Nonmanuals: their grammatical and prosodic roles

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1. Introduction[1]

There are numerous popular misconceptions about sign languages. One of these misconceptions has it that sign languages are "languages on the hands", that is, that sign language lexemes as well as morphologically and syntactically complex structures are articulated entirely by the hands (and possibly the lower arm).

In the course of this chapter, we will show that this statement is far from appropriate. Surely, the hands play an important role in the articulation of signed utterances, but other articulators – the body, the head, and (parts of) the face – are just as important. All linguistically significant elements that are not expressed by the hands are referred to as "nonmanual markers" or just "nonmanuals". Actually, it has been shown that signers, while communicating, do not focus their attention on each other's hands but rather on the face, where essential grammatical information is encoded nonmanually (Siple 1978; Swisher et al. 1989).

Linguistically significant nonmanuals have to be distinguished from purely affective nonmanual markers such as facial expressions or head movements expressing disgust, disbelief, or surprise, which are used by signers just as they are used by speakers. Differentiating between the two types of markers is not always straightforward but certain distinguishing criteria have been suggested. The scope and the timing of linguistic nonmanual behaviors, for instance, is linguistically constrained relative to the manual sign(s) they accompany in a way that affective markers are not (e.g. Baker-Shenk 1983; Reilly & Anderson 2002). The examples discussed in this chapter will make clear that this is indeed the case.

The chapter is divided into two parts. In section 2, we will address various grammatical functions of nonmanual markers. In this section, the grammatical nonmanuals are grouped together according to their role at different linguistic levels. We will consider phonological (§ 2.1), morphological (§ 2.2), syntactic (§ 2.3), and pragmatic (§ 2.4) markers in turn. Section 3 looks at prosodic functions of nonmanuals. Here, we will make a distinction between edge markers (§ 3.1) and domain markers (§ 3.2). We will see that occasionally, a syntactic nonmanual may also function as a prosodic domain marker. Note that in both section 2 and section 3, it is not our goal to describe the repertoire of nonmanuals as found in a single sign language. Rather, we present data from various sign languages and, wherever relevant, point out similarities and differences found between sign languages. Section 4 concludes our survey of linguistic nonmanual markers in sign languages.

2. Grammatical functions of nonmanuals

2.1 Phonological nonmanuals

Phonological (or lexical) nonmanuals are assumed to be an essential part of a sign's phonological description. That is, just like manual parameters such as handshape, movement, and location, these nonmanuals have to be specified in the lexical entry of a sign. Here, we will consider three distinct types of nonmanual articulation, head and body movements, facial expressions, and mouth patterns (§ 2.1.1 to 2.1.3), and we will briefly consider their interaction with the manual part of a sign (§ 2.1.4).

2.1.1 Head and body movements

Signs may be lexically specified for a particular head or body movement. In many sign languages, for instance, in the sign for SLEEP, one hand or both hands are brought to the side of the head as if supporting the head and the head tilts towards the palm of the hand(s). In connected signing, the head tilt may be minimal but it has to be present.

Head movements also commonly accompany negative particles and interjections. In both American Sign Language (ASL) and German Sign Language (DGS), the signs meaning NOT/NO, though different in all manual parameters, are signed with a single sideward head movement. This movement is usually synchronized with the manual movement, a wrist rotation at the chin in ASL and a straight path movement in neutral signing space in DGS (see § 2.1.4). While it is likely that these negative signs are lexically specified for a head movement, we will see below (§ 2.3.1) that negative headshakes also fulfill a syntactic function.

Lexically specified body movements are attested in signs that involve a semantics of inclusion or exclusion (also see § 2.4). The ASL signs for AVOID and REJECT, for instance, involve a slight backward lean while involve and encourage are accompanied by a forward lean (Wilbur & Patschke 1998).

2.1.2 Facial expressions

Just like head and body movements, lexically specified facial expressions are closely related to the semantics of a sign. In DGS and Sign Language of the Netherlands (NGT) (and probably most other sign languages), adjectival signs like HAPPY, ANGRY, and SURPRISED (and the related nominals) are usually accompanied by an expression that reflects the respective emotional state. Besides emotions, sensations can also motivate the presence of a particular facial expression. This holds, for instance, for the NGT sign SOUR in which the facial expression is related to the sensation of sour taste (imagine yourself biting a lemon).

The lack or presence of a facial expression may define a minimal pair, as in the Catalan Sign Language (LSC) examples in figure 1: the two signs PITY and FALL-IN-LOVE have identical manual articulation (flat O-hand at contralateral side of the chest) but differ in facial expression: as expected based on the lexical meaning, PITY is accompanied by a negative facial expression (furrowed brows and pursed lips) while FALL-IN-LOVE has a positive, relaxed one. Examples like this are good evidence for the assumption that the nonmanual marker has phonological significance.
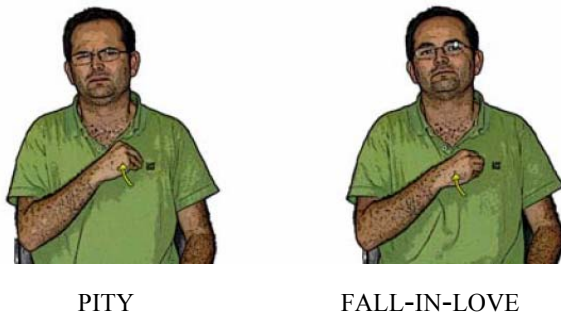
PITY　　　　　FALL-IN-LOVE

Figure 1. Two LSC signs differing only in facial expression

2.1.3 Mouth gestures vs. mouthings

Let us now turn to the role of the mouth. In the literature, two different types of lexical mouth patterns are usually distinguished (Boyes Braem & Sutton Spence 2001): mouth gestures (also referred to as oral components) and mouthings (also labeled spoken components or word pictures). While mouth gestures are not related to or influenced by the surrounding spoken language, mouthings are derived from spoken words.

In mouth gestures, the mouth pattern may either change or remain constant during the articulation of the sign. In the Norwegian Sign Language (NSL) sign GO-AWAY, for instance, the initial mouth position is open and neutral while the final mouth position is closed with lips pressed together (Vogt-Svendsen 2001). Crucially, the sign also involves a handshape change from open (**C**-hand) to closed (**▌** -hand). In contrast, in the NGT sign BE-PRESENT, the hand (**➤**-hand) executes a forward and slightly downward movement ending in an abrupt stop and the accompanying mouth gesture is [shhhh], see Figure 2a.

