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Enumeration in LSQ (Quebec Sign Language): the use of fingertip loci †

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1 INTRODUCTION

In the literature, many authors discuss the establishment of spatial indices and subsequent reference to these spatial loci, but few studies have been conducted into the use of fingertip loci and how they may be used in subsequent reference. The study of enumeration in LSQ permits us to take a closer look at the syntactic behaviour of fingertip locus constructions; in particular, it lets us examine how it affects the use of anaphoric reference in discourse.

This paper will first describe what enumeration is by giving general observations on the difference between numeric and enumeration formational parameters, the organization of the elements and the use of plural forms for the three types of enumeration we have studied. Next, we will pay particular attention to one type of enumeration, namely fingertip enumeration. Finally, we will present one particular aspect of this type of enumeration, namely the anaphoric use of fingertip loci.

2 CORPUS

Our data were compiled from the LSQ88 corpus, which is composed of five videotaped sessions of free conversation, totalling thirty-five hours of recordings. Each recorded session consists of three or four participants engaging in spontaneous discussions with occasional prompts from one of the participants who had the role of animator. There are eleven signers in all, six men and five women. The average age of the signers at the time of taping was twenty-five. None of them was born to deaf parents but all use LSQ as their preferred means of communication.

One of our deaf informants has identified and transcribed seventy-nine examples of enumeration, from nine different signers.

3 TYPES OF ENUMERATION

We identified three types of enumeration: linear enumeration, spatial enumeration and digital enumeration.

In linear enumeration, elements are signed in a sequential manner, one following immediately after the other.

In spatial enumeration, a deictic marker is used to associate each element of the

enumeration to a locus in space. This association between the locus and the referent can be achieved in different ways for example, by signing a noun together with a pointing gesture or a classifier in space; by signing a noun directly on a spatial locus, etc. All these methods and others concerning spatial indexing are already well-known and are described in detail in the literature [among others Edge and Herrmann, 1977; Friedman, 1975; Klima and Bellugi, 1979; Loew, 1984; Wilbur, 1987].

The third type is fingertip enumeration which is based on the non-dominant hand, and where each element of an enumeration is associated with a particular finger. In the second part of this paper, we will concentrate specifically on this type of enumeration.

4 GENERAL OBSERVATIONS

4.1 *Formational parameters of numeric vs enumeration handshapes*

The use of numeral handshapes in enumeration is distinguished from cardinal numerals in the orientation of the hand. Chinchor [1978] investigated the numeral system in ASL and reported a change of hand orientation when enumerating a certain number of elements in a list; the palm is oriented towards the signer, with the fingers extended sideways.

According to our observations, LSQ numerals from one to nine are usually produced on the dominant hand, the palm facing either inwards or outwards, depending on the preference of the signer, with the fingers extended upwards.

The formation of enumerations differs from those of cardinal numerals. The non-dominant hand is used with either the palm oriented upwards and the fingers extended forward, or the palm oriented towards the signer and the fingers extended sideways or upwards. In no instances are enumerations signed with the palm oriented downwards or outwards.

4.2 *Organization of the elements in an enumeration*

It is a logical possibility that, within an enumeration, the order in which the various elements are named may be determined with respect to a particular conceptual order. However, in the linear and fingertip digital enumerations we have studied, we have not noted any examples of such ordering. If the elements of an enumeration are to be ordered with respect to each other, then it is necessary, given the intuitions of our informants, to use a sign such as APRÈS (following), or an ordinal adjective, such as PREMIER (first), and then identify the locus with a referent.

In ASL, unlike LSQ, enumerations involve an intrinsic order of elements. The use of the fingers of the non-dominant hand as loci "is particularly common if the referents are members of a group having some internal order" [Loew, 1984: 18] or

"is to list siblings in the order of their birth" [Liddell, 1990: 189]. In LSQ, the order of elements is not inherent and must be explicitly stated. However, an enumeration may in some cases contain an implicit order, which can be deduced by the receiver of the message on the basis of his/her knowledge of the subject of the conversation or his/her interlocutor. Thus, the birth order of children in a family will only be understood if the receiver is familiar with the sender's family history, otherwise the sender must make this order specific by means of ordinal numerals.

4.3 *Use of plural form*

Given that enumeration is intrinsically composed of many elements, it co-occurs naturally with plural signs, which appear either before or after the enumeration. The types of plural vary along with the elements of the enumeration. If the elements form part of a closed list the enumeration will often be preceded or followed by a definite plural, such as a number (QUATRE, CINQ (four, five)) or a definite plural pronominal sign (NOUS-TROIS (us-three)). On the other hand, if the elements form part of an open list, an indefinite plural (ETC, BEAUCOUP, LONGUE-LISTE (etc, many, long-list)) will be used.

