

# Morphological universals and the sign language type\*

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Now the Egyptians, before the reign of their king Psammetichus, believed themselves to be the most ancient of mankind. Since Psammetichus, however, made an attempt to discover who were actually the primitive race, they have been of opinion that while they surpass all other nations, the Phrygians surpass them in antiquity. This king, finding it impossible to make out by dint of inquiry what men were the most ancient, contrived the following method of discovery:- He took two children of the common sort, and gave them over to a herdsman to bring up at his folds, strictly charging him to let no one utter a word in their presence, but to keep them in a sequestered cottage, and from time to time introduce goats to their apartment, see that they got their fill of milk, and in all other respects look after them. His object herein was to know, after the indistinct babblings of infancy were over, what word they would first articulate. It happened as he had anticipated. The herdsman obeyed his orders for two years, and at the end of that time, on his one day opening the door of their room and going in, the children both ran up to him with outstretched arms, and distinctly said "Becos." When this first happened the herdsman took no notice; but afterwards when he observed, on coming often to see after them, that the word was constantly in their mouths, he informed his lord, and by his command brought the children into his presence. Psammetichus then himself heard them say the word, upon which he proceeded to make inquiry what people there was who called anything "becos," and hereupon he learnt that "becos" was the Phrygian name for bread. In consideration of this circumstance the Egyptians yielded their claims, and admitted the greater antiquity of the Phrygians.

Herodotus, *History*, 2.2

## 1. THE MORPHOLOGY OF NEW LANGUAGES

Most linguists assume with Herodotus that languages can arise *de novo*, given the right circumstances. However the phenomenon of the birth of a language in a natural social setting has never previously been directly observed, strictly speaking, for either spoken or signed languages. We will report here on the first such direct observation known to us of the advent of a new language in such a setting and more specifically on the morphology of that language. New languages are predicted to have certain properties, because of their newness. As

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regards morphology in particular, they should have very little, because morphology takes time. Every language must arrive at its own particular set of morpho-syntactic and morphological categories; arbitrary associations must be established between the morphosyntactic categories and their exponents.

Prototypical creole languages have long been viewed as having very little morphology, either derivational or inflectional (McWorther 1998), because they are new. But recent findings show that, quite to the contrary, creoles have more morphology than they should (Bakker 2003, Braun and Plag 2003, DeGraff 1999, Good 2003, Lefebvre 2003). That actual creoles contradict the typological prototype set up for creole languages (which are the only new spoken languages that linguists have access to) is not unexpected, since creoles are in fact not entirely new languages. Rather, as contact languages, they result from two or more languages coming together. Furthermore, there often ensues long-term continuous contact between speakers of the creole and one or more of the contributing languages, resulting sometimes in the borrowing of wholesale morphological patterns, just as English borrowed much of its derivational morphology through contact with and extensive borrowing from French and Latin.

Sign languages are often said to resemble young creoles in both their genesis and structure, and hence might be expected to exhibit the morphological characteristics that have been ascribed to prototypical creole languages. Detailed study of the morphology of sign languages (Aronoff *et al.*, 2000, *in press*) shows, however, that developed sign languages, like actual creoles, also diverge from the expected prototype. They show complex motivated simultaneous morphology, similar across unrelated languages, but limited affixation, mostly arbitrary and different among languages. But would the same be true of a completely new sign language?

The new sign language that we have been studying recently helps to answer this question. Although there is no documentation of a spoken language arising completely *de novo* since the time of Psammetichus, there are several known instances of sign languages arising in this manner, with no outside influence, the most famous being Martha's Vineyard Sign Language, which flourished in isolation on an island off the northeastern coast of the United States from about 1700 to 1900 (Groce 1985). Harlan Lane and his colleagues (Lane *et al.* 2000) have described the social and genetic prerequisites for the rise of a sign language *de novo*. These are social and physical isolation of a community; endogamy (which is usually concomitant on the first condition); genetically-based non-syndromic recessive deafness; and time for a large enough cohort of signers to develop. Under such circumstances, a sign language will arise which is not used only by an isolated subset of the population, but is widespread among both deaf and hearing members of the community. This is precisely what we have found in the new sign language under study.

We call this new sign language Abu-Shara Bedouin Sign Language (ABSL).<sup>1</sup> This language developed independently within the last seventy years

in a closely-knit endogamous community, consequent to genetically recessive non-syndromic deafness. ABSL, unlike other well-studied sign languages, has little apparent morphology, although it may have the rudiments of agreement and aspect. ABSL morphology thus appears to vindicate the prototype for new languages.

## 2. THE SIGN LANGUAGE MORPHOLOGICAL TYPE

The study of sign languages from all over the world has made it clear that these languages constitute a morphological type: all well studied established sign languages are reported to have the same particular types of complex morphology. Two central sign language morphological constructions are verb agreement for person and number of subject and object in a semantically defined class of verbs (Engberg-Pedersen 1993, Meir 2002, Padden 1988); and a system of polymorphemic classifier constructions that combine nominal classifier handshapes with path shapes, manners of movement, and locations (Emmorey 2003). This type of morphology is typically nonconcatenative in structure (Sandler 1989), combining morphemes in a way that is simultaneous rather than sequential. We will present an analysis and representation of the sign language verb agreement system in Section 3.

What makes it surprising that sign languages universally possess such complex morphology is the fact that all known sign languages are chronologically young – a few hundred years old at the most. For example, American Sign Language (ASL) is about 200 years old and Israeli Sign Language (ISL) is only about 70 years old. In addition, at any given time, fewer than 10% of signers have learned sign language at home from deaf parents. The rest of the deaf population is born to hearing parents and is exposed to degraded and/or late sign language input, if they are exposed to sign language in their childhood at all. Thus, the youth of sign languages and the perpetual interaction between native and non-native users of these languages make sign languages comparable to spoken creoles, and indeed, some researchers have argued that sign languages have many grammatical characteristics in common with creole languages (Fischer 1978, Gee and Goodhart 1988). Yet creoles typically have limited morphology (McWhorter, 1998), while sign languages all seem to have complex morphology of a particular type. We have argued that the complex morphology found universally in established sign languages is linked conceptually and formationally to visuo-spatial cognition (Aronoff et al. 2000, in press; Aronoff et al. 2003).

