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Modality-Independent and Modality-Specific Aspects of Grammaticalization in Sign Languages*

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One type of internal diachronic change that has been extensively studied for spoken languages is grammaticalization whereby lexical elements develop into free or bound grammatical elements. Based on a wealth of spoken languages, a large amount of prototypical grammaticalization pathways has been identified. Moreover, it has been shown that desemantization, decategorialization, and phonetic erosion are typical characteristics of grammaticalization processes. Not surprisingly, grammaticalization is also responsible for diachronic change in sign languages. Drawing data from a fair number of sign languages, we show that grammaticalization in visual-gestural languages – as far as the development from lexical to grammatical element is concerned – follows the same developmental pathways as in spoken languages. That is, the proposed pathways are modality-independent. Besides these intriguing parallels, however, sign languages have the possibility of developing grammatical markers from manual and non-manual co-speech gestures. We will discuss various instances of grammaticalized gestures and we will also briefly address the issue of the modality-specificity of this phenomenon.

Keywords: Grammaticalization, Sign Languages, Modality, Gesture, Non-Manuals, Typology

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1 Introduction

Whatever language one speaks, it is most probably quite different from the language one's ancestors spoke hundreds of years ago. In fact, it may also be different – albeit to a lesser degree – from the language of one's parents and grandparents. In a nutshell, it may sound different, may structure words and sentences in a different way, and may make use of different words to fulfill certain lexical and grammatical functions.

Language change is a crucial property of all languages. As far as the phonology is concerned, sound changes and sound shifts may alter the phonological system of a language. Within morphosyntax and syntax, the inflectional system and the word order of a language may be subject to various changes. And, finally, the lexicon of a language may change due to language politics, borrowing, and grammaticalization, where the first two phenomena add and/or remove elements from a lexicon, while the third changes the function of existent lexical elements. Roughly, the observed changes can be divided into internal ones and external ones. Phonological change, for instance, is a good example for an internal change triggered by physiological conditions such as articulatory-phonetic simplification (e.g. assimilation). Borrowing, on the other hand, is a clear instance of an external change, imposed on a language from the outside due to language contact and bilingualism, amongst others. Obviously, internal and external changes may interact in shaping the structure of a language, for instance, in triggering word order changes.

Not surprisingly, all of the above mentioned phenomena are also responsible for diachronic change in sign languages. It has been observed, for instance, that signs may change their phonological form in order to facilitate articulation and perception (cf. Frishberg 1975 for American Sign Language (ASL); Woll 1987

for British Sign Language (BSL)).¹ Due to phonological change, signs may become less iconic over time and the language system as a whole may become more systematic. As far as the syntax is concerned, Fischer (1975) describes how due to external factors, word order in ASL has changed from SOV to SVO. Another external factor, borrowing, has also been shown to have an important impact on the structure of sign languages (Battison 1978; Brentari 2001). Interestingly, most investigations focus on borrowing from a surrounding spoken language into a sign language by means of fingerspelling and mouthings, while so far only little research has been done on borrowing from one sign language into another. Finally, language politics may also play an important role. In some countries, efforts are made to standardize the sign language lexicon. On the one hand, the rationale behind this effort is to facilitate standardized education for deaf and hearing students of sign language. On the other hand, standardization may also be an important step towards the official recognition of a sign language as a minority language (see, for instance, Schermer (2003) for the standardization of Sign Language of the Netherlands (NGT)).

In this paper, we will be dealing with an instance of an internal change, namely with grammaticalization in sign languages. Our main focus is on the question of what aspects of this phenomenon are modality-independent – that is, in how far sign languages follow the same grammaticalization paths as spoken languages – and what aspects are modality-specific. While a number of studies on grammaticalization phenomena in sign languages (above all on ASL) and even on the modality-specificity of these phenomena are available (e.g. Sexton 1999; Wilcox 2004), so far only little cross-linguistic and cross-modal investigations have been done. Our aim is to fill this gap by presenting and

¹ All abbreviations for sign languages discussed in this paper are explained in the end matter of this paper (Section 6).

comparing grammaticalization data from a number of different sign languages and by also comparing these data to those reported for spoken languages.

This article is organized as follows: in Section 2, we will familiarize the reader with the theoretical background. We will first say a few words about grammaticalization in general and about typical properties of grammaticalization in Section 2.1, before turning to methodological issues in Section 2.2. In Section 3, we will be concerned with modality-independent aspects of grammaticalization. We will show that, as far as the grammaticalization of lexical elements is concerned, signed and spoken languages pattern very much alike. However, we will also pinpoint some interesting differences. In Section 4, we will turn to what we take to constitute modality-specific instances of grammaticalization. Here, our focus will be on the grammaticalization of gestures. Two types of gestures have to be distinguished, namely manual (to be discussed in Section 4.1) and non-manual ones (to be discussed in Section 4.2). In Section 4.3, we will briefly discuss possible instances of grammaticalization of gestural elements in spoken languages and we will compare these patterns to the ones found in sign languages. Section 5 summarizes the main findings of this article.

2 Theoretical background

2.1 Grammaticalization paths

Grammaticalization can be defined as the development from lexical to grammatical forms (functional elements) and from grammatical forms to even more grammatical forms. In accordance with this definition, the primary goal of grammaticalization theory is to describe how grammatical forms arise and develop over time (Traugott and Heine 1991; Hopper and Traugott 1993; Aitchison 1996; Heine and Kuteva 2002ab). Extensive crosslinguistic research

has identified a fair number of prototypical developmental pathways; three of which are given in (1).

(1)	LEXICAL ELEMENT	→	FUNCTIONAL ELEMENT	→	AFFIX
	noun	→	pronoun	→	agreement
	verb	→	adverb	→	tense
	noun/verb	→	complementizer		

In the following, we will refer to the development of free functional elements from lexical elements as type-1 grammaticalization and to the development of affixes from lexical or free functional elements as type-2 grammaticalization. For the sake of illustration, let us look at some examples. As far as the grammaticalization of pronouns is concerned, Lehmann (1995:40f) points out that they derive from two different sources: while those of the third person often develop from demonstratives (e.g. English *he* and German *er* originating from the Proto-Indo-European demonstrative *ei-s*; also cf. Section 4.1.2), those of the first and second person usually originate from nouns denoting social relations (the Indonesian first person singular pronoun *saya*, for instance, being derived from the noun *sahaya* ‘servant’). Many bound agreement markers, in turn, can be shown to go back to pronouns. In Buryat, for instance, person-number suffixes on the verb are clearly related to nominative pronouns, as is illustrated in (2).

Buryat (Eastern Mongolian, Mongolia; Comrie 1980; cited in Hopper and Traugott 1993:141)

(2)		PRONOUN	V-AFFIX
	1 singular	bi	-b
	2 singular	ši	-š
	1 plural	bide	-bdi
	2 plural	ta	-t

The development from verb to tense marker can be exemplified by the Swahili example in (3). In Swahili, the future tense marker *-ta* is historically derived

from the lexical verb *taka* ('want'). Note that similar grammaticalization processes, i.e. from volition verb to future marker, are attested in quite a number of genetically and areally unrelated languages (compare, for instance, the English future tense marker *will* which is derived from the Old English verb *willan*).

Swahili (Bantu, Tanzania; Heine and Kuteva 2002a:378)

- (3) a. **a-taka** ku-jenga nyumba
 c1.PRES-want INF-build house
 'She wants to build a house.'
- b. **a-ta-jenga** nyumba
 c1-FUT-build house
 'She will build a house.'

This change from a full verb to a future tense marker may also serve to illustrate three interrelated mechanisms that are claimed to be typical for grammaticalization processes (Heine and Kuteva 2002ab): (i) desemanticization (or 'semantic bleaching') which implies that the verb loses its lexical meaning and acquires grammatical meaning; (ii) decategorialization, i.e. loss of properties characteristic of verbs such as the capacity to constitute a clause predicate and to take arguments; and (iii) erosion (or 'phonetic reduction') meaning that in the grammatical use of the element, we observe a loss in phonetic substance (also cf. the examples in (2)).

According to Heine and Kuteva (2002a), in recent research, roughly 350 common pathways of grammaticalization have been identified. With respect to these pathways, three things have to be taken into account. First, they are non-transitive, that is, a given category can be derived from more than one other category. Adverbs, for instance, may not only be derived from verbs (as indicated in (1)) but also from nouns. Secondly, a given pathway of evolution need not involve all intermediate categories, In the Swahili example in (3), for instance, the step from verb to adverb has been skipped. Thirdly,

grammaticalization is hypothesized to be prototypically a unidirectional process, that is, grammatical elements do not usually develop into lexical elements. While exceptions to this unidirectionality principle – sometimes referred to as “degrammaticalization” – have been noted (e.g. Ramat 1992; Newmeyer 1998:260ff), there seems to be an agreement amongst scholars that such examples are few compared to the large number of cases that conform to the principle. Still, we have to keep in mind that some have argued that there are too many counterexamples to unidirectionality to consider this principle a defining characteristic of grammaticalization (e.g. Janda 2001).²

Concerning the relation between the older lexical form (the source) and the newer grammatical form (the target) in some grammaticalization process, two more things have to be mentioned. First, in many cases, the source and the target are co-existent, that is, the source of the grammaticalization process is not necessarily replaced by the target. This observation will turn out to be of importance when we describe the method of linguistic reconstruction in the next section. Moreover, one and the same item may, and frequently does, enter more than one grammaticalization path. This phenomenon is referred to as “polygrammaticalization”. The Ewe example in (4) illustrates this point.

Ewe (Kwa, Ghana/Benin/Togo; Heine and Kuteva 2002a:382)

- (4) a. *éjé megbé fa*
 his back be.cold
 ‘His back is cold.’
- b. *é-megbé é-yi aǰé*
 its-back s/he-go home
 ‘Then s/he went home.’
- c. *é-le xo-a megbé*
 s/he-be house-DEF back
 ‘S/he is behind the house.’

² In fact, Newmeyer (1998:263) explicitly states: “I take any example of upgrading as sufficient to refute unidirectionality”.

On the one hand, the noun *meɣbé* ('back') (4a) has been the source for a temporal adverb meaning 'then' (4b); on the other hand, it has also developed into an adposition meaning 'behind' (4c).

2.2 Methodology: internal reconstruction

When it comes to the linguistic reconstruction of sign languages, a few words have to be said about the methodology. In the area of linguistic reconstruction, the comparative method is widely acknowledged to be the most reliable, and the most legitimate, of the available methods of reconstruction. In essence, this method relies on the comparison of forms from different (related) languages. Moreover, for languages for which (sufficiently old) written records exist, the identification and comparison of earlier and later forms of structure is possible on the basis of these records and consequently, patterns of change can be tracked down.

This option, however, is not available for languages which have no written form and therefore lack written records, as is the case with sign languages. The oldest available sources for diachronic research on sign languages are usually dictionaries that contain (mostly sketchy) illustrations of signs or pamphlets and journals containing drawings or photographs of signs (as used, for instance, in Woll 1987). From the early 20th century on, filmed material is also available, but this material is scarce. Between 1910 and 1920, the American National Association of the Deaf (NAD), for instance, created a set of 22 films of what were considered the most fluent ASL signers of the time. The NAD's goal was to preserve the sign language of the epoch for the future (Supalla 2001).³ These

³ The reason for this endeavour was that at this time, ASL and other sign languages were under attack from the so-called oralists. At an 1880 international meeting in Milan, a convention of mostly European educators had passed resolutions that advocated the oral method over the use of signs in the education of the deaf.

films have turned out to be a rich source of material for analyses of historical change in ASL (Frishberg 1975; Janzen and Shaffer 2002).

In the absence of written (or filmed) records of a language, it may still be possible to make statements about its historical development. The method of linguistic reconstruction commonly used under these circumstances is internal reconstruction. According to Ringe (2003:244), internal reconstruction (IR) is “the exploitation of patterns in the synchronic grammar of a single language or dialect to recover information about its prehistory”. In other words: the basic idea behind IR is that evidence for an earlier unobservable stage of a language can be deduced from certain internal patterns of the language, i.e. on the basis of its present shape, without recourse to comparative evidence. Obviously, IR is only of limited use in historical linguistics, since many of the changes that occur naturally over time eliminate language structures in unrecoverable ways. Therefore, the methods of IR are generally less reliable than the standard methods of comparative reconstruction (also cf. Fox 1995:145ff).

While IR is most frequently used to reconstruct conditioned sound changes, it may also be of some use when it comes to research on grammaticalization. As mentioned in Section 2.1, it is quite common for the lexical item that is the source of a particular grammaticalization process not to disappear; rather it may be coexistent with the grammaticalized form. Given that the lexical and the grammatical item are phonologically similar (the target possibly being phonologically reduced), given that grammaticalization is usually unidirectional, and given that we do know about common grammaticalization paths from the study of languages for which written records do exist, one may make inferences about grammaticalization processes in the language under investigation on the basis of synchronic data – albeit with due caution. After all, in the absence of historical data, the possibility of an anomalous development (e.g. degrammaticalization) can never be absolutely excluded.

With few exceptions, the grammaticalization data from sign languages reported on in the sections to follow were compiled by means of IR. However, use is also made of the comparative method by comparing the sign language data to data from spoken languages that exemplify similar grammaticalization paths. In essence, we follow Lehmann (1995), a proponent of the strong version of the unidirectionality hypothesis, who claims that it is possible to reconstruct non-attested stages of a grammatical form at the synchronic level. He states that “[g]iven two variants which are related by the parameters of grammaticalization [...], we can always tell which way the grammaticalization goes, or must have gone. The significance of this for the purposes of internal reconstruction is obvious” (Lehmann 1995:19). We acknowledge, however, that Lehmann’s claim is probably too strong and that we must therefore keep in mind that it is always possible that some of the data are overinterpreted.

3 Modality-independent aspects of grammaticalization

We will begin our investigation of grammaticalization phenomena in sign languages by looking at what we take to be modality-independent aspects of grammaticalization. That is, we will discuss a number of paths that parallel those that have been described for spoken languages. In order to make these parallels clear, we will – wherever possible – supplement the sign language examples with examples from various spoken languages.

We are going to consider the grammaticalization of tense, aspect, and modality markers (Section 3.1), auxiliaries (Section 3.2), pronouns (Section 3.3), complementizers (Section 3.4), intensifiers (Section 3.5), a negative existential (Section 3.6), a negative completive marker (Section 3.7), an intransitivizer (Section 3.8), and a causativizer (Section 3.9). Finally, in Section 3.10, we will discuss possible instances of type 2-grammaticalization.

The sign language data to be discussed come from three different sources. First, a fair number of examples (mostly ASL data) were taken from the available literature. Second, discussions with linguists doing research on various sign languages (including non-Western sign languages) were of central importance for our data collection. The extensive feedback we received forms the basis for the present cross-linguistic investigation. Third, we collected additional data from German Sign Language (DGS) and NGT ourselves.

3.1 The grammaticalization of aspectual, tense, and modality markers

The first grammaticalization phenomenon that we are going to consider involves the emergence of aspectual, tense, and modality markers in various sign languages. It has often been pointed out that verbs in sign languages (at least in those that have been investigated so far) do not inflect for tense.⁴ Rather, temporal information is either conveyed by time adverbials (which make use of so-called ‘time lines’, cf. e.g. Schermer and Koolhof (1990) for NGT) and lexical tense markers (Aarons et al. 1995) or is inferred from the context. In contrast to that, sign languages are known to have at their disposal complex systems of aspectual marking: Aspectual modification is either realized by changing the movement properties of a verb stem – be it by means of stem-internal changes and/or reduplication (cf. Klima and Bellugi (1979) and Wilbur (2005) for ASL, Bergman and Dahl (1994) for Swedish Sign Language) – or by using free aspectual markers.

⁴ There may be exceptions to this generalization. Jacobowitz and Stokoe (1988), for instance, claim that some ASL verbs may show signs of tense by means of extension or flexion at certain joints (wrist, elbow, shoulder). More recently, Grose (2003) argues that the temporal relationship of event-time before reference time (i.e. perfect tense in the Reichenbachian sense) is indicated by a non-manual consisting of a single downward movement of the head. Similarly, Zucchi (2003) observes that in Italian Sign Language (at least in the variant used in the Napoli-Salerno area), temporal information can be conveyed by means of suprasegmental features, i.e. by non-manual markings which simultaneously combine with a verb.

We will first consider the development of aspectual markers in a number of sign languages (Section 3.1.1), then the development of a future tense marker in ASL (Section 3.1.2), and finally the emergence of modal verbs in ASL (Section 3.1.3).