5 DESCRIPTION OF DIGITAL ENUMERATION

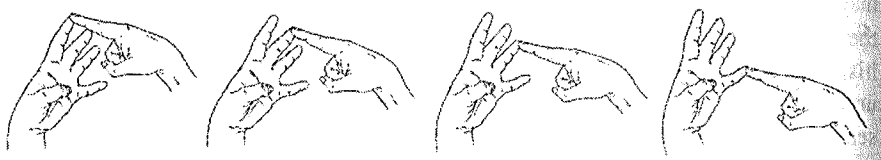
In digital enumeration, the enumeration of the elements is carried out on the non-dominant hand, each element being indexed on a particular finger. The relation between referents and the fingers of the non-dominant hand is established by touching a given finger of the non-dominant hand, then identifying it with a particular sign. The dominant hand, or both hands in the case of a two-handed sign is used to name the elements.

The non-dominant hand can take two forms: it may either adopt a stable handshape or it may move through a progressive handshape sequence.

5.1 *Stable handshape*

A stable handshape is a single handshape which is maintained throughout the length of the enumeration. We have observed the use of only two stable handshapes, the 4-handshape and the 5-handshape. In that case, the signer must make contact with each finger in sequence in order to assign an index. On the other hand, it is possible to use only some of the extended fingers, i.e. only two or three out of the four/five fingers. Contact between the dominant and non-dominant hands is obligatory for a particular fingertip to be referred to. The first fingertip is either the index or the pinky, but not the thumb, contrary to ASL [see Liddell, 1990]. Figure 1 illustrates the 4-handshape with contact on the non-dominant hand starting from the index finger.

Figure 1: 4-handshape with obligatory contact



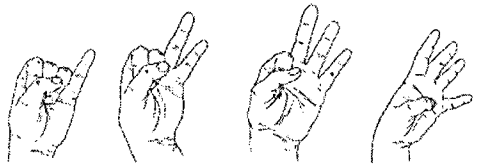
5.2 Progressive handshape sequence

A progressive handshape sequence involves a change of handshapes as each new element is named during the enumeration. We use the term progressive because the number of fingers extended increases progressively.

5.2.1 Forms of progressive handshape sequences

As a general rule, the non-dominant hand is used for progressive enumerations which start with a 1- or a 2-handshape and can increase up to a 10-handshape. The configurations of a progressive handshape sequence in an enumeration follow the same configurations as LSQ cardinal numerals. However, it is also possible (although very rare in the corpus), to begin an enumeration with the little finger and then continue towards the index finger as shown in figure 2.

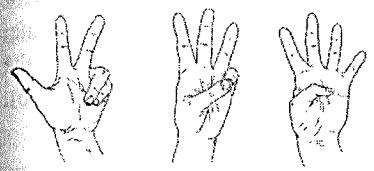
Figure 2: Progressive Handshapes starting with the little finger



5.2.2 Variation between 3-handshape and W-handshape

There is considerable variation between individual signers as to the choice of sign for the third element in an enumeration. The signer can choose between a 3-handshape or a W-handshape. However, if the enumeration extends beyond three elements, the fourth element is always a 4-handshape, and never a configuration that has three fingers and the thumb extended.

Figure 3: Three different handshapes



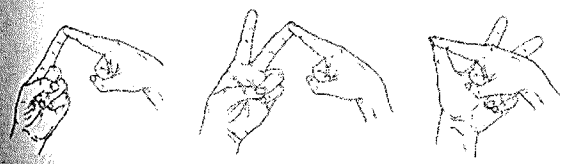
3-handshape W-handshape 4-handshape

5.2.3 Index transfer

An interesting phenomenon we have observed in enumerations with a 3-handshape is that, starting from the third element enumerated, the referent changes fingertip locus, that means the link between the referent and its fingertip locus is relocated onto a new fingertip locus. We term this index transfer.

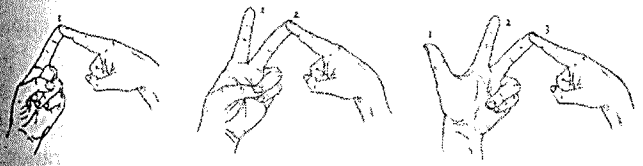
For example, a signer can make contact with either the thumb or the middle finger for the third element. If contact is made with the thumb then the referents will remain in place, the third element being indexed on the thumbtip locus [figure 4].