But sign languages also have another type of morphology that is more commonly found in spoken languages, including creole languages: sequential affixation that has arisen through grammaticalization.<sup>2</sup> We present here one example of this type of affixation from American Sign Language and another

from Israeli Sign Language. In each case, the affixes correspond to independent words that still exist in the language.

### 2.1. Sequential affixation through grammaticalization: The ASL-ZERO affix

Like most other languages, ASL has many ways of expressing negation. One of them is through affixation, usually to a verb, of a one-handed form, in which the fingers form the shape of a zero and the hand moves outward from the body. The affix, meaning ‘not X at all’, is semantically and phonologically similar to a free word. The word is made with two symmetrical hands and means ‘none at all’. The free words, SEE and ZERO (‘none at all’), and the suffixed verb ‘SEE-ZERO (‘not see at all’) are shown in Figure 1:

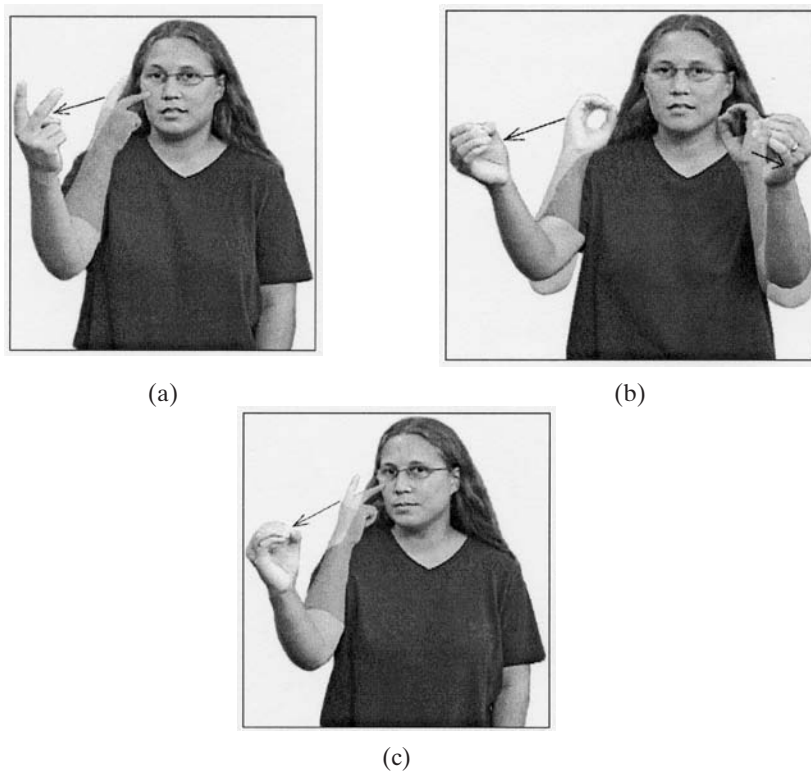


Figure 1. (a) SEE (ASL). (b) Independent word: NONE-AT-ALL (ASL). (c) Affixed form: SEE-ZERO, ‘not see at all’ (ASL)

One reason for considering the form a suffix (rather than an independent word) is that it must occur after, never before, its stem. This is one way in which

it differs from the free word, which can occur either before or after verbs. Another reason is the recurrence of the same ZERO form with many different stems. For most signers, the suffix appears to be lexicalized, phonologically fused to the verb and occurring only with a limited set of verbs, some of which have idiosyncratic meanings (Sandler 1996). For others, the suffix is more productive, and may also attach to adjectives. Suffixed forms sometimes have idiosyncratic meanings; e.g., TASTE-ZERO does not mean ‘not taste at all’, but rather has the meaning ‘not at all to my taste’. A phonological constraint restricts the suffix to one-handed verbs, and a morphological constraint restricts its use to plain verbs and prohibits it from attaching to agreeing verbs or to spatial verbs (Aronoff, Meir, and Sandler 2000, in press; Sandler and Lillo-Martin, in press).<sup>3</sup> Taken together, these properties demonstrate that -ZERO is a grammaticalized affix in ASL.

## 2.2. Sequential affixation through grammaticalization: ISL sense prefixes

Affixation can also be found in ISL. One set of affixes, which we call sense prefixes, are glossed by native signers with words that involve either a sense organ – eyes, nose, or ears – or the head or mouth. So far, we have discovered over 70 prefixed forms of this type in ISL. Like the ASL negative suffix described above, the recurring elements in these forms are affixes rather than independent words. First, although many words formed with a sense prefix have transparently componential meanings (‘to X by seeing (eye)/ hearing (ear)/ thinking (head)/ intuiting (nose)/ saying (mouth)), many do not. For example, the sign meaning ‘cunning’ has the mouth or nose prefix, though its meaning is not related to smelling or saying. Also, in several words formed with these prefixes, the base has no independent meaning without the prefix. Finally, while the lexical category of the base may be indeterminate, the affixed forms are always verbs. Like the ASL ZERO suffix, the ISL sense prefixes also show individual variation in their use and productivity. An example is provided in Figure 2:

Consistent with the claim that the sequence is a word and nothing larger, we find that some affixed forms undergo regressive handshape assimilation, a process that also occurs in ISL compounds (Meir and Sandler 2004) but is not attested across independent words. One reason for considering these forms to be affixed words and not compounds is that the first morpheme is always one of a small class of words typically related to the senses. We conclude, then, that we are dealing with complex words, consisting of a prefix and a stem.

This type of morphology is precisely what might be expected in a young language. It involves grammaticalization of free words and shows individual variation in use and productivity. Furthermore, it is very limited, conforming to the young language prototype. Only two affixes have been described so far in

