raised eyebrows) is used to indicate relative constructions, the syntactic properties of relative constructions differ from sign language to sign language. Head-internal relative clauses, for example, are attested in ASL. In (6a) the head noun DOG is clearly part of the relative clause, as evidenced by the fact that the adverbial precedes the head noun and the non-manual marker extends over the head noun (Liddell 1978). Note that the sentence is ambiguous: while it is clear that the dog chased the cat, it is not clear which of the two animals came home. DGS, on the other hand, uses head-external relative clauses, as illustrated in example (6b), in which the head noun WOMAN appears outside the relative clause. The relative clause itself is introduced by the relative pronoun RPRO-H and the non-manual extends only over the relative pronoun (Pfau and Steinbach 2005b).<sup>13</sup>

- (6) a.  $\overline{\text{RECENTLY DOG (THAT}_a\text{) CHASE+ CAT}}$  <sup>rel</sup> COME HOME [ASL]  
 ‘The dog which recently chased the cat came home.’  
 ‘The cat which the dog recently chased came home.’
- b. WOMAN  $\overline{\text{RPRO-H}_{3a} \text{ MAN IX}_{3b} \text{ 3aHELP}_{3b}}$  <sup>rel</sup> KNOW  $\text{3aPAM}_1$  [DGS]  
 ‘The woman who is helping the man knows me.’
- c. [YESTERDAY HOUSE<sub>i</sub> MARIA SEE PROREL<sub>i</sub>] TODAY BURN [LIS]  
 ‘The house Maria saw yesterday burnt today.’

Yet another type of relative construction has been described for LIS. Cecchetto et al. (2006) analyze LIS relative constructions such as (6c) as head-internal correlative constructions containing the clause-final correlative marker PROREL.<sup>14</sup> According to these authors, the extension of the non-manual marker (not given for (6c)) is variable.

The above examples also exemplify another domain of variation in sign language relative clauses: the use of manual relative markers. Sign languages, like spoken languages, may use relative complementizers, relative pronouns, and zero marking. According to Liddell (1978), relative complementizers are attested in certain relative clauses in ASL (the optional marker THAT<sub>a</sub> in (6a)). Relative pronouns and a correlative marker



are used in DGS and LIS, respectively, whereas relative clauses without a manual marker are found in LSB and in ASL.

### *3.3.6. The use of signing space*

As already noted in section 3.2.1 above, the location, orientation, and motion of classifier predicates in sign space can indicate the location, orientation, and motion of objects in the real world. That is, the locations of classifiers in sign space schematically correspond to the locations of objects in the environment or event space being described. This topographic use of sign space is one of the most unique features of the visual-gestural modality, and is taken to be a general affordance of this modality.

In addition to the use of classifier forms, the way spatial relationships are represented in sign space is dependent on the viewpoint or perspective the signer takes. On the one hand, signers can assume a global viewpoint and oversee the entire environment or event space from an external perspective. On the other hand, the signer can take an event-internal perspective by assuming the role of a participant within the event (as in role shift or constructed action, cf. Liddell and Metzger 1998). These two types of mapping have been described by numerous researchers using different terminologies: Liddell (2003) distinguishes between “depictive space” and “surrogate space”; Morgan (1999) uses the terms “fixed referential framework” and “shifted referential framework”; Schick (1990) describes the use of “model space” and “real-world space”; Emmorey and Falgier (1999) distinguish the use of “diagrammatic space” and “viewer space”; and Perniss and Özyürek (in press) use the terms “observer perspective” and “character perspective”, respectively.

The use of these devices, especially the use of classifier predicates, has been assumed to be similar across sign languages due to the assumption of modality effects driven by the iconic properties of sign languages (Meier 2002; Talmy 2003; Aronoff et al. 2005). However, there has been little research on the way referent location, motion, and action is represented in sign space using classifier predicates, as well as other spatially modifiable signs like index signs and indicating verbs.

In a preliminary study comparing the use of classifier predicates and perspective in event representations in DGS and TİD), Perniss and Özyürek (in press) show that these two sign languages appear to impose different linguistic or discourse constraints on the use of space to depict referent

location, motion, and action. For example, contrary to what was observed for TĪD signers, DGS signers seem to disprefer the use of handling classifiers in a spatial representation from an observer's perspective. Overall, the results indicate that this domain, where modality effects are widely considered to create similarities in the use of space across sign languages, may exhibit more variation than previously thought. The results of the study comparing referential shift marking in ASL and Nicaraguan Sign Language (NSL) presented by Pyers and Senghas (this volume) likewise suggest that sign languages can conventionalize a range of different devices and use space in various ways within this system.

#### **4. Content of this book**

The articles in this volume take up many of the topics discussed in the previous sections and also add new topics. They discuss data from many different sign languages (for an overview see section 2 of the notational conventions) and cover a wide range of topics from different areas of grammar including phonology (word pictures), morphology (pronouns, negation, and auxiliaries), syntax (word order, interrogative clauses, auxiliaries, negation, and referential shift) and pragmatics (modal meaning and referential shift). In addition to this, one paper addresses psycholinguistic issues (slips of the hand) and three papers deal with aspects of language change (grammaticalization). In addition to this, many papers discuss issues concerning data collection in sign languages and provide methodological guidelines for further research. Although some papers use a specific theoretical framework for analyzing the data, this volume clearly focuses on empirical and descriptive aspects of sign language variation.

The paper by *Marie A. Nadolske* and *Rachel Rosenstock* is the only one in the volume that looks at, or rather reconsiders, phonological variation. In their study, the authors investigate the occurrence of mouthings in ASL. Mouthings are mouth movements which resemble spoken words and accompany manual signs. In the past, it has been claimed that ASL uses mouthings to a much lesser degree than European sign languages. Nadolske and Rosenstock, however, provide evidence that mouthings are frequently used in ASL across various discourse situations. Additionally, they show a relationship between the occurrence of mouthings and word classes.

In her investigation of pronoun indexicality, *Kearsy Cormier* explores a domain in which the potential of the visual-gestural modality for iconic representation plays a strong role. The article compares first person plural pronouns in ASL and BSL and investigates the extent to which these pronouns actually index (point toward) the locations associated with their referents. Cormier looks at both inclusive and exclusive contexts and shows that first person plural pronouns in the two sign languages exhibit variation with respect to indexicality. She discusses the loss of indexicality in exclusive pronouns, in particular, and offers explanations based on both linguistic and motor factors. The paper is an important contribution to our understanding of the ways in which the form of iconic or highly visually motivated signs can be constrained within a conventionalized linguistic system.

*Bernadet Hendriks'* contribution adds to our understanding of the variation in the expression of sentential negation by discussing data from an as yet under-investigated sign language, namely Jordanian Sign Language (*Lughat il-Ishaara il-Urdunia*, LIU). She reports on the distribution of various manual negative signs (including negative concord), on morphological negation by means of a suffix, and on the use of non-manual markers in negation. A comparison to negative structures in other sign languages (ASL, CSL, DGS, and LSC) reveals interesting cross-linguistic differences with respect to the obligatory presence of a manual negator, the nature and use of non-manual markers, and the possibility of negative concord.

The second paper dealing with negative structures is the one by *Roland Pfau* and *Josep Quer*. They add to the findings of an earlier comparative study on sentential negation in DGS and LSC by reporting on the use and distribution of negative modals in the two sign languages. It turns out that while DGS and LSC – both SOV-languages – show fine-grained differences in the distribution of the negative headshake in clauses with lexical predicates, they pattern alike in negative clauses containing modals. Pfau and Quer propose a generative grammar analysis to account for the observed similarities and differences.

*Trevor Johnston*, *Myriam Vermeerbergen*, *Adam Schembri*, and *Lorraine Leeson* present a cross-linguistic study of constituent ordering in Flemish Sign Language (VGT), Irish Sign Language (ISL), and Australian Sign Language (Auslan). In addition to providing valuable data about sign language variation in this central syntactic domain, their paper discusses important issues concerning data collection and analysis. Based on an

overview of previous studies on constituent order and their own small-scale cross-linguistic study, the authors point out difficulties for cross-linguistic comparisons due to different methodology and terminology, even when the same elicitation materials are used. Their own comparison is dedicated to ensuring comparability and accessibility of language data, and provides clear methodological guidelines.

In contrast to most areas of sign language linguistics, the syntax of questions is a field that is comparably well studied from a theoretical and typological point of view (cf. section 3.3.4). Still, more sign languages need to be investigated to yield a more fine-grained picture of possible interrogative constructions in sign languages. In their paper, *Ninoslava Šarac*, *Katharina Schalber*, *Tamara Alibašić*, and *Ronnie B. Wilbur* focus on interrogatives in two less studied European sign languages, Croatian Sign Language (*Hrvatski Znakovni Jezik*, HZJ) and Austrian Sign Language (*Österreichische Gebärdensprache*, ÖGS), and compare them to interrogatives in ASL. The paper addresses manual and non-manual interrogative markers. In all three sign languages, polar and wh-questions are marked non-manually and different markers for polar and wh-questions are used. Moreover, the wh-sign can occur in sentence initial, sentence final, or in both positions. Interestingly, HZJ and ÖGS use the same non-manual marker, which differs from the marker used in ASL, whereas only ASL and HZJ have an additional manual marker for polar question at their disposal.

In her paper, *Annika Herrmann* breaks new ground by considering variation within the expression of pragmatic aspects of utterances. She discusses the expression of the speaker's attitude towards the utterance (which is often called modal meaning) in two spoken (English and German) and two signed languages (DGS and Irish Sign Language, ISL). Herrmann's study reveals that the two sign languages show less variation in the expression of modal meaning than the two spoken languages. Nevertheless, it also turns out that the extent of variation between the two sign languages is greater than expected. Whereas in both sign languages, non-manual features are the basic means of indicating the speaker's attitude, ISL also uses various manual and gestural expressions to mark modal meanings. Moreover, Herrmann shows that the non-manual features used in ISL differ from the ones used in DGS.

The contribution by *Jennie E. Pyers* and *Ann Senghas* compares the system of referential shift in ASL, a well-established sign language, and Nicaraguan Sign Language (NSL), a young, emerging sign language. The

authors show that there are differences between the two sign languages in the devices used to mark referential shift, and in the maintenance of discourse cohesion through spatial mapping. The differences found between ASL and NSL are discussed in light of the relative youth of NSL, as the differences in the use of devices by NSL signers of different ages suggest that this young sign language is in the process of developing a more strongly conventionalized means of marking referential shift. In addition, the authors address the possible influence of the gestural systems of the surrounding spoken languages on the development of the ASL and NSL systems of referential shift.

*Markus Steinbach* and *Roland Pfau* investigate the diachronic development of a sign language-specific kind of auxiliary, so-called agreement auxiliaries. As opposed to common auxiliaries found in spoken languages, agreement auxiliaries do not encode tense, aspect, or modality but subject and object agreement (cf. section 3.2.2 above). The authors show that (i) agreement auxiliaries are attested in many (unrelated) sign languages and (ii) that sign languages use modality-specific grammaticalization paths for the development of auxiliaries. In sign languages, unlike in spoken languages, auxiliaries develop not only from verbal sources but also from nominal and pronominal ones. Steinbach and Pfau argue that this difference between spoken and signed languages results from spatial (phonological) and certain semantic properties of agreement in sign languages. Pronouns and certain nouns provide optimal sources for the grammaticalization of agreement auxiliaries.

In the final paper of this volume, *Annette Hohenberger* addresses the issue of possible variation between sign languages from a more theoretical point of view. Before turning to attested variation in several linguistic domains (phonology, morphology, syntax, and lexicon), she discusses possible determinants of linguistic variation in general: (i) general cognitive properties of representation and processing, (ii) general task properties, (iii) principles and parameters of Universal Grammar, (iv) typology, and (v) modality. She adds to the picture the results of research into sign language processing, that is, slip of the hand data from DGS and ASL. She suggests to draw on a comprehensive theory of the human language faculty such as generative grammar which claims universal representations and processes that allow for an abstract model-theoretic characterization of the structure and the processing of a language.

## Notes

1. This rough division of research is, of course, not meant to imply that all studies on sign language in one period follow the respective predominant paradigm. Also note that we confine ourselves to core linguistic aspects only. We will not consider psycho- and neurolinguistic as well as social and institutional issues (for a more detailed discussion of the history of sign language linguistics, see Woll 2003).
2. In some models, handshape (selected fingers and position of fingers) and handorientation are subsumed under a handconfiguration node (see, for instance, Sandler 1989 for ASL).
3. At present, we are not aware of variation that would concern orientation (of the fingers and palm).
4. For variation in other kinds of non-manuals see section 3.3 below.
5. See, for instance, Pfau (1997) for DGS, van der Kooij (2001) for Sign Language of the Netherlands (*Nederlandse Gebarentaal*, NGT), and Sutton-Spence and Woll (1999) for British Sign Language (BSL).
6. The sign MATCH is taken from [www.gebarencentrum.nl](http://www.gebarencentrum.nl), the sign AUSTRIA from [www.effathaguyot.nl](http://www.effathaguyot.nl). Note that the ASL sign AUSTRIA is identical to the NGT sign given in Figure 3.
7. A similar element is attested in German Sign Language (*Deutsche Gebärdensprache*, DGS) and NGT; still, for these two sign languages, it is not clear at present whether the morphological process is one of derivation or compounding.
8. Schreurs (2006) also found a difference in the non-manual component of standardized NGT nouns and verbs: while almost all nouns are accompanied by a mouthing (i.e. a silent articulation of (part of) a Dutch word), almost all of the verbs are accompanied by a mouth gesture (i.e. a mouth movement that is not related to the spoken language). See Nadolske and Rosenstock, this volume, for further discussion of mouthing.
9. The fact that no known sign language exhibits an underlying order in which the object would precede the subject (VOS, OVS, or OSV) is less surprising since these orders are also very rare across spoken languages.
10. Sign languages also differ from each other with respect to the sign order in the nominal domain, that is the position of determiners, adjectives, numerals, and quantifiers vis-à-vis the head noun. We will not go into this issue here.
11. Kata Kolok, a village-based sign language of Bali, seems to be an exception to this generalization. Marsaja and Kanta (2005) point out that the only verbs in the sign language that are used directionally with some frequency are the verbs GIVE and TAKE.

12. As pointed out by Zeshan (2004a), sign languages also differ with respect to the size of their paradigm of clause negators. While all sign languages appear to have a negative particle that conveys basic clause negation, some have at their disposal other manual negators with a more specialized meaning, such as negative existentials, negative modals, negative completives, or negative imperatives.
13. Note that DGS has two relative pronouns: RPRO-H is used for human referents and RPRO-NH for non-human referents.
14. But see Branchini and Donati (in press) whose analysis of relative constructions in LIS slightly differs from the analysis proposed in Cecchetto et al. (2006). Branchini and Donati argue that LIS relative constructions are best analyzed as internally headed relative clauses, although they share many properties with correlatives.

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# Occurrence of mouthings in American Sign Language: A preliminary study

*Marie A. Nadolske and Rachel Rosenstock*

## 1. Introduction<sup>1</sup>

The existence of mouth movements in sign languages, that is, mouth movements that are related to the surrounding spoken language, has been investigated extensively for European sign languages since the 1970s (see Vogt-Svendsen 1981, 1983, 1984; Bergman 1984; Schroeder 1985; Boyes Braem 1984). Studies of non-manual components in ASL, however, have traditionally been restricted to those movements specific to sign languages, such as non-manual adverbials (see Liddell 1978, 1980; Baker and Battison 1980). Mouth movements in ASL that are influenced by spoken English have not been investigated in any detail to date. On the contrary, in previous treatments, use of such elements (henceforth: mouthings) has been described as very restricted (see Padden 1980; Baker-Shenk 1983; Boyes Braem 2001).

The present study is the first full-scale study on the use of mouthings in ASL. It was designed to investigate whether mouthings were present in ASL signing at all, and if they do occur, to determine whether and how their occurrence is related to word class. Moreover, we were interested in identifying any possible variation in the use of mouthing due to differences in discourse setting. Our findings indicate that – contrary to what has been claimed in the literature – mouthings contribute significantly to the formal and semantic aspects of ASL, in a similar manner to what has been claimed for European sign languages.

Other more specific avenues of inquiry remain beyond the scope of this study. In the future, additional areas to be investigated include determining if mouthings are required with particular ASL signs, if specific mouthings qualify as morphemic in nature, if there are significant differences in complete and partial mouthings, and if there are significant differences that can be observed between articulated mouthings and those that are produced with some sort of vocalization.

In Section 2, we will say a few words about terminology (Section 2.1) before discussing attitudes of both the Deaf communities and the researchers toward mouth movements (Section 2.2) and reviewing previous work on mouthings in other sign languages as well as ASL (Section 2.3). In Section 3, we explain the method of data collection. The influence of word class on the occurrence of different mouth movement types in ASL will be discussed in Section 4. As part of this discussion, we will compare the results of our study with findings reported in studies on various European sign languages. In Section 5, we will address possible situational influences on the occurrence of mouthings in ASL. We will discuss our findings for ASL in Section 6 before presenting our conclusions in Section 7.

## **2. The role of the mouth in sign languages**

### **2.1. Terminology troubles**

Logically, the mouth can be doing one of two main things while an individual is signing: it can either be moving or it can be stationary. There has been little dispute about labeling and identifying a stationary mouth. However, within the literature addressing mouth movements, various terminologies and definitions have been used, and the lack of standardized terminology can lead to confusion.

There are at least two major groups of mouth movements that have been identified. Boyes Braem and Sutton-Spence (2001) recount some of the terms used to describe mouth movements that have a relationship with a spoken language as well as mouth movements that have no relationship to a spoken language: “Those mouth patterns derived from the spoken language have been termed *spoken components*, *word pictures*, and *mouthings*. The mouth patterns not derived from spoken languages have been termed *mouth gestures*, *oral adverbials*, *mouth arrangements*, and *oral components*” (Boyes Braem and Sutton-Spence 2001: 2f).

Boyes Braem and Sutton-Spence (2001) adopt ‘mouthings’ and ‘mouth gestures’ to refer to the two types of mouth movements, respectively.<sup>2</sup> In the present paper, the term ‘mouthing’ will be used to refer to those mouth movements that are related to spoken language.

## 2.2 Attitudes towards mouthing

Within the ASL research and Deaf communities, the presence of mouthings has been considered solely a contact phenomenon and discounted as a part of “real” ASL, where “real” ASL refers to natural conversations where only Deaf participants are present.

This rejection of mouthing as a part of a natural sign language is by no means universal. Many of the world’s sign language communities accept mouthings as an integral part of their sign language. Schroeder (1985), for instance, described the attitudes of the Norwegian signing community towards mouthings in Norwegian Sign Language (NSL) as follows: “Social norms within the signing community tend to influence signers’ use of mouthing, whether the lip movements imitate Norwegian words or are special oral components. Upon being told that some signers abroad do not use mouthing, NSL signers often exclaim: ‘But, that’s impossible!’” (Schroeder 1985: 197).

The attitudes in Norway have been noted to be the opposite of those in America, not only regarding mouthings, but also in relation to mouth movements specific to sign languages (mouth gestures).

“The negative attitudes earlier associated with mouth movements were found within both the hearing and the deaf population. [...] They seem to have partially vanished over the last 10-15 years. A more common attitude today seems to be an acceptance both of mouth gestures and mouthings as normal sign language elements. One explanation related to why attitudes are changing is sign language research and on the whole an increasing knowledge and acceptance of sign language.” (Vogt-Svendsen 2001: 16)

## 2.3 Previous findings on mouthing

In research on ASL non-manuals, there is a lack of focus on mouthings. One notable exception to this trend is the study of English-to-ASL interpretation by Davis (1989). The primary goal of this study was to investigate various language contact phenomena in an interpreted setting such as code-switching, code-mixing, and lexical borrowing.

Davis conceived of mouth movements in ASL as a continuum. At one end are mouth movements that are clearly a feature of ASL and have never



had a relationship to spoken English; at the other end of the continuum are mouthings that are fully copied from English. “Between these two extremes of full English mouthing and ASL mouthing, there is reduced English mouthing, which for now is best described as a kind of lexical borrowing. Over time, many of these mouthed English words are no longer recognizable as English. In many cases, native ASL users do not even recognize mouthing as a phonological remnant of English” (Davis 1989: 93). This decreasing recognizability of the English origins of some mouth movements may contribute to the American perception that those movements that are clearly related to English are not a part of natural ASL.

Davis does not specify how this lexicalization process happens, or what the linguistic status and acceptability of mouth movements are at various points on the continuum. He mentions that consultants had commented on a particular sign combination that they had never seen before, but did not report any specific judgments regarding the mouth movement usages. He notes, “on the whole, further research is needed in order to adequately analyze and describe the formal-functional range of mouthing and its linguistic underpinnings.” (Davis 1989: 96).

In contrast to the lack of research on mouthings in ASL, for many other sign languages, this phenomenon has been studied quite extensively.<sup>3</sup> Schermer (2001) describes the international situation.

“Interest in this phenomenon came primarily from European researchers. One of the reasons is probably the fact that mouthings did occur in the majority of sign languages in Europe, such as those in Norway, Germany, Italy, Switzerland, and the Netherlands. Another reason is that American researchers were not interested in mouthing in ASL at that time, partly because they thought that mouthing did not play a role in ASL, partly because their research was focused on how different ASL was from any spoken language.” (Schermer 2001: 273f)

It is also probable that the early identification of non-manual mouthings in Europe and the attention they received was due to the noticeable semantic roles that they play in signing which are not so evident in ASL. For Sign Language of the Netherlands (*Nederlandse Gebarentaal*: NGT), Schermer (2001) describes the functions of mouthings as follows: “From the research that was carried out on the lexicon of SLN [Sign Language of the Netherlands] (Schermer 1985, 1990) we know that mouthings that co-occur

with signs in isolation may have one of two functions: to disambiguate minimal pairs or to specify or complement the meaning of the sign” (Schermer 2001: 277). She elaborates:

“Examples of signs that differ minimally by their mouthings are the signs for ‘sister’, ‘brother’ and ‘friend’. Other minimal pairs are the signs for ‘boy’ and ‘man’ and the signs for ‘how’ and ‘when’. By specifying the meaning of a sign, we mean that the manual part of the sign by itself has a very general meaning. Out of context, these signs are incomplete and vague without the mouthing. Examples are the signs for ‘egg’ and ‘bed’.” (Schermer 2001: 278)

Several sets of signs that utilize mouthings in this semantic manner have also been identified in other sign languages such as Italian Sign Language (*Lingua Italiana dei Segni*; LIS; Ajello et al. 2001), Norwegian Sign Language (NSL; Vogt-Svendsen 2001), British Sign Language (BSL; Woll 2001) and Swedish Sign Language (SSL; Bergman and Wallin 2001). Similar semantic functions of mouthings have yet to be identified in ASL.

### **3. Data sources and methodology**

Altogether, 70 minutes of data from Deaf native or near native signers were analyzed for this study. Twenty minutes were taken from a formal situation, namely three lectures at the *Deaf Way I* conference (Gallaudet University, Washington, DC, 1989) in which the audience was predominantly Deaf. Another 20 minutes of excerpts were taken from different stories of the commercially available “ASL Storytime” series produced at Gallaudet University. Lastly, 30 minutes of free conversation from the variation corpus recorded by Lucas et al. (2001) were analyzed.<sup>4</sup> During these recordings, there was either no researcher present at all or a Deaf researcher was operating the video cameras. All the data used in the present study were filmed within a ten year period, thereby not disrupting cohort groups, and allowing each of the age groups to be subject to similar educational and language policies.

A total of 14 different signers were included in the analysis with one individual signing two different stories. The sample included four males and ten females. Signer’s age was determined either through research records or through visual estimation. There were five signers aged 15-25,

eight signers aged 25-45, and one signer 45-60. The majority of the subjects (12) were white. To gain greater control of individual variation and more precise understanding of situational influence on signing, it would have been beneficial to have a single signer providing data for each of the situations. However, this was impossible because the analysis was based on available data which is widely accepted as being representative of ASL throughout the ASL community.

Mouth activities were categorized into three different groups: mouthings, other mouth activity, and no mouth activity. Mouthings were defined as mouth movements resembling a spoken English mouth movement, associated with a gloss or a translation of the sign. ‘Other mouth activity’ was defined as *any* movement of the mouth that did not resemble a spoken English mouth movement. This category should be considered quite heterogeneous as both linguistic movements, such as mouth gestures and non-manual adverbials (e.g. ‘mm’ or ‘th’; see Liddell 1978; Bergman 1984), and non-linguistic movements, such as opening one’s mouth to breathe, are members of this category. Due to the focus of this study, specific subcategories within this group were not noted, and no distinction was made between fully articulated and reduced mouthings. The third and final category was ‘no mouth activity’; this was defined as a relaxed position of the mouth or no change in the positioning of the lips during the production of manual signs.

In Table 1, the different word classes included in this study are shown. Identification of a sign’s word class was based on the sign’s function within the sentence or utterance (see Section 4.1 for further discussion).

*Table 1.* Word classes included in the analysis

Entities	Verbs/ predicates	Modifying elements	High English contact	Other
- nouns	- modal	- adjectives	- conjunctions	-interjections
- pronouns	- plain	- aspect adjectives	- lexicalized fingerspelling	- mouthing w/o sign
- interrogatives (wh-signs)	- directional - aspect - classifiers	- adverbs - determiners - negators	- prepositions	- pointing

Gestures, non-lexicalized fingerspelling, signs for which the word class could not be determined, signs with mouth movements that could not be categorized, and any obscured sign or mouth activity were excluded from final analysis. A total of 5785 signs were included in the study.

All transcriptions and coding of data were entered into an Excel spreadsheet. A representative excerpt from the corpus is shown in Table 2. The first column enumerates the order in which signs occurred. In the second column, a gloss for the sign is given. The activity of the mouth is recorded in the next column while word class categorization is noted in the fourth column. Counts of the total items and counts of those that were excluded are tabulated in the next two columns. In the final three columns in Table 2, the mouth activity categories, as explained above, are tabulated. In the actual data coding, each of the word classes was given a set of three columns, like the ones under ‘example categorization’.<sup>5</sup>

*Table 2.* Example of data coding

	gloss	mouth	word class	total	excl	example categorization		
						9	0	mouthing
184	INDEX <sub>1</sub>	‘mm’	pro	1				1
185	SIT	‘mm’	verb-pl	1				1
186	SWIM	‘mm’	verb-pl	1				1
187	SWIM-OUT	‘mm’	cl	1				1
188	SWIM-BACK	‘mm’	cl	1				1
189	LOOK	wah	verb-dir	1				1
190	STILL	she	adv	1		1		
191	FISHING	feh	verb-pl	1		1		
192	REEL-POLE	%	cl	1				1

#### 4. Mouthing and word class

We start our analysis by investigating the relation between mouthings and word class. The crucial question here is whether mouthings tend to occur

more frequently with one word class than with another. Before reporting our findings in Section 4.2, we first say a few words about the distinction of word classes in sign languages in Section 4.1. In Section 4.3, we compare our findings to those reported for various European sign languages.

#### 4.1 The problem of word classes in sign languages

The distinction between word classes in sign languages has proven to be difficult. While early studies of ASL (Supalla and Newport 1978; Klima and Bellugi 1979) argued for a clear distinction between some pairs of nouns and verbs (such as CHAIR and SIT-DOWN) and nouns and derived adjectives, these distinctions were solely based on form. Padden (1988) suggests a categorization based on grammatical properties, describing adjectives, verbs, and nouns in detail. For instance, she suggests a distinction between predicate adjectives and attributive adjectives, based on their function within a sentence. More recently, Zeshan (2003) argues for a distinction of word-classes in Indopakistani Sign Language (IPSL) based on morphological properties and/or grammatical function. She proposes a paradigm for IPSL that includes three open word classes (signs that cannot be modified in space, signs with changing place of articulation, and directional signs) and several closed word classes (e.g. functional particles and indexical signs).

For the present study, word classes were defined on the basis of both the semantic value of a sign and its function in a sentence. To highlight some possible functions and to illustrate the process of determining word class, we examine the ASL sign DEAF. Three sentences taken from our corpus illustrate three different functions of a single sign (1a-c).

- (1) a. INDEX<sub>1</sub> MEET DEAF BOY  
       ‘I met a Deaf boy.’  
       b. INDEX<sub>1</sub> DEAF  
       ‘I am Deaf.’  
       c. DEAF CL:SIT-ALONG-RIGHT-SIDE-OF-TABLE  
       ‘The Deaf people sat along the right side of the table.’

First, DEAF can function as an adjective, as in (1a) where it modifies the noun BOY within the noun phrase. Secondly, DEAF is commonly used as a stative adjectival predicate (1b). In this use, it was categorized as a plain

verb/predicate in the present study. Finally, this same sign can also function as a noun, as in (1c) where DEAF is the subject of the classifier predicate that follows it.

#### 4.2 Distribution of ASL mouthings

Before considering the distribution of mouthings in ASL in our corpus, the examples from the corpus given in Table 3 highlight some of the attested variation in mouth activities produced with signs of various word classes.

*Table 3.* Examples of the variety of mouth activities and word classes

	gloss	mouth	word class	categorization	
				mouthing	other %
1	IMPORTANT	important	adj	1	
2	TOO	too	adv	1	
3	SEE	see	verb-pl	1	
4	FIRST	ff	adj	1	
5	DURING	doo	adv	1	
6	BORROW	buh	verb-dir	1	
7	SCHOOL	ool	noun	1	
8	COLLEGE	community-college	noun	1	
9	SPREAD	ped-ped-ped	verb-asp	1	
10	INDEX <sub>1</sub>	me	pro	1	
11	INDEX <sub>1</sub>	i	pro	1	
12	OFF-TOPIC	‘thh’	verb-pl		1
13	CL:SHORT-HAIR	(puffed cheeks)	Cl		1
14		vasa-vasa	mouth		1
15	INDEX <sub>1</sub>	%	pro		1
16	POSS <sub>1</sub>	%	det		1

Table 3. Examples of the variety of mouth activities and word classes (cont.)

	gloss	mouth	word class	categorization		
				mouthing	other	%
17	NO-WAY	%	interject			1
18	YEAR	%	noun			1
19	POINT	%	point			1
20	INFORM	%	verb-dir			1

Three examples in Table 3 illustrate the category of other mouth movements. The plain verb OFF-TOPIC (row 12) is produced with an adverbial mouth movement ‘thh’, meaning ‘carelessly’. The puffed cheeks accompanying the classifier sign in row 13 were also classified as ‘other movement’ and are used in this context to intensify the meaning of CL:SHORT-HAIR. ‘Vasa-vasa’ in row 14 is a special case that could be called a non-manual sign since there was no sign produced with the hands, but the utterance consisted of only the mouth movement. In this data, this particular mouth movement was often used to describe conversations between hearing people.

Finally, rows 15 to 20 show the range of signs and word classes that occur without any type of mouth activity. Note that the pronominal sign INDEX<sub>1</sub> occurred both with (row 10 and 11) and without (row 15) mouth activity.

It was hypothesized that those elements that were relatively easily translated from ASL into English and those considered part of more English signing would have a high occurrence of mouthings.<sup>6</sup> Conversely, word classes that were not easily translatable into English, or elements considered more specific to “real” ASL would have a low occurrence of mouthings. Our predictions concerning the occurrence of mouthings are given in Table 4. Note that no predictions were made regarding the occurrence of mouthings in the classes of determiners, negators, interrogatives, pronouns, interjections, and pointing.

Certain word classes were excluded from the main word class analysis presented here due to their low frequency, that is, relative frequency within a single situation of less than 2.5%. The excluded word classes were aspectual adjectives, modal verbs, aspectual verbs, pointing, fingerspelling,

conjunctions, determiners, and prepositions. These classes were, however, included in the analysis of the situational influence (Section 5).

*Table 4.* Predictions concerning the occurrence of mouthings

low occurrence	high occurrence
- adjectives	- nouns
- aspect adjectives	- plain verbs
- adverbs	- modal verbs
- directional verbs	- fingerspelling
- aspect verbs	- prepositions
- classifiers	- conjunctions
- mouthing without a sign (in natural conversation)	- mouthing without a sign (in lecture)

Although the data generated by these word classes exhibited low frequency, there are some potentially interesting observations for both situational and word class distributions; see Section 6 below for discussion. Interjections have also been excluded from the main word class analysis as it became evident that this category, while useful for labeling various discourse elements, was too heterogeneous to yield reliable mouth activity associations.

The results shown in Figure 1 demonstrate some patterns regarding the distribution of the three mouth activity types across the major word classes. It can be seen that the occurrence of mouth activity categories follows a trend across word classes, with the notable exception of pronouns. In general, ‘no mouth activity’ and ‘other mouth activity’ follow the same pattern of occurrence. That is, the relative frequency of both these categories increases across these word classes. In contrast, mouthings decrease as the other two categories increase. For pronouns, the pattern of reduced mouthings and increased ‘no mouth activity’ is maintained, however, the frequency of ‘other mouth activity’ does not increase in the same way as it does for the other word classes.

Four of the seven major word classes given in Figure 1 exhibited more than 50% frequency of mouthings. Nouns and adjectives had occurrences near 80%, and adverbs and plain verbs had occurrences between 50-60%. The three more morphologically complex classes (directional verbs, pronouns, and classifiers) had occurrences of less than 50%. Pronouns and



directional verbs were between 30-40%. Classifiers had by far the least occurrence of mouthings with less than 7%.

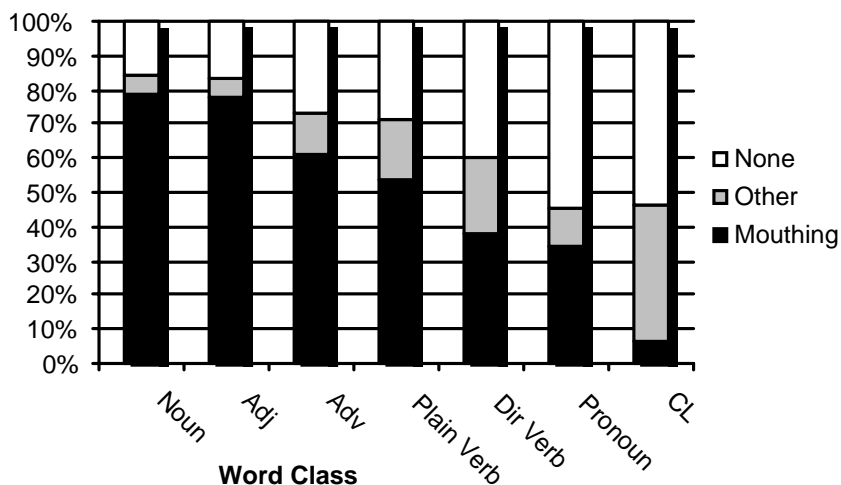


Figure 1. Mouthings across major word classes

The specific classifier signs that had mouthings were very limited. Only a few lexical items in this class allowed the concurrent production of a mouthing. Classifier signs also exhibited other mouth activity (nearly 40%) more frequently than the other classes.

In sum, many of the predictions made regarding mouthing occurrence were confirmed by the data (see Table 4). The notable exceptions were adjectives and adverbs, in which mouthings were quite frequent despite low predicted occurrence. Nouns, plain verbs, directional verbs, and classifiers did exhibit mouthing frequencies in accordance with the prediction. No prediction had been made regarding pronouns and the data indicates that this class does behave in an atypical way: pronouns exhibit a disproportionately low occurrence of ‘other mouth activity’ and a relatively high frequency of mouthings and ‘no mouth activity’.

### 4.3 Mouthings in other sign languages

Many previous studies of mouthings have focused on the coordination of the manual and non-manual portions of signs and sentences in various sign

languages, as well as on the completeness of individual mouthings. As stated previously, this study of ASL has a different focus, but many of the observations made for other sign languages will likely hold true for ASL, too. To illustrate some of these observations, we will briefly discuss some illustrative examples from NSL and NGT.

In NSL, the production of the sign DØV (‘deaf’) is accompanied by a mouthing that coincides with the movement of the sign (Vogt-Svendsen 2001: 11). That is to say that the first part of the mouthing is simultaneously produced with the first part of the sign, and the final portion of the mouthing is produced at the same time as the final position of the manual sign. In other words: the manual and the non-manual part are synchronized.

The relative completeness of mouthings has also been noted in many previous studies. Schermer (2001: 278) illustrates the use of both complete and reduced mouthings for NGT. Complete mouthings resembling the spoken Dutch translation are observed in signs such as SNEEUWEN (‘to snow’), GEIT (‘goat’), and GOEDKOOP (‘cheap’). Some signs, however, have reduced forms as shown in Table 5 (see Table 3, rows 4-7, for examples of reduced mouthings from our corpus).

*Table 5.* NGT signs with reduced mouthings (adapted from Schermer 2001: 278)

Gloss	Mouth
BUITEN (‘outside’)	bui
KINDEREN (‘children’)	kinder
MOEDER (‘mother’)	moe

Our findings replicate in many regards previous results concerning the relationship between the occurrence of mouthings and word class. Recent studies on several European sign languages find a correlation between word class and mouthing occurrence, and the ASL distribution for the mouth activity types also follows this pattern.<sup>7</sup>

Similar to our study, most previous studies have found that nominal signs are accompanied by mouthings more frequently than morphologically more complex signs, such as inflected verbs or classifier constructions. This distribution is found, for instance, in Finnish Sign Language (FinSL): “In standard FinSL used by native deaf adults [...], the Finnish mouthings appear to coincide mostly with signs that could be classified as nouns”

(Rainò 2001: 42). Similarly, in NSL “[s]igns with mouthings are mainly nouns and non-modified verbs [...] and only exceptionally are they modified verbs and classifier verbs” (Vogt-Svendsen 2001: 17). Sutton-Spence and Day (2001) report that in British Sign Language (BSL), mouthings are used very frequently with nouns (88%) and adjectives (77%), and are used to a lesser extent with verbs (60%) and pronouns (53%). For Swiss German Sign Language (DSGS), more frequent use of mouthings in nouns, verbs and adjectives/adverbs were noted in comparison to other word classes (Boyes Braem 2001: 123). The pervasive nature of mouthing production with nouns has also been noted for German Sign Language (DGS) (Ebbinghaus and Heßmann 2001: 127).

Schermer (2001) notes that the high mouthing occurrence for certain word classes in NGT is not limited to those mouthings produced with a manual sign but also holds true for those produced without a manual sign. Interestingly, of all of the mouthings without a sign 60% were prepositions, function words, and adverbs. Nouns accounted for only 11.75% of these items while 28.25% of the mouthings without manual sign were verbs (Schermer 2001: 275). In other words: the distribution of mouthings in relation to word class is reversed for mouthing without a manual part. In fact, Schermer (2001) considers this type of mouthing to be highly influenced by spoken Dutch.

Finally, the completeness of an articulated mouthing has also been found to be related to word class. For LIS, Ajello et al. (2001: 75) observe that more complete forms of mouthings occur primarily with nouns, although complete mouthings do occur with other word classes, too.

## **5. Mouthing and situational variation**

### **5.1 Situational influences on signing**

Changes in the form of signing based on specific discourse settings have been observed for ASL (see Milroy in Woll et al. 2001). Zimmer (1989) examined a single ASL signer in three different situations: a formal lecture, an informal talk, and a television interview. She found differences in signing between these three relatively formal situations that ranged from the phonological to the syntactic and discourse level, and specifically found that the signing in the formal lecture situation behaved differently from the other two situations.

Zimmer reports that individual signs were of longer duration in the lecture. Certain morphological inflections were exaggerated here and fewer phonological processes were utilized; both these aspects contributed to the longer duration of the signs. When exaggerated morphological inflections were used, they often replaced a non-manual that had a similar meaning that would have been used in other less formal situations. Certain lexical items that were used in the other situations were avoided in the lecture situation, for example the sign EXPERT (F-handshape at the chin). Finally, conjunctions were used in lectures that were not used in the less formal situations.

Various parts of the lecture behave differently at the non-manual level. Zimmer (1989) highlights the two main portions of the lecture, referring to them as the main text and direct speech, which is now commonly referred to as role-shift.

“Nongrammatical facial expression is also used differently in the main-body versus direct-speech portions of the lecture. Facial expression is minimally used in the body of the text, whereas it is used at a level that is often quite exaggerated in the portions of direct speech. A clear exemplification of meaningful nonoccurrence of facial expression in the lecture involves the use of the sign IMPORTANT. There is a non-manual marker that is often used as an intensifier with this sign. It consists of a movement of the lips in which the signer appears to be saying “po.” This non-manual marker is not used in the body of the lecture, even when the meaning is clearly ‘very important’. The intensified meaning is indicated, instead, by exaggeration and intensification of the movement of the sign. This absence of facial gestures in the body of the lecture happens even when the gestures have lexical significance. The only way to distinguish between the lexical items NOT-YET and LATE is by a position of the mouth and tongue. In the body of the lecture, even this facial gesture is frequently omitted.” (Zimmer 1989: 268f)

She also notes different articulations based on word class and differing use of various syntactic structures across the situations, but in the interest of space, these findings will not be enumerated here.

## 5.2 Distribution of mouth movements

Given that the form of signing may vary in different discourse settings and, more specifically, that it has been reported previously that mouthings are used in formal but not informal settings, situational variation was examined in this study. Following the prevailing American attitudes regarding mouthings, it was hypothesized that as the formality of the situation increased, the production of mouthings should also increase. Therefore, it was expected that lectures would have the highest occurrence of mouthings, storytelling would have the second most, and natural conversation would have the least amount of mouthing.

However, the actual distribution of the three mouth activity categories in natural conversation and in the lecture turned out to be fairly similar (see Figure 2). For these two situations, the relative frequency of all of the mouth activity categories differed by less than 2%. In contrast, distribution of mouthings in the storytelling proved to be quite different. There was a much lower occurrence (42.4%) of mouthings in this situation when compared to the other two situations ( $m = 60.45\%$ ). In addition, there was a much higher occurrence of ‘other mouth activity’ (33.7%) in storytelling than in the others ( $m = 6.1\%$ ).

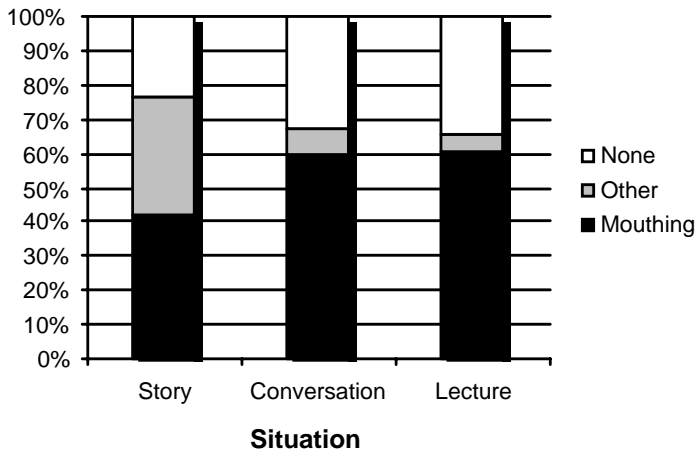


Figure 2. Situational variation

Finally, there was a difference of approximately 10% between the mean occurrence of ‘no mouth activity’ in the lecture and the natural conversation (33.85%) and the 23.9% occurrence in storytelling.

In the stories included in this analysis, a high use of ‘other mouth activity’ stands out. This might be related to the relatively higher use of morphologically more complex signs. Specifically, the high occurrences of CLs within the storytelling genre suggest the use of more non-manual adverbs, which fall into the ‘other mouth activity’ category.

For conversations, the difference between beginning and end of a conversation is most striking. While most conversations start out with a tentative, more formal style including the more frequent use of mouthings, most signers make use of mouthings less frequently once they have established a connection with the conversational partner and understand the interlocutor’s preference for a natural language, as opposed to an artificial sign system.

Lectures consistently have a high number of mouthing occurrences. At the same time, the signers included in this study used a very small number of mouth movements specific to sign languages. The more infrequent use of ‘other mouth activity’ could be due to the nature of the setting. Classifiers and other morphologically more complex signs that tend to be accompanied by other mouth activity occurred less frequently in lectures than in the other genres included in this study.

In sum, the predictions made regarding the frequency of occurrence of mouthings across different situations in ASL were not confirmed to the extent as those made regarding word class. It was assumed that the formality of a situation would be the primary factor influencing mouthings prevalence, and that therefore, lecture would have the highest, storytelling the second highest, and natural conversation the lowest occurrence of mouthings. While the data show that the lecture does indeed have the highest occurrence of mouthings, it turned out that the second highest occurrence is in natural conversation and the lowest in the storytelling situation – contrary to expectation.

Some of the before-mentioned European studies also show a correlation between discourse setting and use of mouthings. For BSL, Sutton-Spence and Day (2001) describe the use of mouthings in different registers and find a significant difference between narrative and information-giving registers. Schermer (2001: 275) also reports that the production of mouthings was lowest in the situation where the signer retold a story from a picture book, in comparison to a story that was retold from written Dutch and natural conversation. Situational variation has also been identified in FinSL. “The use of mouthing along with signing varies from signer to signer and it depends on the situation. If there are hearing people in the audience or if

the signer wants to emphasise being bilingual, fully mouthed words may appear more frequently” (Rainò 2001: 41).

### 5.3 Situational variation, word classes, and mouthing occurrence compared

Situational variation is also evident within most of the word classes. This becomes clear when we compare the occurrence of mouthings with pronouns across the different settings (as shown in Figure 3).

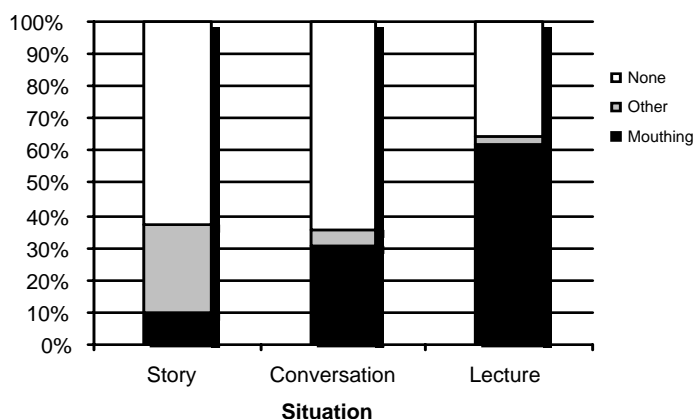


Figure 3. Mouthing occurrence with pronouns across situations

While pronouns in ASL lectures are accompanied by mouthings in over 60% of all cases, fewer than 10% of pronouns are used with mouthings in the stories. The occurrence of ‘other mouth activity’ with pronouns is very low in both lectures and natural conversation, but relatively high in storytelling. A similar kind of variance of ‘other mouth activity’ for word classes and situations can be seen in the use of classifiers (Figure 4).

The occurrence of mouthings with adjectives and nouns, however, seems to be relatively stable across discourse setting in comparison to the other word classes. Figure 5, for instance, shows that nouns were accompanied by mouthings with high frequency across all three settings.

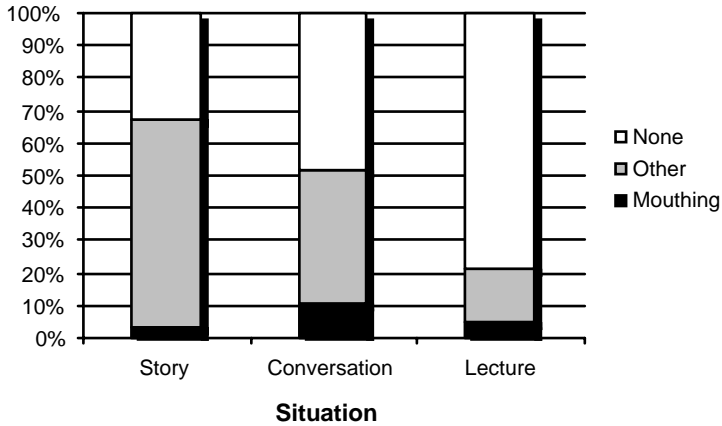


Figure 4. Mouthing occurrence with classifiers across situations

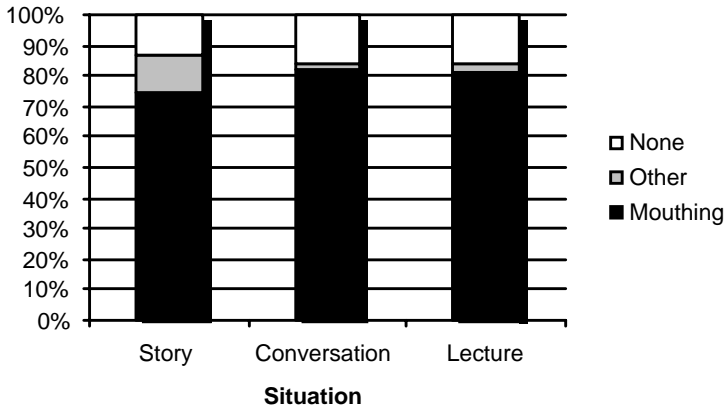


Figure 5. Mouthing occurrence with nouns across situations

Only storytelling exhibits a slightly higher number of other mouth activity relative to both lectures and natural conversation. This may be due to the fact that other discourse factors, such as reenacting a character, could change the actually produced type of the mouth movement from one that could be expected based on production of the same sign in an utterance that does not have such a shift in perspective.



## 6. Summary and discussion

As stated above, there were certain word classes that were excluded from the main word class analysis due to their low frequency. Most of the excluded classes were deemed to be too infrequent (less than 2.5% relative frequency) in all of the situations; these included aspectual adjectives, conjunctions, determiners, modals, mouth movements without a sign, and interrogatives.

There were some classes that surpassed the 2.5% threshold for relative frequency in only one or two of the three situations, but were still excluded from the main analysis. Lexical fingerspelling, for instance, was only produced at low frequency in the natural conversation. It is interesting to note that it is commonly accepted in the ASL communities that this type of fingerspelling is a legitimate part of the language, and is embraced as being sufficiently altered from the contact phenomenon from which it originated. There were two more excluded classes that only failed to be frequent within one of the situations: pointing in the lecture situation as well as aspectual verbs in storytelling. Finally, prepositions were excluded from the main word class analysis due to their low frequency within the stories. This word class is not universally accepted to be a part of “real” ASL by white ASL users, and can be viewed as a feature of contact with English and its derived sign systems. Conversely, black ASL signers often have differing judgments about the acceptability of the preposition class. They often regard prepositions as no longer being a contact phenomenon but rather, as a part of “real” ASL (see Lucas and Valli 1992 for further discussion).

Another interesting observation concerns the distribution of mouthings across different verb types. While most previous mouthing studies that examine the relation of mouthings to word classes either consider verbs as a single group or split them up into an inflected and uninflected subgroup, we distinguished five types of verbs: plain verbs, directional verbs, classificatory verbs, aspectual verbs, and modal verbs. Figure 6 shows the distribution of mouth movements for each of the five verb types. Interestingly, many of the verb types behave quite differently with respect to co-occurring mouth movements. These data indicate that in future studies of sign language word classes, it may be beneficial to identify subclasses to better understand the relationships between different factors.

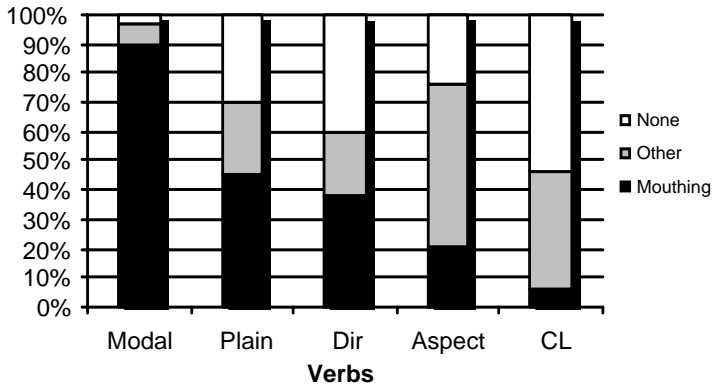


Figure 6. Comparison of verb types

Yet another interesting aspect that emerged from our analysis was the observed individual variation. It is true that there are patterns within situations and within word classes; however, individual signers can differ drastically in the extent to which they use mouthings. An example of the kind of individual variation observed can be seen in Figure 7.

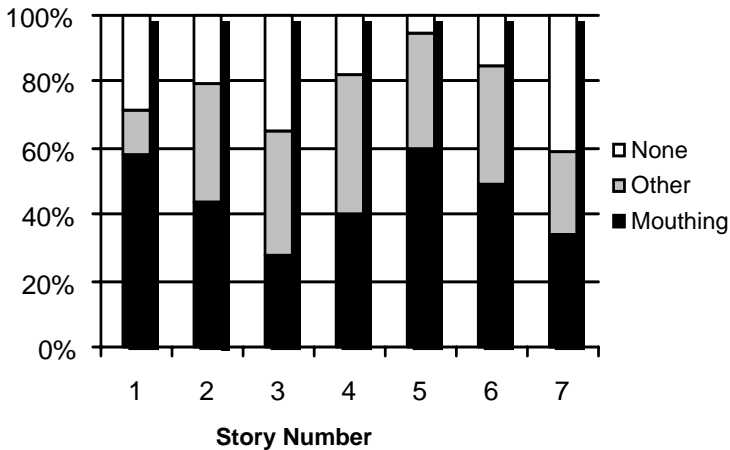


Figure 7. Mouthing distribution across stories

The most dramatic differences between signers were observed in stories 3 and 5. The signer in story 3 used less than 30% of mouthings throughout the story, whereas the signer in story 5 used mouthings nearly twice as

frequently at about 60% of the time. In contrast, the distribution of mouth movements was fairly similar in stories 2, 4 and 6. In fact, two of those stories, numbers 2 and 6, were the only ones produced by the same signer. This may indicate that a single signer may have a tendency to produce similar amounts of mouth movement types within the same situation even though there may be some variation depending on the particular content of the utterances used.

Figure 7 also illustrates that mouthings were used by all of the signers even within a situation that had a lower overall occurrence of mouthings. This final observation holds true for the other situations as well.

## **7. Conclusions and directions for future research**

Overall, the results show a higher use of mouthings in ASL than previously described. When comparing the different discourse settings, natural conversations exhibited more use of mouthing than storytelling. This is an unexpected finding given that the formality of the situation has been shown to affect mouthing production in ASL. Possibly, the nature of the story data influenced these results. The video series “Storytime”, from which the analyzed sections were taken, are produced as instructional videos. The artificial nature of this material and the lack of an audience might lead the signers to dispense with mouthings as an additional channel of information. On the other hand, the amount of mouthings used in natural conversations seems to be strongly influenced by the degree of familiarity between the participants in the discourse. The more familiar the conversational partners are with each other, the fewer mouthings seem to be used. The participants in this segment of the study were not acquainted prior to filming. Further research will have to investigate this relationship further.

For future studies on mouthings and word classes, a more differentiated system of determining word class will be necessary. Similarly, the syntactic category of a sign and the position of a sign in a sentence might be additional factors that influence the occurrence of mouthings. Many studies in European sign languages include information on the completeness of mouthings, demographic information on the signers, and other factors influencing the occurrence of mouthings. A comparison of older videos of ASL and current data could reveal historical changes in the use of mouthings. Research on mouthings in ASL will need further, more

encompassing studies to provide similar information on the usage of mouthings today.

Informal observations by the authors have also illuminated two additional areas of inquiry, which could add to our understanding of the forms and functions of these mouth movements. The first would be a cross-linguistic comparison between ASL and other sign languages that also come in contact with some variety of spoken English, e.g. BSL or Australian Sign Language. This could provide insight into the preference for specific mouth patterns in two or more sign languages that have differing origins, but have come into contact with the same spoken language. The second area of inquiry could help clarify the status of mouthings in ASL beyond the findings presented here. It has been informally observed that Deaf ASL users who have lost their vision later in life still produce mouthings when conversing with another Deaf-Blind individual. If this observation turned out to be accurate, we would have additional evidence that mouthings in visual ASL or Tactile ASL are not solely being produced for the benefit of a mixed audience who need the mouthed English information to understand what is being signed.

## **Notes**

1. The authors would like to thank those individuals who have in some way aided us in this inquiry. Most importantly, we would like to thank the subjects in the study who had actually been videotaped for other purposes, but also provided us with invaluable data. We are also indebted to Scott Liddell who provided the impetus and guidance in the early stages of this project, and to Debra Kenny and Stephanie Caplan for their work on an earlier study. We would like to thank Ceil Lucas for allowing us to use portions of her variation corpus to be included in this work. Although these individuals and others have provided assistance and allowed us to discuss ideas contained in here, as always, the authors remain responsible for any errors or omissions in this text. The preparation of this paper has been partially supported by the National Institutes of Health, National Institute of Deafness and other Communication Disorders grant DC005241.
2. “Lengthy discussion at the workshop failed to produce a consensus for a single terminology. Some of the proposed terms were already being used outside of the field of sign language research; some did not translate well in different languages; some were felt to be too widely encompassing and some

- were misleading. [...] In a true spirit of European compromise, the members of the workshop agreed to continue working without a consensus” (Boyes Braem and Sutton-Spence 2001: 3).
3. In the interest of space, this paper will briefly discuss the large body of literature that has been compiled regarding mouthings in various European sign languages. Note, however, that this phenomenon has also been investigated in non-European sign languages (see, for example, Dubuisson et al. (1992) for Quebec Sign Language and Zeshan (2001) for Indopakistani Sign Language).
  4. Grant SBR Award #9310116 and #9709522.
  5. The symbol “%” was used to denote no mouth activity, and the single quotation marks around the mouth movement notation were used to identify other mouth activity.
  6. It should be noted here that the research findings presented in Boyes Braem and Sutton-Spence (2001) were not available to the researchers at the time the hypotheses were developed for this project in 2001. Therefore, the predictions concerning the occurrence of mouthings could not be guided by the findings presented there.
  7. A difficulty in comparing the results reported here directly to the results reported in other studies is due to the fact that in most studies, no detailed description of how the word class of a given sign was determined is given.

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# **Do all pronouns point? Indexicality of first person plural pronouns in BSL and ASL**

*Kearsy Cormier*

## **1. Introduction<sup>1</sup>**

One of the unique properties of signed languages is that they exhibit a high degree of isomorphism. That is, many characteristics of signed languages involve a close relationship between form and meaning, much more so than spoken languages. Such characteristics include iconicity, topographic space, and indexicality. Iconic signs are those that visually resemble their referents; for example, the sign CAT in some signed languages represents the whiskers of a cat. Topographic use of the signing space maps onto real-world space, such that placement of signs in particular locations in the signing space reflects entity locations in real-world space. Indexic signs are those that point toward (or are located at) the location associated with their referents.

In this paper, I present evidence from both American Sign Language (ASL) and British Sign Language (BSL) suggesting that the pronominal systems of these signed languages, particularly first person plural forms, may under some circumstances lose their indexicality. This loss of indexicality, I argue, is largely due to two types of tendencies: one motoric and one linguistic. Furthermore, I also present evidence suggesting that there may be some variation in indexicality across signed languages.

I first define the notion of indexicality in more detail and provide an overview of analyses of signed language pronominal systems in Section 2. Section 3 outlines the research questions concerning the existence and indexicality of first person plural pronouns in ASL and BSL, and Section 4 describes the data elicitation task and the coding system. The results of the study are presented in Section 5 in a comprehensive discussion of the different types of first person pronouns used and the different contexts in which they occur. After a summary of these results in Section 6, the final section addresses areas for future research (Section 7).

## 2. Background

### 2.1. Indexicality

Indexic signs are those that ‘point to’ a location in space associated with a referent (or referents). Here I define the term indexicality as the extent to which such pointing occurs. The indexicality of some signs is quite strong. For instance, singular pronouns quite literally point to their referents. Some verbs are also highly indexic in their singular forms – for example, spatial verbs (which include classifier predicates) and agreement verbs. Rather than literally pointing, these signs instead move between locations associated with the subject and object, or source and goal, or in the case of intransitive verbs of location, are positioned at the location associated with the argument (Lillo-Martin and Klima 1990; Meir 1998; Padden 1988).

Plural pronouns and verbs, on the other hand, are somewhat less indexic. For instance, Klima and Bellugi (1979) note a loss of indexicality for plural pronouns over time. They note the progression of the ASL sign WE from a series of pointing signs to each referent (ME + HIM + HER + HIM + YOU ... + ME) to the current sign that consists of only two points on the signer’s chest (as illustrated below in Figure 1). The sign was once highly indexic, pointing to each referent, but now is much less indexic and does not point to any referents other than the signer. This seems to suggest that the indexicality of plural forms may be somehow less important than the indexicality of singular forms.



*Figure 1.* WE-CENTRAL (ASL)

## 2.2. Person in signed languages

Before exploring the issue of indexicality in signed languages further, it is important to discuss the issue of person in signed languages, that is, how participant roles are encoded (or not encoded) in the grammar.

### *2.2.1. Three-person system*

Sign languages, like all languages, have ways of distinguishing various participant roles (e.g. signer, addressee, and non-addressed participants). On the surface, sign language pronouns seem to act very much like pronouns in other languages that have a three-person system. That is, sign languages have pronominal signs that can refer to the signer, addressee(s), and non-addressed third participant(s). Thus, Friedman (1975) in one of the first analyses of person in a signed language uses a three-person system to analyse pronominal reference in ASL. Others since then have also used a three-person system to describe “referential indexing” (Klima and Bellugi 1979) or “indexic reference” (Padden 1988, 1990).

### *2.2.2. Locus feature*

One problem with positing a three-person system for ASL is that if the feature in question were person, each non-signer and non-addressed participant present would have the same value (i.e. third person). However, there are theoretically an infinite number of ‘third person’ location values (i.e. locations associated with referents other than the signer or addressee) that can be assigned to an indexer or verb. Thus, following Lacy (1974), there have been several proposals that steer away from a person analysis and instead analyze the locations associated with pronouns and agreeing verbs as variables (‘loci’) whose content comes from discourse (Cormier et al. 1999; Lillo-Martin and Klima 1990).

Bahan (1996) and Neidle et al. (2000) have a similar analysis in which agreement is with a bundle of phi-features, and information from this bundle “constitute[s] the ‘person’ feature” (Bahan 1996: 84). These analyses are based loosely on the locative analysis of Gee and Kegl (1982). Janis (1995) also has a locative analysis of agreement (with no reference to

person) in which nominals are assigned locative case and verbs agree with these locations.

### 2.2.3. *Gestural analysis*

One characteristic that the above analyses share is that they all consider pronominal reference to be linguistic, either morphologically or in terms of the discourse structure. Liddell (1990 and subsequent publications) does not believe that the locations associated with pronouns and certain verbs are grammatical.<sup>2</sup> Previous proposals, he says, all share the assumption that some sort of spatial morpheme is attached to the pronoun or verb. However, he claims that there can be no representation of these spatial morphemes in the grammar because (a) the list of morphemes in the grammar would have to be non-discrete and infinite, while the nature of morphology typically demands that morphemes be discrete and finite, and (b) pronouns and verbs are directed not towards specific points in space, but towards general areas that vary depending on the verb and on the referent. In particular, Liddell notes the striking similarities between the use of space with pronouns in ASL and the use of space with deictic points used by hearing gesturers.

To address these problems, Liddell offers a very different description of the way ASL verbs use space. Liddell claims that the relationship between indicating verbs (his term for agreeing verbs) and location is not linguistic (and therefore not what is normally considered ‘agreement’). Instead he claims that verbs point to people and objects in the same way that hearing people normally use gestures to point to people and objects. He assumes that signers use these pointing gestures both when the referents are present and also when the referents are not present (in which case signers point to people and objects as if they were present). According to Liddell (1995), the only linguistic (i.e. lexically specified) information within pronouns and indicating verbs is the hand configuration, certain movements, and possibly palm orientation.

“I adopt a solution for [pronouns] and for indicating verbs in which the handshapes, certain aspects of the orientations of the hand, and types of movement are lexically specified through phonological features, but for which there are no linguistic features identifying the location the hands are directed toward. Instead, the hands are directed

toward the specific part of the referent's body by non-discrete gestural means.” (Liddell 1995: 26)

#### *2.2.4. First vs. non-first person*

Although both the locus feature analyses and Liddell’s gestural analysis avoid the problems with an analysis that has multiple third person values<sup>3</sup>, none of them address the special status of first person in signed languages. Meier (1990) notes that there is no single default location associated with addressee(s) and non-addressed participant(s). The use of space with pronouns directed toward these participants is fully gradient, and the different distinct locations that can be referred to with these pronouns are non-listable and potentially infinite in number.<sup>4</sup> There is a single default location associated with the signer, however – the centre of the signer’s chest. This is Meier’s primary argument for a distinct first person category.

Furthermore, Meier (1990) notes that the modern ASL first person plural form WE is idiosyncratic – that is, it does not point to its referents in the way that other pronouns do. Although the first person singular form ME seems to follow the general pattern of a point to the referent (specifically, a point to the signer’s chest), Meier notes that this sign does not invariably refer to the signer. In the discourse strategy known as role shift, which can function as a method of direct quotation, a point to the self refers to the person whose role the signer is assuming (i.e. the person being quoted), not the signer him/herself, similar to direct quotation in speech. This can only happen in languages with a first person category, since the signer/speaker within a direct quotation may not be the same as the signer/speaker at the time of utterance.

Meier (1990) therefore proposes a two-person system: first person and non-first person. According to this analysis, there is no grammatical distinction between second and third person, since as Meier notes, the only factor distinguishing reference to the addressee from reference to a third person is eye gaze. Even eye gaze is not always a reliable distinction, since signers typically, but not always, look at their addressees.

Many researchers currently follow Meier’s view about a two-person system in ASL, including Padden (1990), Lillo-Martin (1995), Emmorey (2002), and Rathmann and Mathur (2002). This two-person system has been attributed to other signed languages as well, including Danish Sign Language (Engberg-Pedersen 1993), Polish Sign Language (Farris 1994),

and Taiwan Sign Language (Farris 1998).<sup>5</sup> Even Liddell, who earlier (2000) rejected Meier's two person system, more recently (2003) has accepted this analysis, affirming the special status of first person.

### 2.3. First person plural

Another way in which first person can be considered to have special status is in its plural form. The notion of first person plural is unusual within any language. Other plural categories generally take a noun or pronoun X and change it to mean 'more than one X'. But first person plural generally does not indicate more than one speaker or signer – rather, it indicates the speaker or signer plus other addressees and/or non-addressed participants (Lyons 1968).

As noted above, one of Meier's (1990) arguments for the special status of first person in ASL is that the first person plural pronoun WE in ASL is quite idiosyncratic in form – specifically, that it does not point to any referents other than the signer. Semantically ASL WE follows the pattern of spoken languages just noted, that is, it indicates the speaker or signer plus other addressees and/or non-addressed participants.

The special status of the first person plural category can also be seen by the fact that some languages have developed various distinct sub-categories within the first person plural. One such sub-category is an inclusive/exclusive distinction. In most languages that have this distinction, inclusive forms include a second person referent while exclusive forms exclude a second person referent. One example of such a language is Tagalog, an Austronesian language spoken in the Philippines. Tagalog has a first person plural inclusive pronoun *kami* meaning 'we including you' and a separate first person plural exclusive form *tayo* meaning 'we excluding you' (Forchheimer 1953).

Although an inclusive/exclusive distinction has been identified for many spoken languages, this distinction has been explored very little within the sign language modality.

## 3. Research questions

The current study investigates first person plural forms in two signed languages, with particular attention to inclusive/exclusive distinctions.

Previously, I have shown that ASL has a distinct exclusive form of the first person plural pronoun WE (Cormier 2002, 2005). The current study extends these previous studies by adding data from British Sign Language (BSL). It also looks more in depth at the indexicality of first person plural forms (inclusive and exclusive forms).

In particular, the aims of the current study are to compare ASL and BSL with respect to:

- The inventory of first person plural pronouns
- The status of first person as a category
- Inclusive/exclusive forms
- The indexicality of first person plurals, in general, and specifically of inclusive/exclusive forms

#### **4. Methods**

This section outlines the methods used for both the ASL and BSL studies. The methods for the BSL study were very similar to those used for ASL in Cormier (2002, 2005).

##### **4.1. Participants**

The ASL study included three Deaf native signers of ASL (Cormier 2002, 2005). The BSL study included three Deaf native signers of BSL. All signers grew up in Deaf families where ASL or BSL was the primary language used in the home. Signers were recruited through personal contacts within the Deaf communities in Austin, Texas (USA) and Bristol (England).