3.1.1 Completive and perfective aspect markers

The development of aspectual markers from verbs and adverbs is probably the best-known instance of grammaticalization in sign languages. It has been described in some detail for ASL (Fischer and Gough 1972/1999; Janzen 1995; Sexton 1999), Israeli Sign Language (ISL; Meir 1999), and Italian Sign Language (LIS; Zucchi 2003), but similar markers are attested in DGS and NGT, too. While the relevant markers have originated from the lexical verb for ‘finish’ in ASL and LIS, in ISL, DGS, and NGT, the source of the marker seems to be an adverb meaning ‘already’ or an adjective meaning ‘ready’.

There are subtle differences between the uses of these elements in the various sign languages. Among the (sometimes overlapping) aspectual meanings that have been described in the literature are the consecutive (sequences of actions), the completive, and the perfective. In (5), different uses of ASL FINISH are illustrated. In (5a), FINISH is used as a lexical verb. The sentence in (5b) is quite similar to the one in (5a), the crucial difference, however, being that in (5a) FINISH is signed before the main verb, while in (5b), it follows the main verb. Moreover, in (5a) a conditional non-manual marker (raised eyebrows) accompanies the first clause. In (5c), FINISH serves as a marker of perfective aspect. In this use, as pointed out in Fischer and Gough (1972/1999), it may appear in initial, second, or final position. The notational conventions used in the sign language examples are explained in the end matter of this paper (Section 6).

ASL (ex. (a,b) from Fischer and Gough 1972/1999:68f); (ex. (c) from Isenhardt 1990:203)

- cond
- (5) a. YOU **FINISH** EAT, WE GO SHOPPING
 ‘When you(‘ve) finish(ed) eating, we’ll go shopping.’
 b. YOU EAT **FINISH**, WE GO SHOPPING
 ‘After you eat, we’ll go shopping.’
 c. **FINISH** EAT YOU?
 ‘Have you eaten?’

Similarly, Zucchi (2003) identifies two different aspectual uses of the LIS sign FATTO. In (6a), FATTO is used as a lexical verb. In (6b), the same sign – now glossed as FATTO-1 – is used as a marker of completion, locating the event within the time indicated by the time adverb (note that some LIS signers do not regard this use as acceptable). As in ASL, the lexical verb FATTO appears in preverbal position, while FATTO-1 follows the verb. Moreover, FATTO (FATTO-2) can also mark temporal precedence, as in (6c). In this use, Zucchi (2003) analyses it as a present perfect marker.⁵

LIS (Zucchi 2003)

- (6) a. GIANNI CAKE **FATTO** EAT
 ‘Gianni finished eating the cake.’
 b. YESTERDAY GIANNI HOUSE BUY **FATTO-1**
 ‘Yesterday Gianni bought a house.’
 c. YESTERDAY AT-3 GIANNI EAT **FATTO-2**
 ‘Gianni had already eaten yesterday at 3.’

Similar grammaticalization phenomena have been reported for numerous spoken languages. In Rama, a language spoken in Nicaragua, for instance, the verb *atkul* (‘to finish’, (7a)) has developed into a completive marker (7b), while in Lhasa, spoken in Tibet, the verb *tshaa* (‘to finish’, (8a)) may also function as a marker of perfective aspect (8b). Note that a crucial difference to the sign language

⁵ See Zucchi (2003) for arguments and also for a predicate-logic analysis of the different uses of FATTO.

examples above is that in Rama and Lhasa, the lexical verbs developed into suffixes, that is, we are dealing with instances of type-2 grammaticalization here.⁶

Rama (Chibchan, Nicaragua; Craig 1991:476)

- (7) a. tabulaak tkeeruk nsu-**atkul**-u
 evening grave 1.PL-finish-TNS
 ‘We finished (digging) the grave in the evening.’
 b. dor y-aakang-**atkul**-u
 door 3-shut-ASP-TNS
 ‘She shut the door tight.’

Lhasa (Tibeto-Burman, Tibet; Lord 1993:230)

- (8) a. khó chîi-cææ **tsháa**-pa-re?
 he went-NONFINAL finish-PERF
 ‘He went and finished it.’
 b. nà ihóm-la chîi-**tshaa**
 I market-LOC went-PERF
 ‘I’ve gone to the store.’

As observed by Meir (1999:51), “there is a distinction between a completed action and a terminated action: a completed action is naturally terminated, but not vice versa; one can terminate an action without completing it.” In ASL, completion is part of the core meaning of FINISH. Interestingly, ISL makes use of

⁶ This does not mean that there are no bound aspectual markers in sign languages. One such marker has been described for Turkish Sign Language (TİD) by Zeshan (2003a). In TİD, there are two free signs that can be used to indicate completed action, TAMAM (‘done, complete, ready’) and BITTI (‘finish(ed)'). In addition to that, however, Zeshan identifies a completive movement pattern that is commonly used with a wide range of predicates. She glosses the bound aspectual element as “-son/tam”; see the example in (i).

TİD (Zeshan 2003a:51)

- (i) TÜRKIYE BURADA YAPMAK-son/tam
 Turkey here do-COMPLETIVE
 ‘I have done it here in Turkey.’

The movement pattern consists of a single accentuated movement, which may have a longer movement path than its non-completive counterpart. Crucially, however, this bound marker seems not to have evolved from a lexical sign.

two different signs in order to mark completive and perfective aspect. For marking perfective aspect, ISL signers use the sign **ALREADY**, the source of which is an adverb.⁷ Perfective constructions strongly imply that an action is terminated. As a matter of fact, in most cases, this may also imply completion of the action; this, however, is by no means a prerequisite. The sentence in (9a), for instance, could very well be uttered in a context where I got tired of writing the letter and therefore did not finish it. In contrast, the ASL sign **FINISH** could not appear in a similar context. For marking completion, ISL makes use of a sign which is also glossed as **FINISH**. This sign can co-occur with **ALREADY** in one sentence, as illustrated in (9b), since both signs mark different aspects of the situation.

ISL (Meir 1999:51f)

- (9) a. I **ALREADY** WRITE LETTER SISTER MY
 ‘I have written a letter to my sister (but have not finished it).’
 b. I **ALREADY** HOMEWORK **FINISH**
 ‘I have (already) completed my homework.’

Similarly, in DGS and NGT, the respective signs for ‘ready’ have developed into markers of completive aspect. Distinguishing the lexical and the grammatical use of these two signs is an intricate issue since they do not differ from each other with respect to syntactic position: both signs always appear

⁷ Since **ALREADY** is frequently used in past time contexts, it might be tempting to suggest that it marks past tense. Meir (1999:47), however, shows that it can also co-occur with time adverbials denoting present or future tense, as in (i). Moreover, a comparison between sentences with and without **ALREADY** reveals a distinction similar to the one observed in English perfect and simple past sentences: “the perfect relates the state which results from a prior situation to the reference time of the sentence”. Thus, the sentence in (ii), but not its counterpart without **ALREADY**, has the implication that I am not hungry right now.

ISL (Meir 1999:47)

- (i) WEEK FOLLOWING THEY_{dual} **ALREADY** MARRIED
 ‘Next week they will already be married.’
 (ii) I **ALREADY** EAT
 ‘I have eaten.’

sentence-finally. More research is necessary to differentiate possible further aspectual uses of these two signs.

3.1.2 *Future tense marker in ASL*

Besides being the source for an aspectual marker, lexical verbs can also give rise to tense markers. One such instance is described in Janzen and Shaffer (2002). Using data from the filmed narratives mentioned in Section 2.2, the authors argue that a future tense marker (glossed as FUTURE) has developed from an older sign with the meaning ‘to go’, attested as far back as the 1850s in France. The use of this sign is illustrated in (10a) where it is signed with one hand slightly above waist height with a forward arc movement, with the shoulder being the primary joint involved in the movement (cf. Figure 1).

ASL (Janzen and Shaffer 2002:203f)

(10) a. TWO, THREE DAY PREVIOUS E.M. GALLAUDET **GO-TO** TOWN
PHILADELPHIA

‘Two or three days before, (E.M.) Gallaudet had gone to Philadelphia.’

b. YEAR 50 **FUTURE**_[new] THAT FILM **FUTURE**_[old] TRUE P-R-I-C-E-L-E-S-S
‘In fifty years these films will be priceless.’

In (10a) the sign GO-TO clearly indicates physical movement. At the same time, however, the same form is already used as a marker that indicates future time. This can be seen in (10b) where FUTURE is produced twice. The second instance of FUTURE is identical to the sign GO-TO in (10a), while the first one is phonologically reduced and is signed in a manner consistent with the modern ASL sign FUTURE: it is executed with a much shorter forward movement near the cheek, with the wrist being the primary joint involved (cf. Figure 1). Crucially, in (10b) neither of the two signs indicates physical movement.

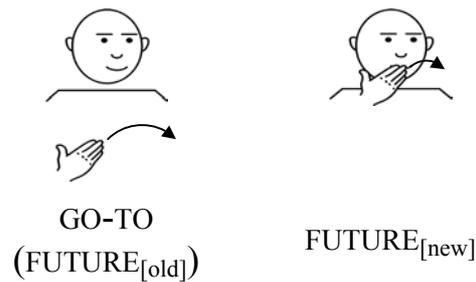


Figure 1. *From verb to tense marker in ASL*

Note that a future tense marker is also discussed in Aarons et al. (1995). The marker they describe is similar to the new form in (10b) which implies that – at least in their data – the new form has taken over the temporal meaning. The authors also discuss differences between the time adverbial $FUTURE_{adv}$ and the tense marker $FUTURE_{tns}$. First, whereas the adverbial allows for variation in articulation (reflecting different degrees of distance in time), the tense marker is restricted in its articulation. Moreover, in contrast to the adverbial, the tense marker has a highly restricted syntactic distribution. In particular, the tense marker exhibits the same distribution as do modals, that is, it appears between the subject and the main verb, a syntactic position in which the adverbial cannot surface. On the basis of this distribution, Aarons et al. argue that $FUTURE_{tns}$ occupies the head of the tense phrase, while $FUTURE_{adv}$ is adjoined to some maximal projection (TnsP or CP). Still, we can maintain that both these elements are grammaticalized from the lexical verb GO-TO, as argued for by Janzen and Shaffer (2002), with the adverb possibly being an intermediate step on the grammaticalization path towards the tense marker.

Interestingly, the ASL example is an instance of a well-documented grammaticalization path, whereby a temporal term is derived metaphorically from a spatial term – here: a lexical verb expressing movement (cf. Bybee and Dahl 1989; Bybee et al. 1991). Consider, for instance, the English expression *going to* (as in ‘He is going to leave’) or the use of *aller* ‘go’ in French to

express future tense ('Il va partir').⁸ Below, we give an example from Krao, a language spoken in Liberia which exemplifies the same phenomenon.

Krao (Kru, Liberia; Marchese 1979:125)

- (11) a. $\bar{o}\bar{o}$ **mū** nī tó
 he.INC go LOC store
 'He is going to the store.'
- b. $\bar{o}\bar{o}$ **mū** nī kpâ
 he.INC FUT water hit
 'He will swim.'

However, Janzen and Shaffer (2002) go one step further by arguing that in ASL the source of the process is not really the lexical verb GO-TO. Rather, they trace the origin of the sign FUTURE further back to a very common gesture of the same form that was and still is used among nonsigners in France.⁹ Consequently, what they are claiming is "that the source of FUTURE in ASL was a gesture used in France, which entered the lexicon of OLSF [Old French Sign Language], and then OASL [Old ASL], and finally proceeded along a common grammaticalization path" (Janzen and Shaffer 2002:207), which is given in (12).

- (12) gesture → full verb → grammatical morpheme
 'to go' GO-TO FUTURE

What is particular about this developmental path when compared to the prototypical spoken language paths in (1) is the first step from manual gesture to

⁸ In English, the grammaticalization chain of 'to go' also involves an intermediate step where it is used to mark a change of state, as in "He's going crazy". To the best of our knowledge, a similar use of GO is not attested in ASL.

⁹ The historical link between (Old) French Sign Language and ASL is due to the fact that Thomas Gallaudet who founded the first school for the deaf (the American Asylum in Hartford, CT) in 1816 went to Paris to learn signs and methods of instructing deaf children. Gallaudet returned to America with Laurent Clerc, himself a deaf graduate of the Paris school. Woodward (1978) suggests that what is now known as ASL constitutes, in large part, a mix of the lexicon and some elements of the grammar of OSFL with an indigenous sign language used in the North-Eastern part of the USA at that time.

lexical item.¹⁰ The same holds for the signs to be discussed in the following section. Note that in Section 4.1, we will discuss possible instances of grammatical elements that are derived directly from manual gestures, that is, grammaticalization pathways that do not involve an intermediate lexical stage.

3.1.3 Grammaticalization of modal verbs

Based on the historical sources mentioned before, it has been argued for ASL that the modal verbs CAN and MUST have developed from gestural sources via lexical elements (for similar LSC examples see Wilcox 2004). As far as CAN is concerned, it has originated from a lexical sign meaning STRONG/POWER, which in turn can be traced back to a gesture ‘strong’ in which the two fists perform a short tense downward movement in front of the body. The use of the lexical sign STRONG is illustrated in (13a), an example from a 1913 lay sermon. While in 1913, STRONG and the modal verb CAN were signed in an identical manner, present-day CAN, illustrated in Figure 2, has undergone some phonological changes; in particular, the orientation of the hands has changed (Shaffer 2002). Just as in English, CAN may not only be used to express physical and mental ability, but also to indicate the possibility of an event occurring (root possibility, as in (13b)) and permission.¹¹

¹⁰ Brita Bergman (p.c.) points out that a similar grammaticalization path may be attested in Swedish Sign Language (SSL), the source, however, not being a motion verb but a verb expressing obligation. This sign is described in the first book on SSL published in 1916 in which the author distinguishes between three related forms meaning: 1) ‘must, shall’, 2) ‘force’ and 3) what he refers to as “the future sign”. Crucially, for the latter, he uses the Swedish word “futurum” which is the grammatical term, and not “framtid” which is the general term for time to come. It is not entirely clear, however, in how far this sign is still in use in its temporal meaning. Note that there is another sign in present-day SSL to express future tense (glossed as SHALL in Bergman and Dahl (1994)) which is formationally very similar to the above sign (all parameters except palm orientation being identical).

¹¹ In IPSL, the lexical verb PASS (i) developed into a modal verb expressing root possibility or permission (ii). Crucially, however, PASS cannot be used in the context of learned abilities (as in e.g. *I can write*); in such contexts, IPSL signers use the sign KNOW.

ASL (ex. (a) from Janzen and Shaffer (2002:208); ex. (b) from Wilcox and Wilcox (1995:142))

- (13) a. OUR FATHER **STRONG** OVER MOON STARS WORLD
 ‘Our father is strong over the moon, and stars and world.’
 _____ y/n
- b. TOMORROW INDEX₂ **CAN** DRIVE INDEX₂
 ‘Can you drive tomorrow?’

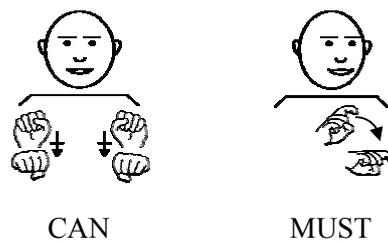


Figure 2. *Modal verbs in ASL*

Not surprisingly, the development of a modal verb expressing physical/mental ability and possibility from a lexical element expressing physical ability or strength is attested in spoken languages, too. Take, for instance, Latin *potere* (‘to be able’) which is related to the adjective *potens* (‘strong, powerful’) (Bybee et al. 1994:190).

Wilcox and Wilcox (1995) and Janzen and Shaffer (2002) sketch a similar development for the ASL modals **MUST** and **SHOULD**. For these modals, the gestural source is claimed to be a deictic pointing gesture indicating monetary debt. This gesture entered the lexicon of Old French Sign Language and, due to the influence of (Old) French Sign Language on ASL (see footnote 9) the lexicon of ASL (14a). In both sign languages, the lexical sign underwent semantic generalization away from the more narrow meaning of monetary debt

IPSL (Ulrike Zeshan, p.c.)