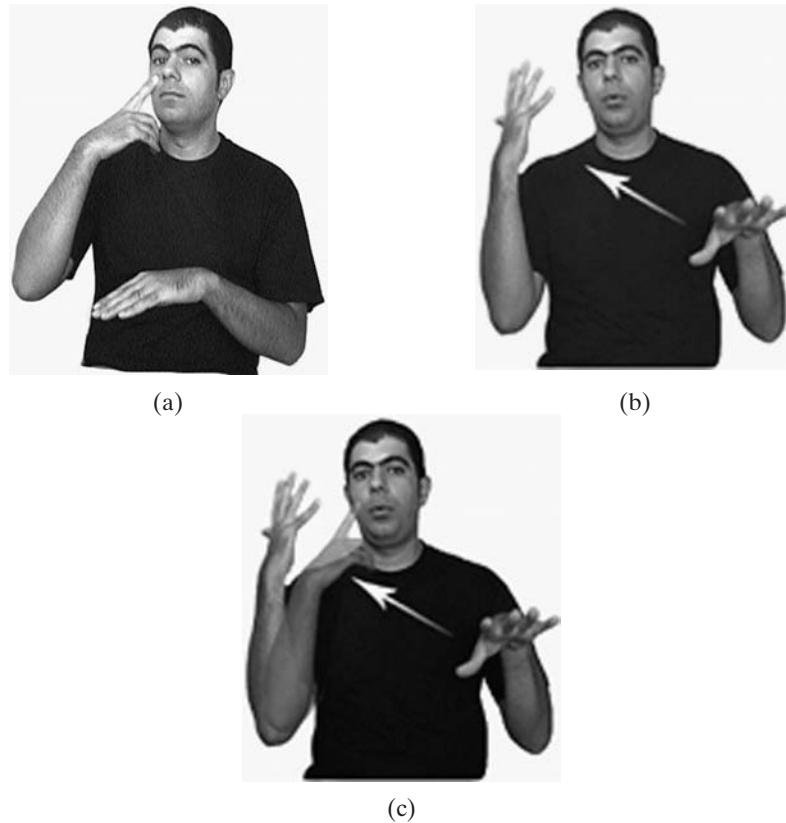


Figure 2. (a) SEE (ISL). (b) SHARP (ISL). (c) Affixed form: SEE-SHARP 'discern by seeing' (ISL)

ISL (Meir and Sandler, 2004) and five in the older of the two sign languages, ASL (Sandler and Lillo-Martin, in press). We now turn to an example of the other major group of morphological processes, the group that we argue earmarks sign languages as belonging to a morphological type: complex simultaneous morphology grounded in visuo-spatial cognition. The example presented here is that of verb agreement.

### 2.3. *Sign language typical morphology: Verb agreement*

Like verb agreement in spoken languages, sign language verb agreement is a grammatical system, because it involves systematic encoding of syntactic and thematic roles. But Padden (1988) showed that ASL verb agreement is different from that of spoken languages in that the language has a three-way classification

of verbs, according to their agreement patterns: plain, spatial and agreement verbs. This three-way classification holds for other established sign languages as well.

Verb agreement in sign languages takes the following form: the beginning and ending points of the agreeing verb are associated with the points in space established for the arguments of the verb. In sign languages, nominals in a clause are associated with discrete locations in space, called 'R(eferential)-loci'. This association is usually achieved by signing a NP and then pointing to, or directing the gaze towards, a specific point in space, as exemplified in the ISL sentence (1) and in Figure 3 below. In this sentence, the signer signs the noun phrase SON MY, and then points to a specific point in space, on his right. He then signs DOG POSSESSIVE-PRONOUN. He directs the possessive pronoun to the same locus that he established earlier, thus forming a connection between the NP SON, and the possessor of the dog.

SON POSS<sub>i</sub> INDEX<sub>i</sub>, DOG POSS<sub>i</sub>, FALL-ASLEEP.<sup>4</sup>  
 'My son's dog fell asleep.'

These R-loci are used for anaphoric and pronominal reference for the

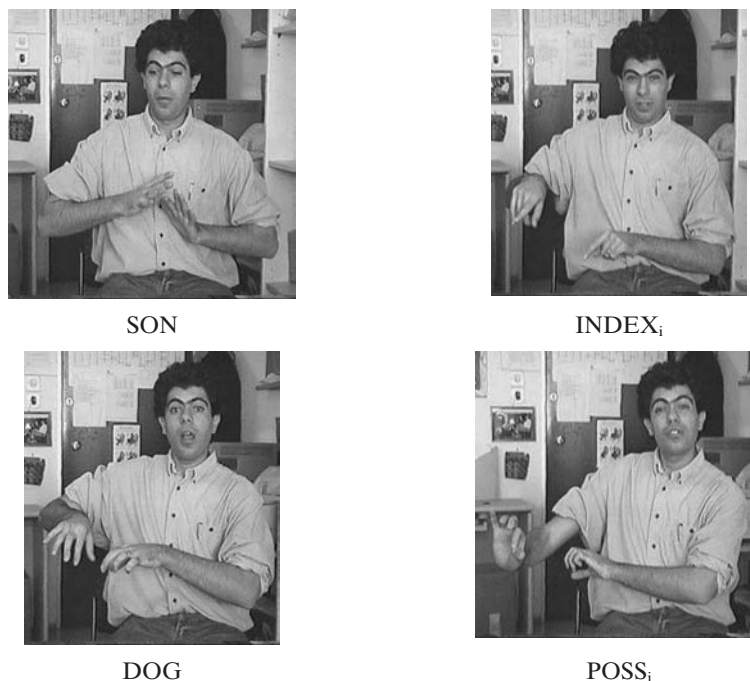


Figure 3. Establishing and referring back to a reference locus (ISL):  
 SON INDEX<sub>i</sub>, DOG POSS<sub>i</sub>

nominals associated with them, and are therefore regarded as the visual manifestation of the pronominal features of the nominals in question (see e.g., Bahan 1996, Janis 1992, Klima and Bellugi 1979, Lillo-Martin and Klima 1990, Meier 1990). Note, however, that these locations are not determined by categories of features like e.g., gender or noun class. Each argument is assigned its own R-locus, and therefore it can be regarded more as an index than as feature complex. Sign languages, then, have overt R-indices (Lillo-Martin and Klima 1990).

