PERSON climbing up a tree (and other adventures in sign language grammaticalization)

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(and other adventures in sign language grammaticalization)

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Studies on sign language grammaticalization have demonstrated that most of the attested diachronic changes from lexical to functional element parallel those previously described for spoken languages. To date, most of these studies are either descriptive in nature or embedded within functional-cognitive theories. In contrast, we take a generative perspective on sign language grammaticalization, adopting ideas by Roberts & Roussou (2003), who suggest that grammaticalization can be characterized as "reanalysis 'upwards' along the functional structure". Following an overview of some of the attested modality-independent pathways, we zoom in on the grammaticalization of two types of agreement auxiliaries, the lexical sources of which are the verb GIVE and the noun PERSON. We argue that the grammaticalization of GIVE-AUX (in Greek Sign Language and Catalan Sign Language) follows directly from Roberts & Roussou's model because a lexical verb is reanalyzed as an element which is merged in a structurally higher functional position (little v). The same is true for PERSON, but this change has an additional modality-specific flavor. In spoken languages, agreement affixes typically enter the functional domain of V via cliticization. In contrast, in German Sign Language and Catalan Sign Language, PERSON, after having been reanalyzed as a determiner-like element, 'jumps' directly from D into AgrO – most probably because it has the relevant spatial properties necessary to express agreement. Thus, grammaticalization in sign languages, while being structurally similar, allows for types of reanalysis that are not attested in spoken languages.

Keywords: grammaticalization, agreement, agreement auxiliary, Generative Grammar

1   Introduction

It is a hallmark of natural languages that they change over time. Diachronic changes may affect the phonology (e.g. sound shifts), the syntax (e.g. word order), and the lexicon (e.g. borrowing of lexemes) of a language, and they may be triggered by external and internal factors. As for the former, language contact plays a crucial role, in particular, when it comes to syntactic and lexical changes; as for the latter, ease of production and perception have been found to commonly motivate phonological alterations. Not surprisingly, similar phenomena have been described for sign languages, that is, natural languages in the visual-gestural modality. To give just a few examples: (i) lexical changes may result from borrowing from other sign languages (Quinto-Pozos 2007) as well as from the surrounding spoken language (as, for instance, in the case of fingerspelling (Battison 1978; Brentari 2001)), and they may also reflect efforts to standardize a sign language (Johnston 2003; Schermer 2003, 2012); (ii)

syntactic changes are often the result of influence from a spoken language, as has been argued for word order change (from SOV to SVO) in American Sign Language (Fischer 1975); (iii) phonological changes affecting, for instance, the place of articulation (PoA) feature of a sign have been argued to increase the ease of perception of signs while ease of production has been found to favour handshape changes in two-handed signs (Frishberg 1975; Woll 1987).

In this paper, we focus on one specific type of internal change which affects the lexicon, namely grammaticalization, whereby lexical elements – mostly nouns and verbs – develop into (free or bound) grammatical morphemes. Numerous common grammaticalization pathways have been identified for typologically diverse spoken languages, and recent studies on grammaticalization in sign languages have demonstrated that, for the most part, the attested pathways are modality-independent (for overviews, see Pfau & Steinbach (2006, 2011), Wilcox et al. (2010), and Janzen (2012)).

To date, however, studies on sign language grammaticalization have either been descriptive in nature – presenting data from various sign languages and comparing the attested patterns to those previously identified for spoken languages – or were embedded in functional-cognitive theories of language (e.g. Janzen 1999; Wilcox et al. 2010). Here, we approach the phenomenon from a different perspective by exploring how selected grammaticalization pathways can be accounted for within generative theories of syntactic change. Again, this endeavour is guided by the question whether the same structural processes and changes can account for the data under consideration.

In Section 2, we start our investigation by summarizing previous findings on grammaticalization in sign languages, addressing both modality-independent and modality specific aspects. As we are focusing on the grammaticalization of agreement markers, some basic facts concerning the nature of sign language agreement are introduced in Section 3. In Section 4, we sketch the theoretical framework that we adopt, the minimalist approach to grammaticalization put forward by Roberts & Roussou (2003). Their model is applied in two case studies in the subsequent sections: the grammaticalization of an auxiliary from the lexical verb GIVE (Section 5) and the grammaticalization of an auxiliary from the noun PERSON (Section 6). The second phenomenon turns out to be particularly interesting from a cross-modal perspective. Section 7 concludes the paper and sketches some avenues for future study.

2   Grammaticalization in sign languages

The primary goal of grammaticalization theory is to describe how grammatical forms arise and develop over time (Hopper & Traugott 1993; Lehmann 1995; Heine & Kuteva 2002ab; Narrog & Heine 2011). Put simply, grammaticalization can be defined as the development from lexical to grammatical forms (free functional elements) and from grammatical forms to even more grammatical forms (affixes). Extensive cross-linguistic research has identified a considerable number of prototypical diachronic pathways, three of which are given in (1).