- (i) INDEX₁ EXAM **PASS** NEG, FAIL
 ‘I didn’t pass the exam, I failed.’
- (ii) MALE SIBLING MONEY BEG INDEX₁ **PASS** NEG
 ‘I cannot beg my brother for money.’

of the sign language auxiliaries to be discussed in this section is to express verbal subject and object agreement. We therefore call these auxiliaries agreement auxiliaries. By contrast, auxiliaries in spoken languages usually express the grammatical categories tense, aspect, or modality, among others, and are thus usually referred to as TAM-auxiliaries. Second, while spoken language auxiliaries usually develop from verbal sources, the sign language auxiliaries are grammaticalized from a wider variety of sources, namely verbs, nouns, and pronouns. In this section, we will focus on agreement auxiliaries in NGT, Taiwan Sign Language (TSL), and DGS which have developed from lexical sources, i.e. they can be traced back to verbs and nouns. Since sign language pronouns are themselves grammaticalized from gestures, we will discuss the third type of auxiliaries, those that developed from pronouns, only in Section 4.1.3, in the context of the grammaticalization of gestures.¹³ Before discussing agreement auxiliaries in NGT, TSL, and DGS in more detail, we briefly introduce some aspects of agreement in sign languages that will be relevant for the discussion of agreement auxiliaries.

3.2.1 Agreement in sign languages

Before considering the emergence of auxiliaries in sign languages, a few words need to be said about how agreement is implemented in sign languages and about a basic distinction of verb types that has been observed in all sign languages investigated so far.

¹³ Sign languages for which the use of such an agreement auxiliary has been described include Argentine Sign Language (LSA), Catalan Sign Language (LSC), Greek Sign Language (GSL), Indo-Pakistani Sign Language (IPSL), Japanese Sign Language (NS), and TSL. Note that GSL has a second auxiliary, which has developed from the verb GIVE; this auxiliary has properties different from the other auxiliaries grammaticalized from verbs (see Section 3.2.2) and will be discussed in Section 3.8. For a more detailed cross-linguistic and cross-modal discussion of the development of sign language auxiliaries see Steinbach and Pfau (to appear).

Agreement in sign languages is locus agreement. Discourse referents are linked to loci in the signing space (cf. Figure 3a) which are either the actual locations of present referents or locations that are assigned for non-present referents by means of the pointing sign INDEX or by eye gaze towards a particular locus. These loci can serve at least two grammatical functions: they can be used in pronominalization and in order to mark agreement on verbs.¹⁴ For illustration, consider the following DGS example.

DGS

- (15) POSS₁ MOTHER INDEX_{3a} BOOK++ LIKE.
 YESTERDAY (INDEX_{3a}) BOOK_{3a}GIVE₁
 ‘My mother likes books. Yesterday she gave me a book.’



Figure 3a.
Signing space

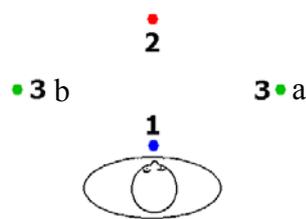


Figure 3b.
Localization of referents

In the first sentence in (15), the first person possessive pronoun POSS₁ is a pointing sign towards the signer's chest (location 1), while INDEX_{3a} localizes the non-present referent MOTHER at location 3a in the signing space (cf. Figure 3b). In the second sentence, this location can be used to pronominalize MOTHER.

¹⁴ In the literature, there is some discussion about what exactly the status of these loci is. While some researchers argue that the loci spell out agreement features (Aronoff et al. 2000; Mathur 2000; Neidle et al. 2000; Rathmann and Mathur 2002; amongst others) – the exact nature of these features also being a matter of debate – others assume that the use of loci in signing space lies outside the linguistic system and should rather be treated as gestural (Liddell 2000). We shall not go into this discussion here. No matter how the movement/orientation properties of the auxiliaries to be discussed below are determined, the fact remains that the auxiliaries are grammaticalized from lexical elements. We will, however, use the term “agreement” throughout.

Moreover, the verb sign GIVE moves from location 3a towards the location 1, by that showing agreement with the subject (begin point of movement) and the object (end point of movement).¹⁵

However, not all verbs in sign languages are agreeing verbs (sometimes also called ‘directional verbs’). There are also plain verbs which do not show agreement. Plain verbs are characterized by the fact that they are lexically specified for location and movement features. The DGS verb LIKE in (15), for instance, is articulated on the signer’s chest. It cannot be detached from this location in order to show agreement with a non-first referent. Many sign languages have developed means to overcome the agreement gap caused by plain verbs. They make either use of agreement auxiliaries, which are capable of expressing the agreement relations whenever the main verb is not capable of doing so, or they use non-manuals to express the agreement relation with plain verbs (for non-manual agreement marking in ASL see Neidle et al. 2000). In the following two subsections, we will first discuss agreement auxiliaries in NGT and TSL, which developed from verbal sources. Then, we turn to an agreement auxiliary in DGS, which is related to a nominal source.

¹⁵ The picture sketched here is very much simplified, but due to space limitations, we cannot go into all the complexities that researchers have noted with respect to sign language agreement. To name just three important aspects: (a) in (15), agreement is realized by means of path movement from location 3a to location 1. Some verb signs, however, realize agreement by means of orientation of the palm or the fingertips towards a particular location or by means of a combination of movement and orientation (Mathur 2000). (b) The verb sign GIVE in (15) moves from the location associated with the subject towards the location associated with the object. In contrast to that, some verbs, the so-called “backwards verbs” (e.g. INVITE), move in the opposite direction, i.e. from the object towards the subject locus (see Meir (2002) for a uniform analysis of agreement verbs). (c) Agreement on the verb licenses pro-drop of subject and object pronouns. Pro-drop, however, is also possible with plain verbs due to topic chaining (Lillo-Martin 1986; Bos 1993).

3.2.2 *From verb to auxiliary in NGT and TSL*

In NGT, an auxiliary is regularly used with plain verbs and adjectival predicates. The use of the NGT-auxiliary, however, is constrained to animate arguments. It is grammaticalized from the spatial verb GO-TO which expresses a change of location. Hence, the source of the auxiliary already contains a directional movement (16a). Bos (1994), however, observes a phonological change: while the verb sign GO-TO has a lax movement, the movement of the auxiliary – which is glossed as ACT-ON – is somewhat shorter and tense. Moreover, the auxiliary which always occurs after the lexical verb obligatorily combines with the Dutch mouthing /op/ ('on'); cf. Figure 4. Interestingly, while in spoken Dutch, the preposition /op/ is commonly used for marking the patient of verb participles or adjectives of emotional states (such as *boos op* 'angry at' and *trots op* 'proud of'; also cf. Hoiting and Slobin 2001), it is never used to mark the patient argument of a finite verb such as *houden van* ('to love') as in the NGT example (16b). Crucially, the NGT verb LOVE cannot be modulated to show agreement. Consequently, the auxiliary is used. Just like some agreement verbs, ACT-ON expresses agreement by means of path movement (from the subject locus towards the object locus) and orientation of the fingertips.

NGT

- (16) a. SCHOOL INDEX₃ BOY **GO-TO**₃
 'The boy is going to school.'
- b. POSS₁ SISTER INDEX_{3a} LOVE ^{_____ /op/} **3aACT-ON**₁
 'My sister loves me.'

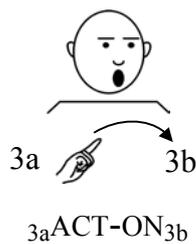


Figure 4.
Aux in NGT

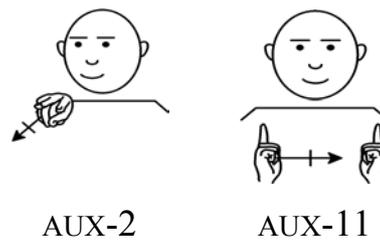


Figure 5.
Auxiliaries in TSL

For TSL, Smith (1990) describes three different auxiliaries. According to Smith, the one most frequently used (glossed as AUX-1) is not derived from any particular TSL verb but rather looks like the concatenation of two pronouns (see Section 4.1.3 below). The other two, however, seem to be derived from verbs. The second one (AUX-2) is similar in form to the verb sign SEE: it is signed with a bent V-hand, the fingertips facing the object locus and the back of the hand facing the subject locus (Figure 5). It is, however, void of the semantic content of the verb SEE and it always appears in combination with some lexical verb. Similarly, the third auxiliary Smith describes (AUX-11), is derived from the verb MEET. This is a two-handed sign in which both hands have a 1-handshape and the dominant hand moves towards the weak hand (Figure 5). Again, the auxiliary does not have the semantics of the source verb and it has to combine with a lexical verb. In contrast to NGT, all three auxiliaries must precede the main verb; they either appear in clause-initial position (as in (17a)) or they immediately precede the main verb (as in (17b)).

TSL (Smith 1990:219ff)

(17) a. ${}_1\text{AUX-2}_3$ INDEX₁ UNFAMILIAR

‘I don’t know him.’

top

b. THAT VEGETABLE, INDEX₁ ${}_1\text{AUX-11}_3$ NOT-LIKE

‘I don’t like that dish.’

In spoken languages, too, auxiliaries are frequently grammaticalized from lexical verbs. Heine (1993) identifies a number of event schemas that are

common sources for the grammatical category auxiliary. Amongst the schemas he proposes are the Location Schema (e.g. “be at”, “stay at”), the Motion Schema (e.g. “go”, “come”), the Action Schema (e.g. “do”, “finish”), and the Volition Schema (e.g. “want”). While the NGT auxiliary ACT-ON and the TSL auxiliary AUX-11 clearly belong to the Motion Schema, i.e. they are grammaticalized from verbs expressing motion, it is not entirely clear how the TSL auxiliary AUX-2 can be integrated into the schemas Heine proposes. He points out, however, that alternative schemas may yet have to be identified, for example, “a proposition involving mental process or utterance verbs such as “think”, “say”, etc.” (Heine 1993:35). In Tonga, for instance, the verb *yeeya* (‘to think’) has developed into an auxiliary marking future tense (18).

Tonga (Bantu, Zambia; Collins 1962, cited in Heine 1993:35)

- (18) Joni u-yeeya ku-fwa
 John 3.SG-think INF-die
 ‘John is about to die (or: John will die).’

Recall that auxiliaries in spoken language and the agreement auxiliaries in sign languages discussed in this and the following subsection differ in one crucial aspect, namely in the inflectional information marked on the auxiliary. In spoken languages, auxiliaries tend to provide expressions for a small range of notational domains, especially for the domain of tense, aspect, and modality. Moreover, agreement tends to be marked on the auxiliary rather than the main verb (Steele 1978). In the sign languages discussed here, however, only (subject and object) agreement is marked on the auxiliary, while aspectual information appears on the lexical verb. In Section 3.1, we have already seen that verbs may

also develop into aspect and tense markers (employing the Motion and the Action Schema); these markers, however, never show agreement.¹⁶

3.2.3 *From noun to auxiliary in DGS*

As opposed to NGT and TSL, in DGS the source for the auxiliary is not a verb but rather the noun PERSON. This sign is realized with a babyC-handshape (index and thumb forming a C) with a downward movement in front of the signer, as shown in Figure 6. Example (17a) illustrates the nominal use of this sign, where the plural is realized by sideward reduplication. In contrast to the lexical sources of the NGT and TSL auxiliaries, the noun PERSON in DGS does not exhibit a directional movement. Still, it has developed into an auxiliary which finds use with plain verbs in order to express agreement. Following Rathmann (2000), we gloss the DGS auxiliary as PAM (*Person Agreement Marker*). In (19b), for instance, the plain verb LIKE finds use and agreement is realized on PAM by moving from location 3a to 3b (as is illustrated in Figure 6). Moreover, PAM can be used to express agreement in sentences containing adjectival predicates, as in (19c).

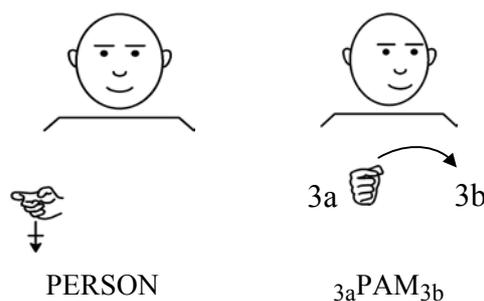


Figure 6. *From noun to auxiliary in DGS*

¹⁶ See Anderson (2000) on split (and double) inflection in auxiliary-verb-constructions in spoken languages; see Steinbach and Pfau (to appear) for sign language examples.

DGS

- (19) a. _____ top _____ /shh/
 CONFERENCE, MANY **PERSON**⁺⁺ BE-PRESENT
 ‘There were many persons/people present at the conference.’
- b. MOTHER INDEX_{3a} NEIGHBOR NEW INDEX_{3b} LIKE **3aPAM**_{3b}
 ‘(My) mother likes the new neighbor.’
- c. INDEX₁ POSS₁ BROTHER INDEX_{3a} PROUD **1PAM**_{3a}
 ‘I am proud of my brother.’

It has been noted that – just like the NGT auxiliary – the DGS auxiliary is accompanied by a mouthing, namely the spoken German preposition /auf/ (‘on’). As in NGT, this preposition is hardly ever used with verbs in spoken German; it only accompanies some adjectival predicates (e.g. *stolz auf* ‘proud of’). While Keller (1998:489) points out that the auxiliary is always accompanied by the mouthing, Rathmann (2000:5) states that it “may be accompanied by the mouthing ‘auf’”. According to more recent observations (in the Frankfurt/Main area), however, the mouthing disappears. We take this to be a further indication of the generalized grammaticalized use of this element.¹⁷

Obviously, the DGS auxiliary does not fit into any of the event schemas proposed by Heine (1993), since all of these schemas concern the grammaticalization of auxiliaries from verbs. In fact, cross-linguistically, the N-to-Aux chain attested in DGS is highly unusual if not nonexistent. Heine (1993:76ff) mentions alternative chains for the grammaticalization of

¹⁷ The DGS as well as the TSL auxiliaries also appear in reciprocal constructions. In its reciprocal form, the TSL auxiliary AUX-2 is two-handed. The two V-hands do not exchange locations; rather, the tips of the two V-hands meet at a location halfway between positions 3a and 3b (i). In contrast, in the DGS example (ii), PAM is one-handed and moves from position 1 (speaker) to position 2 (addressee) and then back to 1 (see Pfau and Steinbach (2003, 2005a) for reciprocal constructions in DGS).

TSL (ex. (i) from Smith 1990:225) and DGS (ex. (ii) from Pfau and Steinbach 2003:21)

(i) _{3a}**AUX-2**_{3b}-recip REMEMBER_(dual)
 ‘They remember each other.’

(ii) ₁WE-TWO₂ TRUST ₁**PAM**₂**PAM**₁
 ‘We trust each other’

auxiliaries, namely the Adposition-to-Aux chain and the Adverb-to-Aux chain, both of which are rarely encountered in the languages of the world. The N-to-Aux chain, however, is not mentioned in his comprehensive study. Similarly, Kuteva (2001:22) states that “all lexical sources for auxiliary verb constructions involve verb meanings which are relatively concrete and basic to human experience”.¹⁸ In the light of this cross-linguistic generalization, the N-to-Aux chain attested in DGS constitutes a highly remarkable pattern. Note, however, that the source noun PERSON has two properties that are highly relevant for sign language agreement. First, the sign PERSON has all phonological properties necessary to express agreement. Since the beginning and the endpoint of the path movement of PERSON are not explicitly lexically specified, a directional movement can easily be substituted for the downward path movement to express agreement. In addition, its orientation and handshape features are ideal for agreement marking. Second, PERSON has all relevant semantic properties to express agreement. Like verbal agreement, the sign PERSON is semantically specified as [+human]. Moreover, as opposed to signs such as CHILD, WOMAN, or MAN, which are also specified as [+human], PERSON has no additional semantic specification. Apparently, these two properties joint forces and paved the way for the highly uncommon N-to-Aux chain attested in DGS.

3.3 From noun to pronoun

3.3.1 Indefinite pronouns

The development of indefinite pronouns from generic nouns, such as ‘thing’, ‘person’, ‘body’, and ‘man’, is a very common process in spoken languages.

¹⁸ Bernd Heine (p.c.) points out, that in spoken languages grammaticalization from noun to auxiliary might in principle proceed via a detour: nouns commonly develop into third person pronouns which in turn may be the source for copula verbs. This reasoning, however, cannot be applied to the DGS case under discussion, since the noun PERSON has not developed into a pronoun (in contrast to Israeli Sign Language; cf. Section 3.3.2.).

Well known examples include the English indefinite pronouns *something/somebody*, the German indefinite pronoun *man* (used for subjects only) which is grammaticalized from *Mann* ('man') as well as French *on* the source of which is Latin *homo* ('man'). Grammaticalization of an indefinite pronoun from the noun 'person' is exemplified by the Baka example in (20).