In addition to pronominal signs, verbs which inflect for agreement (the so-called ‘agreement verbs’) also make use of the system of R-loci: the direction of the path movement of the verb is determined by the R-loci of the verb’s arguments. In agreement verbs, the beginning and end points are determined by the R-loci of their grammatical arguments. The ASL verb ASK, for example, moves from the location associated with its subject argument towards the location associated with its object argument. Figure 4 exemplifies two forms of this

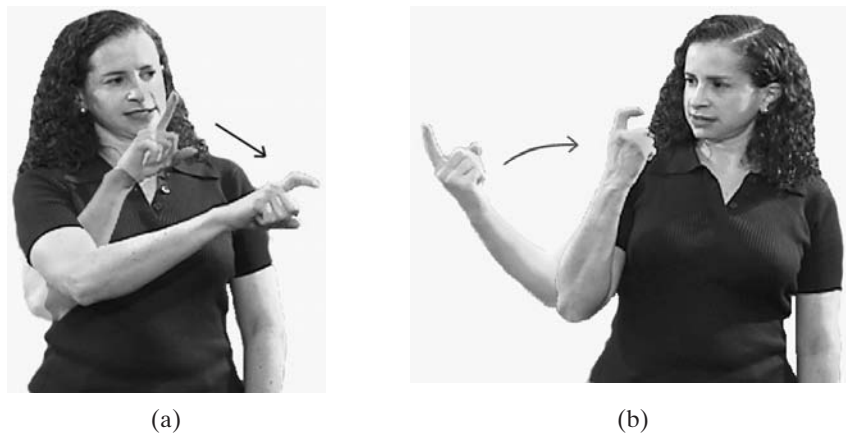


Figure 4. (a)  ${}_1\text{ASK}_2$  ‘I ask you’. (b)  ${}_j\text{ASK}_1$  ‘S/he asks me’

verb:  ${}_1\text{ASK}_2$ , ‘I ask you’ (the verb moves from 1st person locus to 2nd person locus) and  ${}_j\text{ASK}_1$  ‘S/he asks me’ (where the path movement is from the locus established to a 3rd person referent to 1st person locus).

The two other classes of verbs behave differently with respect to verb agreement. Plain verbs have invariant beginning and end points; in particular, the direction of the path movement of these verbs is not determined by the R-loci of their arguments. Spatial verbs are those with beginning and end points determined by spatial referents, that is, actual locations and not subjects or objects. The locations encoded by verbs in this class are interpreted analogically and literally, and not as representing grammatical arguments (Padden 1998).



Subsequent research on many sign languages has revealed an important similarity: all of them have verb agreement, and all exhibit this tripartite division of verbs into the same categories.<sup>5</sup>

The sign language verb agreement system described above characterizes the sign language universal morphological type: it is simultaneous, rule-governed, predictable, productive and universal among sign languages.

a. *Simultaneous*: A sign canonically assumes a prosodic LML template: a location, a movement, and another location (Sandler 1989). This template typically characterizes any sign, whether morphologically simple or complex. Many of the morphological processes that are most typical of sign languages respect this LML template, simply altering the specifications of the location segment(s) or of the movement segment of the sign (Sandler 1990, 1993, 1999). Verb agreement is simultaneous in that sense: the agreement markers are the location specifications of the verb, determined by the R-loci of the verb's arguments. Agreement inflection does not add phonological segments to the sign, but simply provides the phonological specifications of the initial and final locations (Figure 5).

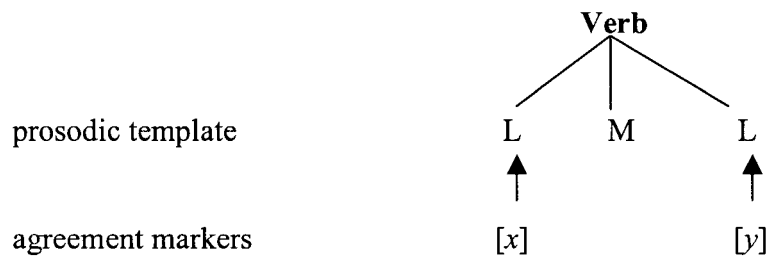


Figure 5. Agreement verb template

b. *Rule-governed*: The principles that govern the direction of the path movement are fully specifiable. The beginning and end points of the verb are the R-loci associated with the subject and the object of the verb, which are linked to the thematic roles of source and goal. The path of the verb moves between these loci. In addition, there is another mechanism involved in verb agreement: the facing of the hand, that is, the direction towards which the palm or fingertips are facing. The two morphological mechanisms, the path movement and the facing, are determined by the following principles (Meir 1998a): (i) the path movement is from source to goal. (ii) the facing of the hand is towards the syntactic object. The interaction between these principles yields the different forms of the various agreement verbs.

c. *Predictable*: Comparing verb agreement in ISL with that of ASL and other sign languages, Meir (1998b, 2002) argues that the classification of verbs into

plain, spatial and agreement verbs is predictable, and need not be listed as an idiosyncratic property of each verb. The classification is semantically determined: verbs denoting motion in space will turn out to be spatial verbs. Verbs denoting transfer are agreement verbs, and plain verbs are defined negatively, as denoting neither transfer nor motion. Most apparent counter-examples to these generalizations are easily explained on phonological grounds: some verbs denoting transfer fail to inflect for agreement because of constraints imposed by their phonological structure.

d. *Productive*: The system is productive in that all verbs that meet the semantic and phonological conditions for agreement inflection indeed inflect for agreement. New verbs entering the language, such as FAX (in ASL and ISL), take on this agreement pattern. And there is hardly any individual variation with respect to the verbs that comprise the class of agreement verbs.

e. *Universal*: All sign languages investigated so far have verb agreement, and they resemble each other in both the morphological instantiation of agreement and the meaning of the members of each class. This includes not only the sign languages of Europe, the US, Canada, Australia and New-Zealand, which might be historically related, but also non-Western sign languages, such as Indo-Pakistani Sign Language (Zeshan 2000), Taiwan Sign Language (Smith 1990) and the Sign Language of Japan (Fischer 1996). This strong cross-linguistic resemblance by no means implies that all sign languages have identical agreement systems. There are significant differences as well. For example, some sign languages have auxiliary-like elements which mark the Subject and the Object of non-inflecting verbs (e.g., Taiwan SL (Smith 1990), Sign Language of the Netherlands (Bos 1994), Sign Language of Japan (Fischer and Osugi 2000), German Sign Language (Rathmann and Mathur 2003)). Languages may also vary with respect to the encoding of plural, and the encoding of 1st person object agreement (Engberg Pedersen 1993).<sup>6</sup> Nevertheless, in all sign languages that we know of, the tri-partite classification of verbs still holds, as does the spatial and simultaneous nature of their instantiation. Furthermore, the kernels of verb agreement have been found in sign systems that are not fully developed sign languages, such as home sign (the signing systems developed by deaf children raised in an oral environment without exposure to any sign language (Goldin-Meadow 1993), the very young sign language which has evolved in Nicaragua (Senghas 1995, 2003), International Sign (Supalla and Webb 1995), and the signing of deaf children exposed only to Manually Coded English (Supalla 1990).