_____[shhh]　　　　　　　　[blu:m]　　　　　　　　　_____[mu:]
a. BE-PRESENT　　　　b. FLOWER　　　　　　c. MOTHER
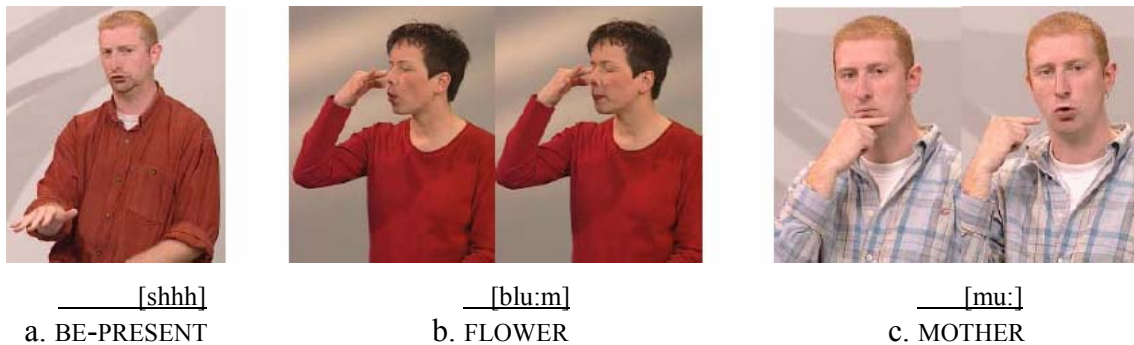
Figure 2. Three NGT signs with mouth gesture (a), full (b), or reduced mouthing (c). Reprinted with permission from Schermer et al. (2006). Illustration copyright © Nederlands Gebarencentrum.

As opposed to mouth gestures, mouthings are silent articulations of (a part of) a corresponding spoken word of the surrounding language. If only part of the corresponding word is articulated, it is usually its first syllable. For illustration, consider the two NGT examples in Figure 2: FLOWER in (b) has full mouthing, MOTHER in (c) has reduced mouthing in that only the first syllable of the Dutch word is articulated (Schermer 2001). Note that the Dutch word for 'flower' is _bloem_ [blu:m] and the word for 'mother' is _moeder_ [mu:də]. While these mouthings could be considered redundant in that they don't add anything to the meaning of the respective manual signs, other mouthings disambiguate the meaning of a manual sign with a more general meaning. A general sign like, for instance,

the NGT sign SMALL-OBJECT can take on specific meanings such as 'pea', 'pearl', or 'detail' by virtue of the accompanying mouthings.

It has to be pointed out that, especially for the group of redundant mouthings, it is a matter of debate whether they really constitute an integral part of a sign language. Based on the observation that there is considerable inter- and intra-signer variation in the use of mouthings, some researchers have argued that many if not most mouthings should be considered a language contact phenomenon. Following this line of argumentation, mouthings are not linguistically significant and are not part of the lexical description of a sign (e.g. Hohenberger & Happ 2001).

Moreover, sign languages may differ from each other with respect to frequency of mouthings. Obviously, the use of mouthings depends on a subject's exposure to the spoken language, which implies that the educational background has an important influence. Also, it has traditionally been argued that, in comparison to many European sign languages, the use of mouthings in ASL is very restricted because ASL signers do not consider mouthings a part of "real ASL" (e.g. Padden 1980). A recent study by Nadolske & Rosenstock (2007), however, challenges this traditional view by showing that mouthings contribute significantly to the formal and semantic aspects of ASL.

2.1.4   Echo phonology
Some of the above examples have already made clear that there is a strong tendency for nonmanual markers to be synchronized with the manual part of the sign. For instance, a head movement is executed in parallel with a manual path movement and opening and closing hand-internal movements tend to be accompanied by opening and closing mouth movements, respectively. This characteristic synchronization pattern is referred to as "echo phonology" (Woll 2001).

Similarly, mouthings, especially reduced mouthings, can be synchronized, for instance, by means of reduplication. The NGT sign HOLIDAY (the Dutch word is *vakantie* [vakantsi]) which is signed on the cheek and involves an inherent repetition, is commonly accompanied by the reduplicated syllable [vava]. Given that in this case, the mouthing matches the syllabic structure of the sign, it could be argued that the synchronization of the reduplicated pattern is prosodic in nature.

2.2   Morphological nonmanuals

Nonmanuals that serve a morphological function come in two different types. On the one hand, such markers may fulfill an adjectival function when modifying nouns (§ 2.2.1); on the other hand, they may fulfill an adverbial function when modifying verbs (§ 2.2.2). In addition, is has been claimed that occasionally, a nonmanual marker may be a free morpheme, that is, appear on its own without accompanying manual material (Dively 2001; Vogt-Svendsen 2001). We shall not consider this last type in the present context.

2.2.1   Nonmanual adjectives
Above we have pointed out that some adjectival signs are lexically specified for a particular nonmanual. Moreover, certain adjectival meanings can be realized by a nonmanual configuration alone which is articulated simultaneously with the nominal it modifies. This is a common strategy, for instance, for expressing the diminutive ('small x') and the augmentative ('big x'). Consider the DGS examples in (1). In (1a), in order to express that

the object (a house) is smaller than usual, the signer sucks in his cheeks (represented by ')(' in the gloss) while in (1b), he blows his cheeks to indicate that the object (a tree) is of considerable size (represented by '( )'). Note that neither of the two examples contains a manual adjective. At least in (1a), however, the manual articulation of the respective noun will also change according to the intended meaning.

(2)   a.   <u>   )(</u>
              POSS$_1$ FRIEND HOUSE BUY   [DGS]
              'My friend bought a small house.'

        b.   <u>   ( ) </u>
              TODAY MAN TREE INDEX$_3$ CUT-WITH-SAW$_3$
              'Today the man will cut down the huge tree.'

It is worth noting that the same nonmanuals can also function as intensifiers when combined with manual adjectives. That is, the nonmanual in (2a) might as well combine with the sign SMALL yielding the meaning 'very small' and the nonmanual in (2b) could accompany the sign TALL to express the meaning 'very tall'.