##### **4.2. Stimuli and task**

The stimuli for this study consisted of a script in English and a set of visual aids. The script contained descriptions of various scenarios which the signer was meant to read. For each scenario, the script instructed the signer to imagine that he/she was engaged in conversation with one or more other signers (the number for each scenario was specified). Each scenario gave a context for this conversation. The signers were instructed to read through



each scenario. At the end of each scenario, there was a statement to be translated into ASL or BSL that used *we*, *us* or *our*. Signers were asked to translate each of these statements, assuming the given context. All productions were videotaped.

Along with the scripts, in which the signer was addressed as ‘you’, signers were also provided with visual aids, a set of small figurines that were placed on a table in front of the signer. Each figurine was labelled, one as **You**, one as **B**, one as **C**, **D**, **E**, etc. These figurines were meant to help the signers visualise the location of referents in the discourse situation. The figurine labelled **You** was placed directly in front of the signer at his/her midline, facing forward (away from the signer). The other figurines were placed in front of and facing the **You** figurine – either all on the left, all on the right, or scattered (see Table 3 below for more information on the placement of the visual aids). Two sample scenarios from the script are given in examples (1) and (2) below. Figure 2 shows a bird’s-eye view of the set-up, including the location of the signer as well as the visual aids with respect to the signer; this setup was used for both examples (1) and (2).

- (1) **You** and ten others (including **B** & **C** & **others**) don't have much in common. During a conversation, you realize that you are all cat lovers.

**B** asks **you**:

Do we all have anything in common?

**You** answer **B**:

*Yes, we like cats.*

- (2) Many people (including **you** & **others**) are having a discussion. Everyone except **B** is a cat lover; **B** likes dogs.

**B** asks the group:

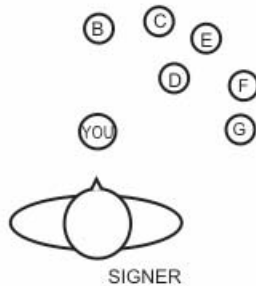
I like dogs. Do all of you prefer dogs or cats?

**You** answer **B**:

*We like cats.*

Example (1) presents an inclusive context – that is, the target sentence (shown in italics) should include the addressee. Example (2) shows an exclusive context – that is, the target sentence should exclude the addressee. In each instance, in order to translate the target sentence appropriately (particularly the pronoun), the signer had to combine

information from the given context with information from the position of the visual aids.



*Figure 2.* Bird's-eye view of discourse scenario for examples (1) and (2), showing location of signer and visual aids **You**, **B**, **C**, **D**, etc.

The examples above represent many (an unspecified number of) referents – these examples were meant to elicit inclusive and exclusive variants of the plural pronoun **WE**. Other contexts were devised to elicit inclusive/exclusive variants of the dual pronoun (**TWO-OF-US**), the trial form (**THREE-OF-US**) and the first person plural possessive **OUR**. In each scenario, the number of referents was varied (two, three, or unspecified many).

The verbs used were varied as well (plain verb **LIKE**, transitive agreement verbs **WATCH** and **KISS**, ditransitive agreement verb **GIVE**), as was the argument position of the first person plural form (subject or object). The sentence for the possessives was the same in each instance ('Our land is for sale.') Furthermore, the location(s) of the visual aids were varied (toward the signer's left or right side) to determine if the location of the referents had any effect on the pronoun (or pronoun variant) produced. In total, 64 stimuli scenarios were presented.

Table 1 shows a breakdown of the 64 different scenarios that were presented in the scripts. The scenarios differed according to the following variables: number, inclusive/exclusive context, argument position of the pronoun, as well as verb and distribution (for certain verbs). Furthermore, there were other scenarios added to elicit possessives; these were broken down to include collective versus distributive possessives, such that 'our

(collective) land’ would indicate ‘the one piece of land that we possess together’ while ‘our (distributed) land’ would indicate ‘the separate plots of land that each of us separately possesses’.

*Table 1.* Breakdown of contexts included in scripts

	<i>Dual incl</i>	<i>Dual excl</i>	<i>Trial incl</i>	<i>Trial excl</i>	<i>Trial excl (dist)</i>	<i>Plural incl</i>	<i>Plural incl (dist)</i>	<i>Plural excl</i>
‘we like’	x	x	x	x		x		x
‘like us’	x	x	x	x		x		x
‘we help’	x	x	x	x		x		x
‘help us’	x	x	x	x		x		x
‘we kiss’	x	x	x	x		x		x
‘kiss us’	x	x	x	x		x		x
‘we give’				x	x	x	x	
‘give us’				x	x	x	x	
‘we watch’				x	x	x	x	
‘watch us’				x	x	x	x	
‘our (coll) land’	x	x	x	x		x		x
‘our (dist) land’	x	x	x	x		x		x

Table 2 further describes the labels used to indicate combinations of number and inclusive/exclusive categories in Table 1.

Table 3 describes the location of the visual aids in each set of scenarios. As noted above, in every instance, the figurine labelled **You** was placed directly in front of the signer at his/her midline, facing forward (away from the signer) and was meant to represent the signer’s location with respect to the location of the other referents. The other figurines were placed in front of and facing the **You** figurine. The figurine meant to represent the addressee (in most cases, figurine **B**) was in each instance placed directly in front of the figurine **You**. The other figurines were placed either to the left and to the right of the addressee figurine, or scattered on both the left and right around the addressee figurine, as noted below.

*Table 2.* Description of number + inclusive/exclusive categories (number of referents included & excluded) in Table 1

<i>Context meant to elicit:</i>		<i>No. referents included</i>	<i>No. referents excluded</i>	<i>Total no. referents involved</i>
Du incl	Dual inclusive forms	2	0	2
Du excl	Dual exclusive forms	2	1	3
Tr incl	Trial inclusive forms	3	0	3
Tr excl	Trial exclusive forms	3	1	4
Tr excl (dist)	Trial exclusive forms with distributed verb reading (e.g. 'we each give')	3	1	4
Pl incl	Plural inclusive forms	many (unspec)	0	many (unspec)
Pl incl (dist)	Plural inclusive forms with distributed verb reading (e.g. 'we each give')	many (unspec)	0	many (unspec)
Pl excl	Plural exclusive forms	many (unspec)	1	many (unspec)

*Table 3.* Placement of visual aids during pronoun elicitation

<i>Context</i>	<i>Placement of visual aids</i>
'we like'	Addressee figurine at centre, other figurine(s) on the signer's right
'like us'	Addressee figurine at centre, other figurine(s) on the signer's left
'we help'	Addressee figurine at centre, other figurine(s) on the signer's right
'help us'	Addressee figurine at centre, other figurine(s) on the signer's left
'we kiss'	Addressee figurine at centre, other figurine(s) on the signer's right
'kiss us'	Addressee figurine at centre, other figurine(s) on the signer's left
'we give'	Addressee figurine at centre, other figurine(s) on the signer's right
'give us'	Addressee figurine at centre, other figurine(s) on the signer's left
'we watch'	Addressee figurine at centre, other figurine(s) on the signer's right
'watch us'	Addressee figurine at centre, other figurine(s) on the signer's left
'our (coll) land'	Du incl & excl: Addressee figurine at centre, other figurine on signer's right Tr incl & excl: Addressee figurine at centre, other figurines on signer's left Pl incl & excl: Addressee figurine at centre, other figurines on signer's right
'our (dist) land'	Du incl & excl: Addressee figurine at centre, other figurine on signer's left Tr incl & excl: Addressee figurine at centre, other figurines on signer's right Pl incl & excl: Addressee figurine at centre, other figurines on signer's left

### 4.3. Coding procedure

#### 4.3.1. *Token and parameter coding*

For each pronoun token, a gloss (e.g. THREE-OF-US) and the inclusive/exclusive context in which the pronoun was used according to the script were coded. In addition, formational details, such as the handshape, location, and movement of the pronoun, were coded, as well as non-manual signals (including body leans, body shifts, head movement, and eye gaze) that co-occurred with any pronoun. Non-manual signals act as grammatical markers in both ASL and BSL, and some can be used in various ways for affect. Because each of these markers can be used to establish or indicate reference in some way, it was expected that these signals might also act as inclusivity or exclusivity markers.

#### 4.3.2. *Indexicality coding*

The data were coded to determine how indexical the pronouns were with respect to the location of the referents (that is, the visual aids that were placed in front of the signer during data collection). Pronouns were coded as located on the signer's right side, at the centre of the chest, or on the signer's left side. These values were then compared to the location of the visual aids that the signer was referring to when producing each pronoun. Pronouns were coded as being either on the left if they were produced on the signer's left side without crossing the midline, or on the right if they were produced on the signer's right side without crossing the midline. Pronouns were coded as centre if they were produced at the midline or if they crossed the midline.

Figure 3a shows an example of a discourse situation in which the pronoun would be coded as matching the location of the referents, while Figure 3b shows an example of a situation in which the location of the pronoun would be coded as not matching the location of the referents.

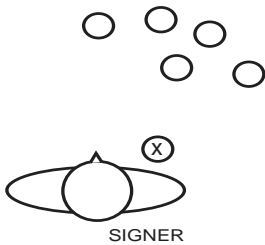


Figure 3a. Location of pronoun matches location of referents

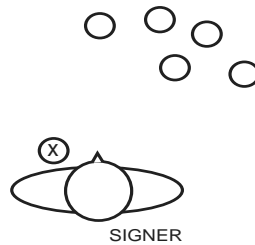


Figure 3b. Location of pronoun does not match location of referents

## 5. Results and discussion

### 5.1. Overall results

#### 5.1.1. Pronoun elicitation

The following pronouns were produced by all signers for both ASL and BSL: WE, OUR, 2-OF-US, 3-OF-US, WE-COMP (composite ‘we’), ALL-OF-US. Two of these signs – 2-OF-US and WE-COMP – point more or less directly at the locations associated with their referents (see Table 4). I refer to these signs as *ostensive plurals*, because they ostensibly indicate their referents.

Table 4. Ostensive plural pronouns coded

<i>Type of first person plural</i>	<i>Phonetic Description</i>
<i>Composite first person plural (WE-COMP):</i> series of pointing signs that point to each member of some set	Varies depending on which referents are being indexed
<i>Dual (TWO-OF-US):</i> Signs made with V or K-handshape where arm (elbow joint) or wrist (wrist joint) moves between locations associated with signer and some other referent.	Varies depending on which referents are being indexed

WE-COMP is a composite plural form, so called because of its similarity to composite first person forms found in spoken languages (Forchheimer 1953). An example of such a composite first person plural is from Melanesian Pidgin English, *yumi* ‘you and me’. This pronoun is a combination of the singular second person pronoun *yu* and the singular first person pronoun *mi*. Similarly, WE-COMP in ASL and BSL is a series of pointing signs, either starting with or ending with a point toward the signer’s chest, that refer to a number of individuals. This pronoun looks and acts essentially the same in both ASL and BSL. Figure 4 shows an example of this pronoun.



*Figure 4.* WE-COMP (ASL & BSL)

TWO-OF-US is a dual pronoun, consisting of a handshake with the index and middle fingers extended, in either a K-handshape (ASL – see Figure 5) or V-handshape (BSL) which moves between the signer and the location associated with another referent.



*Figure 5.* TWO-OF-US (ASL)

When either WE-COMP or TWO-OF-US was produced by signers in inclusive contexts (such as example (1) above), the pronoun referred to the addressee. With WE-COMP, the series of points included a point toward the addressee. With TWO-OF-US, the pronoun moved between the signer and the addressee. When either WE-COMP or TWO-OF-US was produced by signers in an exclusive context, the pronoun included non-addressed participant(s) but not the addressee.

Because these signs transparently point to their referents the same way that singular pronouns do, no grammatical inclusive or exclusive distinction is posited for these pronouns. These signs point to the referents who are included. Other referents are excluded only in that they happen to not be pointed to.

The other four pronouns produced by the signers in this study – WE, OUR, 3-OF-US, and ALL-OF-US – are considered to have citation forms which are either produced at the centre of the signer’s chest or start on one side and end on the other side (such that the central vertical midline is the axis) in both ASL and BSL (Brien 1992; Stokoe et al. 1965). Figure 1 (repeated below as Figure 6) and Figure 7 each show one of the citation forms for the sign WE in ASL and BSL, respectively.



*Figure 6. WE-CENTRAL (ASL)*



*Figure 7. WE-CENTRAL (BSL)*

I classify these signs as *lexical plurals* because they do not index the locations of their individual referents. Thus, it can be claimed that these pronouns are lexicalised with respect to location, such that the specific locations of the individual referents are combined to a single general location. Table 5 describes the forms in which these pronouns occur.



Table 5. Lexical plural pronouns coded

<i>Type of first person plural</i>	<i>Variants</i>	<i>Phonetic Description</i>
<p><i>First person plural (WE):</i> In ASL, the signer's hand moves from one point on chest to another, both in same horizontal plane. In BSL, the signer's hand (pointing downward <sup>6</sup>) moves in circular movement in horizontal plane directly in front of the chest.</p>	WE-CENTRAL	Produced at or near the center of the signer's chest; the signer's midline is the axis of the arc/circular movement.
	WE-DISPLACED	Produced slightly left or right of the signer's midline on the chest; typically involves rotation of the forearm.
<p><i>Number-incorporated first person plurals (3/4/5-OF-US):</i> In ASL, signs made with 3, 4 or 5 handshape (palm up) with small circular motion in horizontal plane. In BSL, signs made with W, 4, or 5 handshape with small circular motion in horizontal plane.</p>	3/4/5-OF-US-CENTRAL	Produced at or near the centre of the signer's chest
	3/4/5-OF-US-DISPLACED	Produced on either the signer's left or right side
<p><i>First person plural possessive (OUR):</i> In ASL, signs made with bent-B handshape, starting with thumb-side of hand near or contacting chest with arcing forearm rotation so that pinky-side of hand ends near or contacting the chest. In BSL, signs made with A-handshape, palm facing toward signer, moving in horizontal circle directly in front of signer's chest.</p>	OUR-CENTRAL	Like WE-CENTRAL, produced at or near centre of the signer's chest such that signer's midline is axis of arc/circular movement.
	OUR-DISPLACED	Like WE-DISPLACED, produced slightly left or right of signer's midline
<p><i>Universally quantified first person plurals (ALL-OF-US):</i> In ASL, first person plural version of fingerspelled loan sign #ALL. Produced with A-handshape moving outward, opening to L-handshape. In BSL, signs made with B-handshape starting facing contralateral side, moving in arcing movement with forearm rotating in toward contralateral side.</p>	ALL-OF-US-CENTRAL	Produced at or near centre of signer's chest; signer's midline is axis of arc.
	ALL-OF-US-DISPLACED	Produced slightly to left or right of the signer's midline.

Signers in this study did often produce these pronouns in more or less citation form, that is, with the central vertical midline as the axis of the arcing or circular movement. Signers produced these pronouns at the centre of the chest in both inclusive and exclusive contexts. However, these pronouns sometimes were displaced from that central location, to the ipsilateral or contralateral side of the signer's chest. These displaced forms were produced in exclusive contexts. Figures 8 and 9 show displaced forms of WE in ASL and BSL, respectively.



*Figure 8. WE-DISPLACED (ASL)*



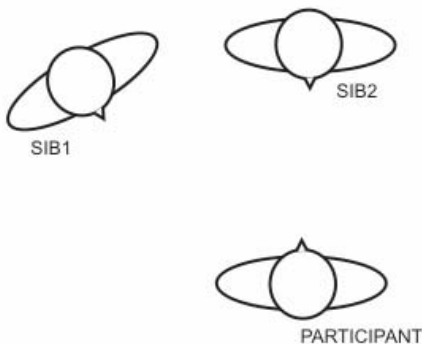
*Figure 9. WE-DISPLACED (BSL)*

As noted in 4.3.1., pronouns were also coded for various non-manual signals, including body shift, body lean, head movement, and eye gaze. Although all of these signals co-occurred with many of the pronouns that were produced, none of them were used reliably for inclusive or exclusive marking. These signals were typically used for other purposes instead, including topic marking, emotional affect marking, affirmative and negative marking.

### *5.1.2. Grammaticality judgements*

Informal discussions with participants after the initial data collection revealed that it might be possible to use displaced forms to exclude referents other than just the addressee. Therefore, after the initial data collection and analysis, follow-up meetings were convened with each signer in order to obtain grammaticality judgements on the forms mentioned above and particularly to determine other possible meanings of the displaced forms. These meetings were based on the following

background scenario. Each participant was told to imagine that he/she has four siblings and that each week some or all five of them go to the cinema together. The participant was to imagine that two of his/her siblings were present. (In actuality, there was a research assistant physically present to act as one of the brothers – Sib1 – and another research assistant presented on a computer screen opposite the participant was a second brother – Sib2. The participant was told that the other two sisters in the family (Sib3 and Sib4) were not present for the conversation. See Figure 10 for a representation of the locations of the participant, Sib1 and Sib2.)



*Figure 10.* Bird's-eye view of set-up for grammaticality judgements. The participant and Sib 1 (research assistant) are physically present. Sib2 is shown on a computer screen.

The computer screen was directly in front of the participant. The research assistant on the screen was a fluent Deaf signer (representing Sib2) who signed, on video, each of the sentences shown in examples (3) - (8):

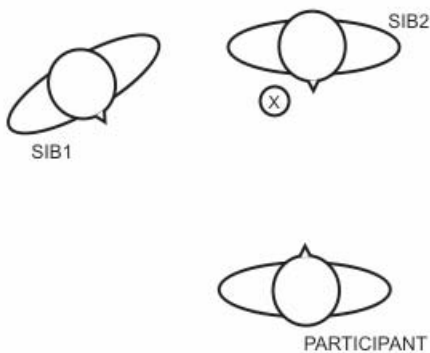
- (3) NEXT-WEEK **WE-CENTRAL** GO-OUT FILM  
'Next week we'll go out to see a film.'
- (4) NEXT-WEEK **WE-DISPLACED(left)** GO-OUT FILM  
'Next week we'll go out to see a film.'
- (5) NEXT-WEEK **WE-DISPLACED(right)** GO-OUT FILM  
'Next week we'll go out to see a film.'
- (6) NEXT-WEEK **THREE-OF-US-CENTRAL** GO-OUT FILM  
'Next week we'll go out to see a film.'
- (7) NEXT-WEEK **THREE-OF-US -DISPLACED(left)** GO-OUT FILM  
'Next week we'll go out to see a film.'

- (8) NEXT-WEEK **THREE-OF-US -DISPLACED (right)** GO-OUT FILM  
 ‘Next week we’ll go out to see a film.’

After each clip was shown, participants were asked questions about which siblings could be included or excluded in each instance. Note that the location of the displaced pronouns was varied from right to left. The location of the physically present research assistant – Sib1 – was also varied from the participant’s left side as shown in Figure 10 to his/her right side.

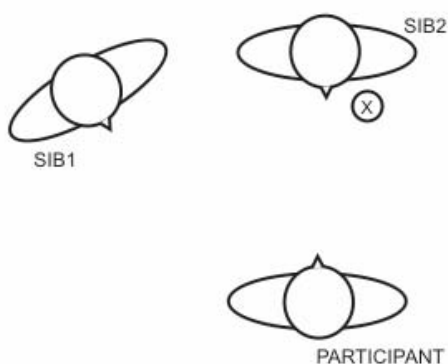
It was important that the background scenario was described to the participants in a very particular way. The researcher was very careful *not* to localise the 2 absent sisters (Sib3 and Sib4) when explaining the background scenario. Specifically, the researcher signed YOU ALSO HAVE TWO SISTERS, NOW NOT HERE, carefully placing all signs in the middle of the signing space, with no points, body or head leans, and with eye gaze directly at the participant. This was to ensure as much as possible that the participant would not localise the two absent sisters Sib3 and Sib4 as a result of information provided by the researcher or the surrounding context.

In the situations where the pronoun produced by Sib2 was on the side where Sib1 was located (as shown in Figure 11), participants judged that the displaced pronoun, whether WE or THREE-OF-US, included the participant him/herself, Sib1, and Sib2. This is to be expected, since in these cases the pronoun would be indexical of those three referents and exclusive (i.e. excluding Sib3 and Sib4).



*Figure 11.* Pronoun (represented by X) produced on the signer’s (Sib2’s) right side, the same side as Sib1’s location.

More revealing were the responses when the pronoun was displaced to Sib2's other side, that is, the side on which Sib1 was not located (as shown in Figure 12). In every case, participants judged that these forms had to be exclusive – excluding one or more of the siblings.<sup>7</sup> The central forms were judged to be able to include any or all of the siblings (the signer + any others).



*Figure 12.* Pronoun (represented by X) produced on the signer's (Sib2's) left side, the opposite side as Sib1.

Thus, the grammaticality judgements obtained from these follow-up meetings confirmed that the displaced forms were acceptable in exclusive but not inclusive contexts, while central forms were judged to be acceptable in both inclusive and exclusive contexts, as noted below in Table 6.

Another finding which first arose in informal discussions after the initial elicitation of data – which was confirmed in these follow-up meetings – was that the displaced (exclusive) forms could actually exclude any salient referent in the discourse, not only the addressee. The stimuli from the elicitation portion of the study had been designed to elicit forms that included or excluded the addressee, since this is how inclusive/exclusive pronouns generally pattern in spoken languages.<sup>8</sup> The fact that these pronouns can exclude other salient referents highlights the importance of additionally obtaining grammaticality judgements when analysing elicited data.

Table 6. Grammaticality judgements for lexical plurals in inclusive and exclusive contexts

<i>Lexical Plurals</i>	<i>Inclusive context</i>	<i>Exclusive context</i>
WE-CENTRAL	√	√
WE-DISPLACED	*	√
3/4/5-OF-US-CENTRAL	√	√
3/4/5-OF-US-DISPLACED	*	√
ALL-OF-US-CENTRAL	√	√
ALL-OF-US-DISPLACED	*	√
OUR-CENTRAL	√	√
OUR-DISPLACED	*	√

(√ indicates grammatical; \* indicates ungrammatical)

What we can conclude from these patterns is that lexical plurals produced at the centre of the signer's chest are neutral with respect to inclusivity/exclusivity because they can be used in inclusive or exclusive contexts. But lexical plurals displaced to the ipsilateral or contralateral side, when not indexic<sup>9</sup>, can only be exclusive. Thus in Cormier (2002, 2005), I have claimed that ASL has a grammatical exclusive first person plural form. Here I claim that BSL has a grammatical exclusive first person plural form that works in very much the same way – that is, by displacing the pronoun to the signer's ipsilateral or contralateral side.

The next question that I raise here is about indexicality. How indexic are these pronouns? Section 5.2 looks at the indexicality of the pronouns produced in inclusive contexts, while Section 5.3 looks at those produced in exclusive contexts.

## 5.2. Pronouns produced in inclusive contexts: Indexicality results and discussion

Examining the production data further revealed that not all displaced pronouns were used in exclusive contexts. Some displaced pronouns were actually used in inclusive contexts. This seems to be in direct contradiction to the findings from the grammaticality judgements above which showed

that signers judged displaced forms to be acceptable for marking exclusive only. Why would this be?

This could be framed as part of a larger question of non-indexicality: Why do non-indexic pronouns occur? That is, under what circumstances does the location of a first person plural pronoun not match the location(s) associated with its referents? Close scrutiny of the non-indexic forms of first person plural pronouns produced in inclusive contexts revealed the following patterns.

Indexicality levels of these pronouns were less than what one might expect from singular pronouns, as shown in Table 7. Of 134 BSL pronoun tokens, 55 were indexic (i.e. the pronoun's location matched the location of the referents in 66% of the pronouns produced). Of 109 ASL pronoun tokens, 51 were indexic (i.e. the pronoun's location matched the location of the referents in 47% of the pronouns produced).

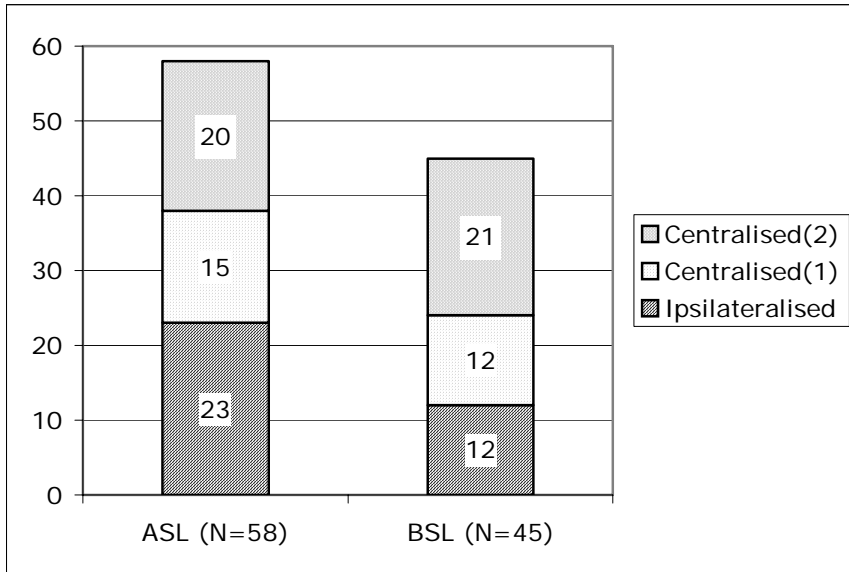
*Table 7.* Indexic and non-indexic tokens of first person plural pronouns (inclusive context)

	Indexic tokens	Non-indexic tokens	Total (N)	% indexicality
ASL	51	58	109	47%
BSL	55	46	134	66%

The non-indexic pronoun tokens from both the ASL data (N=58) and BSL data (N=46) fell into one of two main types: ipsilateralised and centralised. Furthermore, there were two types of centralised forms. The number of tokens for each type are noted in Figure 13 on the next page. The following two sections describe the ipsilateralisation and centralisation patterns.

### *5.2.1. Ipsilateralisation*

Some non-indexic tokens (23 tokens in ASL, 12 tokens in BSL) were ipsilateralised. That is, the pronoun was produced on the ipsilateral side of the signer's chest, but the referents (represented by the visual aids) were located on the signer's contralateral side or directly in front of the signer, thus causing a mismatch in location, as illustrated in Figure 3b.



*Figure 13.* Non-indexic pronoun tokens (inclusive context), by type.<sup>10</sup>  
 Centralised(1) tokens are centralised from the contralateral side.  
 Centralised(2) tokens are centralised from the ipsilateral side.

The most likely reason for this lack of indexicality seems to be ease of articulation – that is, signers produced these pronouns on their ipsilateral side simply because it requires the least effort for the sign to be articulated in that location, as opposed to the central or contralateral side which would require the signer to approach or cross the midline. Thus the proposed explanation for this particular type of loss of indexicality is a motoric one: Signers produce the pronoun at a location that is motorically easier.

One note of reminder here is that, although no grammatical inclusive marking was found in these data, these pronouns are being used in inclusive contexts. This by itself could affect the indexicality of these forms. In each scenario, all of a particular group is meant to be included.

So, it is possible here that ease of articulation could override indexicality that might otherwise be required if certain referents from a group are being picked out (see Section 5.3. below for more about the indexicality of exclusive forms).



### 5.2.2. *Centralisation*

The other non-indexic tokens from both languages were centralised. That is, the pronoun was produced at the centre of the signer's chest when the referents (represented by the visual aids) were located on the signer's contralateral or ipsilateral side. These two situations (whether the referents were on the contralateral or ipsilateral side) require very different explanations.

#### *Centralisation from contralateral side*

If the referents are on the contralateral side, then a pronoun produced at the centre could be considered to be partially ipsilateralised. That is, a centralised pronoun here would be more ipsilateral than a contralateral pronoun. So, the explanation here could potentially be similar to the motoric explanation given above for ipsilateralisation – that is, that these pronouns are produced centrally instead of contralaterally due to ease of articulation. There were 15 of these tokens in the ASL data and 12 in the BSL data, represented by *Centralised(1)* in Figure 13.

#### *Centralisation from ipsilateral side*

However, there were other non-indexic tokens that were centralised when the referents were located on the ipsilateral side (20 tokens in ASL, 21 tokens in BSL, represented by *Centralised(2)* in Figure 12). In these cases, the pronoun is being pulled away from the ipsilateral side. If we assume that the ipsilateral position is motorically easiest as claimed above, these tokens are quite anomalous. The motorically easiest position for these pronouns should be the same position that would lead to a match in indexicality (i.e. ipsilateral). So why are these pronouns being pulled away from the ipsilateral side?

I propose that the reason for the loss of indexicality occurring with centralised pronouns is due to first person marking. Section 2.2.4 above notes that although there is no special location associated with addressees or non-addressed participants, there is a special location associated with the signer – this constitutes part of Meier's (1990) argument for a distinct first person category. The fact that these non-indexic tokens have been centralised, I argue, is due to first person marking. The results of this part of the study confirm the centre of the chest as the default location for first person marking. I argue that this location is such a strong marker of first person marking that it can override indexicality.

### 5.2.3. Indexicality of forms produced in inclusive contexts

Nearly all of the non-indexic pronouns which were produced in inclusive contexts in this study were ipsilateralised or centralised. In fact, only one token out of 245 was contralateralised (that is, produced on the contralateral side when the referents were not).<sup>11</sup> The explanations offered here for ipsilateralisation are largely motoric (ease of articulation). Centralisation could be explained partially in terms of motoric ease (in cases of ipsilateralisation toward the centre), but is more likely to have linguistic reasons, especially in cases of centralisation away from the ipsilateral side. The linguistic explanation is that indexicality can be lost due to explicit first person marking, that is, locating the pronoun at the centre of the chest. This supports the special status of first person that is at the heart of Meier's (1990) first/non-first person distinction. We see here that this holds for both ASL and BSL. These results support the notion that signed languages as grammatical systems are subject to both motoric and linguistic constraints. This is true in particular of the pronominal systems of these languages.

### 5.3. Exclusive forms: Indexicality results & discussion

Exclusive pronouns in this study were displaced to the ipsilateral or contralateral side of the signer's chest. One might expect that with a displaced exclusive pronoun, the pronoun would be indexic of those referents that are included, in order to mark some other referent as being excluded. However, they were not all displaced in terms of indexicality. Table 8 below shows the indexicality totals for the exclusive pronouns.

*Table 8.* Indexic and non-indexic tokens of exclusive first person plural pronouns

	Indexic tokens	Non-indexic tokens	Total (N)	% indexicality
ASL	80	26	106	76%
BSL	104	3	107	97%

5.3.1. *Non-indexic ASL tokens*

The ASL exclusive pronouns in Table 8 show 76% indexicality, with 26 tokens that were not indexic. Follow-up meetings with the participants confirmed that exclusive pronouns did not necessarily have to be indexic of the included referents. One example of a non-indexic pronoun token from the elicited data is shown in example (9) and Figure 14 below.

- (9) Left hand: THREE-OF-US-DISPLACED [ASL]  
 Right hand: FOND-OF CAT  
 ‘The three of us (excl) love cats.’

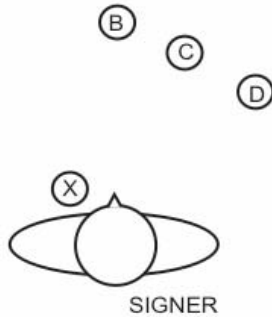


Figure 14. Bird's-eye view of the discourse situation during the production of example (9). The location of the pronoun THREE-OF-US-DISPLACED is marked by X. C and D represent the referents that the pronoun includes (along with the signer); B represents the addressee (whom the pronoun excludes).

In example (9), the referents of the pronoun THREE-OF-US (i.e. the visual aids) are on the signer's right side, represented by the X, Y and Z markers in Figure 14. A pronoun matching the location of the referents in this instance would be on the signer's right side. In this instance, however, the signer produced a pronoun on her left side, represented in Figure 14 by “\*”. Furthermore, she produced this pronoun using her left hand (despite the fact that she is normally right-handed); this pronoun was then held in place while she signed the rest of the sentence (FOND-OF CAT) with her right hand. The other 25 ASL non-indexic exclusive tokens were similar to this example.

The BSL exclusive pronouns however are extremely indexic at 97%. In fact, all but 3 tokens of the exclusive pronoun data from BSL were indexic. The following section examines those 3 tokens in more detail.

### *5.3.2. Non-indexic BSL tokens*

The three non-indexic BSL pronoun tokens had something in common. All three of them were produced in an utterance that ended with the phrase YOU NOTHING. The three examples are glossed in examples (10), (11) and (12) below.

- (10) Referents (represented by visual aids) were located on the left:  
ALL[right] BEEN<sup>12</sup> STONE tracing-classifier KISS, [BSL]  
YOU NOTHING  
'All of us kissed the round-shaped stone, but not you.'
- (11) Referents (represented by visual aids) were located on the left:  
3-OF-US[centre] BEEN FLOWER GIVE-BOUQUET TEACHER,  
YOU NOTHING  
'The three of us gave the teacher flowers, but not you.'
- (12) Referents (represented by visual aids) were located on the left:  
ALL[right] LOVE CAT YOU NO<sup>13</sup>, LIKE DOG  
'All of us like cats except you – you like dogs.'

In these examples, the excluded referent is explicitly identified by a negative phrase (YOU NOTHING or YOU NO) occurring at the end of the clause. In examples (10) and (12), the referents were located on the left and the signer produced the pronoun ALL on her right side. In example (11), the referents were located on the left and the signer produced the pronoun 3-OF-US at the centre of her chest.

These examples suggest that if the excluded referent is explicitly identified, indexic displacement of a pronoun is not necessary. The displacement of the pronoun need not match the location of the referents, as shown by examples (10) and (12). Or, displacement may not occur at all, as shown in example (11).

Although these were the only examples of non-indexic exclusive pronouns in the BSL data, all three of these tokens were produced by the

same signer. Thus, there could be some variation across signers in the use of this negation construction for marking exclusion of referents. More data from more signers are needed to explore this further.

### 5.3.3. *Indexicality of exclusive forms*

The exclusive pronoun data have shown that exclusive marking in both ASL and BSL is marked by displacement of the pronoun to the signer's ipsilateral or contralateral side. The data also revealed a difference between ASL and BSL in the obligatoriness of indexicality with these displaced forms. Results showed that in ASL, displacement need not indexically match included referents. However, in BSL, displacement *must* match included referents. The only exception is if the excluded referent(s) are explicitly identified as in examples (6) to (8) above, in which case indexical displacement is not necessary.

These results are important because they provide counter-evidence for a common assumption about signed languages: that is, the assumption that use of space for reference is uniform across sign languages. Here, we see a difference in indexicality between ASL and BSL. The displacement that occurs with BSL exclusive pronouns is indexic, just as Liddell's analysis predicts. However, the displacement of ASL exclusive pronouns need not be indexic. The obvious question here is: *Why* do we see this difference between the two languages?

Perhaps to answer this question it would help to look at other types of visual motivation in signed language. As noted in the introduction, indexicality is indeed one type of visual motivation. That is, the location that a sign is directed toward (or is produced at) is motivated by the actual physical location of its referent (or the location the referent is associated with). Other visually motivated signs include signs that are iconic – that is, signs whose form resembles or somehow represents their meaning. So, an interesting question to raise here is: Is there any evidence of cross-linguistic variation with iconicity?

All known sign languages have signs that are iconic. However, all sign languages also have signs that are arbitrary. A concept that might be iconically represented in one signed language might be arbitrarily represented in another signed language. For instance: the signs for BLUE in BSL are produced on the hand or wrist. These signs are generally taken to be an iconic representation of blue veins on the hand or wrist. But the sign

BLUE in ASL is an initialised sign, a B-handshape in neutral space with forearm rotation. This sign, although its handshape is motivated by the manual alphabet which is itself motivated by English orthography, is not visually motivated. The form of this sign is in no way linked to its meaning. This can be seen with the entire lexical family of initialised colour signs in ASL (BLUE, YELLOW, GREEN, PURPLE, etc.) which differ only in handshape and are in no way visually motivated. Thus, we see that signed languages differ in which concepts they encode iconically and which they encode arbitrarily. Obviously visual motivation in signed languages is quite strong, and very many concepts which can be encoded visually probably are. But this example shows there is room for cross-linguistic variation here.

There has been little research comparing relative levels of iconicity across signed languages. However, Aronoff et al. (2003) look at the lexicalisation of classifier constructions in ASL and Israeli Sign Language (ISL) – such constructions are often noted for their strong iconicity. Aronoff et al. found some differences between these constructions – particularly, that classifier constructions in ASL seemed more arbitrary than those in ISL, which seemed more iconic. (For instance, ASL has a larger class of entity classifiers, the handshapes for which seem to be more arbitrary than those in ISL.) They attribute this difference in level of iconicity (and extent of lexicalisation in which iconicity is lost) to the relative difference in age between the two languages: ISL is a much younger language than ASL. Following Frishberg (1975), who found a tendency for iconic signs to become more arbitrary over time, Aronoff et al. predict that classifier constructions in ISL may become more arbitrary over time but so far they are less arbitrary than those of ASL.

There may well be some differences between ISL and ASL due to the different ages of the two languages. However, it is dangerous to make this claim based on these two languages alone. Classifier constructions in BSL are much more like those described by Aronoff et al. for ISL than for ASL. For example, BSL seems to have fewer entity handshape classifiers than ASL. BSL is not younger than ASL – if anything it is older. BSL can be traced back to about the mid-17<sup>th</sup> century.<sup>14</sup> ASL can be traced back at least to the establishment of the first school for the deaf in 1817, but not as far back as the mid 1600's.<sup>15</sup> So, if the iconicity of classifier constructions in ASL is more lexicalised (arbitrary) than BSL, age is not likely to be the reason.

It is also possible to look at iconicity from a grammaticisation perspective. Janzen and Shaffer (2002) have looked at the grammaticisation

of modals in ASL and provide evidence that the modal signs CAN, MUST, and WILL derive from gestural, iconic origins (via the LSF signs STRONG, OWE, and GO, respectively). The origins of these modals in BSL appear to be completely different. The modal signs CAN, MUST, and WILL in BSL do not even remotely resemble any signs or gestures meaning STRONG, OWE, and GO that I have been able to find. Clearly there is room for the possibility that these BSL modals are iconic but with very different origins than the origins of the iconicity in ASL. It is also quite possible that these modal signs in BSL are just arbitrary. The point here is: BSL modals do not seem to have the same iconic origins as ASL modals. ASL has followed a particular grammaticisation path for these modals that BSL has not followed.

All of these findings together suggest that, whatever the reason, iconicity is something that can and does vary across signed languages. There is no reason to expect that indexicality, another type of visual motivation, should be different.

Recent work by Aronoff et al. (2004) on Abu Shara Bedouin Sign Language (ABSL) provides further evidence of cross-linguistic variation among signed languages with respect to indexicality. Aronoff et al. found that verbs that are directional in most signed languages (that is, verbs like 'send' and 'throw') do not show directionality in this sign language. Another way of putting it is that these verbs are not indexic as one would expect. Aronoff et al.'s explanation for this lack of directionality is the young age of the language (it is only about 70 years old); they hypothesise that as the language matures it may develop more indexic, directional forms.

This hypothesis is supported by Meier (2002), who cites data suggesting that signed languages become more directional as they mature – that is, indexicality becomes stronger over time. As noted above, the common assumption about iconicity is that signs become more arbitrary as signed languages mature. That is, iconicity becomes lost over time – this has been shown at the very least for ASL (Frishberg 1975). On the surface, if we consider both indexicality and iconicity to be types of visual motivation, this seems to be contradictory. However, I suggest that there is a distinct difference between indexicality with singular forms and with plural forms, and that plural forms are particularly susceptible to loss of indexicality while singular forms retain their indexicality. As far as I can tell, the data cited in Meier (2002) is consistent with this claim.

Based on data presented from the current study on ASL and BSL, I would like to propose that indexicality in exclusive pronouns has been grammaticised in ASL such that these forms no longer necessarily need to be indexic. BSL on the other hand has not grammaticised indexicality in this way. This suggests that within the set of signed languages that use indexic mechanisms, the extent of indexicality can vary across these languages. Clearly more data on other signed languages would help shed light on the factors involved here.

#### 5.4. Indexicality of forms produced in inclusive and exclusive contexts

We have seen in the previous section both linguistic and motoric reasons for non-indexicality. We have certainly seen this with forms produced in inclusive contexts as noted above – ipsilateralisation of these forms seems to be due to motoric factors, while centralisation seems due mostly to linguistic marking of first person.

However, we can also see both linguistic and motoric reasons for non-indexicality with the exclusive pronoun data to some extent. Of the three non-indexic exclusive BSL tokens described above, two (examples (10) and (12)) were ipsilateralised, while one (example (11)) was centralised.

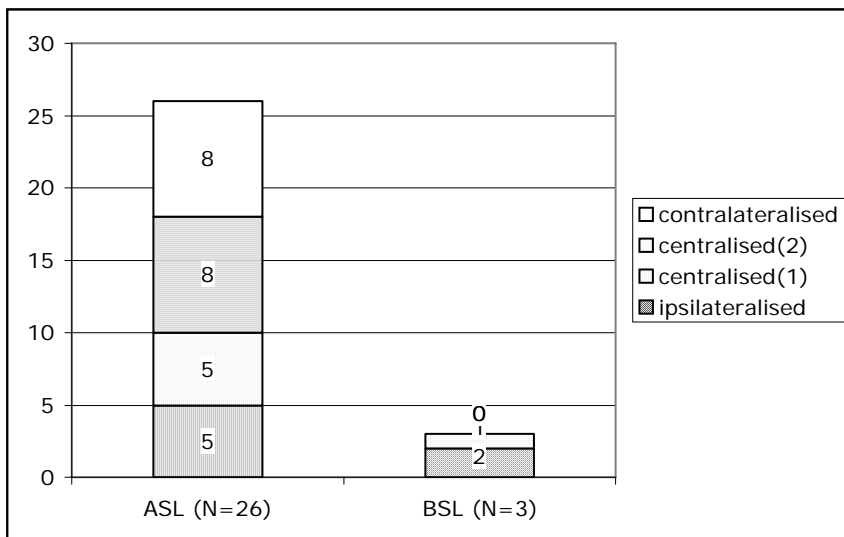


Figure 15. Non-indexic pronoun tokens (exclusive context), by type



Of the 26 non-indexic exclusive forms in ASL, 5 were ipsilateralised, 13 were centralised, and 8 were contralateralised – see Figure 15 above. Note that the contralateralisation is what really makes ASL unique here. Ipsilateralisation and centralisation occurred with forms produced in both inclusive and exclusive contexts, in both ASL and BSL. But contralateralisation does not occur widely in any of the data, except within the non-indexic ASL tokens of which contralateralised forms constitute 30%.

## **6. Summary and conclusion**

The results of these studies on first person pronouns in ASL and BSL reveal that pronouns do not all ‘point’ to their referents to the same degree. That is, pronouns are not all equally indexic: plural pronouns are less indexic than singulars, and first person plurals are even less indexic than general plurals. This lack of indexicality with first person plural forms involves two factors. One of these is linguistic – specifically, a strong preference for the centre of the chest as a marker of first person, and the other is motoric – a tendency for some first person plurals to be produced on the ipsilateral side of the signer’s chest. In some cases the loss of indexicality could be due to a combination of these two factors.

Centralisation supports the first/non-first person analysis of Meier (1990). The fact that centralisation can override indexicality, which in non-first person contexts is considered to be extremely strong, reaffirms the special status of first person in both ASL and BSL.

Another important finding from this study is that distinct exclusive pronouns were identified in both ASL and BSL. For the first person pronouns which were produced in inclusive contexts, there was no clear difference in indexicality between ASL and BSL. However, with exclusive pronouns, there was a clear difference between the two languages. While BSL exclusive pronouns must be indexic of their referents, ASL exclusive forms need not be indexic. Comparisons with iconicity (another type of visual motivation in signed languages) suggest that indexicality, like iconicity, may be a feature of signed languages that is subject to cross-linguistic variation. All signed languages clearly have iconic and indexic elements, but the extent to which these elements prevail in a given signed language (versus the extent to which these elements have become lost, possibly due to lexicalisation or grammaticalization) is variable.

## **7. Areas for future research**

One aspect of this study that could certainly be improved upon is the amount and type of data on which it is based. More data from a variety of signers from both ASL and BSL would help strengthen the findings from this study. It would be best to have both grammaticality judgements from a larger number and greater variety of signers as well as naturalistic data, to confirm whether these patterns do occur in discourse.

The most obvious way to improve and extend this study in other ways would be to examine first person plural pronouns in other signed languages. The centre of the chest as the locus for first person is something that does occur in most Western signed languages. (Clearly, there is probably some relationship between the centre of the chest as first person locus and the 'me' gesture used by hearing non-signers in Western culture which is produced at the same location.) Data on these signed languages would support the claims here that the centre of the chest is such a salient marker of first person that it can override indexicality. However, not all signed languages use this locus for first person reference. One example is Japanese Sign Language (*Nihon Syuwa*, NS); one form of the first person singular pronoun ME is a point to the chest, but another variant is a point to the signer's nose (following the gesture used for 'me' in Japanese hearing culture) (McBurney 2002). The first person plural pronoun (denoting signer + others) is a point to the nose followed by a spread 5 handshape with palm down in neutral space with a small circular movement (Susan Fischer, personal communication). Research on pronouns in NS would help determine the distribution of this and any other first person plurals in the language, whether any inclusive/exclusive forms exist, and also the indexicality of these pronouns.

Other research related to this study could examine more closely the loss of visual motivation in various signed languages over time, including loss of both indexicality and iconicity. With iconicity there is a wealth of different types of signs and grammatical constructions (iconic lexical signs, classifier constructions, role shift, etc) that are strongly iconic. There is evidence from ASL that signs become less iconic and more arbitrary over time. Does this same process happen for other signed languages? Are there reasons why some forms might lose their iconicity differently or more quickly than others? Does loss of iconicity vary from one type of grammatical construction to the next, or from one sign language to the other? Addressing these kinds of questions would help support the finding

here that visual motivation (particularly how signed languages use space) is *not* uniform across signed languages as previously thought.

## Notes

1. A few acknowledgements are in order: I would firstly like to thank those Deaf native signers of ASL and BSL who participated in these studies. I would also like to thank Perry Connolly for acting as model for the ASL examples and Sandra Smith for acting as model for the BSL examples. I am grateful to Claude Mauk, Martha Tyrone, and especially Richard P. Meier for very helpful comments on earlier drafts of this paper. I thank three anonymous reviewers for their comments as well.
2. There are some (Ahlgren 1990; McBurney 2002, 2004) who, like Liddell, have concluded that no formal person distinctions exist in signed languages. While these researchers do not explicitly adopt a gestural analysis as Liddell does, their analyses are consistent with Liddell's.
3. The adoption of a particular model of person (e.g. a locus-feature approach vs. a gestural approach similar to Liddell) is not necessary for the purposes of this paper. For more detail and a clearer stance on the issue, see Cormier (2002).
4. Clearly in practice there are restrictions on the number of distinct locations that can be referred to at one time – that is, it becomes difficult to keep track of more than about 4 or 5 locations at once. There are also conventions for how and where these locations are distributed in space. The point here, however, is that theoretically an infinite number (or at the very least, a large indeterminate number), and an infinite or very large indeterminate spatial distribution, is possible.
5. Berenz (2002) uses data from Brazilian Sign Language (*Língua de Sinais Brasileira*, LSB) to argue against Meier's first/non-first person analysis, in particular arguing for a distinct second person category. Importantly, however, her arguments do not challenge the linguistic status of first person:
 

“Although I question some of the details of Meier's argument for a grammaticised first person pronoun, I agree with his conclusion. For this reason, I will not discuss the status of first person pronouns here, but rather I will focus on the issue of greatest disagreement: the grammaticisation of the conversational role of recipient in a second person pronoun.”  
(Berenz 2002: 206).
6. During follow-up meetings with BSL participants, several other forms of WE were mentioned. One was similar to this one but with the index finger

- pointing upward. Another had both a downward index finger and an upward index finger rotating around each other in neutral space (similar to the ASL sign TORNADO). At this point, it is unclear whether and how these three pronouns differ in meaning; I leave this for future research.
7. Interestingly, in these cases, participants did not always agree on which siblings had to be excluded; however, they did agree that these forms had to be exclusive of at least one of the siblings.
  8. Although see Daniel (2005) for examples of spoken languages with forms that particularly include participants other than the addressee.
  9. Displacement of these plural pronouns to the right or left can certainly be used to indexically mark the general location of a group (Baker-Shenk and Cokely 1980). The point here is that when these displaced pronouns are not indexic, they must be exclusive (i.e. excluding some salient referent).
  10. Note that, in addition to the pronoun tokens tallied in this chart, there was one token of a BSL pronoun that was contralateralised, bringing the total number of non-indexic tokens in BSL to 46.
  11. In this single contralateralised token there was only one referent, represented by a visual aid positioned directly in front of the signer, but the signer clearly gazed toward his left and signed TWO-OF-US as if the addressee were on the left.
  12. BEEN is an aspectual auxiliary in BSL marking the completion of an action.
  13. This sign, glossed here as NO following Sutton-Spence and Woll (1998), is produced with a B-hand facing away from the signer with slight forearm rotation creating a shaking movement.
  14. Although the first school for the deaf was not opened until 1760, there is ample evidence that a conventional sign language existed in Britain dating back to as early as 1666 (Jackson 1990).
  15. The language that came to be modern ASL was influenced largely by French Sign Language (*Langue des Signes Française*, LSF) and also to some extent by the signed language used on Martha's Vineyard dating back to the 17<sup>th</sup> century, which according to Groce (1985) can be traced back to the sign language used in Kent, England earlier in the 17<sup>th</sup> century. The creolisation resulting from these varied sources, and the fact that ASL could potentially be traced back (however loosely) to an early Kentish version of BSL, makes it difficult to truly compare the ages of ASL and BSL.

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# **Negation in Jordanian Sign Language: A cross-linguistic perspective**

*Bernadet Hendriks*

## **1. Introduction**

Negation in sign languages can be expressed both manually and non-manually. In some sign languages, non-manuals (like headshake) are sufficient to express sentential negation; in other sign languages, manual negators are needed to negate a sentence. In this paper, I will give a short overview of several aspects of negation in the sign language used in Jordan (*Lughat il-Ishaarah il-Urduniah*, LIU). These aspects include the use of several manual signs, non-manual features of negation, and negative concord. It will be shown that negation in LIU requires a manual negator while headshake or other non-manual ways of negating a sentence are optional. The characteristics of negation in LIU are compared to negation in other sign languages, to show that the range of grammatical possibilities in sign languages is larger than is often thought.

Before describing some properties of LIU negation, I will first say a few words about LIU and its relation to other sign languages of the Middle East (Section 2) and about data collection (Section 3). In Section 4, I will discuss manual negative signs and negative morphology while Section 5 is devoted to non-manual markers of negation. Finally, in Section 6, I examine negative concord structures in LIU. In all of the data sections, LIU data will be compared to patterns that have been described for other sign languages. Section 7 concludes the paper with a note on cross-linguistic variation.

## **2. Jordanian Sign Language (LIU)**

Although very little research has been done into the sign languages of the Middle East, LIU appears to be closely related to the sign languages of Lebanon, Syria, and the Palestinian areas. Deaf people from these countries

can understand each other without any difficulties. A comparison of lexical items used by signers from Jordan and Aleppo (Northern Syria) shows 60% similarity. Moreover, these languages are grammatically very similar. The same preliminary survey shows around 52% lexical similarity to Iraqi Sign Language and 43% similarity to Yemeni Sign Language. These sign languages, although less similar, are also understood by Deaf Jordanians without great difficulties. Egyptian Sign Language shows about 37% lexical similarity to LIU. In comparison, Turkish Sign Language, which is not easily understood by Deaf people from Jordan, has only about 25% lexical similarity. The figures given here are based on a wordlist of 185 words which I collected and which were analyzed according to their handshape, movement, and location. If two out of these three parameters were found to be the same for two languages, the sign was scored as being partially similar and given a .5 score. If all three parameters were the same (or very similar), they were given a full score of 1. Percentages were calculated by adding up the scores for all the individual words and dividing them by the number of words compared. The original wordlist consisted of 216 words but most of the iconic words were taken out in order to obtain a better representation of relatedness between the languages.



*Figure 1.* Map of Jordan

Deaf people in Jordan often make a distinction between the sign language used in schools and the sign language used by Deaf adults who attend the Deaf clubs. The creation of a dictionary of around 5000 signs, which should be published by the end of 2006, already has some standardizing influence. An introductory grammar of Jordanian Sign Language, written for people who want to learn the language, has been published (Hendriks 2004). The data discussed in this chapter is based on the dialect used at the Holy Land Institute for the Deaf in Salt, which is at present the only residential school for the Deaf in Jordan. The location of Salt is indicated by the bold circle in Figure 1.

### **3. Data**

About an hour's worth of data specifically focusing on eliciting negative constructions was collected on video. Much of this material, however, turned out to be unsuited for the purpose of this article, since it only contained single sign negative responses, and very few negated clauses. Some of the data was elicited by means of questions that required a negative answer. Four different Deaf informants were told to try and answer with sentences rather than just a headshake or the sign NO. This was a difficult task for most of them, and the elicited sentences may not always reflect the grammar of the language correctly. Therefore, most of the examples given in this chapter come from short stories that three different Deaf informants told to their Deaf peers. The stories were between 3 and 5 minutes in length and mainly described the informants' own experiences. The informants were asked to tell these stories in the presence of a hearing researcher and a video camera. This may have somewhat influenced the data, but in general, the informants' signing did not seem significantly different from that observed in natural, spontaneous settings.

The informants were all students at the Holy Land Institute for the Deaf in Jordan and were between the ages of fourteen and twenty at the time of recording. They all have Deaf siblings, and a few of them have at least one Deaf parent or grandparent. All of them learned to sign at a young age.

#### 4. Manual negation

In this section, different manual signs that are used to negate clauses or other sentence constituents, or that function as a negative answer to a question (negative interjection) are described. According to Zeshan (2004: 29)<sup>1</sup> “[s]ign languages overwhelmingly use negative particles, but the paradigms of negatives found across sign languages differ substantially, and syntactic patterns show some variation as well [...]. To a lesser extent, sign languages also make use of morphological means of negation with a negative morpheme incorporated into the predicate [...]” In LIU, the use of manual negative particles is the most common way to negate clauses. In contrast to many Western sign languages, manual negative particles play a more important role than non-manual markers, like headshake (see Section 5 for non-manual negation). In the category of morphological negation, LIU has a negative suffix, which is described in Section 4.2.

In every subsection, I will first discuss examples from LIU and then compare these examples to selected data from other sign languages.

##### 4.1. Manual negative signs: negative interjections and clause negators

There are several manual negators in LIU. Most of these have slightly different shades of meaning. Some of these negative signs can be used as negative interjections as well as clause negators. A number of these signs will be presented here.

The sign in Figure 2 is the most neutral sign for “no” or “not”; it is glossed as NEG. It can be the answer to a question, but it may also negate a clause, as in (1). Note that in the examples in this section, the non-manual markers are neglected.

- (1) FATHER MOTHER DEAF INDEX<sub>1</sub> NEG SPEAK [LIU]  
 ‘My father and mother aren’t Deaf, they speak.’

Figure 3 shows the more emphatic form of this sign, which is often translated as ‘never’ and which has a single, rather than a repeated movement and may also be used as a warning or a negative imperative. An example of the use of this sign is given in (2) which is a girl’s response to the question whether she smoked (note that smoking is considered inappropriate for women in Jordan).

- (2) NEG-EMPH SMOKE NEG-EMPH JORDAN NEG [LIU]  
'No, of course I don't smoke. That's not done in Jordan!'



Figure 2. Neutral clause negator NEG



Figure 3. Emphatic clause negator

The neutral negator in Figure 2 can also be made more emphatic by using both hands and holding them higher, at about head-level (Figure 4). The resulting sign is only used as an interjection and usually has the meaning of a warning, or is used defensively ("it really wasn't me!").



Figure 4. Emphatic negative interjection

The sign in Figure 5 is not normally used to negate a clause, but it can be used to answer a question. It is used, for instance, when declining an offer or denying an accusation. I refer to it as NEG-APOL, because it is mainly used in an apologetic way, as in (3) where it is used to decline an offer.

- (3) A:  $\frac{\text{y/n}}{\text{FOOD}}$  'Do you want something to eat?' B: NEG-APOL 'No thanks.' [LIU]



Figure 5. Negative defensive or apologetic interjection



Figure 6. Negative existential, may be used as clause negator

The sign in Figure 6 is probably the most interesting of the manual negator signs. For this sign, the hand is held in front of the mouth and the fingers bend at the knuckles repeatedly. I have glossed it MA-FI, which in spoken Jordanian Arabic means “there isn’t”. In LIU, however, this sign has a wider meaning. It can be used with the meaning “not have” to negate possession (which is not a possible meaning in Arabic) and it can, even more generally, be used as a clause negator, occurring in the same context as the more neutral sign NEG (Figure 2), as is shown by the semantically equivalent sentences in (4).

- (4) a. YESTERDAY EVENING PARTY COME NEG [LIU]  
 b. YESTERDAY EVENING PARTY COME MA-FI  
 ‘I didn’t come to the party yesterday evening.’

However, a slight difference in the distribution of these two signs is illustrated by the sentence in (5), where the neutral sign NEG is grammatical, but use of MA-FI leads to ungrammaticality.

- (5) a. EVENING PARTY COME NEG TOMORROW  
 b. \*EVENING PARTY COME MA-FI TOMORROW  
 ‘Don’t come to the party tonight, it’s tomorrow.’

It would seem then, that MA-FI cannot be used for advice or warning.

There is another sign that appears to have the exact same distribution and meaning as MA-FI, and that often occurs with the mouthing “ma-fi”. This sign, which consists of an outward movement of the hand (palm up), can be suffixed to some verbs and adjectives (Section 4.2). A more emphatic form of this sign is made with two hands (Figure 7). This two-handed form can be used as a clause negator or negative interjection like MA-FI, but tends to convey a level of annoyance. When used with nouns it may be translated as “absolutely nothing” or “completely useless”.



Figure 7. Emphatic negator conveying annoyance



Figure 8. ZERO

There are other signs with an inherently negative meaning like IMPOSSIBLE, EMPTY, and ZERO. The sign ZERO (Figure 8) can be used as a negative quantifier, as in PERSON ZERO (‘nobody’).

The sign EMPTY is particularly interesting in this respect, because it seems to be in the process of being grammaticalized into a negative particle. It is still used lexically, as in HOUSE EMPTY (‘The house is empty’), but it can also be used more generally to indicate someone’s absence, as in (6).

- (6) DOOR KNOCK EMPTY GRANDMOTHER EMPTY [LIU]  
 ‘They knocked on the door, but nothing, grandmother wasn’t there.’

At present, it is not completely clear to me whether the grammaticalized form of this sign should be analyzed as a negative existential or something else, since it does not occur in my data frequently. If it is in the process of becoming a negative existential, LIU would be particularly rich in having three different negative existentials: MA-FI (Figure 6), the one-handed variant of the sign in Figure 7, and EMPTY.



In summary, LIU has wide range of negative particles, which include a neutral clause negator and three different emphatic negators, two of which can also function as clause negators. In addition, LIU has an apologetic negative interjection and two negative existentials (with a third one possibly in the process of being grammaticalized). It is unclear to me at this point what the exact contexts are in which each of these signs is used. It would seem that there is some overlap in meaning between different particles, although the sentences in (5) shows that there are also subtle differences.

Manual negators in LIU tend to occupy a clause-final position. This is in line with Zeshan's (2004: 52) observation that negative particles in sign languages "have a preference for post-predicate or clause-final position". She also notes that, in contrast, spoken languages predominantly have pre-verbal particles. Some sign languages do allow negative particles in pre-predicate position but they all allow clause-final position as well. Zeshan (2004: 39) points out that it is usually Western sign languages (i.e. European sign languages and those that are derived from them, like American Sign Language (ASL) and Australian Sign Language (Auslan)) that allow pre-predicate negative particles, whereas non-Western sign languages tend to allow only clause-final position. Thus, typologically LIU fits the pattern of a non-Western sign language.

The types of negative particles found in LIU are common in sign languages cross-linguistically. Zeshan (2004: 31) gives a list of negative particles in sign languages, which includes negative existentials, emphatic negatives, and negative interjections. Thus, LIU fits the pattern of other sign languages both syntactically and in terms of the types of negative particles found cross-linguistically. The fact that the negative existential MA-FI can also function as a basic clause negator may be somewhat more uncommon, although this may also be the case for Tanzania Sign Language (Zeshan 2004: 30). The fact that LIU has two, or maybe even three, negative existentials is remarkable, although Israeli Sign Language (ISL) has two negative existentials (Meir 2004).

As far as the form of the negative elements is concerned, Zeshan (2004: 37) shows that certain formational characteristics of negative particles are very common across sign languages. Thus, it is very common for negative particles to have side-to-side movement. Above, we have seen that both the neutral clause negator NEG and the apologetic NEG-APOL in LIU have this type of movement. Moreover, emphatic negatives or negative imperatives typically have a single sideways movement. Again, the LIU emphatic

negative, which can also function as a negative imperative, follows this common pattern. Zeshan suggests that all these forms are iconically motivated, and that this explains why negative particles in different, unrelated sign languages are so similar, when negators in unrelated spoken languages do not show these kinds of similarities. It would seem, however, that the negative existentials in LIU (MA-FI in Figure 6 and the one-handed version of the sign in Figure 7) are not iconic. Yet, it is interesting to note (personal observation) that the negative existential NO-HAY in Mexican Sign Language, which to the best of my knowledge is completely unrelated to LIU, is identical in form to MA-FI. The equivalent sign in Spain (personal observation) is also very similar, although the hand has a sideways orientation in Spanish Sign Language (*Lengua de Señas Española*, LSE). Thus, there appear to be interesting cross-linguistic similarities in the form of negative particles even when there is no obvious iconic motivation involved.

#### 4.2. Negative morphology

Apart from negative particles, LIU also has morphological means of expressing negation manually. It has a suffix which appears to be an abbreviated form of the one-handed negative existential described above (the one-handed version of the emphatic negator in Figure 7) and which attaches to adjectives (Figure 9) and verbs (Figure 10), but not to nouns.



Figure 9. NICE<sup>^</sup>NEG



Figure 10. LIKE<sup>^</sup>NEG

Because it attaches to more than one word category and is simply an abbreviated form of an independently occurring sign, I had first analyzed this form as a clitic (cf. Zeshan 2003 for a negative clitic in Turkish Sign

Language). According to the criteria of Zwicky and Pullum (1983: 503f), however, this form behaves more like a suffix. Zwicky and Pullum give the following six criteria for distinguishing clitics and suffixes.

- (i) Clitics exhibit a low degree of selection with respect to their hosts, while affixes exhibit a high degree of selection with respect to their stems.
- (ii) Arbitrary gaps in the set of combinations are more characteristic of affixed words than of clitic groups.
- (iii) Morphophonological idiosyncrasies are more characteristic of affixed words than of clitic groups.
- (iv) Semantic idiosyncrasies are more characteristic of affixed words than of clitic groups.
- (v) Syntactic rules can affect words, but cannot affect clitic groups.
- (vi) Clitics can attach to material already containing clitics, but affixes cannot.

The first criterion states that a clitic more freely attaches to different categories of stems, whereas a suffix usually attaches to only one word category (the English suffix “-less” in English only attaches to nouns, for instance). The LIU negative suffix attaches to more than one word category (both verbs and adjectives), but does exhibit a certain degree of selectivity in that it does not attach to nouns. It is also highly selective in that it only attaches to a few verbs and adjectives and does not apply across the board. Some of the verbs that the suffix attaches to are UNDERSTAND, SEE, COME, and LIKE. The adjectives it attaches to include IMPORTANT, HAPPY, and NICE. This brings us to the second criterion. According to this criterion, the gaps in the distribution of this form indicate that it is a suffix rather than a negative clitic.

The third criterion also shows that this form is better analyzed as a suffix, because the shape of the suffix may both depend on and influence the form of the stem it attaches to. The sign SEE<sup>^</sup>NEG, for instance, may be produced with the V-hand (ring and middle finger extended) all the way through; that is, we observe progressive assimilation of the handshape of the stem. The sign UNDERSTAND<sup>^</sup>NEG may be produced in neutral space without touching the temple, i.e. the location of the suffix is assimilated. The movement of the sign LIKE, which is normally produced as a repeated up and down movement on the chest, is reduced to a single upward movement when the suffix is attached.

The fourth criterion says that affixes, in contrast to clitics, may change the meaning of the stem. In this respect, the LIU suffix behaves more like a clitic than a suffix. It does not normally change the meaning of the stem, but simply negates it. There is one sign, however, in which the suffix does seem to affect the meaning of the stem. LIU has a sign which can be glossed as SLOWLY or WAIT-A-MOMENT. This sign is a lexicalized form of a gesture that is common in the Arab world. When it is combined with the negative suffix, the meaning of the resulting sign (shown in Figure 11) is NOT-YET (i.e. negative completive).

Zwicky and Pullum's fifth and sixth criteria are harder to test for LIU, because not enough research has been done on syntactic operations involving negative elements (criterion (v)), and there are no other clitics that might provide a suitable environment to test the last criterion.



*Figure 11.* NOT-YET



*Figure 12.* NOT-KNOW

LIU also has some irregular negative forms, like the negative verb NOT-KNOW in Figure 12, which is suppletive (the sign KNOW is made with the same handshape but tapping the temple) and the negative form of LEGAL (Figure 13) which is made by changing the orientation of the non-dominant hand (Figure 14). Also note that the negative sign MA-FI (Figure 6) is itself a suppletive form of the existential FI.

*Figure 13. LAW/LEGAL**Figure 14. ILLEGAL*

Zeshan, in her cross-linguistic study on negative constructions, states that morphological ways of marking negation are comparatively rare in sign languages. She refers to all of these as “irregular negatives” and states that “the number of items that allow morphological negation is usually very small” (Zeshan 2004: 41). Negative suppletion is attested in a number of sign languages, but is usually limited to one or a few items, as it is in LIU. It is interesting to note that, like LIU, both Indian dialects of Indo-Pakistani Sign Language (IPSL) and LSE have a suppletive negative form of the existential. As a further example, Zeshan gives the suppletive verb-pair KNOW and NOT^KNOW from Lebanese Sign Language which is closely related to LIU (see Pfau and Quer, this volume, for suppletive forms of negative modals in Catalan Sign Language and German Sign Language).

Moreover, Zeshan mentions that negative suffixes are attested in Finnish Sign Language (FinSL), ISL, and ASL. The ISL suffix is very similar to the suffix in LIU, both in form and also with respect to the fact that it seems to be derived from a negative existential particle. Meir (2004) assumes that the suffix in ISL has evolved from this sign. The movement of the ISL suffix, however, is stated to be shorter than that of the negative existential, and a twisting movement that is part of the sign is deleted in the suffix. As in LIU, the suffix attaches to nouns and adjectives, but unlike LIU, the resulting complex signs are always adjectives. “There are several indications that this sign is indeed a suffix and not an independent sign. First, its form is determined by the form of the base sign. [...] In ISL we find that the base word determines whether the suffix is one- or two-handed [...]. Additionally, the semantics of the resulting complex words are not

always predictable” (Meir 2004: 116). The two-handed form of the suffix looks similar to the emphatic clause negator in Figure 7.

It is interesting that LIU and ISL have this very similar negative suffix because they are two unrelated sign languages, although they are geographically very close. The fact that the ISL suffix causes semantic changes in the word that it attaches to indicates that it is more grammaticalized and possibly older than the suffix in LIU. The political situation in the Middle East, however, makes it unlikely that ISL has influenced LIU in this area.

## **5. Non-manuals in negation**

Let us now turn to the use of non-manual markers in the expression of negation. Non-manuals have been shown to be crucial in negative contexts in many sign languages studied to date. I will consider three aspects: backward head tilt (Section 5.1), headshake, head turn, and negative facial expressions (Section 5.2), and forward head tilt (Section 5.3).

### **5.1. Backward head-tilt**

As in many other Mediterranean cultures, Jordanians tend to use a backward head-tilt (accompanied by raising of the eyebrows and clicking of the tongue) instead of a headshake. This cultural gesture, shown in Figure 15, is also used by Deaf people, who tend to leave out the tongue-click. Sometimes this gesture is so reduced that only a slight raising of the eyebrows can be noticed.

In LIU, the negative head-tilt does not appear to have a grammatical status, but is generally used by Deaf people in the same way as by the hearing population.<sup>2</sup> It is often used as an informal way of saying “no”, mostly by children. It usually occurs on its own, and does not appear to co-occur consistently with any manual negator sign (although it may occur with the word LIKE<sup>^</sup>NEG (Figure 10), which has an upward manual movement). Crucially, this non-manual is not used as a clause negator by itself in any of my data. In fact, although the gesture is used regularly as a negative interjection in every-day conversation, it does not occur in my data. This may be due to the fact that recording a conversation on video makes the setting more formal, and this gesture inappropriate.