This specific cluster of properties, in particular the universality of this verb agreement system in sign languages, and its absence in spoken languages, calls for an explanation. We suggest (Aronoff et al. 2000, in press; Aronoff, et al. 2003, Meir 1998b, 2002), that the universality of this system in sign languages

derives from the interaction of language structure with the visuo-spatial domain of transmission. The visuo-spatial domain has properties that enable languages transmitted in it to convey in a direct manner certain spatio-temporal conceptual categories, such as source, goal and path. The path movement of agreement verbs, which is determined by the R-loci of the arguments, can be regarded as a direct manifestation of the conceptual category (source-goal) Path. This Path is part of the semantic structure of verbs denoting transfer in any language, spoken or signed (since an entity is “moving” from one possessor to another). However, sign languages, as languages transmitted in space, can represent these spatial-conceptual relations directly, and they (all) seem to exploit this possibility. The universality of these categories, and the fact that they can be represented directly in manual-visual languages, determine the similarity in form and structure among sign languages.

### 3. THE EMERGENCE OF TYPICAL SIGN LANGUAGE MORPHOLOGY

How does such a system emerge and develop, and what might be expected in a new language? Two hypotheses present themselves, each making different predictions.

One might argue that such systems are prevalent because the three classes correspond to a basic three-way semantic contrast: Agreement verbs refer to actions of transfer, spatial verbs to motion and location, and plain verbs are defined negatively, as denoting neither transfer nor motion and location. Many plain verbs refer to emotional and psychological states. Moreover, some of the semantic concepts underlying this classification, e.g., source, goal and path, are represented in a direct manner by the form of these verbs, as explained above. Hence one possible hypothesis concerning a new sign language is that this tripartite classification will be found in the early stages of its development. Supporting evidence for this hypothesis comes from work on gesture and on sign systems that are not fully developed sign languages. Hearing non-signers use gestures to indicate motion and position while speaking (McNeill 1992), and they sometimes use directional gestures to indicate referents when they are not allowed to speak (Casey 2003). Very young deaf children, acquiring ASL as their mother tongue, use directionality in gesture and in their early signs. They do so more often when referents are present in their environment, and with verbs denoting literal iconic movement (Casey 2003). Directional manipulation of signs is also found in home sign (the signing systems developed by deaf children raised in an oral environment without exposure to any sign language (Goldin-Meadow 1993), the very young sign language which has evolved in Nicaragua (Senghas 1995; Kegl, Senghas, and Coppola, 1999; International Sign (Supalla and Webb 1995), and the signing of deaf children exposed only to Manually Coded English (S. Supalla 1990).

However, directional manipulation of signs and gestures does not imply the existence of a morphological system. As argued above, morpho-syntactic categories take time to develop. Agreement verbs are morphologically complex, since they contain affixes for person and number. For a sign language to have a morphological class of agreement verbs, it needs to have acquired the following properties: (a) consistent use of space; (b) location of referents in space (that is, establishment of R-loci for referents); (c) the use of R-loci for non-present referents; (d) the abstract categories ‘person’ and ‘number’; and (e) use of the signer’s body to represent 1st person, whether subject or object. Accordingly, one might promote the opposite hypothesis: that, like the creole prototype, new sign languages will lack marking for person and number, because the morphological categories of person and number, like all morphological categories, take time to develop and are not likely to be found in any new language, signed or spoken. The data from ABSL, presented in the next section, will help decide between these two competing hypotheses.

#### 4. DATA FROM ABSL

The Abu Shara Bedouin group was founded about 200 years ago in the Negev region of present-day Israel. Originally *fellahin* ‘peasants’ from Egypt who worked for traditional Bedouins as laborers, the Abu Shara now function autonomously and are regarded by outsiders as Bedouin. The group is now in its seventh generation and contains about 3,500 members, all of whom reside together in a single community exclusive of others. Consanguineous marriage has been the norm in the group since its third generation. Such marriage patterns are common in the area and lead to very strong group-internal bonds and group-external exclusion. It is indicative that the Abu Shara still view themselves as a single large family, though now subdivided into subfamilies.

Within the past three generations, approximately 150 individuals with congenital deafness have been born into the community, all of them descendants of two of the founders’ five sons (Scott et al. 1995). Kisch (2000) has done a detailed anthropological study of deafness in the Abu Shara community, showing that the deaf members of the community are fully integrated into its social structure and are not shunned or stigmatized. Kisch was the first to report that the deaf members of the community and a significant fraction of its hearing members communicate by means of a sign language. The significance of this rather unusual situation is that the signing community of Abu Shara is actually much larger than the number of deaf members in the community, thus contributing to the stability and continuity of the emerging sign language. ABSL is passed from one generation of signers to another in a natural social setting for language acquisition, and deaf children born into the community are exposed to

native-like linguistic input. These two characteristics, two fundamental properties of natural human languages, are very rare in signing communities, where most of the children are born into hearing, non-signing, families. Thus, the Abu Shara community presents a unique situation of a language that developed *de novo* in a stable community.

We have identified three generations of signers. The first generation in which deafness appeared in the community (the fifth since its founding) included fewer than ten deaf individuals, all of whom are deceased. Information on their language is limited to reports that they did sign and one very short videotape record of one of these individuals. We restrict the present discussion to the language of the second generation. We have worked with eight signers of the second generation, seven deaf and one hearing, all currently in their thirties and forties, except one in her twenties.

From inquiries and interviews with both deaf and hearing members of the community, we have learned that the first two generations of signers had no contact with other deaf people outside the village. Schooling for the deaf children was restricted to the local elementary school, where deaf children attended the same classes as hearing children; they did not receive any special education for the deaf. Older deaf members of the community usually remained in the village. Hence for the first two generations, ABSL developed without known external influence. It is only the youngest generation that has had some contact with ISL signers, through schooling. However, members of the community who have any familiarity with Israeli Sign Language, including those who have attended schools for the deaf outside the village, recognize that the two sign languages are distinct, and are not mutually intelligible. Nor do Abu-Shara signers understand the Jordanian sign language used in simultaneous interpreting on Jordanian television programs received in the area. Hence ABSL seems to constitute a very rare case, in which a language develops *de novo*, within a stable community, without external influence.