      For NSL, Vogt-Svendsen (2001) points out that in combination with a noun, mouthings occasionally function as nonmanual adjectives, in particular, color adjectives. In one of her examples, the nominal sign PULLOVER is accompanied by the mouthing [rœd] ('red') to express the meaning 'red pullover'. She refers to such signs as simultaneous compound signs.

2.2.2   *Nonmanual adverbials*

Mouth gestures may not only modify nouns but also verbs; in this case, the superimposed nonmanual functions as an adverbial expressing how a particular action is executed. For instance, in order to express that a particular action has been done in a relaxed manner, ASL signers may make use of a nonmanual that is glossed as 'mm' (2a). The significant part of this nonmanual is the configuration of the lips: the lips are kept together and pushed out a little bit (Liddell 1980: 42).

(2)   a.   <u>   mm   </u>
              MAN FISH[continuous]   [ASL]
              'The man was fishing with relaxation and enjoyment.'

        b.   <u>   th </u>
              INDEX$_1$ GO-ACROSS. WRONG, ACCIDENT
              'I crossed the street carelessly. Whoops! There was an accident.'

Another nonmanual adverbial from ASL is illustrated in (2b). According to Liddell, the nonmanual glossed as 'th' contributes the meaning of lack of control, unawareness, and inattention. It is the last of the three meanings that is expressed in (2b) (Liddell 1980: 52). Clearly, the fact that the action expressed by the verb GO-ACROSS was performed carelessly is essential for the interpretation of the sentence. This nonmanual is characterized by a slight head tilt and protrusion of the tongue through the lips.

2.3 Syntactic nonmanuals

At the level of syntax, nonmanuals can fulfill numerous functions. They may change the polarity of a sentence (§ 2.3.1), determine the sentence type (§ 2.3.2), and mark topicalized constituents (§ 2.3.3). Moreover, they accompany different types of embedded clauses (§ 2.3.4 and 2.3.5) and are capable of expressing agreement (§ 2.3.6) and person distinctions in pronominals (§ 2.3.7).

2.3.1 Negation and affirmation

The expression of sentential negation has been investigated for a vast number of sign languages. The available studies show that basically, all sign languages have at their disposal manual and nonmanual means to negate a sentence. As far as the latter is concerned, the most common marker is a side-to-side headshake (hs). While these similarities are certainly striking, more recent research has shown that there are also subtle differences between sign languages with respect to the distribution of the headshake.

Let us illustrate the common pattern with ASL examples (Neidle et al. 2000: 44f). In the presence of the manual negative particle NOT, the headshake can either be co-articulated with the particle only or it may optionally spread over the VP, as indicated by the square brackets in (3a). The particle, however, is optional, that is, headshake alone is sufficient to negate a proposition. In this case, the headshake *must* spread over the entire VP (3b).

(3) a. <u>   hs</u> [<u>   hs</u>]
       JOHN NOT BUY HOUSE   [ASL]

                   <u>   hs</u>
     b. JOHN BUY HOUSE
         'John didn't buy the house.'

The example in (4a) indicates that LSC, despite differences in word order, patterns with ASL when the manual negator is present. As in ASL, the particle NOT is optional. In the absence of NOT, however, the spreading pattern is different from the one in ASL. In LSC, it is possible (and actually common) for the headshake to accompany only the predicate. In contrast, in (3b), headshake on BUY only would be ungrammatical. Optionally, headshake may spread onto the direct object (4b) (Pfau & Quer 2002).[2]

(4) a. [<u>   </u> [<u>   </u>]] <u> hs</u>
       SANTI MEAT EAT NOT   [LSC]
              [<u>   </u>] <u> hs</u>
     b. SANTI MEAT EAT
         'Santi doesn't eat meat.'

While nonmanual-only negation seems to be the favored option in many sign languages, there are still some sign languages where a sentence cannot be negated by a negative headshake alone, as illustrated in the ungrammatical Hong Kong Sign Language (HKSL) example in (5) (Tang 2006: 217). Other sign languages that have been claimed to require a

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[2] Pfau (2002) and Pfau & Quer (2002) also include DGS in the comparison. Interestingly, DGS (which – just like LSC – has the order S-V-O-Neg) exhibits yet another pattern. In contrast to ASL and LSC, headshake on the negative particle only is ungrammatical in DGS while, as in LSC, headshake on only the predicate is possible in the absence of NOT.

manual negator are e.g. Italian Sign Language and Jordanian Sign Language. Zeshan (2006) refers to such sign languages as being "manual dominant" while sign languages of the ASL- and LSC-type are considered "nonmanual dominant" sign languages.

<div style="text-align:center">hs</div>

(5)   * YESTERDAY NIGHT FATHER FAX FRIEND   [HKSL]
       'Father didn't fax his friend last night.'

In addition to the headshake and to the lexically marked head turn (see § 2.1.1), we find a third type of nonmanual marking: a backward head tilt. This is attested only in a few languages (e.g. Greek Sign Language, Turkish Sign Language, Jordanian Sign Language) and it appears to be an areal feature resulting from the grammaticalization of the isomorphic gesture used in the speaking community of that area (Zeshan 2004a). Interestingly, this nonmanual co-exists with a negative headshake.

   Just like negation, the positive polarity of a clause can be marked nonmanually when required by emphatic affirmation. This is typically realized by co-articulation of a headnod (hn) on the emphasized constituent, as in the following Italian Sign Language (LIS) example (Geraci 2005).

<div style="text-align:center">hn</div>

(6)   SOMEONE ARRIVE   [LIS]
       'Someone *did* arrive.'

2.3.2   Interrogatives

Across sign languages, different types of questions are marked by distinct eyebrow positions (Zeshan 2004b). Typically, in yes/no-questions, the eyebrows are raised (re). In addition, the head and shoulders are often moved forward. In yes/no-questions, it is usually the entire clause that is accompanied by the nonmanual marker, as shown in the ASL example in (7a) (Liddell 1980: 20). In fact, in most sign languages, the nonmanual is the only indication that we are dealing with a question, since the word order does not change. In addition to the nonmanual marker, some sign languages employ optional question particles. In NGT, for instance, the particle PALM-UP may appear in sentence-final position (7b).