Baka (Ubangian, Sudan; Heine and Kuteva 2002b:232)

- (20) a. nga **bo**, nga so ode
 1.PL.EXCL person 1.PL.EXCL animal NEG
 'We are people, we are not animals.'
 b. **bo** ?á kotòε
 person 3.SG come.PAST
 'Somebody has come.'

Similarly, in DGS and NGT, the nouns for PERSON (which are phonologically similar; cf. Figure 6 above), in combination with the (reduced) numeral 'one', are used as indefinite pronouns (21). Crucially, in both examples, the indefinite pronoun does not necessarily refer to one person. In (21b), for instance, it may very well be two or three persons that are recruited for doing the dishes.

DGS (a) and NGT (b)

- (21) a. INDEX₁ ONE^PERSON SEE
 'I've seen someone.'
 b. ONE^PERSON WASH-DISH DO MUST
 'Someone has to do the dishes.'

3.3.2 A case-marked pronoun in ISL

The emergence of a case-marked pronoun from a noun is discussed in Meir (2003) for ISL. As mentioned above, pronominalization in sign languages is realized by means of pointing signs that point towards a location in the signing space that is associated with a discourse referent (cf. Figure 3b). In ISL, as in many other sign languages, pronouns usually take a 1-handshape (with extended index finger; cf. Section 4.1.2.) that points towards the location of a discourse

referent. In general, these pronominal forms do not show case distinctions, the only exception being the genitive which requires a different handshape in some sign languages (cf. for instance the DGS example (19c) where the first person subject pronoun INDEX₁ has the 1-handshape while the genitive pronoun POSS₁ surfaces with a B-handshape). However, in ISL, certain verbs mark their pronominal object by means of a special morpheme, which has a babyC-handshape (thumb and index finger forming a C) and a downward movement. Meir glosses this sign as PRO_[bC]. Consider the examples in (22), where INTERRUPT requires the usual object pronoun INDEX, while BE-IMPRESSED shows up with PRO_[bC].

ISL (Meir 2003:112)

- (22) a. INDEX₃ INTERRUPT INDEX₂
 ‘He interrupted you.’
 b. INDEX₁ BE-IMPRESSED PRO_[bC]₃
 ‘I am impressed with him.’

Just like the DGS auxiliary PAM discussed in Section 3.2.2, the ISL sign PRO_[bC] is cognate with the sign meaning ‘person’ (cf. Figure 6). Meir (2003) demonstrates, however, that in ISL the two signs PERSON and PRO_[bC] have clearly distinct properties. As far as their syntactic function is concerned, PERSON may assume any NP function in a clause, while PRO_[bC] is restricted to functioning as an object. Secondly, only PERSON allows for modification by means of adjectives and numerals. Moreover, while PERSON denotes only 3rd person, the pronominal sign PRO_[bC] shows person distinctions.¹⁹

Besides the fact that PRO_[bC] can only appear in object position, there are further interesting restrictions on its occurrence. First, it can only refer to NPs

¹⁹ Moreover, the two signs also have different discourse functions. Only PERSON is capable of introducing new discourse referents, while PRO_[bC] can only function anaphorically. See Meir (2003:114ff) for further phonological and morphological differences between PERSON and PRO_[bC], for instance, the possibility of number marking and cliticization.

which have human referents. With non-human objects, the pronominal form INDEX has to be used. Secondly, PRO_[bC] may only co-occur with certain verbs, which – according to Meir – divide into three classes: ‘experiencer subject’ (ES) psych verbs (such as HATE and PITY), verbs denoting an action whose agent intends to harm or negatively affect the complement in some way (such as LIE-TO and INSULT), and verbs which take a ‘content’ object (such as TALK and WRITE). Meir concludes that “the various classes of verbs which select for a PRO_[bC] complement all relate to the qualities of that argument as a person. PRO_[bC] reflects someone’s qualities as a person, not as a referent” (p.120).

Why, then, is PRO_[bC] not analyzed as an auxiliary, similar to the DGS sign PAM discussed in Section 3.2.2? After all, most of the verbs PRO_[bC] appears with are plain verbs and it could therefore be tempting to argue that the function of PRO_[bC] is to mark agreement with the object of such verbs. Meir gives two arguments against such an analysis. First, sometimes PRO_[bC] does co-occur with agreement verbs. Meir points out that this co-occurrence would be unaccounted for, if the function of PRO_[bC] was to mark agreement. Secondly, in contrast to the auxiliaries discussed in Section 3.2, PRO_[bC] marks only the object NP, not the subject NP. This observation by itself may not be a very strong argument, since it is well-known that in sign languages, object agreement takes precedence over subject agreement in general: some agreement verbs only show agreement with their object and subject agreement seems to be optional in many cases (Janis 1995; Mathur 2000). More important is the observation that agreement verbs as well as auxiliaries can co-occur in the same clause with the NPs they agree with, as is illustrated by the examples (15) and (19bc) above and (23a) below. In contrast, PRO_[bC] cannot co-occur with a full NP in the same clause, as shown by the ungrammaticality of (23b). This is evidence for the assumption that PRO_[bC] occupies an argument position in the phrase structure and not an auxiliary position (i.e. some functional head).

ISL (Meir 2003:122)

- (23) a. INDEX₁ LOOK-AT₃ STUDENT INDEX₃
 ‘I looked at the student.’
 b. *INDEX₁ BE-IMPRESSED PRO_[bC]₃ STUDENT INDEX₃
 ‘I am impressed with him the student.’

To the best of our knowledge, in spoken languages, there is no real parallel to this development from a noun denoting ‘person’ to a case marker. While nouns denoting ‘person’ may be the source for various instances of grammaticalization in spoken languages, they are not usually the source for case markers.²⁰ Rather, as pointed out by Meir, in spoken languages, the sources for case markers are mainly of two kinds: verbs denoting locative and spatial relations (e.g. *come*, *go*, *leave*) and nouns denoting body parts with salient location or orientational features (e.g. *stomach*, *face*, *back*).

3.4 The development of complementizers

Complementizers can be grammaticalized from various sources. Two common sources are demonstratives and question words that develop into complementizers introducing verb complements. The former phenomenon can be exemplified by English *that* and Dutch *dat* (‘that’). Presumably, this process is due to a reinterpretation of certain direct speech patterns, for instance, *She said that: he is unhappy* being reinterpreted as a combination of a main clause and a complement clause (*She said that he is unhappy*). In Dutch (and German), this reinterpretation was accompanied by a change of word order in the

²⁰ As far as the pronominal system is concerned, the noun ‘person’ developed into a first person plural pronoun in a number of languages. Consider, for instance, the Kono examples in (i) and (ii) where the first person plural inclusive pronoun is a reduced version of the noun.

Kono (Mande, Sierra Leone; Heine and Kuteva 2002b:233)

- | | |
|--|---|
| (i) mòò kúndú-nù
person short-PL
‘short people’ | (ii) mò` dè án nè
1:PL:INCL mother EMPH here
‘This is our mother.’ |
|--|---|

complement clause. An example of the latter phenomenon is French *que* which is used as a question word ('what') and as a complementizer ('that').

Moreover, nouns and verbs can be the source for the grammaticalization of complementizers, and it is this developmental path that is also attested in sign languages. In the following, we will first consider the Noun-to-Comp chain before turning our attention to an instance of the Verb-to-Comp chain.

3.4.1 *From noun to complementizer*

In DGS, the noun REASON (the bent index finger of the dominant hand tapping the palm of the non-dominant hand) has developed into a complementizer introducing complement clauses. The lexical use of this noun sign is illustrated in (24a). In (24b), the same sign is used to introduce a cause complement while in (24c), it introduces a purpose complement (note that in this example, a non-manual marker (puffed cheeks) in combination with reduplication of the verb sign marks the intensive form). Just as the Demonstrative-to-Comp chain mentioned above, this grammaticalization process probably involves the reinterpretation of a multi-clausal structure, such as "I am sad. The reason is: my dog died". Note, however, that there is no prosodic break between REASON and the following sign. Moreover, the inherent repetition present in REASON tends to be omitted in the grammaticalized form, i.e. the sign is phonologically reduced.

DGS

- (24) a. $\overset{\text{top}}{\text{REASON}}$ INDEX₁ $\overset{\text{neg}}{\text{UNDERSTAND}}$
 'I don't understand the reason.'
- b. INDEX₁ SAD REASON POSS₁ DOG DIE
 'I'm sad because my dog died.'
- c. POSS₁ SISTER $\overset{\text{int}}{\text{WORK++}}$ REASON A-LOT-OF MONEY EARN
 'My sister works hard in order to earn a lot of money.'

This grammaticalization path is, of course, reminiscent of the one attested in English where the noun *cause* developed into the complementizer *because*. In other spoken languages, cause- and purpose-complementizers may be grammaticalized from generic nouns such as ‘matter’, ‘thing’, and ‘place’, as exemplified by the Kikuyu example in (25).

Kikuyu (Bantu, Kenya; Heine and Kuteva 2002b:211)

- (25) a. gu-ti-rĩ **ũndũ**
 C15-NEG-be matter
 ‘no matter’
- b. nĩ-n-gũ-igua ũũru nĩ **ũndũ** wa ũ-horo ũ-cio
 PART-1.SG-FUT-feel bad COP matter of C14-affair C14-that
 ‘I feel unhappy because of that affair.’

In contrast to DGS, NGT has a cause complementizer that is not grammaticalized from a noun/verb. Still, occasionally the NGT sign REASON is used to introduce cause complements. The prosodic properties of the relevant construction, however, require further investigation. In particular, it is not clear whether REASON is followed by a prosodic break. In other words: in NGT, just as in many spoken languages, the process has possibly not yet proceeded beyond an incipient stage where it remains controversial whether, or to what extent, the relevant noun still constitutes a noun or already functions as a clause subordinator. The same observation holds with respect to the use of the *wh*-signs meaning ‘why’ in NGT and DGS, which seem to develop into complementizers introducing cause or purpose clauses.

3.4.2 *From verb to complementizer*

The Verb-to-Comp chain can be illustrated by examples from ASL and NGT. Fischer and Lillo-Martin (1990) observe that the ASL verb UNDERSTAND has developed into a complementizer. In (26a), UNDERSTAND is used as a lexical verb. In this use, it has a core meaning of comprehension, it has only one

movement, and it takes an overt subject. Things are quite different in (26b). In this example, UNDERSTAND functions as a complementizer introducing an adverbial adjunct clause roughly meaning ‘provided that’. Fischer and Lillo Martin observe two phonological changes: first, the movement of the sign is repeated; second, a particular non-manual marker (brow raise and chin thrust) is associated with the sign. They use the gloss UNDERSTAND’ to differentiate the complementizer from the verb. Syntactically, UNDERSTAND’ in (26b) does not function as a verb. In particular, it cannot appear with an overt subject or a modal.²¹

ASL (Fischer and Lillo-Martin 1990:72)

- (26) a. _____ ead nod
 ME UNDERSTAND MEAN
 ‘I understand what (it) means.’
- b. _____ brow raise
 ME GO-TO STORE NOW NIGHT, UNDERSTAND’ YOU WATCH
 MY CHILDREN, OK
 ‘I’ll go to the store tonight provided that you babysit, ok?’
- c. _____ brow raise
 ME GO-TO GALLAUDET, UNDERSTAND’ ME NOT MAJOR BUSINESS
 ‘I’m going to Gallaudet, but not to major in business.’

Besides its meaning in (26b), Fischer and Lillo-Martin (1990) identify two further but semantically related uses of the complementizer UNDERSTAND’. The second meaning is something like ‘contrary to expectation’ (26c), while the third meaning is a form of clarification. Obviously, the three uses have a semantic core in common in that all of them express a meaning like ‘I want you to understand’. Two syntactic tests are taken as proof that UNDERSTAND’ indeed functions as a subordinating and not as a co-ordinating conjunction. First,

²¹ As the translation indicates, some English complementizers, in particular complex complementizers, are also transparently derived from lexical verbs, e.g. ‘provided that’ and ‘given that’. As ASL UNDERSTAND’, when functioning as complementizers, these elements cannot take subjects or modal verbs.

clauses introduced by UNDERSTAND' cannot stand alone. Secondly, second conjunct reduction is permitted in co-ordinate structures but is impossible in clauses introduced by UNDERSTAND' just as in other subordinate clauses.²²

In NGT, the two-handed verb sign FOLLOW originally expresses an event involving two human beings, as is evidenced by the fact that both hands show a classifier handshape for upright long and tall entities (A-hand: thumb extended). However, the same sign is also capable of expressing a more abstract meaning, as, for instance, in "I follow the course". Besides that, FOLLOW can be used as a clause-linking element linking two clauses which express an event and its consequence, as in (27). The translation illustrates that the English verb "to follow" can express a similar meaning, a temporal and causal relation between two events.

NGT (Joni Oyserman, p.c.)

- (27) a. YESTERDAY EVENING MAN POSS₁ SISTER **FOLLOW**
 'Yesterday evening, a man followed my sister.'
 b. LAST WEEK EXPLOSION **FOLLOW** EIGHTY PERSON++ DEAD
 'Eighty people died due to / following the explosion last week.'

Across spoken languages, one very common verbal source for complementizers is the verb for 'to say'. Most frequently, this verb develops into a complementizer introducing sentential complements of verbs of saying and knowing (see Frajzyngier (1996) for Chadic languages). Occasionally, 'to say' may also develop into a complementizer introducing cause or purpose

²² Other verb-complementizer pairs which – according to Fischer and Lillo-Martin (1990) – pattern similarly are SUCCEED-SUCCEED', HAPPEN-HAPPEN', and SUPPOSE-SUPPOSE'. All three of them show idiosyncratic phonological and semantic meanings, although the syntactic shifts that occur are similar. Only for SUPPOSE', which introduces conditional clauses, they give an example.

ASL (Fischer and Lillo-Martin 1990:77)

- (i) **SUPPOSE'** YOU PUT-GAS, ME ACCEDE LOAN-YOU CAR
 'If you put gas (in the car), I'll agree to loan (it) to you.'

complements as, for instance, in the Lezgian example (28) where the complementizer *luhuz* ('because') is actually an inflected form of the verb *luhun* ('to say'). Other verbs that may give rise to complementizers include 'to give', 'to go to', and 'to resemble', the last type of development being exemplified by the Twi example in (29).

Lezgian (North Caucasian, Russia; Haspelmath:1993:390)

- (28) Pul kwadar-na **luhuz** buba k'wal-er-aj aqud-iz že-da-ni
 money lose-AOR saying father house-PL-INE take.out-INF can-FUT-Q
 'Can we kick father out of the house because he has lost the money?'

Twi (Kwa, Ghana; Lord 1993:160)

- (29) a. Kofi sɛ Amma
 Kofi be.like Amma
 'Kofi resembles Amma.'
 b. Na Ama nim sɛ Kofi yɛɛ adwuma no
 PAST Ama know that Kofi did work the
 'Ama knew that Kofi had done the work.'

3.5 Grammaticalization of markers of intensification and emphasis

In a number of sign languages, markers of intensification or emphasis have developed from adjectives or verbs. Such a process has been described for ASL, for instance, where the adjective TRUE (30a) can also be used as an intensifier (30b).

ASL (ex. (b) from Fant 1994:42; cited in Sexton 1999:117)

- (30) a. _____ top neg
 STORY INDEX₂ HEAR, TRUE
 'The story you heard is not true.'
 b. I TRUE SICK
 'I am very sick.'

Again, we find parallel developments in spoken languages. The English intensifier *very*, for example, has been grammaticalized via borrowing of the French adjective *vrai* ('true'). Similarly, in Baka, the adverb *ko* ('truly, really')

verb HIT (33a) frequently combines with a number of other verbs in order to intensify the meaning expressed by the main verb (33b).

AdaSL (Victoria Nyst, p.c.)

- (33) a. TEACHER HIT CHILD
 ‘The teacher is hitting the child.’
 b. YESTERDAY FATHER WORK HIT
 ‘Yesterday (my) father worked very hard.’

A spoken language equivalent that comes to mind is the use of *do*-verbs to emphasize the action described by the main verb, a strategy which is attested in a number of languages, as, for instance, English (*He came* versus *He did come*, with stress on the auxiliary) and Imonda (for details see van der Auwera 1999). Seiler (1985) points out that the Imonda verb *fe* is basically a transitive verb meaning ‘to make, to do’, as in (34a). However, *fe* may also be used as an existential verb, as a marker of future tense, and – most important in the present context – it may be added for the sake of emphasis, as is illustrated in (34b).

Imonda (Waris, New Guinea; Seiler 1985:112ff)

- (34) a. bēsèi adeia fe-f
 what work do-PRES
 ‘What are you doing?’
 b. pon ka-m ha fe-f
 hunger 1.SG-GOAL affect do-PRES
 ‘I am hungry.’