Figure 4: Progressive 3-handshape with contact on the thumb



However, if the contact is made with the middle finger then the referents already associated with the index and the middle fingers must relocate [figure 5]. Thus, the referent of the index finger is relocated on the thumb and the referent of the middle finger is relocated onto the index finger. It is the double use of the middle finger which forces the referents that are already associated with their loci, the index and middle fingers, to relocate onto another locus, thumb and index finger respectively.

Figure 5: Index transfer on a progressive 3-handshape with contact on the middle finger

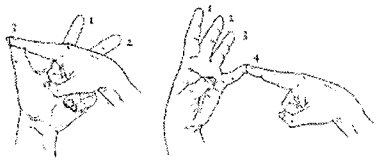


If the enumeration continues beyond three entities, there is once again a transfer of indexation. When the non-dominant hand changes from a 3-handshape, with contact made on the middle finger, to a 4-handshape, all the referents must relocate; the first referent will relocate to the index finger, the second to the middle finger, the third to the ring finger and the fourth will be associated to the little finger [figure 6].

Figure 6.: Complete index transfer

When the non-dominant hand has a 3-handshape with contact made on the thumb, the only transfer of reference necessary is from the thumb to the ring finger [figure 7].

Figure 7: Index transfer from the thumb to the ring finger



An important consequence of transfer of indexation is that it does not allow anaphoric use of fingertip loci later in the discourse. Such a transfer of indexation between fingers is potentially confusing both for the sender and the receiver since it complicates the task of remembering correctly the reference assigned to each fingertip. Therefore, if a signer intends to use fingertip loci anaphorically, he must use stable 4- and 5-handshapes or the following progressive handshape sequences: 1, 2, W, 4; I, II, F, 4 [cf. figure 2] or 1, 2, 3 with contact made on the thumb [cf. figure 4].

5.3 Functions of the fingertips

Fingertip loci appear to have a double function; the first, linguistic function concerns the anaphoric use of fingertip loci (cf. 5.0), whereas the second is paralinguistic and concerns the use of the fingertips as a visual point of reference.

The function of visual point of reference is fulfilled by using the fingertips of the enumeration handshape as an indication of the present stage of the enumeration. Thus, when the elements of the enumeration form a closed list, the function of

visual reference distinguishes those elements that have been enumerated from those that remain to be enumerated. On the other hand, when elements form an open list, it is not clear what functions the enumeration handshape fulfils and it seems that the functions are not linguistic.

6 ANAPHORIC USE OF FINGERTIP LOCI

Several studies have been carried out on the establishment of spatial indexing but little work has been done on fingertip indexation. Except Liddell [1990] who analyzed the relation between a referent and its spatial or fingertip locus, Lillo-Martin and Klima [1990], Loew [1984] and Steyaert and Loew [1978] who have dealt peripherally with the role of the fingertips, no other author, to our knowledge, has dealt with the place of fingertip loci in the grammar.

Some examples from our corpus make use of digital loci in anaphora. We will first show the results of an investigation that we carried out with two deaf informants and then we will cite some examples taken from our corpus.

6.1 Anaphoric usage of the fingertip loci : elicited corpus

We investigated the anaphoric usage of fingertip loci with a number of agreement verbs e.g. REFUSER (to refuse), DONNER-CADEAU (to give a gift), INVITER (to invite), POSER-UNE-QUESTION (to ask), RÉPONDRE (to answer)[1].

6.1.1 Loci of enumeration

In enumeration involving three fingertips, our first informant, tended not to accept constructions involving movement of a directional verb towards any but the last. An example is given in (1) where the directional verb moves towards the first referent (index fingertip) mentionned in the enumeration.

Example 1.

*FRIEND MARY$_j$ CHRISTINE$_k$ JEAN-GUY$_i$
conf1$_j$ __ conf2$_k$ _____ conf3$_i$ ___...
IINVITE$_j$ [2]
_____|

'Out of my friends Mary$_j$, Christine$_k$, Jean-Guy$_i$, I invited Mary$_j$.'

However, the three following possibilities are perfectly acceptable: the movement of an agreement verb toward or from the centre of the hand, the movement of the same agreement verb towards or from each finger, or the use of an agreement verb with an arc movement towards or from the loci. In this instance, the subject or object of the verb is a plural as in examples (2), (3) and (4). In (2a), the verb is moved towards the centre of the hand and in (2b), it is moved away from the center of the

hand. In (3) the verb uses an individual plural by repeating the verb towards each finger as in (3a) and away from each finger as in (3b). In (4 a and b), the verb has an arc movement towards the fingertips of the non-dominant hand, and away from the fingertips, respectively.