Figure 15. Backward head-tilt

Interestingly, it seems that in Lebanese Sign Language (*Lughat il-Ishaarah il-Lubnaniah*, LIL), which is closely related to LIU, the backward head-tilt is often used together with clause negators, although, as in LIU, it does not appear to negate a clause by itself in the absence of a manual negator (Zeshan, personal communication). In Greek Sign Language (GSL) and Turkish Sign Language (*Türk İşaret Dili*, TİD), the backward head-tilt clearly has a grammatical status. In TİD it “preferably combines with particular negator signs, and its scope is mostly limited to a single sign” (Zeshan 2003: 13). Antzakas (2006) says that backward head-tilt can spread over the whole sentence in GSL, although this is rare and mainly used for emphasis. Like headshake, backward head-tilt in GSL (in contrast to LIU and LIL) can also occur on its own to negate a sentence. In this case, it occurs on the predicate or after the sentence, as in (7), in which both the headshake and the backward head tilt are a grammatical way to negate the sentence (Antzakas 2004:266).

- \_\_\_\_\_ headshake/head back
- (7) INDEX<sub>1</sub> AGAIN HELP INDEX<sub>3</sub> [GSL]  
 ‘There is no way for me to help him again.’

In both TİD and GSL, it appears that the backward head-tilt tends to be used more with manual negators that have a backward or upward movement, whereas headshake tends to be used with negative signs that have a sideward or side-to-side movement. It would seem, then, that there is some form of phonological agreement (synchronization of movement)

between the manual and non-manual negator, although this agreement is not absolute. Zeshan (2004) also notes that all languages that have the backward head-tilt also use a negative headshake in addition.

## 5.2. Non-manual negation: headshake, head-turn, and facial expressions

Headshake is probably the most common negative marker in sign languages across the world. It occurs in all the sign languages in Zeshan's (2004) cross-linguistic study on negation. Some sign languages also use a sideways head-turn, which may be interpreted as a reduced form of the headshake. In LIU, headshake may be reduced to a sideward head-turn or a head-tilt. It may accompany a manual negative sign, but cannot replace it as a clause negator. Headshake can be used on its own only as a negative interjection. Moreover, a manual negative sign may occur without headshake. Thus, manual negative signs are the main clause negators in LIU, while headshake is optional and may be a way of emphasizing the negation. Headshake tends to be more prominent in negative answers than in spontaneous conversation or story-telling. Example (8) shows that clause negators can occur both with and without negative head movement.

- left turn
- (8) GIVE<sub>1</sub> MA-FI GIVE<sub>1</sub> MA-FI GIVE<sub>1</sub> NEG [LIU]  
 'You didn't give me that, you didn't give me that, you didn't.'

In (8) there are three negators. The clause GIVE<sub>1</sub> MA-FI is signed twice, and the verb is repeated a third time with a different clause negator. In the first two clauses no headshake is present. The third has a head-turn to the left. The presence or absence of the headshake does not appear to be caused by the manual negator. MA-FI may be accompanied by a headshake, as in (9), and other negators may occur without a headshake, as in (10).

- \_\_\_\_\_ hs
- (9) TODAY EXAM MA-FI, TOMORROW EXAM [LIU]  
 'I don't have an exam today, I have one tomorrow.'
- (10) GIRL STUBBORN NEG-EMPH  
 'The girl was stubborn and said "Never!"'



There is only one example in my data of a headshake occurring without a negative sign. In example (11), the sign SMELL is made and followed by a headshake without a manual negator. This appears to be an exception in LIU and there are not enough examples in my data in which a headshake occurs on its own to negate a sentence to allow for an analysis.

- (11) GAS BOTTLE SMELL  $\overline{\hspace{1cm}}$  DRINK [LIU]  
 ‘He didn’t smell that it was gas in the bottle and drank from it.’

In the LIU example in (11), the sign SMELL clearly has a negative facial expression, which spreads to the headshake. The corners of the mouth are down, and the lips are pursed, which is a common negative facial expression in many sign languages (cf. e.g. Bergman (1995: 94) for Swedish Sign Language (SSL); Sutton-Spence and Woll (1999: 73f) for British Sign Language (BSL)). The facial expression used in (11) is shown in Figure 16. It may be that it is this negative facial expression that makes it possible for the headshake to occur without a manual sign.



*Figure 16.* Negative facial expression



*Figure 17.* Negative facial expression

In one other exceptional example in the data, a sentence appears to be negated by just this facial expression (Figure 17) and a slight head-turn, but with no manual negator. The context of this sentence, shown in (12), clearly shows that the sentence has to be negative, but no negative sign is made.<sup>3</sup>

- (12) OLD-MAN WALK-AROUND OLD left turn  
NORMAL(2h) [LIU]  
 BREATHE-HARD  
 ‘The old man walked around, he was very old but he didn’t breathe hard, he was fine.’

According to Zeshan (2004) a sideward head-turn is best considered a reduced form of the side-to-side headshake and in the sign languages she describes, it is not ‘strong’ enough to negate a sentence on its own. Likewise, Zeshan (2003) notes that negative facial expression has not been shown to occur as a negator by itself in any sign language, although TĪD has a facial expression with puffed cheeks that can negate a sentence on its own. Thus, this LIU example is exceptional cross-linguistically.<sup>4</sup> However, there are not enough examples in my data in which a headshake, a head-turn, or a negative facial expression occurs on its own to negate a sentence to give a plausible analysis for these cases.

Since manual negators tend to occur at the end of sentences in LIU, headshake also tends to occur towards the end of the sentence. It does not seem to spread backward over entire clauses or even predicates. In most cases, the headshake is limited to the duration of the manual negative sign, although sometimes it may start slightly earlier. But even when the headshake or head-turn starts slightly before the manual negator is signed, it does not spread over an entire constituent, but starts on the sign before the negator irrespective of whether that sign is a subject, predicate, or even an adverb. As there is quite a lot of repetition of signs in LIU, manual negators are often repeated, and sometimes two different manual negators are used with the same meaning, as in (8) above and (13) below. When more than one manual negator occurs in a sentence, the headshake may spread to a sign that occurs between the two negators, but further analysis is needed to show over which constituents headshake can spread in these cases and which constituents would stop the headshake from spreading. The example in (13) contains a topicalized constituent (KEYS) which may stop the headshake from spreading<sup>5</sup>, but headshake can spread over the pronoun in (14).

- (13) hs hs  
 MA-FI NEG TAKE MA-FI KEYS TAKE MA-FI [LIU]  
 ‘No, I didn’t take them, I didn’t take the keys.’

- (14)  $\frac{\text{y/n}}{\text{MATHS, LIKE}^{\wedge}\text{NEG INDEX}_1 \text{ NEG}} \frac{\text{hs}}{\text{NEG}}$  [LIU]  
 ‘I don’t like maths.’

Although manual negative signs in LIU tend to occur at the end of a clause, pronouns may come after a manual negator. In this case, the headshake may spread over the pronoun and to the end of the sentence, as in (15).

- (15)  $\frac{\text{y/n}}{\text{FATHER COME INDEX}_1. \text{SEE}^{\wedge}\text{NEG INDEX}_1} \frac{\text{hs}}{\text{NEG}}$  [LIU]  
 ‘Did my father come? I didn’t see him.’

Thus, spreading of headshake does occur in LIU, but it is quite limited.

In contrast to LIU, headshake in many Western sign languages is the main way of negating a sentence. In ASL, Sign Language of the Netherlands (*Nederlandse Gebarentaal*, NGT), German Sign Language (*Deutsche Gebärdensprache*, DGS), Catalan Sign Language (*Llengua de Signes Catalana*, LSC), Swedish Sign Language (SSL), and other sign languages, headshake is the obligatory part of clause negation, while manual negator signs are optional. This appears to be the normal pattern in most signed languages described so far. It may, however, very well be that this phenomenon is more typical of the signed languages of Europe and America, since these have been described in most detail. In Zeshan’s (2004) typological survey of negation in signed languages, headshake-only negation was confirmed possible in 26 out of 38 sign languages. She notes that sign languages that do not allow headshake-only negation appear to be exceptional. There are a few examples, like Japanese Sign Language (*Nihon Syuwa*, NS) and the village sign language Kata Kolok from Bali.

As mentioned above, Zeshan (2004) notes that, in contrast to the negative headshake, the sideways head-turn is not ‘strong’ enough to negate a sentence by itself. It normally has to co-occur with a manual negative sign. There are several sign languages (e.g. GSL and BSL) where a negative headshake can negate a sentence without the presence of a manual negator, but the sideways head-turn only has a negative meaning when a manual negator is present. It would seem that LIU differs from these sign languages in that even the negative headshake is not normally ‘strong’ enough to negate a sentence on its own, but requires a manual negator.

Even in sign languages that do allow headshake-only negation, it does not appear that headshake is obligatory in all negative sentences. In Chinese Sign Language (CSL), headshake may occur after a sign to negate it, but it is also possible to add a negative sign (a handwave) instead of the headshake. This is shown in example (16) from Yang and Fischer (2002: 176). The authors state that in examples in which the headshake follows the manual sign(s), “the entire sentence is topicalized, or questioned, and the headshake is the answer” (Yang and Fischer 2002: 177). Note that this construction is similar to the exceptional LIU example in (11).

- (16) a.  $\text{DONG} \xrightarrow{\text{hs}}$  [CSL]  
 understand not  
 ‘I don’t understand.’  
 b.  $\text{DONG}^{\wedge}\text{BU}$  (handwave)  
 understand-not  
 ‘I don’t understand.’

In CSL, it appears that “negative nonmanuals cannot by themselves simultaneously negate a sentence” (Yang and Fischer 2002: 194). A negative non-manual cannot occur on a positive sign to negate it, but it may occur after the sign (16a). This structure is impossible in sign languages like DGS and LSC (cf. Pfau and Quer 2002), although it has been reported to be possible in BSL.

Manual negation without non-manual marking is also possible in ISL, where most but not all negative sentences are accompanied by a headshake. Negative imperative signs, for instance, are never accompanied by a headshake (Meir 2004). In NS, manual-only negation is also possible. But manual-only negation is rare “and is uncommon or impossible in several sign languages” (Zeshan 2004: 18).

As far as the scope of negative head-movement is concerned, headshake on a manual negator only, as is common in LIU, is also possible in other sign languages, like ASL and LSC. An example from ASL is given in (17) (Neidle et al. 2000: 44; also cf. Pfau and Quer 2002).

- (17)  $\text{JOHN NOT BUY HOUSE} \xrightarrow{\text{hs}}$  [ASL]  
 ‘John is not buying a house.’



in which headshake is the main way of negating a sentence and manual negators are optional, and another class in which manual negators are the main way of negating a sentence and non-manual markers like headshake are optional (see Zeshan (2006) for a proposal along these lines). With regard to scope and spreading of non-manual negation, LIU does not seem to be exceptional. In fact, it seems to follow some well-established cross-linguistic rules for spreading of negative headshake. Finally, the negative facial expression used in LIU is very similar to that of at least a number of other sign languages.

### 5.3. Forward head-tilt

Apart from headshake and negative facial expression, it is interesting to note that many negative sentences are accompanied by a forward head-tilt. This is somewhat unexpected given that the backward head-tilt is the cultural gesture for negation in Jordan and the surrounding countries. The forward head-tilt tends to spread over entire sentences and seems to indicate denial or disbelief. The sentences in (8) and (13), for example are made with this forward head-tilt, which is illustrated in Figure 18.



*Figure 18.* Forward head-tilt in a negative sentence

Forward head-tilt cannot negate a sentence by itself and does not preclude headshake, but it is fairly consistent in negative sentences when a signer feels she is being accused or when something completely unexpected and

negative happens. It seems that this forward head-tilt is not limited to negative sentences only, but is also used to indicate surprise in positive sentences. It is therefore not as clearly a negative marker as headshake or the sideways head-turn. Its pervasiveness in negative sentences, however, has caused me to mention it here. To the best of my knowledge, this phenomenon has not been described for other signed languages.

## 6. Negative concord

Negative concord is defined as two (or more) negative elements co-occurring in one sentence without changing the negative interpretation of the sentence back to affirmative. Negative concord may take place between a manual and a non-manual component (i.e. a negative headshake or facial expression, combined with a manual negative sign), or it may take place between two manual negators. The first type of negative concord, which is common in most signed languages, has been discussed above. The second type, however, is not possible in every signed language, as Pfau and Quer (this volume) show.

In LIU manual negative concord is possible, as illustrated in (13) and (14), repeated here as (19) and (20).

(19)  $\overline{\hspace{10em}}_{\text{hs}} \quad \overline{\hspace{2em}}_{\text{hs}}$   
 MA-FI NEG TAKE MA-FI KEYS TAKE MA-FI [LIU]  
 ‘No, I didn’t take them, I didn’t take the keys.’

(20)  $\overline{\hspace{2em}}_{\text{y/n}} \quad \overline{\hspace{10em}}_{\text{hs}}$   
 MATHS, LIKE^NEG INDEX<sub>1</sub> NEG  
 ‘I don’t like maths.’

Different negators regularly occur together to give emphasis, and they can either be adjacent, as in (19) or non-adjacent, as in (20). It appears that when two different manual negators (including the negative suffix) occur within a clause, NEG tends to appear in clause-final position accompanied by headshake. Whether this is just a tendency or a rule is not clear from the data. While in (19) and (20) different manual negators combine, manual negators may also be doubled, i.e. the same negator may occur twice in a sentence.

Manual negative concord has also been described for some other sign languages. An example of negative concord in LSC (from Pfau & Quer,

this volume) is given in (21). LSC has a rule that says that if the negative particle NO is present, other negative manual negators must follow it.

- (21) INDEX<sub>1</sub> FUMAR NO MAI/NO-RES [LSC]  
 I smoke not never / NEG  
 ‘I have never smoked / have not smoked at all.’

In ASL negative concord is possible, too, but, unlike in LIU, two manual negative items cannot occur adjacent to each other (Wood 1999: 62). Not all sign languages, however, allow manual negative concord. In DGS, for instance, the use of two manual negators within a clause is ungrammatical. Moreover, Pfau & Quer (this volume) state that negative cliticization (modal plus negation) combined with a manual negative sign is impossible in both DGS and LSC. In contrast, example (20) shows that in LIU a negative suffix can co-occur with a negative particle. Thus, negative concord between two manual negators seems to be quite free in LIU when compared to other sign languages, in which there are either combinatorial restrictions or restrictions with respect to the sequencing of manual negators. It may be, however, that further research will show that certain restrictions pertain to LIU as well.

## 7. Conclusion: Cross-linguistic variation

Clearly, from a cross-linguistic point of view, it is interesting to look at negation in LIU. On the one hand, LIU has elements in common with other signed languages. On the other hand, however, LIU does not seem to behave in exactly the same way as any other signed language described so far and has a number of characteristics that are uncommon cross-linguistically.

As we have seen, there are a number of different manual negators in LIU. Interestingly, these manual clause negators are the obligatory constituents of negation (with very few exceptions) while non-manual negative markers, although very common, are optional. This pattern is uncommon among signed languages. In fact, most signed languages investigated to date show the opposite pattern, with an optional manual negator and obligatory headshake. LIU is also interesting in that it has a negative suffix that occurs with certain verbs and adjectives. Negative



affixes are uncommon across sign languages, but do occur in some, including ASL and ISL.

Another interesting feature of LIU is the fact that it is used in a culture where a backward head-tilt is common. Still, unlike other signed languages in the region (notably GSL and TĪD), this head-tilt is not clearly a part of the grammar of the language. Instead, it seems to remain a cultural gesture even when used by Deaf people. This leads to questions about the way cultural gestures are integrated into signed languages and become part of their linguistic structure.

It is also interesting to see that LIU has certain things in common with CSL. Although the occurrence of headshake without a manual negator is exceptional in LIU and common in CSL, the fact that the headshake can occur after the negated element, rather than simultaneously with it is true for both languages. This pattern has been shown to be ungrammatical in other sign languages, for instance, DGS and LSC. With respect to negative concord, LIU seems to be very free in the way it allows both manual and non-manual negators to combine.

The negative system of LIU as a whole is not exactly like that of any other signed language described so far. It therefore adds to our understanding of cross-linguistic variation in the realization of negation. Much more analysis is needed and it would be interesting to see how negation works in related Arab signed languages. It may be clear, however, that a lot more variety is possible in the grammar of different signed languages than has often been thought.

## Notes

1. Zeshan (2004) gives a typology of negative constructions in 38 different sign languages from around the world. It describes both manual and non-manual aspects of negation in these sign languages. Since this is the most comprehensive typological study in negation to date, it is referred to frequently in this chapter.
2. In both Italy and Israel, the backward head-tilt is used among hearing people, but it does not appear to occur at all in either Italian Sign Language or Israeli Sign Language (Zeshan 2004: 11).
3. Note that some manual simultaneity occurs in this example. The first line of glosses represents the dominant hand, the second line the non-dominant hand.

- ‘2h’ indicates that the sign NORMAL is signed with two hands. Manual simultaneity occurs quite frequently in LIU.
4. For Chinese Sign Language, Yang and Fischer (2002) argue that a negative facial expression alone is sufficient to negate a sentence while a headshake is optional and never co-occurs with manual signs (see (16)).
  5. Bergman (1995) points out that topicalized constituents tend to be outside the scope of negative headshake in SSL.

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# On the syntax of negation and modals in Catalan Sign Language and German Sign Language

*Roland Pfau and Josep Quer*

## 1. Introduction<sup>1</sup>

To date, sentential negation has been described for a fair number of sign languages. Although little is known about the genetic relationships between sign languages, we may assume that most of the investigated sign languages are genetically unrelated. Still, striking similarities have been observed in the domain of negation: in all these sign languages, a manual negative element (a negative sign) is combined with a non-manual marking (a head movement), and in most of them, the manual negative sign is optional, that is, the non-manual alone is sufficient to negate a proposition (cf. Zeshan 2004, 2006a for a cross-linguistic overview of sign language negation). Moreover, in all these sign languages, one available non-manual marker is a side-to-side headshake. Besides that, in some (but not all) sign languages of the Eastern Mediterranean area a backwards head tilt is also observed in negative contexts; this holds, for instance, for Greek Sign Language (Antzakas 2006), Turkish Sign Language (Zeshan 2006b), and Jordanian Sign Language (*Lughat il-Ishaarah il-Urduniah*: LIU; Hendriks, this volume).

Crucially, the headshake which accompanies negated utterances is not just an affective expression but rather an integral part of the grammar of sign languages. Its use, distribution, and acquisition are clearly distinct from that of affective head movements (Reilly and Anderson 2002). Moreover, the two types of facial expressions – linguistic vs. affective – are processed differently and can be selectively impaired (Corina et al. 1999).<sup>2</sup>

In this paper, we analyze and compare the patterns of sentential negation and the interaction of negation with modal verbs in two unrelated sign languages, namely Catalan Sign Language (*Llengua de Signes Catalana*: LSC) and German Sign Language (*Deutsche Gebärdensprache*: DGS), and we give an account of the attested cross-linguistic variation on morphosyntactic grounds. We start by examining the distribution of the negative headshake in the two sign languages in Section 2.1. In Section 2.2,

we briefly discuss the sign language patterns from a typological point of view and in Section 2.3, we add to the picture negative concord data. Building up on the morphosyntactic analysis to be sketched in Section 2.4, we incorporate into the discussion new data on negative modals in Section 3 that can be argued to support the proposal put forth. Here, we first summarize some properties of modal verbs (Section 3.1) before turning to specific characteristics of negative modals in some spoken languages as well as in LSC and DGS (Section 3.2). In Section 3.3, we extend our analysis in order to account for the negative modal data. Ultimately, we contribute some arguments about the hierarchical functional structure in these languages and show how it interacts with morphological and lexical properties.

## 2. Sentential negation in LSC and DGS

### 2.1. Distribution of the non-manual marker

In LSC and DGS, the underlying word order is SOV (Quer 2002; Pfau and Glück 2000; Rathmann 2000). Moreover, in both sign languages, the manual Neg signs follow the verb. The negative signs have a different form in each language, as is illustrated in Figure 1.

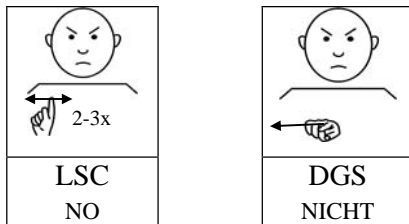


Figure 1. Manual negators in LSC and DGS

The examples in (1) illustrate that in both sign languages, it is not possible to negate a sentence by a manual Neg sign only. Rather, in both sign languages, a side-to-side headshake (hs) is compulsory in negative contexts.<sup>3</sup> Crucially, however, the exact distribution of the non-manual marker differs from sign language to sign language.





- b. *Kòkú mú-sà-nà sìgá ò* [Ewe]  
 Kokou NEG-sell-HAB cigarette NEG  
 ‘Kokou does not sell cigarettes.’

Obviously, however, in the sign languages under investigation, it is not a sequential affix which attaches to the verb; rather the observed change is simultaneous in nature in that it is superimposed on the sign. It has been established that, amongst other functions, non-manual markers may serve a prosodic function in sign languages and can be compared to intonational contours in spoken language (Sandler 1999; Wilbur 2000; Lillo-Martin 2001). Following this line of research, we propose to analyze the negative headshake associated with the verb as a prosodic alteration imposed on a base form. The negative headshake is a featural affix (in the sense of Akinlabi (1996)) which behaves in a way similar to tonal prosodies in tone languages.

Interestingly, prosodic changes are also observed in some spoken languages in the context of negation. Consider the following example from Ógbrû, a Kwa language spoken in the Southern Ivory Coast. In the negative sentence (6b), the postverbal negative particle *mú* is added. Interestingly, in addition to that, the tone on the aspectual element changes from low to high (Mboua 1999: 21f).

- (6) a. *Kirî è pìpjé òkókò* [Ógbrû]  
 Kéré ASP peel.RES banana  
 ‘Kéré has peeled the banana.’  
 b. *Kirî é pìpjé mú òkókò*  
 Kéré ASP.NEG peel.RES NEG banana  
 ‘Kéré has not peeled the banana.’

As far as the syntax of (6b) is concerned, Mboua (1999) claims that the negative marker is a tonal affix which attaches to the aspectual head. Below, we will argue that a similar operation can be held responsible for the prosodic change observed in LSC and DGS.

Let us summarize the facts we have established so far: (i) in LSC and DGS, sentential negation is expressed by a combination of an optional manual sign (a negative particle) and an obligatory non-manual marker (a negative affix); (ii) headshake on the manual Neg sign only is grammatical in LSC but ungrammatical in DGS, and (iii) headshake on the verb sign



only (in the absence of a manual Neg sign) is grammatical in both sign languages.

### 2.3. Negative concord

Negative concord (NC) is known in linguistic description as the phenomenon whereby two (or more) negative elements co-occur in a sentence, without changing the negative interpretation of the sentence. This is in contrast to “double negation”, where the two negative elements retain their negative force and therefore, their combination in a sentence changes the polarity back to affirmative. The difference between double negation and negative concord can be illustrated by the following examples from Standard English ((7a), Zeijlstra 2004: 59) and Black English Vernacular ((7b), Labov 1969; cited in Pinker 1994: 29), respectively.

- (7) a. **Nobody** will **not** be touched by this movie.  
 b. Tha’s bullshit, ‘cause you **ain’t** goin’ to **no** heaven.

Given that sign languages have at their disposal manual and non-manual negative markers, two types of NC must be distinguished (Quer 2002):

- (I) NC between the non-manual component and the negative manual sign (as observed above);  
 (II) NC between a manual negation sign (NO, NICHT) and other manual negative XPs.

As we are going to show in the following, the latter type of NC is only attested in LSC, not in DGS.

Negative XPs are typically non-argumental in LSC. The examples in (8) show that negative XPs – such as NO-RES<sup>7</sup> (‘NEG’), MAI (‘never’), EN-ABSOLUT (‘at all’) – must follow the verb. Consequently, (8bd) are ungrammatical. Note that the headshake associated with adjacent manual signs is realized continuously.

- (8) a. INDEX<sub>1</sub>      hs                      hs  
                          FUMAR                      NO-RES                      [LSC]  
                          I                      smoke.NEG                      NEG  
                          ‘I haven’t smoked (at all).’



The above data show that, as far as sentential negation is concerned, the patterns attested in LSC and DGS are only superficially similar in that both sign languages make use of a combination of a manual Neg sign with a negative headshake. On closer inspection, the two sign languages differ on the non-manual and on the manual level. On the one hand, the exact distribution of the non-manual marker is slightly different; on the other hand, type-II negative concord is only attested in LSC.

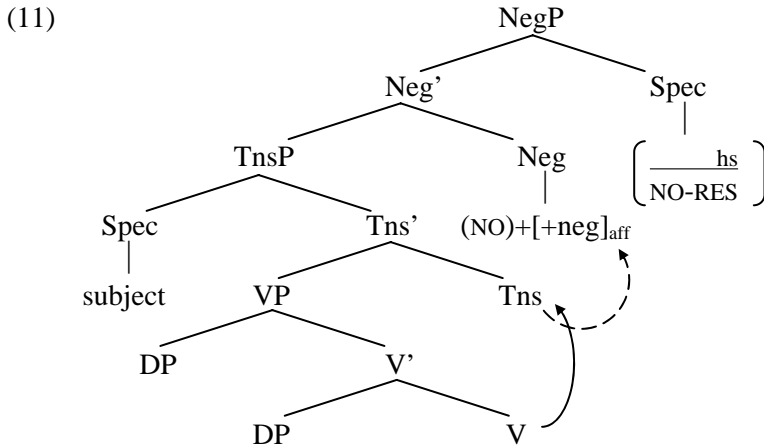
## 2.4. Analysis

Following standard assumptions (Pollock 1989; Ouhalla 1990; Zanuttini 1997), we assume the projection of a negative phrase (NegP) in the functional domain of the clause which makes available two positions for negative elements: the head position Neg<sup>o</sup>, as well as a specifier position which may host negative XPs. In this section, we are going to show how the grammaticality patterns sketched above for LSC and DGS can be accounted for by assuming that the manual and non-manual Neg elements occupy different positions within NegP in the two sign languages.

### 2.4.1. *Catalan Sign Language*

As far as LSC is concerned, we assume that Neg<sup>o</sup> hosts the negative sign NO as well as the negative affix [+neg]. The LSC clause structure is given in (11) (Quer 2002).

As mentioned above, we assume that [+neg] in LSC is a featural affix comparable to tonal affixes in spoken languages. That is, [+neg] imposes a prosodic alteration on the manual sign it attaches to; its phonological realization is a simultaneous side-to-side headshake. When the manual negative marker NO is present, [+neg] will be affixed to NO, yielding structures such as (12a) where the headshake only accompanies the manual Neg sign. Whenever NO is not present, though, V-to-Neg raising is triggered by the Stray Affix Filter (Baker 1988), which bans free bound morphemes in syntax, thus triggering movement of another element to support it. Following verb movement, the featural affix attaches to the verb and consequently, headshake on the verb sign only is grammatical in LSC, as in example (12b).<sup>9</sup>



- (12) a. SANTI [<sub>NegP</sub> [<sub>VP</sub> CARN MENJAR] [<sub>Neg</sub> <sup>hs</sup> NO] [<sub>SpecNegP</sub> Op] ]  
 b. SANTI [<sub>NegP</sub> [<sub>VP</sub> CARN t<sub>v</sub>]<sup>hs</sup> [<sub>Neg</sub> MENJAR ] [<sub>SpecNegP</sub> Op] ]  
 c. SANTI [<sub>NegP</sub> [<sub>VP</sub> CARN t<sub>v</sub>] [<sub>Neg</sub> <sup>hs</sup> MENJAR ] [<sub>SpecNegP</sub> <sup>hs</sup> NO-RES]]

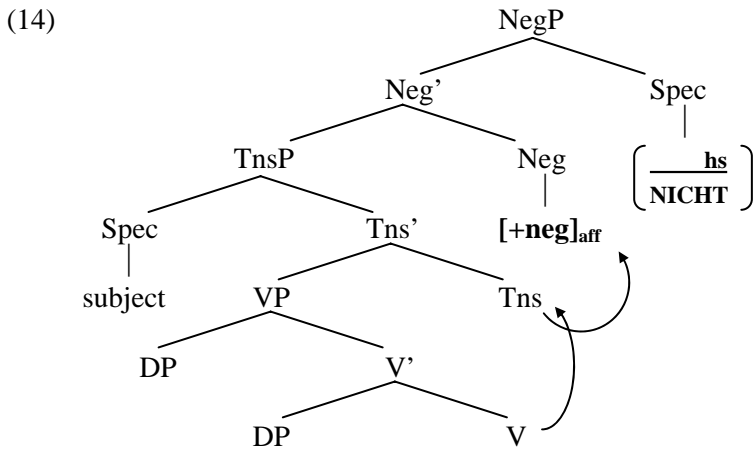
Still, there is a second position available for phrasal elements within NegP, i.e. SpecNegP. In compliance with the NEG-criterion (Haegeman and Zanuttini 1991; Haegeman 1995), the head Neg° hosting [+neg] must be in a Spec-head configuration with a negative operator.<sup>10</sup> This may be an empty negative operator, as in (12ab), or an overt operator such as NO-RES, as in (12c).

In addition, adjunction to NegP is argued to be possible for negative adverbs such as MAI. This explains why MAI has to follow NO-RES in cases of co-occurrence of multiple negative XPs such as (9c). These adjoined phrases are certainly not adjoined to CP, as they appear to the left of a sentence-final wh-phrase, as is shown in (13). Crucially, we assume that wh-elements occupy a right SpecCP in LSC (for details, see Quer 2002).<sup>11</sup>

- (13) INDEX<sub>2</sub> MENJAR NO-RES QUÈ [LSC]  
 you eat NEG what  
 ‘What do you not eat?’

## 2.4.2. German Sign Language

Let us now turn to DGS. On the one hand, DGS patterns with LSC as far as the affixal nature of [+neg] is concerned. On the other hand, however, it differs from LSC with respect to the positioning of the negative elements within NegP. In particular, we claim that, in contrast to LSC, the manual Neg sign NICHT occupies SpecNegP in DGS; this sign is lexically specified for a headshake. This is reflected in the structure in (14) (Pfau 2002).



Since the manual sign occupies SpecNegP in DGS, the headshake cannot simply attach to the manual Neg sign in Neg°, as has been claimed for LSC. Rather, the verb must always raise to Neg in order to pick up the Neg-affix. Consequently, (15a) where verb raising has not applied is ungrammatical.

In (15bc), verb movement to Neg has applied and [+neg] has been affixed. Note that when NICHT is signed (15b), the headshake on the verb and the Neg sign is continuous, that is, the two instances of headshake – one being affixal, the other one being a lexical property of NICHT – are integrated into one prosodic contour.

- (15) a. \* MUTTER [NegP [VP BUCH KAUF] [Neg +neg] [SpecNegP NICHT]]
- \_\_\_\_\_hs
- \_\_\_\_\_hs
- \_\_\_\_\_hs
- b. MUTTER [NegP [VP BUCH t<sub>V</sub>] [Neg [V KAUF]] [SpecNegP NICHT]]

- c. MUTTER [<sub>NegP</sub> [<sub>VP</sub> BUCH t<sub>V</sub>] [<sub>Neg</sub> [<sub>v</sub> KAUF]] [<sub>SpecNegP</sub> Op]]<sup>hs</sup>

In contrast to LSC, DGS does not allow for the co-occurrence of two negative manual signs with a negative concord reading, as shown in (10). This should either derive from a ban on adjunction to NegP or from the lexical properties of the negative XP in question.

In the syntactic hierarchy put forth, Neg selects TnsP as its complement in LSC and DGS. This is actually one of the two options allowed by the fine-grained functional structure as argued for in Zanuttini (1997) and Cinque (1999). It is worth noting that, by contrast, ASL has been claimed to choose the other option: Tns selecting NegP (Wood 1999; Neidle et al. 2000).

The above examples and structures make clear that both, LSC and DGS, show NC in the sense that two Neg elements – a manual particle and a non-manual affix – may be combined without changing the polarity of the sentence back to affirmative. Only LSC, however, allows for NC in the sense that two manual negative signs can be combined.

### 3. The interaction of negation and modals in LSC and DGS

In this section, we introduce negative modals in the discussion in order to determine how they interact with the syntax of negation. The tentative account proposed here is argued to provide additional support for the analysis of negative patterns in LSC and DGS and, more generally, for the interaction of morphological and lexical properties with specific assumptions about the functional structure in these languages.

In Section 3.1, we shall point out some of the characteristics commonly attributed to modal verbs and consider to what extent these can be applied to the sign languages under discussion. Next, we turn to the interaction of modals with negation in spoken and signed languages, focusing on systematic cliticization and lexicalization patterns attested in both modalities (Section 3.2). Finally, in Section 3.3, we will extend the analysis presented in Section 2.4 in order to account for the specific properties of negative modals.



- b. *Devia pod-er treball-ar a casa* [Catalan]  
 must.PAST.3.SG be.able-INF work-INF at home  
 ‘She was probably able to work at home.’

Despite the lack of clear grammatical features setting apart modals from lexical predicates in languages other than English, they seem to belong to the same set because they are able to convey the same types of modal meanings. As such, they lexicalize modal notions as predicates and they coexist with mood, which in turn typically carries modal meanings in verbal morphology (Palmer 1986; Cinque 1999). In this sense, they must be viewed as functional elements (“functional restructuring verbs” in the sense of Wurmbrand (2004)). In an extremely detailed syntactic account of the distribution of modals and mood categories, Cinque (1999, 2001) proposes a fine-grained hierarchy of various modal categories interspersed among other heads in the functional domain. Such heads are argued to host modals according to their semantic interpretation (epistemic, necessity, possibility, obligation, ability, permission, etc.).

From a semantic point of view, modals can convey two basic kinds of modalities: epistemic and deontic. Epistemic modality has to do with what the speaker (or another attitude holder, for that matter) knows about the world, and what is possible or necessary in that world according to that knowledge, that is, it relies on his/her epistemic state. Deontic/root modality, by contrast, has to do with necessary or possible states of affairs according to a norm, a law, a moral principle, or an ideal, and it surfaces with meanings such as will, ability, permission, or obligation (see Palmer (1986) for a detailed overview of these notions and their linguistic materialization in a cross-linguistic perspective). Modal verbs are often ambiguous between epistemic and deontic/root readings, as is illustrated in the English example (20).

- (20) At midnight, he must be home.
- a. Given what I know, it is necessary that he is home at midnight (deduction).
  - b. Given my behaviour norms, it is necessary that he is home at midnight (obligation).

Putting aside a number of grammatical and lexical factors that can force one reading or the other, it is the context which allows us to disambiguate between the two interpretations in (20a) and (20b).



Since Ross (1969), the semantic distinction between epistemic modals and root modals has been argued to derive from the monadic vs. dyadic status of epistemic vs. root modals. Hence, the sentence in (20) would have two potentially distinct semantic representations, as sketched in (21).

- (21) a. Epistemic: must (he be at home at midnight)  
 b. Root: must (he, be at home at midnight)

The traditional generative treatment of modals postulates a syntactic correlate of this semantic distinction: an epistemic modal has been argued to possess the basic properties of a raising verb (no  $\theta$ -role is assigned to its subject position, which is the landing site of the embedded subject (22a)), while a root modal patterns with a control verb (it has a thematic subject which controls a PRO in the subject position of the complement clause (22b)).<sup>12</sup>

- (22) a. He<sub>i</sub> must [<sub>IP</sub> he<sub>i</sub> be at home]  
 b. He<sub>i</sub> must [<sub>IP</sub> PRO<sub>i</sub> be at home]

Several counterarguments have been put forth against the syntactic distinction of epistemic and root modals in such terms (for an overview, see Barbiers (forthcoming)). On the basis of German and Icelandic mainly, Wurmbrand (2001) also rejects such a distinction in syntactic terms and argues for a unified analysis of modal verbs as raising predicates. Due to the lack of evidence to the contrary, for our purposes, we adopt the latter position and uniformly generate modal verbs in Tns for LSC and DGS.

Sign languages also have modal predicates of the kind discussed above, with similar types of readings. However, some of the properties of (English) modals pointed out above are not easily tested for LSC and DGS. Note that in both sign languages, the modals follow the lexical verb.<sup>13</sup> While it is true that modals in LSC and DGS do not agree with their subject, this also holds for a large group of lexical verbs (the so-called plain verbs, for example, MENJAR ('to eat') and KAUFEN ('to buy') in (1)). Moreover, neither lexical verbs nor modals in the two sign languages inflect for tense and there is no phonological distinction between infinitival and tensed forms. Hence, the two instances of RAUCHEN ('to smoke') in (23ab) are identical. In both sign languages, modals can take agreeing verbs as their complements, as is illustrated in the LSC example (23c) where

AJUDAR ('to help') agrees with its subject and object (see (31b) for a DGS example).<sup>14</sup>

- (23) a. POSS<sub>1</sub> BRUDER RAUCH [DGS]  
 my brother smoke  
 'My brother smokes.'
- \_\_\_\_\_ re \_\_\_\_\_ hn
- b. RESTAURANT INDEX<sub>3a</sub> RAUCH DARF [DGS]  
 restaurant INDEX smoke may  
 'In this restaurant, one may smoke.'
- \_\_\_\_\_ hn
- c. INDEX<sub>2</sub> <sub>2</sub>AJUDAR<sub>1</sub> HAVER-DE [LSC]  
 you AGR.S.help.AGR.O must  
 'You must help me.'

In line with what has been observed for English (17d), modals in LSC and DGS cannot co-occur with each other within one clause, irrespective of order (24).<sup>15</sup>

- (24) a. \* INDEX<sub>2</sub> <sub>2</sub>AJUDAR<sub>1</sub> PODER HAVER-DE [LSC]  
 you AGR.S.help.AGR.O can must  
 'You must be able to help me.'
- b. \* KINO MANN WEIN KANN MUSS [DGS]  
 movies man cry can must  
 'At the movies, (even) a man must can cry.'

Although some questions remain open both with respect to the finite/non-finite status of the complement of the modal, there is enough evidence to treat them as a consistent class in the sign languages under study. In the next sections, we concentrate on the interaction of these predicates with negation in order to disentangle their syntactic properties within the functional domain of the clause.

### 3.2. Properties of negative modals

Having discussed some properties of modal verbs, we shall now turn to negative modals. As is well known, negation closely interacts with modal predicates, giving rise to systematic cliticization and lexicalization patterns

(de Haan 1997; van der Auwera 2001). As we will show in 3.2.2, this also holds for the sign languages under consideration. First, however, we shall have a brief look at the interaction of modals with negation in spoken languages.

### 3.2.1. Negative modals in spoken languages

Typically, to express negative modality, two markers are required, one for negation and one for positive modality, as is illustrated by the French example in (25) in which the modal *pouvoir* ('can') and the (split) negative marker *ne ... pas* join forces.<sup>16</sup>

- (25) *Tu ne peux pas mange-r de la viande* [French]  
 you.SG NEG can.2.SG NEG eat-INF of the meat  
 'You can't eat meat.'

Sometimes, however, negative modality is not as clearly expressed by two separate markers where one contributes modal semantics and the other negative polarity. Firstly, languages may employ lexemes that are specialized for negative modality, that is, modal verbs which only occur in negative contexts (and which therefore have to be analyzed as negative polarity items). This is illustrated by the Dutch modal *hoeven* ('need') in (26a) which expresses negative necessity and which cannot be used in affirmative contexts (26b) (see van der Auwera (2001) for discussion of further instances of specialized modals).

- (26) a. *Je hoeft dat niet te doe-n* [Dutch]  
 you.SG need-2.SG that not to do-INF  
 'You needn't do that.'  
 b. \* *Je hoeft dat te doen*

Secondly, it is not uncommon for the modal and the negative marker to form one prosodic word due to cliticization. This phenomenon is well-known from English (Zwicky and Pullum 1983), as shown in (27).

- (27) a. *Peter can't go out tonight*  
 b. *One mustn't drink and drive*

In the cases in (26) and (27), we are still clearly dealing with two markers that combine forces to express negative modality. Thirdly, however, we also find languages in which a suppletive form is used to express the negation of certain modal notions. In order to illustrate this point, take Tamil, a Dravidian language of India and Sri Lanka. Sentential negation is usually marked by the negative suffix *-le* in Tamil. However, there are special negative modal auxiliaries which are detached from the verb. For instance, *mutiyum* expresses (physical) ability while *mutiyaatu* expresses inability (28ab) (Asher 1982: 77).

- (28) a. *Ennaale atu ceyya mutiyum* [Tamil]  
 I.INSTR that do.INF can  
 ‘I can do that.’  
 b. *Ennaale atu ceyya mutiyaatu*  
 I.INSTR that do.INF cannot  
 ‘I can’t do that.’

Similarly, in Babungo, a Bantu language spoken in Cameroon, ability is expressed by the sentence initial auxiliary *kà’* (29a), while the sentence-final auxiliary *didū* expresses inability (29b). Note that usually, sentential negation is expressed by a double particle construction *kèe ... mē*, which is absent in (29b) (Schaub 1985: 91, 228).

- (29) a. *kà’ ηwə gáŋtə ghə* [Babungo]  
 can he help.PRES you  
 ‘He can help you.’  
 b. *ηwə nyu didū*  
 he run.PRES cannot  
 ‘He cannot run.’

In contrast to (27), in the suppletive cases, we are not dealing with transparent contractions of two adjacent independent markers. In the next section, we show that LSC and DGS, too, employ signs that are specialized for negative modality.

3.2.2. Negative modals in LSC and DGS

Just like the spoken languages discussed above, sign languages commonly lexicalize the merger of a modal with negation either as a result of negative cliticization or by means of suppletion. Let us first consider the cliticization strategy. In LSC, this strategy applies to NECESSITAR ('to need'), AGRADAR ('to like' (30a)), and VOLER ('to want' (30b)).<sup>17</sup> In the negative forms, an outward movement is added (wrist rotation of 180°), during which the handshape changes to the 1-hand of NO. The small side-to-side movement of NO (see Figure 1) may be retained. When the modal verb itself has a movement (as in VOLER), this movement gets shortened or deleted (see pictures in Figure 2).

- (30) a. INDEX<sub>1</sub> TREBALLAR \_\_\_\_\_hs  
 I work AGRADAR^NEG [LSC]  
 'I don't like working.'
- b. INDEX<sub>1-2</sub> ANAR-JUNTS \_\_\_\_\_hs  
 we-two go-together VOLER^NEG  
 'I don't want to go with you.'

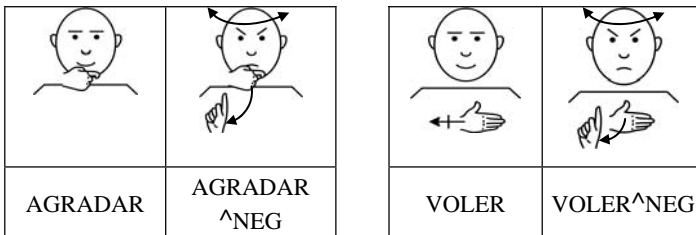


Figure 2. Cliticization of modal and negation in LSC

Similarly, in DGS, cliticization is observed with the modal verbs KÖNNEN ('can'), DÜRFEN ('may' (31a)), MÜSSEN ('must' (31b)), and BRAUCHEN ('need') all of which have a downward movement executed at the wrist joint. The phonological change imposed on the modals differs from the one observed in LSC in that in DGS, the negative clitic consists of an alpha-shaped movement (see Figure 3). Note that optionally, the DGS modals can be signed with two hands, as is true in (31b).

- (31) a. GARTEN INDEX<sub>3</sub> KIND++ SPIEL DARF<sup>hs</sup>^NEG [DGS]  
 garden INDEX child.PL play may.NEG  
 ‘The children may not play in the garden.’
- b. SPIEL INDEX<sub>3</sub> INDEX<sub>2</sub> 2ERKLÄR<sub>1</sub> MUSS<sup>hs</sup>^NEG(2h)  
 game INDEX you AGR.S.explain.AGR.O need.NEG  
 ‘You don’t have to explain the game to me.’

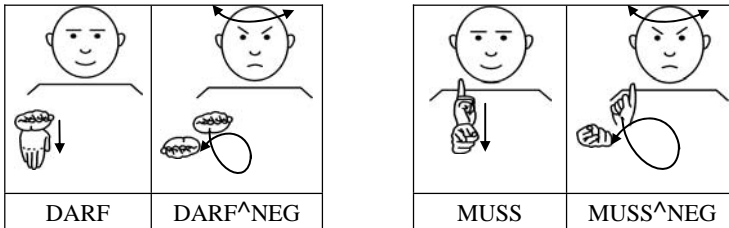


Figure 3. Cliticization of modal and negation in DGS

Besides cliticization, we find instances of suppletion in both sign languages. In LSC, a suppletive form exists for the modal PODER (‘can’ (32a)) which in its affirmative form has an outward rotating movement executed with the lower arm and wrist; in DGS, suppletion is observed for the modal WOLLEN (‘to want’ (32b)) the affirmative form of which involves contacting movement of the hand at the contralateral side of the torso near the shoulder. The pictures in Figure 4 illustrate that the negative forms of these modals do not show the characteristic changes described above, that is, outward movement accompanied by handshape change (LSC) or alpha-movement (DGS), respectively. In both cases, the head moves sideward, parallel to the movement of the hand.<sup>18</sup>

- (32) a. ÚLTIM INDEX<sub>1</sub> DORMIR <sup>hs</sup>PODER-NEG [LSC]  
 last I sleep can.NEG  
 ‘Lately I can’t sleep.’
- b. POSS<sub>2</sub> BRUDER INDEX<sub>3</sub> TREFF <sup>hs</sup>WILL-NEG [DGS]  
 your brother INDEX meet want.NEG  
 ‘I don’t want to meet your brother.’

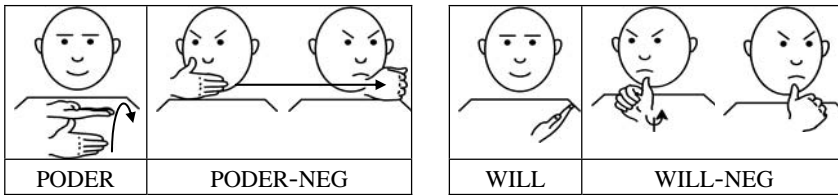


Figure 4. Suppletive forms of negative modals in LSC and DGS

Let us now consider the conceivable combinations of negative modals with the manual and the non-manual negation marker. We shall look at DGS first. As expected, in DGS, sentences containing modals cannot be negated by means of the manual Neg sign NICHT only, since – just like lexical verbs – the modal has to raise to Neg in order to combine with the negative affix (33a). In contrast to lexical verbs, however, it is impossible to negate a modal by a headshake only (33b). Note that (33b) is also ungrammatical in the presence of the optional Neg sign NICHT. Obviously, the use of the cliticized form of the modal (as in (31a)) is obligatory.

- (33) a. \* GARTEN INDEX<sub>3</sub> KIND++ SPIEL DARF <sup>hs</sup>NICHT [DGS]  
 garden INDEX child.PL play may not  
 ‘The children may not play in the garden.’
- b. \* GARTEN INDEX<sub>3</sub> KIND++ SPIEL DARF <sup>hs</sup>(NICHT)  
 garden INDEX child.PL play may.NEG (not)

Comparing LSC to DGS, it turns out that modals in the two sign languages show exactly the same behavior in the context of negation. First, in LSC, too, modals cannot simply combine with the manual Neg sign NO (34a). Remember that in this respect, lexical verbs in LSC have been shown to behave differently from those in DGS. It thus seems as if LSC modals – in contrast to LSC lexical verbs – must raise to Neg. Also in contrast to lexical verbs, LSC modals cannot be negated by means of a simultaneous headshake only (34b).

- (34) a. \* INDEX<sub>1</sub> XINÈS LLEGIR NECESSITAR <sup>hs</sup>NO [LSC]  
 I Chinese read need not  
 ‘I don’t need to read Chinese.’

- b. \* INDEX<sub>1</sub> XINÈS LLEGIR hs NECESSITAR [LSC]  
 I Chinese read need.NEG

In (33) and (34), the grammaticality patterns have been exemplified using modals that have a cliticized negative form. However, in both sign languages, exactly the same patterns are observed with modals that have a suppletive negative form. In other words, in both sign languages, the use of a negative modal is obligatory, be it a cliticized (as in (30) and (31)) or a suppletive form (as in (32)). Moreover, in both sign languages, negative modals, unlike main verbs, cannot co-occur with a negative XP in SpecNegP (NO-RES in LSC or NICHT in DGS), as is shown in (35ab). As expected, in LSC it is also impossible for the negative modal to co-occur with NO (35c).

- (35) a. \* AHIR INDEX<sub>1</sub> VENIR hs hs PODER-NO NO-RES [LSC]  
 yesterday I come can.NEG NEG  
 ‘Yesterday I wasn’t able to come.’
- b. \* KIND EIS ESS hs hs DARF^NEG NICHT [DGS]  
 child ice eat may.not.NEG not  
 ‘The child may not eat icecream.’
- c. \* INDEX<sub>1</sub> XINÈS LLEGIR hs hs PODER-NO NO<sup>19</sup> [LSC]  
 I Chinese read can.NEG not  
 ‘I can’t read Chinese.’

It thus turns out that while LSC and DGS show a different behavior of lexical verbs under negation, they pattern alike when it comes to the negation of modal verbs. In contrast to lexical verbs, modals cannot be negated by a headshake only; rather, a special negative form of the modal (cliticized or suppletive) has to be used. These negative modals cannot further combine with any manual Neg sign.

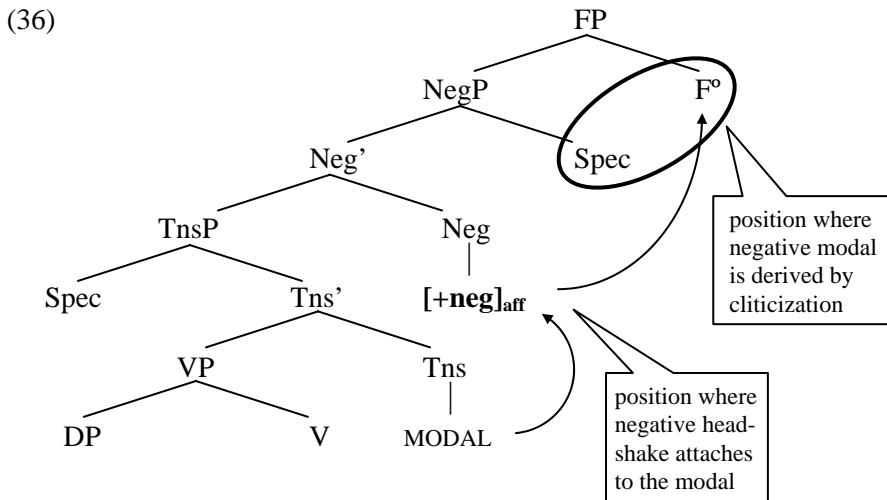


## 3.3. Analysis

Clearly, in the context of negation, modal verbs in LSC and DGS behave differently from lexical verbs. Remember that, based on the derivations sketched for lexical verbs in Section 2.3, we would expect the DGS sentence (33b) as well as the LSC sentences in (34) to be grammatical.

We assume that the distinct behavior of negative modals is due to the fact that they obligatorily raise to Neg as an intermediate step towards the head of a higher functional projection FP where both affirmative and negative modals must end up. Consequently, modals in LSC cannot combine with the manual Neg sign NO, since NO would block head-to-head movement of the modal to F°. Simply skipping this head position is not an option, since on their way up negative modals have to pass through Neg due to the Head Movement Constraint (Rizzi 1990).

We further propose that at PF, SpecNegP obligatorily cliticizes to the modal in F°, as sketched in (36).<sup>20</sup> As a consequence of this cliticization process, negative modals cannot co-occur with negative XPs in SpecNegP (such as NO-RES in LSC or NICHT in DGS). Moreover, adjunction of a negative XP (such as MAI) to SpecNegP is no longer possible in LSC since it would block cliticization.



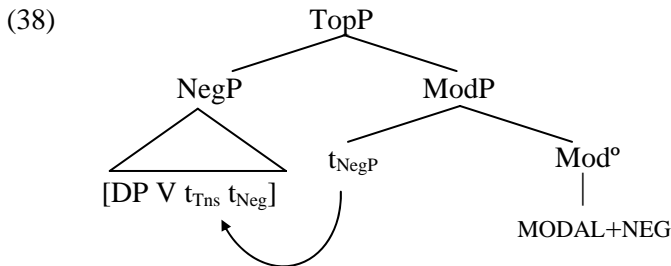
What could be the nature of this higher functional projection and why is movement of the modal to it obligatory? We propose that the second movement step is triggered by the functional head Mod°,<sup>21</sup> which hosts a

modal featural affix.<sup>22</sup> The modal head generated in T must move up in order to support the affix and to check its own modal feature. We further argue that the modal affix is responsible for the non-manual marking associated with modal predicates.

Evidence for a movement operation triggered by a modal affixal head comes from non-manual properties of modals in affirmative sentences. In LSC and DGS, non-negative modals are usually accompanied by a headnod, which is a prosodic modification of the manual sign with which it co-occurs. This is illustrated by the following two examples (also see (23) above).<sup>23</sup>

- (37) a. MORGEN INDEX<sub>2</sub> RECHNUNG BEZAHL hn [DGS]  
 tomorrow you bill pay must  
 ‘Tomorrow you have to pay the bill.’
- b. AVUI PLOURE ALTRE-COP POSSIBLE hn [LSC]  
 today to-rain again possible  
 ‘Today it may rain again.’

Therefore, what we claim is that modals in the two sign languages under consideration – in contrast to lexical verbs – always move to a Mod<sup>o</sup> head. Given that in a negative sentence, the modal has to pass through Neg<sup>o</sup> on its way up, it is obligatorily associated with a headshake. It is therefore not surprising that in these cases, the modal feature is not spelled out by a headnod, but by a headshake; after all, the two non-manual markers are not compatible with each other. An intriguing observation in this respect is that the lexical verbs in examples containing sentence-final modals are not co-articulated with the respective non-manual marker – be it a headnod or a headshake.



Since leftward spreading of the non-manual onto manual material has been shown to be possible as a consequence of structural c-command (cf. Neidle et al. 2000), this is an unexpected result. We take this to indicate that after movement of the modal to  $\text{Foc}^\circ$ , the  $\text{NegP}$  moves as a remnant to a higher left specifier position, presumably the specifier of a topic phrase, as indicated in the structure in (38) above.<sup>24</sup>

The conclusions of this section can be summarized as follows: it turns out that with respect to modals the two sign languages pattern alike. Modals can neither be negated by a manual sign only nor by headshake only (nor by a combination of the two). Rather, in both sign languages, the use of a special negative modal is obligatory. These negative modals cannot combine with any manual Neg signs. Following the common assumption that modals are base-generated in Tns, negative modals in DGS and LSC are argued to undergo Tns-to-Neg movement in order to support the unbound negative morpheme [+neg]. From there they move further to a higher functional head  $\text{Mod}^\circ$  where  $\text{SpecNegP}$  obligatorily cliticizes to the modal.

#### 4. Conclusions

In this paper, we have taken a closer look at the interaction of modals with negation in two sign languages, Catalan Sign Language (LSC) and German Sign Language (DGS). In both sign languages, sentential negation is expressed by the combination of an optional manual Neg sign (NO/NICHT) with an obligatory non-manual marker, viz. a headshake. The exact distribution of the headshake, however, differs slightly: while it is possible for the headshake to be associated with the Neg sign only in LSC, the same is impossible in DGS. We have argued that this difference can be accounted for when we assume that the Neg elements (a negative particle and a negative affix) occupy different positions within  $\text{NegP}$ . In LSC  $\text{Neg}^\circ$  hosts affixal [+neg] and NO; in DGS  $\text{Neg}^\circ$  hosts affixal [+neg] while NICHT occupies the specifier of  $\text{NegP}$ .

Interestingly, with respect to negative modals, the two sign languages pattern alike. In negative contexts, the use of negative modals is obligatory, that is, modal verbs cannot be negated by a headshake only. Moreover, they cannot combine with any manual Neg signs. We have argued that in both sign languages, modals, unlike negated lexical verbs, undergo obligatory further movement to a higher functional head. In both sign languages,

negative modals are incompatible with negative XPs due to cliticization of SpecNegP to the immediately higher functional head to which the negative modal has moved. This higher head is arguably related to focus.

The rather intriguing cross-linguistic variation attested can be made to follow from general principles of syntax in combination with a limited number of assumptions about the morphological and lexical properties of the elements involved in negative structures. It remains to test the proposed account against a wider set of sign languages.

## Notes

1. We are indebted to our sign language informants Delfina Aliaga (LSC), Rosa Maria Boldú (LSC), Imma Codorniu (LSC), Santiago Frigola (LSC), Michael Geist (DGS), Daniela Happ (DGS), Andrea Kaiser (DGS), and Jutta Warmers (DGS); without their patient help this research would not have been possible. Moreover, we would like to thank Jill Morford, Christian Rathmann, Markus Steinbach, and two reviewers for helpful comments. This research has in part been made possible thanks to a project grant of the Spanish Ministerio de Educación y Ciencia awarded to Josep Quer (BFF2003-04867).
2. This is not to imply that affective headshakes are not attested in sign languages. In fact, it has been shown that signers, just like speakers, use headshakes to signal uncertainty or to intensify affirmative sentences with a negative meaning (McClave 2001).
3. For some sign languages it has been claimed that they do allow for sentential negation by a manual Neg sign only; see e.g. Yang and Fischer (2002) for Chinese Sign Language and Hendriks (this volume) for LIU.
4. Note that the DGS example (2b) becomes grammatical when the first three signs are accompanied by a particular facial expression, namely raised eyebrows (re), as indicated in (i).

(i)  $\frac{\text{re}}{\text{MUTTER BUCH KAUF}} \frac{\text{hs}}{\text{NICHT}}$  [DGS]

We assume that such an utterance has very different structural properties, as is also reflected in the non-manual marking. In this case, we are either dealing with a cleft-like structure ('it is not the case that...') or with a VP-topic construction.

5. Again, this generalization does not hold for all sign languages. For LIU (Hendriks, this volume), Italian Sign Language (LIS; Geraci 2005), and Hong

Kong Sign Language (Tang 2006), for instance, it has been pointed out that a negative headshake by itself is insufficient to negate a proposition.

6. Since neither LSC nor DGS have a copula verb, exactly the same distribution of the negative headshake is attested with adjectival and nominal predicates.
7. The traditional gloss NO-RES has actually been used for two related but different signs, one conveying emphatic negation (NO-RES2) and another one expressing a negative perfect (NO-RES1). The one appearing in the LSC examples here corresponds to the former.
8. For ASL, Wood (1999: 61f) argues that it also displays type-II NC, that is, NC at the manual level, as is illustrated in (i).

(i) MARY NOT LEARN ASL NO° [ASL]  
 ‘Mary did not learn any ASL.’

Similarly, Hendriks (this volume) shows that in LIU, different (or even identical) manual negators regularly co-occur in one sentence to give emphasis.

9. Note that in the following, we neglect the possibility of non-manual spreading, as indicated in the examples in (4). In a nutshell, we assume that spreading of the headshake is a prosodic phenomenon (comparable to external tone sandhi in spoken languages) that targets prosodic domains (see Pfau (2002) for discussion).
10. The NEG-criterion (Haegeman 1995: 106f):
  - a. A NEG-operator must be in a Spec-head configuration with an X° [NEG];
  - b. An X° [NEG] must be in a Spec-head configuration with a NEG-operator. Where the following definitions obtain:
  - c. NEG-operator: a negative phrase in scope position;
  - d. Scope position: left-peripheral A'-position [Spec,XP] or [YP,XP].
11. See Neidle et al. (2000) and Cecchetto and Zucchi (2004) for similar claims with respect to the positioning of SpecCP in ASL and LIS, respectively.
12. See Zubizarreta (1982), Roberts (1985), and Picallo (1990) for different implementations.
13. We should mention that sentence initial modals are possible in LSC in examples like (i). The intonational pattern, though, is different and pragmatically it is more restricted than the sentence final cases. Such order has also been attested in DGS, as exemplified in (ii) (Heßmann 2001: 386).

(i) AVUI POSSIBLE PLOURE ALTRE-COP [LSC]  
 today possible rain again  
 ‘Today it might rain again.’

- (ii)  $\overline{\text{hn}}$   
 MUSS INDEX<sub>1</sub> OFFEN SAG FIRMA INDEX<sub>3</sub> [DGS]  
 must I frankly say company INDEX  
 ARBEIT VORSTELL  
 work introduce  
 'I had to frankly mention (it) at the job interview.'
14. The fact that the lexical verb in (23c) shows agreement need not contradict the fact that it is infinitival. Inflected infinitives have been argued to exist in languages as e.g. Portuguese (Raposo 1987).
15. For ASL, too, it has been observed that modals cannot co-occur with each other (i) (Aarons et al. 1995: 231). Interestingly, Aarons et al. have identified a number of lexical tense markers which are in complementary distribution with modals, e.g. the lexical tense marker FUTURE-TNS (ii) (Aarons et al. 1995: 243). They argue that this is due to the fact that the modal and the tense marker compete for the same syntactic position, namely Tns. In addition, unlike lexical predicates, ASL modals occur to the left of sentential negation (iii) while main verbs occur to the right (Aarons et al. 1995: 231).
- (i) \* J-O-H-N MUST CAN PASS TEST [ASL]  
 'John can have to pass the test.'
- (ii) \* J-O-H-N CAN FUTURE-TNS BUY HOUSE  
 'John will be able to buy a house.'
- (iii)  $\overline{\text{neg}}$   
 J-O-H-N SHOULD NEVER EAT CORN  
 'John should never eat corn.'
16. Note that in (25), the negation scopes over the modal. In order to express the opposite scope relation, that is, the modal scoping over the negation, French uses the syntactic structure in (i) (van der Auwera 2001: 24).
- (i) *Tu peux ne pas mange-r de la viande* [French]  
 you.SG can.2.SG NEG NEG eat-INF of the meat  
 'You can not eat meat.'
17. Here we gloss over possible differences among modal predicates in terms of their lexical/functional status: some of them, such as *like* or *want* seem to be more lexical than others.
18. The existence of cliticized and suppletive forms of negative modals has been described for a number of sign languages (see Zeshan (2004) for overview). For ASL, for instance, Aarons et al. (1995: 231) point out that MUST has a contracted form MUST^NOT which is articulated using the handshape of the modal in combination with the thumbing motion outward from the chin

characteristic of the manual Neg sign NOT. In contrast, CAN has a suppletive form CAN'T.

Note that for ASL, it has been claimed that the use of the cliticized form is not obligatory (Neidle et al 2000: 79ff). See Shaffer (2002) for further discussion of negative modals in ASL.

19. Interestingly, in LSC there is a complex form involving the suppletive form and cliticized negation PODER-NO^NO which is lexically specialized for the expression of prohibition (deontic). This is different from the case discussed under (35b).
20. A similar proposal is brought forward for Italian by Cinque (1999: 124). He assumes that the negative marker *non*, originating in SpecNegP, cliticizes onto the verb raised to the head immediately above NegP.
21. The presence of such a functional projection hosting modals has been independently proposed for ASL by Matsuoka (1997).
22. An alternative analysis that remains to be explored is that this higher functional projection corresponds to FinP (Rizzi 1997). We thank Enoch Aboh for this suggestion.

Another possibility would be that the higher head where the negative modal ends up is the head of a focus-related projection FocP (Rizzi 1997). See the following footnote on why we do not pursue this line of analysis. A different alternative would be that the landing site of the modal is simply the C head endowed with a [+focus]-feature. This proposal would be in line with Petronio and Lillo-Martin's (1997) analysis of modal doubling in ASL.

23. Headnod has been independently shown to be a marker of focused constituents (see e.g. Wilbur (1991) for ASL; Van der Kooij et al. (2004) for SL of the Netherlands). For Brazilian Sign Language (LSB), Nunes and de Quadros (in press) describe a focus doubling construction. Amongst the elements that may be doubled for focus reasons are modals. Interestingly, the sentence-final copy of the modal, which they claim to be adjoined to a focus head, is also accompanied by a head nod, as can be seen in (i):

- |      |                                       |           |       |
|------|---------------------------------------|-----------|-------|
|      |                                       | <u>hn</u> |       |
| (i)  | INDEX <sub>1</sub> (CAN) GO PARTY CAN |           | [LSB] |
|      | 'I <i>can</i> go to the party.'       |           |       |
| (ii) | INDEX <sub>1</sub> CAN GO PARTY       |           |       |
|      | 'I can go to the party.'              |           |       |

Nunes and de Quadros claim that after adjunction of the modal to Foc<sup>o</sup>, there is remnant movement of TP to the specifier of a topic phrase where the first instance of the modal is optionally deleted. While this is a suggestive parallelism, it must be acknowledged that in LSB, there is also a non-focused variant, that is, the one in (ii), without headnod on the modal. As DGS and

LSC sentence-final modals do not always turn out to be focused, we do not pursue such a focus analysis of headnod on modals. Moreover, the non-manuals occurring with sentence-initial modals would require a completely different explanation, which seems undesirable.

24. Sentence-initial affirmative modals display a different behaviour with respect to non-manual spreading. In this case, rightward spreading is possible. We tentatively derive this from rightward adjunction of the complement of Mod<sup>o</sup> to ModP, that is, a sort of extraposition.

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# **‘Real data are messy’: Considering cross-linguistic analysis of constituent ordering in Auslan, VGT, and ISL**

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## **1. Introduction<sup>1</sup>**

This chapter explores some of the issues relating to data collection, description, analysis, and cross-linguistic comparison in the investigation of constituent ordering in signed languages. First, we present a brief overview of the existing literature on constituent order in signed languages and discuss a widely applied elicitation task used for this purpose. Then we present a small comparative analysis of declarative utterances in three signed languages using the elicitation task. This includes the methodology and a description of the guidelines we attempted to follow for the collection and interpretation of the data. After discussing the results for the three signed languages individually and in comparison, we conclude by discussing some of the practical problems in data collection and analysis we encountered, and close with some more general and theoretical issues that arose from this study.

## **2. Overview**

### **2.1. Comparing approaches to the study of constituent order in signed languages**

The range of approaches that have been adopted in considering constituent order in signed languages makes it extremely difficult to compare and contrast findings across all studies. Researchers have collected signed language data, for example, using translations of English sentences, grammaticality judgments of possible constructions, and elicitation from drawings. A small number have also used naturalistic, spontaneous data filmed in informal settings.

Table 1 provides an overview of the diverse data collection methodologies of some of the major studies reported in the literature for American Sign Language (ASL), British Sign Language (BSL), Danish Sign Language (DSL), Italian Sign Language (*Lingua Italiana dei Segni*, LIS), Swiss-French Sign Language (*Langue de Signes Suisse-Française*, LSSF), Sign Language of the Netherlands (*Nederlandse Gebarentaal*, NGT), Hong Kong Sign Language (HKSL), as well as Flemish Sign Language (*Vlaamse Gebarentaal*, VGT) and Irish Sign Language (ISL). These differences with regard to the data are but one reason why the degree of confidence we can have in cross-linguistic comparison based on these studies is limited.