3.6 From adjective to negative existential

It has been observed that in spoken languages, lexical items that have negative semantics (“implied absence”), as for instance the verb ‘to lose’, may turn into grammatical markers that highlight this particular property, that is, into markers of negation. Consider, for instance, the Fula example in (35). In (35a) *waas* functions as a lexical verb with the meaning ‘to lose’ while in (35b) this meaning is bleached and *waas* fulfills the function of a clause negator.

Fula (West Atlantic, Nigeria; Marchese 1979:311f)

- (35) a. o **waas-ii** debbo makko
 3.SG lose-TNS woman his
 ‘He has lost his wife.’
 b. ko miin **waas-i** am-de
 FOC me NEG-TNS dance-INF
 ‘It’s me who did not dance.’

Apparently, the adjective *EMPTY* in Jordanian Sign Language (LIU) has undergone a similar change. In its lexical use, this sign clearly has the semantics of implied absence. Bernadet Hendriks (p.c.) reports that *EMPTY* is not only used as an adjective, as in (36a), but may also function as a negative existential. Example (36b) was signed in a context where two girls knocked on the door of a house but got no answer. Clearly, it is not implied that the mother is empty but rather that she is not present, that is, that the house is empty. The phonological form of the sign, however, is exactly the same in both examples.

LIU (Bernadet Hendriks, p.c.)

- (36) a. HOUSE **EMPTY**
 ‘The house is empty.’
 b. MOTHER **EMPTY**
 ‘Mother is not there / not present.’

We therefore assume that, just as in the Fula example in (35b), we are dealing with an instance of grammaticalization of a lexical sign – here: an adjective – towards a grammatical element, a negative existential.

3.7 Grammaticalization of a negative completive marker

LIU provides yet another intriguing example of a grammaticalized negative sign, the negative completive marker *NOT-YET*. This grammatical marker has developed from the adjectival sign *SLOW(LY)*. As is true for the ASL tense marker *FUTURE* and the modal verbs discussed in Section 3.1.3, the lexical source is in turn derived from a culture-specific gesture, namely a commonly

used Jordanian gesture roughly meaning “Wait a second” or “Take it easy”, illustrated in Figure 7a.



Figure 7a.
Gestural source / SLOW(LY)

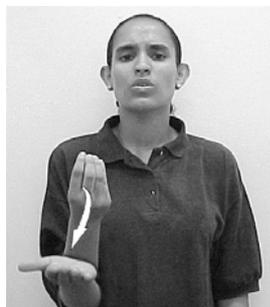


Figure 7b.
Negative completeive in LIU

What is peculiar about the LIU negative completeive marker – and what distinguishes it from the grammaticalized elements discussed so far – is that it is morphologically complex. In order to express the negative completeive meaning, the lexical sign combines with a negative suffix, which consists of a downward movement of the hand and which may also attach to various verbs and adjectives. The morphologically complex sign is phonologically reduced in that the repeated movement of gestural/lexical source is lost (Figure 7b; Hendriks 2004:107).

3.8 From verb to intransitivizer

A particularly interesting grammaticalization phenomenon has recently been described by Nyst and Perniss (2004). When investigating the realization of motion events in AdaSL and DGS, they came across a sign – glossed as GUAN (*guan* meaning ‘to run’ in Twi) – which they analyze as an intransitive marker. This marker has developed from the main verb ‘to refuse’ (37a). One of their striking findings is that AdaSL, in contrast to DGS and many (if not most) other sign languages, does not make use of classifier handshapes that combine with movement roots in order to express the motion of a referent, for instance,

movement of a car versus movement of a person (see Section 4.1.2 for a discussion of classifier handshapes). That is, in contrast to what has been described for other sign languages, in AdaSL, the referent is not mapped onto the hand. Rather, AdaSL makes use of a limited set of four signs with very basic motion semantics: GO for expressing directed motion from a reference point, COME to express directed motion towards a reference point, THROW to express directed, released motion, and ENTER to express an entering motion. All of these generic directionals have a lax B-handshape.

All four generic directionals can express transitive and intransitive events. GO, for instance, means ‘to give’ or ‘to send’ in a transitive sentence (37b) but ‘to go’ or ‘to leave’ in an intransitive sentence (37c). Only in its intransitive use, however, the generic directional can optionally combine with the sign GUAN, as shown in example (37c). Note that GUAN always immediately precedes the directional sign.²⁴ The same distribution is observed with THROW which may either mean ‘to throw’ (37d) or ‘to fall’ (37e). In both transitive contexts, use of GUAN would lead to ungrammaticality.

AdaSL (Nyst and Perniss 2004)

- (37) a. BROTHER WORK GUAN
 ‘My brother refuses to work.’
 b. CHILD GO LETTER
 ‘The child is sending a letter’
 c. FATHER GUAN GO
 ‘(My) father is leaving.’
 d. CHILD THROW BALL
 ‘The child throws a ball.’
 e. BOOK GUAN THROW
 ‘A book falls down.’

²⁴ GUAN is signed in the following way: lower arm and upper arm form an angle of approximately 45°, the elbow points somewhat outwards and then the upper arm slaps against the side of the body. GUAN can be signed with one or with both arms.

languages, causativizers developed from the verb ‘give’ can be complementizers, auxiliaries, or affixes. Consider, for instance, the Luo example in (38), where the causative auxiliary *miyo* developed on the basis of the ditransitive source schema ‘X gives Y to Z’.

Luo (Nilotic, Kenya and Tanzania; Stafford 1967:72)

- (38) Koth no-**miyo** wa-bedo e tiend yath
 rain 3-give 1.PL-stay at foot tree
 ‘The rain made us stay at the foot of the tree’

For sign languages, the development of a causative auxiliary is attested in at least Greek Sign Language (GSL), where the main verb GIVE (39a) can be used as a causative marker GIVE-AUX (39b).

GSL (Galini Sapountzaki, p.c.)

- (39) a. INDEX₁ TEACHER BOOK ₁GIVE₃
 ‘I give the book to the teacher’
 b. INDEX₂ ₂GIVE-AUX₃ BURDEN END
 ‘Stop being a trouble/nuisance to him/her!’

As far as the manual part is concerned, GIVE-AUX is identical to the one-handed main verb GIVE. However, Sapountzaki (2004) reports that signers seem to avoid mouthing with the auxiliary but not with the main verb. Recall that the main function of the auxiliaries discussed in Section 3.2 is to express verbal agreement. This also holds for GSL as is illustrated in (39b). Besides that, however, GIVE-AUX also expresses causativity in that it functions as a marker of a causative change of state. Moreover, it can only be used with intransitive and transitive psych-verbs, i.e. it adds a causative meaning to a non-causative psych-verb. The basic meaning of the sequence ${}_x\text{GIVE-AUX}_y \text{ VERB}$ is ‘x causes in y a specific psychological state described by V’, as is illustrated by the example in (39b) above. Hence, GIVE-AUX clearly has more semantic content than its counterparts in NGT, TSL, and DGS.

3.10 Instances of type 2-grammaticalization

According to the scheme in (1), grammaticalization may proceed in two steps: from free lexical elements to free grammatical elements (type 1) and from free grammatical elements to affixes (type 2). So far, however, we have only been concerned with instances of type 1-grammaticalization. In this section, we will briefly discuss possible instances of type 2-grammaticalizations.

Note first that this second step of grammaticalization is rarely attested in sign languages. As a matter of fact, affixational morphology – at least sequential affixation – is uncommon in sign languages. Consequently, the development of free morphemes into affixes is also expected to be rare. There seem to be two major reasons for the ban on affixation in sign languages. On the one hand, the paucity of affixational morphology is sometimes attributed to the youth of sign languages (Aronoff et al. 2005).²⁶ On the other hand, sign languages are known to exploit other, modality-specific means for the morphological modification of signs. The phonological primitives of sign languages – handshape, orientation, movement, location, and non-manual markings – may combine simultaneously to form signs. Since each of these phonological parameters may function as a morpheme, various stem-internal changes may apply to a single sign. In particular, handshapes may function as classifier morphemes (see Section 4.1.2), orientation and direction of movement may express agreement (see Section 3.2.1), locations may indicate the spatial distribution of referents, and non-manual markings commonly function as adverbial or adjectival modifiers (as, for instance, in (24c)). Consequently, a verb sign such as GIVE can be modulated to express the complex meaning “you give a flat object to me with effort” by

²⁶ Aronoff et al. (2005) argue that sign languages and spoken creole languages exhibit many similarities with respect to grammatical structure, conditions of language acquisition and language development. However, sign languages seem to preserve the grammatical properties of creole languages much longer than spoken creole languages because of the unusual sociolinguistic situation of signers.

modifying the handshape, the direction and manner of movement, and the non-manual component (facial expression); no sequential affixation occurs. What is modality-specific about this word formation strategy is the fact that signs tend to be monosyllabic but polymorphemic (Brentari 2002).²⁷ By exploiting simultaneous word formation strategies, sign languages make up for the fact that the production of signs takes longer than the production of spoken words (Klima and Bellugi 1979).²⁸

Still, a few instances of sequential affixation have been described in the literature. According to Aronoff et al. (2005), for instance, so far five affixes have been identified in ASL. Many, if not most, of the affixes that have been found in sign languages have developed from lexical signs, apparently skipping step 1 of the grammaticalization chain. One of the examples discussed in Aronoff et al. (2005:328f) is the ASL negative suffix ZERO, which attaches to verbs to express the meaning ‘not at all’.

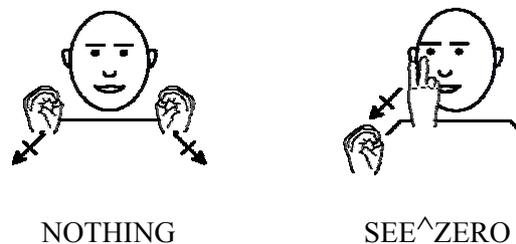


Figure 8. *ASL negative suffix*

ZERO is a one-handed sign, which is performed with an O-hand and an outward movement. The source of the suffix is the phonologically very similar two-

²⁷ In various phonological models (e.g. Perlmutter 1992; Brentari 1998), sign language syllables are taken to consist of positions (holds) and movements, where movements constitute syllable peaks and the maximal syllable is a position-movement-position sequence. Following this line of reasoning, most base signs are monosyllabic.

²⁸ Non-simultaneous word formation strategies that are common across sign languages are compounding (usually accompanied by phonological reduction and assimilation) and various types of reduplication, e.g. in aspectual, plural, and reciprocal marking (Fischer 1973; Pfau and Steinbach 2005a; Wilbur 2005).

handed sign NOTHING illustrated in Figure 8. Aronoff et al. point out that the bound variant of this sign, also shown in Figure 8, is subject to certain phonological and morphological restrictions which support an analysis as affix. First, as opposed to the free morpheme NOTHING, the affix ZERO always occurs right-adjacent to the verb (e.g. SEE in Figure 8). Second, the affix tends to fuse phonologically with the verbal stem. Third, the affix can only combine with plain verbs. And finally, ZERO can only be adjoined to one-handed stems. Hence, unlike compounds, where two-handedness commonly spreads from one part of the compound onto the other, ZERO does not only prohibit spreading of two-handedness but is also blocked from combining with two-handed stems.

Commonly, the development from a grammatical element to an affix proceeds via cliticization. There is some evidence that the DGS auxiliary PAM, which is grammaticalized from the noun PERSON (see Section 3.2.3), is in the process of turning into a verbal clitic and possibly even further into an inflectional affix. Remember that PAM always immediately follows the verb sign. In the examples in (40), the assumption that PAM has in fact cliticized to the verb is corroborated by three observations. First, in colloquial signing, there is a strong preference for only one continuous movement contour, i.e. the auxiliary loses its own syllabicity. Second, we observe optional regressive handshape assimilation: in (40b), for instance, the babyC-handshape of PAM spreads onto PROUD (which has a bent 1-handshape in citation form). Third, the mouthing associated with the lexical sign – the verb LIKE in (40a), the adjective PROUD in (40b) – stretches onto the auxiliary. Consequently, the lexical sign and PAM clearly form one prosodic word (Sandler 1999).

DGS

- (40) a. $\text{POSS}_1 \text{ FRIEND INDEX}_{3a} \text{ LIKE}^{\wedge}_{3a} \text{ PAM}_2$ /ma:g/
 ‘My friend likes you.’
- b. $\text{INDEX}_1 \text{ POSS}_1 \text{ BROTHER INDEX}_{3a} \text{ PROUD}^{\wedge}_1 \text{ PAM}_{3a}$ /štolts/
 ‘I am proud of my brother.’

Similar cases of prosodic integration of functional elements have been observed in other sign languages, for instance, in ISL (Sandler 1999), NGT (Nonhebel et al. 2004), and Norwegian Sign Language (NSL; Vogt-Svendsen 2001). For DGS, we have found similar cliticization phenomena involving the manual negation marker NOT, the aspectual marker READY, as well as post-nominal and post-verbal indexical signs (see Section 4.1.3 for further discussion of pronominal indices). Future studies will have to reveal in how far these processes depend on phonological properties of the lexical sign as well as on morphosyntactic (agreement) properties and in how far we are in fact dealing with general processes which can be claimed to be affixal in nature.²⁹

Another frequently cited example for affixation is that of an agentive suffix, which is used at least in ASL, DGS, and NGT (for ASL, see Aronoff et al. 2005). In ASL, the suffix is two-handed, while in DGS and NGT, it is one-handed. In all languages, AGENTIVE, like PAM in DGS, has developed from the noun PERSON and it always follows the verbal stem it is attached to.

In DGS, the AGENTIVE is subject to similar processes of prosodic integration as the auxiliary PAM: (i) the place of articulation of the agentive suffix assimilates to the preceding nominal stem, (ii) the path movement of the affix becomes shorter and (iii) the mouthing associated with the nominal stem spreads

²⁹ Note that some of the grammaticalized gestures discussed in the next section have been argued to be affixal in nature, for instance agreement and classifiers (Aronoff et al. 2000; Pfau and Glück 2000; Zwitserlood 2003), as well as the negative headshake (Pfau, 2003; Pfau and Quer 2002).

over the affix. Moreover, the combination of agentive verb and AGENTIVE is highly productive in DGS and AGENTIVE has a very specific meaning.³⁰ Hence, AGENTIVE, like ZERO and PAM, seems to be a good candidate for an instance of type 2-grammaticalization in sign language.

3.11 Summary

The examples discussed in the previous sections make clear that grammaticalization in sign languages is by no means an uncommon phenomenon. This may not come as a surprise, given that sign languages are natural languages which are subject to diachronic change. However, the extent to which the grammaticalization paths attested in sign languages parallel those described for spoken languages is striking. With few exceptions, the grammaticalization pathways appear to be modality-independent: verbs, adjectives, and adverbials develop into markers of tense, aspect, and modality, verbs into auxiliaries, nouns and verbs into complementizers, and nouns into pronouns, to name just a few of the examples discussed above. Just as in spoken languages, grammaticalization in sign languages is characterized by semantic bleaching, decategorialization, and phonetic reduction where the latter most commonly affects the movement component of a sign.

Still, we also came across some instances of grammaticalization that possibly lack a spoken language equivalent. One particularly interesting grammaticalization path is the N-to-Aux path attested in DGS. In addition, we take the V-to-intransitivizer chain (AdaSL) and the Adj/Adv-to-negative completive chain (LIU) to constitute cross-linguistically unusual patterns (remember that in both these cases, the lexical elements originated from culture-

³⁰ The combination of a verb and AGENTIVE always refers to the agent argument of the verbal stem. This observation seems to exclude a compound analysis, since the semantic interpretation of a compound is usually more flexible.

specific gestures). Note that the fact that similar pathways have not (yet) been discovered in spoken languages does not necessarily imply that they are modality-specific; it only implies that they are rare. In the following sections, we will turn to modality-specific aspects of grammaticalization.

Note finally, that the above list of grammaticalization phenomena in sign languages is by no means extensive. Most probably the data we presented are only the tip of the iceberg and many other grammaticalization pathways (as well as similar phenomena in other sign languages) are yet to be uncovered.

4 Modality-specific aspects: the grammaticalization of gestures

Let us now turn to what we take to be the modality-specific side of grammaticalization, that is, the grammaticalization of co-speech gestures. As is well-known, speakers of spoken languages make extensive use of co-speech gestures while communicating, be it with their hands or by means of facial expressions or head movements. It has been demonstrated that such gestures do not occur randomly and that occasionally, they supply information that is not part of the verbal utterance. Moreover, the frequency of gesture use as well as their form are subject to culture-specific variation (see Kendon (2004) for an overview of gesture research).