Example 2.

a) FRIEND MARY$_j$ CHRISTINE$_k$ JEAN-GUY$_i$
conf1$_j$ — conf2$_k$ ——— conf3$_i$ —— ...
IGIVE-GIFT$_{cntr}$
———————|
'My friends Mary$_j$, Christine$_k$ and Jean-Guy$_i$, I gave them$_{jki}$ a gift.'

b) FRIEND MARY$_j$ CHRISTINE$_k$ JEAN-GUY$_i$
conf1$_j$ — conf2$_k$ ——— conf3$_i$ —— ...
cntrGIVE-GIFTI
———————||
'My friends Mary$_j$, Christine$_k$ and Jean-Guy$_i$,they$_{jki}$ gave me a gift .'

Example 3.

a) FRIEND MARY$_j$ CHRISTINE$_k$ JEAN-GUY$_i$
conf1$_j$ — conf2$_k$ ——— conf3$_i$ —— ...
IGIVE-GIFT$_i$IGIVE-GIFT$_j$IGIVE-GIFT$_k$
———————————————||
'My friends, Mary$_j$, Christine$_k$ and Jean-Guy$_i$, I gave each of them$_{ijk}$ a gift.'

b) FRIEND MARY$_j$ CHRISTINE$_k$ JEAN-GUY$_i$
conf1$_j$ — conf2$_k$ ——— conf3$_i$ —— ...
$_i$GIVE-GIFTI$_j$GIVE-GIFTI$_k$GIVE-GIFTI
———————————————| | |
'My friends, Mary$_j$, Christine$_k$ and Jean-Guy$_i$, each of them$_{ijk}$ gave me a gift.'

Example 4.

a) FRIEND MARY$_j$ CHRISTINE$_k$ JEAN-GUY$_i$
conf1$_j$ — conf2$_k$ ——— conf3$_i$ —— ...
IGIVE-GIFT $_{kji}$
+arc
———————||
'My friends Mary$_j$, Christine$_k$ and Jean-Guy$_i$, I gave them$_{kji}$ a gift .'

b) FRIEND MARY$_j$ CHRISTINE$_k$ JEAN-GUY$_i$
conf1$_j$ — conf2$_k$ ——— conf3$_i$ —— ...
$_{ijk}$GIVE-GIFTI
+arc
———————||
'My friends Mary$_j$, Christine$_k$ and Jean-Guy$_i$, they$_{ijk}$ gave me a gift .'

This informant considered it necessary for the movement of the verb to be made towards the palm or all the fingers. This leads us to believe that for agreement verbs, the fingers are considered as a single unit.

Our second informant found it perfectly acceptable to use the fingertip loci as plural subject or object as in (2), (3) and (4). Contrary to the first informant, he found it admissible to use one of the first digital loci individually as in (1), and to use an agreement verb between each of the digital loci as in example (5) .

Example 5.

5) MARY$_j$ CHRISTINE$_k$ JEAN-GUY$_i$ BOOK
conf1$_j$ conf2$_k$ ——| conf3$_i$ —|
GREEN [ILENT$_{i\,i}$LENT$_{k\,k}$LENT$_j$ LOSE$_j$]
conf3 ———————————|
'I lent the green book toJean-Guy$_i$ who lent it to Christine$_k$ who lent it to Mary$_j$ but Mary$_j$ lost it.'

In this case, eye gaze appears to play an important role. When the verb is moved towards or away from a plural subject or object, eye gaze is fixed on the adressee but when the verb is moved towards or from a singular subject or object, eye gaze is fixed on the digital locus or on each digital locus in succession.

These two informants agree that it is easier and more common to make anaphoric use of the final element of an enumeration as in (6).

Example 6.

FRIEND MARY$_j$ CHRISTINE$_k$ JEAN-GUY$_i$
conf1$_j$ — conf2$_k$ ——— conf3$_i$ —— ...
IINVITE$_i$
———|
'Out of my friends Mary$_j$, Christine$_k$, Jean-Guy$_i$, I invited Jean-Guy$_i$.'