Table 1. Data types in research on constituent order, adapted from Brennan (1994)

<b>Researcher(s), date: language</b>	<b>Data type used</b>
Fischer, 1975: ASL	interpretation of signed sequences
Friedman, 1976: ASL	natural discourse in informal settings
Liddell, 1980: ASL	translation of English sentences
Deuchar, 1983: BSL	natural discourse in informal settings
Volterra et al., 1984: LIS	elicitation using drawings
Boyes-Braem et al., 1990: LSSF	elicitation using drawings
Coerts, 1994: NGT	elicitation using drawings
Vermeerbergen, 1996, 1998: VGT	elicitation using drawings and natural discourse data
Saeed, Sutton-Spence and Leeson, 2000: ISL & BSL	elicitation using drawings
Neidle et al., 2000: ASL	naturalistic and elicited data, including grammaticality judgments
Leeson, 2001: ISL	elicitation using drawings and natural discourse data
Sze, 2003: HKSL	elicitation using drawings
Engberg-Pedersen, 2002: DSL	naturalistic conversations and monologues

Six of the studies listed above (that is, all but one of those that used ‘elicitation using drawings’) were based on data collected with an

elicitation task first designed by Volterra et al. (1984). In addition to the initial study by Volterra et al. on LIS, this task has been used in research on at least five other signed languages: DSGS (Boyes-Braem et al. 1990), NGT (Coerts 1994), VGT (Vermeerbergen 1996, 1998), BSL (Saeed et al. 2000) and ISL (Leeson 2001). A related (but not identical) method was used in Sze's (2003) work on HKSL. In the Volterra et al. task, eighteen pairs of drawings are used to elicit utterances describing three distinct types of states of affairs (henceforth SoA): (1) six pairs of non-reversible SoA (where only one of the illustrated entities, the animate or human one, would be likely to be the agent of the action), (2) six pairs of reversible SoA (where either illustrated entity could be the agent) and (3) six pairs of locative SoA (presenting the motion and/or location of two entities relative to each other). Possible English translations of the eighteen sets of elicited SoA are given in Table 2. Each pair of drawings attempts to elicit only one contrastive element (e.g., 'a boy closes a door' versus 'a boy opens a door').

The main purpose of these investigations has been to analyze whether the signed languages studied exhibit systematic ordering of constituents in declarative utterances that contain two arguments, and if so, to determine the patterns that occur.

Given that all of these studies are based on the analysis of the same type of data, one might expect that comparing the results from the various signed languages would be a fairly easy task. However, this cross-linguistic comparison turns out to be less straightforward than foreseen, for four main reasons.

First, different authors use different methods of analysis and hence different terminology to identify the constituents in the responses elicited. Fortunately, almost all authors explicitly explain the terminology they use. We should note here that this is not always the case in the signed language literature, where more traditional grammatical notions such as *subject*, *object*, and *topic* often remain undefined. When terminology and theoretical assumptions are clearly defined, then, in principle, re-analyzing the findings of one study using the analytical terminology and concepts from another study becomes possible, allowing for cross-linguistic comparison. Yet, due to the fact that most papers do not include a presentation of the analysis of all data collected, this is usually not possible. Coerts (1994), for example, used semantic roles from Dik's theory of Functional Grammar (Dik 1989) as her main means of analyzing the constituent order in her NGT data, but because she does not present an



analysis for every sentence in her data set, one cannot verify which semantic role was used for each and every argument. So if there are any doubts about how certain arguments were analyzed in this study, the paper itself does not provide an answer.

*Table 2.* Types of sentences elicited by the Volterra et al. (1984) task

<b>Type of state of affairs (SoA)</b>	<b>Situations depicted in stimulus pictures</b>
Non-reversible	1. A boy closes/opens the door 2. A girl/boy eats a slice of cake 3. A man builds/paints a wall 4. A girl watches television/looks at a painting 5. A woman/man cuts a piece of string 6. A man washes a dog/a car
Reversible	7. A car tows a truck/A truck tows a car 8. A little boy hugs an elderly woman/ An elderly woman hugs a little boy 9. A boy pushes a girl/A girl pushes a boy 10. A woman brushes a child's hair/ A child brushes a woman's hair 11. An American Indian stabs a cowboy in the back/ A cowboy stabs an American Indian in the back 12. A girl strokes a boy's cheek/A boy strokes a girl's cheek
Locative	13. A tree is behind/in front of a house 14. A bunch of flowers is beside/in a vase 15. A man stands near/far away from a car 16. A cat is under/on a chair 17. A car goes under/over a bridge 18. A ball is under/on a table

Although in the small comparative study we present here, each of us has been able to view the data and the analysis of each language, the reader,

unfortunately, still cannot access the full data set. However, we give numerous examples and discuss possible alternative analyses for them.

Second, in many cases, information about social and linguistic factors needed for cross-linguistic comparison is missing. In terms of sociolinguistic factors, Volterra et al. (1984), for example, found a considerable difference in constituent order patterning in clauses describing reversible SoA between native and non-native signers of LIS. Not all other studies explicitly contrast data collected from native and non-native signers (sometimes this is not even possible, because only native signers are involved in the study). With regard to linguistic factors, there are previous studies in the literature that document the apparent association of spatially modified verbs and ‘classifier’<sup>2</sup> constructions with particular sign orders, such as Friedman (1976) and Liddell (1980) (for similar observations on Auslan see Johnston 1992). More recently, Engberg-Pedersen (2002: 8) observed that in DSL, sentences with classifier constructions and/or constructed action<sup>3</sup> (see 3.2.1 below) ‘typically start by a presentation of the participants involved before the classifier predicate or the verb with the stylized imitation of one of the participants’ actions’. Of the other authors who have used the Volterra et al. (1984) materials (or a related task), Vermeerbergen (1996, 1998) and Sze (2003) also make reference to the influence of classifier constructions and spatially modified verbs on sign order (see 2.4.2 below for further discussion). Given that not all other authors indicate what types of verbs occur in their data, it is not possible to check if such differences play a role in other signed languages, as well. In Saeed et al. (2000), simultaneous constructions received a lot of attention, but again, because some of the other studies only refer to simultaneity in passing (e.g., Boyes-Braem et al. 1990), cross-linguistic comparison of this aspect of the data is not always possible.

Third, different interpretations of the same findings may obscure the cross-linguistic picture. In relation to the relative order of subject (S), verb (V) and object (O), Volterra et al. (1984) explicitly state that they ‘found that in many cases of the SVO order, the verb is repeated at the end of the sentence (SVOV)’. Vermeerbergen (1996) rejected the analysis of SVOV as a subtype of SVO or SOV. Both orders occur commonly in her VGT data, and it is not clear what criteria should be used to determine whether the first verb should be seen as the main verb and the second verb as the repeated element, or vice versa.

Another construction allowing different interpretations is the so-called ‘split sentence’. Volterra et al. (1984: 32f) treated the following utterances

from their LIS data as examples of split sentences (i.e., ‘as two distinct sentences, each with a subject and a verb’). In both cases, a distinct pause or prosodic break occurs between the two parts of the construction.

- (1) a. NONNA FERMA, BAMBINO ABBRACCIARE [LIS]  
 grandmother stand-still, child hug  
 ‘The grandmother stands still, and the child hugs (her).’  
 b. BAMBINO SEDUTO, MAMA PETTINARE  
 child seated, mother comb  
 ‘The child is seated, and the mother combs (her hair).’

But Volterra et al. (1984) also admitted that, especially when there is no pause, these constructions might be seen as OSV (where the – possibly topicalized – clause initial object noun phrase is followed by some kind of verbal or adjectival element).

Fourth, there is a fundamental assumption in the previous investigations using the above-mentioned elicitation task which may not be warranted. The assumption is that – irrespective of language-specific preferences for particular constituent orders – language informants will typically produce only one clause or, at least, only one matrix clause in their description of the SoA depicted in the stimulus. As we shall see below, this was not the most common response pattern across all three languages and there is no indication in the literature that a single clause response would be the norm for most spoken language informants describing these SoA.

In summary, authors studying constituent ordering in different signed languages have used different types of data, which makes it very hard to compare findings cross-linguistically. Even the studies that analyze similar types of data, collected using the Volterra et al. (1984) materials, do not always allow for a straightforward comparison because of (1) different methods of analysis (resulting in different terminology and grammatical concepts being used to identify constituents); (2) different choices concerning the aspects which should be highlighted or rather left un-discussed in the presentation of the findings; (3) different interpretations of the same phenomena; and (4) different assumptions about the nature of the responses to the task.

Shared concerns about these issues led the authors of this paper to collaborate on a small comparative analysis of declarative utterances in three signed languages and attempt to make explicit some of these problems.

### **3. Methodology**

Like the studies described above, our study of Auslan, VGT and ISL was based on the Volterra et al. (1984) picture elicitation task data. Due to problems with the elicitation of grammaticality judgments in any language study (e.g., Labov 1996), we decided only to analyze the spontaneous responses to the stimuli without consideration of judgments of well-formedness.

#### **3.1. Data collection**

Four informants for each of the three signed languages (i.e., a total of twelve informants) participated in this study. A deaf research assistant conducted the data collection in each instance (i.e., he/she presented the data elicitation session).

To minimize sociolinguistic complexities, we controlled for age range, region, gender and native competence, collecting data from male native signers aged 25-50 years, all living in the same region in Australia (from Sydney), Flanders (from West Flanders), and Ireland (from Dublin). Native signers were defined as deaf adults who had acquired their community's signed language before six years of age.

Signers looked at two pictures that were different in only one salient feature, and were then asked to describe to the deaf research assistant the illustration marked with an arrow. The signer was aware that the addressee (i.e., the research assistant) had a similar set of pictures and knew that the addressee's task was to select the picture described. There was no printed text or translation involved and they were not aware of the specific aims of the study. The sessions were videotaped.

#### **3.2. Data analysis**

In order to avoid as much as possible the variable coding and interpretation of the data that appears almost inevitable between data sets from different signed languages (and even within a data set from a single signed language), we applied one basic criterion for 'clause-hood': the nucleus of each clause should be some kind of predicating element, often a verb (Van Valin and LaPolla 1997). In other words, each individual verb represented

a separate clause, even if there were no explicit and separate signs for the various arguments of the verb. (For an exploration of issues and problems that arise from this approach, see the discussion of results, Section 4 below).

A small number of verbless clauses were, however, also recognized. The verbless clauses which were included were of three types: (i) clauses involving an adpositional element such as a prepositional sign (e.g., HOUSE TREE BEHIND), or (ii) the juxtaposition of two nominal signs (e.g., MAN COWBOY), and (iii) simultaneous constructions in which two classifier handshapes were simultaneously produced without any apparent verbal element being involved (e.g., there was no clear locating or path movement of either of the signs). In brief, this is the procedure we followed:

- (1) Label arguments: We labeled the semantic roles for the arguments involved, drawing on the work of Van Valin and LaPolla (1997). In our data, this meant identifying the *actor* (the entity controlling or primarily involved in an action) and the *undergoer* (the entity affected by an action) for the non-locative SoA, and the *theme* (the entity primarily involved in a state or a change of state) and the *location* (the place where or the entity with reference to which something is located) for the locative SoA. For the purposes of making generalizations about the data, actor and theme were re-labeled respectively as A1, and undergoer and location as A2 (cf. Coerts 1994). Additional third or fourth arguments within the same clause (e.g., a recipient) were coded as A3 etc. Co-reference in multi-clausal responses involving change of semantic role of some participant relative to the verb was indicated by the use of ‘a’ or ‘b’ thus: A1a, A1b, A2a, etc.
- (2) Code/annotate for simultaneous constructions: Two signs deliberately uttered simultaneously, one on each hand, and with meaningful reference to each other (i.e., not the simple perseveration of one sign while a subsequent sign is articulated) were coded in curly brackets, with a comma separating the two elements, thus: { ... , ... }.
- (3) Label predicates: Predicates were labeled either V (verbal predicates) or PREP (prepositions). Simultaneous signs in which at least one hand realized a verb, preposition, or classifier handshape that was moved or located in some way were analyzed as ‘complex predicates’. In multi-clausal responses, each new verb was numbered consecutively (i.e., V1, V2, V3, etc.) and further annotations added for verb modification

and argument incorporation (i.e., V1+ coded a verb modified for manner or aspect; V1+A1 coded a verb incorporating locative or directional information about an argument; V1+A2-CL coded a verb incorporating an argument by way of a classifier handshake).

- (4) Label repeated constituents: arguments, verbs or clauses that were repeated within the one response to a stimulus picture were placed in square brackets.
- (5) Simplify and re-label arguments as A1 or A2: We re-labeled all arguments as simply A1 or A2, ignoring finer distinctions for co-reference (e.g., A1a, A1b become simply A1), and ignored additional arguments in a single clause (i.e., disregarded A3 or A4).
- (6) Simplify and re-label predicates as V, {+V}, or {~V}: We re-labeled all PREP predicates where there was no other verbal element in the clause as V. This is because many signs labeled as prepositions in all three of the signed languages appear also to act as verbs (e.g., the Auslan sign often glossed as IN may also mean 'enter'). In other clauses which had both a V and a PREP, the preposition is ignored in the simplified re-labeling. In all these cases, the prepositions appeared to be some kind of borrowing from the spoken language and their omission leaves the overall analysis of constituent ordering unchanged. All verb labeling was simplified and internal modifications were ignored for the analysis of gross constituent order. (They remain, however, available for more detailed examination of the types of verbs that occur at various locations within each individual response.) Simultaneous constructions which appeared to be the only verbal element in a clause were re-labeled as V. All other simultaneous constructions which appeared to stand alone as clauses (i.e., without any other signs in that clause) were simplified and relabeled as {+V} ('simultaneous construction with a verbal element') and {~V} ('simultaneous construction without any apparent verbal element, yet appearing to constitute a clause/proposition of its own').
- (7) All the clausal annotations, rich and simplified, were entered into a database program for analysis and comparison.

#### **4. Results**

The results of the study are first presented according to the SoA depicted in the elicitation pictures described in Table 2: non-reversibles (pictures 1-6),

reversibles (pictures 7-12) and locatives (pictures 13-18). The overall results for each SoA for all three languages are presented before details of each signed language are given.

There are a number of examples in the data set in which the particular analytic approach and coding regime outlined above could be seen as problematic. It is evident that different decisions regarding clause boundaries and annotation conventions and simplification procedures could yield slightly different results. Moreover, it is not surprising that there are some differences between the three signed languages and the responses from the individual participants. Where these issues relate to examples found only in one signed language's data set, they are discussed with the results for that language. In all other cases, the interpretation of the overall distribution of types, alternative analyses of clauses, and general observations on the data are left to the discussion section.

Before we examine the responses to the three different types of SoA, it is important to remember that the total number of clauses we analyzed is not equal to the total number of stimulus pictures multiplied by the number of participants in each language and the number of languages ( $18 \times 4 \times 3 = 216$ ). Respondents varied in the number of clauses they produced in order to describe the SoA depicted. Approximately half of all responses did consist of a single clause. In the other half, participants produced two, three and even four clauses as part of their response. All clauses produced as part of an integrated single response to each stimulus were analyzed. In total, 354 clauses were identified and constitute the data set for the purposes of this analysis. (As we shall see in the discussion of the data and of the problems of analysis that arose from this study, the exact number of clauses, independent or otherwise, in the data may be difficult to determine.) Finally, the number of clauses in the data set is also influenced by the fact that there were no responses for two stimuli in the ISL data, and there was one 'unanalyzable' response in the VGT data.

With respect to the total number of clauses produced by participants from each signed language, it can be seen from Table 3 that fewer clauses were elicited from the Flemish signers than from the Australian or Irish signers. (It is possible that an apparently idiosyncratic VGT signer had a significant impact on the lower overall number of clauses elicited in that data set.)

Table 3. Numbers of clauses elicited for each language and type of SoA

	Auslan	VGT	ISL	Total
Non-reversible	47	30	44	121
Reversible	44	34	48	126
Locative	43	31	33	107
	<b>134</b>	<b>95</b>	<b>125</b>	<b>354</b>

#### 4.1. Non-reversible states of affairs

The results for the non-reversible states of affairs in all three sign languages are given in Figure 1.

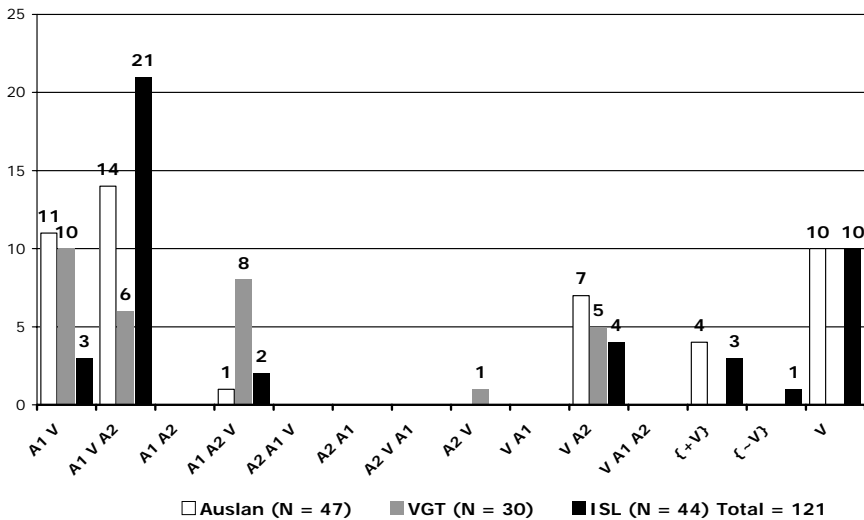


Figure 1. Number of clause types in responses to the non-reversible SoA

As can be seen from Figure 1, the 121 responses in the non-reversible category include 41 clauses (34%) that are based on an A1 V A2 pattern; another 24 clauses (20%) have a A1 V pattern; and 14 (12%) have a V A2 pattern. Therefore, in approximately 66% of all clauses for reversible SoA in the data set, the sign representing the actor precedes the verb and that



representing the undergoer follows the verb, but both arguments need not be present.

#### *4.1.1. Auslan*

Apart from the most frequent pattern of A1 V A2, there is also frequent use of clauses consisting of only one explicit signed argument with a verb (e.g., A1 V or V A2), or even of just a single verb without any explicit signed arguments. The four stand-alone verb clauses of this type occur in environments in which the arguments are easily identifiable because they are incorporated into the form of the verb (two instances), or because the stand-alone verb is a repeated form of a verb that was modified in this way in the preceding clause (two instances). The five examples of V A2 are found as the second member of apparently co-ordinated clauses in which the first argument of the first clause (an A1 V clause) appears to be omitted in the second. Of the remaining responses of the A1 V type, three may be regarded as the first element of a potential ‘split sentence’ pattern (see the discussion of results below), while one simply has no undergoer argument separately mentioned (e.g., BOY CLOSE-DOOR).

#### *4.1.2. VGT*

The four most frequent orderings in VGT clauses describing non-reversible situations are A1 V, A1 A2 V, A1 V A2, and V A2 (see Figure 1). Only six of the clauses exhibit the A1 V A2 pattern and four of these clauses were produced by the youngest VGT signer, who appears to be quite idiosyncratic in his signing (see below). Over half (17 of 30) of the VGT clauses found in responses to non-reversible SoA contain only one argument (A1 V, A2 V, or V A2) and of these 10 are of the A1 V type (e.g., MAN LAY-BRICKS). The A1 V pattern is found in similar environments as in the Auslan data.

In the eight clauses with a A1 A2 V pattern, the final verbal element consists of a verb which is modified in a way (i.e., located, used in a simultaneous construction, or incorporating a classifier handshape) that makes it clear that the A2 is the undergoer. This is in line with previous studies of VGT that have shown that constituent order varies depending on the kind of verb used by a signer. For example, Vermeerbergen (1996)

found that clauses containing lexical verbs and clauses containing ‘other predicates’ – which are labeled ‘werkwoordelijke constructies’ in Dutch (or ‘verbal constructions’ in English) and include classifier verbs and constructed actions – differ with respect to constituent order. The A1 A2 V pattern was shown to occur (1) when the signer used a classifier verb or constructed action instead of a lexical verb sign; (2) where the citation form of the lexical verb was modified to (spatially) refer to A2; and (3) when the signer simultaneously produced a lexical verb on the dominant hand, while the non-dominant hand produced a classifier construction referring to A2. It turns out that in the data presented here, the status of the verb and the position this constituent takes in the clause appears to be significant: all verbs in A1 V A2 clauses are plain lexical verbs, whereas all of the verbs in the A1 A2 V pattern are not.

#### *4.1.3. ISL*

The highest frequency for the A1 V A2 pattern for the non-reversible category – 21 of 44 (48%) – is found in the ISL data (see Figure 1). This includes one example in which a signer uses a determiner (e.g., BOY CLOSE THE DOOR).

Only five of 44 clauses in the responses to the non-reversible situations contained simultaneity. While not a dominant pattern, it is noteworthy that three of these simultaneous constructions come after a preceding A1 V1 A2 clause as part of a single response. It would appear that these signers felt it necessary to amplify or clarify the role of the arguments in the first clause further.

In the remaining responses, two involved an A1 A2 V pattern, three lacked an A2 argument, and one A1 V A2 clause actually included the A2 in a prepositional phrase (i.e., A1 V PREP A2 which, as explained above, is included as an example of A1 V A2).

#### *4.2. Reversible states of affairs*

As can be seen by comparing Figure 1 and Figure 2, the responses describing the reversible SoA are similar to the non-reversible ones, with slightly higher frequencies for the A1 V A2 pattern (58 of 126 (46%) are of this type). Another 23 clauses (18%) have an A1 V pattern, and 5 have a V

A2 pattern. In other words, in approximately 69% of all clauses for reversible SoA in the data set, the actor precedes the verb and the undergoer follows the verb (compared to 66% of responses for non-reversible SoA).

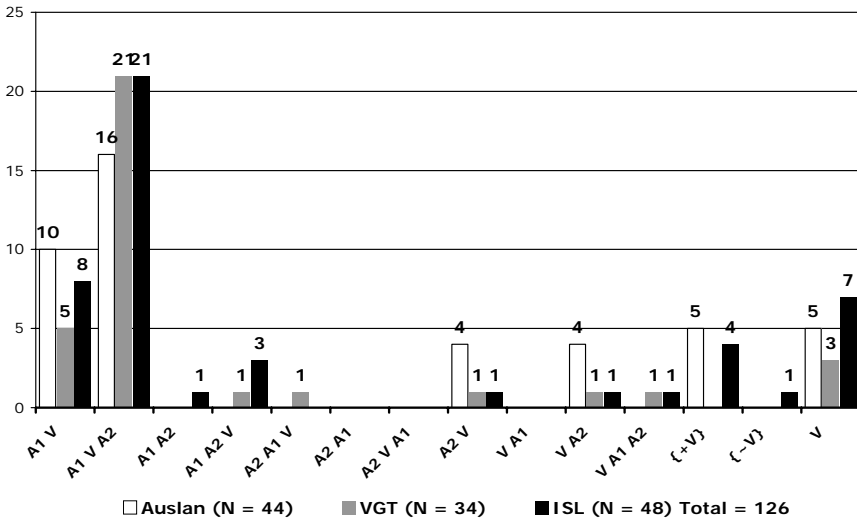


Figure 2. Number of clause types in responses to the reversible SoA

In all three signed languages, very complex sequences were produced in response to the illustrations showing a girl embracing a boy (the illustration actually shows the girl holding the boy’s hand and touching his face) and a woman combing a girl’s hair. For the girl embracing the boy, many participants produced multi-clausal responses, and two participants produced similar responses for the woman combing the girl’s hair illustration. The Auslan example in Table 4 represents a typical response:

Table 4. Auslan response to the illustration showing a girl embracing a boy

Clause	Gloss	Annotation	
		Detailed	simplified
1	GIRL STAND	A1 V1	A1 V
2	CHEEK TOUCH-CHEEK <sub>self</sub> <sup>4</sup>	A2a V2	A2 V
3	{CL.B: SURFACE <sub>f</sub> , TOUCH-SURFACE <sub>f</sub> }	{A2b-CL, V3+A2b}	{+V}
4	TOUCH-CHEEK <sub>self</sub> POSS <sub>3</sub> BOY FACE	[V2] A2b	V A2

This whole string was produced without any discernible pauses or syntactically significant changes in non-manual features. If we focus on the verbs that describe the action, we see that the signer produced the sign TOUCH-CHEEK on his own face, before producing another form of the same sign in a simultaneous construction in space as if the referent was physically present and the signer was stroking his face (the subordinate flat handshape acts as the face that was touched). This was followed by a repetition of the sign on his own face, before finally signing POSS<sub>3</sub> BOY FACE. Thus, we have four verbs (three types, four tokens) before the second participant is identified explicitly.

#### 4.2.1. Auslan

Not only does the A1 V A2 pattern dominate, but in no cases does the A2 precede the A1 if both are explicitly and separately expressed. Of the 18 clauses in which only one argument is expressed (A1 V, A2 V, and V A2), 10 follow the A1 V pattern and five the V A2 pattern. They thus conform to the dominant pattern with respect to their placement relative to the verb (i.e., the actor precedes the verb, and the undergoer follows it).

As mentioned above, participants produced very complex and difficult to analyze constructions in response to the stimulus picture of a girl stroking a boy's cheek. These constructions had verbs describing the same action or event first from one referential viewpoint and then another. These have been called 'AB verb constructions' by Morgan and Woll (2003) for BSL, a signed language very closely related to Auslan (in fact, these two varieties are arguably dialects of the same signed language, see Johnston 2002). It is interesting to note, however, that the ordering of the elements here was mixed, unlike what is reported in Morgan and Woll. They claimed that adult native signers consistently signed the A form encoding the actor's perspective first, with the B form encoding the specific location of the action on the undergoer's body occurring second. Only two responses in our data began with the sign modified to reflect the actor's perspective followed by the undergoer (i.e., GIRL STROKE-CHEEK<sub>f</sub> STROKE-CHEEK<sub>self</sub>), while four began with the undergoer's perspective (i.e., WOMAN<sup>5</sup> STROKE-CHEEK<sub>self</sub> STROKE-CHEEK<sub>f</sub>). In two of the Auslan responses, moreover, other verb forms were also produced as part of the AB construction (i.e., GIRL STROKE-CHEEK<sub>self</sub> FLIRT<sub>f</sub> BOY STROKE-CHEEK<sub>self</sub> STROKE-CHEEK<sub>f</sub>).

Two of the 16 A1 V A2 responses had a lexical preposition inserted before the undergoer argument (i.e., AMERICAN-INDIAN <sub>c</sub>STAB<sub>f</sub> ON COWBOY and WOMAN PINCH-CHEEK<sub>self</sub> ON BOY). Although prepositional phrases like this are common in English, in neither case did the resulting construction produce a phrase that resembled a grammatically correct English structure. These constructions may be the result of English influence, but are not clear loan translations. The use of the preposition may be a result of the reversible nature of the arguments, perhaps used by the signers to make the undergoer role maximally distinct from the unmarked actor role.

Lastly, only one response involved an A1 A2 V structure, in which the actor appeared first, followed by the undergoer argument, and the verb occurred clause-finally (i.e., AMERICAN-INDIAN MAN <sub>c</sub>STAB<sub>f</sub>). This pattern was actually followed by a second clause in which the undergoer role was clarified (i.e., COWBOY BOY {CL.V:HUMAN<sub>f</sub>, STAB-HUMAN<sub>f</sub>}), but the actor was not explicitly mentioned.

#### 4.2.2. VGT

The A1 V A2 pattern was also found to be the most frequent in the VGT data, with 21 of 34 responses (62%) appearing to be of this type (see Figure 2). However, there is a subset of responses in the VGT data that have been included in this simplification of patterning which should perhaps be identified separately. Seven clauses make use of what appears to be a ‘light verb’ (GIVE) which is inserted between the first and the second argument, thus: ONE BOY GIVE OLD WOMAN HUG. (See the discussion of VGT light verbs in Van Herreweghe and Vermeerbergen (2004) for more details). In other words, only 14 of these 21 clauses have a straightforward A1 V A2 pattern. It is possible, therefore, that a clause pattern unique to VGT might need to be identified – A1 Vlt A2 V – in which the first verb acts as a kind of light verb (hence ‘Vlt’). There are eight examples of these in the VGT data set, seven in the reversible situations and one in the locative SoA. If recognized as a distinctive pattern in VGT, it would be the third most frequent pattern in the responses to reversible SoA after A1 V A2 (with thus 14 and not 21 exemplars) and A1 V (10 instances).

It needs to be noted that the possible A1 Vlt A2 V pattern resembles constructions in Dutch and English like *A boy gave the old woman a hug*. It is therefore possible that the pattern may result from some degree of

language contact and that the second verb may actually be analyzed as an additional argument (i.e., a nominalized verb) forming a ditransitive construction. The fact that six of these seven clauses were produced by only one signer also suggests that they may be atypical or idiosyncratic in some way. (No such similar constructions were found in the Auslan or ISL data and there was only one other instance in the VGT data set.) With these considerations in mind, and in order to give the simplest possible reading of all of the data from the three signed languages, the second verb (if it is indeed a verb) in these constructions is coded as an additional argument, thus: A1 V A2 A3. This is then simplified to an underlying pattern of A1 V A2 which accounts for the numbers presented in Figure 2. We should, however, be mindful of the possible existence of a distinctive A1 VIt A2 V pattern in VGT. A larger corpus of the language may help to resolve the status of this construction type. Regardless of the status of this pattern, one can see that in terms of the overall order of constituents in clauses, the actor still precedes mention of the undergoer, whichever analysis is used.

To conclude, we want to point out that for VGT, like Auslan, the reversible sentence elicitation task results in a greater variety of construction types than the non-reversible task and that some of the responses consisted of rather complex multiple-clause utterances that may be subject to alternative analyses (see Section 5 below).

#### *4.2.3. ISL*

While the responses for reversible SoA demonstrate considerable variability, we still find that A1 V A2 is the most frequent ordering, with 21 out of 48 clauses (48%) in the ISL responses of this type. The next most frequent clause pattern was A1 V (8 instances). This partly reflects the fact that in ISL, as with the other two signed languages, the SoA were often described by focusing on each participant in what appears to be two separate clauses (e.g., GIRL FRONT STAND, BOY PUSH coded as A1 V, A2 V). In ISL, strings of this type were typical of one signer from a deaf family. Many clauses consisting of stand-alone verbs (7 instances) or verbal simultaneous constructions (5 instances), both of which encoded information about previously mentioned participants, were typically found as the second, third, or fourth clause of a response (see also Figure 6). There are also a small number of A1 A2 V constructions (3 instances).

Importantly, seven of the A1 V A2 clause types actually included the use of lexical prepositions (i.e., A1 V PREP A2). Two signers from deaf families used the preposition TO after the verb and before the second argument in over half of their responses (e.g., COWBOY STAB TO AMERICAN-INDIAN). There is, however, also one use of a preposition clause finally. It appears that TO functions as a means of marking the following constituent as the undergoer while the preceding constituent is the actor, as mentioned above with ON in the Auslan data and as has been reported for OP ('on') in VGT (Vermeerbergen 1998). However, the fact that TO is not used consistently by all the ISL signers suggests that its function as a marker of actor/undergoer relations in reversible SoA is not mandatory. As in the Auslan data, the use of TO does not typically produce a phrase resembling a grammatically correct English structure. This seems to strengthen the view that the use of the TO preposition may be a result of the reversible nature of the arguments and is used to make the undergoer role maximally distinct from the unmarked actor role.

#### 4.3. Locative states of affairs

As shown by Figure 3 below, the locative SoA elicited a greater variety of constructions than either the non-reversible or reversible situations. The A1 V A2 pattern is still frequent but is matched by the A2 A1 V pattern, both with 22 occurrences. The latter is a constituent ordering that only occurs once in the descriptions of non-reversible and reversible SoA discussed above.

These patterns aside, the remaining clauses (more than half of the total) are much more evenly distributed across a wide variety of clause types than found in the responses for non-reversible or reversible situations. Most notably, there are significant numbers of clauses that consist of simultaneous constructions alone ( $\{+V\}$  or  $\{\sim V\}$ ) and none that consist of only a verb (V).

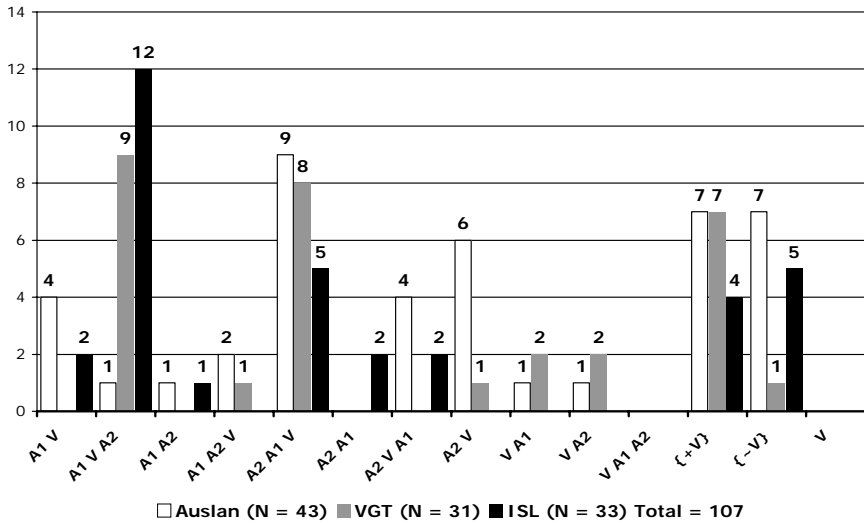


Figure 3. Number of clause types in responses to the locative SoA

The responses to the location sentence elicitation materials were easily the most complex in our data, and posed a number of difficulties for analysis. The clauses describing locative SoA involved simultaneous constructions depicting motion events in which one argument was clearly the theme (i.e., the located or moving entity), and another the location (i.e., the non-moving entity acting as the place in which the theme is located or in relation to which the theme moves). For example, one picture showed a car moving under a bridge. We have analyzed the theme in these cases (e.g., the car) as A1 (i.e., as equivalent to the actor in the reversible and non-reversible clauses), and the location (e.g., the bridge) as A2. In other situations, the pictures simply illustrate locative relationships, such as a tree behind a house. It was decided that the most theme-like argument would be A1 (the thing which is located with reference to some larger environment) and the most location-like argument would be A2 (the thing that constitutes the environment or background). Thus we analyze the tree, flowers, man, cat, car, and ball as A1 and the house, vase, car, chair, bridge, and table as A2.

It should be noted that almost all of the simultaneous constructions involve classifier handshapes and occur at the end of the utterance. When part of individual clauses, simultaneous constructions often appear after the



theme (A1) with the location (A2) articulated first (i.e., A2 A1 {...}) and in only a few cases does the theme precede the location (i.e., A1 A2 {...}).

In many of the responses from all three signed languages, the locative relationship is expressed by a lexical preposition, often articulated in a simultaneous construction in which the non-dominant hand acts as a kind of ‘fragment buoy’ (Liddell 2003). In these cases, the passive hand is held after the production of the previous sign, so that instead of the non-dominant hand articulating part of the preposition, it instead maintains a fragment of the previous sign, keeping this argument active in the discourse. The following ISL example, in which the subordinate B hand representing half of the ‘roof’ of the house is held while the dominant hand produces the signs TREE and BEHIND, is also typical of responses found in Auslan and VGT:

Table 5. ISL example for locative relationship expressed by non-dominant hand

Gloss	Annotation	
	detailed	simplified
HOUSE {HOUSE, TREE} {HOUSE, BEHIND}	A2 {A2, A1}{A2, PREP}	A2 A1 {+V}

#### 4.3.1. Auslan

As can be seen from Figure 3, 14 of the 43 Auslan clauses (33%) in the locative responses involved clauses that consisted of nothing but a simultaneous construction, while over two thirds of all clauses in the locative responses involved an element that was a simultaneous construction (see Figure 5). For Auslan, this compares to approximately one in ten of non-reversible and reversible clause responses having a simultaneous element.

In the locative responses in which there is no simultaneity at all, the locative relationship is invariably expressed by a lexical preposition (e.g., HOUSE TREE BEHIND). There is a single case where it is expressed by a verb of motion (‘the flowers are next to the vase’ is expressed as VASE FLOWER<sub>lf</sub> <sub>lf</sub>PICK-UP-AND-MOVE<sub>rt</sub> or ‘the flowers are taken out of the vase and placed to the right (of it)’). Both types of clause appear in the simplified annotation as A2 A1 V. Four of the remaining responses included the use of existential HAVE (e.g., CHAIR HAVE CAT UNDER).

In total then, 20 clauses in the responses appear to involve clause-final verbal elements (lexical verbs, prepositions, or simultaneous classifier constructions), with 10 of these explicitly mentioning both arguments.

#### *4.3.2. VGT*

The most frequent clause type (nine A1 V A2 responses out of 31 clauses) is perhaps somewhat misleading because seven of these verbs are actually instances of lexical prepositions, four of which are produced by the one ‘idiosyncratic’ signer. Almost all of this signer’s clauses for all situation types were of the A1 V A2 pattern. This skews the distribution of types found in the VGT data. The A1 V A2 responses tended to occur as the first, and only, clause produced in response to the stimulus picture. Thus, not only is the spread of clause types affected, it also partly explains the lower total number of clauses that were elicited in the VGT data.

In response to the illustration showing a man standing at some distance away from a car, all four participants produce complex multiple-clause utterances that are difficult to analyze because of complex combinations of classifier handshapes in simultaneous constructions. One proved to be completely unanalyzable.

Overall, we can see from Figure 3 that 17 of 31 clauses (55%) in the VGT data describing locative situations were either A1 V A2 patterns (nine clauses) or A2 A1 V patterns (eight clauses). Almost half of the VGT clauses describing a locative SoA involve simultaneity. If we take into consideration the fact that the youngest signer (i.e., the atypical participant) uses a simultaneous construction only once, we see that well over half of the clauses produced by the other signers involve simultaneous constructions.

#### *4.3.3. ISL*

The most frequent order of arguments in the clauses elicited was A1 V A2 (12 clauses) of which eight actually used a lexical preposition like ON and UNDER in the verb slot (e.g., CAT ON CHAIR or A1 PREP A2). In some responses the use of a preposition was clearly influenced by English grammar (e.g., TABLE WITH BALL UNDER I-T). If both arguments were explicitly signed, the next most frequent pattern (five clauses) was A1 A2

V. Ten of the locative responses consisted of at least two clauses or more. In nine of these, the subsequent clause(s) involved a simultaneous construction.

Fifteen of the 33<sup>6</sup> clauses (45%) in the responses for locative situations in the ISL data set included simultaneous constructions. It should be noted that, as with the VGT data set, one participant did not use any simultaneous constructions at all.

#### 4.4. Overall results and summary

There appeared to be a similar spread of clause patterns in similar proportions across the three signed languages, though several differences were noted: fewer overall clauses produced by the VGT signers, a particular clause pattern (i.e., the use of the light verb GIVE) was only found in the VGT data, and one signer in both the VGT and the ISL data sets appeared to be responsible for a large proportion of idiosyncratic clause patterns. Without ignoring the possible impact of these observations, overall we can say that the most common clause type in the combined data set from the three signed languages was an A1 V A2 ordering (121 or 34% of 354) (see Figure 4). This was also the most frequent clause type found in responses to the non-reversible (34%) and reversible (46%) SoA.

Interestingly, data from all three languages included some more marked constructions in the reversible responses, such as the use of prepositions and, in VGT, the use of light verbs. Although prepositions are often used to mark non-core arguments in many languages (see, for example, Van Valin and LaPolla, 1997), we suggest that these examples may represent a way to distinguish between the core semantic roles of reversible arguments. Similarly, the light verb, by apparently encoding directionality between arguments, appears to fulfill a similar role.

Locatives, in contrast to the non-locatives, elicited almost equal numbers of A1 V A2, A2 A1 V, and stand-alone simultaneous constructions with a verbal element, or {+V}. Together these three types account for over half of all clauses in the responses to locative situations. It should be noted, however, that the number of A1 V A2 clauses in the locative category was inflated by a large number of responses from ISL of the pattern A1 PREP A2. Overall, the locative responses were much more diverse than for the other SoA.

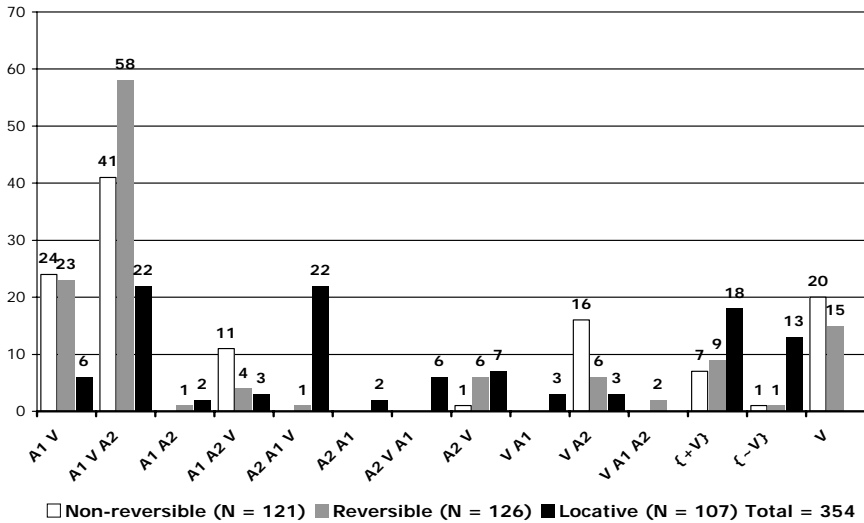


Figure 4. Frequency of clause types by type of SoA

Perhaps it is not surprising that locative situations elicited the highest number of simultaneous constructions (see Figure 5) and, with the exception of VGT, that the non-reversible situations elicited the least.

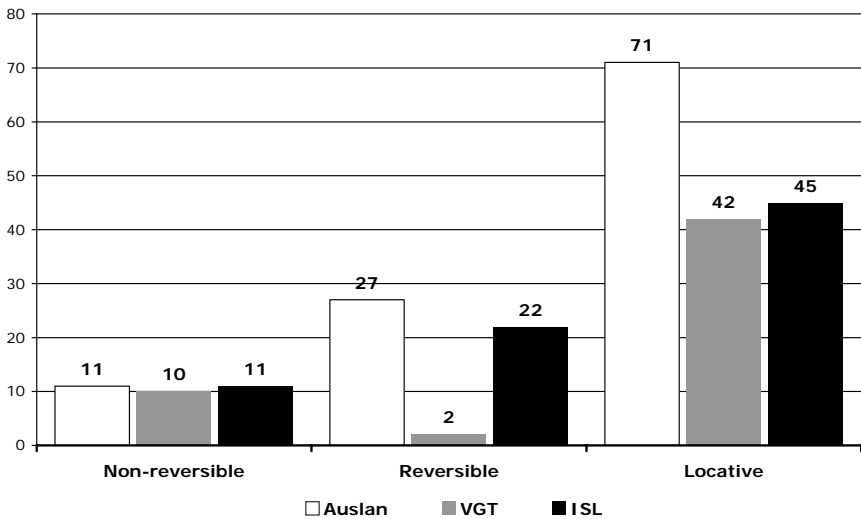


Figure 5. Percentage of clauses with simultaneous constructions

There may be no imperative to show through some kind of spatial arrangement who does what to whom if there is only one likely or possible interpretation of agency. Similarly, if the modality of the language allows one to show simply and effectively a spatial relationship or arrangement of arguments by means of a visual depiction (e.g., the classifier handshape for a vehicle is placed under another handshape representing a bridge to represent that a car is under a bridge), there is simply no need for additional clauses to disambiguate the situation.

There thus appears to be a relationship between the type of SoA and the number of clauses typically elicited to describe it. An indication of this likely relationship can be seen in Figure 6. Locative responses are the most likely to require two – and only two – clauses to convey a SoA (they have the smallest number of responses with a third or fourth clause). It appears that the first clause typically establishes the existence of the location or the arrangement of the theme and location, and the second clause describes the relationship of the theme to the location, or describes the movement of the latter relative to the former.

## **5. Discussion**

Many issues and difficulties were raised by this study and some were surprisingly difficult to resolve given the previous amount of published research on constituent order in signed languages. The comparability of data analyses conducted by different researchers on different signed languages may need to be re-examined if some of the problems we experienced are typical. Indeed, insofar as some problems remain unresolved, this raises questions as to the reliability of studies of basic constituent orders in some signed languages, and of cross-linguistic comparisons and typological generalizations that might be made on the basis of such observations. We will now discuss some of the problems this small study raised with respect to data collection and analysis before taking up some broader theoretical considerations regarding the identification of constituents and constituent order in signed (and spoken) languages.

### 5.1. Problems with data collection

Although the participants in our research study were simply asked to describe an illustration (rather than, say, translate a written sentence), the data are still not optimal for a number of reasons.

First, most participants looked at the stimulus drawings while producing their responses. This interfered with natural phrasing, such as pauses, head movements and eye-gaze, and made the task of establishing clause boundaries difficult (see discussion below). In addition, the fact that signers were necessarily being videotaped (even though they were all willing participants in the study) must have led to some self-consciousness and some self-monitoring of language use. Any future studies using these types of materials would be improved by instructing participants to memorize the picture, look away from the picture and then tell the addressee what they have seen. Only after seeing the description should the addressee then look at the illustrations and select one that matches.

Second, because participants were presented with two pictures that were different in only one salient feature, this may have elicited more marked contrastive structures (e.g., the use of prepositions preceding undergoer arguments) than would have otherwise occurred. It may be preferable to present the two pictures separately rather than at the same time. On the other hand, the fact that the participants were also aware that the addressee had a similar set of pictures could have reduced the signers' motivation to be explicit about certain elements, on the assumption the viewer could easily disambiguate the message. In order to overcome this problem, the pictures might only be shown to the addressee after the signer has produced a response, or the addressee might be asked to select the picture from a larger set of unrelated illustrations. Alternatively, the pictures might not be given to the addressee at all. He or she may simply be asked to repeat the response or answer some questions about it in order to test his or her comprehension of what has been signed.

Third, the data collected are possibly quite different from naturalistic connected discourse and this is likely to influence the types of orderings found. In particular, the need to produce a compact utterance to describe a picture could have encouraged signers to use less ellipsis, for example, than is typical of everyday connected discourse. If the aim of the study is to elicit information about the possible ordering of constituents in a language, this is not such a concern. If researchers would prefer to have more

naturalistic data, they could have the participants tell a story that leads up to the events in the picture.<sup>7</sup>

Finally, the sample size was extremely small. We chose to select only native signers, considering them, as do most sign linguists, the most ‘authentic’ type of informant (i.e., likely to know and use the community signed language with the greatest fluency and with the least possible interference from the majority spoken language). Of course, it must always be remembered that data from native informants may not be easily generalized to the signing community as a whole because non-native signers are the majority of deaf signers in any signing community. Native signers are thus not necessarily typical signers.

By only selecting native signers while trying to control for region, sex and age, we significantly reduced the pool of potential participants. With such a small data set, it is thus possible that the idiosyncratic personal style of just one individual will distort any overall pattern. For example, in the VGT data, a single signer produced six out of seven responses involving the production of the light verb GIVE, and virtually all of another signer’s responses consisted of single clause responses of the A1 V A2 type. Indeed, there is hardly any use of space in his signing and no non-manual activity apart from mouthing (cf. Schermer 1990). Although one cannot say the sentences he produces are not genuine VGT sentences (i.e., they do not represent examples of signed Dutch), his production on the whole is very unusual.

## 5.2. Problems with data analysis

In this study, we present data on the order of arguments in clauses in three signed languages. The order of signs within a phrase (e.g., a noun phrase) is, therefore, not particularly relevant to this question and, as explained in the methodology section above, it was ignored (i.e., there was no need to code for or consider adjectives, determiners, possessives, adverbials etc).

We also recognized that some predications in signed languages are verbless. For example, some descriptions of a spatial arrangement or existence use only signed arguments that are located through the placement of signs in the signing space or through body shifts left or right during the production of certain signs (e.g., COWBOY<sub>lf</sub> AMERICAN-INDIAN<sub>rt</sub> ‘There’s a cowboy here and an American Indian there’) with no verb. In other cases, two signs are simply juxtaposed (e.g., MAN COWBOY ‘The

man is a cowboy’). Though there is no overt verb in these strings, they are treated here as propositions or predications and are counted as clauses. There are only a few of these in the data set.

Also as explained in the methodology, other propositions or predications involve either prepositions or classifier handshapes which are not clearly moved or located in space. We have opted to include these in the verb category.

These principles were fairly easy to make explicit and implement. However, there were other problems we encountered which related to the status of elements in a sequence of verbs and strings with verb repetition, and extra-clausal elements. Another serious issue concerned the identification of clause boundaries and the treatment of simultaneous constructions, especially in the responses to the locative SoA. It is to these various problems that we now turn in some more detail.

### *5.2.1. Clause boundaries*

The identification of clause boundaries is difficult, and differences in analysis can lead to differences in putative constituent orders attributed to an utterance. Clauses are predications or propositions and are usually identified by the presence of a verb (i.e., most clauses have a verb and this forms the nucleus of a clause). Attempting to apply the traditional notion that a clause centers around a verb as a means of identifying clause boundaries was, however, sometimes problematic.

The major problems revolved around two issues: (i) some ‘verbs’ may be better understood as adjectives modifying nouns and thus not as the nucleus of a clause at all (e.g., what appears to be a clause is actually a clause fragment consisting of a noun phrase); (ii) some strings appear to be independent but co-ordinated clauses, but might be better analyzed as subordinate and embedded clauses (e.g., as relative clauses). It is evident that in some situations differing decisions regarding clause boundaries and status would lead to alternative analyses for responses. Before we discuss adjectives and relative clauses in more detail, we need to discuss so-called ‘split sentences’.

Actually, relatively few examples in the responses from all three signed languages are examples of what have been called ‘split sentences’ (Volterra et al. 1984): constructions in which one central proposition appears to be made up of two tightly bound A1 V clauses (see examples 1 and 2 above in



the overview). It has been suggested that they actually represent a A2 A1 V pattern (Volterra et al. 1984). In a string potentially of this form (CAR PULL TRUCK FOLLOW from VGT), it is in fact difficult to justify any particular alternative to a straightforward sequence of clauses, with each clause presenting a different aspect of the same situation. It is analyzed as two separate clauses (A1a V1, A1b V2 or simplified as A1 V, A1 V). (In this case there is no A2 because both participants are A1 in their respective clauses.)

More frequently, we find A1 V, A1 V, V strings in the three language data set which also appear superficially similar to ‘split sentences’ (e.g., BOY STAND DOOR CLOSE CLOSE-DOOR from Auslan, or BOY SIT MOTHER STAND COMB from VGT). Interestingly, these strings also have a third final verb. As the coding suggests, we have analyzed these examples as consisting of three independent clauses because there appeared to be no clearly identifiable and systematic pattern of non-manual or prosodic features in any of the languages to argue for anything more complex than the concatenation or juxtaposition of clauses with understood or omitted arguments. However, the final stand-alone verb clause (often spatially modified) at the end of an integrated utterance describing a SoA is a multi-clausal pattern (or perhaps clause complex) which has been already noted in this data. The pattern has also been previously identified in the signed linguistics literature (some examples resemble ‘verb sandwiches’ discussed below).

#### *5.2.1.1. Verbal adjectives and relative clauses*

The real issue in many responses, as in the ‘split sentences’, is determining the status of the verb. Consider the two strings found in both the VGT and Auslan data GIRL SIT EAT CAKE and GIRL SIT WATCH TV. An analytical problem arises given the fact that (1) lexical markers of conjunction and/or subordination in signed languages appear to be rare and certainly do not appear in these data, and (2) in all of the clauses of this type in the data, there is no discernible or systematic pattern of pauses or changes in non-manual features between the first clause (e.g., GIRL SIT) and the second (e.g., EAT CAKE). Given these facts, it could be argued that the former ‘verb’ is actually an adjective modifying GIRL (‘the sitting/seated girl’).

It would also be possible, following a suggestion by Fischer and Johnson (1982; cited in Fischer and van der Hulst 2003), that the first clause is a relative clause modifying an indefinite head noun (e.g., as ‘a girl

who is sitting down eats cake’). Although non-manual signals (such as raised eyebrows and a backwards head tilt) have been found with relative clauses in ASL (Liddell 1980), and similar constructions appear to occur in Auslan (Johnston and Schembri, 2007), Fischer and Johnson argue that these non-manuals only occur with definite head nouns (e.g., as in ‘the boy whom I saw yesterday is coming again today’). This may explain why there are no non-manual relative clause markers in these examples. If this type of analysis were adopted, it could be argued that such clause complexes also reflect an underlying A1 V A2 pattern, because all the arguments in the actor role precede the verb while those in undergoer role follow the verb. This would actually inflate the most frequent A1 V A2 type in the data set for each language, as the phenomenon is common to all.

We have nonetheless analyzed these constructions as representing two clauses, perhaps best described as coordinated with omitted arguments, thus: A1 V (and) (A1) V A2. The existence in all three data sets of numerous examples of clauses consisting of only one explicit argument with a verb (e.g., A1 V, V A2, A2 V, and so on) suggests that such an approach should be the default analytic option. After all, it is well-known that clauses with omitted arguments are certainly not atypical in any of these three signed languages.

Similarly, an alternative analysis of the VGT string (cited above) BOY SIT MOTHER STAND COMB is possible. Treating the first two verbs as adjectives would transform the string from an instance of A1 V, A1 V, V (this is the analysis we have used in the data presented here) to an A2 A1 V pattern. In other words, the sign SIT, and especially STAND, might be functioning as a post-nominal modifier attributing locations to BOY and MOTHER (‘As for the sitting boy, the standing mother combs his hair’).

Potential problems of clause status are again found in strings like BOY PUSH INDEX<sub>f</sub> GIRL STAND from Auslan. This could be analyzed as an A1 V A2 clause (rather than the A1 V, A1 V we have adopted) if the second clause (i.e., INDEX<sub>f</sub> GIRL STAND) is treated as a noun phrase (‘the standing girl’) or a subordinate relative clause (‘the girl who is standing’) and treated as the argument of the first verb PUSH. Of course, in terms of determining the most frequent patterns of constituent ordering in these signed languages this makes little difference – the order in the second clause, whether independent or not, remains A1 V.

### 5.2.1.2. *Serial verbs*

Other strings which also present problems for the analysis of clause boundaries involve sequences of verbs. There are numerous examples from the three signed languages. One Auslan signer produced BOY MEET EMBRACE<sub>f</sub> WOMAN and another BOY MEET HUG<sub>f</sub> GRANDMOTHER in response to the picture showing a boy embracing an old woman. Due to the lack of any prosodic cues, we have analyzed examples like these as two separate clauses showing an actor-verb and verb-undergoer structure with some ellipsis of arguments. When both A1 and A2 are omitted and two or more clauses are concatenated, the string can resemble a serial verb construction. There are many examples where an analysis describing a sequence of apparently independent verb-only clauses is problematic: two or more verbs (with no other intervening matter) often appear to describe only a single action. Allowing for serial verb constructions as a specific type of constituent ordering in these languages would reduce the number of clauses identified in some of the responses. However, it has yet to be shown that these verb sequences behave as typical serial verbs in any of these three signed languages (typologically, serial verbs usually refer to simultaneous or immediately consecutive events, have the same subject, lack any connectives, and share markings for tense, aspect, modality, and polarity).

### 5.2.1.3. *Verb sandwiches and verb doubling*

There are responses in all three signed languages in which a second verb is used which seems to create patterns that have been called ‘verb sandwiches’ or ‘verb doubling’ in the literature (Fischer and Janis 1990; Kegl 1990). Indeed, over 33 of the 213 responses in the three language data set (16%) included a repeated verb form.

For example, in BOY HUG WITH OLD<sup>^</sup>MOTHER HUG<sub>f</sub> (ISL), the initial form of HUG does not involve any movement indicating the relationship between the actor and undergoer, but the second form does. Both signs are separated by A2. This general pattern has already been described for a broader range of ISL data in Leeson (1996, 2001) and McDonnell (1996) and for VGT in Vermeerbergen (1996). Similarly, MAN LAY-BRICK BRICK LAY-BRICK (Auslan) is coded as A1 V A2, V (i.e., as two clauses) in our data, but could also be analyzed as an A1 V A2 V structure (i.e., as a single clause with two verbs, in which the second is a kind of sentence-final tag). This potential pattern is also found in at least three responses

(produced by the same signer) in the VGT data. In two of these clauses, the form of the verb is the same at each instance, while in the third sentence, the first instance is produced on the signer's body and the second is spatially modified. Verb sandwich constructions in which a modified form of a different (but related) verb appears after the undergoer argument (e.g., MAN BATH DOG WASH<sub>fd++</sub>) (Fischer and Janis 1990) are also found in many other responses in the ISL and Auslan data.

This type of pattern has been coded and analyzed as A1 V A2, V in this study. Thus, like Liddell (2003), we counted these second or final elements as separate clauses. The possibility should be left open, however, that these strings represent a distinctive form of constituent ordering and structuring apparently found in many signed languages, as argued by Vermeerbergen (1996). The fact that there is some evidence that pronouns and auxiliaries may also be repeated clause-finally in many signed languages, such as in Auslan (see Johnston and Schembri 2007), also suggests it may be a distinctive kind of constituent order typical of these languages.

#### *5.2.1.4. Simultaneous constructions and locatives*

A unique feature of signed languages is that it is possible to produce two signs (be they lexical signs or otherwise) simultaneously, one on each hand. The simultaneity itself may also be spatially meaningful. As described in the methodology section above, two signs deliberately uttered simultaneously, one on each hand, and with meaningful reference to each other (i.e., not the simple perseveration of one sign while a subsequent sign is articulated) were considered to constitute a simultaneous construction. With respect to the identification of constituents, it was decided that simultaneous signs in which at least one hand realized a verb, preposition, or classifier handshape that was moved or located in some way should be treated as verbs. These verbs either combined with other explicit arguments articulated before or after the simultaneous construction to form a clause, or are stand-alone verbs and therefore clauses ('complex predicates') in their own right.

These principles were fairly straightforward and in most cases easy to apply. However, it was sometimes difficult to distinguish between perseveration that seemed unconscious and lacking in communicative intent and deliberate co-articulations. If there was doubt, the use of two hands was regarded as intentional and was coded as such.

With respect to the order of constituents in a clause, there is of course the problem of the ordering of elements within the simultaneous construction. Though it is impossible to say one element comes before the other in the actual co-articulation, where one handshape in the simultaneous construction is a classifier handshape representing a just mentioned referent or is a fragment of a sign (referent) articulated immediately before the co-articulation, it seems reasonable to label the entire simultaneous construction as V since that element would already have been coded as an immediate prior constituent in the description of the string of which the V is part. Similarly, with stand-alone {+V} and {~V} constructions, A1 and/or A2 have almost invariably already been sequentially identified in the response as a whole. No overall information about the order of constituents is therefore lost by coding simultaneous constructions in this way. Problems arise, however, when neither element of a simultaneous construction is articulated either before or after the co-articulation. In such situations, the non-verbal element of the simultaneous construction would simply ‘disappear’ in the simplified annotation. This, however, occurred in very few instances and thus does not alter the overall description of the clause types to any meaningful extent.

The high number of simultaneous constructions in our data suggests that the phenomenon may be under-reported in the literature (Miller 1994). Indeed, as mentioned in the overview above, in most previous studies of constituent order in signed languages, simultaneity has received only passing mention.

The locative data were the most complex and posed a similar range of difficulties for analysis. Clause boundaries were difficult to identify in some long utterances produced without pausing or changes in non-manual features. The extensive use of simultaneity to mark relative locative relations, typically involving two simultaneously produced and interacting classifier handshapes, raised questions regarding how we should account for these structures in an analysis of word order.

In response to the picture showing a man standing at some distance from a car, signers from all three signed languages used very similar simultaneous constructions. For example, one Auslan signer produced the sign MAN followed by a construction using the classifier handshape for standing person (‘V-legs’) on his right hand to indicate the location of the man. While continuing to hold his right hand in space, he produced the sign CAR with his left hand (even though this is normally a two-handed sign), followed by a classifier handshape for vehicle on the left side of space to

represent the location of the car. This simultaneous construction in which the relative locations of the two referents can be depicted by the spatial relationship between the two hands appears to be a very common strategy in signed languages, but there is no consensus among researchers about the exact nature of the resulting construction.

Some suggest that the two propositions (i.e., ‘a human is located here on the left’ and ‘a car is located here on the right’) represent two separate clauses that form a kind of clause complex (Padden 1988). Alternatively, one could analyze these types of examples as single clauses because it is unclear whether the first clause is actually an independent proposition (i.e., ‘a human is located on the left’), or simply part of the overall proposition (‘a car is located on the right at some distance from a person on my left’). The fact that the V-legs classifier handshape is held throughout the utterance until it forms part of the final simultaneous construction at the end also supports this interpretation.

Many strings involving simultaneous constructions appear reminiscent of other clause patterns that have already been noted. For example, we have numerous examples in which the first clause expresses the situation focusing on the A1, and the second the A2 (e.g., CAR {CL.B:BRIDGE<sub>f</sub>, CL.B:VEHICLE-MOVE-UNDER-BRIDGE} BRIDGE {CL.B:BRIDGE<sub>f</sub>, CL.B:VEHICLE-MOVE-UNDER-BRIDGE}, or A1 {+V} A2 {+V}). Other responses involved a combination of a simultaneous classifier construction followed by a preposition (e.g., CAT {CL.B:CHAIR-SEAT, CL.V’:CAT-SIT-UNDER-CHAIR} UNDER CHAIR {CL.B:CHAIR-SEAT, CL.V’:CAT-SIT-UNDER-CHAIR} or in simplified annotation A1 {+V} A2 [{+V}]). The similarity of the overall patterns involving simultaneous constructions seems to suggest that the simplified treatment of simultaneous constructions as verbs in the data coding is reasonable and well motivated.

#### 5.2.1.5. *Extra or peripheral clausal elements*

In some responses, the signers from all three signed languages produce an initial A1 V A2 construction that does not actually refer to the action in the picture (e.g., GIRL HAVE STRING<sub>u</sub>). Instead, it provides a setting, which is then followed by a second (or third) clause that describes the event and incorporates one of the core arguments, but does not explicitly mention both (e.g., {CL.F:HOLD-STRING<sub>u</sub>, CUT-WITH-SCISSORS} or {V+A2-CL, V} which is simplified to {+V}). According to Coerts (1994), these constructions could be construed as extra-clausal (i.e., outside the main

clause) and thus need not be considered in this analysis since they act merely as a means of setting the scene for the SoA. Similarly, in all three signed languages the sign HAVE can be used as an existential presentative. Such examples in our data are treated as separate clauses. On the other hand, because they are a specific type of introductory clause, it may be reasonable to treat them as extra-clausal elements. We have not taken this approach here, however, and have included all clauses produced by all participants in our analysis.

### 5.3. Problems of theory

#### *5.3.1. The relationship between spoken and signed languages*

In the field of signed language linguistics, there appears to be no widespread default assumption regarding the potential influence of majority spoken languages on community signed languages. This has an important impact on how one interprets parallelisms with majority spoken languages (i.e., are they coincidental, derivative and still foreign, or derivative but fully integrated?). For example, should we consider the strong tendency for A1 V A2 constituent orders in the non-locative data from Auslan and ISL the result of influence from the spoken language (i.e., English)? Assumptions about the autonomy of signed languages from spoken languages will also influence how cross-linguistic differences between signed languages are analyzed. For example, observed differences may be interpreted as essential differences between two (or more) signed languages. In contrast, they may be regarded as marginal or peripheral phenomena in each, perhaps the product of interference from the majority spoken languages, and thus to be treated with caution when generalizing about the signed languages.

In signed language research, considerations such as these can never be ignored and it is important to show in this paper that we recognize this problem.

#### *5.3.2. Lexis and constituency*

An utterance in a signed language is highly likely to consist of lexical signs (modified or not), classifier signs (simultaneous or not), fingerspelled

items, constructed action, and gestures. If due regard is not given to the likely presence of these different types of meaningful units, then the task of identifying the constituents of a signed utterance may itself be problematic, let alone the task of establishing a preferred, basic, or grammaticalized ordering of these constituents in a given signed language.

Many sign language scholars appear to assume that when signers use a natural signed language, the vast majority of their intentional communicative output is actually, if not necessarily, part of a visual-gestural lexico-grammatical system, with little or no place for gesture in supporting, complementing, or even forming the very essence of some of the meanings which are conveyed. In this conception of signed languages, signed utterances are treated as being entirely composed of lexical constituents that themselves form part of grammatical constructions. It is sometimes assumed that in those signed utterances which include a signed element that appears not to be lexical but, rather, an iconic depiction or gesture, an underlying syntactic structure is still present.

For example, in the picture showing a girl stroking a boy's cheek, the girl is illustrated as holding the boy's hand and placing her hand on his face. In response to this stimulus, many signers produced a form in which they directly imitated the girl's posture (i.e., they held out their hand in a B hand configuration as if stroking the boy's face). This form is clearly closer to a type of constructed action than any lexical sign meaning TOUCH. To simply treat these forms in the same way as lexical signs is not entirely satisfactory because their status as lexical items (and thus as possible constituents) is not clear.

It is difficult to know how to analyze such examples of constructed action and gesture, let alone analyze them consistently across utterances, between researchers, or cross-linguistically. From real 'messy' signed language data (rather than sentences generated by informants using lexical signs, such as those in Neidle et al. 2000), it is clear that the use of the whole range of non-lexical signs is common in signed language discourse.

### *5.3.3. Language as a heterogeneous or homogeneous system*

Certain theoretical assumptions regarding signed language structure may influence data analysis in terms of constituent order. Rather than being homogeneous systems, as is sometimes assumed (i.e., all major elements of signing behavior are equally part of a morphosyntactic system), signed (and



spoken) languages may be best analyzed as essentially heterogeneous systems in which meanings are conveyed using a combination of elements, including gesture (Schembri 2001). For example, when signed languages are assumed to be homogeneous systems, all manual elements of the signal are treated as possible constituents in the syntax. However, if signed languages are assumed to be heterogeneous systems, not only would some aspects of, say, verb agreement, pronominal reference, and classifier constructions, be considered to have a gestural basis or dimension, but there would also have to be an accommodation of sign elements that were indisputably constructed actions. This would impact on the analysis of constituent order. For example, the linguistic status of some putative verbal lexical signs could be uncertain or indeterminate (i.e., a given signed element may be neither a lexical nor a productive sign, but rather a visual representation of an action, event, or spatial relationship, as suggested by Cogill-Koez 2000a, 2000b). Should all such elements be considered to participate in the syntax of signed languages?

#### *5.3.4. Constituent order in all languages*

Constituent order in language is not just a product of the exigencies of language-specific syntax: it has long been recognized in linguistic theory as also being the product of semantic and pragmatic factors, such as verb meanings and information structure within the clause in its discourse context (Danes 1974; Halliday 1974; Lambrecht 1994; Van Valin and LaPolla 1997). More recently, general cognitive and processing principles applied to language structure and language learning have also been shown to be relevant to an understanding of constituent order (Croft and Cruse 2004; Taylor 2002; Tomasello 2003). Basic or preferred constituent orders that are able to be identified in a language may be shown to be semantically, pragmatically or syntactically driven, and, indeed, they are often the result of the complex interaction of all three factors.

However, this needs not always be so because grammatical (or syntactic) relations (such as subject, direct object, and indirect object) are not necessarily found in all languages. As argued by Van Valin and LaPolla (1997: 274) ‘only where behavioral patterns of a language give evidence of a syntactic relation independent of semantic and pragmatic relations’ can the former be said to exist, and even then any identified syntactic relation (be it subject, direct object, or whatever) will manifest itself language-

specifically. A general example of this would be the manifestation of subject in accusative as opposed to ergative languages. Behavioral properties include phenomena such as the control of zero anaphora (e.g., the interpretation of omitted NPs in co-ordinate active clauses) or the behavior of the relative pronoun in relative clauses (e.g., can the relative pronoun have any semantic role?). Coding properties include constituent order or morphological properties, such as verb agreement or case marking. For example, is constituent order based on the organization of the construction as topic-comment (pragmatic relations), actor-undergoer (semantic relations) or subject-object (syntactic relations)?

Identifying constituents and the constructions (clauses) in which they appear is but the first step in establishing the basic constituent orders of a particular signed language. Only then may they be analyzed language-internally (examining their coding and behavioral properties) in order to establish the existence and type of grammatical relations relevant to the description of the language. It is the presence or absence of these roles that are ultimately the most relevant in the cross-linguistic comparison of signed languages and the establishment of typological generalizations with respect to signed languages. And whatever the results of such initial studies may be, it must be remembered that small scale studies like we present here must be complemented by larger studies and/or the use of text taken from natural connected discourse, like that reported in Engberg-Pedersen (2002), before patterns of constituent order can be identified with greater confidence.

## **6. Conclusion**

This small study has tried to show some of the difficulties experienced when taking the first step in the analysis and cross-linguistic comparison of constituent ordering in signed languages. We have attempted to show that not only do many assumptions about constituent order in signed languages need to be re-examined, but also we may need to rethink how we go about such a re-examination both language internally and cross-linguistically.

## Appendix

Some of the notational conventions used in this paper differ from the conventions introduced at the beginning of the volume.