Signers use gestures, too (Emmorey 1999). Obviously, however, manual gestures use the same articulators that are also active in the production of signs. Therefore, manual gestures interrupt the sign stream, they do not co-occur with it.³¹ Since manual gestures and signs share the same articulatory and perceptual systems, it is not uncommon for culture-specific and sometimes even for

³¹ In principle, manual gestures could co-occur with the sign stream when they are articulated simultaneously by the non-dominant hand. To the best of our knowledge, however, this is hardly ever observed. We have to keep in mind, however, that gestures are not always easily distinguished from signs (cf. Wilcox 2004).

improvised gestures to become lexicalized in a sign language (cf. Wilcox 2004). Examples abound and include emblematic gestures such as the OK-gesture and the thumbs up-gesture but also more specific gestures such as the Dutch gesture meaning *lekker* ('yummy') attested in NGT and the Italian gesture meaning *fame/affamato* ('hunger/hungry'), which has become part of the lexicon of LIS (Pizzuto and Volterra 2000).

In the following, we will not be concerned with lexicalized gestures but only with possible instances of grammaticalized gestures. Wilcox (2004) distinguishes two different grammaticalization paths from gesture to sign in sign language. The first path begins with a conventionalized or improvised gesture, which develops into a lexical element.³² This lexicalized gesture may then further develop into a functional element as has already been discussed in section 3 (see especially the discussion of tense, aspect, and modality markers in Section 3.1 above). Since in this case, the grammaticalization process begins with a lexicalized gesture, this path does not crucially differ from grammaticalization in spoken languages. The only difference is the gestural source of certain functional elements, which is not attested in spoken languages. However, the development of a gesture into a lexical element is not an instance of grammaticalization but only of lexicalization of this gesture.

By contrast, the second path does not involve lexicalization of a free gesture. In the second path, grammaticalization does not rely on the lexicalization of a gesture but proceeds directly from a gestural source to a functional element, possibly mediated by paralinguistic uses of the gesture. The source element can be either a free or a bound gesture, such as handshapes, movement types, or

³² Wilcox (2004) distinguishes two different sources of lexicalization: the first source is a conventionalized 'quotable' gesture, which is commonly used by the local hearing community. The second source is an 'improvised' gesture, which are metaphorical and less standardized as the first source.

non-manual markers. Since bound gestures cannot occur by themselves, lexicalization of the bound gestural source is impossible. Consequently, grammaticalization of bound gestures does not involve the intermediate step of lexicalization. Likewise, some free gestures can become functional elements without being lexicalized. Hence, the second grammaticalization path, unlike the first one, crucially differs from grammaticalization in spoken language. The respective source gestures (as well as the corresponding grammaticalized morphemes) can either be manual or non-manual elements, including certain hand configurations, pointing signs, manner of movement types, various facial expressions, and mouth and eye gestures. We will first consider free and bound manual gestures that developed into free or bound grammatical morphemes (Section 4.1) and then turn to bound non-manual gestures which accompany the manual signs and fulfill certain grammatical functions (Section 4.2). Finally, in Section 4.3, we will argue that the claim that grammaticalized gestures are only attested in sign languages may be too strong. In Section 4.4, we will briefly reconsider the incorporation of gestures into spoken and signed languages.

4.1 Manual gestures

At various points in the above discussion, we have already pointed out that sometimes the lexical source of a grammatical marker can be traced back to a gestural origin. This has been claimed to be true for the ASL tense marker *FUTURE* (Section 3.1.2), some ASL modal verbs (Section 3.1.3), the LIU negative completive marker (Section 3.7) and the AdaSL intransitivizer *GUAN* (Section 3.8) but it probably also holds for some of the aspectual markers discussed in Section 3.1.1. The crucial difference to the elements to be presented below is that the latter do not have an intermediate lexical meaning, that is, the developmental path proceeds from free and bound gesture (and paralinguistic uses of this gesture) directly to grammatical element.

The grammaticalized gestures that we are going to discuss in this section include classifiers (Section 4.1.1), pronouns, agreement auxiliaries, and possibly agreement affixes (Section 4.1.2), question particles (Section 4.1.3), discourse markers (Section 4.1.4), and manner of movement (Section 4.1.5).

4.1.1 *From gesture to classifier*

The most common lexical source for classifiers in spoken languages are nouns which – on account of some specific semantic characteristic – are recruited as structural templates for a taxonomic classification of nominal concepts. Amongst the nouns that may enter this grammaticalization process are ‘branch’, ‘man’, ‘piece’, and ‘tree’, and ‘woman’. In Kilivila, for instance, the noun *tau* (‘man’) has given rise to the classificatory particle *to* for persons of male sex, while the noun *vivila/vivina* (‘woman’) developed into the phonologically reduced particle *na* classifying not only persons of female gender but also animals, stars, moon, and spirits, amongst other things. The example in (41) exemplifies the use of both these classifiers.

Kilivila (Oceanic, Trobriand Islands; Senft 1996:22)

- (41) Vivila **na**-salau tauwau **to**-bugubagula
 woman CL:FEM-busy men CL:MALE-work.in.the.garden
 Tommota gala **to**-dubakasala [...]
 people not CL:HUM-rude
 ‘The women are busy, the men are good gardeners. The people are not rude [...]

In her study on the evolution of noun incorporation, Mithun (1984) points out that diachronically, noun incorporation (NI) may give rise to a classificatory system. In NI-constructions, a noun stem is compounded with a verb stem to yield a larger, derived verb stem, as, for instance, in Siberian Koryak where *qoya-* (‘reindeer’) may combine with *-nm-* (‘to kill’) to yield *qoyanm-* (‘to reindeer-slaughter’). In what she calls “classificatory noun incorporation”, a

relatively general noun stem is incorporated to narrow the scope of the verb but the compounded stem can still be accompanied by a more specific external NP which identifies the argument implied by the incorporated noun. Since, for this purpose, only general nouns are incorporated, the process often gives rise to a system of classification. This is observed, for instance, in the Gunwinggu example in (42) where the incorporated noun *dulg* ('tree') narrows the scope of the verb (also cf. Mithun 1986).

Gunwinggu (Australian, Northern Australia; Mithun 1984:867)

- (42) ... bene-**dulg**-naŋ mangaralaljmayn
 they.two-tree-saw cashew.nut
 '... they saw a cashew tree.'

Things are quite different in sign languages. It has been observed that in (most) sign languages, a certain class of verbs, i.e. verbs of motion and location, obligatorily classify one of their arguments by means of a handshape change (Supalla 1986). The argument that is being classified is always the theme argument (Zwitserslood 2003). The two most important types of sign language predicate classifiers are Entity (semantic) classifiers which indirectly reflect shape characteristics of the subject of intransitive predicates and Handle (object) classifiers which directly refer to the way the object of a transitive predicate is handled or manipulated. The DGS example in (43a) illustrates the use of an entity classifier, while in (43b) the verb stem combines with a handle classifier.

DGS

- (43) a. HILL CAR_{loc1:down}MOVE:CL(**vehicle**)_{loc2:up}
 'A car is driving up a hill.'
 b. WOMAN INDEX_{3a} CHILD INDEX_{3b} FLOWER_{3a}GIVE:CL(**long/thin**)_{3b}
 'The woman is giving a flower to the child.'

The leftmost picture in Figure 9a shows the handshape that is used with the predicate in (43a), the left picture in Figure 9b illustrates the handshape that

combines with the movement root in (43b). Interestingly, the shape of an entity classifier may be rather arbitrary; moreover, it may differ significantly from sign language to sign language. While the shape of the DGS vehicle classifier clearly represents a flat object, the vehicle classifier handshapes used in ASL and LIU (van Dijken 2004) are much less iconic (note that for both these handshapes, the palm orientation is to the side while for the DGS handshape it is down). In contrast to that, handle classifiers are iconically motivated, they are the same across sign languages, and they are clearly related to gestures used in the hearing community (the right handshape in Figure 9b would be used when a round object like e.g. a cup is handled).



Figure 9a.
Entity CL for vehicles

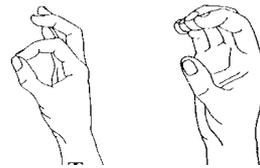


Figure 9b.
Handle CL

In fact, some authors have argued that classifier handshapes are non-linguistic gestural elements (Liddell 2003b). We think, however, that there is good evidence for assuming that classifiers are part of the grammatical system of (at least some) sign languages, more precisely, that they are (gender) agreement markers. First of all, they are obligatory on a particular class of verbs. Secondly, they form a closed paradigmatic set comparable to spoken language noun class systems (Zwitzerlood 2003). Thirdly, it has been shown that they are not used creatively. In order to represent movement of three-legged entities, for instance, a handshape with two extended fingers (index and middle finger) is used, not a handshape with three extended fingers, as would be expected if classifiers were merely iconic gestural elements (van Dijken 2004). Finally, just like locus

agreement morphemes, classifiers are capable of licensing pro drop (Glück and Pfau 1997, 1998).

Crucially, handle classifiers are not grammaticalized from nouns. That is, the DGS noun FLOWER does not have the F-handshape depicted in Figure 9b. For the same reason, the handshape cannot be seen as an incorporated argument. Without the overt argument FLOWER, sentence (43b) becomes ungrammatical. Similar to the spoken language examples given above, however, the handshape is quite general and it narrows the scope of the verb which is accompanied by a more specific external NP. Consequently, classifiers can be seen as grammaticalized gestures which enter the language system at the morphology stage, i.e. as bound morphemes. In other words: the morphology is directly created from non-linguistic input.

Note, however, that the degree of grammaticalization of the gestural source need not be the same for all sign languages. On the one hand, Zeshan (2003b), for instance, argues that the handle classifier system of Indopakistani Sign Language (IPSL) is much closer to the gestural origin. In this language, the choice of one handshape over another appears to be largely improvised and consequently, one cannot speak of a tightly organized subsystem with paradigmatically contrasting handshapes. She concludes that the most appropriate way of characterizing the IPSL construction is as a “pre-classificatory subsystem” which, of course, has the potential of developing into a fully grammaticalized system. On the other hand, as has already been mentioned in Section 3.8, AdaSL does not make use of a system of entity classifiers.

4.1.2 *From gesture to pronoun and further*

Similarly to classifiers, the status of pointing signs is debated. Liddell (2000, 2003a), for instance, argues that at least the direction and the goal of the movement parameter constitutes a gestural component of these signs.

Other authors, however, argue that the consistent linguistic patterns exhibited by pronouns (and agreement verbs) in sign languages cannot be accounted for by assuming that the loci are non-linguistic (Aronoff et al. 2000; Mathur 2000; Meier 2002). In particular, it is shown that the use of pronominal forms as well as their distribution is syntactically constrained (pro-drop, pronoun copy) and that children acquiring a sign language make errors in the use of pronouns that would not be expected if the system were essentially iconic rather than linguistic (Petitto 1987).

Here we adopt the assumption that the pointing signs that find use in sign languages form part of the grammatical system of these languages and that gestural space links the conceptual structure to the articulatory-perceptual (A-P) interface. That is, “[e]lements from the conceptual structure are made visible through the gestural space and must go through a matching at the A-P interfaces with the linguistic elements from syntactic and phonological structures” (Rathmann and Mathur 2002:390). Note that this does not exclude the possibility that signers also make use of pointing gestures.

For the most part, co-speech pointing gestures are used for locative deixis; these gestures are acquired early by hearing and deaf children. We therefore assume that the pointing gesture entered the grammatical system of sign languages as a locative marker (44a). The locative use of this pointing sign, which is glossed as INDEX, is not easily distinguished from its demonstrative use. Clearly, however, the INDEX in (44b) does not refer to a location but rather to an object.

DGS

- (44) a. PAST POSS₁ BROTHER LIVE INDEX₃
 ‘My brother used to live (over) there.’
 b. INDEX₁ DECIDE BOOK INDEX₃ BUY
 ‘I decided to buy that book.’

As far as the phonological form of these signs is concerned, note that only the movement component of the locative INDEX can be modified according to proximity/distality of a location or object. In the proximal form, a longer and arc-shaped movement is added and the head is tilted slightly backwards. In the demonstrative use, the movement is short and tense and the eyebrows may be raised and the lips pressed together.

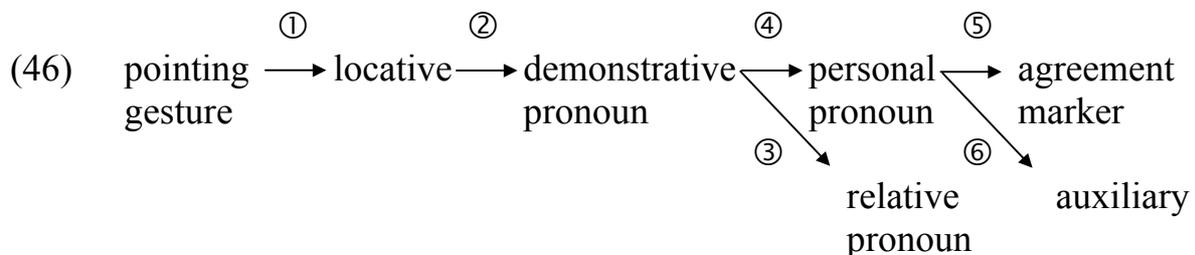
In his thorough study on the form, function, and grammaticalization of demonstratives, Diessel (1999) subsumes not only demonstratives being used as pronouns (e.g. English *this/that*) but also locational adverbs (e.g. English *here/there*). Here we keep the two notions apart based on the observation that locational adverbs may be the source for demonstrative pronouns. In Hausa, for instance, the adverb *nân* (‘here’) developed into the proximal demonstrative, while *cân* (‘there’) has been the source for the distal demonstrative (45).

Hausa (Chadic, Nigeria; Cowan and Schuh 1976; cited in Heine and Kuteva 2002b:294)

- (45) a. Audù yanà **cân**
 Audu 3.M.be there
 ‘Audu is over there.’
 b. dabbōbin **cân**
 animals that
 ‘those animals (over there)’

We therefore tentatively claim that in sign languages, the demonstrative use of INDEX also developed from its locative use (see the grammaticalization scheme in (46), step ②). Of, course, the possibility that both the demonstrative and the locative INDEX developed from the pointing gesture cannot be excluded.

Interestingly, Diessel (1999) points out that there is very little evidence from spoken languages that demonstratives may have developed from a lexical source. It has therefore been suggested that demonstratives might present an exception to the hypothesis that all grammatical expressions are eventually derived from lexical items. In other words: “Demonstratives, or the deictic elements on which they are based, might belong to the basic vocabulary of every language” (Diessel 1999:151). Clearly, our assumption that sign language demonstratives developed from a non-linguistic gesture does not contradict this hypothesis.³³



As indicated in the scheme above (step ③), at least in some sign languages, the INDEX may also serve as a relative pronoun (or relative complementizer). This is reminiscent of a development attested in e.g. English where the demonstrative *that* also serves as a marker introducing relative clauses. In DGS, the pointing sign only introduces relative clauses modifying a noun phrase which refers to a non-human entity, as illustrated in (47) where the pointing sign is glossed as RPRO-NH.³⁴ Note that in this function, it is obligatorily accompanied by raised eyebrows (see Section 4.2.2 for further discussion).

³³ But see Frajzyngier (1987) for the development of a distal demonstrative from the verb ‘to go’ in Mupun (Chadic, Nigeria); also see Heine and Kuteva (2002b:159).

³⁴ With nouns referring to humans, a different relative pronoun is used, namely the classifier handshape for human entities. Note that pointing signs are also attested in relative clause constructions in ASL and LIS (Liddell 1978; Branchini and Donati 2005; Cecchetto, Geraci and Zucchi, to appear). The syntactic properties of ASL and LIS relative clauses, however, are different from those in DGS (Pfau and Steinbach 2005b).

use of space in DGS. In particular, he claims that DGS does not realize functional agreement projections in the syntax and he analyzes the so-called agreement features of verbs as pronominal affixes (also see Keller 1999).

Similarly, Wilbur (1999) speculates about the affixal status of some unstressed sentence-final pronouns in ASL. These final pronouns predominantly comprise experiencer subject arguments, a category which, according to Wilbur, does not usually participate in the verb agreement system of ASL, see the example in (49).

ASL (Wilbur 1999:217)

- (49) MUST REMEMBER YOU
'You must remember (to take off your shoes).'