Friedman [1976] mentions a maximum of four or five different referents which can be established in space and maintained, that is to say, which can be remembered in discourse. This leads us to believe that anaphoric use of fingertip loci is syntactically permissible but it depends on the addressee's ability to keep track. In effect, the larger the number of elements in an enumeration, the more difficult it is to memorize the respective identification of each finger and therefore to subsequently use it for anaphoric reference. This would explain the unacceptability of examples (1) and (5) for the first informant. Thus anaphoric use of fingertip loci is more easily achieved on the last referent of a fingertip locus. The degree of temporal lag between the first establishment of a fingertip locus and subsequent anaphoric

reference to this locus is thus an important factor in understanding.

6.1.2 *Numeric configurations*

We can make a comparison between anaphoric pronominal use of fingertip loci in enumerations where each finger selected is related to a definite referent, with the example (7) which is acceptable for both informants.

Example 7.

FRIEND IINVITE$_{ijk}$ $_{i}$ANSWERI $_{j}$ANSWERI
+arc
THREE———————————…
NOTHING$_{k}$
————||

'I invited my three friends. Two$_{ij}$ of them responded and the other one$_{k}$ didn't say nothing.'

The difference between example (7) and the second part of the example (8) relies on the definitness of each digital locus. In example (7), the fingers have no definite reference and the individual use of the fingers is acceptable. This leads us to hypothesise that the definiteness of the referents is important for a anaphoric use of the fingertip loci.

Example 8.

FRIEND MARY$_{j}$ CHRISTINE$_{k}$ JEAN-GUY$_{i}$
conf1$_{j}$—conf2$_{k}$———— conf3$_{i}$——…
IINVITE$_{ijk}$ *[$_{i}$ANSWERI $_{j}$ANSWERI NOTHING$_{k}$]
+arc
————————————————————||

'My friends Mary$_{j}$, Christine$_{k}$ and Jean-Guy$_{i}$, I invited all of them. Jean-Guy$_{i}$ gave me an answer, Mary$_{j}$ gave me an answer but Christine$_{k}$, nothing.'

Since in (7) each of the three fingers stands for a referent that receives no precise identification, the question of memorising the identity of each of the respective fingertips does not present a problem whereas in (8), each has an overtly identified element which must be recovered in memory in order to identify the subject of the following verbs. The anaphoric use of the fingertips loci in (7) is acceptable for both informants.

6.2 *Anaphoric usage of the fingertip loci: spontaneous corpus*

Looking through the examples drawn from our videotaped corpus, we note the

following facts. First, it is possible to make anaphoric use, either as pronoun or as discourse topic, of the last fingertip locus mentioned. We observe this anaphoric use in the first series of bold signs in (9). Second, if the signer wishes to return to the first element of the enumeration, he reindexes the full lexical element in its initial locus, which can subsequently become the discourse topic as in the second and third serie of bold signs in (9).

Example 9.

'marketing'
(…)INDEX$_{m}$ LAW$_{m}$ INDEX$_{l}$ STORE
(…)conf5————————————|
M-A-R-K-E-T$_{l}$ // INDEX$_{l}$ VARIOUS SALE IN //
conf5
INDEX$_{l}$ TAKE-OFF INDEXI COMPLICATED
conf5————————————————|
INCAPABLE EXPLAIN INDEX$_{k}$ MATHEMATICS$_{k}$
conf5————————…
INDEX$_{j}$ BOOK-KEEPING$_{j}$ (…) LAW$_{m}$ LOSE
————————————|
INDEXI INDEX$_{m}$ INTERESTED INDEXI
conf5—|
IMPORTANT INTERPRETER NOT-CLEAR (…)
LOSE INDEXI INDEX$_{m}$
conf5—|

'There was law$_{m}$, there was marketing$_{l}$, this$_{l}$ is different sales techniques. I dropped that$_{l}$, it$_{l}$ was too complicated and I couldn't follow the explanations. Then there was mathematics$_{k}$ and bookeeping$_{j}$. I lost out on my law$_{m}$ course - I was really interested in that one$_{m}$ and it$_{m}$ was really important - The interpreter wasn't clear. (…) So I lost out on that one$_{m}$.'

Third, it is possible to make use of serial anaphora, in which a sign (2-MONTH) is located on each individual fingertip locus in sequence as in the series of bold signs in (10) and (11).

Example 10.

TRADE VARIOUS INDEX$_{j}$ MACHINE PURE$_{j}$
conf4
INDEX$_{k}$ DRAWING$_{k}$ INDEX$_{l}$ METAL$_{l}$ INDEX$_{m}$
conf4————————————————…
ELECTRICITY$_{m}$ (…) 2-MONTH$_{j}$ 2-MONTH$_{k}$
————————|conf4————————— …

2-MONTH$_l$ 2-MONTH$_m$
——————————||

'There were different trades: metal working$_j$, drawing$_k$, metal$_l$, electricity$_m$. Each trade lasted two months.'