Two sets of sign language data were gathered from eight of the oldest ABSL signers, representing the second generation of signers in the community. The data consisted of signed responses to video clips depicting actions between individuals as well as movement of objects through space;<sup>7</sup> and spontaneous narratives. The signed responses were divided into clauses, using semantic and prosodic criteria for determining constituency and clause boundaries. Predicates were linked to their arguments according to meaning, and rhythmic cues together with facial expressions marked boundaries between constituents (Nespor and Sandler, 1999). We were also guided by a spoken language translation provided by a consultant fluent in ABSL. These data were analyzed according to the following parameters: word order; the use of space to indicate motion and location; and the use of space to indicate verb agreement. We found that the word order was remarkably systematic, and we report those results in

Sandler, Meir, Padden, and Aronoff (2004). We restrict the present discussion to the morphological issues.

(i) *The use of space to indicate motion and location*

The data obtained from both the free narratives and the signed responses to the video clips indicate that there is a preliminary use of space: signers may use space to indicate the locations, and to express actions denoting real motion. For example, when describing a clip showing two men standing opposite each other (on the two sides of the screen), one kicking a ball to the other, in three out of the seven responses to the clip the signers localized the two men on a sideward axis, and three of them used a pointing sign which moved between those locations in order to depict the path of the ball. However, it should also be noticed that four signers did not localize the referents, and one signer localized the referents, but did not use these locations to indicate the path of the ball. This pattern is repeated with other clips as well. Some signers use space to show the location of the referents involved in the action, and some signers modify the path movement of the predicate in order to depict the motion of an object between the two referents. This mechanism does not seem to be obligatory for our signers: there is significant variation among signers, and sometimes even within the same signer. Out of 48 sign responses describing clips with two people transferring an object from one another (e.g., kicking, giving, throwing etc.), only in 13 did the signers localize the referents. What is consistent is that the axis used to represent motion between two locations is usually the side-to-side axis. This contrasts with the axis used for verbs which do not denote actual motion, as we show in (ii).<sup>8</sup>

(ii) *The use of space to indicate verb agreement*

In the data we have collected so far, we have not found verb forms inflected for agreement. Our elicitation material includes actions involving transfer, such as giving, throwing something to someone, taking and catching. Such actions are usually expressed in sign languages by verbs that inflect for agreement (the so called ‘agreement verbs’). We expected to find similar forms in ABSL. However, when looking at predicate forms referring to acts of transfer, we found a striking absence of morphology marking person. Instead, we found predicates in which the transfer motion extended from the signer’s own body outward. In these cases, there was no agreement with the R-loci of subject or object referents. In the following example, an ABSL signer positions the referents corresponding to subject and object opposite each other in the side-to-side axis, sequentially, as shown in 6a and b, suggesting their R-loci. But in the next clause, there is no agreement with either of these R-loci. That is, the hand does not move on the side-to-side axis, from the R locus of the subject to the R locus

of the object. Instead, it simply moves outward from the body of the signer, as shown in Figure 7.<sup>9</sup> Example 8 includes the gloss, with the portions that are represented in Figures 6 and 7 printed in bold, and a rough translation of the utterance.

MAN **INDEX<sub>i</sub>**, WOMAN **INDEX<sub>j</sub>**. APPLE **GIVE<sub>0</sub>**.  
 ‘There is a man here, and a woman there. Give an apple.’



Figure 6. Establishing spatial positions. (a) **INDEX<sub>i</sub>**. (b) **INDEX<sub>j</sub>**.



Figure 7. Signing the verbal sign **GIVE<sub>0</sub>** on the back-front axis, not incorporating spatial locations into the sign

Out of 64 occurrences of signs denoting acts of transfer, in only 5 cases did the signers modulate the direction of the path movement of the sign to indicate the path that the object traverses. It is significant that in these 5 cases, the

signers did not use the sign glossed as GIVE, with a stable handshake, but rather a sign that looks like a grasping gesture followed by a change in the location of the hand. Such signs clearly mimic an act of grasping an object and then moving it to another location. Hence they are much more spatial in nature, and do not denote transfer. Directionality is completely absent in transfer predicates.

For predicates of transfer in ABSL, we find a consistent use of the body as subject, in which the motion of transfer extends outward from the signer's body. Unlike ASL and ISL where the body marks the location of first person, there appears to be no first person marking on ABSL predicates among the older signers. In established sign languages, agreement verbs with first person subjects move outward from the signer's body, and in forms with first person objects, the motion is inward toward the body. Thus person and subject are marked separately. Furthermore, there is a subclass of "backwards verbs," when the subject is the recipient or benefactor of an action such as INVITE, TAKE, COPY, GRAB. In these verbs, the motion begins at the R-locus of the object and moves toward the subject. These verbs appear to be "backwards" since the motion is backwards toward the subject.<sup>10</sup>

We do find the backwards verbs TAKE (15 occurrences) and CATCH (8 occurrences) in our data. These verbs are characterized by an inward movement towards the signer's body. However, we find no predicate forms in ABSL where there is a split between subject and first person. Crucially, we find no forms in which the body is the location of a first person *object*. Instead, a backwards verb will be used. For example, when signing a sentence meaning 'He gave me the scarf', where the first person pronoun is in object position, an ABSL speaker will say <sub>0</sub>TAKE<sub>body</sub> ('I got a scarf'), where the first person pronoun is in subject position. In such a form the body is the syntactic subject, rather than the object. We do find some forms where the outward movement is from the signer toward one side or the other, suggesting some possibility of second or third person marking, but it is not yet clear to us that this is indeed *agreement* marking. They may be spatial forms in which the signer depicts movement between locations, including locations to one or the other side of the signer. We find no absence of spatial reference among the older ABSL signers; they point to locations of objects and people, and can show how these locations change as well as relationships between locations. However, we have no clear evidence that these locations are R-loci marking person.

The fact that we find reference to locations of various entities and people suggests to us that locational reference may precede agreement morphology in the development of a new language. Secondly, the fact that we find consistent word order within clauses and phrases also suggests to us that argument structure appears early in the form of word order, but is not marked morphologically.

To sum up, the data from second generation ABSL signers support the second hypothesis, that the tripartite verb system common among established



sign languages is not present in the earliest forms of a sign language. Instead, systematic word order appears prominently. In the next phase of the project, we will address the question of when person marking appears, and how it interacts with word order, by fine-tuned analysis of a larger and more varied corpus across the generations.