<div style="text-align:center">re</div>

(7)   a.   WOMAN FORGET PURSE   [ASL]
           'Did the woman forget the purse?'

<div style="text-align:center">re</div>

      b.   YESTERDAY INDEX$_2$ BIKE BUY PALM-UP   [NGT]
           'Did you buy a bike yesterday?'

In contrast, in most sign languages, wh-questions are accompanied by lowered eyebrows (le), often in combination with a slight backward head tilt. While in the LIS example in (8a), the nonmanual accompanies the entire clause (Geraci 2005), it has been claimed for ASL that nonmanual marking on the wh-sign alone is possible when it appears in sentence-final position (8b) (Neidle et al. 2000: 113). Still, in ASL, too, the nonmanual may optionally spread over the entire clause.

$$\overline{\text{\hspace{4cm}le\hspace{0cm}}}$$

(8) a.   TOMORROW HOUSE BUY WHO   [LIS]

          'Who will buy a house tomorrow?'

$$\overline{\text{\hspace{5.5cm}le\hspace{0cm}}}$$

    b.   TEACHER LIPREAD YESTERDAY WHO   [ASL]

          'Who did the teacher lipread yesterday?'

An exception to the general pattern that wh-questions are marked by lowered eyebrows is found in Indopakistani Sign Language (IPSL); in this sign language, wh-questions are marked by raised eyebrows in combination with chin up and a forward head movement (Aboh et al. 2005). In Figure 3, we illustrate the nonmanual markers accompanying yes/no- and wh-questions in Flemish Sign Language (VGT; Van Herreweghe & Vermeerbergen 2006) as well as the marker attested in IPSL wh-questions.

    a. VGT yes/no-   b. VGT wh-   c. IPSL wh-
       question   question   question

Figure 3. Nonmanuals accompanying VGT interrogatives (a,b) and IPSL wh-questions (c). Figures (a) and (b) reprinted with permission from Van Herreweghe & Vermeerbergen (2006). Illustration copyright © Ishara Press.

2.3.3   Topics

In this section, we introduce a nonmanual marker which is related to information structure: topicalization. While information structure has to do with the discourse function of a constituent and is therefore clearly pragmatic in nature, topicalization also has an impact on the constituent order; it can therefore be located at the syntax-pragmatics interface.[3] Nonmanuals related to information structure that can be considered purely pragmatic will be discussed in § 2.4.1.

Sign languages are sometimes claimed to be topic-prominent languages – just like e.g. Chinese. Sentence topics are characteristically realized as constituents at the left edge of the clause and are co-articulated with specific nonmanual markers. The basic marking of topics

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[3] Another specialized construction that fulfills a pragmatic function, namely focusing, is the wh-cleft construction, as analyzed by Wilbur (1994b). In example (i), the constituent LEE in the main clause is the focus while the subordinate wh-clause is the presupposition (Wilbur 1994b: 653). Amongst other things, Wilbur stresses the fact that the nonmanual accompanying the wh-clause is not the one found in ASL wh-questions (see § 2.3.2).

$$\overline{\text{\hspace{3.5cm}re\hspace{0.3cm}}}\overline{\text{\hspace{0cm}hn\hspace{0cm}}}$$

   (i)   CHAIR PAINT WHO, LEE

            'The one who painted the chair was Lee.'

is raised eyebrows, but since the information structure status of topics can vary, other nonmanuals can be layered with the raised eyebrows.

In the LSC example in (9a), the direct object occupies a topic position where it receives nonmanual marking. (9b) is different in a number of respects. First, it involves topic stacking, where the first topic relates to the subject position and the second is a temporal adjunct. Second, the subject topic is resumed by an indexical sign in the clause. It has been argued for ASL that different types of topics are accompanied by slightly different nonmanual markers such as eyes wide open, backwards movement of the head, mouth open, or head jerked up and down (Aarons 1994). In the gloss, these are usually lumped together as "t". However, for LSC (and other sign languages) such subtle differences have not yet been identified.

(9) a. $\overline{\quad\text{t}\quad}$
ONION, INDEX₁ HATE   [LSC]
'Onions, I hate.'

b. $\overline{\qquad\qquad\text{t}\qquad}$ $\overline{\qquad\text{t}\qquad}$
INDEX₁ BROTHER INDEX₃, TOMORROW MORNING, INDEX₃ CAR BUY
'As for my brother, tomorrow morning he will buy a car.'

The topicalized constituent is usually followed by an intonational break, which is marked by a change of different nonmanuals simultaneously (see § 3.1.3) and possibly an eye blink (see § 3.2).

2.3.4   Conditionals

Just like topics, conditionals involve raised eyebrows, possibly in combination with other nonmanual markers (such as raised chin). In fact, similarities between topics and conditionals have been the topic of studies on spoken (Haiman 1978) and signed (Coulter 1979) languages. In the sign languages that have been investigated to date, it is always the protasis, that is, the clause that describes a hypothetical situation, that is accompanied by the nonmanual marker. Just like topics, this clause appears in sentence-initial position; it may be followed by an eye blink (see § 3.1) and by a change in head orientation. In addition, Liddell (1986) argues that in ASL, the predicate in the conditional clause is frequently accompanied by a head thrust (ht), see (10a). ASL also has the manual conditional markers I-F and SUPPOSE; the use of one of these markers, however, is optional.

(10) a. $\overline{\quad\text{ht}\quad}$
$\overline{\qquad\text{re}\qquad}$
TOMORROW RAIN, PICNIC CANCEL   [ASL]
'If it rains tomorrow, no picnic.'

b. $\overline{\qquad\qquad\text{re}\qquad\qquad}$
IF INDEX₃ INVITE-ME BIRTHDAY-PARTY OF-HIM, INDEX₁ GO   [ISL]
'If he invites me to his birthday party, I will go.'

c. $\overline{\qquad\text{re \& squint}\qquad}$
IF INDEX₃ STOP SMOKE, INDEX₃ LIVE   [ISL]
'If he had quit smoking, he would be alive.'