Example 11.

(...) CL.V$_{mlkj}$
conf5 _|

'He went through each of these jobs$_{mlkj}$.'

Fourth, it is possible to make anaphoric use of the fingertips as a set, as plural object as in examples (12) and (13). Here the signs ALL and DELETE are located on the fingers of the non-dominant hand.

Example 12.

(...) A L L$_{ijklm}$
(...) conf5 —|

'(I experienced) all these jobs$_{ijklm}$.'

Example 13.

(...) DELETE$_{mlkj}$ [3]
(...) conf5 ———|

'(As for the non-organic compounds), they$_{mlkj}$ are all$_{mlkj}$ deleted.'

7 CONCLUSION

In light of the information gathered from the elicited and spontaneous corpus, we can state that it is syntactically possible to use each locus differently and individually if they have no definite referents. On the other hand, when the referents are part of an enumeration, anaphoric use of the fingertip digital loci as subject or object pronouns, or as discourse topic is possible under the following conditions. If only one locus is used, then this locus must be the last one a referent has been associated with. If a signer wants to return to one of the first referents established in the enumeration, then he must re-sign the referent locus and optionally re-establish the index on the relevant finger-tip locus, but cannot simply re-establish the index without repeating the sign. Individual use of each locus is possible under the condition that the same sign is used on each of the loci. In that case, the loci constitute a distributive plural. Finally, any plural use of the loci is permissible, namely an arc movement, a sign directed towards or away from the center of the hand, or a sign located on each of the loci in sequence.

The data we have reported here do not exhaust all the possibilities and restrictions

related to enumerations and to the anaphoric use of fingertip loci. For example, we have observed that it is possible for a fingertip locus to be associated with two different referents (for example, the same finger may refer both to a particular school year and the name of a teacher) a situation we have not observed for spatial loci, and which seems not to be attested. In the light of Liddell's (1990) finding that only fingertip loci encode referential equality (in contradistinction to body or spatial loci or a classifier in a spatial locus), a comparison between the properties of fingertip and spatial loci would then be interesting.

Footnotes:

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1. All the predicates in the examples from (1) to (8) are located on or moved towards/away from a fingertip locus.
2. For all the following examples, the indices 'i', 'j', 'k', 'l' and 'm' correspond to the thumb, the index finger, the middle finger, the ring finger and the little finger respectively.
3. Each finger, 'j', 'k', 'l' et 'm' represents, in order: nitrogen, oxygen, hydrogen and carbon.

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Negation in international sign †

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Abstract

In this paper, we describe our analysis of negation in International Sign as part of our ongoing research effort to understand the linguistic status of International Sign. We found five types of negative markers and five different types of negative sentence structures. The distribution of negators in negative sentence structures in International Sign is very systematic and resembles that found in full national sign languages. We conclude that, although International Sign is functionally a pidgin, it has an unusually complex grammatical structure. We propose that this is due to the fact that the sign languages in this contact situation use very similar devices for marking grammatical structures such as negation, therefore these devices are not reduced or eliminated in the formation of the pidgin, but rather included.

1 INTRODUCTION

International Sign is a system of communication in the signed modality which has been used between deaf people from different sign language backgrounds for at least 150 years[1]. It has developed naturally within the European deaf community, unlike Gestuno, which is a system invented by a committee[2]. There has been little analysis of the linguistic structure of International Sign. This paper describes our analysis of negation in International Sign and addresses the fundamental question 'What is the linguistic status of International Sign?'. One possible answer is that International Sign is an ad hoc gestural system, that is, gestures adapted for use by individual signers to communicate with foreigners having different native sign languages. Another possibility is that International Sign is a pidgin. It is clearly a contact language, which exists purely for communicative purposes between signers of different and mutually unintelligible sign languages. Like a pidgin, it is not the native language of any of its users. A third possibility is that International Sign has the structure of a full signed language.

There is only a small prior literature describing the linguistic characteristics of International Sign. Moody [1987, 1989] describes it as using devices common to all sign languages, including the use of space for reference and agreement, the use of movement to encode aspect, bodyshifting, and facial expression to mark different grammatical structures. Woll [1990] analyzed the lexicon of International Sign and verified Moody's description by providing examples and discussion of the