## 5. CONCLUSION: ABSL HOLDS LESSONS FOR TYPOLOGY

We have shown that established sign languages comprise a morphological type. In all these languages, visuo-spatial concepts and relations are represented in a motivated yet rule-governed and linguistic morphological system. Developed sign languages also show non-motivated, grammaticalized morphology, but to a limited extent, because they are young. ABSL shows neither the motivated nor the arbitrary morphology found in more developed sign languages. The lesson from ABSL is therefore that even the motivated morphology that we find in all established sign languages requires social interaction over time to crystallize. ABSL thus vindicates the new language prototype: little or no systematic morphology. This prototype was originally formulated on the basis of creole languages, but the formulation has run into empirical difficulty in recent years, as we noted above. Because ABSL is a completely new language, it allows us to distinguish between relatively young languages (established creoles and sign languages) and new languages, and to realize that the prototype holds of the latter.

## NOTES

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<sup>1</sup> In the interest of preserving their privacy, we adopt a pseudonym for this community used in Kisch (2000).

<sup>2</sup> ‘Grammaticalization’ is used here as a cover term for various processes which result in the development of an affix from a free word. See Aronoff et al. (in press) for a discussion.

<sup>3</sup>These affixes are discussed in detail together with other sequential affixes in ASL and ISL in Aronoff, Meir, and Sandler (2000, in press) and in Sandler and Lillo-Martin (in press).

<sup>4</sup> A subscript which follows the sign indicates that the sign is articulated in a specific locus position. Articulation at 1P locus is indicated with a 1 subscript. Articulation at 2P locus is indicated with a 2 subscript. Articulation at 3P locus is indicated with letters *i*, *j*, *k*. A 0 subscript indicates articulation in neutral space. For signs which have a path movement (i.e. the articulation of the sign involves moving from one locus position to another), the subscript

which precedes the sign indicates its beginning point, and the subscript which follows the sign its end point.

<sup>5</sup> Though different researchers may vary regarding the theoretical status of these classes, descriptively all well-studied sign languages show the tri-partite verb classification. For works on verb agreement in different sign languages, see references in Meir, 2002 and Sandler and Lillo-Martin, in press.

<sup>6</sup> For more differences between the verb agreement systems of sign languages, see Mathur and Rathmann (2003).

<sup>7</sup> We are grateful to the Language and Cognition Group at the Max Planck Institute for Psycholinguistics, Nijmegen, The Netherlands, for making their elicitation materials available to us.

<sup>8</sup> The side-to-side axis used when localizing people might be due to the fact that in the clips the two participants are located on the two sides of the screen. However, what is significant is that when signers used verbs denoting transfer, such as GIVE, TAKE, THROW, they do not use the side-to-side axis, even though transference of the object in the clip (e.g., an apple, a scarf) is on this axis as well.

<sup>9</sup> The identity of the woman in Figure 7 is masked, in keeping with the norms of the community.

<sup>10</sup> See Padden (1988) and Meir (1998b) for analyses of backwards verbs.

## REFERENCES

- Aronoff, Mark, Meir, Irit, and Sandler, Wendy (2000). The universal and the particular in sign language morphology. *University of Maryland Working Papers in Linguistics* 10:1–24.
- Aronoff, Mark, Meir, Irit and Sandler, Wendy (in press). The paradox of sign language morphology. To appear in *Language*.
- Aronoff, Mark, Meir, Irit, Padden, Carol, and Sandler, Wendy (2003). Classifier complexes and morphology in two sign languages. In *Perspectives on Classifiers Constructions in Sign Languages*, K. Emmorey (ed.). Mahwah, NJ: Lawrence Erlbaum.
- Bahan, Ben (1996). Non-manual realization of agreement in American Sign Language, Linguistics, Boston University: Doctoral dissertation.
- Bakker, Peter (2003). Pidgin inflectional morphology and its implication for creole morphology. In *Yearbook of Morphology 2002*, 3–34. Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Bos, Heleen (1994). An auxiliary verb in Sign Language of the Netherlands. In *Perspectives on sign language structure: Papers from the Fifth International Symposium on Sign Language Research*, Inger Ahlgren, Brita Bergman and M. Brennan (eds.), 37–53: Deaf Studies Research Unit, University of Durham, England, International Sign Linguistic Association.
- Braun, Maria, and Plag, Ingo (2003). How transparent is creole morphology? A study of early Sranan word formation. In *Yearbook of Morphology 2002*, 81–104. Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Casey, Shannon K. (2003). “Agreement in gesture and signed languages: The use of directionality to indicate referents involved in action.” Ph. D. Dissertation, University of California, San Diego.
- DeGraff, M. (1999). *Language Creation and Change: Creolization, Diachrony and Development*. Cambridge: MIT Press.