It has been defended that nonmanuals systematically distinguish between factual (neutral) and counterfactual conditionals in Israeli Sign Language (ISL): while brow raise marks the former type of conditional (10b), the combination of the brow raise and eye squint flags the

latter (10c) (Dachkovsky, in press). See figure 4 for illustration of the respective nonmanuals.[4]

factual/neutral conditional (10b)   counterfactual conditional (10c)
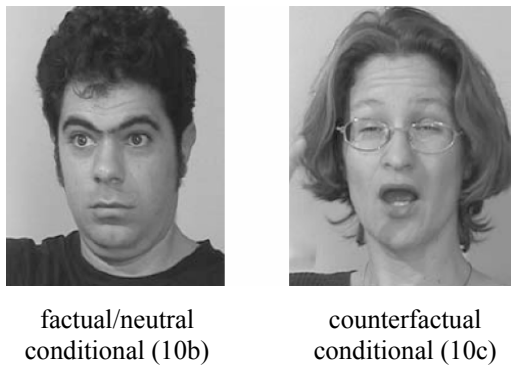
Figure 4. Nonmanuals accompanying ISL conditionals. Reprinted with permission from Dachkovsky (in press). Illustration copyright © Signum Press.

2.3.5   Relative clauses

In the area of relativization, sign languages have been shown to be subject to typological variation. Just as in spoken languages, an important distinction concerns the use of head-internal versus head-external relative clauses; the former type has been described for ASL (Liddell 1980), while the latter has been identified in DGS. Irrespective of this typological distinction, and similar to topics and the protasis of conditionals, relative clauses are marked by raised eyebrows.

LIS relative clauses usually appear in sentence-initial position. As can be seen in (11a), borrowed from Branchini & Donati (in press), the time adverbial TODAY preceding the head noun MAN has scope over the relative clause predicate. Moreover, the nonmanual (re) extends over the head noun and the adverbial, thereby defining a prosodic constituent (see § 3.1). Note that PE is an obligatory clause-final marker that is accompanied by the mouth gesture [pə] (Cecchetto et al. 2006; Branchini & Donati, in press).[5]

(11) a. $\overline{\qquad\qquad\text{re}\qquad\qquad}$
         [TODAY MAN$_3$ PIE BRING PE$_3$] YESTERDAY (INDEX$_3$) DANCE   [LIS]
         'The man that brought the pie today danced yesterday.'

      b. $\overline{\qquad\text{body lean-3a}\qquad}$
          $\overline{\qquad\text{re (}\underline{\qquad}\text{)}\qquad}$
         TOMORROW [MAN (INDEX$_{3a}$) [RPRO$_{3a}$ TIE BUY]] CONFERENCE$_{3b}$ GO-TO$_{3b}$ [DGS]
         'Tomorrow the man who is buying a tie will go to a conference.'

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[4] At least in ASL, DGS, and ISL temporal adverbial clauses ('when' clauses) also appear in sentence-initial position and are marked by raised eyebrows. Due to the similarity in nonmanual marking, a sentence may sometimes be ambiguous between an adverbial and a conditional reading, as e.g. in (i) from Coulter (1979: 26).

   (i) $\overline{\quad\text{re}\quad}$
         RAIN, NOT GO PICNIC
         'If it rains, we won't go on the picnic.'
         'When it rains, we don't go on picnics.'

[5] Note that the two studies offer different accounts for LIS relative clauses. According to Cecchetto et al. (2006), LIS has correlatives and PE is correlative marker. In contrast, Branchini & Donati (in press) argue that LIS relatives are internally headed and that PE is a determiner-like element.

Things are different in DGS. Note that in (11b), the adverbial TOMORROW scopes over the main clause predicate and, crucially, the head noun MAN is outside of the domain of the nonmanual marker, which either marks only the clause-initial relative pronoun RPRO or spreads over the entire relative clause. It has therefore been suggested that DGS relative clauses are externally headed (Pfau & Steinbach 2005). In addition, DGS relative clauses may be accompanied by a body lean towards the locus of the antecedent of the relative, i.e. locus 3a in (11b).

2.3.6 Agreement

It has long been realized that in most sign languages, the movement and/or orientation parameter of certain verbs can be modulated to express agreement with the subject and the object of the verb (Padden 1988). That is, agreement can be realized manually (see Mathur & Rathmann, this volume, and Padden et al., this volume, for discussion). More recently, it has been claimed that, at least in ASL, agreement can also be expressed nonmanually (Bahan 1996; Neidle et al. 2000). The important observation is that in transitive sentences, head tilt towards the subject locus may be used to express subject agreement while eye gaze towards the object locus may mark object agreement. These markings are found both in clauses containing agreement verbs (like BLAME in (12a)) and in clauses containing plain verbs (like LOVE in (12b)). Note that head tilt is argued to begin slightly prior to eye gaze (examples adapted from Neidle et al. (2000: 64)).

$$
\begin{array}{ll}
& \underline{\text{head tilt-3a}} \\
& \underline{\text{eye gaze-3b}} \\
\text{(12)} \quad \text{a.} \quad \text{ANN}_{3a} \quad {}_{3a}\text{BLAME}_{3b} \ \text{MARY}_{3b} & \text{[ASL]} \\
& \text{'Ann blames Mary.'} \\
& \underline{\text{head tilt-3a}} \\
& \underline{\text{eye gaze-3b}} \\
\text{b.} \quad \text{JOHN}_{3a} \quad \text{LOVE MARY}_{3b} \\
& \text{'John loves Mary.'}
\end{array}
$$

However, the assumption that eye gaze systematically targets the locus of the object referent is challenged in a study by Thompson et al. (2006). Making use of eye-tracking equipment, they show, amongst other things, that only eye gaze accompanying agreement verbs frequently targets the object location. In contrast, with plain verbs, eye gaze is rarely directed toward the object; rather, it targets the addressee or some other location. They therefore conclude that there is no nonmanual object agreement in plain verbs.[6]

2.3.7 Pronominalization

The pointing sign glossed as INDEX in the previous examples has been argued to fulfill various functions: it is used to localize a referent in signing space (as in (11b)), it may function as a definite determiner or a spatial adverbial, and, last but not least, it may serve

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[6] Thompson et al. (2006) also investigate eye gaze patterns accompanying spatial verbs such as PUT-DOWN and MOVE. In spatial verbs, the movement is not determined by subject and object but rather by locatives, as e.g. in 'I move the book from the shelf to the table'. Bahan (1996) claims that in spatial verbs, too, eye gaze targets the object location. That is eye gaze should follow the movement of the hand which manipulates the object (the book). Thompson et al., however, find that eye gaze in spatial verbs systematically targets the goal location (the table).

to pronominalize an argument. In particular, the latter use of INDEX is debated (see Coppola & Senghas, this volume). While the first person pronoun INDEX$_1$ has a fixed location (the signer's chest), the same does not hold for second and third person pronouns, which can be articulated anywhere in the signing space (the "listability problem"). It has therefore been argued that sign languages, in contrast to spoken languages, only distinguish between first and non-first person in their pronominal systems (Meier 1990).