DOOR-OPEN	A gloss consisting of more than one word, but standing for one sign only. Note that a gloss is based on the meaning in context, and is not necessarily a grammatical analysis (therefore a sign glossed as LAY-BRICKS may not necessarily include any explicit marking for a specific undergoer argument).
CL.X:	A classifier construction, the handshape is specified by the letter after the period. The meaning of these constructions is glossed after the colon.
,	Clause boundary
{ }	A simultaneous construction, the signs within the brackets are co-articulated. The first sign is the left hand; the second sign is the right hand.
[]	A repeated predicating element.

Modifications for spatial loci are represented by subscript letters or letter combinations for individual loci:

rt	Right
lf	Left
f	Forward
u	Upward
d	Downward
fd	Forward down
c	The signer's locus
self	On the signer's body
∞STAB <sub>f</sub>	The locus symbol before the gloss indicates the locus at the beginning of the sign, while the symbol after the gloss indicates the final locus.

## Notes

1. The quote in the title comes from a remark made by Susan Fischer in her presentation at the *Cross-linguistic Workshop on Sign Language Classifier Constructions* in Barcelona, September 29th, 2004 (Fischer 2004).
2. There is some debate in the literature about the appropriateness of this terminology to describe these types of signs (Schembri 2003), but we will continue to use it in this paper because it is so widely recognized.
3. Constructed actions are sequences in which signers appear to imitate the actions of a referent (see, for example, Liddell and Metzger 1998).
4. Despite our gloss here, this sign is not a lexical sign (see the discussion section).
5. Note that WOMAN and GIRL in these examples refer to the same participant (one signer used the sign WOMAN to refer to the girl).
6. Two participants did not produce any response for the locative stimulus picture showing flowers beside a vase.
7. The authors wish to thank the anonymous reviewer for these suggestions.

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# Cross-linguistic comparison of interrogatives in Croatian, Austrian, and American Sign Languages

*Ninoslava Šarac, Katharina Schalber, Tamara Alibašić, and Ronnie B. Wilbur*

## 1. Introduction<sup>1</sup>

Zeshan (2004) provides a broad cross-linguistic overview of interrogatives in sign languages, based on extensive surveys, field work, and published material. Here we add to her results by reporting on two additional sign languages, Croatian Sign Language (*Hrvatski Znakovni Jezik*: HZJ) and Austrian Sign Language (*Österreichische Gebärdensprache*: ÖGS), not previously included in her database. In general, both of these languages fit within the observations that she draws from her data and provide further support for them. At the same time, these two languages differ from each other, and ASL, in interesting syntactic ways while sharing interrogative non-manual markers with each other but not ASL.

Zeshan observes that polar (yes/no) questions in most sign languages are marked mainly with non-manual markers, though most of them do also have a manual polar sign. In content (wh-) questions, sign languages mainly use content signs that are usually accompanied with non-manual marking. These content words may appear sentence initially, sentence finally or both (copying/doubling). For example, ASL, British Sign Language (BSL), Sign Language of the Netherlands (*Nederlandse Gebarentaal*, NGT), and Swedish Sign Language (SSL) all use ‘brows up’ and ‘head forward’ as polar non-manual markers, and ‘brows down’ as the primary content non-manual marker. Quebec Sign Language (*Langue des Signes Québécoise*, LSQ) uses ‘head forward’ for polar marking and ‘head back’ for content question marking.

In this research, we compare interrogative sentences of two less studied sign languages, HZJ and ÖGS, with ASL. In the analysis we address two topics: (1) the word order and the position of interrogative signs; and (2) non-manual markers and their scope. The next section starts with a brief overview over the data used in this study. In Section 3, we discuss some basic syntactic properties of the three sign languages. We argue that the

basic word order in ASL and HZJ is SVO, but SOV in ÖGS (Section 3.1) and we briefly deal with copying constructions in all three sign languages (Section 3.2). In Section 4, we turn to the cross-linguistic investigation of interrogative constructions. Section 4.1 shows that polar questions in all three languages were essentially made with non-manual marking, ‘brows up’ in ASL, and ‘chin down’ in HZJ and ÖGS. ASL and HZJ also allow a manual polar sign, QMwg and JE-LI, both probably borrowed from surrounding pedagogical sign systems, such as Signed English and Signed Croatian, respectively. Finally, in Section 4.2, we discuss content questions. The ASL content question non-manual marker is ‘brows down’, and the primary content non-manual marker in HZJ and ÖGS is ‘chin up’. In addition, ÖGS uses ‘head forward’ as a secondary marker of content questions. In all three sign languages, content signs can occur sentence initially, sentence finally, or both. The final section summarizes the main findings of this study.

The comparison of HZJ and ÖGS is also of interest because of the historical contact between these two languages and the possible influence of ÖGS on the development of HZJ. Historical documents show that for a long time Croatian Deaf students and teachers were sent to the deaf institute in Vienna (Taubstummeninstitut) before the first school for the deaf opened in Zagreb in 1880.

## **2. Data sources**

### **2.1. ASL data sources**

The data used for the ASL analysis comes from three different sources. One source includes stories, conversations, lectures, and teaching materials from already existing published videotapes. A second source is the pool of existing examples in the literature that we have been able to reconfirm with our signers. The third source is our own accumulated videotapes (N = 50+ signers, age range 17-70+ years) with stories, conversations, elicited sentence production, judgments in isolation, judgments in context, story completion, and video clip description.

## 2.2. HZJ data sources

Approximately 10 hours of HZJ data used in this research were collected over a period of 5 years. The signers (N = 6, age range 10-42 years, Zagreb area) produced conversations, stories, and elicited sentences. Five subjects are native HZJ users with deaf parents and siblings. One native signer, who was mostly used as a consultant, has only deaf cousins. All subjects have lived in the Zagreb region at least 10 years prior to the data collection; all of them have been using HZJ as their primary language since birth. Elicited data comes from posing questions based on (1) pictures containing one or multiple, simple or complex sentences, (2) sentences written in Croatian, (3) cartoons, (4) picture stories, and (5) a guessing game. Conversations include a task where one signer inquires personal information from other signers without the expectation of an accurate answer. All signers were also asked to give grammaticality judgments about interrogatives.

## 2.3. ÖGS data sources

In the analysis of ÖGS, we use approximately 3 hours of signing including published material and elicited data (N = 10, age range 20-50 years). The analyzed material contains monologues and dialogues of Deaf signers from different parts of Austria as well as collected data from native signers from Styria which include elicited sentence productions based on glossed paragraphs.

# 3. Discussion and results of ASL, HZJ, and ÖGS syntactic analysis

## 3.1. Word order

Like other languages, sign languages have word order preferences and pragmatically, semantically, and syntactically licensed word order modifications (Wilbur 1997; Zubizarreta 1994). Factors that can influence the basic order of constituents include topicalization, classifier constructions, types of verbs, or verb inflections. Word order has been studied extensively in ASL (Fischer 1975; Kegl 1976, 1977; Liddell 1977; Wilbur 1997; Chen Pichler 2001) and to a lesser extent in HZJ (Milkovic 2005). ÖGS, however, lacks detailed syntactic studies which go beyond

basic word order. In the following paragraphs, the differences and similarities of constituent order in the three sign languages are discussed.

### *3.1.1. American Sign Language*

The basic word order in ASL is subject-verb-object (SVO) shown in example (1a) (Baker-Shenk 1983; Fischer 1975; Liddell 1977; Wilbur and Patschke 1999); there is consensus that C° is head-final. In locative constructions (1b), or with verb agreement or aspectual marking such as reduplication (1c), main verbs may appear finally or as part of verb sandwiches (unmarked verb before object, inflected verb finally (Fischer and Janis 1990)).

- (1) a. FEW STUDENT READ BOOKS [ASL]  
       ‘Few students read books.’  
       b. OVEN, PIE CL:FLAT PUT-IN  
           oven, pie flat-thing put-into  
           ‘(The woman) puts the pie in the oven.’  
       c.       br  
           DRESS GIRL BUY++  
           ‘The girl buys dresses.’

ASL prefers focus in final position and has no stress shift within phrases or clauses (Wilbur 1996, 1997; it is [-plastic] in Vallduvi’s 1991, 1992 terms). Like Russian and Catalan, ASL modifies word order to accommodate final focus and lack of stress shift, but ASL uses predominantly left-movement strategies (preposing) as compared to Catalan, which, as Vallduvi demonstrates, predominantly uses right dislocation (Wilbur 1997). This requirement on focus will help to explain the decision we have made regarding the location of SpecCP in ASL, HZJ, and ÖGS, discussed further below.

Some non-manuals (e.g. eyeblinks) are used as prosodic markers (Wilbur 1991, 1994a). Some non-manuals spread across the constituents they c-command (Aarons et al. 1992). Two examples are ‘brow furrow’ position to mark [+wh] and side-to-side headshake for negatives. Wilbur and Patschke (1998) describe the use of leans for semantic and pragmatic functions: forward for inclusion/assertion; backward for exclusion/rejection. Like [neg] and [wh], they have c-command domain. However,

brow raise (br) does not spread over its c-command domain. Rather, it is the overt marking on the restriction of [-wh] operators in Spec-head agreement with such operators (Wilbur 1995a; Wilbur and Patschke 1999)

It is important to understand that 'br' is semantically/syntactically determined, and not functionally or pragmatically determined by 'presupposed, old, given' as suggested in earlier literature (Coulter 1978; Wilbur and Patschke 1999). Briefly, the evidence includes the fact that 'br' occurs with new information, for example on items focused by topicalization (Aarons et al. 1992) and THAT-clefts (these latter are the ASL equivalent of English 'it'-clefts (Susan Fischer, personal communication)). The [-wh] operators which occur with 'br' on their restrictions include: base-generated topic, left dislocation, and conditionals; yes/no questions; focus with preposing (topicalization, wh-cleft, focus particles/quantifiers, and clefting); relativization; and focus by I-to-C coupled with preposing (negation, modals). Note that with topicalization, the brow raise is on the focused item, but with wh-cleft and focused negatives and modals, the brow raise is on the unfocused material. Thus, brow raise does not mark information status (old, new) or focus. The only consistent factors associated with brow raise are being in the semantic restriction of a [-wh] operator and being located in a standard syntactic operator position (SpecCP or SpecDP).

The behavior of 'br' is important because it highlights a large set of data ignored during the discussion of the location of SpecCP in ASL (cf. Neidle et al. 2000; Petronio and Lillo-Martin 1997), which concentrated entirely on the behavior of [+wh] questions. In order to account for the behavior of 'br', SpecCP must be on the left because SpecCP is an operator position. Making the assumption that 'br' is associated with [-wh] operators also accounts for the 'br' behavior inside DP, namely that items in SpecDP (also an operator position) also display 'br', which does not spread over the c-command domain within DP. Thus, both acknowledged operator positions, SpecCP and SpecDP, behave identically in ASL, marking the manual signs located there with 'br' (Wilbur 1995a, 1999a; Wilbur and Patschke 1999).

Furthermore, the location of SpecCP on the left is compatible with the data from wh-questions. First, we know that ASL prefers phrase final focus (Wilbur 1995a, b, 1996); we do not yet have conclusive evidence for either ÖGS or HZJ, so our analysis there is based on the absence of counterevidence so far. From an information packaging perspective, focus is the central determinant of both surface word order and prosodic structure (Chafe 1976; Lambrecht 1994; Prince 1986; Vallduví 1992). In Catalan,

intonational prominence is fixed on clause-final position and syntactic operations must be used to make the focus fall together with prominence (Vallduví 1991). As indicated above, ASL does this either by preposing old/given information or by omitting it (Wilbur 1997). Next, the strongest argument for the location of SpecCP is the location of wh-phrases with overt manual signs, a wh-sign, and the appropriate non-manuals. Neidle et al.'s (2000: chapter 7) discussion of the structure of ASL wh-questions contains examples like (2) which look like an overt wh-phrase in SpecCP: WHO POSS NP 'whose NP' (Neidle et al. 2000: 136). Yet in each of their examples, the remainder of the sentence is clearly *old* information that is repeated from previous context. Put another way, the wh-phrase itself is in contrastive focus (cf. Wilbur and Patschke (1998) for a discussion of focus marking in ASL).

- (2) a.  $\frac{\text{wh}}{\text{WHO POSS MOTHER DIE}}$  [ASL]  
       'Whose mother died?'
- b.  $\frac{\text{wh}}{\text{DIE WHO POSS MOTHER}}$
- c.  $\frac{\text{wh}}{\text{DIE WHO POSS MOTHER}}$

However, the analysis consistent with the brow raise analysis and the phrase-final focus/preposing analysis is that the old/non-contrastive information has been preposed, putting it before the wh-phrase which, as everyone agrees, is in SpecCP. The difference however is that the structure Neidle et al. posit is that SpecCP is on the right, whereas the analysis consistent with the brow raise analysis is that SpecCP is on the left of CP, followed by *t* left from preposed IP old information, followed by C° on the right of CP containing the [+wh] feature that must be checked by Spec-head agreement (see the structure in Figure 1 below). This same analysis will be seen below in the discussion of the polar (yes/no) questions in ASL and HZJ.

ASL researchers agree that ASL has tag questions adjoined to the right of CP (Neidle et al. 2000; Fischer and Janis 1990; Petronio and Lillo-Martin 1997). These tags are similar to those in English, in that they may contain a subject pronoun copy, a modal, and optionally a negative. This differs from languages like French, which has a fixed tag 'n'est-ce pas?', or Spanish 'verdad?'. The possibility of certain parts of speech occurring in a

tag helps to identify the location of certain signs that are ‘doubled’, that is, permitted to be repeated on the right periphery (cf. Wilbur 1999b).

### 3.1.2. HZJ

Although unrelated, HZJ looks like ASL with head-final CP, and other phrases head-initial (Figure 1).

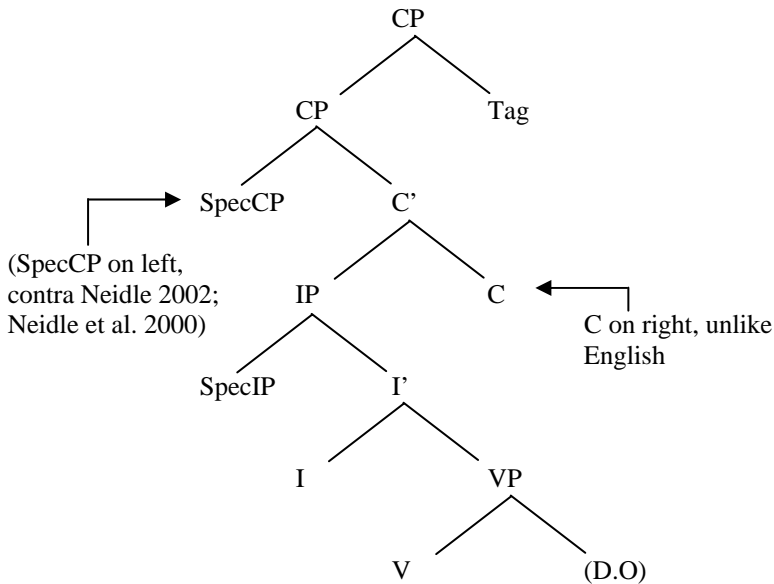


Figure 1. ASL and HZJ

In the HZJ data, SVO was found as the basic word order (3) (Šarac 2003). This has been confirmed more recently by Milković (2005).

- (3) a. BEBA GLEDATI BUBAMARA [HZJ]  
 baby look-at ladybug  
 ‘The baby is looking at the ladybug.’  
 \*‘The ladybug is looking at the baby.’
- b. KONJ JESTI TRAVA  
 horse eat grass  
 ‘The horse eats the grass.’



## 3.1.3. ÖGS

Unlike German, which is known for its variations in word order of matrix and embedded sentences, investigation of word order has shown that ÖGS does not make this distinction (Hunger and Schalber 2001). While the finite verb in spoken German may be in second position or final, ÖGS verbs appear in sentence final position, independent of the type of sentence, with the modal verb (if present) after the subject preceding the verb (4).

- (4) a. *Das Kind spielt im Garten.* [German]  
 the child plays in.the garden  
 ‘The child plays in the garden.’
- b. INDEX<sub>1</sub> DENKEN KIND<sub>a</sub> INDEX<sub>a</sub> MÖGEN [ÖGS]  
 I think child index like  
 DRAUSSEN GARTEN SPIELEN  
 outside garden play  
 ‘I think that the child likes to play in the garden.’
- c. KIND MÖGEN GARTEN SPIELEN  
 child like garden play  
 ‘The child likes to play in the garden.’

Thus, neither spoken German nor German Sign Language (DGS) appear to have affected the basic phrase structure of ÖGS, which shows no word order distinction with respect to modals and verbs between main and embedded clauses. An additional observation from the data is that, despite the intense language contact and the common history of the two countries, the sign languages of Austria and Croatia do not show the same basic word order. Unlike HZJ and ASL, the basic word order of ÖGS is SOV (5) (Skant et al. 2002).<sup>2</sup>

- (5) BUB KIRSCH E ESSEN [ÖGS]  
 boy cherry eat  
 ‘A boy eats cherries’.

However, as we will show, the non-manual marking of interrogatives is similar in ÖGS and HZJ, which may be a trace of historic relations and language contact.

Based on previous analyses of the position of modal verbs and interrogatives as well as on what we know about the behavior of doubling,

the syntactic tree in Figure 2 can be proposed for ÖGS. Like spoken German, SpecCP is on the left, while IP and VP are head-final.

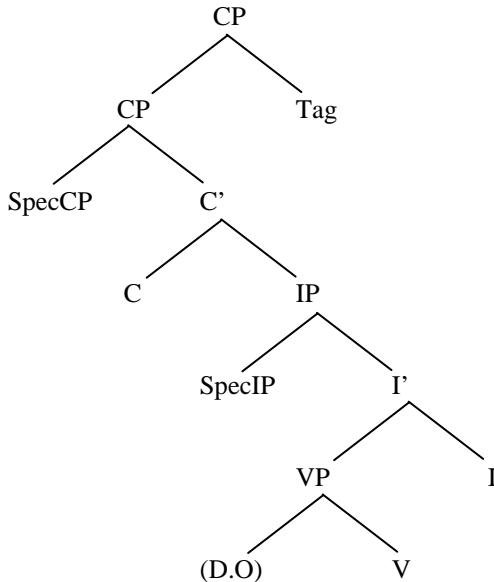


Figure 2. ÖGS

### 3.2. Copying/doubling

Petronio (1993) notes that, in ASL, some categories (e.g. wh-words, modals, quantifiers, verbs) can be stressed by *doubling* into final position; that is, a sign occurs both in situ (or fronted) *and* copied into final position (which she treats as cliticized to the head C°), as in the following:

- (6) MUST GO-WORK MUST [ASL]  
 'I must go to work.'

The categories that can be stressed by doubling are mutually exclusive with the categories that can be focused by the wh-cleft or cleft in either English or ASL (Wilbur 1994a, b):

- (7) a. \* *The way I work is MUST.*  
 b. \* *How many cookies they ate is ALL/HOW MANY.*  
 c. \* *It is PAINT that he did.*  
 d. \* *The way I work is HOW.*  
 e. \* *It was WHICH COMPUTER that he bought.*

Subsequently, Petronio and Lillo-Martin (1997) argue that doubled constructions have the function of emphasis, whereby the item to be doubled moves from IP to SpecCP on the left, while the doubled item is base generated in [+FOCUS] C° to the right, which then can check its FOCUS feature through Spec-head agreement. In contrast, Neidle et al. (1998, 2000; Aarons et al. 1992) propose rightward movement which suggests that the final wh-element moves to the right SpecCP (or stays in situ), and that the left-peripheral wh-element is a base-generated topic adjoined to CP. Nunes and de Quadros (to appear) argue that doubling is a result of movement which leaves a trace, i.e. copy. This copy may move to FocP and is morphologically reanalyzed as being part of a word and as such is invisible to the Linear Correspondence Axiom (Kayne 1994) and phonetically realized on the surface structure. The need for careful attention to claims regarding emphasis and focus, separation of doubled items from items in tag questions, and the specification of discourse context so as to determine what is in focus and what is not lead us now to follow Petronio's original suggestion that the doubled item is cliticized to C° (see also Wilbur 1999b).

Comparing the three sign languages in our study, we found differences in number and type of lexical categories that can be doubled. While ASL (and potentially HZJ) allows doubling of a variety of categories, doubling in ÖGS is more limited given the significant difference in the phrase structure.

### 3.2.1. ASL

In ASL there are several lexical categories that can be copied: subject pronouns, modals, content question signs, quantifiers, and numerals (Padden 1988; Wilbur and Patschke 1999; Wilbur 1996). ASL allows these categories to be copied with or without a pause before the double (Figure 3). Without a pause, these are likely adjoined to C on the right (8a-c); with a pause, they are likely to be in tag position (8d). In the examples, 'br' is

'brow raise', 'bf' is 'brow furrow', the line underneath the non-manual signs (scope), pausing is indicated by a comma, and bold shows emphasis.

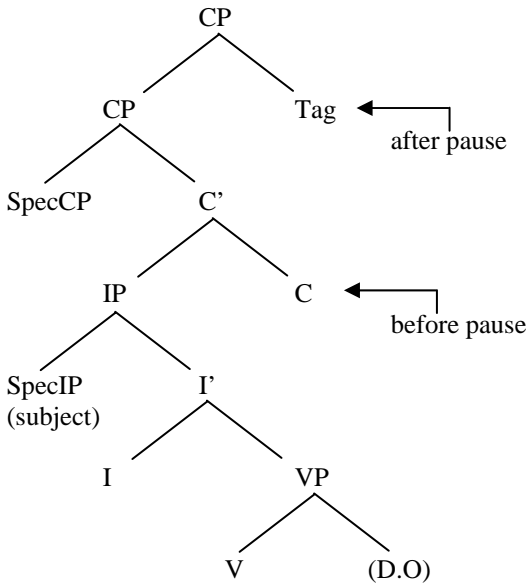


Figure 3. ASL doubling sites

- (8) a. Context: Signer wants to stay home after birth of baby but discovers she can't:
- br  
 FIND INDEX<sub>1</sub> CAN'T STAY HOME CAN'T, [ASL]  
 MUST GO WORK MUST  
 'I found that I **couldn't** stay home; I **had to** go back to work.'  
 b. FIVE CHILDREN PLAY FIVE  
 'Five children are playing.'  
 c. bf  
 WHERE LEAVE POSS<sub>1</sub> SHOES WHERE  
 '**Where** did I leave my shoes?'  
 d. JOHN WILL GO, WILL  
 'John will go.'

## 3.2.2. HZJ

Initial analysis on content interrogative structures shows that HZJ allows copying of content question signs similarly to ASL (9a) (Šarac 2003). Alibašić (2003) reported that pronouns can be copied in HZJ as well (9b). Further investigation of HZJ still needs to be done to find more evidence on the content question sign and pronoun copying as well as to see if other lexical categories show the same property.<sup>3</sup>

- (9) a. 5-(što) PRATI 5-(što) [HZJ]  
 5-(what) wash 5-(what)  
 ‘What is she washing?’
- b. INDEX<sub>3</sub> INDEX<sub>1</sub> DJEČAK INDEX<sub>1</sub>  
 INDEX I boy I  
 ‘I’m that boy.’

## 3.2.3. ÖGS

The available knowledge of doubling in ÖGS at this point indicates that only heads, but not phrases can be doubled (in line with Petronio 1993; Wilbur 1996, 1999b; Nunes and de Quadros, in press). Due to the differences in the syntactic structure, copying of constituents, however, is much more limited in ÖGS. Personal pronouns in ÖGS can be copied without a pause before them. They appear to parallel ASL pronoun copies, which may be on the grammaticalization path to affixation for agreement marking (Wilbur 1999). In ÖGS, they could be attached/right adjoined to V (Figure 4). Also content question signs may be doubled without a pause and are probably adjoined to IP.

In contrast, the doubling of modal verbs requires a pause before the second modal (indicated with a comma in the examples in (10)) and/or different non-manual signals associated with it. This suggests that doubled modals are located in a tag-position adjoined to the CP (‘cd’ is ‘chin down’, ‘hn’ is ‘head nod’).

- (10) a. BUB WOLLEN LERNEN, <sup>cd</sup> WOLLEN [ÖGS]  
 boy want learn, want  
 ‘The boy wants to learn.’

- b. hn BUB WOLLEN FUSSBALL SPIELEN, hn WOLLEN [ÖGS]  
 boy want football play want  
 ‘The buy wants to play football/soccer.’
- c. br BUB SOLLEN FUSSBALL SPIELEN, bf SOLLEN  
 boy should football play should  
 ‘The buy should play football/soccer.’

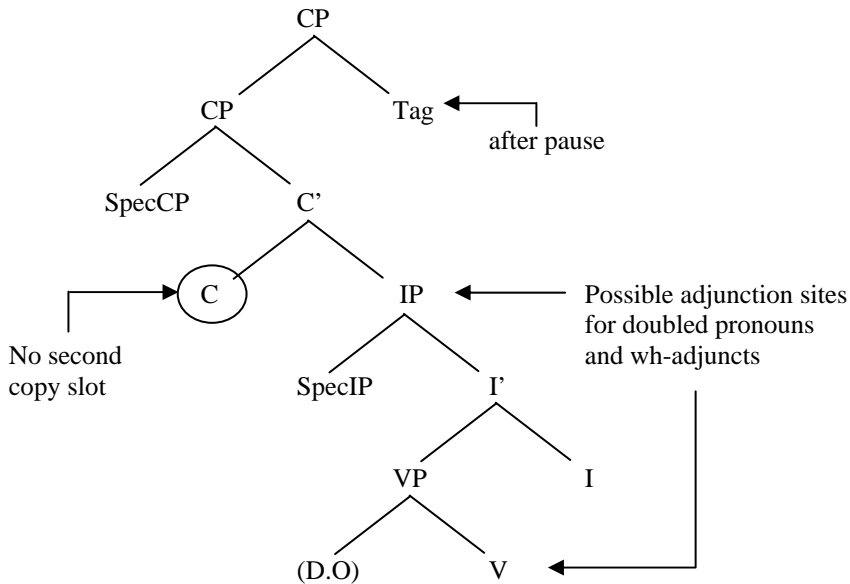


Figure 4. ÖGS doubling sites

In fact, in ASL the head of CP is on the right, making a landing site for doubled modals available without requiring a pause. The ÖGS structure (Figure 4), in contrast, does not provide such a second landing site. In other words, C is not available as a position for doubling because it is on the left. As a result, doubled modals appear in ÖGS only as a tag, which requires a pause and different non-manuals. A clear pause marking, however, may be lost in narratives (Schalber and Hunger 2000), which is compatible with the phenomena of fast signing (Wilbur 2000). Differences in the occurring non-manual signals, however, still indicate that the location of the doubled item is in a separate prosodic phrase.

Another piece of evidence that ÖGS has different CP branching than ASL or HZJ is the ungrammaticality of copying numerals or quantifiers (11). This is in contrast to ASL, where numerals/quantifiers adjoin to C on the right, with no pause before them, as shown in example (8b) above.

- (11) \* FÜNF KINDER SPIELEN FÜNF [ÖGS]  
       five children play five  
       ‘Five children play.’

#### 4. Cross-linguistic comparison of interrogatives

##### 4.1. Polar Questions

In her overview of polar (y/n) questions, Zeshan (2004: 14) notes that in spoken languages polar questions may be marked in one or more of three possible ways: (1) intonation; (2) question particles; or (3) constituent order change or doubling of constituents. For sign languages, the analysis needs to separate manual marking (overt signs made by hands) from non-manual marking (markings on face, head, and body).

Non-manual marking includes the markers themselves, their scope over co-occurring manual signs or the entire clause, and the possible combination of markers that are permitted. Zeshan (2004: 19) identifies typical non-manual marking as a combination of ‘eyebrow raise’, ‘eyes wide open’, ‘eye contact with the addressee’, ‘head forward position’, or ‘forward body posture’.

Manual marking may include question particles, constituent ordering, and doubling. For the sign languages she investigated, Zeshan (2004: 21) reports that question particles are found mainly in polar questions and are “never obligatory for all questions”. Such particles may co-occur with non-manual markers, or may be restricted to certain polar question sub-types. As for constituent ordering changes or doubling, she reports that such syntactic changes in polar questions are not obligatory in any of the sign languages she studied. This is certainly true for the data we report here. She also finds a tendency for pronouns to be shifted to the end of a clause or to be repeated clause finally, without conveying the emphatic meaning that would accompany such doubling in declaratives. Our research on HZJ and ÖGS supports this finding. Finally, she observes that Hong Kong Sign

Language shows doubling of the main verb in polar questions; we did not find such verbal doubling in our data.

#### *4.1.1. Polar questions in ASL*

ASL was included in Zeshan's typological database on which the above generalizations were based. The word order in polar questions is SVO, that is, like declaratives in general (Fischer 1975; Liddell 1977). There is evidence for an optional question particle QMwg on the right (Neidle et al. 2000) which is produced by wiggling movement of the index finger (see Figure 5a).



a. Q4-bend



b. QMwg

*Figure 5.* Q4-BEND and QMwg



QMwg can also occur initially when it takes scope over the whole sentence. In the dialect on which we base our descriptions of ASL (Indiana), such manual marking is infrequent. Another form that occurs, also infrequently, is Q4-BEND, which consists of a single or occasionally repeated bending of the 4 extended fingers, as might represent a series of four punctuation question marks (see Figure 5b).

With respect to non-manual marking on questions in ASL, Liddell (1977) reported that manual signs, such as QMwg (or wh-signs), *cannot* be a substitute for non-manual marking. Polar questions are marked with ‘brow raise’ (br) that has scope over the whole question (12). Secondary markers include: ‘head, body, and shoulders forward’; ‘chin forward’ enough to keep face vertical; ‘eyes widened’; ‘eyegaze directed at addressee’; ‘slight pursing of lips’ (Liddell 1977; Baker-Shenk 1983, 1985). Neidle et al. (2000) also report that QMwg is capable of carrying the non-manual marking of the question by itself (that is, no other signs are in the non-manual marking domain).

- (12)  $\overbrace{\text{THINK HAVE ENOUGH MONEY}}^{\text{br}}$  [ASL]  
 ‘Do you think we have enough money?’

The traditional generative analysis of polar questions in ASL is that there is a question operator/feature in C, referred to as [Q] (Chomsky 1993). To satisfy the requirements of [Q], material must occur in the specifier of Q, that is, SpecCP. This material carries the non-manual material associated with [Q].

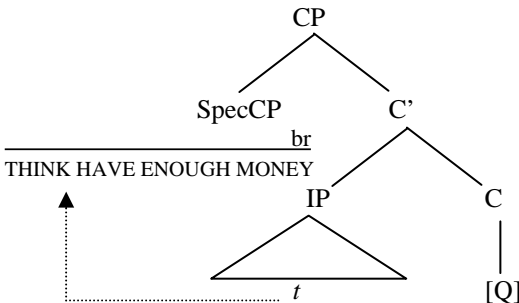


Figure 6. Polar question in ASL

In the case of polar questions, all of the signs in IP – in (12), THINK HAVE ENOUGH MONEY – are assumed to move to SpecCP, and thus receive ‘brow raise’ through Spec-head agreement with [Q] (see Figure 6 above) (Wilbur 1996; Wilbur and Patschke 1999).

#### 4.1.2. Polar questions in HZJ

Polar questions in HZJ are mostly signed in the same SVO order as declaratives and without any manual sign (Šarac 2003). An optional question particle in HZJ polar questions is JE-LI (‘is-it’), which is most probably borrowed from Signed Croatian. The primary non-manual marker is ‘chin down’ (cd) (see example (13) and Figure 7), which is often accompanied with ‘brow raise’.

- (13)  $\overline{\text{cd, br}}$   
 ZNATI KUHATI INDEX<sub>2</sub> [HZJ]  
 know cook you  
 ‘Do you know how to cook?’

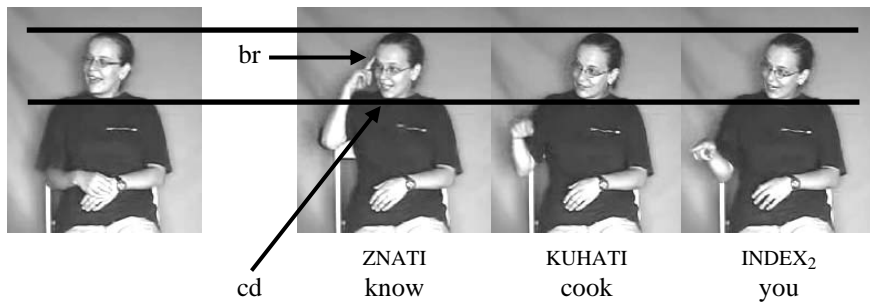


Figure 7. Polar question in HZJ without manual sign JE-LI

In polar questions in which ‘brow raise’ does not occur, the question is more prominently marked with ‘chin down’ (see (14) and Figure 8). Other secondary non-manuals such as ‘eyes wide open’ and ‘head thrust forward’ (hf) can occur together with or instead of ‘chin down’ and ‘brow raise’.

- (14) cd  
 JE-LI KOZA PITI VODA INDEX<sub>2</sub> [HZJ]  
 is-it goat drink water you  
 ‘Did the goat drink the water?’

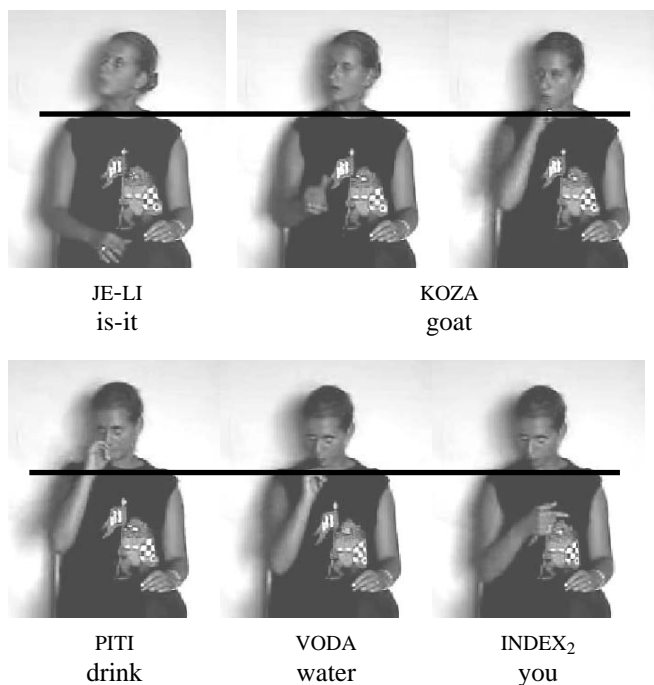


Figure 8. Polar question in HZJ without ‘br’

The JE-LI question particle occurs either sentence initially or sentence finally. When it is initial, it is adjoined to the IP on the left side, and it moves with IP to SpecCP so that it can appear in sentence initial position and bear the same non-manuals as the rest of the question (see (15) and Figure 9).<sup>4</sup>

- (15) cd, br  
 JE-LI KONJ UMORAN [HZJ]  
 is-it horse tired  
 ‘Is the horse tired?’

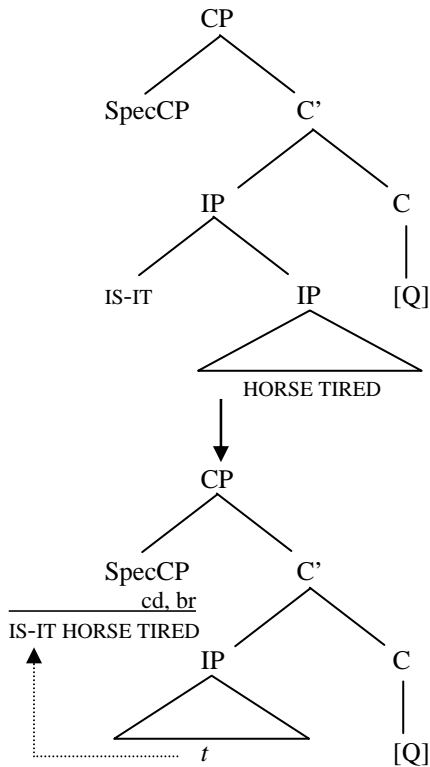


Figure 9. Tree for HZJ polar question with the particle JE-LI in sentence initial position

As seen in (15) the scope of polar non-manuals in HZJ is over the whole sentence. The particle JE-LI does not bear the most intense non-manuals in the question, from which we conclude that it is an adjunct to IP. The highest intensity peak of the non-manuals is at the *end* of the polar question, despite JE-LI in initial position.

When JE-LI occurs in sentence final position, the non-manuals ‘br’ and ‘cd’ spread over the whole sentence and increase in their intensity toward the end. JE-LI happens to be final and may give the appearance of controlling the intensity of the non-manual. However, there is a small pause and a ‘head tilt down’ before final JE-LI, which create a prosodic break before it. We conclude that final JE-LI is a tag question (see example (16) and Figure 10).

- (16)  $\overline{\text{cd, br}} \quad \overline{\text{i}^5}$   
 ČOVJEK SLIČITI CRV, JE-LI [HZJ]  
 man look-like worm is-it  
 ‘The man looks like a worm, doesn’t he?’

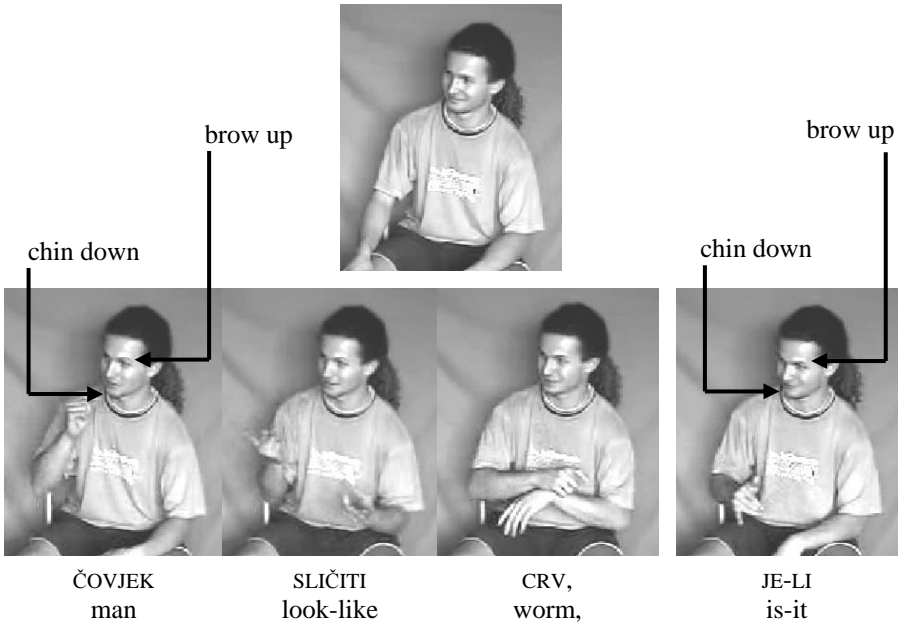


Figure 10. Polar question in HZJ with the particle at the end of the question

These findings regarding the intensity of non-manuals are in keeping with the observations of Neidle et al. (1998: 10) that the intensity characteristics of content (wh) marking in ASL increases toward the end of the question because of the existence of a wh-question feature in head-final C position at the right edge of the clause. It is clear that like ASL, HZJ has its head C on the right and that the non-manuals in polar questions are controlled from the question features located in C.

4.1.3. Polar questions in ÖGS

Similar to other sign languages, ÖGS does not employ inversion of subject and verb to differentiate polar questions from declaratives (Schalber 2002). Rather there is a set of non-manual polar question markers. The prominent marker for polar questions is ‘chin down’ (see example (17) and Figure 11), the same marker found with polar questions in HZJ. Possible additional non-manual signals include ‘head lean’, ‘body lean’, ‘head thrust forward’, ‘squinted eyes’, and prolongation of the last sign.

- (17) a. cd  
INDEX<sub>2</sub> MÖGEN NOCH BIER [ÖGS]  
you want another beer  
‘Do you want another beer?’
- b. cd  
DA ZEIT KAFFEE TRINKEN 5-5  
have time coffee drink question particle  
‘Do you have time for coffee?’

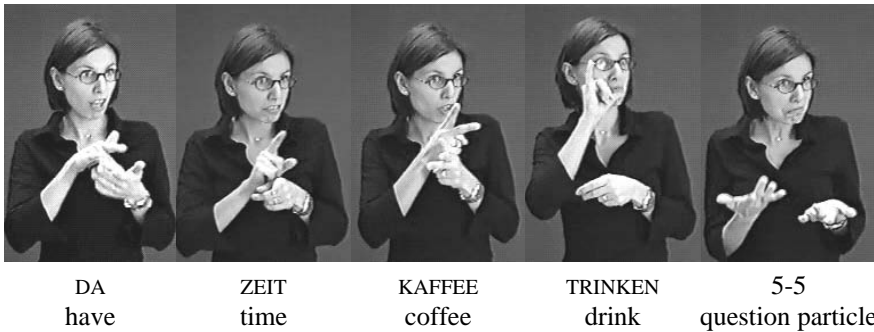


Figure 11. Polar question in ÖGS

The use of a manual sign to mark polar question similar to QMwg in ASL or JE-LI in HZJ has not been evidenced in ÖGS. There is, however, an optional sign – here labeled as ‘5-5’ – which may occur in ÖGS interrogative constructions at the end of questions (occasionally also at the beginning). It seems to be similar to the sign PALM-UP in Finnish Sign Language which Zeshan (2004: 33) identifies as a question particle. The sign in both languages not only shares the same articulation and position, but they also appear in the same prosodic phrase as the question. Thus, as for now we

suggest that the 5-5 sign in ÖGS also has the function of a question particle; a more detailed investigation about the use and context it can appear in, however, needs to confirm this assumption.

In sign languages, the position of the signer’s head may also serve other functions, such as indicating the height of the participants in a signed story. Since ÖGS employs chin position to mark polar questions, this may result in conflicting chin positions, i.e. marking the height of a taller person (‘chin up’) and marking polar questions (‘chin down’). The analysis of such examples (Schalber 2002) has shown that the question marker ‘chin down’ overrules the indication of a person’s height with the signer’s head. Instead the participant’s height is indicated by means of ‘eyegaze up’ (egu). In other words, the signer’s eyegaze looks upward towards the taller discourse referent, while at the same time the signer’s head marks the polar question by moving the chin down (see example (18) and Figure 12).

- |      |   |                   |           |       |  |  |       |
|------|---|-------------------|-----------|-------|--|--|-------|
|      | _____ hf                                  |                   |           |       |  |  |       |
|      | _____ cd                                  |                   |           |       |  |  |       |
|      | _____ egu                                 | _____ egd         | _____ egu |       |  |  |       |
| (18) | INDEX <sub>2</sub>                        | POSS <sub>1</sub> | TELLER    | ESSEN |  |  | [ÖGS] |
|      | you                                       | my                | plate     | eat   |  |  |       |
|      | ‘Did you eat from my plate?’              |                   |           |       |  |  |       |
|      | (one of the seven dwarfs asks Snow White) |                   |           |       |  |  |       |

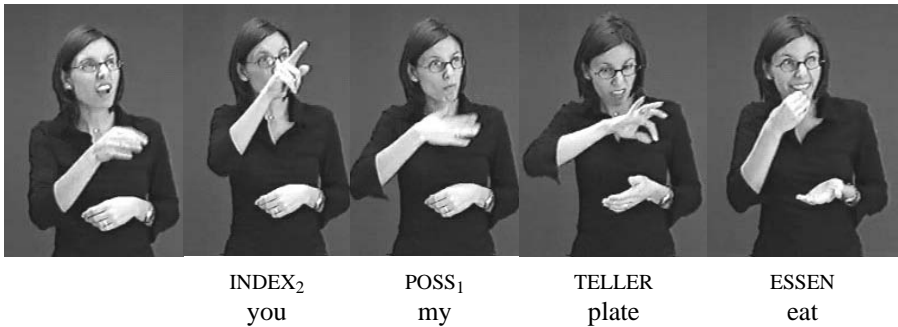


Figure 12. Addressee height shown by ‘eyegaze up’ in ÖGS

## 4.2. Content questions

In her description of content questions, Zeshan (2004: 22) observes that the primary issues of analysis include: (a) the nature of the content question words themselves; (b) their syntactic position in clauses; and (c) the non-manuals that occur with or without them. With respect to the question words themselves, there are several concerns such as (1) the presence or absence of a general interrogative question word, (2) whether other interrogative words co-exist with a general word if it exists, (3) whether these question words show distinctions according to lexical and grammatical categories (person, number, case etc.), and (4) the use of interrogative words in non-interrogative constructions or non-interrogative words being recruited for interrogative purposes, usually with the help of non-manuals. She notes that the question word paradigms differ radically among sign languages. For example, Indopakistani Sign Language (IPSL) has the minimum possible paradigm: only one question word INTERROGATIVE for all purposes. This general question sign can combine with non-interrogative words like TIME to create TIME + INTERROGATIVE ‘when’, NUMBER to create ‘how-many’, and FACE to create ‘who’. Zeshan cites numerous sign languages that have similar paradigms. She observes that there are three different situations that can occur, all based on the general interrogative question word having as its basic meaning ‘what’: “(1) the general interrogative covers the whole question-word paradigm, (2) the general interrogative covers part of the question-word paradigm, and (3) the general interrogative exists alongside an extensive question-word paradigm.” (Zeshan 2004: 23).

With respect to the syntactic position of the question words in content questions, the most common positions are clause initial, clause final, or both, that is, doubling the question word. Several systematic exceptions occur: (1) topics of whatever type precede initial question words; and (2) pronouns may precede initial or follow final question words. Also, if there is a question particle in addition to the question word, the question particle takes the initial or final position. In situ question words are less common and appear to be more constrained (for example, only certain question words are allowed to stay in situ in a given sign language).

Sign languages in Zeshan’s database allow split interrogative constituents (cf. Boster (1996) for ASL). In these cases, a constituent consisting of a question word plus a non-interrogative word, for example ‘which computer’, may be split so that the non-interrogative word may



appear in a location other than adjacent to the question word. The ASL construction COMPUTER PAUL BUY WHICH ('Which computer did Paul buy?'; see (20)) illustrates this option. It exists alongside the non-split construction WHICH COMPUTER PAUL BUY.

Finally, Zeshan notes that content questions may also be produced without a content question word. In these cases, the content question is shown either by the use of content question non-manual markers or by silent mouthing of a content word from a surrounding spoken language (Zeshan 2004: 30). Non-manual markers seem to be used more commonly than mouthing in marking content questions without manual content signs. Zeshan explains that silent mouth movements are present more often in countries with a significant oral education background.

#### *4.2.1. Content questions in ASL*

Content question signs ('wh-signs') can appear in initial, final or both positions, by staying either in situ or moving from in situ. Content words move from in situ to SpecCP to check [+wh] features in C by Spec-head agreement. In doubled constructions, the final content word is a copy of the head (Petronio 1993; Wilbur 1996; Nunes and de Quadros, in press). As discussed in the introduction to ASL structure in Section 3.1.1 above, full content constituent phrases (e.g. 'which computer') are not allowed in final position; only content words (e.g. 'which') are allowed, as shown in (19). The primary non-manual marker is brow furrow 'bf'. Secondary non-manual markers include: narrowed eyes; slight frown; forward movement of torso; tilted head; somewhat rounded lips; slight sharp side-to-side headshake (Baker-Shenk 1983).

- (19) bf  
 \_\_\_\_\_  
 WHICH COMPUTER PAUL BUY [ASL]  
 WHICH COMPUTER PAUL BUY WHICH  
 \*WHICH COMPUTER PAUL BUY WHICH COMPUTER  
 'Which computer did Paul buy?'

Example (20) provides an illustration of the split interrogative construction reported by Zeshan (2004). Note that the non-manual marking on COMPUTER is brow raise, indicating topic status.

(20)  $\frac{\text{br}}{\text{COMPUTER, PAUL BUY WHICH?}} \frac{\text{bf}}$

As we mentioned above, Neidle et al (2000) and Neidle (2002) claimed that SpecCP is on the right in ASL content interrogatives. Petronio and Lillo-Martin (1997) argued in contrast that it is on the left. Using data from polar questions, conditionals, topics, generics, and other structures with ‘brow raise’ in ASL, as well as [+wh] examples, Wilbur (1995a; 1999a, b) and Wilbur and Patschke (1999) argue that SpecCP is on the left in ASL (as represented in Figure 1 above), and that this formulation, necessary for various brow raise constructions, also accommodates the facts of content questions with ‘brow furrow’. We have no counterevidence in the three sign languages discussed here.

#### 4.2.2. Content questions in HZJ

Zeshan (2004) talks about the existence of general interrogative signs, which can be used for the entire content question paradigm. At first glance, HZJ might appear to have such a system because it uses one manual sign to cover a range of interrogative words. However, semantic differences are indicated with mouthing as appropriate.



Figure 13. Two forms of HZJ content sign KAKAV ‘what kind’: general and specific sign

For this reason, the interrogative sign ‘5’ is not considered to be a general content word (e.g. the sign ŠTO ‘what’ is noted as 5-(što) ‘5-(what)’). Mouthing usually is or resembles the whole or part of the Croatian content

word. We assume that the mouthing accompanying interrogative words results from the long oral tradition in the education of the Deaf, and it was incorporated into HZJ through Signed Croatian. This finding is compatible with Zeshan’s observation about sign languages in her database. Moreover, in addition to the ‘5’ interrogative sign, some of the interrogative signs have a more specific form as well (e.g. KAKAV ‘what-kind’ in Figure 13).

Parallel to polar questions, content questions in HZJ can be made with or without manual question signs. Content signs can appear initially, finally or doubled even within the same signer. The content question sign in HZJ moves to SpecCP and, in contrast to HZJ polar questions, bears the highest peak of non-manual intensity from the beginning of the sentence (see example (21) and Figure 14; hs = headshake).

- (21) hs br, cu  
 5-(što) ČOVJEK JAHATI [HZJ]  
 5-(what) man ride  
 ‘What does the man ride?’

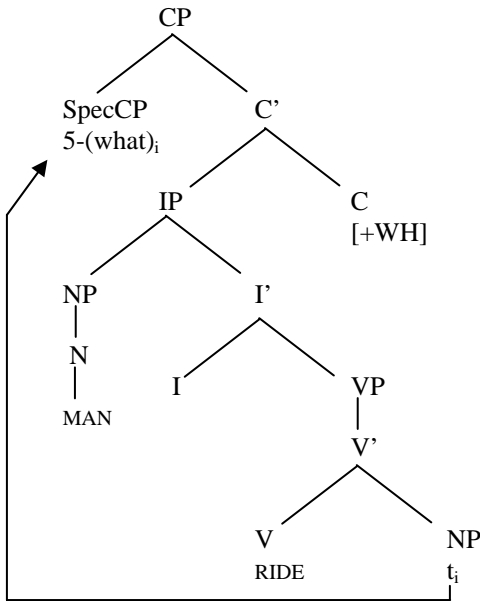


Figure 14. Tree for content question in HZJ

Thus, in content questions, the content signs are question operators capable of controlling the non-manuals and taking scope. In contrast, the polar manual sign JE-LI is not an operator integrated into the grammar of HZJ questions, but rather an adjunct that is just ‘hanging on’ to the basic question form.

Like ASL, doubled content signs are copied to the right either to C or tag (see example (22) and Figures 15 and 16). When signs get copied to tag, there are non-manuals (i.e., blink and head forward) that signal a change before it. These non-manuals occur in addition to the content non-manuals, creating a prosodic break preceding the final content sign. The copying in HZJ content questions is optional as all doubled questions can be also formed with only initial or final content signs. Subjects confirmed this observation when asked for grammaticality judgments.

- (22)  $\frac{\text{cu, br}}{5-(\text{što}) \quad \text{PRATI} \quad 5-(\text{što})}$  [HZJ]  
 5-(what) wash 5-(what)  
 ‘What does she wash?’

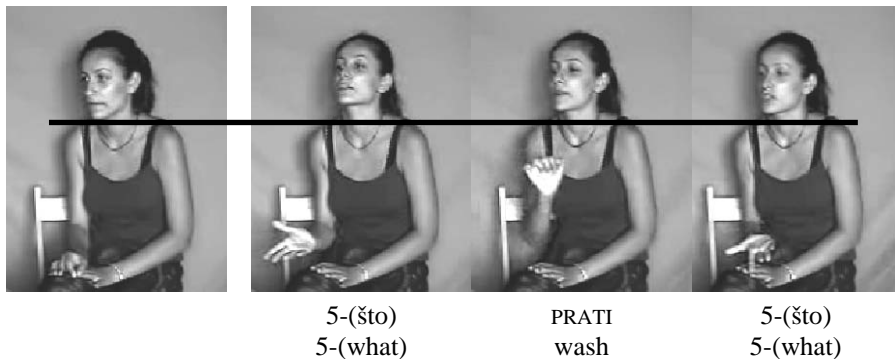


Figure 15. Content question in HZJ with doubled content sign

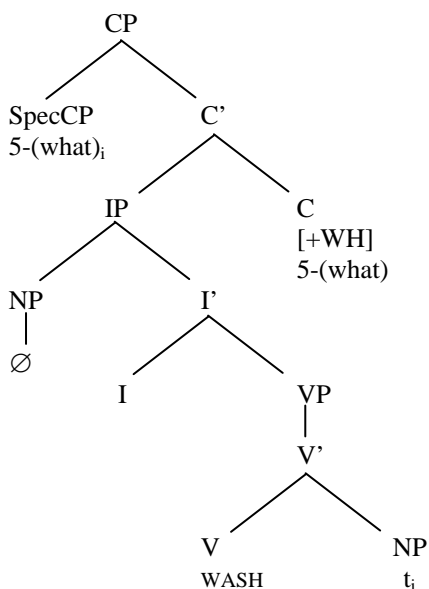


Figure 16. Tree for content question in HZJ with copying into C

HZJ uses ‘chin up’ to mark content questions (Šarac 2003). If a question does not contain a content question sign, the non-manual markers are more prominent (see example (23) and Figure 17).

- (23) cu, br KONJ [HZJ]  
 horse  
 ‘How many horses are there?’



KONJ  
 (wh-many) horse

Figure 17. Content question in HZJ without manual question sign

Additional non-manual characteristics are ‘headshake’, ‘body lean forward’ and ‘eyes closed’. ‘Headshake’ occurs only with content signs that have shaking movement of the hands; therefore, we consider these headshakes to be assimilation with the movement of the hands.

Unlike ASL, we find no consistent brow marking associated with content questions. ‘Brows down’ can occur with content signs, where it could be related to the signer’s attitudes (Dubuisson and Miller 1992; Sutton-Spence and Woll 1999). These questions seem to include emotions of surprise or disapproval by the signer which may be linked to the lowered or furrowed position of the brows. However, since the ‘brows up’ marker appears quite often in content interrogatives, and since it occurs in a similar way in polar questions, we assume that it serves the function of being a *general* non-manual question marker in HZJ. This finding differs from what Schalber (2002) found for ÖGS polar and content questions, which occur with all three brow positions yet with a slight tendency of ‘brows down’ for content questions and ‘brows up’ for polar questions.

#### 4.2.3. Content questions in ÖGS

ÖGS uses a very elaborate content paradigm to ask for various aspects of information. The most neutral position of content question signs is at the beginning of the sentence preceding the subject (see (24a) and Figure 18; cf. also Schalber 2002, 2006).<sup>6</sup> Also copying of content signs is allowed and does not require a pause; therefore it appears to be an adjunct to the rightmost verbal constituent (IP) (see (24b) and (24c) and Figure 19).

- (24) a.  $\overline{\text{cu}}$  WO PAST INDEX<sub>2</sub> [ÖGS]  
 where PAST you  
 ‘Where were you?’
- b.  $\overline{\text{cu}}$   
 WARUM EINCREMEN WARUM  
 why put-on-lotion why  
 ‘Why did you put on the lotion?’

<u>cu</u>	_____ hf	
	_____ bf	
c.	WAS WILL KAUFEN WAS	[ÖGS]
	what will buy what	
	‘What will you buy?’	



Figure 18. ÖGS content question with initial only content sign



Figure 19. ÖGS content question with doubled content sign

In contrast to ASL, but similar to HZJ, the position of the eyebrows in both polar and content questions does not show regular patterns. Although there is a slight tendency for raised eyebrows to occur with polar questions and furrowed brows with content questions, all three eyebrow positions (i.e. raised, furrowed, neutral) can be found with both types of questions. This suggests that eyebrow position may not be a question marker, but related to the signer’s attitude (e.g. surprise, doubt, anger) as was identified in Dubuisson and Miller (1992) for LSQ, or in Sutton Spence and Woll (1999) for some cases in BSL. That is, eyebrow positions may be part of emotional

facial expressions in interrogative and non-interrogative constructions, but not do necessarily mark questions.

The main marker for content questions involves the position of the head. Similar to HZJ, the non-manual marker is ‘chin up’, which may be accompanied with a ‘head thrust forward’ (hf). If the marker ‘chin up’ is not used, ‘head thrust forward’ is found to be the only reliable marker across signers. That is, unlike polar questions, content questions are marked with two non-manual signals which may occur together or individually. A possible explanation for the employment of both ‘chin up’ and/or ‘head thrust forward’ in content questions is the occurrence of content question signs. While the marking of polar questions depends on non-manual signals only, content questions mostly appear with content signs. The use of manual signs gives the interlocutor an additional clue that the construction has to be interpreted as a question and thus allows the non-manual signals to be less rigid. In support of this argument is the fact that questions lacking content question signs *require* the presence of the appropriate head/chin position for content questions. Additional non-manual markers are a ‘headshake’, ‘head lean’, and ‘squinted eyes’.

## **5. Conclusion**

This research compares interrogative structures in two sign languages, Austrian (ÖGS) and Croatian (HZJ), to American Sign Language (ASL) and Zeshan’s (2004) observations on interrogatives across sign languages. Our findings support Zeshan’s observations.

We address three areas in this study: (1) word order, (2) the position of interrogative signs, and (3) the non-manuals and their scope. The results are summarized in Table 1. The three sign languages, ASL, HZJ and ÖGS, demonstrate variation in basic word order typology. ASL and HZJ both have SVO, and ÖGS has SOV basic word order. None of the three languages uses word order inversion to create interrogatives.

Polar questions in all three languages are essentially indicated by non-manual markers, and not by manual signs. ASL and HZJ do allow an optional polar question sign, QMwg or Q4-BEND in ASL, and JE-LI in HZJ. We assume that JE-LI came to HZJ through Signed Croatian. Further investigation is needed to confirm the status of the possible ÖGS question particle 5-5, which might be parallel to what Zeshan reports for Finnish Sign Language. ASL differs from HZJ and ÖGS substantially in non-



manual marking of polar questions. ASL regularly uses ‘brow raise’ to mark polar questions, whereas HZJ and ÖGS use ‘chin down’.

*Table 1.* Summary of main syntactic similarities and differences between ASL, ÖGS, and HZJ

	<b>ASL</b>	<b>HZJ</b>	<b>ÖGS</b>
word order	SVO	SVO	SOV
polar question	brow raise	chin down	chin down
polar question sign	QMwg; Q4-BEND	JE-LI	possible question particle (5-5)
content question	brow furrow	chin up	chin up and/or head forward
content question sign	elaborate wh-sign paradigm	generic sign – distinguished with different mouth patterns	elaborate wh-sign paradigm; possible question particle (5-5)
doubling	relatively open	pronouns and content signs; others N/A	restricted

Content questions in all three sign languages are indicated by manual content signs, either alone or doubled. These content signs can occur sentence initially, sentence finally, or both. In general, there is an interaction between the non-manual markings and the presence of content signs, with non-manuals less rigid when the content signs are present. The ASL content question non-manual marker is ‘brows down’, and in HZJ and ÖGS, the content non-manual marker is ‘chin up’. A secondary non-manual marker for content questions in ÖGS is ‘head forward’.

The basic word order typology of HZJ, which is SVO, and ÖGS, which is SOV, so far appears to be independent of historical contact they had with each other. Historical contact might have had an influence on other linguistic elements, such as non-manual marking. The two sign languages share some commonalities regarding non-manual interrogative marking, using ‘chin down’ for polar questions and ‘chin up’ for content questions, and assigning only secondary status, if at all, to brow position. This similarity suggests the possibility that non-manuals may spread in a manner similar to areal phenomena such as tone.

## Notes

1. This material is based upon work supported by the National Science Foundation under Grant No. 0345314, by National Institutes of Health DC005241 and by the Croatian Ministry of Science, Education, and Sport. We are grateful to all the individuals from the Zagreb Deaf community who participated in our research and helped us with their intuitions about HZJ. We owe a big thank you to the rest of our HZJ team, Ljubica Pribanić and Marina Milković, for all their help and support. Special thanks go to the Deaf community in Graz, Linz, and Vienna for their participation and insights into ÖGS. Our gratitude to the Deaf community in Indianapolis and the Indiana Deaf School for their continuing assistance. We would like to thank Donovan Grose for his comments and discussions on the syntactic structure.
2. As an anonymous reviewer pointed out, German Sign Language (*Deutsche Gebärdensprache*, DGS) is also SOV, with the difference that the modal verb is final, following the verb (Pfau 2002; Pfau & Quer, this volume).
3. ‘5-(content word)’ is a format used to describe the content signs that are formed in the same/similar way (handshape 5, flat hand with spread fingers) but are expressing different content question signs (marked by mouthing Croatian words).
4. One reviewer suggests that JE-LI should not be able to adjoin because it is a head. However, we have no evidence that it is a head, nor that it projects any phrase. Indeed, we have no evidence that it is anything other than a ‘frozen form’ borrowed from contact with Croatian and Signed Croatian in the school system. Thus, we consider it to be as loosely attached as possible, namely adjoined. If it begins to act more like a Speech Act Type marker, or to associate more closely with the non-manuals, then perhaps it can be assigned to such a functional projection.
5. Non-manuals ‘cd’ and ‘br’ increased in their intensity at the end of the sentence [i = intense].
6. Skant et al. (2002) also reports examples with final content questions signs. The different position of content question signs may be due to topicalization or focus which would require specific non-manual signals which Skant et al. do not provide.

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# The expression of modal meaning in German Sign Language and Irish Sign Language

*Annika Herrmann*

## 1. Introduction

This paper presents the results of a cross-linguistic study on modal particles and modal meaning in two spoken languages – German and English – and two sign languages – German Sign Language (*Deutsche Gebärdensprache*: DGS) and Irish Sign Language (ISL).<sup>1</sup> It will be shown that modal particles have no signed equivalents in either of the two sign languages. In DGS, modal particles are realized non-manually. By contrast, ISL partly uses strategies found in English (e.g. circumlocutions and adverbials), but also provides individual means like specific signs, gestures, and non-manual marking. The data will be analyzed against the background of the variation hypothesis, according to which spoken languages show more variation cross-linguistically than signed languages (cf. Meier et al. 2002). Interestingly, it turns out that the sign languages under investigation behave more differently with regard to modal meaning than expected. Still, they both use non-manual features (NMFs) to express modal meaning and are more similar to each other than to the surrounding spoken languages, German and English.

After a brief description of the variation hypothesis in Section 2, I will start with spoken languages and show the differences between German and English with regard to modal particles and modal meaning (Section 3). In Section 4, I will review the discussion about grammatical and affective non-manual features, give some background information on DGS and ISL, and familiarize the reader with the methodology of data collection. Special focus is placed on NMFs and the question of how grammatical NMFs and affective, non-manual gestures can be distinguished. In Section 5, I will turn to the analysis of modal meaning in sign languages. I will present selected examples of the elicited data and contrast the results of the realization of modal meaning in DGS and ISL. Section 6 concludes the paper and offers an outlook on possible further research.



## **2. The variation hypothesis**

According to the variation hypothesis, sign languages in general show less variation cross-linguistically than spoken languages. “The relative uniformity of signed languages, in contrast to the typological diversity of spoken languages, may be due to the differing resources available to sign and speech, as well as to the differing perceptual and articulatory constraints imposed by the visual-gestural and oral-aural channels” (Meier 2000: 1965). While sign languages do show variation in vocabulary, morphology, syntax, and many other distinctive features, there seems to be a modality-dependent limitation of typological variation across sign languages (on the topic of cross-linguistic comparison, see Zeshan 2004a, b; Pfau and Quer 2002; Perniss, Pfau, and Steinbach, this volume). This suggestion is a fundamental hypothesis, very interesting with regard to structures available to language in general and therefore important to linguistic and cognitive theories. In addition to the effect of modality, the youth of sign languages, iconicity, and their spatial syntax are listed as reasons for the more limited degree of variation (cf. Aronoff, Meir, and Sandler 2005; Meier 2002; Woll 2000), but these aspects have to be scrutinized carefully, as not enough cross-linguistic research has yet been done on sign languages worldwide.

The comparison of languages across modalities reveals the inter-modal variation and may yield interesting results concerning mutual influences between languages in the same country or region. In investigating the differences between spoken languages or respective sign languages, intra-modal variation becomes visible (see Hohenberger et al. 2002). Taking the variation hypothesis as a starting point, it is the aim of this investigation to find out to what extent the two sign languages under investigation, DGS and ISL, vary in their means of expressing modal meaning. The intra-modal variation between DGS and ISL is given special emphasis here.

## **3. Modal particles and the expression of modal meaning in spoken languages**

Modal particles are known as a typical German phenomenon, and, besides Dutch and Frisian (cf. Abraham 1991: 205), are attested in only few other languages. In particular, they have no equivalents in English. As far as

modal meaning is concerned, research in this field confirms the great variation across spoken languages.

The following examples from German illustrate that modal particles change the communicative aim of the sentence. The semantic meaning remains the same, but the speaker's attitude towards the utterance is modified. The attitude in (1b), for instance, is different from that in the neutral sentence in (1a).<sup>2</sup>

- (1) a. *Es regnet.*                      b. *Es regnet ja!*                      [German]  
       it rains                                  it rains MOD.PART.  
       'It is raining.'                        'It is RAINing!'

Example (1) additionally illustrates that modal particles may change the speech act. The modal particle *ja*, which automatically triggers specific pitch patterns, turns an assertion into an exclamation. In English the equivalent of (1b) is expressed by intonational means only.

The modal particle *wohl* converts the assertion in (2a) into an assumption (2b). In English, a similar meaning is expressed by an adverb or by the verb *suppose*, as is indicated in the translations.

- (2) a. *Sie hat ihr Auto verkauft.*                      [German]  
       she has her car sold  
       'She sold her car.'
- b. *Sie hat wohl ihr Auto verkauft.*  
       she has MOD.PART. her car sold  
       'She probably sold her car.'
- 'I suppose she sold her car.'

Modal particles are non-inflectional and they belong to the word class of particles. Despite common characteristics with adverbs and interjections, modal particles have specific features, which make it difficult to assign them to any other word category. Modal particles can be separated from other kinds of particles as they do not have scope over certain constituents like scalar particles (*Gradpartikel*) or focus particles (*Fokuspartikel*), but rather have sentential scope. They cannot serve as an answer or stand alone (*Antwortpartikel*) and they do not operate beyond the sentence domain like discourse particles that arrange and structure the discourse (*Gliederungspartikel*). Depending on whether a maximalistic or minimalistic view is taken, modal particles are either seen as a subclass of

particles with different functions and meanings (Thurmair 1989) or regarded as an individual word category (Meibauer 1994; Doherty 1985). The minimalistic approach tries to find a core meaning for each modal particle and intends to give one underspecified lexical entry for all variants of a modal particle (for further discussion see König 1997; Helbig 1988; Abraham 1991).

In general, modal particles can only occur in the middle field (*Mittelfeld*).<sup>3</sup> Within the middle field, modal particles can take different positions, but their exact distribution depends on the sentence type (cf. Meibauer 1994: 28). Usually, modal particles do not carry main stress, the only exceptions being emphatic and contrastive stress. They cannot be negated and modified and while it is possible to use various modal particles within one sentence, they cannot be coordinated (i.e. conjoined) (cf. Lindner 1991: 168).

Modal particles modify the illocutionary force of the utterance and are thus able to change or specify the speech act. They are referred to as illocutionary force-indicating devices, like e.g. intonation, punctuation, adverbs, modal verbs, special affixes, and performative expressions, which can cause similar modifications of the illocutionary force (cf. Bußmann 1990: 324). These modifications are called modal meaning. Dietrich (1992: 23) defines modality, in the sense of modal meaning, as a category specifying the manner of an event or state described by a sentence, and the speaker's attitude towards the utterance expressed by this sentence. In terms of Bierwisch's (1980) levels of meaning, modal particles act on the level of the communicative sense of a proposition (for extensive discussion of form and function of individual modal particles see Authenrieth 2002; Borst 1985; Helbig 1988; Hentschel 1986; Ormelius-Sandblom 1997; Waltereit 2001).