Wilbur argues that there is an ongoing process of phonological reduction that affects these pronouns to fill an existing morphological gap. That is, the unstressed pronouns possibly develop via cliticization into verbal affixes indicating subject agreement on verbs that do not usually agree with any of their arguments. Consistent handshape assimilation (e.g. thumb position) involving these pronouns is taken as a strong indicator of a close phonological association between verb and pronoun.

Finally, we want to turn to step © in the scheme in (46), the development of agreement auxiliaries from pronouns. As has already been mentioned in footnote 13, sign languages for which the use of such an agreement auxiliary has been described include LSA (Massone and Curriel 2004), LSC (Josep Quer, p.c.), GSL (Sapountzaki 2004), IPSL (Zeshan 2003c), NS (Fischer 1996), and TSL (Smith 1990).

In all these sign languages, the auxiliary is obviously derived from two co-occurring pronominal signs. In all cases, the index finger points first towards the subject locus and then moves in a smooth movement towards the object locus.

The short movement towards a locus which usually characterizes pronominal signs is lost and the auxiliary consists of one hold-movement-hold sequence (i.e. one syllable). Moreover, in first person singular forms, the contact with the signer's chest can also be dropped. Crucially, the auxiliary is semantically empty except for the agreement relation it specifies. Here, we only give two examples, one from TSL (50a) where the auxiliary – glossed as AUX-1 – appears in preverbal or sentence-initial position and one from LSA (50b) where the auxiliary almost always occupies the sentence-final position.

TSL (ex. (a) from Smith 1990:217) and LSA (ex. (b) from Massone and Curiel 2004:77)

- (50) a. THAT FEMALE ₃AUX-1₁ NOT-LIKE
 ‘That woman doesn’t like me.’
 b. BOB INDEX₁ SEND-LETTER ₃AUX₁
 ‘Bob sends me a letter.’

While the development of demonstrative and personal pronouns into copulas is not uncommon in spoken languages (see e.g. Arends (1986:107) for an example from Sranan, an English-based creole), a phenomenon comparable to step © in (46) is, to the best of our knowledge, unattested in spoken languages, that is, a process whereby two pronouns combine and form one prosodic word that functions as an auxiliary expressing subject and object agreement. Apparently, the development of agreement auxiliaries from pronouns is a modality-specific phenomenon since it is related to the specific spatial properties of pronouns and agreement in sign languages. Pronouns are an optimal source for the development of agreement auxiliaries because they share all relevant spatial properties with verbal agreement (see Steinbach and Pfau (to appear) for detailed discussion).

Assuming that the grammaticalization chain in (46) that we have argued for in this section is correct, we are left with a grammaticalization scenario in which

only step ①, the one from gestural source to locative adverb, and one of the final steps (step ⑥), from pronouns to agreement auxiliary, are modality-specific. All the other steps are well attested in spoken languages and can therefore be considered modality-independent grammaticalization phenomena.

4.1.3 From gesture to question marker

In India and Pakistan, the gesture illustrated in Figure 10 is commonly used in the hearing community as a co-speech gesture accompanying interrogatives (yes/no-questions and wh-questions). In IPSL, this gesture has grammaticalized into a wh-particle, which obligatorily appears in sentence-final position. Notably, this wh-particle, which is glossed as G-WH, covers the whole range of question words found in other (sign) languages. The interpretation of the wh-sign has to be inferred from the context; see the examples in (51).³⁶



Figure 10. *General wh-sign*
G-WH in IPSL

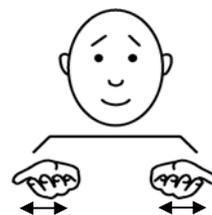


Figure 11. *Question particle*
PALM-UP in NGT

IPSL (Aboh, Pfau and Zeshan, 2005:23)

- | | |
|---|--|
| <p>(51) a. CHILD ANGRY $\frac{\text{wh}}{\text{G-WH}}$
‘Why is the child angry?’</p> | <p>b. INDEX₂ AGE $\frac{\text{wh}}{\text{G-WH}}$
‘What’s your age?’</p> |
| <p>c. INDEX₃ COME $\frac{\text{wh}}{\text{G-WH}}$
‘Who is coming?’</p> | <p>d. INDEX₂ GO $\frac{\text{wh}}{\text{G-WH}}$
‘Where are you going?’</p> |

³⁶ In order to express more specific meanings, IPSL has the option of combining G-WH with other non-interrogative signs. The combination of G-WH with the sign FACE, for instance, yields the meaning ‘who’. However, this option is not available for ‘what’, ‘why’, and ‘how’; these meanings can only be expressed by the general wh-sign G-WH alone (see Aboh, Pfau and Zeshan (2005) for details and syntactic analysis).

In a number of sign languages, a palm-up gesture is used as a question particle in interrogative contexts. According to Zeshan (2004), cross-linguistically the preferred position for this particle is the clause-final position, but occasionally, it may also appear sentence-initially or in both these positions. In most sign languages that do have this particle, it is used only in yes/no-questions, NGT being an exception to this generalization (another exception noted by Zeshan (2004:33) is Finnish Sign Language). The NGT particle PALM-UP is signed with two lax 5-hands (see Figure 11; note that PALM-UP is accompanied by a forward lean that is not visible in the picture) and it optionally appears in sentence-final position in yes/no-questions (52a) and wh-questions (52b).

NGT (ex. (a) from Smith 2004)

- (52) a. _____ y/n
 INDEX₃ PARTY CANCEL INDEX₃ **PALM-UP**
 ‘Is the party cancelled?’
- b. _____ wh
 MARKET BUY WHAT **PALM-UP**
 ‘What did you buy at the market?’

4.1.4 *From gesture to discourse marker*

Engberg-Pedersen (2002) describes a manual gesture in Danish Sign Language (DSL) which is used for various discourse functions such as temporal sequencing, evidentiality, or (dis)confirmation, among others. This gesture, which she calls the presentation gesture, imitates someone holding out something for inspection. It is produced with (one or) two flat hands outside the shoulders with the palm(s) oriented up. The presentation gesture fulfils a grammatical function at various levels: it can be used in discourse to organize dialogues, between sentences to semantically combine two sentences (53a), and within a sentence to indicate the relation between topic and comment (53b). In (53) ‘/’ indicates a boundary shown by visual rhythm. ‘f’ stands for ‘forward’ and ‘fd’ for ‘forward down’.

DSL (Engberg-Pedersen 2002:151,154)

(53) a. Context: The signer quotes her own question to her mother in law:

y/n

INDEX₁ ASK WANT LOOK-AFTER INDEX_{3a} [presentation gesture]
 INDEX-f NURSERY-SCHOOL STRIKE [presentation gesture]
 ‘I asked, ‘would you look after her, since the nursery school is on strike?’

b. Context: The signer describes the situation when she had just told her husband that their daughter had been tested deaf.

INDEX₃ DEAF / INDEX-fd / YES [presentation gesture] / THINK OF-COURSE [presentation gesture] / REASON MANY FAMILY DEAF++
 ‘Is she deaf!? Yes [presentation gesture: ‘well’]. We thought that of course [presentation gesture: ‘she would be deaf’] as so many in the family are deaf.’

Interestingly, the presentation gesture can also be found in spoken language. McNeill (1992) argues that in English the presentation gesture is used at a meta-narrative level to structure discourse, a function that can also be found in DSL. As opposed to English, however, DSL uses the presentation gesture not only at the meta-narrative level but also at other levels of grammar to express more linguistic functions as is illustrated for example in (53ab). Hence, in DSL, the presentation gesture developed into a grammatical marker indicating various functions related to discourse. Engberg-Pedersen argues that the underspecified lexical meaning of all uses of the presentation gesture is something like inspect. On this basis, the more specific meanings mentioned above can be pragmatically derived from the linguistic context and the non-manuals accompanying the presentation gesture.³⁷

³⁷ Note finally that a similar discourse functional gesture has been described for Irish Sign Language (Herrmann, forthcoming). The so-called ‘where-gesture’, which differs phonologically and semantically from the wh-sign WHERE, is produced with two flat hands outside the shoulders with palm up (similar to the NGT-question particle in Figure 11 above) and a searching facial expression. The where-gesture, which is analyzed as a modal particle by Herrmann, is frequently used in questions to modify the illocutionary force of the sentence. Its meaning corresponds to the English circumlocation *where on earth*.

4.1.5 Movement modifications in gesture and sign

The last example of a grammaticalized manual gesture that we want to discuss are movement variations which are used to mark strong and weak forms of certain signs. Recall from Section 3.1 that in many sign languages, markers of tense, aspect, and modality have developed from lexicalized gestures. Besides their gestural source, modal verbs have yet another interesting property, which can also be traced back to a gestural origin. Wilcox (2004) shows that in LIS and ASL, movement alternations (which are accompanied by particular facial expressions) are used to express different meanings of modal verbs. Modals performed with faster, larger, and more distal movements express, for example, stronger obligation, evidentiality, and possibility. By contrast, modals performed with slower, smaller, and more proximal movements express weaker obligation, evidentiality, and possibility. Hence, certain semantic alternations are systematically marked by manner of movement. Similar phonological alternations distinguish strong and weak forms of other parts of speech such as adjectives or verbs. Consider, for instance, color adjectives, which allow for different movement types to express different intensities of the corresponding color. In sum, movement types in sign languages correspond to adjectival/adverbial manner and degree markers, which are also attested in many spoken languages.

Wilcox (2004) points out that the crucial difference to the gestural source of modals and other grammatical morphemes discussed in Section 3 is that movement types used to mark semantic alternations do not have a corresponding intermediate lexical meaning. Since movement types, just like handshapes, are not free gestures, lexicalization is blocked. Consequently, the developmental path of movement types proceeds from a gesture via paralinguistic uses of this gesture directly to a grammatical morpheme expressing specific semantic

modification of the sign. Therefore, movement types, as well as the non-manual gestures to be discussed in the following section, can be taken to correspond to certain aspects of intonation in spoken languages to which we turn in Section 4.3 below.

4.2 Non-manual gestures

Besides manual gestures, non-manual gestures such as facial expressions, head and body movements also play an important role in every-day communication. Most certainly, deaf signers also make use of such affective non-manual gestures and they borrow these gestures from the surrounding hearing population. As McClave (2001:67) points out “[s]uch borrowing of gestures should not surprise us even though to date linguistic studies of borrowings have focused on the verbal”.

Moreover, in all sign languages investigated to date, non-manual markers also constitute an integral part of the grammar in that they are capable of distinguishing sentence types and of giving clues about the information structure. Many, if not most of these syntactic non-manual markers originate from communicative gestures also used in the hearing population. Occasionally, the non-manual expression is supplemented by a manual sign (e.g. a negative sign or a wh-sign); frequently, however, the non-manual is the only expression of the relevant syntactic feature. In this section, we will consider negative headshakes and head tilts (Section 4.2.1) as well as question and topic markers (Section 4.2.2).³⁸

³⁸ Other examples of grammaticalized non-manual gestures in sign languages are facial expressions which function as adjectival and adverbial modifiers and mouth gestures which accompany certain signs.

4.2.1 Negative headshake and head tilt

One non-manual gesture which is known to frequently accompany spoken utterances is a side-to-side headshake (Kendon 2002). Interestingly, this headshake is not only observed in negative contexts, that is, in order to intensify a negated sentence. It is also commonly used to signal uncertainty – e.g. when accompanying wh-questions, as in (54a) – or to intensify affirmative sentences that have a negative connotation, as is illustrated by (54b).

American English (McClave 2001:61, 2000:873)

- (54) a. _____^{hs} Where is he going?
 b. what I needed to do was uh to clean it and uh (pause) _____^{hs} it was real bad

McClave (2001) shows that ASL signers use lateral headshakes for exactly the same reasons, that is, for signalling intensification, as in (55a), or uncertainty. In the DGS example (55b), just as in the English example (54a), a headshake accompanies an interrogative sentence (and therefore co-occurs with the non-manual wh-question marker). That is, signers also make affective use of headshakes.

ASL (ex. (a) from McClave 2001:57) and DGS (ex. (b))

- (55) a. _____^{hs} WOW SHOW-UP MANY
 ‘Wow! Many (non-handed signs) showed up.’
 b. _____^{hs} YESTERDAY INDEX₂ MAKE WHAT
 _____^{wh-q}
 ‘What did you do yesterday?’

However, besides this affective function, a headshake can also fulfill a linguistic function in sign languages in that it can be the sole marker of sentential negation (this is in clear contrast to spoken languages where a headshake alone can never turn an affirmative utterance into a negative one). Based on the observation that

the affective use of headshake in spoken and signed language is qualitatively different from its linguistic use, we are going to argue that the negative headshake is a grammaticalized gesture the distribution of which is constrained by language-specific grammatical principles.

Most importantly, the distribution of the negative headshake in sign languages is not at all random. Rather, the scope and the timing of the non-manual behavior is clearly linguistically constrained relative to the manual sign(s) it accompanies. As was shown by Baker-Shenk (1983) in her thorough study of non-manual components accompanying questions in ASL, a grammatical facial behavior begins milliseconds before the manual sign and terminates milliseconds before the end of the manually signed string it accompanies, i.e. the non-manual signal is synchronized with manually produced signs. In contrast, the appearance of affective expressions is not constrained in such a way. Rather, they may begin and end at any time regardless of the manually realized signs.

For DGS, which is underlyingly SOV, Pfau (2002, 2003) has shown that the headshake always has to accompany the verb sign even if the optional manual negation marker NOT is present; that is, in (56a), headshake on NOT only would make the sentence ungrammatical. When the manual sign is dropped (as is commonly the case), it is possible for the headshake to accompany the verb sign only, but it may also spread onto neighboring constituents, as indicated in (56b). However, when spreading occurs it has to target entire constituents. Consequently, example (56c) where headshake only spreads onto the part of the object noun phrase is ungrammatical.

- neg
- d. SANTI MEAT EAT
 ‘Santi does not eat meat.’

The observed differences are clearly syntactic in nature and they strongly support the claim that the use of the headshake to signal negation is grammatical and not gestural in the above examples. Pfau and Quer (2002) account for the differences between the three sign languages by assuming that the manual Neg element and a negative (featural) affix, which is realized by the headshake, occupy different positions within the syntactic phrase structure.

As is well known, not all cultures make use of a side-to-side headshake in order to signal negation. In particular, in the Eastern Mediterranean area, a backwards head tilt may also find use in such contexts. It is therefore not surprising that the same gesture is also observed in the sign languages in the respective countries. Note, however, that in all these countries, signers also make use of headshakes. The use of a backward head tilt in negative contexts is illustrated for Turkish Sign Language (TİD) in (58a) and for GSL in (58b). Interestingly, as illustrated by the latter example, just like the headshake, the head tilt may also negate a proposition without an accompanying manual negative sign.

TİD (ex. (a) from Zeshan 2003a:57) and GSL (ex. (b) from Antzakas 2006)

- (58) a. neg (head back)
 PARA KENDI DEĞİL
 money self not
 ‘There is no money involved for ourselves.’
- neg (hb)
- b. WORK AFTER GO, HURRY
 ‘Don’t be in a hurry we will go (there) after work.’

Obviously, speakers as well as signers make use of gestural headshakes in certain marked pragmatic contexts. However, only in signed languages, such culture-specific gestures may grammaticalize on the syntactic level. As has

Interestingly, a similar polysemy is also observed in some spoken languages. In Hua, for instance, interrogatives and topics are marked by the same morphological marker (61) (C.P. = connective particle).

Hua (Papuan, Papua New Guinea; Haiman 1978:570f)

- (61) a. E-si-ve baigu-e
 come-3.SG.FUT-INT will.stay-1.SG
 ‘Will he come? I will stay / If he will come, I will stay.’
- b. Dgai-mo-ve baigu-e
 I(emph.)-C.P.-TOP will.stay-1.SG
 ‘As for me, I will stay.’

Note that example (61a) can also have a conditional reading. Similarly, many sign languages use the brow raise not only to mark questions and topics but also to mark conditionals, as is illustrated by the NGT example in (62a) (cf. Janzen (1999) for ASL). Hence, in sign languages, just as in some spoken languages, yes/no questions, topics, and conditionals are marked by the same means.