This proposal has been challenged on the basis of meticulous analyses of the pronominal systems of Brazilian Sign Language (LSB; Berenz 2002) and Croatian Sign Language (HZJ; Alibašić Ciciliani & Wilbur 2006). In both studies, it is argued that nonmanual properties systematically distinguish second from third person pronouns. Taking into account not only the direction of pointing, but also direction of eye gaze, and degree of head turn, the authors find that all three parameters align with each other in second person pronouns but tend to be in disjunction in third person pronouns. That is, when pointing to the addressee, the face and the eye gaze follow the direction of the hand. For the sake of illustration, we give two representative HZJ examples in figure 5. Note that in the right picture, the nonmanual features eye gaze and head turn are not aligned with the hand.
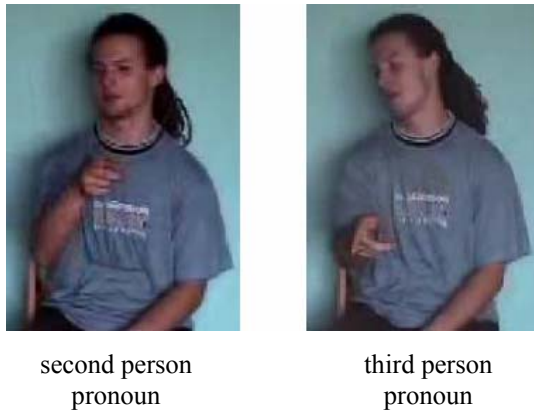

second person
pronoun

third person
pronoun

Figure 5. HZJ pronouns distinguished by nonmanuals. Reprinted with permission from Alibašić Ciciliani & Wilbur (2006). Illustration copyright © John Benjamins.

The evidence from HZJ and LSB suggests that at least these sign languages distinguish between first, second, and third person in their pronominal systems, thereby conforming to a universal that has been suggested on the basis of spoken language evidence.

2.4   Pragmatics

2.4.1   *Focus: body leans*

In § 2.1.1, we already pointed out that certain verbs may be lexically specified for body leans. Besides this phonological function, another important function of body leans lies in marking pragmatic distinctions. In this use, leans interact with the discourse notion of focus. Broadly, forward leans are associated with inclusion and affirmation while backward leans are associated with exclusion and negation.

Wilbur & Patschke (1998) distinguish various focus functions of leans, some signaling completive focus, some indicating contrastive focus. Here, we will consider only one example of the latter type: replacing (corrective) focus whereby a specific item of the previous discourse is rejected and replaced by another item. In the ASL example in (13), we

observe a backward lean on the rejected (i.e. excluded) item but a forward lean on the replacing (i.e. included) item (Wilbur & Patschke 1998: 296).

<pre>
                    _____lean back_____   ____lean back___   ___lean forward___
(13) a.   INDEX₁ THINK TUESDAY TODAY, INDEX₁ MISTAKE INDEX₁, WEDNESDAY   [ASL]
           'I thought it was Tuesday but I was wrong. It's Wednesday.'
             _____leftward lean_____   _____rightward lean_____
           _____hs_____
      b.   NO INDEX₃ RIDE-BIKE   INDEX₃ ASL STUDY INDEX₃   [NGT]
           'No, he's not out biking, he's studying ASL.'
</pre>

Results from a recent study on NGT (Kooij et al. 2006) indicate that NGT signers have a preference for a left-right spatial contrast in marking replacing focus – as opposed to ASL where the backward-forward contrast is more common. The sentence in (13b) is a response to the question "Is your brother riding his bike?". Note, however, that the left-right contrast in NGT is not used systematically to indicate inclusion/exclusion, as has been suggested for the forward/backward contrast in ASL by Wilbur & Patschke.

2.4.2   Role shift

Role shift (also known as role taking and referential shift) plays two, sometimes overlapping roles in the grammar of sign languages. First, in its quotational use, it is used to directly report the speech or the unspoken thoughts of a character (also known as constructed discourse). Consider the LSC sentence pair in (14). (14a) involves indirect speech; INDEX₃ₐ in the embedded clause targets the locus in signing space that has been assigned for ANNA. In contrast, in (14b), we observe a slight body shift towards the locus of ANNA (bs-3a) following the main clause predicate SAY. Crucially, in this example, the signer uses the first person pronoun INDEX₁ to refer to the referent producing the reported utterance. In addition to body shift, role shift may be marked by a change in head position, and a break in eye gaze contact with the addressee (Quer 2005).

<pre>
(14) a.   ANNA₃ₐ ₃ₐSAY₁ INDEX₃ₐ FED-UP LOSE+++   [LSC]
           'Anna told me that she was fed up with losing so often.'
                              _____bs-3a_____
      b.   ANNA₃ₐ ₃ₐSAY₁ INDEX₁ FED-UP LOSE+++
</pre>

Secondly, in its nonquotational use, role shift expresses a character's action, including facial expressions and nonlinguistic gestures. That is, the signer embodies the event from the character's perspective. This embodiment is also referred to as constructed or reported action. The DGS example in (15) is part of a retelling of a *Canary Row* episode. The signer first takes on the role of the cat by means of facial expression and eye gaze; the referent is projected onto the signer's body and the action is reported as seen in the cartoon. He then switches to the role of the bird, again by adapting the nonmanual features to those of the cartoon character. Note that the adverbials in the translation are inferred from the nonmanual features.

		tongue out		pursed lips
		squint		eyes open
	t	eye gaze up		eye gaze down

(15)   RAIN-PIPE, CAT CLIMB-UP(2h), FLAT-SURFACE BIRD LOOK-DOWN   [DGS]
'The cat (eagerly/slyly) climbs up through the rain pipe while the bird
(curiously) looks down from the roof.'