Modal meaning and modifications of speech acts, in general, are a universal property of language, but the linguistic devices used are clearly language-specific. The German-English translations given in a dictionary of particles (König, Stark, and Requardt 1990), as well as those of the sentences investigated in this paper show that there are no one-to-one translation into English for German modal particles. Many different constructions can be used to express a specific meaning of a modal particle. Moreover, a single modal particle often has more than one interpretation depending on the context. Sometimes, combinations of different strategies must be used in English to express the modal meaning conveyed by a German sentence with modal particles. For example, English can modify

the sentence meaning in the following ways: intonation, tag questions, change of sentence type, implicit questions, adverbs, interjections, and circumlocutions.

To illustrate, I provide some examples below, beginning with tag questions. Tags “convey presupposition[s] about the speaker’s and the hearer’s knowledge and attitude” (Cuenca 1997: 9), and are quite frequently used to express modal meaning. The tag softens the illocutionary force of a question or utterance, thereby indicating the speaker’s attitude towards the utterance (see Holmes 1982: 46). Therefore, a tag question can modify a sentence in the same manner as a modal particle does in German. Consider, for instance, (3), where the meaning of the modal particle *doch* is expressed by the tag *won’t you* in the English translation.

- (3) a. *Das schaffst du bis morgen?* [German]  
 that manage you by tomorrow  
 ‘You can have it done by tomorrow?’
- b. *Das schaffst du doch bis morgen?*  
 that manage you MOD.PART. by tomorrow  
 ‘You’ll have it done by tomorrow, won’t you?’
- c. *Schaffst du das bis morgen?*  
 Manage you that by tomorrow  
 ‘Will you have it done by tomorrow?’

Both the modal particle *doch* and the tag question imply a certain attitude of the speaker towards the utterance. The purpose of the question in (3b) is to remind the addressee to complete his task on time, as well as to receive confirmation from the addressee that it will happen. The speaker is expecting the addressee to be finished by tomorrow, whereas in (3a), the speaker doubts that the hearer will succeed in completing his task. Compare the marked V-2 interrogative in (3a) to the corresponding V-1 question in (3c). In (3c), the implication of doubt is not present. In contrast to (3b), however, the speaker asks for information without any further intention. By using the tag question in (3b), the speaker “modalises the utterance by introducing implicit information denoting her or his attitude about the communicative exchange” (Cuenca 1997: 10). In this example, the tag question and the modal particle fulfill the same function.

The meanings of other modal particles are often expressed in English with adverbs like *just*, *probably*, or *maybe*. In (4), the modal meaning evoked by *schon* is expressed by the English adverb *probably*.

- (4) *Ich werde den Weg schon finden.* [German]  
 I will the way MOD.PART. find  
 'I will probably find the way.'

In other cases, however, *schon* would better be translated by using a tag question. Obviously, the translation chosen to express modal meaning in English also depends on the context and not only on the modal particle itself. The context triggers the respective variant and even though there are a few regularities and preferences for translating German modal particles (*halt* is frequently translated as *just*, for example), there is no fixed way of translating a particular modal particle into English.

Circumlocutions like *where on earth* or *be sure* provide other means for translating modal particles into English. *Where on earth* is a common translation for the modal particle *nur* (or *bloß*) in sentences like (5) while *be sure* is commonly used to translate the stressed modal particle *JA* in examples like (6).

- (5) *Wo ist nur der Autoschlüssel?* [German]  
 where is MOD.PART. the car key  
 'Where on earth is the car key?'
- (6) *Mach JA deine Hausaufgaben!*  
 do MOD.PART. your homework  
 'Be sure to do your homework!'

Intonation is yet another strategy that is frequently used in English to convey the meaning of various German modal particles (as in sentence (1) above). Another example of intonation used explicitly for the expression of modal meaning, combined with some colloquial interjections, is given in (7).

- (7) *Warum musste er nur wegfahren?* [German]  
 why must he MOD.PART. leave/go  
 'Aw, (but) WHY did he have to leave/go?'

In the German-English sentence translations used as elicitation materials in this study, German sentences including *ja*, stressed *JA*, *schon*, *bloß/nur*, and *doch* were expressed by intonation in English. In general, intonational patterns were often used in addition to the different possible variants of translation. Thus, intonation in English can convey modal meaning in the

same way that modal particles do in German (on the question of German intonation for this purpose see Esser 1984; Scuffil 1982; Altmann 1993; Bublitz 1978).

The example sentences used in this study were translated with the aim of completeness and comparability, following Bublitz (1978), the particle dictionary (König, Stark, and Requardt 1990), and with the help of professional translators. Still, there is no guarantee that the translations provide fully equivalent sentences, as we are always faced with the general problem of translatability between languages.

In summary, the above discussion makes clear that English crucially differs from German with respect to the realization of modal meaning. The fact that modal particles do not exist in English and the various ways in which both German and English deal with modal meaning illustrate the great variation found across spoken languages. This study investigates how two sign languages, DGS and ISL, express modal meaning and, in particular, whether they use modal particles.

#### **4. Sign language background and methodology**

The fact that the production of individual signs takes longer than that of individual words may be related to the development in sign languages of modality-specific means for the morphosyntactic modification of signs. Sign languages use various kinds of simultaneous strategies to combine as much information as possible within one single sign or utterance (cf. Boyes Braem 1995; Hohenberger, this volume; Klima and Bellugi 1979; Wilbur 2003). In addition to changes of handshape, hand orientation, and direction of movement, sign languages frequently use non-manual means to modify signs and sentences. Hence, we may expect there to be no specific manual signs for modal particles or modal meaning in sign languages. Since NMFs will turn out to be crucial for the expression of modal meaning in the sign languages under investigation, I discuss their general properties, and the difference between grammatical NMFs and affective non-manual gestures, in the next section.

#### 4.1. Non-manual features in sign languages

NMFs are defined as the actions produced by any part of the body other than the hands. They are generally produced simultaneously with manual signs, and can be associated with a single constituent or have sentential scope. This is often referred to as “layering”, since manual, non-manual, and gestural levels of language are layered vertically in one utterance and are used simultaneously for communication (cf. Wilbur 2003).

This aspect of signing is of enormous interest as the visual-gestural system allows signers to use both linguistic and affective markers on the face, head, and body for various purposes. On a grammatical level, NMFs are important for determining the sentence type and for modulating the meaning of a sentence. In many cases, the non-manual marker is the only morphosyntactic indicator. For example, the position of the eyebrows can grammatically distinguish between different question types (Zeshan 2004b). “This phenomenon is comparable to the use of pitch to distinguish otherwise identical strings of sound segments in tone languages” (Brennan 1980: 2). Other syntactic non-manual markers include topic and focus markers and negative headshakes (cf. Wilbur and Patschke 1999; Pfau 2002; Zeshan 2004a). Moreover, verbs can be adverbially modified by various facial expressions accompanying the verbal sign. Thus, NMFs are also used for adverbial, adjectival, and aspectual modifications. In sign languages, these non-manual expressions are in many cases obligatory, as the sign or sentence cannot be interpreted correctly without them.

In this study, I focus on NMFs that modify the whole clause. I do not consider lexical and morphological NMFs. Recall that modal particles are sentential modifiers that modify the speaker’s attitude toward the utterance. The attitude that the speaker intends to convey to the hearer differs depending on the discourse context and sentence type. Because modal meaning plays a role on a sentential semantic and pragmatic level, it is expected that it may be expressed mainly by facial expressions in signed language.

When investigating NMFs, it is very important to bear in mind that there is a crucial difference between NMFs, which are an integral part of the grammar, and non-manual gestures.<sup>4</sup> These gestures, which are also called affective NMFs, do not fulfill any grammatical functions. The distinction between affective and grammatical NMFs is evident, for instance, in the course of language acquisition which is characterized by “the early use of facial expressions for affective purposes and the later use for linguistic

functions” (Wilbur 2003: 337). Just as in the acquisition process, non-manual gestures can diachronically develop into grammatical markers in sign language (see Janzen 1999; Pfau and Steinbach 2006). The distinction between the use of NMFs and gestures, especially facial gestures, in adult signing is an apparent problem.<sup>5</sup> Non-manuals, body movement, and sign movement often interact so closely with each other that a clear distinction or separation of non-manual elements is very difficult (see Becker 1997: 67; Boyes Bream 1995: 174). Nevertheless, there are crucial differences between facial gestures and NMFs. Above all, they differ in their scope and timing. Grammatical NMFs show clear on- and offsets, whereas affective facial expressions are more gradual and inconsistent. Apart from the fact that different facial muscles are used for the production of either type, it is very important that grammatical non-manuals are coordinated with constituent structures, whereas affective NMFs are not timed to occur parallel to specific signs or constituents (cf. Emmorey 1999; Reilly and Anderson 2002; Wilbur 2003). In the data collected for this study, NMFs were examined with respect to these characteristics in order to find out whether modal meaning is expressed by grammatical means.

An investigation into signers’ intuitions is an additional way of learning about the form and function of these facial expressions, and of distinguishing grammatical from gestural features. “There are non-obvious constraints on the form of signs and signers have clear intuitions about what is permissible and what is ill-formed. Such is not the case for gesture” (Emmorey 1999: 135). Since these constraints are constant within the community of signers of the same sign language, the intuition of native signers is very important. Hence, it is necessary to ask different informants for their intuition about NMFs in the elicited sentences. If different signers have the same intuition that a modal meaning in a sentence should be expressed by a specific NMF, this could be additional evidence for its grammatical status. “Just as speakers vary in their tendency to use their voice to depict different characters or to convey affective information, signers vary in the extent to which they use affective facial expressions. However, signers do not vary in their use of obligatory grammatical facial expression” (Emmorey 1999: 153). Consequently, a NMF may be analyzed as a grammatical means to express a specific modal meaning if all informants use the same or a similar facial expression to mark the meaning in a certain context.



Before discussing the expression of modal meaning in DGS and ISL, I introduce the two sign languages and outline the methodology used in the present study.

#### 4.2. Comparison of DGS and ISL

The Deaf community in Ireland comprises approximately 4,500 people and an estimated additional 32,000 people are using sign language as a first or second language (cf. Leeson 2001: 17). In Germany, the sign language community is estimated to be much larger (approx. 80,000 people). More research has been conducted on DGS than on ISL, but research on ISL has been growing in recent years.<sup>6</sup>

ISL has a basic SVO sentence structure, but commonly uses topic-comment constructions (cf. Irish Deaf Society 1997: 24; Matthews 2000; see Leeson 2001 for a discussion of ISL basic constituent order and the use of topics). ISL therefore exhibits a different sentence structure than DGS, as DGS mainly uses an SOV word order. Topic-comment structures may occur in DGS as well, but the underlying structure in DGS is suggested to be SOV.

As for NMFs in ISL and DGS, the non-manuals that are used to mark wh-interrogatives, yes/no-questions, and topic-comment structures are very similar to those described for other sign languages.

Matthews (2000: 45) provides examples of NMFs in ISL and explains their functions within the linguistic system of ISL (further cf. Leeson and Nolan 1993). Besides indicating emotions, Matthews shows that NMFs may serve as morphological and syntactic markers. For example, NMFs express negation, mark topics, or indicate conditional clauses. He also mentions that “they function as intensifiers, which includes different modulations used to express the manner or way in which something is done” (see Matthews 2000: 168f). As modal meaning makes use of intensification, amongst other things, it can be assumed that in ISL and DGS, NMFs are used for these purposes as well. The analysis presented below illustrates how modal meaning is realized in DGS and ISL. It will turn out that in both sign languages, NMFs are the basic means to express the speaker’s attitude. In ISL, however, NMFs are not the only means to express modal meaning.

### 4.3. Methodology

Three German and two Irish informants participated in the study. The participants were asked to give signed translations of written sentences (about 100 sentences in total). Each signer was interviewed in separate sessions in Germany and Ireland, and video recordings were made of their translations. All participants were either born deaf or became deaf prelingually and consider themselves to be native signers. Most informants are surrounded by a deaf and/or signing social environment of over 90%. Two of the German signers were exposed to DGS at a very early stage in childhood; in addition, they have linguistic competence of teaching DGS and a profound knowledge of written German. The third DGS informant learned DGS only around the age of 16, which was taken into account in the analysis. Both Irish informants also work as sign language teachers and are skilled signers with a high competence of written English. They also participated as sign presenters in the 'ISL Computer Dictionary' project.

The specific, semantic distinctions with regard to modal meaning cannot be elicited properly by experiments or an analysis of natural language corpora, as we do not know what to look for yet. This made it necessary to present sentences in written form, which then had to be translated into sign language by the participants. Usually deaf signers are not 100% competent in the corresponding spoken language as it is not their first language. Though signers grow up with both the sign and the spoken language of their country, the educational situation of native signers does not always ensure perfect conditions for typical bilingual language acquisition. This may be problematic in the case of a colloquial and highly pragmatic phenomenon like modal particles. However, all informants understood the difference in modal meaning between sentence pairs presented to them.

The signers had time to think about how to sign the sentences and translated them without further instructions. At times, the specific context of a sentence had to be clarified, but these discussions – all of which were conducted in sign – were helpful and productive, rather than manipulative, since the informants mostly created their own contexts. If there was any doubt that the illocutionary force was not conveyed according to the meaning of the respective modal particle, the translations were not considered in the analysis. Additional discussions and a re-examination of the video clips after the recording helped to eliminate problematic cases as well.

## 5. The realization of modal meaning in DGS and ISL – A cross-linguistic comparison

In this section, I will discuss selected examples of the elicited data to show how modal meaning and speaker's attitude are conveyed in DGS and ISL. I will proceed in three steps. First, in Section 5.1, I will present representative DGS sentences to demonstrate that modal particles are mainly expressed non-manually in this sign language. In Section 5.2, I will discuss the methods used to express modal meaning in ISL. In Section 5.3, DGS and ISL examples are analyzed alternately in order to further evaluate the variation between the two sign languages. Recall from Section 2 that the variation hypothesis predicts that sign languages are more similar cross-linguistically than spoken languages. According to this hypothesis, we should expect ISL and DGS to express the speaker's attitude in a similar fashion. However, the situation is more complex than this as the examples discussed in this chapter will show. In Section 5.4, I summarize the main findings.

The presentation of the examples in this paper always follows the same principle: the sentences are divided into part (a) and part (b). The first part contains the basic sentence, while the second part contains the same sentence, which has been modified to express a specific modal meaning. Thus, the German (b) sentences contain a modal particle, whereas the English (b) sentences are modified by a tag, an adverbial, a verb (e.g. *suppose*), or a specific intonation pattern.<sup>7</sup> I will refer to the (b) sentences as modal particle-modified sentences or simply as modal sentences, as opposed to the basic or non-modal sentences in part (a) of the examples.<sup>8</sup>

### 5.1. Modal particles and speaker's attitude in DGS

The starting point for this study are the German modal particles *ja*, *schon*, *nur*, *wohl*, *doch*, and *halt*. I will present selected examples and begin with a sentence pair including the modal particle *ja*. The examples in (8) and (9) are from two different German signers. PAM stands for 'Person Agreement Marker', a sign that is used as an agreement auxiliary in DGS (cf. Rathmann 2001; Pfau and Steinbach, this volume). In the following examples, '∩∩' stands for raised eyebrows, 'hn' for headnod, and 'e' for energetic.<sup>9</sup>

(8) German signer 1:

a. *Du kennst ihn.* [German]

	_____	/ken/	
INDEX <sub>2</sub>	KENN	<sub>2</sub> PAM <sub>3</sub>	[DGS]
you	know	AGR.S-AUX-AGR.O	
‘You know him.’			

b. *Du kennst ihn ja!* [German]

	_____	/ken/	
	_____	e	
	_____	hn, oo	
	_____	oo	
INDEX <sub>2</sub>	KENN	<sub>2</sub> PAM:MOD <sub>3</sub>	[DGS]
you	know	AGR.S-AUX-AGR.O	
‘You know what he is like!’; ‘You know him, don’t you?’			



Figure 1. <sub>2</sub>PAM<sub>3</sub> (8a)



Figure 2. <sub>2</sub>PAM:MOD<sub>3</sub> (8b)

In this example, the first striking difference between the sentences is the form of the sign PAM. In the first, neutral, sentence, just one hand with a babyC-handshape (index and thumb forming a C) is used. This is the standard way of expressing PAM in DGS. However, to translate the sentence with the modal particle, the signer uses both hands and B-handshapes (all fingers extended) to emphasize the contrast (PAM:MOD = modal modified PAM). The second difference concerns the non-manual component. In the sentence (8b), the facial expression, together with a more energetic movement of the hands, are of great importance for the expression of the modal meaning triggered by the modal particle *ja* in the corresponding German sentence. The informant uses an expressive head nod, a forward body lean, and raised eyebrows to express the intensification of the modal meaning. The signer presupposes the addressee's knowledge of the referent, conveying to him/her to not be surprised, as s/he should 'know what he is like'.

When translating the same sentence, the second signer also expresses the difference in modal meaning by means of different NMFs, but he does not use two hands or a different handshape for PAM (see example (9) below). The non-manual features are the only things that change in (9b) (sh = short; sl = slow; hb = head back).

- (9) German signer 2:
- a. *Du kennst ihn.* [German]
- |                    |                 |               |                               |       |
|--------------------|-----------------|---------------|-------------------------------|-------|
|                    |                 | <u>/kɛn/</u>  |                               |       |
|                    |                 | <u>sh, hn</u> |                               |       |
| INDEX <sub>2</sub> | KENN            |               | <sub>2</sub> PAM <sub>3</sub> | [DGS] |
| you                | know            |               | AGR.S-AUX-AGR.O               |       |
|                    | ‘You know him.’ |               |                               |       |
- b. *Du kennst ihn ja!* [German]
- |                    |   |              |   |       |
|--------------------|---|--------------|---|-------|
|                    |   | <u>/kɛn/</u> |   |       |
| <u>hn, ∩∩</u>      | <u>e, sl</u>  | <u>hb</u>    |   |       |
| INDEX <sub>2</sub> | KENN  |              | <sub>2</sub> PAM <sub>3</sub> [gesture] | [DGS] |
| you                | know  |              | AGR.S-AUX-AGR.O                         |       |
|                    | ‘You know what he is like!’; ‘You know him, don’t you?’ |              |   |       |

The difference between (8b) and (9b) indicates that the manual modification is not obligatory. The reason for the use of a different handshape in (8b) may be that the first signer imagined a very typical situation where such a sentence is uttered and therefore exaggerated her expression. This suggests that different grades of modal meaning can be expressed in DGS, depending on the context and the discourse situation. The variation between the signers may thus be due to a difference in intention regarding how intensely the modal meaning of the sentence should be expressed. However, note that the second signer combines PAM with a gesture (following the auxiliary). This also gives additional emphasis to the modal meaning, similarly to the handshape variation of the first signer. The two examples thus show the use of different manual means for emphasis, but both exhibit a modification of facial expression and movement intensity to express the modal meaning. The head nods, together with specific facial features, as well as intensification as the means of expressing the modal meaning of *ja* were observed in other examples, as well. In fact, the use of NMFs to realize modal meaning was exhibited in nearly every DGS-example. The variation between the signers with respect

to the manual modification of the PAM sign could be compared to variation in intonation in spoken languages.

## 5.2. Modal meaning and speaker's attitude in ISL

A comparison of the DGS examples in (8) and (9) above to corresponding sentences in ISL reveals that in ISL, NMFs are not used as the main distinguishing feature between the (a) and (b) sentences. In (10) below, the English translations of the German sentences provide two possible ways of expressing the modal meaning. Either the sentence "You know what he's like!" or a tag question are possible. The signer signs the variant without the tag question, adopting the common English structure naturally, which suggests that it is also common in ISL. Rather than distinctive NMFs, the circumlocution is used to convey the modal meaning. However, the position of the eyebrows (furrowed brows, glossed as '∪∪') and the facial expression (a look saying 'how typical of him', glossed as 'tp') do change simultaneously in support of the modal reading.

- (10) a. *You know him.*  
 INDEX<sub>2</sub> KNOW INDEX<sub>3</sub> [ISL]
- b. *You know what he's like!; You know him, don't you?*  
 \_\_\_\_\_ tp. ∪∪  
 INDEX<sub>2</sub> KNOW WHAT LIKE INDEX<sub>3</sub>

Throughout the ISL data, this strategy of translating the given English sentences into ISL is often found. The basic expression (that is, the (a) sentence) is not changed by means of NMFs to express modal meaning. However, the data also provides examples where the given English structures are not adopted. This is illustrated in (11) and (12) below, where both Irish signers use a gesture to express the modified sentence 'Where on earth are the car keys?' Note that the non-manuals accompanying the wh-elements are not transcribed, as they did not differ between (a) and (b).

- (11) Irish signer 1:  
 a. *Where are the car keys?*  
 WHERE KEY CAR? [ISL]

- b. *Where on earth are the car keys?*

\_\_\_\_\_e  
WHERE KEY [where-gesture], KEY CAR?

(12) Irish signer 2:

- a. *Where are the car keys?*

WHERE POSS<sub>1</sub> KEY CAR? [ISL]

- b. *Where on earth are the car keys?*

\_\_\_\_\_e                          \_\_\_\_\_sear  
WHERE POSS<sub>1</sub> KEY CAR [where-gesture]?

A phrase that would be an equivalent of the idiomatic expression *where on earth* is not available in ISL. Therefore, in (11) and (12), a different way of expressing the modal meaning is used instead of a word-for-word counterpart. Here, the more energetic facial expression accompanies the modal modified utterances. However, this facial expression does neither show a clear on- and offset nor is it restricted to certain constituents. Instead, a gesture and/or a searching facial expression ('sear') convey the modified meaning (cf. Figures 3 and 4).



Figure 3. [where-gesture] (11b)



Figure 4. [where-gesture] (12b)

The manual component in the expression of the modal meaning is analyzed as a gesture, for two main reasons. Firstly, the WHERE sign introducing the sentences (11b) and (12b) looks completely different from the forms shown in Figures 3 and 4. In the sign WHERE, both hands, forming a flat handshape, move around each other with the right hand resting on top of the left at the end (cf. Figure 5). Secondly, the different syntactic placement of the gesture in (11b) versus (12b) indicates that the signers are not constrained as to how and when to use this gesture. Additionally, this kind of movement is sometimes also used as a gesture by hearing people, which further supports the gesture analysis.<sup>10</sup>



Figure 5. WHERE (12b)

In contrast to DGS, gestures occur quite frequently in the ISL data. This observation raises the question of whether it may be a phenomenon particular to ISL. However, since this paper presents the results of an initial investigation, where research has not been undertaken on a grand scale, we leave this question for further research.

The use of manual signs to convey modal meaning occurred in ISL even in a sentence pair like (13), where intonation is the only distinguishing feature in the corresponding English sentences (see footnote 7), and where NMFs might thus be highly expected. One signer uses a special sign to express the surprised attitude of the speaker, the sign AH in (13b).

(13) Irish signer 1:

- a. *It is raining.*  
 WEATHER LOC<sub>a</sub> RAIN [ISL]
- b. *It is RAINing!*  
hb.oe.fr. o o \_\_\_\_\_ e  
 AH, LOC<sub>a</sub> RAIN

(14) Irish signer 2:

- a. *It is raining.*  
 LOC<sub>a</sub> RAIN [ISL]
- b. *It is RAINing!*  
 \_\_\_\_\_ /o:/  
 \_\_\_\_\_ oe, e  
 LOC<sub>a</sub> RAIN

In (13a), the signer simply expresses a fact without much emphasis and without an attitude towards the utterance. Therefore he introduces the topic WEATHER first, before pointing towards a location (LOC<sub>a</sub>) with the index-finger and then signing RAIN. To express the surprised attitude of the modal



sentence (13b), the signer uses the F-hand of the Irish finger alphabet on one side of the chin, raised eyebrows, but also frowning ('fr'), open eyes ('oe'), a backward head tilt (hb), and a slightly open mouth (see Figure 6 below for illustration). This sign, which I call the AH-sign, as there is no equivalent expression in English, is commonly used for the purposes of expressing surprise and seems to be integrated into the vocabulary of ISL. In addition, the accompanying NMFs are important to distinguish the assertive from the modified sentence.

Example (14) shows the translation of the same pair of sentences by the other Irish signer. Similarly to signer 1, signer 2 in (14a) states that it is raining by pointing to a specific location ( $LOC_a$ ) and signing RAIN. In contrast, in the modified sentence in (14b), an astonished expression, open eyes, and the mouthing /o:/ accompany the pointing sign (see Figure 7). Together with a disappointed look and energetic signing, these NMFs are used to express that the signer is surprised. As frequently observed in the ISL data, a combination of mimetic encoding and additional manual methods is used to express the difference between the (a) and the (b) sentences. NMFs are used as simultaneous and complementary means in the expression of modal meaning in ISL. In (13), NMFs are the predominant, but not the only distinctive features. In (14) modal meaning is expressed by NMFs alone.



*Figure 6.* AH-sign (13b)



*Figure 7.*  $LOC_a$  (14b)

Whether the pointing activity of the signers in (13) and (14) should be analyzed as a gesture or a sign is not yet clear. As is well-known, there is an ongoing discussion about the linguistic versus gestural use of loci in signing space and pointing signs. Liddell (2000), as opposed to many other researchers (Aronoff et al. 2005; Mathur 2000; Petitto 1987; Rathmann & Mathur 2002), argues in favor of a gestural interpretation of these spatial pointing activities. At the same time, he emphasizes that “the gradient and

gestural aspects of the signal are not peripheral or paralinguistic. They are required to be present and central to the meaning being expressed” (Liddell 2000: 362). Therefore, the whole utterance with all levels of sign language communication is important, no matter if localizations are seen as gestural or linguistic devices. Non-manual expressions, gestures, and sign constructions operate together to express modal meaning in ISL. Despite the fact that specific NMFs accompany the signed sentences in most cases, NMFs are hardly ever used as the only distinguishing feature. The use of various methods shows that ISL does not have a homogeneous strategy of expressing modal meaning. ISL prefers the use of gestures or signed circumlocutions to grammatical NMFs. The facial expressions play a supplementary role in the combination of means; they exhibit no clear on- and offsets, are very affective, and are not always the same between signers. The NMFs in DGS, on the other hand, do provide clear on- and offset patterns (see next section) and appear to be very similar across signers.

### 5.3. Analysis of the NMFs for modal meaning in DGS and the equivalent methods in ISL

The clear on- and offset of the NMFs in the DGS data is seen in examples (15) and (16) below. In the *wh*-interrogative modified by a modal particle, the distinguishing NMFs either spread over the whole sentence, as in (15b), or accompany only the sentence-final *wh*-element *WO* (‘where’), as in (16b) (*shr* = shrug, *dl* = desperate look, *fr* = frown).

(15) German signer 2:

a. *Wo hast du deinen Stift hingelegt?* [German]

$\underbrace{\hspace{1.5cm}}$ POSS <sub>2</sub> STIFT LEG WO?	[DGS]
your pen put where ‘Where did you put your pen?’	

b. *Wo hast du nur deinen Stift hingelegt?* [German]

<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> $\underbrace{\hspace{1.5cm}}$ POSS <sub>2</sub> STIFT LEG WO?	[DGS]
your pen put where ‘Where on earth did you put your pen?’	

## (16) German signer 3:

a. *Wo hast du deinen Stift hingelegt?* [German]

WO STIFT WO? [DGS]

where pen where

‘Where did you put your pen?’

b. *Wo hast du nur deinen Stift hingelegt?* [German]

STIFT WO STIFT WO? [DGS]

pen where pen where

‘Where on earth did you put your pen?’

Both informants choose slightly different sentence constructions, but use nearly the same facial expressions. Only the distribution of the non-manuals varies. Within the modified sentences (15b) and (16b), the sign WO is performed very energetically, with a quite desperate look (‘dl’) (see Figures 9 and 11). Frowning (‘fr’) also accompanies the signing in (15b). Moreover, the sign WO is signed much higher than in both the (a) sentences (compare Figures 8 and 10 to Figures 9 and 11). Note that the modal particle *nur* is homophonous with the quantifying focus particle *nur* (‘only’) which in DGS, is realized by a separate sign. The examples show that the signers were well aware of this difference in interpretation.<sup>11</sup>



Figure 8. WO/where (15a)



Figure 9. WO/where (15b)



Figure 10. wo/where (16a)



Figure 11. wo/where (16b)

As is clear from the examples above, the distribution of NMFs for modal meaning can vary. The same is true for questions. Sometimes there are two or more options for the distribution of NMFs in interrogatives. In particular, non-manuals may accompany only one constituent or they may spread over the whole sentence. However, once a variant is chosen, specific constraints define the scope, and signers' intuitions overlap (Neidle et al. 2000; Lillo-Martin and Petronio 1997; Wilbur and Patschke 1999). In other words: the variation between the signers does not provide evidence for the assumption that NMFs expressing modal meaning are extralinguistic. Though the spreading of the NMFs may be varying, the signers largely share intuitions about which NMFs can be used to express a specific modal meaning. This can be seen in the following example, where total congruence is apparent between DGS signers 2 and 3.

(17) German signers 2 and 3:

- |    |   |          |
|----|---|----------|
| a. | <i>Ich werde den Weg finden.</i>                                    | [German] |
|    | <u>sh</u>   |          |
|    | WEG FIND  | [DGS]    |
|    | way find  |          |
|    | 'I will find the way.'  |          |
| b. | <i>Ich werde den Weg schon finden.</i>                              | [German] |
|    | <u>sl, ins</u>  |          |
|    | WEG FIND  | [DGS]    |
|    | way find  |          |
|    | 'I will probably find the way. '; 'Don't worry, I'll find the way.' |          |

In (17b), the signers express hope that they will find the way, but, as opposed to (17a), they are not entirely convinced. Therefore, an insecure facial expression (ins) is used in (17b) to soften the strength of the assertion

in (17a). Note that the scope of the NMFs is restricted to the verb. Another crucial difference between both sentences is the rapidity of signing. In (17b), the nodding and the encouraging look is expressed more slowly (sl) than in the short statement (sh) in (17a). Both signers sign the sentence in exactly the same way, which once again confirms that the informants have the same intuition towards NMFs for modal meaning.

The corresponding ISL examples, on the other hand, focus on the given English constructions and therefore incorporate the adverb MAYBE. In addition, the signers furrow the eyebrows and the second signer performs the sentence in a very slow manner.

(18) Irish signer 1:

*I will probably find the way; Don't worry I'll find the way.*

\_\_\_\_\_ <sup>uu</sup>  
 INDEX<sub>1</sub> WILL MAYBE FIND WAY WINDING-TO HOUSE [ISL]

(19) Irish signer 2:

*I will probably find the way; Don't worry I'll find the way.*

\_\_\_\_\_ <sup>da, uu</sup>  
 \_\_\_\_\_ <sup>sl</sup>  
 INDEX<sub>1</sub> WILL MAYBE FIND WAY

Both signers use the same sentence construction except for the additional explanation of the first signer at the end of the sentence in (18), which can be neglected here. In (19), the doubting attitude ('da') is shown more explicitly by facial expressions, but the crucial difference to the non-modified sentence is the addition of the manual sign MAYBE.

Interestingly, with the very similar sentence in (20) and (21), the Irish signers use different circumlocutions, as they choose different options for translating the given data. Signer 1 uses the adverb MAYBE (even doubled, (20)) while signer 2 chooses an embedded structure introduced by the verb THINK (21). Both signers perform nearly the same change in facial expressions but still, the signers make no attempt to express modal meaning by NMFs only. Additionally, for the most part, the non-manual expressions are distributed over the whole sentence and are hardly ever restricted to a particular constituent.

(20) Irish signer 1:

*She probably sold her car.; I suppose she sold her car.*

hn, sl, ∪∪

INDEX<sub>3</sub> MAYBE SELL CAR MAYBE

[ISL]

(21) Irish signer 2:

*She probably sold her car.; I suppose she sold her car.*

sl, ∪∪

INDEX<sub>1</sub> THINK INDEX<sub>3</sub> SELL POSS<sub>3</sub> CAR

[ISL]

Indeed, the ISL informants stated that they prefer circumlocutions and adverbs, even though they would also recognize the difference in meaning if non-manuals were the only features to change. This latter strategy, however, is not very frequently observed in ISL. The above examples (as well as the ISL-counterparts of the English sentences in (13) and (14)) and the tendency to use affective gestures indicate that the preference for manual means of modal marking is characteristic of ISL. This tendency is neither due to language contact with spoken English nor does it have its source in the presented English data.

By contrast, in DGS, the modification of meaning is consistently achieved by the change of facial expressions (especially eyebrow position), head nods, and sometimes body movement. However, there is no fixed non-manual expression associated with a given modal particle as the interpretation of modal particles depends on the context and the respective situation, and not on the word itself. In one example, shown in (22), repetition of a verb sign ('++') together with a more energetic, forceful ('ff'), and self-admonishing expression ('ad') is used to strengthen the importance of the uttered fact. In the corresponding German sentence, this is caused by the stressed modal particle *ja*.

(22) German signer 1:

*Ich muss JA daran denken den Brief einzuwerfen!*

[German]

e, ad ff, e

INDEX<sub>1</sub> MUSS DENK++ BRIEF EINWERF

[DGS]

I must think letter post

'I really have to remember to post the letter!'

The expressions change according to the urgency and the specific discourse situation. This can also be seen in the following sentences signed by two

different informants, where the modal meaning induced by the stressed modal particle *ja* in German changes the force of the imperative.

- (23) German signer 1:  
*Mach JA deine Hausaufgaben!* [German]  
e, thr, res  
 POSS<sub>2</sub> HAUSAUFGABEN MUSS [DGS]  
 your homework must  
 ‘Be sure to do your homework!’
- (24) German signer 2:  
*Mach JA deine Hausaufgaben!* [German]  
e, thr, res  
 BITTE HAUSAUFGABEN GEH [DGS]  
 please homework go  
 ‘Be sure to do your homework!’

Both signers modify the basic utterance by using energetic and threatening (‘thr’) facial expressions and a resolute look (‘res’).<sup>12</sup> The signers use different signs at the end of the utterance: signer 1 (23) uses the deontic modal MUSS (‘must’), whereas signer 2 uses the verb GEH (‘go’). Note that the order interpretation of the utterance in (24) is reinforced by the mouthing /ab/ that accompanies the verb sign. However, the general pattern of changing the facial expressions for modal meaning and for expressing the speaker’s attitude is also observed in these examples. Only the scope of the NMFs differs, which can be analyzed as an adjusting strategy of the respective construction. In (23), the modal verb MUSS alone combines with the NMFs. The sentence construction in (24) seems to require NMFs over the whole utterance, since the unmodified sign BITTE (‘please’) might contradict the meaning of obligation intended by the speaker.

The gradual variation of the force of an imperative, as seen in the examples above, can be expressed very precisely in sign languages. Intonation in spoken languages can also change the meaning gradually, but the lack of a specific intonation pattern in a German modal sentence, for example, will generally not affect its meaning. By contrast, a signed modal sentence without facial expressions in DGS is not entirely and correctly interpretable and may even lose the modal meaning completely. Consequently, with regard to modal meaning in DGS, non-manual features are of utmost importance.

#### 5.4. Summary

NMFs play an important role in many different areas of sign language grammar and offer significant insight into how sign languages work. It is argued here that in DGS, NMFs are also used as grammatical features when it comes to realizing modal meaning. ISL uses NMFs simultaneously to other means that express modal meaning, but their inconsistent use does not allow for a grammatical interpretation. A number of interesting conclusions can be drawn from the present investigation, which are discussed in the following section.

### **6. Conclusion: Inter- and intra-modal variation**

Concerning the spoken languages investigated, it is obvious that German and English vary in their ways of expressing modal meaning. The use of modal particles is typical for German. Similar strategies are attested in a few other languages like Dutch and Frisian, but not in English, which lacks exact counterparts for German modal particles. Instead, English uses implicit and explicit methods such as intonation, tag questions, adverbs, or circumlocutions to express the meaning conveyed by modal particles in German. Often various English translations are possible for an individual German modal particle, and the choice of strategy depends on context. Both languages behave strikingly different with regard to the expression of modal meaning, thereby supporting the variation hypothesis, especially when considering the fact that both languages belong to the family of Germanic languages.

Comparing German and DGS, it is clear that German modal particles do not have DGS sign equivalents. Instead, DGS employs NMFs to express the meanings of modal particles, though there is no one-to-one-relation between a particle and a specific facial expression. The expression of modal meaning in DGS is guided by the context and does not follow the distinction between individual particles of spoken German.

Turning to English and ISL, the same general observation holds with regard to the differences between the signed and spoken language, since ISL does not use the exact same constructions as English. However, ISL and English have in common that they use various means to express modal meaning. English uses different strategies and occasionally, a particular strategy or expression has an equivalent in ISL. Thus Irish signers do not



necessarily encode the information with NMFs. Hence, from an inter-modal point of view, English and ISL are more closely related in this respect than are German and DGS. This may be due to the specific topic of modal particles, as they exist neither in spoken English, nor in DGS or ISL. However, ISL does not always follow the English construction, and often uses different circumlocutions, gestures, and non-manual features. The comparison between DGS and ISL thus shows that modal meaning is expressed in different ways in the two sign languages. This is an interesting result, especially in the light of the assumption that there may be less cross-linguistic variation between sign languages.

The analysis of the expression of modal meaning in DGS has confirmed the assumption that the speaker's attitude is realized by NMFs which accompany the signed utterance. The attested NMFs show various grammatical characteristics and in almost every case, they are the only distinguishing features between the opposing sentences in the respective examples. They convey modal meaning and carry the linguistic function of expressing the speaker's attitude. The eyes, especially eyebrow movement, head position, and facial expressions are used in the DGS translations to express the meaning conveyed by German modal particles. For the most part, these NMFs exhibit clear on- and offsets and are either restricted to specific constituents or have scope over the whole sentence. Finally, the fact that the informants share intuitions about the use of NMFs for the expression of modal meaning further supports the assumption that these NMFs are part of the grammar.

While DGS almost consistently uses NMFs to show the difference in modal meaning, ISL uses various methods and strategies. As mentioned above, ISL sometimes follows the English constructions of expressing the speaker's attitude by using signed equivalents for adverbs or circumlocutions. In addition to that, ISL signers make frequent use of gestures in the examples, whereas, in DGS, gestures were rarely attested in this study. Nevertheless, NMFs play an essential role in the ISL translations of the corresponding English modal sentences. They are used in every example to emphasize the speaker's attitude and therefore provide a supplementary function in addition to other means. However, the results do not clearly argue in favor of a grammatical use of NMFs for modal meaning in ISL. In contrast to their linguistically consistent use in DGS, the NMFs in ISL only seem to play a complementary role in the expression of modal meaning. Thus, the assumption that both sign languages behave alike and use only NMFs for the expression of modal meaning cannot be

maintained. Nevertheless, both languages take advantage of the visual-gestural system and use layering methods and multiple channels to convey modal meaning.

The two investigated sign languages, DGS and ISL, vary more than might be predicted on the basis of the variation hypothesis. The results show that each sign language, despite the modality-specific characteristics, exhibits a unique way of expressing modal meaning.

Five informants, numerous video clips, and lengthy discussions with the native signers built a broad fundament for analysis, but more data from more sign languages must be elicited and analyzed to verify the conclusions reached in this paper. Since the present study is an investigation into a very new research field, many results remain speculative.

## Notes

1. ISL is used as the abbreviation for Irish Sign Language throughout this paper. Note that sometimes Israeli Sign Language is also abbreviated as ISL.
2. Capitals are used to indicate pitch accents since intonation conveys modal meaning in English. Note that I do not provide detailed information about stress and pitch patterns.
3. In *wh*-questions, some modal particles can also occur in sentence-initial position, where they cliticize to the *wh*-word, as seen in the following example (cf. Meibauer 1994).

(i) *Wer schon in aller Welt will das?* [German]  
who MOD.PART in all world wants this  
'Who, in god's name, wants this?'

4. For general research on gestures see Kendon (1981, 2004), Liddell (2003), McNeill (1992, 2000), Stokoe and Marschark (1999), for NMFs in ASL see Baker and Padden (1978).
5. For neuropsychological research and the differentiation of linguistic and affective functions of facial expressions in ASL see Corina, Bellugi, and Reilly (1999).
6. ISL is not related to English or Irish, although there is evidence of English language contact (cf. The Irish Deaf Society, 1997). For information about deaf education in Ireland or further details on language influences from British Sign Language and French Sign Language by British and French institutions see Matthews and O Baoill (1996), Ó'Gliasáin (1996), and also Sutton-Spence and Woll (1999).

7. When presenting these examples to signers, they were told that intonation was used in the spoken language examples. The linguistic function of intonation was explained in detail. Thus, all of the informants had an understanding of the interpretational difference between stressed and unstressed words. In addition, I presented the context of the sentences and explained the different situations in which the sentences were uttered to ensure a natural sign language translation conveying the modal meaning.
8. The sign language translations are transcribed with a specialized transcription system following the standardized gloss forms as closely as possible. Within the transcription system, the modal particles are referred to and abbreviated as MOD.PART. Individually created abbreviations for specific NMFs will be explained separately with the respective examples.
9. In examples (8a) and (8b), the mouthing /kɛn/ is included since it spreads from the verb KENN onto PAM, a process which may be indicative of cliticization (see Pfau and Steinbach, this volume, for further discussion of this issue). In ISL, mouthings were not used as often as in the DGS examples. Nevertheless, mouthing in ISL is used to simplify communication and to distinguish minimal pairs, for instance. However, mouthing is neglected in the transcription system, as it is not relevant for the data discussed in this paper (see contributions in Boyes Braem and Sutton-Spence (2001) for a discussion of the functions of mouthings in various sign languages).
10. In various sign languages, a similar type of gesture has been attested. In Indopakistani Sign Language, a one-handed variant appears as a grammaticalized co-speech gesture in the function of a wh-particle (Aboh, Pfau, and Zeshan 2004; Pfau and Steinbach 2006). In Sign Language of the Netherlands, the so called PALM-UP sign is also analyzed as a question particle (Smith 2004). See Zeshan (2004b) for further cross-linguistic research with regard to such particles. Engberg-Pedersen (2002) gives examples for various grammatical and discourse-functional uses of a similar sign in Danish Sign Language which she calls a “presentation gesture”.
11. An excursus into scalar particles (also called focus particles) has yielded interesting results (cf. Herrmann 2004, 2005). Both sign languages have various realizations for *nur* (*only/just*) as a scalar particle, depending on the context. DGS, for instance, uses different means for the scalar and the quantifying interpretation of the scalar particle *nur* (either NMFs or a special sign). Thus, DGS distinguishes both readings of *nur* explicitly. By contrast, ISL does not use NMFs for neither *only* nor *just*. I take this issue, which cannot be discussed in this paper, to deserve further investigation.
12. Due to lack of space, the basic utterances are not mentioned separately here. Note that they can be transcribed exactly like the modified sentences in (23) and (24), but without the respective NMFs.

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# Reported action in Nicaraguan and American Sign Languages: Emerging versus established systems

*Jennie E. Pyers and Ann Senghas*

## 1. Introduction

In a narrative, the perspective of the narrator and various characters are thoroughly interwoven. This dynamic interplay of several perspectives requires a narrator to speak from multiple points of view – a task that involves more than recounting speech acts. The change of perspective, also known as *referential shift*, is indicated by a variety of grammatical devices in different languages around the world. Speakers must master the syntax of referential shift in their language to effectively control multiple perspectives within a narrative.

Cross-linguistic research has revealed the devices for marking referential shift in many different spoken languages. However, few studies directly compare referential shift across sign languages. Analyses of perspective shift in sign languages other than American Sign Language (ASL) typically focus on those features that are shared with ASL, while those that differ from ASL seem absent from the discussion (cf. Engberg-Pedersen 1993; Poulin and Miller 1995). Without a mention of the differences between various sign languages, current analyses imply that all sign languages mark referential shift in a similar fashion.

Recent work comparing referential shift in ASL to the gestures that accompany reported speech in English indirectly challenges the assumption of universality across sign languages. McClave (2001) found that American English speakers often make a characteristic shift of the body to one side or the other during quoted speech. McClave proposes that the gestural body shift has become systematized to mark referential shift in ASL. That is, the co-speech gesture of the local spoken language supplied ASL with the raw materials for a syntactic marker of perspective shift. If this account is correct, sign languages should differ from each other in the syntax of perspective shift. To the degree that co-speech gesture differs from one spoken language to another (Kendon and Versante 2003; Kita and Özyürek 2003), different sign languages would be drawing from different, local

sources for syntactic raw material, yielding variability across sign languages in their syntactic markers of perspective shift.

Cross-linguistic analyses of sign languages can help us to better understand the ways in which visual-spatial languages vary. Such comparisons can further inform our understanding of which linguistic features are characteristic of the manual modality, and which are unique to a specific sign language.

This paper compares the system of referential shift in ASL, a mature sign language that is approximately 200 years old, to that of Nicaraguan Sign Language (NSL), a young language that has emerged over the past 25 years. We pay particular attention to the devices used to encode referential shift, and to the role these devices play in maintaining discourse cohesion. Both sign languages mark referential shift with specific syntactic features, and further distinguish the referential shift from enactment by incorporating the narrator's perspective into the referential shift but not into enactment. Yet NSL exhibits unique characteristics in referential shift that set it apart from ASL. These include differences in the use of overt signs and non-manual movements of the body to mark the referential shift, as well as a less constrained use of space within and across referential shifts.

## **2. Referential Shift in Spoken English**

To create a rich and vivid narrative, narrators often use quoted speech as they adopt the point of view of different characters (Labov 1972; Chafe 1982; Ochs 1979; Tannen 1982; Schiffrin 1981). In spoken English, quoted speech is distinguished from indirect speech by a contrast in pronoun assignment between the matrix clause and the reported clause. In the example given in (1), the pronoun "she" in the matrix clause and the pronoun "I" in the quoted clause refer to the same individual, even though one is a third-person pronoun and the other is a first-person pronoun.

(1) She said: "I need more paint."

This change in pronoun mapping marks a deictic shift from the narrator's to the character's point of view; following this shift, the quoted utterance reflects the point of view of the subject of the sentence. The deictic shift is further marked by a contrast in tense. Note that the matrix verb in (1) is in

the past tense, while the quoted verb is in the present tense, although both are temporally referring to the same moment.

The means of marking quoted speech are not cross-linguistically universal. In Russian, unlike in English, the matrix verb and the verb in the quoted clause share tense. German, unlike English, can differentiate indirect and quoted speech by using a different word order for indirect speech.

One particularly widespread cue for indicating quoted speech is a shift in prosody. During the quoted part of the utterance, the narrator changes both intonation and voice quality, highlighting the part spoken by someone else. With this shift in intonation and voice quality, the narrator attempts to adopt the prosodic characteristics of the original utterance (Clark and Gerrig 1990).

Even with this change in prosody, the quoted speech is rarely a veridical replication of the original utterance. Because this part of a narrative is actually an approximate reconstruction of a speech event, it is more accurately referred to as *constructed dialogue* (Tannen 1986) rather than “quoted”, “reported”, or “direct” speech.

While constructed dialogue typically recreates overtly expressed utterances, it can also report unspoken thoughts and emotions. In English, the colloquial use of the verb phrase *be like* in the matrix clause indicates that the “quoted” component represents a character’s thoughts and feelings – thoughts and feelings that may not even have been directly observable (Blyth et al. 1990). In (1), the quoted utterance is presumed to have been an overt utterance. By changing the matrix verb to *be like* in sentence (2), the quoted utterance may now be read as reflecting the private thoughts of the speaker.

(2) She was like, “I need more paint.”

Thus, depending on the matrix verb, constructed dialogue can be used to represent spoken utterances or internal thoughts.

The effective use of constructed dialogue in English requires a mastery of verb tense, pronoun reference, and prosodic changes to mark perspective shifts, as well as a functional understanding that these perspective shifts can report speech, thoughts, and emotions. Though complex, constructed dialogue is a central component of discourse. It creates a dynamic engagement of the speaker with the listener, drawing the listener in as an

active re-constructor of the narrative (Mather and Winston 1998; Roy 1989; Tannen 1986).

### 3. Referential shift in American Sign Language

Like English, ASL uses referential shift<sup>1</sup> (often termed role-shift) to represent specific characters' perspectives. Referential shift is described in detail in many sources (e.g., Liddell 1990; Lillo-Martin and Klima 1990; Loew 1984; Meier 1990; Padden 1986, 1990; Shepard-Kegl 1985). Here, we summarize some of its key features in ASL, highlighting those that are relevant to our analysis of NSL.

Some of the syntactic features of constructed dialogue found in English also appear in ASL. Both pronoun and prosody shifts similarly mark an embedded sentence as a quoted utterance (Padden 1986, 1990). The function of constructed dialogue is also similar; it is used to shift point of view away from the narrator, directly reporting both the speech and the unspoken thoughts of a character (Mather and Winston 1998).

The manual nature of a signed language, however, allows for more than just the speech and thoughts of a character to be expressed in the perspective shift; characters' actions can also be expressed in this way.<sup>2</sup> Such actions are "quoted" by signers by embodying the event from the character's perspective. This "quoted" action is commonly referred to as *reported action* (e.g., Emmorey and Reilly 1998). However, as in *constructed dialogue*, the "quote" is a reconstruction rather than a veridical report; for this reason it is more consistent to use the term *constructed action* (Liddell and Metzger 1998).

In constructed action utterances in ASL, a narrator typically takes on the emotional facial expressions and the non-linguistic gestures of the referent character. This combination allows the narrator to report the character's action and attitude simultaneously. That is, the signer's facial expression and non-linguistic manual gesture are both attributed to someone other than the signer.

In most respects, the form of constructed dialogue is similar to the form of constructed action. However, the two differ in the formal structure of the quoted material. In constructed dialogue, the quoted material is a complete grammatical utterance. In constructed action, the quoted material is a blend of non-linguistic elements, including the facial expression, manual gestures, and even full body movements of the character being described.

As we develop a more detailed description of referential shift in ASL, we will draw from previous work by others, as well as our own analyses of narratives elicited from American Deaf signers. Our examples below are drawn from narratives produced by 10 native signers of ASL. Participants viewed four 30-second vignettes that involved one to three characters; one character in each vignette would make an amusing mistake. Participants watched each vignette on a monitor and recounted the story to a peer; narratives were videotaped for later analysis. These narratives are directly comparable to the Nicaraguan data described in the following section, as both studies used the same elicitation materials.

### 3.1. Marking referential shift

Referential shift in ASL is marked by a change in facial expression, with an optional shift of the head and body position of the signer. The shift is frequently accompanied by a break in eye-gaze (Padden 1986), though this too is optional. In ASL (and other sign languages), as in English, constructed dialogue requires a pronoun shift in quoted clauses. In these cases, again, the first-person pronoun does not refer to the narrator, but rather to the quoted character (Engberg-Pedersen 1993; Friedman 1975; Poulin and Miller 1995).

### 3.2. Space in referential shift

In ASL, constructed dialogue and constructed action enrich a narrative by providing multiple perspectives on a single event. The interweaving of different perspectives is organized, in part, by a strict set of conventions that establish and maintain spatial relationships (Mather and Winston 1998; Winston 1991).

There are two types of grammatical spatial conventions applied during a signed discourse: *diagrammatic space* and *viewer space* (Emmorey and Falgier 1999). **Diagrammatic space**, as defined by Emmorey and Falgier, provides a “big-picture” view of how characters and objects are spatially related to one another. It is typically expressed early in a narrative, when the narrator sets the spatial stage on which the narrative is to take place. Poulin and Miller (1995) refer to the narrator’s representation as the “main

frame of reference.” Within the main frame of reference, spatial indices are linked to their respective referents.

Take, for example, one ASL signer’s description of the vignette depicted in Figure 1. In this vignette, a girl is sitting on a woman’s lap, while another woman (the “painter”) paints her face. The painter turns away for a moment, and the girl hops off the seated woman’s lap and leaves. The painter turns back, intending to paint the face of the girl, but accidentally paints the face of the seated woman instead.



Figure 1. A scene from one of the elicitation videos



Right hand: <sup>a</sup>CL: hooked-U ‘person sit’ <sup>a</sup>IX WOMAN  
 Left hand: <sup>b</sup>CL: hooked-U ‘person sit’ <sup>b</sup>CL: hooked-U ‘person sit’ <sup>b</sup>CL: hooked-U ‘person sit’  
 Perspective: Narrator      Narrator      Narrator

Figure 2. An example of the use of diagrammatic space in ASL<sup>3</sup>

In the ASL description shown in Figure 2, the signer, as narrator, begins by setting up the spatial relationship between the painter and the seated woman. She places two classifiers indicating “sitting person” in distinct locations, one to her left and one to her right. She then indexes the space to the right and labels it with the noun WOMAN, naming the character represented by the classifier at that location. In this way, she explicitly associates a particular spatial location with a referent. The signer has provided the addressee with a visual schematic of where the two characters

are located with respect to one another; the seated woman is explicitly placed to the right, and the addressee must infer that another person (identified later in the narrative as the painter) is in the other location, to the left.

**Viewer space**, in contrast, conveys the spatial layout from the perspective of a character within the narrative (Emmorey and Falgier 1999). This view is adopted by the signer, while in the referential shift, to represent objects and people relative to the embodied character. In ASL, the referential shift, along with its represented spatial relations, is one of the “dependent frames of reference” that is subordinate to the main frame of reference (Poulin and Miller 1995). The link between the main and dependent frames of reference is maintained by a consistency in the spatial representations that are laid out in diagrammatic and viewer space. For example, in the face-painting narrative begun above, the signer later adopts the perspective of the painter, accidentally painting the seated woman’s face (Figure 3). In the constructed action, the signer shifts her body to the left, taking over the spatial position of the painter as specified in the main frame of reference, and she directs the manual sign PAINT to her right, emphasizing that the seated woman is located to the right of the painter.



Left hand:                    ${}_b\text{PAINT}_a$   
 Perspective:               painter

Figure 3. An example of the use of viewer space in ASL

Importantly, in ASL, the spatial relationships established in diagrammatic space are maintained in viewer space (Winston 1991). Because the signer has set up the seated woman to the painter’s right in diagrammatic space (Figure 2), she keeps the location of the woman to her right when she adopts the painter’s perspective. Conversely, given the pre-established spatial relations, when the signer later takes on the seated woman’s perspective, she will locate the painter to the left. Across multiple shifts between characters and narrator, the signer keeps the spatial information of

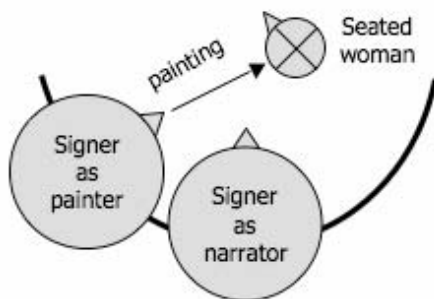


the narrative consistent, helping the listener build a single mental image of the scenario (Mather and Winston 1998).

### 3.3. Angle of body shift

Recall that one of the markers of constructed dialogue and constructed action is a body shift (Engberg-Pederson 1993, Lillo-Martin 1995, Lillo-Martin and Klima 1990). A signer uses this body movement to shift into the spatial locus that has been assigned to a particular character in diagrammatic space, typically to the right or left of the signer. By shifting the body into a pre-established locus, the signer simultaneously marks a referential shift and identifies the character represented within the referential shift. Because the location has already been associated with a particular character, explicitly repeating the name of the character is not necessary, and is ungrammatical once the shift is underway.

Note that in the sign *PAINT* above (Figure 3), the signer directs the action of painting approximately 45 degrees to her right, just in front of where the seated woman had been located in the diagrammatic spatial layout. This repositioning of her body is schematized in Figure 4.



*Figure 4.* A schematic representation of the referent locations in the ASL *PAINT* narrative.

As the signer enters the referential shift, she moves her body to one side to convey the represented character (here, the painter) from the location in diagrammatic space where that character was originally situated. In moving

to this location, the signer shifts onto a diagonal axis. From there, she directs the sign PAIN<sub>T</sub> approximately 45 degrees to the right of her original neutral position. This places the seated woman just in front of where she was located in diagrammatic space.

Had the signer been using only one spatial dimension, she would have directed the sign PAIN<sub>T</sub> directly to her right, to the same location where she (as narrator) had set up the seated woman. Instead, by locating the seated woman slightly forward of that location, the signer indicates that there are two relevant dimensions of space, one used by the signer as narrator, and one used within the referential shift. As this example shows, a signer maintains spatial continuity across the two spatial dimensions, not by producing the signs for a referent each time in the same precise location in signing space, but rather by keeping referents consistently to the right or left while shifting from one dimension to the other.

In a slightly different analysis, Janzen (2004) argues that the body shift in ASL is an optional marker of referential shift and that its use is constrained by signers' conceptualization of the events. Instead of marking referential shift with a body shift, signers can mentally rotate a spatial scene to convey different perspectives on the same scenario. For example, to describe a scenario where a mother chases a child, a signer might adopt the perspective of the mother, not by shifting her body to the left or right, but by manipulating the spatial representation of events to reflect the unique perspective of the mother. In the role of the mother, the signer conveys the spatial relations of the chasing event in front of the body. To shift into the perspective of the child being chased, the signer changes the perspective of the spatial array, articulating the action of the chasing event behind the body. These shifts in perspective take place without a shift of the body. For the purposes of this discussion, it is important to note that, regardless of whether there is a shift of the body, the articulation of space relative to the different perspectives remains consistent across the discourse in ASL signing.

### 3.4. Representing multiple perspectives in referential shift

Throughout discourse, there are fluid shifts back and forth between the narrator's and characters' perspectives, though a character's perspective is never fully distinct from the narrator's. In spoken language, the report of the character's perspective is typically not intended as a literal reproduction

of the original speech act (Clark and Gerrig 1990; Tannen 1986). Rather, it carries undertones of the speaker's perspective. For example, a speaker may overlay a sarcastic tone that was not part of the original statement to express doubt about the truth of the quoted utterance. In this case, the words are attributed to the referent character, while the intonation is attributed to the narrator.

In ASL, this overlay of the narrator's perspective onto the character's is frequently applied to both constructed dialogue and constructed action. Within constructed action, a signer can even insert lexical signs that clarify or label the action being depicted. In one example, a signer recounts a vignette that begins with a woman reading a newspaper (Figure 5).



Woman reads

Figure 5. A scene from one of the elicitation videos

The signer first produces the sign WOMAN from a neutral position, indicating the perspective of the narrator (Figure 6, frame 1). The signer then shifts to her right, into the perspective of the character of the woman, and constructs the action of reading, taking on the woman's body position and head movement.



Right hand:	WOMAN	READ
Left hand:		READ
Perspective:	Narrator	Woman

Figure 6. An ASL signer incorporates a lexical sign into constructed action

Here, while in the shifted perspective, the signer produces the sign READ (Figure 6, frame 2). This is not a direct quote, as the character in the vignette never produced the word “read.” Rather, it is commentary from the perspective of the narrator describing the activity being depicted. In this case, the actions are attributed to the character, while the lexical sign is attributed to the narrator.

### 3.5. Summary

ASL signers make constant use of referential shifts to express the utterances, thoughts, and actions of others. These shifts are signaled overtly with lateral movements of the body, head tilts, breaks in eye-gaze, and changes in facial expression. As they shift from one point of view to another, ASL signers preserve discourse continuity by maintaining the spatial relations across the narrator’s main frame of reference and the dependent frames of reference. Using referential shift, a signer can build an engaging narrative that interweaves multiple perspectives.

McClave (2001) hypothesized that the markers of perspective shift in ASL have their origin in the co-speech gesture of the local spoken language. We know little about perspective shift in other signed languages, and even less about how it emerges. Other signed languages may hold clues to the relationship between referential shift and gesture. In the following discussion, we describe what we have learned about constructed action in NSL, including how it is similar to and how it differs from constructed action in ASL.

## 4. Nicaraguan Sign Language

Relative to the Deaf community in the United States, the Deaf community in Nicaragua is quite young. It has its origins in Managua, Nicaragua in the late 1970s, when rapidly expanding programs in special education brought deaf children and deaf adolescents together in greater numbers than ever before (Polich 1998). As deaf students interacted socially on the school buses, in the school yard, and, later, in their homes, they converged on a common vocabulary of signs and common rules by which to organize them – and a new language was born (Kegl 1994). Since that time, NSL has grown in complexity year by year, as new children entered the community

and learned the language (Senghas and Coppola 2001; Senghas et al. 2004). Studies that track the changes in NSL compare the language of older signers, the *first cohort*, who produced the early form of NSL, to that of younger signers, the *second cohort*, who learned NSL in the mid-1980s and later. Comparing the language of the first cohort to that of the second illuminates how the language changed over its first two decades.

Our analysis of referential shift and constructed action in NSL is based on ongoing longitudinal work on narrative and conversation structure in NSL. The examples in this chapter are drawn from narratives produced by 8 first-cohort signers and 8 second-cohort signers. Participants viewed each of the four vignettes described above, and recounted them to a peer. Narratives were videotaped for later analysis.

These data provide an opportunity to examine markers of referential shift in a new language – in this case, a very young language. Some of these features resemble those found in other languages; others may turn out to be particular to NSL, or to languages in their early stages.

#### 4.1. Marking referential shift

The devices used in NSL to mark referential shift include a break in eye-gaze, a change in body position, and an indexical point to the self. The first, the break in eye-gaze, is similar to the break in eye-gaze observed in ASL. At the moment of shift from narrator to character perspective, all NSL signers broke eye contact with their conversation partner. They reestablished eye contact to reassume the narrator's perspective, and maintained this eye contact until the next shift.

The second device, a change in body position, entails turning the body on its vertical axis, instead of shifting the shoulders laterally to a new location. In this way, the body movement is strikingly different from the body shift observed in ASL. The differences in spatial rotation and in the angle of body shift in the two languages will be discussed in detail below.

The third device, an indexical point to the self (IX:self), is shown in Figure 7. In this example, the signer points to herself before shifting into the character's perspective. Sometimes signers follow the indexical point with the lexical sign for the represented character (e.g., IX:self WOMAN) to specify the new referent. Once they have articulated the indexical point or sign, signers break eye-gaze and shift into the perspective of the specified character.

This indexical point to the self is similar in form to the first-person pronoun used with referential shift in ASL. However, it is distinct in its use. In NSL, the indexical point is produced before the shifted construction, to signal its onset, while in ASL, the first-person pronoun is produced as part of the referential shift, to signal the perspective of the character. There is also a second functional difference. In ASL (and in at least some other sign languages), the shifted use of the first-person pronoun appears only in constructed dialogue, and never in constructed action (Engberg-Pedersen 1993). These other sign languages can therefore use the first-person pronoun as a cue that explicitly distinguishes constructed dialogue from constructed action. That is, in these languages, the first-person pronoun signals to the listener that the shift represents constructed dialogue (Poulin and Miller 1995). In contrast, NSL places this form certainly before expressions of constructed action, and possibly before constructed dialogue as well. Consequently, the indexical point to the self does not appear to distinguish between the two forms of referential shift.



Right hand:		“reading”
Left hand:	IX:self	“reading”
Perspective:	Narrator	Woman

Figure 7. An example of the use of the indexical point to mark referential shift in NSL

The indexical point and the lexical specification appear inconsistently across signers, and even across the utterances of a single signer. This variability may indicate that these devices are optional; alternatively, it may indicate that the language is in transition. Perhaps NSL in its earliest form relied more heavily on manual markers of referential shift and less on non-manual markers like eye-gaze. As the language continues to change over time, the manual devices might even drop out entirely in favor of the simultaneous non-manual devices, freeing up the hands for lexical

production. Analyses of future cohorts' production of constructed action will reveal more about the process of language change, and the possible competition between different types of devices used for a common function.

#### 4.2. Space in referential shift

In ASL, the narrator uses diagrammatic space to establish the spatial relationships among the various characters. Recall that in Figure 2, the ASL signer used entity classifiers to represent where the seated woman was located relative to the painter. Once the spatial relationships had been established, the signer kept the locations of the referents consistent, even when she shifted into a character's perspective.

The NSL signers, in contrast, rarely provided diagrammatic spatial information in their narratives. In many sign languages, signers use classifier constructions to establish spatial relations between characters. The Nicaraguan signers, however, used few entity classifiers, and never with this function.

The rarity of classifier use may turn out to be an artifact of the language's youth. This phenomenon was also observed in Israeli Sign Language (ISL), which employs more referent projections (i.e. constructed actions) and fewer classifier constructions in everyday conversational dialogue than observed in ASL (Aronoff et al. 2003). Aronoff et al. conclude that the extensive use of referent projections instead of classifier constructions is a direct result of the language's youth, as the Israeli deaf community has existed for only 75 years. It may be that young languages, with fewer classifiers, afford fewer means to represent space diagrammatically.

Without a ready use of classifiers, NSL signers could adopt a strategy of pointing to locations in space to associate a locus with each referent. Yet none of the NSL signers used this device either. Evidently, NSL uses neither classifiers nor indexical points to set up the spatial relationships among characters, at least not in short narratives like the ones analyzed here.<sup>4</sup> Without the use of classifiers or spatial loci to represent entities in relation to one another, Nicaraguan signers may not have a felicitous way to establish spatial relationships within diagrammatic space.

On the other hand, signers did provide some spatial information in viewer space. In particular, they would represent the locations of characters

in relation to one another from the point of view of a particular character, executing the referent's action relative to another character's position. This is similar to the device used by the ASL signer in Figure 3. Here, the conversation partner can infer the location of the seated woman by monitoring the direction in which the painter, as represented in the constructed action, is painting.

In representing this scenario spatially, there are two possible spatial layouts available for locating the seated woman with respect to the painter: *rotated* and *unrotated*. Note that in the vignette, from our perspective as viewers, the painter paints to the left. A representation of this movement produced to the signer's own left would therefore be unrotated with respect to the referent. A representation of this movement produced to the signer's right would be rotated with respect to the referent. One of the characteristics of the short narratives in ASL is that the spatial relationships in both diagrammatic and viewer space are consistently rotated across multiple perspective shifts.

Strikingly, none of the NSL signers were consistent in the spatial layout they applied within a narrative. Across different perspective shifts, they used both unrotated and rotated layouts equally often. In the example shown in Figure 8, an NSL signer adopts the painter's perspective, painting a girl to his left, and then turning to his right, away from the locus of the girl. Here he represents an *unrotated* layout of the spatial relationships. Then, as he shifts from the painter's to the seated woman's perspective, he changes spatial layout. Instead of indicating the girl walking away from him on his left, which would be consistent with an unrotated representation, he indicates her walking away on the right, a rotated representation. When shifting between referents, the signer switches freely between unrotated and rotated representations within a single short narrative.

As mentioned above, one function of spatial continuity across multiple perspective shifts in ASL is to help the listener build a mental image of the spatial relationships of the event. Once referents have been associated with particular spatial locations, signers can shift into a specified location to indicate which character's perspective they are assuming (Winston 1991). Without this spatial continuity across a narrative, a listener must build a new representation of the spatial layout with each perspective shift. We know little of how NSL listeners construct a mental representation of a story as they watch a signed narrative, and what spatial relations are included in that representation. Future comprehension studies will inform



us as to whether listeners use these multiple representations of space to build a single mental image of a scene.



Right hand:	PAINT	“turning away with paintbrush”	WALK
Perspective:	Painter	Painter	Sitting woman
Spatial Layout:	unrotated	unrotated	rotated

*Figure 8.* An example of the use of both rotated and unrotated spatial layouts in a single NSL narrative

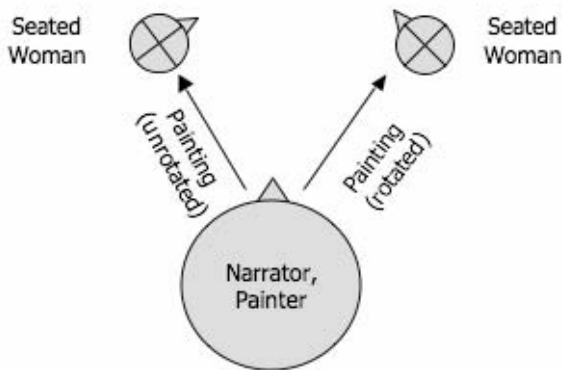
The inconsistent use of spatial layouts by both first- and second-cohort signers is striking given recent results on their use of spatial language under different conditions. In one study that included a communication task, first-cohort signers describing photographs showed an inconsistent use of spatial layouts. Second-cohort signers, in contrast, were consistent as individuals. That is, a single spatial layout was chosen by each second-cohort signer and applied consistently throughout the task. However, as a group, the second-cohort signers were not consistent; some produced rotated representations, while others produced unrotated representations (Senghas 2001).