Moreover, in DGS, the non-manual accompanying a relative pronoun is identical to the non-manual marker in (60) accompanying questions and topicalized constituents (see example (47) above). The same overlap has been observed for ASL (Liddell 1978) and LIS (Branchini and Donati 2005; Cecchetto, Geraci and Zucchi, to appear). This coincidence between non-manual topic marking and relative clause marking is not surprising given that relative clauses are known to share interesting properties with topic constructions (Lewkowicz 1971; Kuno 1973; Schachter 1973). We therefore assume that the non-manual topic marker has further developed into a relative clause marker.³⁹

³⁹ Ngemba uses no less than five distinct markers to signal relative clauses, one of which – the verbal suffix *-ne* – is a multipurpose marker also marking topic constructions. Moreover, as illustrated in (i), we find the relative conjunction/determiner *wá*, the complementizer *bah* (the only one of the five markers that is optional), pronoun retention, and the sentential definitizer *la*. We are indebted to Tania Kuteva for bringing this example to our attention.

A LIS example is given in (62b). In contrast to the DGS example in (47), in (62b), the non-manual marker stretches over the head noun and the relative clause; note that the sign glossed as PE is analyzed as a clause-final (relative) determiner by Branchini and Donati (2005).

NGT (ex. (a) from Smith 2004) and LIS (ex. (b) from Branchini and Donati 2005)

- (62) a. cond IF RAIN, PARTY headnod CANCEL
 ‘If it rains, the party will be cancelled.’
- b. rel TODAY MAN_i PIE BRING PE_i YESTERDAY DANCE
 ‘The man that today brought the pie danced yesterday.’

Recent syntactic analyses of ASL offer a uniform treatment of the non-manual marker in yes/no questions, topic constructions, conditionals, and relative clauses. Neidle et al. (2000) argue that many instances of non-manual marking should be analyzed as overt realizations of abstract syntactic features occupying functional heads (cf. also Petronio and Lillo-Martin 1997; Pfau and Quer 2002). More specifically, Wilbur and Patschke (1999) claim that eyebrow raise typically marks A'-moved constituents. Following this line of argumentation, the topicalized constituent in (60b) and the relative pronoun in DGS (47) always move to a sentence-initial functional position (presumably the specifier of TopP) in order to check a syntactic feature. This analysis can also be applied to the non-manual in yes/no questions, as in (60a). One may either assume that the whole clause moves to a sentence-initial specifier position to check the [+q]-feature or that this specifier position remains empty and that therefore the non-

Ngemba (Niger-Congo, Cameroon; Chumbow 1977:290; cited in Kuteva and Comrie, forthcoming)

- (i) nyung wá bah a-keshung-ne mung wa la a-kung atsang
 man REL bah he-TNS.beat-ne child DET la he-enter prison
 ‘The man who beat the child went to prison.’

manual marking which realizes the [+q]-feature has to spread over its entire c-command domain. We conclude that eyebrow raise can be analyzed as a highly grammaticalized gesture expressing various discourse functions in sign languages.

4.3 Grammaticalization of gestures in spoken languages

Basically, we argue that the above-mentioned phenomena are modality-specific. Recall that sign languages, unlike spoken languages, use the same articulatory and perceptual systems as gestures. As a consequence, sign languages have the unique possibility of integrating manual and non-manual gestures into their linguistic structure. By contrast, spoken languages relying on a completely different articulatory and perceptual system lack the interface to manual and non-manual gestures. Nevertheless, spoken languages can also integrate ‘gestural’ elements. A prerequisite for this integration process, however, is that the respective gesture belongs to the articulatory and perceptual domain characteristic of spoken languages, i.e. the acoustic-auditory domain. In Section 4.3.1, we therefore briefly discuss the grammaticalization of paralinguistic intonational patterns in spoken languages, which parallel the grammaticalization of manual and non-manual gestures in sign languages. Finally, in Section 4.3.2, we discuss an intriguing example which seems to contradict the generalization that only acoustic gestures can be integrated into the grammatical system of spoken language, i.e. the grammaticalization of manual gestures in a French dialect.

4.3.1 Grammaticalization of non-manual gestures: intonation

Gussenhoven (2004:71f.) discusses various kinds of grammaticalized paralinguistic meanings of intonation (cf. also Bolinger 1986 and Wilcox 2004). On the one hand, intonation is an integral part of linguistic structure with

specific linguistic forms and functions. On the other hand, intonation has also non-structural paralinguistic properties. Experimental studies have revealed that these paralinguistic properties are universal and language independent. Gussenhoven argues that certain aspects of the speech-production mechanism can be exploited for various affective and informational functions. While affective interpretations signal attributes of the speaker such as friendly/not friendly or less surprised/more surprised, informational interpretations signal attributes of the uttered message such as uncertain/certain or less urgent/urgent. Grammaticalization of universal paralinguistic meanings typically affects the informational interpretations since these interpretations refer directly to properties of the utterance. Moreover, Gussenhoven distinguishes three biological codes, which are the source for various grammaticalizations: (i) the frequency code, (ii) the effort code, and (iii) the production (phase) code. The exploitation of these codes has given rise to specific form-function relations which then developed further into grammaticalized intonational morphemes.

Consider the frequency code first. This code depends on the correlation between the size of human larynx and the rate of vocal fold vibration: high pitch is associated with properties such as polite, friendly, less dominant, non-aggressive, and vulnerable, among others, while low pitch is associated with the opposite properties. The corresponding informational interpretations of the frequency code are the association of low pitch with certainty and high pitch with uncertainty. As is well known, this association has been grammaticalized in many languages: rising intonation contours are used to mark interrogatives while non-rising contours mark declaratives. Second, the effort code associates greater articulatory precision, mainly signaled by wider excursion of pitch movement, with greater effort. Greater articulatory precision signals enthusiasm, authority, insistence, helpfulness, and significance. The latter interpretation leads to the grammaticalization of specific intonations marking focus and negation.

Simplifying somewhat, focus is signaled by the increase of the excursion of pitch size whereas negation is marked by the reduction of the excursion of pitch size. Finally, the production code associates high pitch with the beginning of utterances and low pitch with the end of utterances since the subglottal air pressure is usually higher at the beginning of an exhalation phase. Therefore, higher pitch at the beginning of an utterance signals new topics (or topic change), while lower pitch signals continuation. The opposite holds true for the end of an utterance: while higher pitch signals continuation, lower pitch signals the end of a turn. The production code is the source for various grammaticalized intonational patterns, most of which are used to indicate continuation or finality at the end of an utterance (for detailed discussion see Gussenhoven 2004:sections 5-6).

Recall that in Section 4.2, we have argued that in sign languages, grammaticalized non-manuals originate from a similar source and fulfill similar functions. They start out as affective visual gestures which grammaticalize via paralinguistic uses into functional elements that signal various grammatical meanings such as interrogativity, negation, or topicality, among others. Hence, both intonation and non-manual markers are used for the same purposes in that they provide important clues about information structure and sentence type.

4.3.2 Grammaticalization of manual gestures in a French dialect

Before summarizing this section, we wish to present one possible counterexample to the generalization that spoken languages do not allow for the grammaticalization of manual gestures. The counterexample comes from Atlantic French, a dialect of French spoken in the Western part of France along the Atlantic coast. Jouitteau (2004) claims that Atlantic French allows null subjects if the preverbal position is occupied by a vocal or manual/body gesture. Consider the following two examples in which the symbol ‘’ stands for a

minimally recoverable acoustic element, such as an intake of breath or a minimal vocalic production, and the symbol ‘’ stands for facial expressions, head movements (such as a head nod, head shake etc.), or movements of the hand(s) and body parts (such as a shrug, hands opened, snap of fingers etc.).

Atlantic French (Jouitteau 2004)

(63) a. Context: Il est encore pas là aujourd’hui. (He is again not here today.)

/  viendr-a demain, tu verr-as
 GESTURE come-FUT tomorrow you see-FUT
 ‘He’ll come tomorrow, you’ll see.’

b.  &  va souvent à la plage, ces temps-ci
 GESTURES go often to the beach these times-that
 ‘I/you(sg.)/he/she/we go often to the beach, these times.’

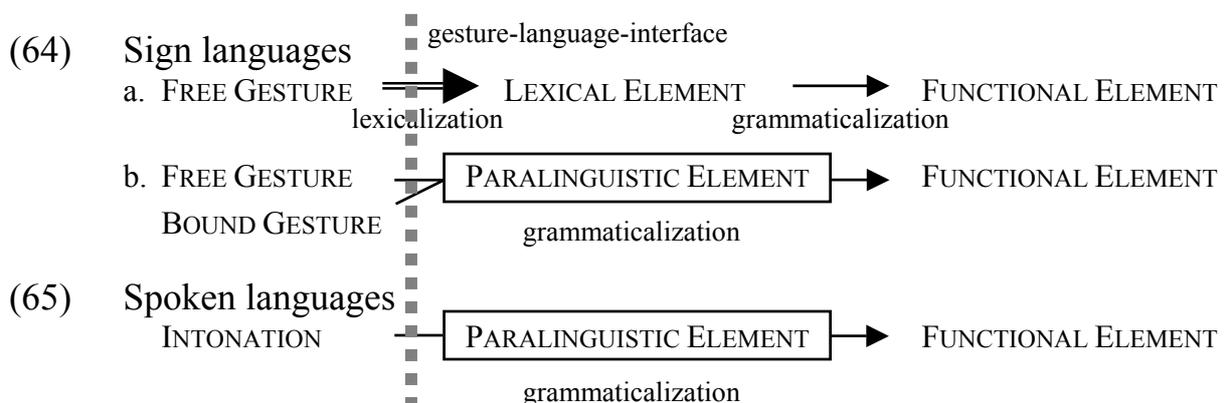
Note that this distribution contrasts with the one in Standard French, which is not a pro-drop language. Crucially, in Atlantic French, (63a) is ungrammatical without / . From this, Jouitteau concludes that /  is a fully syntactic element. She argues that the null subject in both examples in (63) is an instance of topic drop. In Atlantic French, just as in Chinese (Huang 1984) and ASL (Lillo-Martin 1986), null subjects can be licensed by topic chaining; they are not licensed by rich agreement on the verb. Therefore, topic drop is not felicitous in out-of-the-blue contexts. In contexts without appropriate discourse anaphora, a pointing gesture () is capable of channeling the referent tracking of pronouns. In (63b), the pointing gesture is accompanied by a -gesture (a head dip). This sentence is grammatical even without an available discourse topic, since the pointing gesture allows for unambiguous referent tracking. Given that the interpretation of this sentence depends on the directionality of the pointing gesture, Jouitteau takes  to be a realization of agreement. She concludes that in Atlantic French, the identification of a null subject is achieved by topic chaining when there is a topic available, but that last resort strategies such as the insertion of a pointing gesture are also available.

Obviously, these patterns are reminiscent of what sign languages researchers have argued for, namely that the directionality of INDEX spells out a person (or locus) feature and that INDEX is optional in cases where the zero pronoun can be identified by topic chaining or by agreement.

If Jouisseau's analysis is on the right track, then we are indeed dealing with a case of grammaticalization of manual gestures in a spoken language. The gestures under discussion are clearly grammatical elements, which fulfill a syntactic function: they are merged into a phrase structure in order to satisfy a syntactic requirement (the Extended Projection Principle). In essence, this implies that spoken languages are multi-channel languages but further research is necessary in order to find out whether similar phenomena are attested in other spoken languages.

4.4 Summary

Since sign languages, unlike spoken languages, use the same articulatory and perceptual systems as gesturing, sign languages have the unique property of incorporating gestures into their linguistic structure by means of lexicalization (64a) and grammaticalization (64b), cf. also Wilcox (2004).



Various instances of the grammaticalization of lexicalized gestures (i.e. step 2 in (64a)) have been discussed in section 3. In this section, we have focused on the grammaticalization of various kinds of free and bound visual gestures. We have

shown that manual and non-manual source gestures develop via paralinguistic uses into functional elements that provide important clues about information structure and sentence type.

As opposed to sign languages, spoken languages use different articulatory and perceptual systems as gesturing. Therefore, they do not have the option of integrating manual and non-manual gestures (one possible counterexample seems to be the grammaticalization of manual gestures in Atlantic French discussed in the previous subsection). However, spoken languages can integrate acoustic gestures, as is illustrated in (65), since the acoustic-auditory domain is the articulatory and perceptual domain characteristic of spoken languages. We have argued that the grammaticalization of intonational patterns in spoken languages parallels the grammaticalization of manual and non-manual gestures in sign languages. Moreover, in spoken languages, intonation fulfills similar functions as non-manual markers in sign languages.

In sum, the main difference between grammaticalization of gestures in spoken and signed languages is that the source gestures must belong to the same articulatory and perceptual domains the target language belongs to. While sign languages can integrate visual gestures, spoken languages can integrate acoustic gestures. Besides, sign languages seem to use more grammaticalized gestures than spoken languages. There are at least two reasons for this difference. First, visual gestures provide more input than acoustic gestures. Second, sign languages have yet another option of integrating gestures. As illustrated in (64a), many functional elements used in sign languages can be traced back to lexicalized gestures. Since this grammaticalization path is not attested in spoken languages, only sign languages have two different kinds of grammaticalized gestures.

5 Conclusion

In this paper we have argued that sign languages employ exactly the same grammaticalization paths as do spoken languages. That is, the pathways proposed in the literature are modality-independent. However, we also discussed two modality-specific properties of grammaticalization. First, as opposed to spoken languages, sign languages only have very few (if any) instances of type 2-grammaticalization (i.e. from free to bound grammatical morpheme). This may either be due to the fact that sign languages are comparably young languages or to the general scarcity of affixational morphology in sign languages. Second, the grammaticalization of gestures is different in signed and spoken languages. Since the source gestures must belong to the same articulatory and perceptual domain as the target language, sign languages have the unique possibility of grammaticalizing manual and non-manual visual gestures. By contrast, spoken languages do not grammaticalize visual but acoustic gestures. Moreover, grammaticalized gestures seem to be more frequent in sign languages than in spoken languages. Hence, although grammaticalized gestures can be found in both modalities, the grammaticalization of gestures clearly has modality-specific properties.

6 Notational conventions and abbreviations

Following common conventions, sign language examples are glossed in small caps. For the most part, the glosses are in English, except for those examples taken from the literature, which are glossed in the surrounding spoken language in the source article. Moreover, the following notational conventions are used:

₁SIGN₃ Subscript numbers indicate points in the signing space used in verbal agreement and pronominalization (for further discussion of the use of signing space see Section 3.2).

- SIGN++ indicates reduplication of a sign to express grammatical features such as plural or aspect.
- SIGN^SIGN indicates the combination of two signs (frequently accompanied by certain phonological assimilation and reduction processes); either the combination of two independent signs by compounding or a sign plus affix combination.
- SIGN-SIGN indicates that two words are needed to gloss a single sign.
- S-I-G-N represents a fingerspelled sign.

Lines above the glosses indicate the scope (i.e. onset and offset) of a particular non-manual marker, be it a lexical, a morphological, or a syntactic marker; the following markers are relevant:

- /xxx/ Lexical marker: a mouth gesture or mouthing (silent articulation of a spoken word) associated with a sign.
- int Morphological marker marking the intensive form: puffed cheeks, frequently accompanied by manual changes such as reduplication and/or tense movement.
- top Syntactic topic marker: raised eyebrows, head tilted slightly back.
- wh Syntactic wh-question marker: either lowered eyebrows (as in the NGT example (52b)) or raised eyebrows and head tilt (as in the IPSL examples (51); also cf. Figure 10).
- y/n Syntactic yes/no-question marker: raised eyebrows, forward head tilt.
- neg Syntactic negation marker: side-to-side headshake accompanied by negative facial expression (except for the examples in (58)).

Throughout this paper, the following abbreviations for sign languages are used (some of which are acronyms based on the name of the sign language used in the respective countries):

AdaSL: Adamorobe Sign Language (Ghana)	LSC: Catalan Sign Language (<i>Llengua de Signes Catalana</i>)
ASL: American Sign Language	NGT: Sign Language of the Netherlands (<i>Nederlandse Gebarentaal</i>)
DGS: German Sign Language (<i>Deutsche Gebärdensprache</i>)	NS: Japanese Sign Language (<i>Nihon Syuwa</i>)
DSL: Danish Sign Language	NSL: Norwegian Sign Language
GSL: Greek Sign Language	SSL: Swedish Sign Language
IPSL: Indopakistani Sign Language	TİD: Turkish Sign Language (<i>Türk İşaret Dili</i>)
ISL: Israeli Sign Language	TSL: Taiwan Sign Language
LIS: Italian Sign Language (<i>Lingua Italiana dei Segni</i>)	VGT: Flemish Sign Language (<i>Vlaamse Gebarentaal</i>)
LIU: Jordanian Sign Language (<i>Lughat il-Ishaara il-Urdunia</i>)	
LSA: Argentine Sign Language (<i>Lengua de Señas Argentina</i>)	

7 References

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