There is some overlap between both uses of role shift since in quotational role shift, signers frequently take on affective facial expressions of the character whose utterance they report (e.g. an annoyed or frustrated expression in (14b)). Moreover, nonquotational role shift may also involve body shift to a character's locus in signing space.

3.   Prosodic functions of nonmanuals

The intention of the previous sections was to convince the reader that nonmanual markers are indeed an essential part of the grammar of natural sign languages. Although the story so far certainly doesn't suffer from a lack of complexity, we shall now add to our investigation yet another domain in which nonmanuals have been claimed to play a crucial role, thereby making the plot even a little more complex. The domain that we are referring to is prosody.

Besides the various grammatical functions set out above, it has been shown that nonmanuals also participate in structuring an utterance prosodically. In sign languages, just as in spoken languages, utterances are organized in chunks that are characterized by intricate patterns of stress, rhythm, and intonation. These patterns are referred to as prosody. The relevant prosodic chunks are hierarchically organized according to the Prosodic Hierarchy in (16) (Selkirk 1984).

(16)   syllable > foot > **prosodic word** > phonological phrase > **intonational phrase (IntP)**
        > phonological utterance

While it has been argued that the syllable (see Jantunen & Takkinen, this volume) and the phonological phrase (Sandler 1999) are also relevant prosodic constituents in sign languages, in the following, we shall only be concerned with the prosodic word and the intonational phrase (IntP). Two distinct groups of nonmanual markers will be discussed: domain markers (§ 3.1) and edge markers (§ 3.2).

3.1   Domain markers

The ability to be co-articulated with a sequence of adjacent signs is a hallmark of domain markers. The reader will remember that actually, most (if not all) of the syntactic nonmanuals introduced in § 2.3 are also capable of accompanying complex constituents. We therefore have to start our discussion of domain markers with a note on the relation between syntactic and prosodic phrasing (§ 3.1.1). Following these preliminary remarks, we will show how nonmanual domain markers can be employed to mark prosodic words (§ 3.1.2) and intonational phrases (§ 3.1.3).

3.1.1 On the relation between syntactic and prosodic phrasing

What complicates the search for specifically prosodic nonmanual markers is the fact that frequently, prosodic structure aligns with syntactic constituency. The apparent isomorphism though is not complete, which suggests that the two grammatical components are autonomous (Nespor & Vogel 1986). Still, given that there is a tendency for prosodic constituents to be isomorphic with syntactic ones, the same nonmanual marker could potentially be interpreted as fulfilling a syntactic and/or prosodic function. In other words: one nonmanual marker might play multiple roles in grammar. For instance, since a topicalized constituent forms its own IntP, it cannot be decided with certainty whether the nonmanual marker accompanying the topic (see example (9)) marks a syntactic or a prosodic domain.

Sign language examples where syntactic and prosodic structure do not fully overlap are difficult to come by. The DGS example (11b), repeated in (17), is a possible candidate. While syntactic structure groups the antecedent noun MAN with the relative clause material (17a), intonationally the head noun and the preceding adverbial form a prosodic constituent which is independent of the relative clause (17b), as indicated by the nonmanual marking.

$$\overline{\quad\quad\text{re}\,(\quad\quad\quad)}$$

(17) a. Sy: TOMORROW [MAN (IX$_{3a}$) RPRO$_{3a}$ TIE BUY] CONFERENCE$_{3b}$ GO-TO$_{3b}$ [DGS]

$$\overline{\quad\quad\text{re}\,(\quad\quad\quad)}$$

　　　 b. Pr: [TOMORROW MAN (IX$_{3a}$)] [RPRO$_{3a}$ TIE BUY] [CONFERENCE$_{3b}$ GO-TO$_{3b}$]
　　　　　　 'Tomorrow the man who is buying a tie will go to a conference.'

In addition, nonmanuals associated with a specific syntactic construction are often lumped together into a single marker, although it might well be the case that the different components of the complex (layered) nonmanual marker have specialized functions, i.e. syntactic vs. prosodic. This hypothesis awaits further investigation. We will come back to the layering of nonmanuals in § 3.1.3.

In current theorizing on nonmanual phrasing, there are opposing views as to whether domain markers are ultimately determined by syntactic or prosodic structure. According to the first view, all grammatical nonmanuals spell out morphosyntactic features (e.g. [+wh], [+top], [+neg]) in dedicated positions in the sentence structure (Neidle et al. 2000; Wilbur & Patschke 1999). In contrast, proponents of the second view claim that "grammatical facial expressions in sign language are best understood as intonational 'tunes'" (Sandler & Lillo-Martin 2006: 259). Obviously, a more fine-grained account of the interaction of syntax and prosody is needed to resolve the tension between these domains of grammar and to do justice to the complexity of the facts.

3.1.2 Mouthings and the prosodic word

Occasionally, in connected speech two free words may be merged into one prosodic word. This process generally affects adjacent lexical and functional elements (e.g. English *haven't*) and is referred to as cliticization. For ISL, Sandler (1999) describes a number of manual indicators of cliticization, such as phonetic weakening by handshape assimilation and coalescence whereby halfway through the production of a symmetrical two-handed lexical sign, the dominant hand signs a pronominal sign while the nondominant hand completes the lexical sign. In coalescence, the pronoun loses its own syllabicity (see Jantunen & Takkinen, this volume, for discussion) but in assimilation, too, the lexical and the functional sign are often merged into one movement contour.

Besides that, nonmanual markers can also be indicative of cliticization. Frequently, mouthings spread from the lexical sign with which they are associated onto a neighboring functional sign. In a comparative study on NGT, British Sign Language (BSL), and Swedish Sign Language (SSL), Van der Kooij et al. (in press) found that all three sign languages make similar use of mouth patterns (mouth gestures and mouthings) and that in all three sign languages, mouth patterns are capable of spreading (which they compare to tone spreading in spoken languages). Spreading characteristics of mouthings, however, turned out to differ between sign languages. In NGT and BSL, the spreading direction was almost without exception rightwards. In the NGT example in (18a), we observe three instances of spreading of mouthing, two from lexical sign onto a right-adjacent INDEX, one from lexical sign onto a classifier (the Dutch words for 'village', 'boy', and 'live' are *dorp* [dorp], *jongen* [joŋən], and *wonen* [vo:nən], respectively).