In another study, in which signers described simple transitive events, second-cohort signers were consistent as a group, using unrotated spatial layouts in their production and comprehension. First-cohort signers' layouts, again, were inconsistently applied (Senghas et al. 1997; Senghas 2003). What varies across all these tasks, then, is whether the second cohort is consistent in the use of rotated versus unrotated spatial layouts. The first cohort is never consistent, and appears, therefore, not to be using spatial layouts to build a spatial representation of the event. Within short sentences that describe simple transitive events (e.g., giving), spatial layout is apparently being used – by the second cohort – to identify a verb's arguments; it carries out a grammatical function that can be served only if layout is applied consistently. However, in a narrative with multiple perspective shifts, spatial layout may be serving a different function, one that does not require the same consistency in rotation across utterances.

More cross-linguistic work on sign languages is needed in this domain to determine whether inconsistency in spatial layouts is characteristic of young sign languages, and whether there is a general preference in sign languages for rotated or unrotated representations of space.

#### 4.3. Angle of body shift

The body movement used to mark referential shift in NSL appears quite different from that observed in ASL and other sign languages. In ASL, a signer can reinforce pre-established spatial relationships between characters by shifting the body to the locus associated with a character and taking on that character's perspective. Once shifted, the signer conveys all of the current character's actions with respect to the spatial relationships previously set up in diagrammatic space. In NSL, however, a signer does not shift the body to the right or left of neutral position to mark referential shift. Instead, the signer keeps the body centered, and rotates 45 degrees (or even less) to the left or right, engaging in all of the character's actions on the diagonal (see Figure 9). Here, the diagonal originates from the signer's center, and extends forward, slightly to the right or left. The resulting movement is a clockwise or counter-clockwise rotation on the vertical axis of the body, not an ASL-like shift of the shoulders to one side or the other.



*Figure 9.* A schematic representation of the referent locations in the NSL PAINT narrative

An example of this diagonal is shown in Figure 10. Here, an NSL signer adopts the painter's perspective by rotating his body slightly to his left and signing PAINT on the diagonal.

In ASL, the body shift serves to reinforce the already-established spatial relationships between characters, creating continuity across the narrative. Because NSL does not have this constraint to maintain spatial continuity across a narrative, body rotation in NSL may not carry all the same referential functions as body shift in ASL.



Right hand:	P A I N T
Perspective:	Painter
Spatial Layout:	unrotated

*Figure 10.* An example of the 45-degree body turn in NSL

Recall McClave's (2001) argument that the body shift in ASL is derived from the body movements produced by hearing speakers of Standard American English when they use constructed dialogue. It would be worthwhile to compare the movement found in NSL referential shift to the body movements that accompany constructed dialogue in Nicaraguan spoken Spanish. If similar movements are found to accompany spoken constructed dialogue, we would have good cross-linguistic evidence for gestural origins of sign language devices.

#### 4.4. Representing multiple perspectives in referential shift

A characteristic of constructed action commonly found in both NSL and ASL is the ability to represent multiple perspectives simultaneously. Just as in the ASL example, Figure 11 shows a Nicaraguan signer deftly incorporating a lexical sign into the constructed action. Here, she enacts the

facial expression and body rhythm of a child walking while producing the sign WALK-FORWARD.



Left hand: WALK-FORWARD  
Perspective: child

*Figure 11.* An NSL signer incorporates a lexical sign into constructed action

Simultaneously holding multiple perspectives may be an emerging characteristic of NSL. In tracking constructed action from the earliest to the later cohorts of Nicaraguan signers, the frequency of these combined perspectives in referential shift increases, appearing more often in the narratives of the second-cohort signers.

#### 4.5. Summary

The features that mark constructed action in NSL appear to have undergone development in the transition from the first cohort to the second. The indexical point to mark constructed action appears frequently in the narratives of first-cohort NSL signers, and less in the narratives of second-cohort signers. The simultaneous integration of the narrator's and the character's perspectives during the referential shift also appears in the language of both cohorts, again, to a greater extent in the second cohort. Importantly, this integration of perspectives indicates that even in a young, emerging language, constructed action has gone beyond the simple enactment of a character's behavior in the world and has become a complex feature of discourse structure.

NSL stands apart from ASL in the way that space is used across multiple perspective shifts in a short narrative. ASL uses space to tie together the multiple perspectives and to aid the listener in building a

mental image of the scene. NSL, on the other hand, allows for multiple, unconnected representations of space; signers from all cohorts exhibit flexibility from one utterance to the next in their choice of spatial layout. While NSL signers do use space within each constructed action, they do not maintain one spatial layout across multiple perspective shifts. Apparently, NSL does not use space as a tool for identifying the new character being assumed under the referential shift.

## **5. Conclusion**

In many ways, referential shift in NSL differs markedly from referential shift in ASL. It is marked with an overt lexical point, uses a turning instead of a lateral shift of the body, is more flexible in its choice of spatial layout in constructed action, and lacks the use of diagrammatic space to constrain the spatial layouts expressed in viewer space. This comparison of a mature sign language to a young language undergoing rapid linguistic change points to ways in which sign languages can differ. What such a comparison leaves unanswered is whether these differences reveal domains of cross-linguistic variation, or properties specific to a young, emergent language.

One possibility is that referential shift in NSL is somehow closer in form to its gestural roots – that is, closer to enactment. However, this account does not easily explain all of the differences observed between NSL and ASL. For example, an indexical point followed by a lexical item does not seem particularly enactive. If anything, it seems less enactive than a consistent use of a single spatial layout. Furthermore, the incorporation of both the narrator's and the character's perspectives into a single representation is also more abstract than simple enactment.

Nevertheless, the high variability in the use of the indexical point, and in the combination of multiple perspectives within a single referential shift, do suggest that the language is still undergoing rapid change, and is currently developing a systematic means of marking perspective shift. The features of referential shift found in the language of younger signers appear to represent a more mature form of referential shift in NSL.

Determining which features of referential shift in NSL are consequences of its emergent nature would require comparisons across sign languages of different ages. Additionally, by directly comparing mature languages, we would see the range of devices for marking referential shift, and determine which features derive from gestural practices. With cross-linguistic studies,

including those presented in this volume, we will move beyond an analysis of “sign language” as if it were a single, unified phenomenon, and discover the variety and the commonalities in sign languages, around the world and over time.

## Notes

1. See Engberg-Pedersen (1993) for a thorough discussion of three elements of referential shift: shifted reference, shifted attribution of expressive elements, and shifted loci.
2. Tannen (1986) observes that, in spoken Greek narratives, action can also be reported from the first person perspective. In these cases, the sound of an action is reported using onomatopoeia.
3. Transcription conventions (not included in or somewhat different from the conventions listed at the beginning of the volume):
 

" "	(e.g., "wave-no", "what-left")	indicates a gesture-like sign
a,b,c	(e.g., PLANT <sub>a</sub> , TABLE <sub>b</sub> )	represent unique spatial locations
CL:	(e.g., CL: hooked-U ‘seated figure’)	a classifier construction, followed by the handshape and a semantic description
IX	(e.g., IX:self, IX:girl)	indexes (points to) a person or locus associated with a character or object
4. It is striking that the NSL signers did not use indexical points to set up spatial relationships diagrammatically in short narratives, given that some signers do readily use this device to mark the arguments of a spatial verb (c.f. Senghas et al. 1997; Senghas 2003).

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# Grammaticalization of auxiliaries in sign languages

*Markus Steinbach and Roland Pfau*

## 1. Introduction<sup>1</sup>

Just like spoken languages, sign languages are subject to diachronic change, with changes being triggered by internal and external factors. On the one hand, phonological changes may be the result of internal factors such as, for instance, physiological conditions. On the other hand, changes imposed on a sign language through language contact (mostly between a spoken and a signed language) and language politics are clearly externally triggered. Our focus in the present paper is on an instance of internal change observed at the lexical level, namely grammaticalization. While a number of intriguing grammaticalization phenomena have been noted in the sign language literature, we will restrain ourselves to the discussion of auxiliaries. We will present data from a number of sign languages and we will investigate in how far the grammaticalization paths identified on the basis of a wealth of spoken language data can also account for the patterns found in sign languages. In other words: we will investigate the modality-independence of these patterns. Where patterns are found to differ, we will consider in how far the differences can be attributed to the difference in modality.

This paper is organized as follows: in Section 2, we start by looking at auxiliaries in spoken languages. Here, we first briefly discuss some of the properties commonly attributed to auxiliaries (Section 2.1) and then we turn to the grammaticalization pathways described for spoken language auxiliaries (Section 2.2). Section 3, the heart of the present study, is devoted to agreement auxiliaries in sign languages. Before turning to sign language auxiliaries, we give evidence in Section 3.1 which indicates that generally, signed and spoken languages follow the same grammaticalization paths, that is, the grammaticalization patterns and the restrictions thereon seem to be modality independent. Some basic properties of sign language agreement are introduced in Section 3.2. In the remainder of Section 3, we present data from various sign languages to illustrate that they make use of auxiliaries which have developed from

various sources. We argue that the emergence and the specific function of agreement auxiliaries follow from the spatial properties of verbal agreement in sign languages. Section 4 discusses further issues related to the grammaticalization of sign language auxiliaries, in particular, the distribution of inflectional markers. Section 5 summarizes the main findings of this study.

## 2. Auxiliaries in spoken language

Heine (1993: 70) defines auxiliaries as grammaticalized linguistic items “covering some range of uses along the Verb-to-TAM [i.e. tense, aspect, and modality] chain.” He assumes that auxiliaries are grammaticalized elements expressing tense, aspect, modality, along with other grammatical functions. In this section, we briefly discuss both aspects of Heine’s definition. The next section deals with the form and function of auxiliaries while Section 2.2 addresses the issue of grammaticalization.

### 2.1. Some properties of auxiliaries in spoken language

Auxiliaries are functional items that express a small range of grammatical concepts, such as, for instance, tense, aspect, modality, and voice. This is illustrated by the English examples in (1). The auxiliary *will* in (1a) is used to express future tense, while the auxiliary *have* in (1b) expresses perfect aspect. *Can* in (1c) is a modal verb expressing the notions of possibility or ability and *was* in (1d) is a passive auxiliary.

- (1) a. *Mary will read this book*  
 b. *Mary has read this book*  
 c. *Mary can read this book*  
 d. *This book was read by Mary*

Typological studies have revealed that it is tough if not impossible to give a simple universally applicable definition of the notion auxiliary since auxiliaries may have different grammatical and functional properties across languages. Nevertheless, cross-linguistically, auxiliaries have many prototypical properties that distinguish them from other word classes, especially from verbs. Still, they also share some properties with verbs.

In his comprehensive study on auxiliaries, Heine (1993: 22f.) lists the following properties, which are frequently mentioned in descriptions of auxiliaries in different languages (cf. also Steele 1978; Akmajian et al. 1979). First, auxiliaries form a closed set of linguistic items that is mainly used to express a small range of grammatical functions illustrated in (1). Thus, as opposed to main verbs, they have no lexical meaning of their own but modify or specify the basic meaning of the main verb. Second, they have a (reduced) verbal morphosyntax and they tend to carry all morphological information related to the predicate. That is, verbal inflection (agreement, tense, etc.) is usually expressed on the auxiliary and not on the main verb, which appears in a nonfinite form. This, too, is illustrated by the English examples in (1). On the one hand, auxiliaries like *will* and *can*, unlike main verbs, do not inflect for person (1ac). On the other hand, the main verb occurs in its nonfinite form and the auxiliary is inflected for agreement and tense (cf. 1bd). Besides, they have a full and (phonologically) reduced form, which very often cliticizes to some adjacent element (see Pfau and Quer (this volume) for discussion of some of these properties in relation with sign language modals). Moreover, in contrast to affixes, auxiliaries tend to be separated from the main verb and to occur in a fixed order and in a fixed (mainly the second) position. In many languages, main verbs and corresponding auxiliary verbs exist simultaneously. Consider, for example, the English verb *have*, which is used as a perfect marker in (1b) but as a main verb expressing possession in a sentence like *Mary has a book*. In sum, auxiliaries are neither clearly lexical nor grammatical expressions. This hybrid character of auxiliaries is strongly related to the emergence of these items to which we turn in the next section.

## 2.2. Grammaticalization of auxiliaries in spoken languages

Recall from Heine's definition above that auxiliaries are grammaticalized functional expressions that develop mainly from verbal sources to express abstract grammatical concepts such as tense, aspect, or modality, among others. Grammaticalization, on the other hand, can be defined as the development from lexical to free grammatical forms (functional elements) and further from free grammatical forms to bound grammatical forms (affixes). In accordance with this definition, the primary goal of grammaticalization theory is to describe how grammatical forms arise and

develop over time (Traugott and Heine 1991; Hopper and Traugott 1993; Aitchison 1996; Heine and Kuteva 2002ab). Extensive cross-linguistic research has identified a fair number of prototypical developmental pathways; three exemplary grammaticalization paths are given in (2).

(2)	LEXICAL ELEMENT	→	FUNCTIONAL ELEMENT	→	AFFIX
	noun		→ pronoun		→ agreement
	verb		→ adverb		→ tense
	noun/verb		→ complementizer		

Similar pathways have been identified for the development of auxiliaries. Investigations into the diachronic development of spoken language auxiliaries have revealed that most of them originate from full lexical verbs. In many cases, the source and the target element are coexistent, as can be seen in the English example in (3). Clearly, the future tense marker in (3b) has developed from the change-of-location verb in (3a).

- (3) a. *Peter is **going** to London*  
 b. *Peter is **going** to win*

On the pathway from lexical verb to auxiliary, the verbal source undergoes several linguistic changes. First, it loses its lexical meaning and acquires a grammatical function (desemanticization). Moreover, the verbal source loses its categorical and argument-taking (thematical) properties, that is, a source structure containing a verb and a complement turns into a target structure containing an auxiliary and a main verb (decategorization). In addition, the verbal source may also be phonologically reduced (phonological erosion) and may change its morphophonological status from an independent element to a clitic or affix (cliticization).

Heine (1993) argues that abstract grammatical concepts expressed by auxiliaries develop from more concrete concepts such as, for example, location, motion, or activity, which are preferably expressed by verbs. However, since the development of auxiliaries concerns more complex linguistic units such as predicates and their arguments, Heine proposes several event schemas, which he takes to be the conceptual basis for the emergence of auxiliaries. All these basic event schemas consist of one predicate and two arguments. Cross-linguistically, event schemas like the location scheme in (4a), the motion scheme in (4b), and the action scheme

in (4c) and their corresponding syntactic frames are found to be the main sources for the development of grammatical categories.

- (4) a. “X is at Y” (location schema)  
 b. “X moves to/from Y” (motion schema)  
 c. “X does Y” (action schema)

One event schema may give rise to different grammatical concepts and a grammatical concept may be derived from different event schemas. The location schema, for example, is the conceptual basis for progressive, ingressive, and continuous aspect. The examples in (5) are representative for progressive forms developed on the basis of the location schema, which usually involves verbs such as *sit* (as in the Dutch example (5a)), *stand*, *stay*, or the copula verb *be* (as in the German example (5b)).

- (5) a. *Ik zat net te denken dat ...* [Dutch]  
 I sit.IMPERF just to think that  
 ‘I was just thinking that ...’  
 b. *Er ist ein Buch am Lesen* [German]  
 He is a book at.the reading  
 ‘He is (busy) reading a book.’

The motion schema, which is encoded by verbs of motion like *go*, *come*, *move*, or *walk*, is mainly responsible for the development of auxiliaries expressing future tense as is illustrated, for instance, by the English *be going-to* future in (3b) above.<sup>2</sup> Consider finally the action schema, which is known to be the basis for various kinds of aspectual auxiliaries. This schema involves verbs like *do*, *take*, *finish*, *leave*, and *remove* and it can nicely be illustrated by the two examples in (6). Like a fair number of other sign languages, American Sign Language (ASL) has a perfective marker that developed from the main verb FINISH (Sexton 1999: 115; also see Janzen 1995; Fischer and Gough 1999; Pfau and Steinbach 2006).

- (6) a. **FINISH** EAT YOU? [ASL]  
 ‘Have you eaten?’  
 b. *ḡà ṭhóm-la chî-tshaa* [Lhasa]  
 I market-LOC went-PERF  
 ‘I’ve gone to the store.’

Similarly, in Lhasa (Tibet), the verb *tshaa* ('to finish') has taken on the function of a marker of perfective aspect (6b) (Lord 1993: 230).

According to Heine (1993), these are the three most important event schemas. In addition, he discusses further schemas such as the volition schema, the change-of-state schema, the equation schema, the accompaniment schema, the possession schema, and the manner schema as well as some more complex schemas. In Section 3.4, we illustrate that the same event schemas are also the conceptual basis for the development of sign language auxiliaries from verbal sources.

### **3. Grammaticalization of agreement auxiliaries in sign languages**

In this paper, we focus on the grammaticalization of a specific kind of auxiliary in sign languages. The grammaticalization of these sign language auxiliaries differs from that of auxiliaries in spoken languages in at least two respects. First, while spoken language auxiliaries usually develop from verbal sources, the sign language auxiliaries to be discussed in this section are derived from verbal, nominal, and pronominal sources. Second, the basic function of the sign language auxiliaries is to express verbal subject and object agreement. Therefore, we will refer to them as agreement auxiliaries or SOA ('subject object agreement') auxiliaries. By contrast, auxiliaries in spoken languages usually express tense, aspect, or modality and are thus often called TAM ('tense, aspect, modality') auxiliaries (cf. Section 2). Before dealing with agreement auxiliaries in various sign languages in more detail in Sections 3.3 to 3.5, we briefly introduce some aspects of grammaticalization (3.1) and agreement (3.2) in sign languages that will be relevant for the discussion of agreement auxiliaries to follow. A possible instance of a spoken language agreement auxiliary is described in Section 3.6. Section 3.7 summarizes and compares the properties of the sign language auxiliaries discussed.

#### **3.1. Grammaticalization in sign languages**

Just as spoken languages, sign languages are subject to diachronic change – be it due to internal or external factors. As far as grammaticalization is concerned, it is particularly interesting to note that the patterns that have been found in sign languages are strikingly similar to those described for

spoken languages (cf. Sexton 1999; Pfau and Steinbach 2006).<sup>3</sup> It has, for instance, been observed that the development of grammatical elements such as, for example, tense and aspect markers, pronouns, complementizers, and intensifiers is modality-independent. That is, the grammaticalization of these elements proceeds along similar paths in signed and spoken languages. In example (6a), we have already seen that in sign languages, just as in spoken languages, verbs like ‘finish’ can be the source for aspectual markers. To give just one more example, consider the development of cause complementizers in German Sign Language (*Deutsche Gebärdensprache*: DGS) and Kikuyu, a Bantu language of Kenya. In DGS, the noun REASON (7a) has developed into a complementizer introducing cause complements (7b).

- (7) a.  $\overline{\hspace{1.5cm}}_{\text{hs}}$  REASON INDEX<sub>1</sub> UNDERSTAND [DGS]  
 ‘I don’t understand the reason.’
- b. INDEX<sub>1</sub> SAD REASON POSS<sub>1</sub> DOG DIE  
 ‘I’m sad because my dog died.’
- c. *gu-ti-rĩ* ***ũndũ*** [Kikuyu]  
 C15-NEG-be matter  
 ‘no matter’
- d. *nĩ-n-gũ-igua* *ũũru nĩ* ***ũndũ*** *wa ũ-horo* *ũ-cio*  
 PART-1:SG-FUT-feel bad COP matter of C14-affair C14-that  
 ‘I feel unhappy because of that affair.’

Similarly, in Kikuyu, the source for the grammaticalization of the complementizer *ũndũ* (‘because’) in (7d) is the noun meaning ‘matter’ (7c) (Heine and Kuteva 2002b: 211). Note that in both languages, the source nouns are still existent.

### 3.2. Agreement in sign languages

Before considering the emergence of agreement auxiliaries in sign languages, a few words need to be said about how agreement is implemented in sign languages and about a basic distinction of verb types that has been observed in all sign languages investigated so far.

Agreement in sign languages is locus agreement. Discourse referents are linked to loci in the signing space (cf. Figure 1a) which are either the actual



locations of present referents or locations that are assigned for non-present referents by means of the pointing sign INDEX and/or by eye gaze towards a particular locus. These loci can serve at least two grammatical functions: they can be used in pronominalization and in order to mark agreement on verbs. For illustration, consider the following DGS example.

- (8) POSS<sub>1</sub> MOTHER INDEX<sub>3a</sub> BOOK++ LIKE. YESTERDAY BOOK<sub>3a</sub>GIVE<sub>1</sub>  
 ‘My mother likes books. Yesterday she gave me a book.’



Figure 1a. Signing space

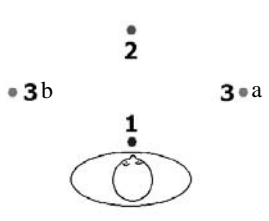


Figure 1b. Localization of referents

In the first sentence in (8), the first person possessive pronoun POSS<sub>1</sub> is a pointing sign towards the signer's chest (location 1), while INDEX<sub>3a</sub> localizes the non-present referent MOTHER at location 3a in the signing space (cf. Figure 1b). In the subsequent discourse, this location may be used to pronominalize MOTHER. Since DGS (just as other sign languages) allows for pro-drop in the context of an agreement verb, pronominalization of the subject and object is optional in the second sentence in (8). This sentence contains the agreement verb GIVE, which moves from location 3a towards the signer (location 1), by that showing agreement with the subject (begin point of movement) and the object (end point of movement). An important constraint on the use of agreement verbs which has often been pointed out in the literature (e.g. Janis 1995; Mathur 2000) is that they can only agree with [+human] arguments.<sup>4</sup>

However, not all verbs in sign languages are agreeing verbs (sometimes also called 'directional verbs'). In fact, most verbs belong to the class of plain verbs, which do not show agreement. Plain verbs are characterized by the fact that they are lexically specified for location and movement features. The DGS verb LIKE in (8), for instance, is articulated on the signer's chest. It cannot be detached from this location in order to show agreement with a non-first referent (although both arguments in the example are [+human]). As we are going to show in the remainder of this

paper, some sign languages – including DGS – have developed a means to overcome this “shortcoming”: they make use of auxiliaries which are capable of expressing the agreement relation by movement and orientation features whenever the main verb does not allow for modulation of these features.<sup>5</sup>

Note that in the literature, there is some discussion about what exactly the status of the relevant loci in signing space is. While some researchers argue for a linguistic analysis of the sign language agreement system (Aronoff et al. 2000; Neidle et al. 2000; Lillo-Martin 2002, Rathmann and Mathur 2002; amongst others) – the exact nature of these features also being a matter of debate – others assume that the use of loci in signing space lies outside the linguistic system and should rather be treated as gestural (Liddell 2000, 2003). We shall not go into this discussion here. No matter how the movement/orientation properties of agreement constructions are determined, the fact remains that the auxiliaries to be discussed below are grammaticalized from lexical elements. We will, however, use the term “agreement” throughout.

In the following sections, we will present data from various sign languages to illustrate that the use of SOA auxiliaries is quite common across sign languages. Moreover, we will show that these auxiliaries have developed from various sources, namely pronouns, verbs, and nouns.

### 3.3. From pronoun to auxiliary

For a number of sign languages, an auxiliary has been described which is obviously derived from two co-occurring pronominal signs. Such an auxiliary is attested in at least Argentine Sign Language (*Lengua de Señas Argentina*: LSA), Catalan Sign Language (*Llengua de Signes Catalana*: LSC), Greek Sign Language (GSL), Indopakistani Sign Language (IPSL), Japanese Sign Language (*Nihon Syuwa*: NS), and Taiwanese Sign Language (TSL). In all cases, the index finger points first towards the subject locus and then moves in a smooth movement towards the object locus. The short tense movement towards a locus which usually characterizes pronominal signs is lost and the auxiliary consists of a hold-movement-hold sequence (i.e. one syllable). Moreover, in first person singular forms, the contact with the signer’s chest can also be dropped. Crucially, for all sign languages discussed in this and the following

sections, it has been pointed out that the auxiliary is semantically empty except for the agreement relation it specifies.

Smith (1990) was the first researcher to describe the use of auxiliaries in a sign language, namely TSL. The auxiliary which is most frequently used in TSL is the one which he glosses as AUX-1 (due to its 1-handshape; note that two further TSL auxiliaries will be discussed in Section 3.4.2). In example (9a) where it is used with the plain verb LIKE, AUX-1 displays third person subject agreement and first person object agreement. That is, it begins with the tip of a 1-hand pointing toward the third person locus in neutral signing space and then moves along a straight path toward the signer where it ends either in contact with or close to the center of the signer's chest. In most of its occurrences, AUX-1 immediately precedes the main verb, as in (9a) where it is preceded by an overt subject, but it may also appear in sentence-initial position, as is shown in (9b) where the auxiliary is followed by an overt subject pronoun (Smith 1990: 217f).

- (9) a. THAT FEMALE <sub>3</sub>AUX-1<sub>1</sub> NOT-LIKE [TSL]  
 'That woman doesn't like me.'  
 b. <sub>1</sub>AUX-1<sub>3</sub> INDEX<sub>1</sub> KNOW  
 'I know him.'

Two further aspects about the TSL auxiliary AUX-1 are noteworthy. First, the auxiliary can also be used in reciprocal constructions. In its reciprocal form, AUX-1 is two-handed, the two hands moving in opposite directions and exchanging locations. Two phonological changes are observed in reciprocal marking: at the beginning of the sign, it is the back of the hand rather than the fingertips that is oriented towards the subject locus; moreover, the handshape is a bent 1-handshape. The main verb may optionally be signed in its dual form, if it has one (10a) (Smith 1990: 225). Secondly, Smith points out that AUX-1 can be used with virtually every verb but is observed more frequently with plain verbs. When it is used with an agreeing verb, the main verb tends to appear in an uninflected form, as is true, for instance, for the verb BOTHER in (10b). The combination of AUX-1 with an agreeing verb that is inflected for subject and/or object agreement is regarded as redundant by most signers. Smith concludes that double marking of agreement is ungrammatical; still, he gives some examples with double marking, as, for instance, (10c) with object agreement on the main verb ALLOW (Smith 1990: 218).

- (10) a.  ${}_{3a}\text{AUX-1}_{3b}\text{-recip(2H)}$  LIKE(dual) [TSL]  
 ‘They like each other.’  
 b.  ${}_{3}\text{AUX-1}_1$  BOTHER INDEX<sub>1</sub>  
 ‘He bothers me.’  
 \_\_\_\_\_<sub>t</sub>  
 c. SEE MOVIE,  ${}_{1}\text{AUX-1}_3$  CHAO-CHIEN-MIN NOT-ALLOW<sub>3</sub>  
 ‘I don’t allow Chao Chien-min to see movies.’

NS, which is related to TSL, also makes use of AUX-1 (Fischer 1996) although it seems from Fischer’s description of this element that its movement path looks somewhat different from that of the TSL sign. The order of the NS auxiliary with respect to the verb is not fixed; in contrast to TSL, however, the preferred position for AUX-1 is the postverbal position (11a). Fischer also stresses the fact that in NS, the auxiliary can never co-occur with a main verb that shows overt agreement, as is illustrated by the ungrammaticality of (11b) (Fischer 1996: 107).

- (11) a. CHILD<sub>3a</sub> TEACHER<sub>3b</sub> LIKE  ${}_{3a}\text{AUX-1}_{3b}$  [NS]  
 ‘The child likes the teacher.’  
 b. \* MOTHER FATHER  ${}_{3a}\text{HIT}_{3b}$   ${}_{3a}\text{AUX-1}_{3b}$

The LSA auxiliary described in Massone and Curiel (2004) has similar articulatory characteristics: a smooth hold followed by a curved movement ending in a smooth hold. The auxiliary almost always appears in sentence-final position (12a). Note that the verb SEND-LETTER is usually an agreement verb; in (12a), however, it appears in an uninflected form (just as BOTHER in (10b) above). Interestingly, like in TSL, AUX may also co-occur with main verbs that show agreement, such as SAY in (12b) which agrees with its object (Massone and Curiel 2004: 77).

- (12) a. BOB INDEX<sub>1</sub> SEND-LETTER  ${}_{3}\text{AUX}_1$  [LSA]  
 ‘Bob sends me a letter.’  
 \_\_\_\_\_<sub>wh</sub>  
 b. INDEX<sub>2</sub> SAY<sub>3</sub>  ${}_{2}\text{AUX}_3$  WHAT  
 ‘What did you tell her?’

Similarly, for IPSL, Zeshan (2000) points out that double marking of agreement on the main verb and the auxiliary is not at all uncommon. While in combination with a plain verb, the auxiliary always appears in

sentence-final position, in combination with an agreeing verb, the order of auxiliary and main verb is more flexible. In (13a), for instance, the auxiliary occupies the sentence-initial position (Zeshan 2003: 174). Furthermore, the auxiliary has a two-handed reciprocal form in which both hands move repeatedly between the two agreement loci in order to express that two referents are simultaneously involved in an action, as in (13b) (Zeshan 2000: 136).

- (13) a.  ${}_3\text{AUX}_1$  ALL COMPLETE  ${}_3\text{TEACH}_1$  [IPSL]  
 ‘He taught me everything completely.’  
 b. SINGAPORE ENGLAND COMPETITION HOCKEY  ${}_{3a}\text{AUX}_{3b}\text{-rec(2H)}$   
 ‘Singapore and England are playing hockey against each other.’

Other sign languages that make use of agreement auxiliaries developed from pronouns are LSC (Quer and Frigola 2006) and GSL (Sapountzaki 2005). To the best of our knowledge, a similar phenomenon is not attested in spoken languages, that is, a process in which two pronouns combine and form one prosodic word that functions as an auxiliary expressing agreement with the subject and object. However, both phenomena (that is, concatenated pronouns and pronouns used as auxiliaries) are attested in isolation.<sup>6</sup> Concatenated pronouns are attested, for example, in the Austronesian creole language Bislama (Crowley 2004). In this language, the plural pronouns are concatenations of singular pronouns, numerals, and/or the noun *fala* (‘fellow’). The first person inclusive pronoun *yumi*, for instance, is a transparent combination of two singular pronouns, namely *yu* (‘you’) and *mi* (‘me’).

The development of personal and demonstrative pronouns into copulas, on the other hand, has been described for Modern Hebrew. In the example in (14a), for instance, the item *hi* can be interpreted alternatively as a third person pronoun or as a copula (Glinert 1989: 188, cited in Diessel 1999: 144). Depending on the interpretation, the initial DP is either the subject of a copular clause or the topic of a topic-comment construction.<sup>7</sup>

The Demonstrative-to-Copula chain is also attested in a number of pidgin and creole languages. In Sranan, an English-based creole, the element *da* which is derived from English *that* can function as a demonstrative or definite article but also as an equative copula; both these uses are illustrated in (14b) (Arends 1986: 107).

- (14) a. *hevrat bóing hi taagid anaki* [Hebrew]  
 company.F.SG Boeing is/she corporation.F.SG giant  
 ‘The Boeing company is a giant corporation.’
- b. *da somma da wan boen somma* [Sranan]  
 that person is a good person  
 ‘That’s a good person.’

According to Heine and Kuteva (2002b), the fact that demonstratives may also develop into personal pronouns suggests that we may be dealing with a more extensive grammaticalization chain here, namely demonstrative > personal pronoun > copula.<sup>8</sup>

This leaves us with the question of how the above sign language auxiliaries came into being. For Sranan, Arends (1986) points out that the use of *da* as an equative copula standing between subject and predicate was derived from topicalization structures in which *da* functioned as a resumptive pronoun. Although similar reasoning might account for at least some of the above examples, the development of SOA auxiliaries from pronouns appears to be modality-specific since it is related to the specific spatial properties of pronouns and agreement in sign languages.<sup>9</sup> Pronouns are an optimal source for the development of agreement auxiliaries because they share all relevant spatial properties with verbal agreement. Moreover, as opposed to agreement verbs, plain verbs are frequently used in combination with pronouns to overtly realize the grammatical functions subject and object. Therefore, constructions containing two pronouns and a plain verb may give rise to the emergence of agreement auxiliaries in sign languages.<sup>10</sup>

### 3.4. From verb to auxiliary

In the previous section, we discussed auxiliaries that have developed from pronouns and we pointed out that this grammaticalization chain, while being very uncommon in spoken languages, is quite productive in sign languages. In this section, we focus on a different class of sign language auxiliaries. These auxiliaries have the same function – they are also mainly used to express agreement – but they belong to a different grammaticalization chain, namely the Verb-to-Aux chain, which, as we have seen, is also frequently attested in spoken languages. Like the

Pronoun-to-Aux chain, the Verb-to-Aux chain is very productive in sign languages. We discuss data from four sign languages.

3.4.1. Sign Language of the Netherlands (NGT)

In Sign Language of the Netherlands (*Nederlandse Gebarentaal*: NGT), an auxiliary which is grammaticalized from the spatial verb GO-TO is regularly used with plain verbs and adjectival predicates. Just as in the examples discussed in the previous section, its use is constrained to human arguments. The lexical source of this auxiliary expresses a change of location and already contains a directional movement (15a). Bos (1994), however, observes two phonological changes: while the verb sign GO-TO has a lax movement, the movement of the auxiliary – which following Bos we gloss as ACT-ON – is somewhat shorter and tense. Moreover, the auxiliary always follows the lexical verb and obligatorily combines with the Dutch mouthing /op/ ('on'); cf. Figure 2a. Interestingly, while in spoken Dutch, the preposition /op/ is commonly used for marking the patient argument of adjectives of emotional states (such as *boos op* 'angry at' and *trots op* 'proud of'), it is never used to mark the patient argument of a verb such as *houden van* ('to love'). Still, in NGT the auxiliary is not only used with adjectives, but also with plain verbs like LOVE, which cannot be modulated to show agreement, cf. example (15b).

- (15) a. SCHOOL INDEX<sub>3</sub> BOY GO-TO<sub>3</sub> [NGT]  
 'The boy is going to school.'  
 \_\_\_\_\_ top \_\_\_\_\_ /op/  
 b. INDEX<sub>1</sub> PARTNER INDEX<sub>3a</sub> LOVE 3aACT-ON<sub>1</sub>  
 'My boyfriend loves me.'

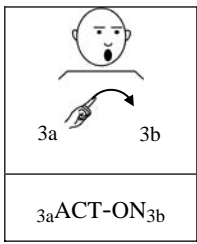


Figure 2. Aux in NGT

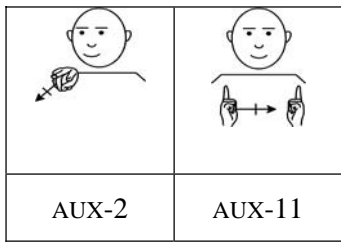


Figure 3. Auxiliaries in TSL

Just like many agreement verbs, ACT-ON expresses subject and object agreement by means of path movement and orientation of the fingertip (Bos 1994: 39). In contrast to the auxiliaries discussed in Section 3.3, the orientation of the fingertip does not change during the movement, it is towards the object throughout.

Interestingly, in NGT, aspectual inflection always shows up on the main verb, even in the presence of the auxiliary ACT-ON. In (16a) this is shown for the habitual which is realized by slow reduplication of the verb stem (indicated by ‘++’ in the example). It is not possible to aspectually modify the auxiliary. Reduplication of ACT-ON is, however, observed in reciprocal constructions; in this case, we are dealing with sequential backward reduplication (Pfau and Steinbach 2005), that is, only the dominant hand moves in a sequence from the signer towards the addressee and then back to the signer (16b). This contrasts with the auxiliaries in TSL and IPSL discussed in the previous section since these auxiliaries permit simultaneous reduplication of both hands in reciprocal constructions.<sup>11</sup> Finally, in NGT, double agreement is possible, although it is not very common (16c).

- (16) a. ALWAYS INDEX<sub>1</sub> WAIT++ <sub>1</sub>ACT-ON<sub>2</sub> [NGT]  
 ‘I always (have to) wait for you.’  
 b. WE-TWO TRUST <sub>1</sub>ACT-ON<sub>2</sub>-rec(1H)  
 ‘We(dual) trust each other.’  
 c. INDEX<sub>3</sub> <sub>3</sub>TEASE<sub>1</sub> <sub>3</sub>ACT-ON<sub>1</sub>  
 ‘He teases me.’

Referring back to the event schemas which – according to Heine (1993) – underlie the grammaticalization of auxiliaries, it is clear that the NGT auxiliary ACT-ON can be subsumed under the Motion Schema, in that it is grammaticalized from a verb expressing motion (cf. (4b) in Section 2).

### 3.4.2. Taiwanese Sign Language (TSL)

Besides the frequently used TSL auxiliary AUX-1 discussed in Section 3.3 (examples (9) and (10)), Smith (1990) describes two further auxiliaries which – in contrast to AUX-1 – are grammaticalized from verbs. The first one of these (AUX-2) is similar in form to the sign SEE: it is signed with a bent V-hand, the fingertips facing the object locus and the back of the hand



facing the subject locus. Similarly, the third auxiliary (AUX-11) is derived from the verb MEET. This is a two-handed sign in which both hands have a 1-handshape and the dominant hand approaches the non-dominant hand in neutral signing space (cf. Figure 3 above). Both auxiliaries are clearly void of the semantic content of the respective source verbs and both always appear in combination with some lexical verb. AUX-2 and AUX-11 pattern with AUX-1 with respect to syntactic positioning: they either appear in clause-initial position (17a) or they immediately precede the main verb (17b) (Smith 1990: 219ff). Note that (17b) is interesting in that the auxiliary agrees with a non-human argument.

- (17) a.  ${}_1$ AUX-2 $_3$  INDEX $_1$  UNFAMILIAR [TSL]  
 ‘I don’t know him.’  
 \_\_\_\_\_  
 top  
 b. THAT VEGETABLE, INDEX $_1$   ${}_1$ AUX-11 $_3$  NOT-LIKE  
 ‘I don’t like that dish.’

As in NGT, the TSL auxiliaries cannot inflect for aspectual information but, as has been observed for AUX-1 above, there are reciprocal forms of the auxiliaries, both of which are two-handed. In the reciprocal form of AUX-2 in (18a), however, the two V-hands do not exchange locations (as is true for AUX-1 in (10a) above); rather, the tips of the two V-hands meet at a location halfway between positions 3a and 3b. Actually, the reciprocal of AUX-2 is identical to the reciprocal form of the lexical verb SEE. At least for AUX-11, Smith (1990: 222) gives an example in which the auxiliary occurs with a main verb that shows object agreement (18b). Moreover, in (18b), a TSL gender marking handshape finds use. When signing the auxiliary, the 1-handshape on the non-dominant hand is replaced by the I-handshape (pinky extended) which represents a referent of female gender. Similarly, in the verb TEACH, which usually has an A-handshape on the non-dominant hand, this is replaced by the I-handshape.

- (18) a.  ${}_{3a}$ AUX-2 $_{3b}$ -**recip** REMEMBER(dual) [TSL]  
 ‘They remember each other.’  
 b.  ${}_{3a}$ AUX-11 $_{3b}$ -[fem] TEACH $_{3b}$ -[fem]  
 ‘He/she teaches her.’

Just as the NGT auxiliary ACT-ON, the grammaticalization of the TSL auxiliary AUX-11 can be seen as an instantiation of the Motion Schema

since it involves the conceptual form “X moves to Y”, although the verb “to meet” is not mentioned by Heine (1993) in this context.

In contrast, the integration of the TSL auxiliary AUX-2 into the event schemas Heine proposes is less straightforward. Heine points out, however, that alternative schemas may yet have to be identified, for example, “a proposition involving mental process or utterance verbs such as “think”, “say”, etc.” (Heine 1993: 35). In Tonga, a Bantu language spoken in Zambia, for instance, the verb *yeeya* (‘to think’) has developed into an auxiliary marking future tense (19) (Collins 1962, cited in Heine 1993: 35).

- (19) *Joni u-yeeya ku-fwa* [Tonga]  
 John 3.SG-think INF-die  
 ‘John is about to die (or: John will die).’

We propose to analyze AUX-2 which is grammaticalized from the TSL verb SEE as an instantiation of this alternative and less common event schema.

### 3.4.3. Greek Sign Language (GSL) and Catalan Sign Language (LSC)

Yet another lexical verb has been the source for an auxiliary that is described for GSL by Sapountzaki (2005: 131f). In GSL, the verb GIVE can be used as an agreement auxiliary GIVE-AUX in certain contexts.

- (20) a. INDEX<sub>2</sub> <sub>2</sub>GIVE-AUX<sub>3</sub> BURDEN END [GSL]  
 ‘Stop being a trouble/nuisance to him/her!’  
 b. INDEX<sub>1</sub> SEA ALL-IN-FRONT-OF-ME SIT SUN SUN-SETS, WHAT?  
<sub>3</sub>GIVE-AUX<sub>1</sub> (gesture “oh, how nice!”) BE-CALM, BE-HAPPY  
 ‘When I sit in front of the sea and the sun sets, what is it like?  
 It makes me calm and happy.’

As far as the manual part is concerned, the auxiliary GIVE-AUX is identical to the one-handed main verb GIVE. However, Sapountzaki (2005) reports two differences between the main verb GIVE and the corresponding auxiliary GIVE-AUX. First, signers seem to avoid mouthing with the auxiliary but not with the main verb. Second, the agreement properties of GIVE-AUX seem to be more restricted than those of GIVE. Unlike the main verb, the auxiliary is mainly used with first person object agreement as in

example (20b) above. Nevertheless, second and third person object agreement is not excluded in principle as example (20a) illustrates.

Interestingly, the GSL auxiliary does not only differ morphosyntactically but also semantically from other sign language auxiliaries. In the previous sections, we saw that the auxiliaries in NGT and TSL are mainly used to express agreement. By contrast, the GSL auxiliary GIVE-AUX does not only express agreement but also causativity in that it functions as a marker of a causative change of state. Moreover, it can only be used with intransitive and transitive psych-verbs, that is, it adds a causative meaning to a non-causative psych-verb. The basic meaning of the sequence  ${}_x\text{GIVE-AUX}_y - \text{VERB}$  is ‘x causes in y a specific psychological state described by V’, as is illustrated by the examples in (20) above.<sup>12</sup> Hence, unlike other sign language auxiliaries, GIVE-AUX is not a genuine agreement marker but a causative auxiliary, that is, it has more semantic content than its counterparts in NGT and TSL. Consequently, aspectual reduplication of the GSL auxiliary is possible. Double agreement, on the other hand, is prohibited in GSL. GIVE-AUX cannot be used with agreeing psych-verbs. The GSL causative auxiliary GIVE-AUX thus differs from the NGT and TSL auxiliaries discussed in the previous sections w.r.t. the following morphosyntactic and semantic characteristics: it has restricted agreement properties, it can only be used with non-causative psych-verbs, it cannot express double agreement, and it permits aspectual reduplication.

A similar auxiliary has recently been described for LSC (Quer and Frigola 2006). As in GSL, this auxiliary is grammaticalized from the lexical verb GIVE and combines exclusively with psychological predicates in order to express a causative result. In contrast to its GSL counterpart, the LSC auxiliary combines with the mouthing /da/ which is not present in the lexical verb; therefore, Quer and Frigola (2006) gloss the auxiliary as AUX-DA. AUX-DA tends to occur with an agreeing 1<sup>st</sup> person argument, and it excludes agreement between 3<sup>rd</sup> person subject and object. It precedes the psychological predicate and it is capable of taking inanimate subject arguments, as illustrated in (21).<sup>13</sup>

- (21) EXAM  $\overset{\text{/da/}}{\text{3AUX-DA1}}$  NERVOUS [LSC]  
 ‘The exam makes me nervous.’

Note finally that the development of a causative marker from the verbal source ‘give’ is also attested in spoken languages, where the causative

marker can be a complementizer, an auxiliary, or an affix. Thai, for example, derived a causative complementizer from this source (cf. Matisoff 1991). A causative auxiliary is attested in Luo, a Nilotic language spoken in Kenya and Tanzania (Stafford 1967: 72), as illustrated in (22).

- (22) *Koth no-miyo wa-bedo e tiend yath* [Luo]  
 rain 3-give 1.PL-stay at foot tree  
 ‘The rain made us stay at the foot of the tree’

Interestingly, the Luo auxiliary *miyo* in (22) and the GSL and LSC auxiliaries in (20) and (21) all developed from the same ditransitive source schema, namely ‘X gives Y to Z’.

### 3.5. From noun to auxiliary

In contrast to the sign languages discussed in the preceding section, in DGS, the source for the auxiliary is not a verb but rather the noun PERSON. This sign is realized with a babyC-handshape (index and thumb forming a C) with a downward movement at the lateral side of the signing space, as shown in Figure 4.

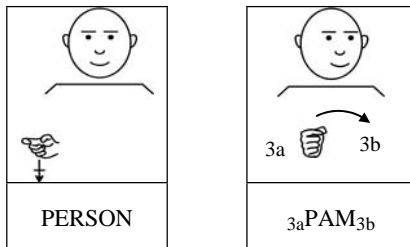


Figure 4. From noun to auxiliary in DGS

Example (23a) illustrates the nominal use of this sign. In contrast to the lexical sources of the NGT, TSL, and GSL auxiliaries discussed in Section 3.4, the noun PERSON in DGS does not exhibit a directional movement. Still, it has developed into an agreement auxiliary which expresses the agreement relation in very much the same way as the before-mentioned auxiliaries, that is, by path movement from subject locus towards object locus and orientation of the fingertips towards object locus. Following Rathmann (2000), we gloss the DGS auxiliary as PAM (Person Agreement

Marker). In (23b), for instance, PAM combines with the plain verb LIKE (cf. also example (10) above) and agreement is realized on PAM by moving from location 3a to 3b (as is illustrated in Figure 4). Moreover, PAM can be used to express agreement in sentences containing adjectival predicates (23c).

- (23) a.  $\frac{\text{top}}{\text{CONFERENCE, MANY PERSON BE-PRESENT}} \frac{\text{/shh/}}{\text{[DGS]}}$   
 ‘There were many persons/people present at the conference.’  
 b. MOTHER INDEX<sub>3a</sub> NEIGHBOR NEW INDEX<sub>3b</sub> LIKE  $\frac{\text{3aPAM3b}}$   
 ‘(My) mother likes the new neighbor.’  
 c. INDEX<sub>1</sub> POSS<sub>1</sub> BROTHER INDEX<sub>3a</sub> PROUD  $\frac{\text{1PAM3a}}$   
 ‘I am proud of my brother.’

It has been noted that, just like the NGT auxiliary, PAM is accompanied by a mouthing, namely /auf/ (‘on’). This preposition is hardly ever used with verbs in spoken German; it only combines with some adjectival predicates. While Keller (1998: 489) points out that the auxiliary is always accompanied by the mouthing, Rathmann (2000: 5) writes that it “may be accompanied by the mouthing ‘auf’”. According to more recent observations (at least in the Frankfurt/Main area), however, the mouthing seems to disappear. We take this to be a further indication of the generalized grammaticalized use of this element.<sup>14</sup>

As in NGT and TSL, the DGS auxiliary cannot inflect for aspect and it also finds use in reciprocal constructions. Pfau and Steinbach (2003, 2005) show that with agreeing verbs, reciprocity can be realized on the verbs themselves by means of backwards reduplication; that is, the movement path (or orientation) of the verb sign is reversed, either sequentially (with two-handed agreement verbs) or simultaneously (with one-handed agreement verbs). This strategy, however, is not available for plain verbs. Depending on the sign language variant, plain verbs derive their reciprocal form either by zero marking or by insertion of PAM which can then take over the backwards reduplication. In (24a), the dual inclusive pronoun WE-TWO oscillates between the signer and the addressee and the auxiliary moves from the signer towards the addressee and then back to the signer. Note that two facts speak against analyzing PAM as a reciprocal pronoun in such constructions: first, PAM retains its agreement properties in the reciprocal construction, and secondly, PAM does not occupy the canonical pre-verbal object position.<sup>15</sup>

- (24) a. WE-TWO HATE  $_1$ PAM $_2$ -rec(1H) [DGS]  
 ‘We(dual) hate each other.’
- b. INDEX $_1$  SON INDEX $_{3a}$  PROBLEM  $_1$ EXPLAIN $_{3a}$   $_1$ PAM $_{3b}$   
 ‘I explain the problem to my son.’
- c. INDEX $_1$  POSS $_1$  BROTHER INDEX $_{3a}$  PROUD $^1$ PAM $_{3a}$                     /ʃtolts/  
 ‘I am proud of my brother.’

The example in (24b) illustrates that PAM can also combine with agreeing verbs; in this example, both the main verb and PAM agree with the subject and the object. The DGS double agreement cases will be subject to further discussion in Section 4.2.

Note finally that frequently, PAM cliticizes to a lexical host, as is illustrated in (24c). In this case, a number of intriguing assimilation phenomena occur. First, there is only one continuous movement contour from the nose (location of PROUD) towards location 3a in neutral signing space; in other words: the auxiliary loses its own syllabicity. Second, we observe optional regressive handshape assimilation: the babyC-handshape of PAM spreads onto PROUD (which has a bent 1-handshape in citation form). Third, the mouthing associated with the adjectival predicate extends over PAM. Consequently, the lexical sign and PAM clearly form one prosodic word (Sandler 1999).<sup>16</sup> Based on the well-known observation that clitics often develop further into affixes, we speculate that PAM is on its way to become an affix.

LSC, too, has an agreement auxiliary derived from the lexical noun PERSON (Quer and Frigola 2006). For this auxiliary, agreement is restricted for the subject slot to 1<sup>st</sup> and 2<sup>nd</sup> person, which excludes agreement with nonhuman arguments. As in DGS, this auxiliary does not inflect for aspect. In contrast to DGS, however, there is no reciprocal form available.

Obviously, the auxiliaries derived from the noun PERSON do not fit into any of the event schemas proposed by Heine (1993), since all of these schemas concern the grammaticalization of auxiliaries from verbs. In fact, cross-linguistically, the N-to-Aux chain attested in DGS and LSC is highly unusual if not non-existent. Heine (1993: 76ff) mentions alternative chains for the grammaticalization of auxiliaries, namely the Adposition-to-Aux chain and the Adverb-to-Aux chain, both of which are rarely encountered in the languages of the world. The N-to-Aux chain, however, is not mentioned in his comprehensive study. Similarly, Kuteva (2001: 22) states

that “all lexical sources for auxiliary verb constructions involve verb meanings which are relatively concrete and basic to human experience”.<sup>17</sup>

In the light of this cross-linguistic generalization, we take the N-to-Aux chain attested in DGS and LSC to constitute a highly remarkable pattern. Nevertheless, the N-to-Aux chain in these two sign languages perfectly accounts for the development of SOA markers since the source noun PERSON has two properties that are highly relevant for agreement in sign languages. First, it has all phonological properties necessary to express agreement. The sign PERSON is signed in the neutral signing space with a simple downward movement, that is, the beginning and the endpoint of the path movement of PERSON are not explicitly lexically specified. Consequently, a directional movement can easily be substituted for the downward path movement to express agreement. Besides, its orientation and handshape features are ideal for agreement marking. Second, it also has all relevant semantic properties. Like verbal agreement, the sign PERSON is semantically specified as [+human]. Moreover, as opposed to signs such as CHILD, WOMAN, or MAN, which are also specified as [+human], PERSON has no additional semantic specification.

### 3.6. Agreement auxiliaries in spoken languages

Recall that most sign languages use SOA auxiliaries in order to express agreement. In this respect, sign languages differ from spoken languages. Although spoken language auxiliaries normally also express agreement, they are not genuine agreement markers. Rather, spoken language auxiliaries basically function as markers for tense, aspect, and modality and they only inflect for agreement because of syntactic reasons. Usually, it is the auxiliary that is the first and hence inflected element in a verbal complex containing more than one verbal element. By contrast, almost all SOA auxiliaries discussed above developed as genuine agreement markers. They are mainly used to express agreement with so called plain verbs, that is, with verbs that do not have the ability to inflect for subject and object agreement.

Genuine agreement auxiliaries are rare or even nonexistent in spoken languages. Possibly, the German auxiliary *tun* (‘to do’) in (25), which is frequently used in Colloquial German and in most German dialects, is an exception to this generalization. *Tun* is not a TAM marker and its use seems to be functionally very similar to SOA auxiliaries in sign languages

(see Eroms (1998) and Erb (2001) for a more detailed discussion of the syntactic and semantic properties of *tun*).

- (25) a. *Sie tu-t ein Buch les-en* [Colloquial German]  
 She do-3.SG a book read-INF  
 ‘She is reading a book’
- b. *Sie lies-t ein Buch* [Standard German]  
 She read-3.SG a book  
 ‘She is reading a book’

As opposed to *do*-insertion in English, *tun*-insertion in German is always optional and it is not restricted to specific syntactic and semantic contexts. *Tun* can be used in main and in embedded clauses and it has no specific syntactic function at all. Moreover, it is not associated with specific semantic features. It can, however, only occur as a finite auxiliary and usually it is not combined with auxiliaries and high-frequency verbs. Hence, *tun* is some kind of dummy auxiliary that is only used to express morphosyntactic features such as present and past tense and agreement.<sup>18</sup> These features exist independently in the sentence and they can always be optionally expressed by the main verb. The insertion of *tun* is not regulated by grammar but rather by style. Since German has many frequent irregular forms, *tun* is probably used to avoid inflection on the main verb.

Consequently, SOA auxiliaries in sign languages share some properties with the auxiliary *tun* in German. Like the German dummy auxiliary, the sign language auxiliaries are semantically empty and they are only used to express a morphosyntactic feature that can also be expressed by main verbs. However, as opposed to German, it is not the case that this feature could optionally be expressed on the main verb since in sign languages, only certain verbs can take agreement inflection. Therefore, the use of an agreement auxiliary in sign languages is not really optional. Rather, an auxiliary must be used in certain contexts if the speaker wants to express subject and object agreement. In other contexts, speakers usually prefer inflected main verbs.



## 3.7. Summary

In this section, we have discussed the grammaticalization and use of agreement auxiliaries in a number of sign languages. Our main findings are summarized in Table 1.

Table 1. Properties of agreement auxiliaries across sign languages

	n	source	aspectual marking	double agr?	reciprocal marking?	sentence position
<b>LSA</b>	1	pronouns	on verb	yes	yes (1H)	sf <sup>a</sup> > prv
		pronouns	on Aux	yes	yes (1H)	prv/sf <sup>ab</sup>
<b>LSC</b>	3	verb GIVE	on verb	??	??	prv
		noun PERSON	on verb	rare	no	sf <sup>a</sup>
<b>DGS</b>	1	noun PERSON	on verb	yes	yes (1H) <sup>c</sup>	sf <sup>a</sup>
<b>GSL</b>	2	pronouns	on verb	no	yes	sf <sup>a</sup>
		verb GIVE	on Aux	no	no	prv
<b>IPSL</b>	1	pronouns	on verb	yes	yes (2H)	sf <sup>a</sup> > si <sup>d</sup>
<b>NS</b>	1	pronouns	on verb	no	??	sf > prv/si
<b>NGT</b>	1	verb GO-TO	on verb	yes	yes (1H)	sf <sup>a</sup>
		pronouns	on verb	yes	yes (2H)	prv, si
<b>TSL</b>	3	verb SEE	on verb	yes	yes (2H)	prv, si
		verb MEET	on verb	yes	yes (2H)	prv, si

Abbreviations: LSA = Argentine SL, LSC = Catalan SL, DGS = German SL, GSL = Greek SL, IPSL = Indopakistani SL, NS = Japanese SL, NGT = SL of the Netherlands, TSL = Taiwanese SL; si = sentence-initial, sf = sentence-final, prv = immediately pre-verbal, 1H = one-handed, 2H = two-handed, > means “more frequent than”.

<sup>a</sup> Some signs, such as wh-signs, manual negation, or aspectual markers may follow Aux.

<sup>b</sup> Aux can either immediately precede or follow plain verbs, but immediately precedes agreeing verbs

<sup>c</sup> Aux is used in reciprocal constructions only in one variant of DGS; the other variant marks reciprocity with plain verb by means of zero marking (Pfau and Steinbach 2003).

<sup>d</sup> Zeshan (2003: 172) points out that IPSL Aux may also appear on both sides of the predicate, i.e. it may be doubled.

It turns out that there are three types of lexical sources for the agreement auxiliaries in sign languages: pronouns, nouns, and verbs. Only the latter source is also frequently found in spoken languages. Grammaticalization of agreement auxiliaries in sign languages thus proceeds from different sources than grammaticalization of auxiliaries in spoken languages. First, the Verb-to-Aux chain is less important in sign languages. This seems to be related to the special morphophonological properties of agreement in sign languages. As opposed to agreement in spoken languages, agreement in sign languages is a spatial concept that crucially depends on phonological properties of a verb or auxiliary and on semantic properties of the arguments. Consequently, phonological and semantic properties of a sign may be more important for the development of agreement markers than event schemas and grammatical category. Still, within the Verb-to-Aux cases, the same event schemas as in spoken languages form the conceptual basis for grammaticalization. Secondly, in contrast to spoken languages, personal pronouns and the noun PERSON are both convenient sources for the development of agreement markers in sign languages because they are endowed with all phonological and semantic properties relevant for the expression of agreement.

#### **4. On double and split inflection**

So far we have seen that many sign languages make use of auxiliaries and that at least some of these auxiliaries are grammaticalized forms of lexical elements. What is striking about the sign language auxiliaries – and what differentiates them from auxiliaries in spoken languages – is the fact that they are not used throughout in order to take over inflectional morphology; rather they are used predominantly with only a subset of verbs, the so-called plain verbs. At various points in the discussion, however, we have already pointed out that this is not the whole story, since at least in some sign languages, the auxiliary may also be used in combination with agreeing verbs. Moreover, and in contrast to the patterns commonly found across spoken languages, aspectual inflection appears on the main verb, not on the auxiliary.

In this section, we will first show that similar inflectional patterns – that is, double and split inflection in auxiliary verb constructions – are also found in spoken languages. We are then going to speculate that, at least in DGS, the double marking pattern constitutes a further development on the

grammaticalization path, namely a development from auxiliary towards marker of emphasis.

#### 4.1. Double and split inflection in spoken languages

It has been observed that in the languages of the world, inflection in auxiliary verb constructions comes in several distinct patterns as far as the locus of the inflection is concerned. The most common pattern is certainly the one where all the inflections (TAM-marking, agreement, negation, etc.) appear on the auxiliary whereas the lexical verb appears in an unmarked participial or infinitival form. As pointed out above, in the sign languages under discussion, the major function of the auxiliary is to spell-out agreement features whenever agreement cannot be expressed on the (plain) main verb. The fact that occasionally, a sign language auxiliary combines with an inflected agreeing verb therefore comes as a surprise. As has been shown, such constructions are attested in at least TSL, LSA, IPSL, NGT, and DGS. In fact, only for NS and for GSL, it has been explicitly argued that double marking is ungrammatical.

It is worth pointing out, however, that a similar pattern – double inflection in an auxiliary verb construction – is also observed in some spoken languages (Anderson 2000). That is, there are spoken languages in which both the auxiliary and the lexical verb inflect for the same categories. This pattern is exemplified by the data from Limbu, a Tibeto-Burman language spoken in Nepal, in (26). Limbu makes use of a number of aspectual auxiliaries. In these cases, subject and object agreement as well as tense marking (a portmanteau morpheme in (26b)) appear on both the lexical verb and the auxiliary which expresses completive aspect in (26a) and resultative aspect in (26b) (A = agent, P = patient, S = subject, NPT = non-preterit (van Driem 1987: 119, 124)).

- (26) a. *yaŋ te:s-u-ŋ sur-u-ŋ* [Limbu]  
 money spend-3.PL-1.SG.A COMPL-3-1.PT  
 ‘I’ve spent all the money.’
- b. *siʔ-ε kheʔ-ε laʔba*  
 die-1.SG.P.S/NPT RES-1.SG.P.S/NPT probably  
 ‘I’ll probably be dead (by that time).’

Above, we have also seen that – again in contrast to many spoken languages – not all of the inflectional categories appear on the auxiliary. In particular, aspectual inflection stays with the main verb. In other words, the inflectional categories are split between the auxiliary and the lexical verb. Again, similar split phenomena are attested in some spoken languages. The Siberian language Evenki, for instance, makes use of the negative auxiliary *e-* in negative contexts. Agreement and tense suffixes (as well as some aspectual suffixes) attach to the auxiliary while other inflectional markers, such as valence, voice, aspect, and modality markers appear on the lexical verb. In (27), two examples are given: in (27a), the causative suffix *-v* appears on the verb, in (27b), the durative suffix *-t* as well as the reciprocal suffix *-met* (Nedyalkov 1994: 11ff; FFNLV = fixed form of the lexical verb).

- (27) a. *Nujan nekun-mi e-che-n* [Evenki]  
 he younger.brother-REL.POSS NEG-PAST-3.SG  
*suru-v-re*  
 go.away-CAUS-PART  
 ‘He did not lead away his younger brother.’
- b. *E-kellu iche-t-met-te*  
 NEG-2.PL.IMPER see-DUR-REC-FFNLV  
 ‘Don’t look at each other.’

Finally, Anderson (2000) also mentions the existence of split/doubled patterns where one category is split-marked and one is double-marked. Actually, this pattern comes close to what we find in some of the sign languages under discussion where agreement is doubly marked on the lexical verb and the auxiliary while aspectual inflection only appears on the main verb (see (29) below for an example).

#### 4.2. From auxiliary to marker of emphasis

Based on the preceding discussion, we want to take one further, admittedly somewhat more speculative, step. It has been observed that in some languages, auxiliaries may also fulfil the function of emphasizing the action described by the main verb. In English, for instance, the emphatic function of the auxiliary *do* can be illustrated by a sentence pair such as *He came* versus *He did come* (with stress on the auxiliary).

According to Seiler (1985), a similar phenomenon is found in Imonda, a Waris language of New Guinea. Imonda has a transitive lexical verb *fe* meaning ‘to make, to do’, as in (28a). However, *fe* may also be used as an existential verb, as a marker of future tense, and – most important in the present context – it may be added for the sake of emphasis, as is illustrated in (28b) (Seiler 1985: 112ff).

- (28) a. *bēsèi adeia fe-f* [Imonda]  
 what work do-PRES  
 ‘What are you doing?’  
 b. *pon ka-m ha fe-f*  
 hunger 1.SG-GOAL affect do-PRES  
 ‘I am hungry.’

We speculate that the DGS auxiliary PAM is presently undergoing a similar development: the SOA auxiliary (which itself is the result of grammaticalization; cf. Section 3.5) develops further into a marker of emphasis when used in combination with agreement verbs, as can be seen in (29). Recall from Section 3.5 that the auxiliary PAM basically functions as an agreement marker. With agreement verbs, PAM insertion is superfluous, since these verbs, unlike plain verbs and adjectival predicates, are capable to express agreement by themselves. Accordingly, PAM insertion, just like *do*-insertion in positive declaratives and the use of *fe* in (28b), gives rise to a marked structure that triggers an emphatic interpretation, which may be analyzed as a M-implicature (cf. Levinson 2000). A speaker, who is annoyed by the stubbornness of a third person, may sign (29) in order to emphasize the fact that s/he explained something to this person over and over again,

- (29) But I already told you that ... [DGS]  
 \_\_\_\_\_<sub>hs</sub>  
 INDEX<sub>1</sub> EXPLAIN<sub>3a++</sub> **1PAM**<sub>3a</sub>. INDEX<sub>3a</sub> UNDERSTAND  
 ‘I did explain it to him over and over again. He didn’t understand.’

Note, however, that in principle, emphasis can also be expressed in contexts in which PAM combines with a plain verb by imposing one or more of the following manual and non-manual alterations on the auxiliary: tense movement, pursed lips, and a sharp headnod.

## 5. Conclusion

In sign languages, just as in spoken languages, auxiliaries may be grammaticalized from lexical elements. The preceding discussion revolved around some general properties of (a group of) sign language auxiliaries as well as around some modality-independent and modality-specific aspects of their grammaticalization.

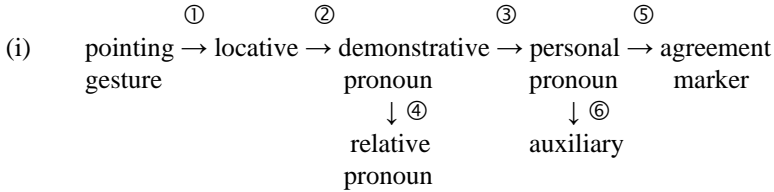
As far as the grammatical information encoded by the sign language auxiliaries is concerned, they crucially differ from the common spoken language auxiliaries: while the primary function of the latter is to encode tense, aspect, and modality (TAM), the former are used to express subject and object agreement (SOA) whenever the main verb is not capable of doing so. Of course, spoken language auxiliaries may also encode agreement, but this is not usually considered their primary function.

We have seen that sign language auxiliaries may be grammaticalized from various sources: from concatenated pronouns, verbs, and nouns. Again, this is in contrast to spoken languages, where verbs are the most common source for grammaticalization. Other sources have been identified, but concatenated pronouns and nouns are not amongst them. We have argued that this modality-specific grammaticalization pattern is grounded in the spatial properties of agreement in sign languages. Still, the sign language auxiliaries which are grammaticalized from verbs have developed on the basis of the same event schemas as the spoken language auxiliaries. Not surprisingly, these conceptually based schemas are modality-independent.

## Notes

1. We are very much indebted to the people who so patiently answered our questions with respect to auxiliaries in various sign languages: María Massone, Alejandro Makotrinsky, and Mónica Curiel (Argentine Sign Language), Santiago Frigola and Josep Quer (Catalan Sign Language), Andrea Kaiser, Jutta Warmers, and Elke Steinbach (German Sign Language), Galini Sapountzaki (Greek Sign Language), Ulrike Zeshan (Indopakistani Sign Language), Susan Fischer and Yutaka Osugi (Japanese Sign Language), Heleen Bos, Joni Oyserman, and Marijke Scheffener (Sign Language of the Netherlands). For further helpful comments, we wish to express our gratitude to Umberto Ansaldo, Bernd Heine, and Christa König.

2. See Janzen and Shaffer (2002) for a similar development in ASL.
3. Let us add a few remarks on methodology. For languages for which written records exist, the identification and comparison of earlier and later forms of structure is possible on the basis of these records and, consequently, patterns of change can be tracked down. This option, however, is not available for sign languages, which have no written form and therefore lack written records. Still, it is possible to make statements about the historical development of sign languages. One method commonly used under these circumstances is internal reconstruction (cf. Lehmann 1995; Ringe 2003). This method takes advantage of the fact that frequently, the lexical item that is the source of a particular grammaticalization process coexists with the grammaticalized form. Given that the lexical and the grammatical item are phonologically similar, given that grammaticalization is usually unidirectional, and given that we do know about common grammaticalization paths from the study of other languages, one may make inferences about grammaticalization processes in the sign languages under investigation on the basis of synchronic data, although we must, of course, keep in mind that it is always possible that some of the data are overinterpreted (for a detailed discussion see Pfau and Steinbach 2006).
4. The picture sketched here is very much simplified, but for space reasons, we cannot go into all the complexities that researchers have noted with respect to sign language agreement. To name just three important aspects: (a) In the second sentence in (8), agreement is realized by means of path movement from location 3a to location 1. Some verb signs, however, realize agreement by means of orientation of the palm or the fingertips towards a particular location or by means of a combination of movement and orientation (Mathur 2000). (b) The verb sign GIVE in (8) moves from the location associated with the subject towards the location associated with the object. In contrast to that, some verbs, the so-called “backwards verbs” (e.g. INVITE), move in the opposite direction, that is, from the object towards the subject locus (see Meir (2002) for a uniform analysis of agreement verbs). (c) Agreement on the verb licenses pro-drop of subject and object pronouns. Pro-drop, however, is also possible with plain verbs due to topic chaining (Lillo-Martin 1986; Bos 1993).
5. Note that not all sign languages make use of agreement auxiliaries. ASL and British Sign Language, for instance, do not have such elements.
6. Note however that the Pronoun-to-Aux chain, that is, the development of a single pronoun into an auxiliary seems to be very rare (Heine 1993).
7. See Li and Thompson (1977: 427ff) for arguments supporting the view that *hi* (or its masculine counterpart *hu*) functions as a copula in this context.
8. Similarly, in Pfau and Steinbach (2006), we argue for a more extensive grammaticalization chain for sign languages, namely the one given in (i).