- Emmorey, Karen (2003). *Perspectives on Classifier Constructions in Sign Languages*. Mahwah, N.J.: Lawrence Erlbaum Associates.
- Engberg-Pedersen, Elisabeth (1993). *Space in Danish Sign Language: The semantics and morphosyntax of the use of space in a visual language*, vol. 19: International studies of sign language and communication of the deaf. Hamburg, Germany: Signum.
- Fischer, Susan D. (1978). Sign language and creoles. In *Understanding Language Through Sign Language Research*, Patricia A. Siple (ed.), 309–331. New York: Academic Press.
- Fischer, Susan D. (1996). ‘The Role of Auxiliaries in Sign Language’. *Lingua* 98, 103–119.
- Fischer, Susan D., and Osugi, Yutaka. (2000). Verb agreement in Japanese Sign Language. Ms., *Conference on Theoretical Issues in Sign Language Research*. Amsterdam.
- Gee, James, and Goodhart, Wendy (1988). American Sign Language and the human biological capacity for language. In *Language Learning and Deafness*, Michael Strong (ed.), 49–74. Cambridge: Cambridge University Press.
- Goldin-Meadow, Susan (1993). When does gesture become language? A study of gesture used as a primary communication system by deaf children of hearing parents. In *Tools, Language and Cognition in Human Evolution.*, Kathleen R. Gibson, Tim Ingold et al. (eds.), 63–85. Cambridge, England UK: Cambridge University Press.
- Good, Jeff (2003). Tonal morphology in a creole: High-tone raising in Saramaccan serial verb constructions. In *Yearbook of Morphology 2002*. Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Groce, Nora Ellen (1985). *Everyone Here Spoke Sign Language: Hereditary Deafness on Martha's Vineyard*. Cambridge, MA: Harvard University Press.
- Janis, Wynn (1992). Morphosyntax of the ASL verb phrase, Linguistics, State University of NY, Buffalo: Doctoral dissertation.
- Kegl, J. Coppola, M. and Senghas, A. (1999). Creation through contact: Sign language emergence and sign language change in Nicaragua. In M. DeGraff (Ed.), 179–237.
- Kisch, Shifra (2000). “Deaf Discourse”: The Social Construction of Deafness in a Bedouin Community, University of Tel Aviv: Masters’ Thesis.
- Klima, Edward S., and Bellugi, Ursula (1979). *The Signs of Language*. Cambridge: Harvard University Press.
- Lane, Harlan, Pillard, Richard, and French, Marilyn (2000). Origins of the American Deaf-World: Assimilating and differentiating societies and their relation to genetic patterning. In *The Signs of Language Revisited: An Anthology to Honor Ursula Bellugi and Edward Klima*, eds. K. Emmorey and H. Lane, 77–100. Mahwah, NJ: Lawrence Erlbaum Associates.
- Lefebvre, Claire (2003). The emergence of productive morphology in creole languages: The case of Haitian Creole. In *Yearbook of Morphology*, 35–80. Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Lillo-Martin, Diane, and Klima, Edward S. (1990). Pointing out differences: ASL pronouns in syntactic theory. In *Theoretical issues in sign language research*, Linguistics, S.D. Fischer and P. Siple (eds.). Chicago, ILL: University of Chicago Press.
- Mathur, Gaurav, and Rathmann, Christian (2003). Cross-Linguistic Variation in Verb Agreement Across Signed Languages. A paper presented at the MMM4 conference, Catania, Sicily.
- McNeill, David (1992). *Hand and Mind: What gestures reveal about thought*. Chicago: University of Chicago.

- McWhorter, John H. (1998). Identifying the creole prototype: Vindicating a typological class. *Language* 74:788–817.
- Meier, Richard (1990). Person deixis in American Sign Language. In *Theoretical Issues in Sign Language Research*, Susan D. Fischer and Patricia Siple (eds.), 175–190. Chicago: University of Chicago Press.
- Meir, Irit (1998a). Syntactic-semantic interaction in Israeli Sign Language verbs. *Sign Language and Linguistics* 1:3–38.
- Meir, Irit (1998b). Thematic structure and verb agreement in Israeli Sign Language, Ph.D. dissertation, Hebrew University, Jerusalem.
- Meir, Irit (2002). A cross-modality perspective on verb agreement. *Natural Language and Linguistic Theory* 20, 413–450.
- Meir, Irit, and Sandler, Wendy (2004). *Safa bamerxav: Eshnav le- sfat hasimananim hayisraelit (Language in space: A window on Israeli Sign Language)*. Haifa: University of Haifa Press.
- Nespor, Marina, and Sandler, Wendy (1999). Prosody in Israeli Sign Language. *Language and Speech* 42:143–176.
- Padden, Carol (1988). *Interaction of Morphology and Syntax in American Sign Language: Outstanding Dissertations in Linguistics, Series IV*. New York: Garland Press.
- Rathman, Christian and Ganrav, Mathur (2003). Is verb agreement the same crossmodally? In *Modality and Structure in Signed and Spoken Languages*, R. Meier, K. Cormier and D. Quinto-Pozos (eds.), 370–404. Cambridge, UK: Cambridge University Press.
- Sandler, Wendy (1989). *Phonological Representation of the Sign*. Dordrecht, The Netherlands: Foris Publications.
- Sandler, Wendy (1990). Temporal aspects in ASL phonology. In *Theoretical issues in sign language research*, eds. Susan D. Fischer and Patricia Siple, 7–35. Chicago: University of Chicago Press.
- Sandler, Wendy (1993). A sonority cycle in ASL. *Phonology* 10, 243–280.
- Sandler, Wendy (1996). A negative suffix in American Sign Language. Paper presented at conference on Theoretical Issues in Sign Language Research. Montreal.
- Sandler, Wendy (1999). Cliticization and prosodic words in a sign language. In *Studies on the Phonological Word: Current issues in linguistic theory*, T. Hall and U. Kleinhenz (eds.), Amsterdam/Philadelphia: John Benjamins.
- Sandler, Wendy, and Lillo-Martin, Diane (in press). *Sign Language and Linguistic Universals*. Cambridge: Cambridge University Press.
- Sandler, Wendy, Meir, Irit, Padden, Carol, and Aronoff, Mark (2004). *The Emergence of Grammar: Systematic structure in a new language*. Ms. The University of Haifa; University of California, San Diego; SUNY Stony Brook.
- Scott, Daryl et al. (1995). Nonsyndromic autosomal recessive deafness is linked to the DFNB1 locus in a large inbred Bedouin family from Israel. *American Journal of Human Genetics* 57, 965–968.
- Senghas, Ann (1995). Children's Contribution to the Birth of Nicaraguan Sign Language, Linguistics, Massachusetts Institute of Technology: Ph.D Dissertation.
- Senghas, Ann (2003). Intergenerational influence and ontogenetic development in the emergence of spatial grammar in Nicaraguan Sign Language. *Cognitive Development* 18, 511–531.
- Senghas, Ann and Coppola, Marie (2001). Children creating language: How Nicaraguan Sign Language acquired a spatial grammar. *Psychological Science* 12, 323–328.

- Smith, Wayne (1990). Evidence for auxiliaries in Taiwan Sign Language. In *Theoretical Issues in Sign Language Research*, S. Fischer and P. Siple (eds.). Chicago, IL: University of Chicago Press.
- Supalla, Sam (1990). Manually Coded English: The modality question in signed language development. In *Theoretical Issues in Sign Language Research*, eds. P. Siple and S. Fischer. Chicago: University of Chicago Press.
- Supalla, Ted, and Webb, Rebecca (1995). The grammar of International Sign: A new look at pidgin languages. In *Language, Gesture, and Space.*, K. Emmorey and J. Reilly (eds.), 333–352. Hillsdale, NJ, US: Lawrence Erlbaum Associates, Inc.
- Zeshan, Ulrike (2000). *Sign Language of Indo-Pakistan: A Description of a Signed Language*. Philadelphia/Amsterdam: John Benjamins Publishing Company.

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