             <u>   [dorp]</u>   <u>   [joŋən]</u>   <u>   [vo:n]</u>

(18) a.   VILLAGE INDEX$_3$ BOY CL-PERSON LIVE INDEX$_3$ [NGT]
           'There was a boy who lived in a village.'

                   <u>   [fœrstæ]</u>
                   <u>   hs</u>

      b.   INDEX$_1$ UNDERSTAND   [SSL]
         'I don't understand.'

In contrast to NGT and BSL, SSL also allows for leftward spreading of mouthings, that is, spreading from a lexical sign onto a preceding functional element. In the corpus compiled by Van der Kooij et al., in almost a third of the SSL examples that involve spreading, spreading proceeds leftwards, as e.g. in example (18b), in which the mouthing spreads onto a first person pronoun ('understand' in Swedish is *förstå*).[7]

    It has to be pointed out that spreading of mouthing, while being a possible indicator of cliticization, is also observed in other contexts. Van der Kooij et al. report cases in which mouthing spreads from one lexical sign onto another lexical sign and even cases where mouthing spreads over more than one adjacent sign. Therefore, in order to determine whether an instance of spreading flags cliticization, movement and handshape characteristics of the sequence also have to be considered.

3.1.3   Layered nonmanuals and the intonational phrase
As pointed out above, nonmanual markers – in contrast to prosodic signals in spoken languages (tones) – can be layered in a complex fashion. Sandler (1999) refers to this phenomenon as superarticulation, which should be understood as the sign language equivalent of suprasegmentals.

    As far as the intonational phrase is concerned, Nespor & Sandler (1999) and Sandler (1999) conclude that superarticulatory arrays of nonmanuals systematically change at IntP boundaries. For the sake of illustration consider the ISL example in (19) which is given in a detailed score notation (adapted from Sandler (1999: 206)). The example consists of two IntPs, the first one containing a topic, the second one the main (adjectival) predicate.

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[7] See Brentari & Crossley (2002) for discussion of comparable ASL examples and Boyes Braem (2001) on the use of mouthings and mouth gestures as prosodic markers in early and late learners of Swiss German Sign Language.

(19) [[BOOK-THERE]$_P$ [INDEX$_3$ WRITE]$_P$]$_{Int}$ [[INTERESTING]$_P$]$_{Int}$ [ISL]

brows	up	down
eyes	squint	droop
mouth	'O'	down
head	tilt	
mouthing	'book'	'interesting'
torso	lean	

It is worth pointing out that within the first IntP, some of the nonmanuals (eye and mouth position) also change, presumably marking smaller intonational units, namely two phonological phrases (P) corresponding to a head noun and a relative clause. However, it is only at the IntP boundary that all nonmanuals change. Besides the nonmanual signals coded in (19), Sandler also describes a number of manual cues, such as repetition of sign, signing speed, and size. Again, in this example, the prosodic structure reflects syntactic constituency.

3.2 Edge markers

In contrast to domain markers, prosodic edge markers signal the edge of a prosodic domain. They are punctual in nature, that is, they do not spread. The two types of edge markers that we want to briefly discuss are head thrusts and eye blinks. As pointed out by Wilbur (2000), there is an important difference between these two markers: while head thrusts occur on the last sign of a prosodic domain, eye blinks follow the last sign of a prosodic domain, i.e. they occur during a pause (during which the last manual sign may be held).

A head thrust is articulated with the lower jaw thrust forward. Above, we have already illustrated that head thrusts tend to co-occur with the last sign of an 'if' clause in ASL (10a). Wilbur (2000) adds to this observation that head thrust is also observed on the last sign of 'when' clauses (see footnote 4).

Eye blinks are a highly complex matter since there are different types of blinks: startle reflex blinks, involuntary periodic blinks, and voluntary blinks. According to Wilbur (1994a), the latter two types can serve linguistic functions: periodic blinks serve as boundary markers and voluntary blinks occur on lexical signs. Here, we will only consider the former of the two types. In particular, Wilbur argues that one of the functions of periodic blinks is to mark the edge of an IntP. For HKSL, Sze (in press) also argues that periodic blinks can function as prosodic edge markers ("boundary-sensitive blinks" in her terminology). In (20a), for instance, the blink (bl) occurs on a pause following a conditional antecedent which constitutes an IntP.

(20) a. _____bl_____
         SUBSIDY HAVE,   RESTRICT-ONE'S FREEDOM   [HKSL]
         'If you receive subsidy (from government), your freedom will be restricted.'

     b. _____bl_____   _____bl_____
         INTERPRETER STAND SIGN, IX$_1$ IX DEAF WATCH UNDERSTAND CONVENIENT
         'The interpreter stood (in front of the deaf person) and signed. That deaf person and I watched her signing and understood; it was very convenient.'

In addition, Sze (in press) reports boundary-sensitive blinks that overlap entirely or partly with the co-occurring sign. In other words, these blinks behave just like the head thrust in that they occur on the last sign of a prosodic domain, thereby weakening the distinction

made by Wilbur (2000). In (20b), two blinks overlap with SIGN and CONVENIENT suggesting that they serve as boundary markers. Sze also points out that blinks frequently occur at other grammatical boundaries that do not overlap with an IntP boundary, e.g. between a subject and its following predicate (see also Tang et al., this volume).

4. Summary

In natural signed discourse, nonmanual markers are all over the place. Actually, it is quite likely that, if one blackened the face of a signer on a video recording, a good part of the meaning of the message would be lost because important lexical distinctions, morphological modifications, and syntactic structures could no longer be detected. Surely, pragmatic information conveyed by body leans would still be visible and (part of) the prosodic structure could probably be inferred from manual cues such as pauses and holds. Claiming that nonmanual markers are an essential part of sign languages at the level of grammar and prosody is therefore certainly no exaggeration.

Much work remains to be done in identifying and analyzing relevant nonmanual markers. Obviously, this is a challenging task given that such markers may have very subtle properties. Once a potential candidate has been identified, its actual function has to be investigated. A prerequisite for an accurate classification is a thorough understanding of the grammatical structure of the sign language under investigation. Interesting avenues of research are opened by recent psycholinguistic and neurolinguistic studies that investigate the acquisition of linguistic nonmanuals (e.g. Reilly & Anderson 2002) or the selective impairment of nonmanual processing (Corina et al. 1999; Atkinson et al. 2004).

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