Notably, only step ①, the one from co-speech pointing gesture to locative, and step ⑥, from concatenated personal pronouns to agreement auxiliary (as discussed in this section), are modality-specific. All the other grammaticalization phenomena in (i) are well-attested across spoken languages, too.

9. Torigoe (1994) analyzes the NS auxiliary as a smoothed out series of pronoun copies which are overt realizations of agreement. We refer the reader to Fischer (1996) for discussion of problems that such an analysis raises.
10. Note that this argumentation requires both pronouns to be adjacent to each other at some stage of the Pronoun-to-Aux chain. While this requirement is easily met in SOV-languages, SVO-languages have to reorder pronominal arguments. Another interesting issue for further research is the sentential position of pronominal agreement auxiliaries in the final stage of grammaticalization. The data above illustrate that some auxiliaries preferably occur left-adjacent to the main verb, while others occur right-adjacent (see also Table 1 in Section 3.7 below).
11. Sometimes, NGT also uses a two-handed form of ACT-ON in reciprocal constructions. However, in contrast to TSL and IPSL (cf. examples (10a) and (13b) above), in this case, too, NGT does not allow simultaneous, but only sequential, movement of both hands.
12. The class of verbs GIVE-AUX can be used with includes non-causative psych-verbs such as WORRY, FEEL-LEEPY, FEEL-NERVOUS, HAVE-A-HEADACHE, FEEL-BORED, THINK, or BE-INTERESTED.
13. Interestingly, in other sign languages, verbs like ‘give’ are also found in serial verb constructions. In NGT, for example, GIVE may combine with other transfer verbs, as in (i), GO-TO may be used with verbs of movement, and CALL is sometimes used with verbs of communication, as in (ii) (Bos 1996).

- |      |   |       |
|------|---|-------|
|      | <u>/be-/</u> <u>/ta-/</u> <u>/len/</u>                                    |       |
| (i)  | PLEASE INDEX <sub>1</sub> PAY INDEX <sub>1</sub> <b>GIVE</b> <sub>2</sub> | [NGT] |
|      | ‘Please, I want to pay you (for it).’                                     |       |
| (ii) | (INDEX <sub>2</sub> ) ASK <sub>2</sub> CALL <sub>1</sub>                  |       |
|      | ‘You asked me.’   |       |



14. Interestingly, the position of the DGS auxiliary appears to be subject to variation. While according to our informants, PAM always appears in sentence-final position, in Rathmann's examples, the auxiliary occupies the position between subject and object, as shown in (i) and (ii) from Rathmann (2000).

- (i) HANS<sub>3a</sub> 3aPAM<sub>3b</sub> MARIE<sub>3b</sub> LIKE [DGS]  
'Hans likes Marie.'
- (ii) HANS<sub>3a</sub> 3aPAM<sub>3b</sub> MARIE<sub>3b</sub> CAN ANGRY  
'Hans can get mad at Marie.'

15. Grammaticalization of a reflexive or reciprocal pronoun from a noun is, of course, a very common process in spoken languages. According to Heine (2000: 9), the most common nominal source for reflexive/reciprocal markers is the noun for 'body', as in (i) from the Chadic language Lele (Frajzyngier 2000: 188), but he also lists one instance where the noun for 'person' is the source for a reflexive marker (Maba, a Nilo-Saharan language spoken in Chad).

- (i) Ngù<sub>i</sub> gól-é kūsū-ngū<sub>i</sub> wàyán gà [Lele]  
2:PL see-NOM body-2:PL:POSS tomorrow Q  
'Will you see each other tomorrow?'

16. Moreover, in combination with symmetrical two-handed lexical signs (e.g. TRUST) we also observe what Sandler (1999: 193) calls "coalescence": both hands begin their movement together, but halfway through production of the host sign, the dominant hand signs PAM, while the non-dominant hand simultaneously completes the host sign.
17. Bernd Heine (personal communication) points out, that in spoken languages grammaticalization from noun to auxiliary might in principle proceed via a detour: nouns (e.g. the noun for 'person') commonly develop into third person pronouns which in turn may be the source for copula verbs (as has been shown in Section 3.3). This reasoning, however, cannot be applied to the sign language cases under discussion, since the noun PERSON has not developed into a pronoun.

According to Meir (2003), in Israeli Sign Language (ISL) the noun PERSON (which is phonologically similar to the DGS sign) has been the source for a case-marked pronoun. The properties of the pronominal sign she describes, however, are quite different from those of PAM.

18. Since *tun* cannot be combined with temporal auxiliaries, it can only express simple tense forms, that is, present tense and simple past. Besides, *tun* is often used to express subjunctive mood.

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# **The possible range of variation between sign languages: Universal Grammar, modality, and typological aspects**

*Annette Hohenberger*

## **1. Introduction**

It is an indisputable though frustrating everyday experience that languages differ from each other, usually up to complete unintelligibility. That this variability is the very nature of the human language faculty seems to be frankly denied by all those who think that at least for sign languages, there is just one universal sign language which is understood by all deaf signers around the globe. This myth is easily invalidated by empiricism and theory. As for empiricism, the many different sign languages of the world – a fraction of which is represented in this volume – are evidence that immense variability is also found in the visual-gestural language modality. As for theory, Chomsky's well-known statement that the human language faculty is "rich and diverse" (Chomsky 1965, 1981, 1986, 2001) embraces spoken languages as well as sign languages.

Languages vary, though not randomly. Some aspects are universally invariable (universal principles, in the sense of generative grammar), some vary in systematic ways within certain dimensions (parameters), some are even more open to variation and change (for example, the composition of the lexicon).

The issue of variability and invariability is closely connected to the issue of determinism and indeterminism. If languages were completely determined, their state could be predicted exactly, at any point in time. No variation would occur on their historical trajectory that could change their endpoint. If languages were completely indeterministic, their state could not be predicted at all, at no point in time. Random variation would constantly change their developmental trajectory (van Geert 1997). Neither complete invariability and determinism nor total variability and indeterminism characterize languages. Rather, languages are in a constant search for a dynamically stable state between both extremes.



Variability is also closely connected to time. Throughout this chapter, I will argue that time enhances variability through evolution and emergence of structure and therefore must be taken into account especially if the amount of variation between sign languages and spoken languages is evaluated.

The article is organized as follows: In Section 2, I will delimit the possible range of variation in natural languages, proceeding from very general considerations to more specific aspects (cognitive properties, task properties of language, universal grammar, typology, modality). In Section 3, I will report on a study comparing slips of the tongue in German, slips of the hand in German Sign Language (*Deutsche Gebärdensprache*, DGS), and slips of the hand in American Sign Language (ASL). I will evaluate the impact of modality on sign language production, especially how modality and typological constraints on the production interface limit variation in sign language production. In Section 4, I will point out in which domains (phonology, morphology, syntax, and the lexicon) sign languages do show cross-linguistic differences and which linguistic aspects are concerned. I will conclude that, once the domain of variation is properly delimited theoretically, sign language variation can be predicted and traced empirically in a more straightforward way. This is a desirable outcome since it will help integrate the other studies reported in this volume as well as guide the future search for cross-linguistic differences between sign languages.

## **2. Possible range of variation across languages**

In order to evaluate cross-linguistic variation between sign languages, it is necessary to first determine the possible range of variation across languages in general. What properties of the human mind in general and of the human language faculty in particular determine what variation can occur at all?

In the following, I will discuss five possible determinants of linguistic variation which either permit or limit variation: (i) general cognitive properties of representation and processing (Section 2.1.); (ii) general task properties (Section 2.2.); (iii) principles and parameters of Universal Grammar (Section 2.3.); (iv) typology (Section 2.4.); and (v) modality (Section 2.5.).

## 2.1. General cognitive properties

The human language faculty is one cognitive faculty among others, such as visual processing, number processing, action processing, theory of mind, etc. (Fodor 1983; Hauser et al. 2002; Jackendoff 1997, 2002). When adopting a modular view of the human mind, one has to bear in mind domain-general cognitive properties which cut across the specific domains and which are responsible for a common processing and/or representational style. Thus, the three major properties of language, namely its being *recursive*, *discrete*, and *compositional* (Hauser et al. 2002; Fodor and Pylyshyn 1988; van Gelder 1990; Bierwisch 2001), are inherited from properties of human thought. As Hurford (2004) argues, syntactic recursion derives from compositionality and recursion on the conceptual and semantic level. Human thinking is recursive, that is, we know “that things have parts that have subparts which have subparts” (Hurford 2004). According to Hurford, what makes humans unique is their evolved capacity to make use of arbitrary symbols, the combination of which adheres to the principles of recursion, discreteness, and compositionality. It may be argued that the human faculty of language came into existence when the brain's capacity for recursive calculation became coupled with the (newly) evolved capacity to use arbitrary symbols.

Apart from these purely formal properties of language and thought, there are general cognitive properties of representation and processing. Thus, Gestalt properties shape the representation and processing of events and objects in vision and in language in a similar fashion, for instance, in terms of *figure-ground* relations. Especially for sign languages it has been pointed out that word order mirrors this principle: mentioning of big immobile objects (as the ground) precedes mentioning of small mobile objects (as the figure). As for the representation of action/events, Goldin-Meadow (2003) argues that the focusing on the patient theta role and the end-state of actions/events is a “resilient” property of language which results in a universal preference for *ergative patterns*, as evidenced by the spontaneous emergence of gesture systems in deaf children with no proper language model. As for objects, Goldin-Meadow argues that humans are universally biased towards making *generic statements* about object categories in terms of natural kinds, based on essential, enduring, and timeless qualities (2003: 140f). Moreover, such generic statements are more frequent for animals than for artificial categories.

Finally, let me add to this non-exhaustive list of general cognitive properties of representation and processing the general parsing preference for right-attachment over central embedding. This preference has been explained with general limitations of the working memory which constrain any cognitive operation.

Hence, all natural languages are subject to general cognitive constraints on representation and processing. This, however, does not mean that they all conform to them in the same way or to the same extent. Differences in the amount of discreteness, styles of compositionality (van Gelder 1990), or the realization of Gestalt properties, may arise in interaction with the other properties to be discussed in the following.

## 2.2. General task properties of language

Language serves a specific task, namely to transfer one's own thoughts into the mind/brain of another person, and *vice versa*. As Elman et al. (1996: 390) put it, grammars solve the "problem of mapping non-linear thoughts onto a highly constrained linear channel". Goldin-Meadow (2003) argues that this task fosters a digital way of processing, specifically the two processes of *segmentation* and *combination*. These two processes operate in any language serving the full function of communication and they operate on both aspects of language, form (syntax) and meaning (semantics). Grammar brings together the two essential aspects of language, meaning and form, in a systematic way. As Bierwisch (2001: 301, footnote 4) puts it, the human language faculty has created a "highly complex interface system integrating two independently given, heteromorphic domains, namely meaning and form."

Recently, in the minimalist program (Chomsky 1995, 2000, 2001), the requirement of linearization has been emphasized which holds at the interface of Phonetic Form (PF). This processing requirement has to be met by syntactic representations. In minimalism, it is claimed that syntax has to deliver representations which are interpretable at the interfaces. In order to translate a syntactic phrase-marker into a linear string of linguistic units, syntactic representations have to be *hierarchical*, *binary-branching*, and *asymmetric* (Kayne 1994; di Sciullo 2003). According to Kayne's *Linear Correspondence Axiom* (LCA), hierarchy in the syntactic structure is translated into linearity of the syntactic string. Thus, if an element X is higher in the syntactic hierarchy than an element Y, X will precede Y in the

linear string. Linearization is a constraint on natural language processing in general since all languages are produced and perceived in time. However, spoken languages and sign languages differ with respect to linearity, the former showing a greater degree of linearity than the latter (see Section 2.4. for discussion).

To conclude, all natural languages are subject to general task properties of language. Again, this does not mean that they all conform to them in the same way or to the same extent. Note that the mapping of meaning onto form interacts with the properties of the sensory channels through which a particular language is processed. This taps into the modality issue. Despite their intimate interaction, both issues have to be kept apart. This paragraph deals only with the universal task property of mapping between meaning and form. The question of which meanings natural languages can convey and which form they have to take will be dealt with in the next section on Universal Grammar. The question of which role the processing channel plays in this context, will be dealt with in Section 2.5.

### 2.3. Universal grammar (UG)

According to generative grammar, UG consists of constraints on the possible format of human languages. In the *Principles-and-Parameters Theory* (e.g. Chomsky 1981, 1986; Atkinson 1992), there are *fixed principles* that hold for every language and *variable parameters* whose specification is language-specific. Thus, all languages have to obey the principle of “Full Interpretation” which requires that each element in a representation be interpretable at the language interfaces, namely Phonetic Form (PF) and Logical Form (LF). Languages, however, may vary with respect to the direction of government between the head and its complement in a phrase, to give just one example. In some languages, such as English, the head-parameter is set to “head-initial” which means that, for instance, the verb governs to the right, resulting in a VO-word order; in other languages, such as German or Japanese, the head-parameter is set to “head-final” which means that the verb governs to the left, resulting in an underlying OV-word order. Likewise, there are parameters in phonology and morphology which allow for cross-linguistic variation.

Let us take a closer look at Logical Form (LF) and the Conceptual-Intentional (C-I) interface at which language and thought meet. Both LF and the C-I interface are thought to be universal. Thus, “UG must grant the

possibility that what can be thought can be said” (Bierwisch 2001: 290). Katz (1972) speaks of “effability” in this respect, Searle (1969) of “expressibility”. The implication of this requirement is that “every conceptual distinction is, at least in principle, accessible in SF [Semantic Form, A.H.]” (Bierwisch 2001: 290). According to Bierwisch, Semantic Form covers the entire domain of intentional conceptualizations, that is, possible thoughts. There are no alternative semantic/conceptual systems, as there are alternative phonetic systems, to which we will turn now.

Whereas the Semantic Form (SF) of all languages is thought to be universal, their Phonetic Form (PF) can vary dramatically. The specific phonetic features which a particular language has in its repertoire of phonetic primitives may be quite distinct from that of another language. For instance, French, unlike German, has nasal vowels. Likewise for morphology and syntax, some languages have morphosyntactic features which others do not have. English, for instance, has an aspect morpheme on the verb (progressive *-ing*) while German does not have such a morpheme.

The variability in morphosyntactic and phonetic features can be understood in two ways (Bierwisch 2001: 287f). First, one might conceive of UG as defining a set of, for instance, phonetic features from which the languages of the world can choose. Second, one might conceive of UG as defining the constraints on the character of proper PF-elements (such as being discrete, being organized in syllables, etc.). According to the former view, UG defines the set of substantive phonetic primitives of a language; according to the latter, the primitives are fixed through the interaction of UG constraints with experience, that is, with the Primary Linguistic Data.

Sign languages are a crucial subset of natural languages in this respect. Bierwisch argues that a phonetic feature like [velar] cannot be universal since it is only available in spoken languages. UG “cannot fix the substance – i.e. the specific interpretation – of the primitive terms, but rather provides the conditions in terms of which an interpretation can be constructed” (Bierwisch 2001: 288), e.g., that motor patterns (vocal or manual gestures) be perceptually categorizable. In his view, it is unlikely that UG defines two separate sets of substantive primitives – one for spoken languages and one for sign languages. Rather, Bierwisch assumes that UG defines one set of conditions for interpretation which constrain the set of derived substantive primitives in both spoken and signed languages. This makes sense from a theoretical as well as a dynamical point of view. Theoretically, it is more parsimonious to have general constraints range over all natural languages irrespective of modality; dynamically, it is not

necessary to define different sets of primitives for the two subsets since they emerge by themselves when the UG constraints act upon the different PF-interfaces. For example, since lips can be made [ $\pm$  round] and this effectively produces two different vowels, this feature is eligible as a distinctive phonetic feature in spoken language phonology. Likewise for sign languages: since a finger can be [ $\pm$  extended] and this effectively produces two different handshapes, this feature is eligible as a distinctive phonetic feature in sign language phonology.

From these universal conditions, primitive elements are derived during the acquisition process. How these derived primitive elements are instantiated in the language is a secondary question which has to take into account modality and typology. The “mirror principle” (Baker 1985), for instance, which specifies that the order of morphemes of a verb is reversed in the syntactic phrase structure, seems to focus on concatenative morphology and seems to be unable to account for non-concatenative sign language morphemes on first sight. If, however, non-concatenative morphemes are conceived of as featural affixes, as in Akinlabi (1996) for spoken languages and in Pfau (2002, 2004) for sign languages, the same representation covers both modalities. Such a principled explanation is the objective of any universal theory of grammar despite very different implementations at the PF-interface.

The universalist perspective on language, and the generative perspective in particular, has repeatedly been challenged by authors who doubt that sign languages have (hierarchical) structure at all (Bouchard 1996; Bouchard and Dubuisson 1995). These authors argue that the seemingly flexible word order in ASL obviates the need to postulate any underlying structure. Other mechanisms by which relations between elements can be expressed in language include agreement and case (Bouchard 2005). For sign languages, these relationships can be construed through spatial loci in signing space rather than through temporal order as in spoken languages. Only temporal order calls for structure which faithfully represents the underlying relation between possibly dislocated surface elements. Spatial relations, on the other hand, directly depict the relations, thus rendering superfluous any structural representation. If an alternative strategy to word order and structure is used in a language, this is tantamount to denying it any structure. Bouchard and Dubuisson’s non-structural account of sign languages has provoked a controversy with generative sign language linguists who have countered their arguments on both empirical and theoretical grounds (Sandler and Lillo-Martin 2006). Empirically, it is

incorrect that word order in sign language is random. Rather, on a generative account, sign languages show the same kind of movement processes and feature-checking mechanisms that lead to derived word orders (e.g. topicalization and *wh*-movement) as spoken languages (Sandler and Lillo-Martin 2006: 304-8; Neidle, Kegl, MacLaughlin, Bahan, and Lee 2000). The deeper understanding of the role of non-manual markers in these movement processes has even fostered the parallelism between sign and spoken language phrase structure. Furthermore, not all verb classes, hence not all sentences, involve spatial syntax, only agreement and spatial verbs do. Sign languages would at best be “mixed” systems, alternating between the use of hierarchical and non-hierarchical structures – a theoretically rather odd position. From a generative perspective, the default assumption is to assume phrase structure for any natural language. Thus, the burden of proof that there are some languages without structure lies with non-structural accounts. If sign languages do show evidence for structure-dependence, despite their typical use of space, this is a strong argument for structure-dependence as a critical component of any natural language (Sandler and Lillo-Martin 2006: 307).

From the above discussion, we can conclude that UG constrains the possible form of linguistic primitives, invariantly, for all natural languages. Structure-dependence is a crucial constraint which permeates even sign languages with their stronger use of space to mark relations among elements. The substance of linguistic primitives, however, is fixed through experience, and may therefore vary between languages along modality and typological dimensions. The most likely typological and cross-linguistic variation is that between values of parameters in phonology, morphology, and syntax and between inventories of (derived) primitive elements in these domains.

#### 2.4. Typology

Part of the variation between languages can be accounted for by typological differences. The most well-known typology of languages, going back to Sapir (1921), is based on word structure and distinguishes morphological classes such as agglutinating/concatenating, inflectional, polysynthetic, incorporating, and isolating ones (Anderson 1992, chapter 12). In the remainder of this paragraph, typological variation will be understood as morphological variation.

In an attempt to include sign languages into a universal typological scheme, Brentari (1998, 2002) takes canonical *wordshape* as the defining typological characteristic. Canonical wordshape results from the systematic pairing of the binary values of two features, namely *syllabicity* (mono- or poly-) and *morphemicity* (mono- or poly-). She includes sign languages as a whole group into a single typological class and compares them with three spoken languages of different types, as in Table 1.

Table 1. Canonical wordshape according to the number of syllables and morphemes per word (Brentari 2002: 57)

<i>Wordshape</i>	<i>Monosyllabic</i>	<i>Polysyllabic</i>
<i>Monomorphemic</i>	Chinese	English
<i>Polymorphemic</i>	Sign languages	West Greenlandic

The canonical wordshape in sign languages is polymorphemic/monosyllabic, that is, signs are usually composed of multiple morphemes but only one syllable. In this respect, “sign languages form a typological class unto themselves” (Brentari 2002: 57). Importantly, they differ from (spoken) languages that are traditionally called ‘non-concatenative’ such as the Semitic languages in the simultaneity of vowel-like and consonant-like units. In the Semitic languages, still, vowels and consonants alternate with each other whereas in sign languages, dynamic features (movement) which correspond to vowels and static features (handshape) which correspond to consonants do in fact co-occur simultaneously.

Multiple morphemes fit into a single syllable because of the simultaneous expression of morpho(phono)logical information. This way of processing is called *vertical* processing as compared to *horizontal* processing which is typical of spoken languages. This difference will be discussed in detail in the next paragraph on modality. With respect to canonical wordshape, modality and typological (morphological) aspects coincide. In fact, for sign languages, the typological difference can be reduced to a modality difference. However, modality and typology are not co-extensive, in general, as can be seen from the classification of various spoken languages into different boxes in the typological scheme in Table 1. The three spoken languages given as examples share the same modality, still, they behave differently with respect to typology.



Why is it that spoken languages are free to vary typologically while sign languages are not? Why is there no cross-linguistic variation between sign languages, typologically? Canonical wordshape reflects the optimal packaging of linguistic information in a particular language. For spoken languages, there are a couple of solutions which are equally accessible in the typological state space. This typological ramification is independent of modality. For sign languages as a whole group, there seems to be a single stable solution in the typological state space. Their membership is (pre-) determined by their membership in the modality class.

Modality differences, in turn, are defined by processing differences. Any language has to convey information in real time (Slobin 1977). The ratio of information/time should be the same for all languages, generally, but may vary with respect to the information packaging into units of processing and the dimensionality of processing. Thus, in spoken language with its fast articulators, a more horizontal way of processing through concatenation is affordable because information flows rapidly in uni-dimensional linear time. In sign languages, however, a more vertical way of processing through simultaneous articulation is fostered because information flows slowly through the gross-motor articulators such as the hands, arms, and body (Gee and Goodhart 1988; Klima and Bellugi 1979). Thus, in spoken languages, little information may be conveyed in many small chunks, whereas in sign languages, a lot of information is conveyed in few big chunks (Hohenberger et al. 2002; Leuninger et al. 2004). There is an interaction between production time and processing time leading to an optimal trade-off between the advantages and disadvantages of the aural-oral and the visuo-gestural processing system. These differences are located on the PF-interface of the language system with the articulatory-perceptual system.

How PF-constraints act on signed languages can be nicely demonstrated in the area of prosody. Sandler, in a series of publications (1999, 2000, 2005; Sandler and Lillo-Martin 2006), has provided ample evidence for the existence of a prosodic hierarchy of language units in sign languages (drawing mainly on Israeli Sign Language, ISL). The prosodic hierarchy in sign languages comprises the prosodic word < phonological phrase < intonational phrase. The central prosodic unit is the prosodic word. The definition of the *prosodic word* in ASL, as proposed by Brentari (1998: 295), given in (1) below, certainly also holds for other sign languages, since prosodic constraints delineate the spatio-temporal extension of a sign in terms of processing (articulation and perception).

- (1) PROSODIC WORD =  $1 \leq 2 \sigma$  (PWD =  $1 \leq 2 \sigma$ )

Core lexemes consist of at least one syllable and not more than two.

Brentari (1998) defines the prosodic word in Optimality-theoretic (OT) terms, that is, the constraint is stated with respect to its unmarked value. The constraint may be violated (i) if it gets dominated by a stronger constraint or (ii) if it does not refer to a core lexeme. The minimal size of a sign consists of a single syllable (defined as a single sequential movement with at least one weight unit (Brentari 1998: 205). The maximal size of a sign consists of two syllables. To what extent the lower and upper boundary are motivated by the PF-interface remains to be carefully spelled out. But most certainly, the motor and articulatory systems have lower and upper boundaries for the integration of dynamical movements unfolding in space and time. These interface boundaries can enter into a linguistic definition as in (1). Brentari and Sandler give numerous examples that support the empirical adequateness of the PROSODIC WORD constraint in ASL and ISL, Hohenberger (submitted) does so for DGS.

In sum, processing differences due to modality lead to a different information packaging and different processing type (horizontal *vs.* vertical). Sign languages as a group are typologically different because of the high pressure to economize time which the slow articulators need for production. Therefore, simultaneity of expression is fostered. Since this pressure is equally high on any sign language, no significant typological cross-linguistic variation is to be expected between sign languages.

Does this imply that there is no typological variation between sign languages at all? Certainly not. As mentioned at the beginning of this section, morphological typology is only one, though a very prominent, typological system. Other typological systems are, for example, syntactic ones based on word order or phonological ones based on tone, etc. Along these typological dimensions, sign languages can and do vary, indeed (see Section 4). Furthermore, there are morphological categories and processes that can form the basis of a typological distinction (see Section 4.2). The typology of sign languages along these dimensions has been studied by Zeshan (2000a+b, 2002, 2003a+b, 2004a+b) in particular (see Section 4.2). Only with respect to the canonical wordshape and morphological processing in sign languages, the strong modality constraints severely restrict typological variation.

## 2.5. Modality

The modality difference between sign languages and spoken languages has received much attention throughout the history of sign language research (see Meier et al. 2002 and articles therein; Woll 2003; Sandler and Lillo-Martin 2006). While languages vary on PF in general, that is, in their production and processing characteristics and their set of primitives, part of this variation can be explained by modality. Spoken languages are processed in the aural-oral modality; sign languages in the visual-gestural modality. This difference affects the way in which the abstract representational system of language interfaces with the sensory periphery in perception and production (Leuninger, Hohenberger and Waleschkowski 2007). Modality distinguishes classes of languages as a whole on the basis of their PF interface characteristics. All sign languages and all spoken languages are subject to the constraints imposed on them by their respective modality.

An obvious candidate for a modality difference pertains to the dimension of processing (see already Section 2.4). To recapitulate, according to Brentari (1998, 2002), sign languages are characterized by *vertical processing*, whereas spoken languages are characterized by *horizontal processing*.

Vertical processing means that various linguistic information can be conveyed simultaneously in space. Such an arrangement would informally be represented as a vertically layered score of independent tiers. In phonology, the four phonological features of a sign – handshape, hand orientation, movement, and place of articulation – are present simultaneously. In morphology, various morphemes can be present at the same time by either expressing them through a change in one phonological feature or by distributing them over the various manual- and non-manual articulators. In syntax, syntactic information may be conveyed by non-manual expressions which scope-mark syntactic constituents by temporal co-occurrence.

Horizontal processing means that various linguistic information is conveyed in a linear way, as in strings of linguistic units, for example, segments, morphemes, and words. Such an arrangement would informally be represented as a linear string of elements.

Note, however, that on a more abstract level of representation, both formats have to conform to the same formal organizational principles. This results, for instance, in common phonological representations for signed

and spoken languages, irrespective of their different phonetics. That this is in fact the case has been convincingly shown by Brentari (1998, 2002), Sandler (1998, Sandler and Lillo-Martin 2006), van der Hulst (van der Hulst and Mills 1996), and others. The same holds true of morphology and syntax.

Of course, both sign and spoken languages do use both dimensions, the vertical and the horizontal axis – only to different degrees. Thus, in sign languages, too, signs, phrases, and sentences unfold in linear time. In spoken languages, too, prosody adds to the simultaneity of linguistic expressions.

A legitimate question is whether sign languages would take advantage of simultaneity in the visual-gestural modality regardless of the information transmission rate (as suggested by an anonymous reviewer). That is, if sign and speech could convey information at an equal rate without simultaneity in sign languages, would sign languages make use of the affordance of simultaneity at all? This scenario has to be addressed in a two-step answer. First, both signed and spoken languages have at their disposal and make use of sequential and simultaneous morphology (Aronoff, Meir, and Sandler 2005). Although the aural-oral modality of spoken languages has only limited potential for simultaneous expression, simultaneity does exist – even with the fast rate of transmission. Likewise, although the visuo-gestural modality of sign languages has only limited potential for sequential expression, sequentiality does exist. From this we may conclude that both dimensions are necessary for the transmission of language. However, for sign languages, unlike for spoken languages, the additional factor of low transmission rate comes into play. This may drive sign languages to develop the usage of one dimension over the other. This is the second part of the answer, relating to selectional pressure, which acts on signed and spoken languages in different ways. This pressure reinforces the use of simultaneity in sign languages since its use increases the rate of language transmission. The generally slow production rate of sign thus acts as an indirect modulatory factor favoring one processing dimension over the other. Nevertheless, if the processing rates for both language modalities were the same, we could still reasonably speculate that the use of simultaneity would be higher in sign because of the inherently simultaneous nature of the visual system. In general, cognitive tasks as complex as language depend on the interaction of many different factors – some supporting, some constraining, some even conflicting. It is through

this complex interplay that the “ecology” of signed and spoken language processing emerges.

In summary, modality explains part of the variability between languages. All members within a group defined by modality are subject to the same constraints. This does not mean, however, that all members conform to these constraints in the same way or to the same extent. The intra-group variation, however, is expected to be lower than the inter-group variation. It is important to bear this distinction in mind for the discussion of (possible) cross-linguistic variation between sign languages in Section 4.

### **3. Sign language production**

In this section, I am concerned with possible modality and typological variation and with determining the locus of this variation. As pointed out in Sections 2.4 and 2.5, sign languages are somewhat more restricted than spoken languages in this respect. I will report on recent research into sign language processing and try to assess in an empirical domain if the above reasoning and conclusions are correct. The empirical domain under consideration will be slips of the hand in DGS and ASL.

In an extensive research program on the comparison of slips of the hand in DGS and slips of the tongue in spoken German, we have tried to assess the impact of modality on language production (Hohenberger et al. 2002; Keller et al. 2003; Leuninger et al. 2004, 2005, 2007). Our main results support the conclusions in the above paragraph with respect to the role of UG and to modality and typological differences. While all major slip categories (such as anticipation, perseveration, exchanges, substitutions, blends, and fusions) and slip units (phonological features, morphemes, words, clauses) are instantiated in DGS as well, their quantitative distribution differs. This finding underlines the different information packaging and typology of DGS as compared to German. Signs are the units that are affected most while morphemes and phrases are less affected in DGS as compared to German. This is because of the lower degree of concatenation in DGS which is most obvious in morphology. Non-concatenative morphemes are harder to detach in DGS and therefore are less likely to be affected in a slip. As for the slip categories, the only obvious difference concerns the higher prevalence of fusions (of adjacent signs) in DGS as compared to spoken German (Leuninger et al. 2007). This is not surprising since the morphology of sign languages in general is

fusional. Fusion is a mechanism which is regularly employed in morphological processes such as compounding.

The major conclusion of our research project is that the language processor as such is modality-independent: language production takes the same (time) course through the same stages of planning in both modalities. The content on which the processor operates, however, is modality-specific. Modality-specific processing characteristics, such as production time and the dimension of processing (vertical *vs.* horizontal), exert their influence on the PF-interface.

If our above conclusions are correct, especially if sign languages form a single typological class unto themselves, we expect no major differences in processing between different sign languages. In order to test this prediction, we have compared our data on DGS with ASL data.

### 3.1. Slips of the hand in DGS and ASL

The earliest corpora of slips of the hand were from ASL (Klima and Bellugi 1979; Newkirk et al. 1980; Sandler and Whittemore, in Whittemore 1987). In these corpora, only parametric errors (phonological errors) and whole sign errors were reported, whereas in our slip corpora, we distinguished phonological, morphological, lexical, and phrasal slips. For a cross-linguistic comparison, we therefore compared only the phonological and the lexical slips. In Table 2, we have arranged the data from the Klima and Bellugi (K&B) corpus, the Sandler and Whittemore (S&W) corpus, and (part of) our own data on DGS (see Keller et al. 2003):

Inspection of the data from these three corpora reveals some major similarities and one dissimilarity. As for the latter, the proportion of whole sign errors is markedly different, especially in our DGS corpus. This discrepancy can best be explained by the different sampling methods. While K&B's data were off-line records of spontaneous slips of the hand, S&W's data were elicited 'hand twisters', and finally, our own data were elicited in a semi-natural story telling task which may have led the signers to emphasize meaning over form and thus produce more whole word errors (semantic substitutions, anticipations, perseverations, etc.). Therefore, we do not think there is any theoretical significance behind this discrepancy (Keller et al. 2003).

*Table 2.* A comparison of slips of the hand in ASL and DGS (from Keller et al. 2003: 313). Please note that the various authors used slightly different categories.<sup>1</sup>

	<b>K&amp;B-Corpus</b> (N=131) <sup>2</sup> naturally occurring	<b>S&amp;W-Corpus</b> (N=62) elicited hand twisters	<b>DGS-Corpus</b> (N=203) elicited, story telling
<b>Parameter Errors</b>			
handshape	65 (49,6%)	18 (29,5%)	37 (18,2%)
place of articulation	13 (9,9%)	15 (24,6%)	5 (2,5%)
movement	11 (8,4%)	13 (21,3%)	5 (2,5%)
orientation	3 (2,3%)		5 (2,5%)
contact/fingers, etc.			4 (2%)
hand arrangement	8 (6,1%)		11 (5,5%)
combined			6 (3%)
<b>Whole Sign Errors</b>	9 (6,9%)	10 (16,4%)	112 (55,2%)

### 3.2 Phonological slips

In order to make the three corpora more comparable, we therefore excluded the whole sign errors and looked only at the phonological errors. In Table 3, we have recomputed the proportion of the various phonological parameters which can be affected in phonological slips.

Inspection of the recomputed proportions of the various parametric categories of only phonological slips reveals a more consistent picture across the three corpora. The most significant outcome is that in all three corpora, handshape errors outnumber errors in the various other categories. The prevalence of handshape errors is most pronounced in the K&B and the DGS corpora (65% and 50%, respectively), and least pronounced in the S&W corpus (39%). The relatively equal proportion of handshape, POA, and movement errors in the latter corpus may be due to the specific composition of the stimulus set for the hand twisters. I therefore take the high proportion of handshape errors evidenced in the former two corpora as representative for the true distribution of phonological errors.

Table 3. Comparison of phonological slips of the hand in ASL and DGS (from Keller et al. 2003: 312)

	<b>K&amp;B-Corpus</b> naturally occurring	<b>S&amp;W-Corpus</b> elicited hand twisters	<b>DGS-Corpus</b> elicited, story telling
<b>Parameter Errors</b>			
handshape	65 (65%)	18 (39,1%)	37 (50,7%)
place of articulation	13 (13%)	15 (32,6%)	5 (6,8%)
movement	11 (11%)	13 (28,3%)	5 (6,8%)
orientation	3 (3%)		5 (6,8%)
contact/fingers, etc.			4 (5,5%)
hand arrangement	8 (8%)		11 (15,1%)
combined			6 (8,2%)
<b>Sum</b>	100 (100%)	46 (100%)	73 (100%)

There are three possible reasons for the overwhelming predominance of handshape errors. First, under-representation of features is rarely possible for handshape, as compared to the other parameters, especially place of articulation. Handshapes are rather discrete as opposed to places of articulation which are more variable, gradient, and context-dependent (Emmorey and Herzig 2003; Emmorey, McCullough, and Brentari 2003; Brentari 2006). Processing, however, depends on representations, and thus the error probability for fully-specified features is enhanced for handshape (Keller et al. 2003). Second, the number of phonological contrasts for handshapes is much higher than for any of the other parameters (place of articulation, movement, and orientation). In DGS, for example, there are at least 32 contrastive handshapes (Pfau 1997). In a set with many members, a mis-selection is much more likely than in a set with only few members because so many members compete for selection. Third, following up on the second argument, the motor representations for handshapes (underlying their phonological representation) also have to be much more refined and therefore competition is high. Although the hand is granted a projective area of impressive size in the motor (and sensory) cortex, this representational area has to distinguish many subtle configurations of a relatively small part of the human body.



Most importantly, these reasons all have to do with general issues of the representation and processing of phonological features which are unlikely to vary between sign languages. We expect all sign languages to have more phonological contrasts for handshape than for the other parameters and to represent and process them in the same way, due to modality and typological reasons. This is not only true for sign languages but for typologically related languages, in general. Thus, English and German, which both presumably have a hierarchical syllable structure (with an 'onset-rhyme' pattern) both adhere to the 'syllable position constraint' which demands that in a phonological slip, only the same syllable positions may interact, namely onset with onset, nucleus with nucleus, and coda with coda. In a typologically different language such as Arabic, which has a flat syllable structure, this constraint does not hold and therefore Arabic phonological slips look quite different (Berg and Abd-El-Jawad 1996).

Given the restrictive impact of modality and typology on the form and occurrence of processing errors, what space is left for cross-linguistic variation in the processing of various sign languages? First, variation may occur due to the different size of the lexicons of two sign languages and/or the amount of co-existing dialectal variants which would foster paradigmatic errors (semantic substitutions and blends). The number of grammaticalized morphemes (verbal, nominal, classifiers) would foster morphological slips. The richness of the lexicon with phrasal idioms would foster phrasal blends, etc. Note that almost all of these phenomena are dependent on the age of a sign language. The older a sign language, the more time its structure has had to grow and ramify and the stronger its language-internal relations have become (e.g. the generation of stable paradigms). Therefore, it would be interesting to also study and track over time processing phenomena in novel sign languages such as Nicaraguan Sign Language (NSL; Kegl et al. 1999; Senghas et al. 2004).

The above discussion shows that processing data (such as slips of the hand) are not very likely to reveal cross-linguistic differences between sign languages. Coarse-grained modality and typological aspects will dominate the more fine-grained cross-linguistic differences.

#### **4. Possible cross-linguistic variation between sign languages in phonology, morphology, syntax, and the lexicon**

In the preceding section, I have shown that not much cross-linguistic variation can be expected in the processing domain. In this section, I will survey various domains of linguistic representation – phonology, morphology, syntax, and the lexicon – and give examples of existing variation (see Perniss, Pfau, and Steinbach, this volume, for additional examples). At the end of the section, I will come to a conclusion concerning the possible and actual range of cross-linguistic differences between sign languages.

As Woll (2003) points out, the search for cross-linguistic differences between sign languages has been dominated by the emancipatory impetus of showing that sign languages, too, differ from each other as much as spoken languages. This impetus, she attributes to the “Modern Period” of sign language research. Since the beginning of that period, the cross-linguistic comparison of sign languages has received a lot of attention (Baker et al. 2003). Authors in this line of research either tried to describe as many sign languages as possible in their own right or explicitly tried to compare them to each other. This research, though, has not always been guided by a principled account of possible cross-linguistic variation between sign languages but followed partly more the heuristic of discovery. It was considered sufficient to have described another sign language than ASL and at least to have tried to compare aspects of both languages. Domains of variation were not systematically looked for but more or less accidentally discovered. The harvest of this research heuristic, however, was not always rich, at least if one does not already consider mere phonetic variation of certain signs in the lexicons of two sign languages a significant cross-linguistic difference.

The impetus of the “Modern Period” to try to show that sign languages differ as much as spoken languages, however, is not just a pedagogical one. The actual cross-linguistic variation between spoken languages can be accounted for theoretically, for example, in terms of “parameters” in the framework of generative grammar. Languages vary from each other with respect to their particular profile of parameter settings. Parameters are dimensions in phonology, morphology, and syntax, along which languages vary. The Principles-and-Parameter-Theory has become most prominent in syntactic research and serves as a framework to describe and explain cross-linguistic variation as well as language acquisition (Chomsky 1981;

Atkinson 1992; Lightfoot 1991; and many others). If, as Woll claims for the “Modern Period”, the ambition is to show that sign languages vary along the same lines as spoken languages do, the same theoretical account of variation can also be given for sign languages. This line of reasoning has especially been followed by sign language syntacticians (Lillo-Martin 1986; 1999; Crain and Lillo-Martin, 1999; Sandler and Lillo-Martin 2006; Pfau 2002, 2004; Pfau and Steinbach 2003, 2006; Pfau and Quer, this volume). In the same vein, I would like to point to principled variation in the domains of phonology, morphology, and syntax, and give examples of each as they are discussed in other articles in this volume and in the literature.

#### 4.1. Phonological variation

In this section, I would like to start out with a brief example of phonological variation and then embed it in a more comprehensive view on possible sign language phonological variation.

In their study on the morphophonological features of agreement in four sign languages, namely DGS, Japanese Sign Language (*Nihon Syuwa*, NS); Australian Sign Language (Auslan), and ASL, Mathur and Rathmann (2004) show that a set of five different phonological parameters and their combinations is responsible for the expression of agreement in all four languages. The agreeing verb may change in orientation (Ori), direction of movement (Dir), both (OriDir), orientation, direction, and position of the hands with respect to the body (OriDirHnd), or only in orientation and position of the hand (OriHnd). While all four sign languages express agreement most frequently through an OriDir change, they differ in their preference of Ori *vs.* Dir verbs and OriDirHnd *vs.* OriHnd verbs.

Also with respect to handedness, the four sign languages prefer different types of handedness in the sense of Battison (1978). Interestingly, the authors find that cross-linguistic variation occurs among the less frequent parameter sets and handedness types but not among the highly frequent sets and types. They try to explain the observed variation in terms of two alternative hypotheses, the *Lexicon Hypothesis* and the *Prototype Hypothesis*. The former states that the variation is just a random lexical phenomenon and as such needs no further explanation. According to the latter, one phonological parameter set is prototypical, namely OriDir, and the frequency of any set is directly related to the similarity of a particular

pattern with respect to the prototype. In fact, Mathur and Rathmann (2004) found partial evidence for both hypotheses. Nevertheless, it is easy to see how predictions for acquisition and language change can be derived from them: the prototypical set should be the starting set, in language development as well as in language history. As is well known from language acquisition of hearing children, the less frequent constructions are also always subject to a lot more variation than the highly frequent ones.

Phonology is a rich domain for variation. Other areas of phonological variation relate to *phonological inventories* and *manual alphabets*, *sonority in syllables*, and *handedness*, which shall be briefly discussed in the following.

*Phonological inventories:* As is well known, the inventories of handshapes vary between sign languages. That is, a handshape that is contrastive in one sign language may be missing in the inventory of another or, while being present, be not contrastive. An example of the former is the ASL D-handshape that seems not to exist in Turkish Sign Language (*Türk İşaret Dili*, TİD); an example of the latter is the ASL F-handshape that is an allophone of the O-handshape in TİD (Kubus 2007). It has been noted for a long time already that sign languages show subtle phonetic variation of handshapes. For example, the A-handshape in ASL differs from the A-handshape in Chinese Sign Language (CSL) in that in the CSL-A, the thumb is more abducted and the fingers are less tense (Sandler and Lillo-Martin 2006: 148). If native ASL-signers were to learn CSL they would probably show a foreign “accent”, and native CSL-signers vice versa.

As for the frequency of shared handshapes among sign languages one might apply the same logic as Mathur and Rathmann did to the phonological parameter sets and handedness types for agreeing verbs: those handshapes shared by all sign languages should be the most frequent ones, whereas variation should concern the less frequent ones. Here, the set of unmarked handshapes (flathand, A, S, O, G, C) would instantiate the “prototypical” set of universal handshapes (Battison 1978). Not surprisingly, the other phonological parameters – orientation, place of articulation, and movement – are far less subject to cross-linguistic variation. There is simply not enough space for true random variation. For orientation – although there is an indefinite number of possible hand orientations – a much smaller number of discrete positions, maybe nine, are really used distinctively. For place of articulation, too, there are many more possible values than truly distinctive ones (Emmorey and Herzig 2003). The distinctiveness of place of articulation is very likely also constrained

by the neural representation of the body in the sensory and motor areas of the brain (see Section 3). Those areas for which the sensory and motor “homunculus” has very fine-grained representations (e.g., the hand) should also allow for more distinctive places of articulation. The high neuronal representational resolution of the hand is most obvious in handshape variation. Handshapes are far more discrete and arbitrary than any of the other phonological features (see literature quoted in Section 3).

*Manual alphabets:* Handshapes are closely linked to the manual alphabet of sign languages. In ASL, many of the letters of the manual alphabet serve as contrastive handshapes in initialized signs and proper names. This is generally true for one-handed alphabets. Things look different, however, for two-handed alphabets, such as the Czech, Russian, British, and Turkish Sign Language alphabets, in which the form of the letters of the alphabet are more or less iconically depicted. A relatively small binary difference – one- vs. two-handed letters – may lead to quite dramatic consequences for the overall sign language system, with effects on the lexicon (concerning sign formation) and the overall frequency of finger-spelling usage. The difference between these two broad classes of manual alphabets may indeed be typological.<sup>3</sup>

*Sonority within syllables:* In sign languages, too, the nucleus of a syllable has to be the most sonorous element of the syllable (Perlmutter 1992). Usually, the movement feature constitutes the nucleus of a sign language syllable. Only when there is no movement feature present can a hold (“position” in Perlmutter’s terminology) be a syllable nucleus. Sign languages may, however, vary with respect to the minimal sonority required for a well-formed syllable nucleus. Whereas in ASL, the nucleus must contain a segment with a movement feature, minimally a secondary movement, in DGS, sonority may be even lower and a segment with just a hold may constitute a syllable nucleus, as, for instance, in the signs DEUTSCH (‘German’), FLEISCH (‘meat’), or DOKTOR (‘doctor’) (Pfau 1997). *Syllable complexity*, as discussed in Hara (2004), is another case in point.

*Restriction on two-handed signs:* Although the main articulators in sign language are the two hands, their simultaneous use is highly regulated by phonological rules. Especially the use of the non-dominant hand is severely constrained as compared to the much more liberal use of the dominant hand (Sandler 1989; Sandler and Lillo-Martin 2006). This highly characteristic asymmetry may, however, be modulated differently in the various sign languages, according to their particular phonological constraints.

This discussion is far from being comprehensive. Since research on the phonological component of sign languages has been established (Stokoe 1960; Klima and Bellugi, 1979; to name but a few), phonology has been focused on by many researchers, either from an intrinsic sign language or from a seemingly more extrinsic spoken language perspective. But note that from a universalist perspective there is no intrinsic/extrinsic distinction. The phonologies of sign languages and spoken languages are alike, in a theoretically relevant way – only their respective PF-interface differs. This is why, in the phonological component itself, the same variation can, in principle, occur.

The rise of Optimality Theory (OT), which originated in spoken language phonology and which has meanwhile spread to other domains (such as morphology, syntax, language acquisition, etc.), also stimulated sign language researchers to apply this framework to various sign languages (Brentari 1998 for ASL; Pfau and Steinbach 2003, 2005 for DGS). OT is especially apt at capturing variation – be it typological, cross-linguistic, or even dialectal variation – since it relies on the dynamic interaction between conflicting universal constraints (for an introduction to OT, see Archangeli and Langendoen 1997; Kager 1999).

#### 4.2. Morphological variation

Due to modality effects, sign languages are not expected to differ with respect to the canonical wordshape to the same extent as spoken languages (see Section 2). The sign language processor will always prefer vertical processing which results in a non-concatenative morphology. Therefore, sign languages will tend to uniformly obey the prosodic word constraint and prefer poly-morphemic mono-syllabic signs. However, basic design features of grammar such as compositionality are equally satisfied by linear-concatenative and non-linear, tiered representations. As pointed out above, a concatenative type and a sign language simply do not go together well. The failures of the various artificial manual codes of spoken languages in the environment of a particular sign languages are telling. If allowed to “go native”, sign languages will always be attracted to their natural habitat of the morphological state space, namely to tiered, vertical co-temporal processes and representations.

However, there is still enough space for morphological variation. A first important way in which sign languages may differ concerns the

grammaticalization of particular morphosyntactic categories such as number, gender, person on nouns or aspect, agreement, tense, case, reciprocity, etc., on verbs. Although all of these Functional Categories (FCs) may in principle remain implicit with no overt morphological exponent on their hosts, languages over time tend to mark linguistically those categories which correspond to important conceptual or grammatical categories.

For nominals, I take plural as a case in point. Note that I will restrict myself to the morphological marking of plural on the noun and disregard other types of plural marking such as the use of numerals or classifiers. Plural marking in sign languages is neither simply an optional nor just an iconic process. To the contrary, Pfau and Steinbach (2005, 2006b), who thoroughly examine plural formation in DGS, conclude that this is a strictly phonologically determined process which depends on the basic phonological properties of the base noun, namely if the sign is body-bound or not and if the sign is two-handed or not. Depending on noun categories, three noun-specific possibilities of plural formation have to be distinguished:

- (i) *Sideward reduplication*: In non-body-bound one-handed signs, the plural is marked by a sideward reduplication of the whole sign.
- (ii) *Simple reduplication*: In non-body-bound two-handed signs, the plural is marked by simple reduplication of the whole sign.
- (iii) *Zero marking*: In non-body-bound two-handed signs with inherent repetition as well as in body-bound nouns, the plural is not marked at all.

Pfau and Steinbach (2005) put forward a plural analysis in terms of OT which accounts for the empirical facts in DGS. Since OT accounts are particularly apt at covering cross-linguistic variation, plural marking in other sign languages can easily be accommodated by re-arranging the constraint hierarchy of the already identified constraints.

For verbs, I take the membership to one of the three major verb classes as a case in point, namely plain verbs, agreeing verbs, and spatial verbs (Padden 1988). Verbs belonging to these classes show different morphosyntactic marking and behave differently syntactically. Only agreeing and spatial verbs show agreement, namely with the goal and/or the source theta-role of the verb (Meir 2002), and can licence null arguments (Lillo-Martin 1991; Sandler and Lillo-Martin 2006). The class membership

of a verb, however, may vary between sign languages. While it is true that class membership is determined partly by conceptual aspects of signs, as in the case of GIVE (which, in its very conceptual structure, implies a source, a theme, and a goal), verbs with similar argument structure can still be an agreeing verb in one sign language but a plain verb in another.

The expression of agreement may also be subject to variation. While in all sign languages that have agreeing verbs, agreement is expressed by modifying movement and/or orientation features (sometimes analyzed as empty subject and/or object pronouns on the verb), as in the ASL verb SUBJASKOBJ (see Section 4.1), in some sign languages, agreement may also be expressed on a category other than the verb, namely on an auxiliary-like element. Such auxiliaries are attested, for instance, in DGS (Rathmann 2000; Rathmann and Mathur 2002, 2005), NS (Fischer 1996), Taiwan Sign Language (Smith 1990), and Sign Language of the Netherlands (Bos 1994). For DGS, Rathmann calls this auxiliary “Person Agreement Marker” (PAM). While the form of the auxiliary may differ from sign language to sign language, it is generally capable of expressing the agreement relation by moving from the subject’s location towards the object’s location. The DGS verb LIEBEN (‘to love’), for example, is a body-anchored plain verb. Frequently, this verb combines with PAM which expresses object agreement and optionally subject agreement (see Steinbach and Pfau, this volume, for a cross-linguistic comparison of the form, use, and grammaticalization of auxiliaries across SLs).<sup>4</sup>

The above discussion on the emergence of agreement morphemes and the ensuing variation points to an important factor determining grammaticalization of particular morphological markers in sign language: *time*. It has often been noted that the reduced variation between sign languages may be due to their relative youth (Meier 2002; Woll 2003; Goldin-Meadow 2003). Morphological paradigms and categories need time to develop. Complex systems such as language “find structure in time” (Elman 1990). Grammaticalization is such a process of structure-building. Numerous functional morphemes have been shown to have emerged from lexical signs along well-known pathways of grammaticalization, among them completive and perfective aspect markers as well as the future tense marker in ASL (for a comprehensive overview over modality-specific and -independent aspects of grammaticalization in sign languages, see Pfau and Steinbach 2006a, this volume). In DGS, PAM has evolved from the noun for PERSON (‘person’) (Rathman 2000; Pfau and Steinbach 2006a, this volume).



While sometimes grammaticalization spans decades or even centuries, it can also happen between generations, as in the creolization of NSL (Kegl et al. 1999). Although the creolization of NSL was not abrupt, it took less than two decades during which sequential cohorts of learners systematized the grammar of this newly emerging language (Senghas and Coppola 2001; Senghas et al. 2004; Pyers and Senghas, this volume).

Insight into the grammaticalization of morphological categories can also be gained by looking at new sign languages, such as the sign language of the Abu Shara Bedouin group (ABSL), reported in Aronoff, Meir, Padden, and Sandler (2004). This team of authors holds that in established and developed sign languages, two kinds of morphology are found: morphology motivated by the visuo-spatial concepts and relations in the language and, due to their relative youth, non-motivated grammaticalized morphology. However, they find neither type of morphology in ABSL. The lack of systematic morphology leads them to conclude that social interaction over time is necessary even for motivated morphology to crystallize.

Grammaticalization leads to variation – variation of forms within a paradigm of a language and variation between languages with respect to the existence of a particular grammatical morpheme and to its overt expression. In sign languages which are “old enough” to have undergone language change, such as ASL, grammaticalization can be observed with respect to lexical class membership. In language change, verbs may come to express agreement features and thus change lexical class membership (Engbert-Pedersen 1991). In the same vein, Rathmann and Mathur (2005) report that older generations of ASL-signers do not yet treat the verb TEST as an agreement verb since the old form lacks movement. Movement, however, is one prerequisite for agreement since one option for marking agreement is changing the direction of path movement of the verb (which proceeds from Source to Goal). In the course of time, when the movement feature emerged, the verb has become an agreeing verb.

Apart from the morphological processes of inflection, *derivation* and *compounding*, too, may be subject to cross-linguistic differences between sign languages. As for derivation, sign languages may, for instance, have nominalization as a productive morphological rule and mark it overtly with a certain (non-concatenative) morpheme (Supalla and Newport 1978). Alternatively, there are grammars that do not have this process or have it but do not mark it, as in conversion. As for compounding, sign languages may differ in the compound formation rules (Klima and Bellugi 1979; Liddell and Johnson 1986) and the productivity of this process.

### 4.3. Syntactic variation

Cross-linguistic syntactic variation can easily be predicted and explained by a theory of syntax such as generative grammar. As pointed out above, the Principles-and-Parameters-Theory gives a principled explanation of the major syntactic differences between the languages of the world – irrespective of modality.

In generative grammar, morphology closely interacts with syntax through the set of Functional Categories. These syntactic features are overtly instantiated as inflections, auxiliaries, complementizers, *wh*-words, determiners, etc. but they may also have no phonetic content at all. They are syntactically active in that they project phrase structures and engage in feature-checking processes in the syntactic structure (Sandler and Lillo-Martin 2006; Neidle et al. 2000). Thus, an aspect marker *Asp* resides in the head position of an aspect phrase (*AspP*) with the structure [<sub>AspP</sub> [specifier [*Asp*<sup>o</sup> [complement]]]] where it combines with the verb and checks its feature with a noun in the specifier position of *AspP*. Through the checking of its formal syntactic feature, the aspectual marker contributes to the overall meaning of the sentence which would be different without the aspectual information.

Importantly, this approach does not posit a universal set of primitive linguistic elements as a prerequisite of acquisition in the sense of an innate endowment with morphosyntactic or phonetic features such as [ $\pm$ finite], [ $\pm$ tns], [ $\pm$ labial], [ $\pm$ round], etc. Rather, as pointed out in Section 2.3, Bierwisch (2001) assumes that the language learner acquires those features which are instantiated in the respective target language under the guide of formal constraints on natural languages. What is innate is not the set of primitives but formal constraints on what constitutes possible primitives in language. These formal constraints include discreteness, combinatoriality, and recursivity. Within the space defined by these universal constraints, modality, typological and cross-linguistic variation is allowed and expected.

As far as syntax is concerned, typological variation between languages concerns word order, among other things. Different word orders arise from (i) the different selectional properties of the Functional Categories, that is, in which order they appear in the phrase structure, and (ii) from the setting of the head-parameter which determines whether a head takes its complement to the left or to the right. In de Quadros, Lillo-Martin, and Chen Pichler (2004) and Šarac et al. (this volume), word order differences

between Brazilian Sign Language (*Língua de Sinais Brasileira*, LSB) and ASL, and between DGS, Austrian Sign Language (*Österreichische Gebärdensprache*, ÖGS) and Croatian Sign Language (*Hrvatskog Znakovnog Jezika*, HZJ) are discussed; the basic sign order in DGS and ÖGS is SOV, whereas ASL, LSB, and HZJ are SVO. Note that variable word order between sign languages is not a sign of absent structure, as Bouchard and Dubuisson might argue (see Section 2.3) but the predicted outcome of parameter setting. Signed as well as spoken languages may choose from the universal options offered by the head parameter and by the different selectional properties of Functional Categories.

In order to illustrate the interaction of morphology and syntax resulting in cross-linguistic word order variation, I refer to de Quadros, Lillo-Martin and Chen Pichler's account of the phrase structure of LSB and ASL with respect to *Aspect*. They observe a difference between LSB and ASL concerning the distribution of a Neg-element with respect to aspect in sentences with plain verbs. In ASL, negation can intervene between (a virtual) Asp and the verb phrase (VP), as in KATHY MUST NOT SUPPORT ARNOLD. Consequently, the order of the Functional Categories is TP > Mod > Asp > Neg > VP, as in (2).

- (2) [TP KATHY [Mod MUST [Asp ASP [Neg NOT [VP SUPPORT ARNOLD ]]]]]  
[ASL]

In LSB, however, negation cannot occur pre-verbally, as evidenced by the ungrammaticality of (3).

- (3) \* INDEX<sub>3a</sub> ANNA<sub>3a</sub> NO SUPPORT INDEX<sub>3b</sub> LULA<sub>3b</sub> [LSB]

The authors explain this difference with the different nature of the aspectual morpheme in both languages. In ASL, aspect is featural, whereas in LSB it is affixal. In ASL, the verb enters the syntactic structure already fully inflected (with the feature) and only needs to check this feature in the course of the derivation. In contrast, in LSB, the verb has to combine with the aspectual affix in AspP in the syntax. In order to do so, adjacency of the VP and the aspectual head is required. This adjacency requirement is violated by an intervening Neg-element. Thus, the word order difference is explained in terms of the different nature of inflection in both sign languages: in ASL, inflection is featural, in LSB it is affixal.

Interestingly, the same cross-linguistic difference that holds between two sign languages, namely ASL and LSB, also holds between two spoken languages, namely French and English (Lasnik 1995). This distribution shows that the same inflectional parameter – featural vs. affixal inflection – cuts across modality. It groups together ASL and French on the one hand and LSB and English on the other hand.

Other typological differences in the domain of syntax are manifest in negation (Zeshan 2002, 2004a; Hendriks, this volume; Pfau and Quer, this volume) and question formation (Zeshan 2004b; Šarac et al., this volume).

#### 4.4. Lexical variation

Traditionally, in any language theory, the lexicon is the locus variation is relegated to. It is the repository of unpredictable outcomes of linguistic processes and idiosyncratic, exceptional forms. Whereas productive inflectional morphological and syntactic rules operate outside the lexicon, namely in the syntax, semi- and unproductive morphological processes such as backformations, analogies, irregular inflection, etc., and plain idiosyncrasies reside in the lexicon. Since lexicons are defined by variation, cross-linguistic variation between the lexicons of sign languages will naturally occur. In the following, I want to focus on two different kinds of lexical variation, lexical variation of Functional Categories and variation in the form of lexical entries.

First, consider *lexical variation of Functional Categories*. Assuming that Functional Categories belong to syntax and not to the lexicon, it sounds like a contradiction to claim that there is lexical variation of Functional Categories. The contradiction resolves, however, if the lexicon is assumed to be the locus where the parametric values of Functional Categories are marked. This is what Borer (1984) claims in her Lexical Parametrization Hypothesis. The parametric value of a specific functional category is noted in its lexical entry. The Icelandic anaphor *sig*, for example, would have listed in its lexical entry that it may engage in long-distance anaphoric binding (Wexler and Manzini 1987), whereas the German anaphor *sich* may not. The languages of the world differ in these syntactic parameters. The Lexical Parametrization Hypothesis curtails cross-linguistic variation to exactly this variation in the syntactic features of lexical entries. Any other variation can be neglected. The lexical categories of all natural languages are basically the same and so are their lexicons.

Nouns and verbs do not differ in their behaviour cross-linguistically. The fact that the same concept HORSE has different lexical forms such as *horse* in English, *cheval* in French, *Pferd* in German, or HORSE in ASL, does not count as substantial variation. It is just due to the arbitrariness of the sign. Superficial variation like this is mere contingency, nothing that has to be accounted for in a principled way.

Second, consider variation in the form of lexical entries nevertheless. From a more comprehensive linguistic point of view, lexical variation due to the *arbitrariness of the sign* is relevant variation, indeed. Especially in the context of sign languages the issue of iconicity needs to be addressed (Wilcox 2006). Iconicity is a highly controversial topic. What is true is (i) that the visual-gestural modality has a higher potential of iconicity (van der Hulst and Mills 1996; Goldin-Meadow 2003) and (ii) that signing, especially in narrative context, is interspersed with gestures and pantomimes. The latter holds true of spoken narratives, too. Besides these two aspects, signed words are as arbitrary as spoken words because they serve as signs (in the semiotic sense). A sign representing something in the mind functions within a semiotic system which serves the overall language system (Merrell 2006). As soon as it enters this system, it is subjected to linguistic constraints – discreteness, compositionality, recursion. Whatever the raw material may have been – vocal cries in the case of spoken language, or iconic gestures in the case of sign languages – the linguistic system transforms it for its own purpose. It is the language function that makes a sign more similar to a spoken word than a gesture is to a sign. Petitto's study (1987) of the acquisition of personal pronouns in ASL shows the reorganization process of a gesture becoming a sign in an impressive way. The language-systematic character of lexical entries, signed or spoken, is always the same. On the basis of this overall uniformity, variation in form between several spoken languages or between several sign languages can be classified as morphophonological variation in the sense that concept  $C_1$  in language  $L_1$  has the form  $F_1$  and the same concept  $C_1$  in language  $L_2$  has the form  $F_2$  which may or may not be morphophonologically related to  $F_1$ .

The lexicon of a language is not at all arbitrary or chaotic. After all, lexical entries have rich paradigmatic relations and morphological processes like derivation and compounding drive word formation processes. Rather, the mental lexicon in which all these inter-related forms are stored is a complex network of lexical items which is structured according to two major aspects, namely form and meaning. The form- and

meaning-relatedness of lexical items can easily be demonstrated by slips of the tongue in spoken languages and slips of the hand in sign languages, respectively (Hohenberger et al. 2002; Keller et al. 2003; Leuninger et al. 2004). Slips that witness the grouping of items according to similarity in form are *formal substitutions* (or, as they are sometimes called, *malapropisms*). In a sign language malapropism, an erroneous sign substitutes for an intended sign which minimally differs in form. Often only one of the phonological parameters is altered, as in the DGS example in (4) from Leuninger et al. (2004: 226) in which FENSTER ('window') substitutes for ZEITUNG ('newspaper'). Note that '/' signals a short hesitation after which the signer self-corrects himself.

- (4) FENSTER // ZEITUNG [DGS]  
window newspaper



Figure 1a. FENSTER ('window')



Figure 1b. ZEITUNG ('newspaper')

Note that FENSTER and ZEITUNG only differ in the orientation of the two hands: for FENSTER, the palms of the hands are in the horizontal y-plane (Figure 1a); for ZEITUNG in the mid-sagittal z-plane (Figure 1b).

Slips that witness the grouping of items according to similarity in meaning are *semantic substitutions*. In a sign language semantic substitution, an erroneous sign substitutes for an intended sign which minimally differs in meaning. In the DGS example (5), for instance, the intended noun LKW ('van') and the intruding noun ZUG ('train') both stem from the same semantic field 'vehicles' (Leuninger et al. 2004: 225); see Figures 2a and 2b for illustration.

- (5) ZUG // (laughs) LKW  
train // van



*Figure 2a.* ZUG ('train')



*Figure 2b.* repair: LKW ('van')

This kind of lexical variation is a language-internal processing phenomenon. It holds universally for all natural languages. However, depending on the modality, typology, and language-particular aspects of a given language, such processing errors show differences in the form of the errors and their distribution over error categories (see Section 3; Keller et al. 2003; Leuninger et al. 2004).

## 5. Conclusions

In this paper, I have tried to discern various sources of variation between and within languages in an attempt to clarify possible cross-linguistic variation between sign languages. What kind of cross-linguistic variation can we expect and what kind can't we expect? In this vein, I have spanned a variation space defined by various dimensions such as UG, modality, typology, and cross-linguistic variation along which languages may or may not vary.

In this effort, I plead to proceed in a principled way, drawing on an overarching theory of the human language faculty, such as generative grammar, rather than to proceed in an eclectic or merely descriptive way. The advantage of using such a comprehensive theory is that it claims universal representations and processes which allow for an abstract model-theoretic characterization of the structure and the processing of a language. Such a universalist perspective claims that all languages are basically equal, on a very abstract level of characterization, in the sense of UG, i.e., no variation exists. However, generative grammar also claims that the human language faculty is rich and diverse, i.e., there is variation. Proceeding from underlying uniformity, one can step by step add variation in a controlled way by drawing on the above-mentioned dimensions of

variation – parametric variation, modality, typology – and pin-point their respective contribution to the overall amount of variation.

In generative grammar, cross-linguistic differences are due to parametric variation in the lexical entries of Functional Categories (see Section 4). Thus, whether Tns selects Agr or Agr selects Tns (Ouhalla 1991) makes a difference in word order. Languages also vary with respect to their inventories of FCs, that is, which of the FCs are grammaticalized. Parametric variation between languages can be found between modality- and typologically related and also unrelated languages (see Section 4.3), that is, one dimension of variation (parametric variation) can cut across another one (modality). Importantly, the set of linguistic primitives, for example, FCs or phonetic primitives, is not fixed by UG. Rather, they emerge in the interaction of innate constraints on their possible form with the concrete data provided by the linguistic environment. This holds true of signed and spoken languages alike.

Generative grammar can deal with modality effects, too, in a principled way. Since the advent of the minimalist program (Chomsky 1995, 2001), linguistic constraints have been relegated to the two language interfaces, namely A-P (Articulatory-Perceptual) and C-I (Conceptual-Intentional). PF-interface constraints, in particular, are suited to capture modality differences since here the internal linguistic system interacts with production and perception (information channels, articulators and sensory transducers, etc). Vertical processing, the major processing dimension for sign languages (see Section 2.5), thus fosters non-concatenative morphology whereas horizontal processing, the major processing dimension for spoken languages, fosters concatenative morphology. On the level of representation, however, this superficially impressive variation can be reduced to a minor difference in the setting of a morphological parameter, namely if the alignment of morphemes is realized predominantly horizontally (in the dimension of time) or predominantly vertically (in the dimension of space, and, of course, also in time) (Leuninger et al. 2005, 2007).

Throughout this chapter, I have pointed out the role of *time* as a ‘generator of variation’. The diversity of languages develops over time. The role of time, however, is not very well implemented in the time-less character of an innate language module in the sense of UG. Time, however, is crucial for structure-building processes (Hohenberger 2002; Elman 1990) and for generating variation (van Geert 1997). The fact that generativists usually ignore the role of time is probably caused by the fact that so much



time has already elapsed in the evolution of language and has allowed for a rich linguistic structure to emerge that theorists only focus on the (preliminary) end-product of it rather than on the lengthy temporal process leading to these end products. However, acknowledging time as an agent of change and variation is especially important for the evaluation of the range of variation between sign languages (Meier 2002; Woll 2003; Aronoff et al. 2003, 2005; Goldin-Meadow 2003). The fact that there is not as much variation between different sign languages may be the trivial result of a lack of time for them to develop. Especially, the creation and stabilization of morphological paradigms and syntactic derivations may be time-sensitive. To put it metaphorically, whereas for most of the spoken languages we see already the fruits, we only see the blossoms of sign languages. The trees on which they bloom need to be cultivated to grow and eventually reveal their fruits. This cultivation needs our collective cross-cultural efforts.

## Notes

1. Besides the four major phonological parameters (handshape, place of articulation (POA), movement, orientation), also more refined categories such as selected fingers and contact, and broader categories such as hand arrangement (of the two hands with respect to each other) and feature combinations were assessed.
2. In Table 2, we compute the proportion of phonological and lexical slips against the overall number of slips (including also other affected categories like morphemes and phrases) in the respective corpora.
3. For a comprehensive overview over manual alphabets of the sign languages of the world, see Sutton-Spence (2006) and the omniglot website at: <http://www.omniglot.com/links/signlanguage.htm>.
4. PAM resembles English “do-support” in that in both cases a “dummy” lexical element is created onto which a morphosyntactic feature (agreement) is discharged.

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