(1)   LEXICAL ELEMENT   →   FUNCTIONAL ELEMENT   →   AFFIX

    a.   noun   →   pronoun   →   agreement

    b.   verb   →   adverb   →   tense

    c.   noun/verb   →   complementizer

Typically, the lexical element undergoing grammaticalization loses its lexical meaning (*desemanticization*) as well as its categorical and argument-taking properties (*decategorization*), and it may be phonologically reduced (*phonological erosion*) (Heine & Kuteva 2002a).

With respect to grammaticalization paths, three things have to be noted. 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 in (1a)) but also from nouns. Secondly, a given pathway need not involve all intermediate steps. Thirdly, grammaticalization is hypothesized to be prototypically a unidirectional process. While exceptions to this unidirectionality principle – sometimes referred to as "degrammaticalization" – have been noted (e.g. Ramat 1992; Norde 2011), there seems to be agreement amongst scholars that such examples are few compared to the large number of cases that conform to the principle.

2.1   Methodological challenges

Before turning to the description of selected grammaticalization phenomena, a few words have to be said about 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. 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. The study of diachronic change in sign languages, however, is complicated by the fact that sign languages lack a written form. Therefore, just as in unwritten spoken languages, the identification and comparison of earlier and later forms of structure on the basis of written records is impossible.[1]

The method of linguistic reconstruction that is often applied under these circumstances is internal reconstruction (IR), "the exploitation of patterns in the synchronic grammar of a single language […] to recover information about its prehistory" (Ringe 2003:244). Put differently, the basic assumption is that evidence for an earlier unobservable stage of a language can be deduced from certain internal patterns of that language, that is, on the basis

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[1] For sign languages, the oldest available sources are usually dictionaries or pamphlets that contain (mostly sketchy) illustrations or photographs of signs. 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, for instance, created a set of 22 films of what were considered the most fluent American Sign Language (ASL) signers of the time (Supalla 2001). These films have turned out to be a rich source of material for analyses of historical change in ASL (Frishberg 1975; Janzen & Shaffer 2002).

of its present shape, without recourse to comparative evidence. Obviously, the methods of IR are generally less reliable than the standard methods of comparative reconstruction. Still, provided that (i) the lexical and the grammatical item are phonologically similar (the target possibly being phonologically reduced), (ii) grammaticalization is usually unidirectional, and (iii) 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 on the basis of synchronic data – albeit with due caution.

For the most part, the sign language phenomena reported in the following were compiled by means of IR. 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).

2.2 Grammaticalization of lexical elements

In sign languages, just as in spoken languages, lexical elements may diachronically develop into grammatical markers, and these changes are also characterized by desemanticization, decategorization, and phonological erosion. For the sake of illustration, we briefly discuss two examples.

For American Sign Language (ASL), Janzen & Shaffer (2002) describe the development of a future tense marker from the lexical verb GO-TO (cf. (1b)). Example (2a) illustrates the lexical use of the sign (Janzen & Shaffer 2002:203), while in (2b), the same sign – now glossed as FUTURE$_{tns}$ – does not express change of location but rather encodes future tense (Neidle et al. 2000:79). Obviously, this change exemplifies a well-documented grammaticalization path, whereby a temporal term is derived metaphorically from a spatial term (Bybee & Dahl 1989) – a pattern also familiar from Germanic (e.g. Dutch, English) and Romance (e.g. French, Spanish) languages.

(2) a. TWO, THREE DAY PREVIOUS E.M. GALLAUDET **GO-TO** TOWN PHILADELPHIA   [ASL]
         'Two or three days before, (E.M.) Gallaudet had gone to Philadelphia.'

     b. JOHN **FUTURE**$_{tns}$ BUY HOUSE
         'John will buy a house.'

The path sketched in (1c) is attested in German Sign Language (DGS), where the noun REASON (3a) has developed into a cause-complementizer (3b). This grammaticalization process probably involves the reinterpretation of a multi-clausal structure, such as 'I am sad. The reason is: my dog died' (cf. English *because*). Note, however, that there is no prosodic break between REASON and the following sign in (3b). Again, this functional change is well-known from many spoken languages (Heine & Kuteva 2002b).

        <u>   top   </u>   <u>   neg   </u>

(3)   a. **REASON,** INDEX$_1$ UNDERSTAND   [DGS]
          'I don't understand the reason.'

       b. INDEX$_1$ SAD **REASON** POSS$_1$ DOG DIE
          'I'm sad because my dog died.'

In both grammaticalized forms, we observe phonological reduction. In ASL, both the lexical verb and the tense marker are signed with a ~-hand executing a forward movement, but while GO-TO is articulated slightly above waist height with a forward arc movement executed by the elbow and shoulder joints, the grammaticalized form is characterized by an abbreviated forward movement executed near the cheek by the wrist joint. As for DGS REASON, both the noun and the complementizer are two-handed with a dominant B-hand (index finger slightly bent) contacting the non-dominant]-hand. However, while the noun involves repetition, this repetition is usually lost in the grammaticalized form.

     Numerous other modality-independent pathways have been identified in previous studies; these include developments (i) from verb/noun/adjective to modal verb (Wilcox & Wilcox 1995; Janzen & Shaffer 2002), (ii) from verb/adverbial to completive/perfective aspect marker (Fischer & Gough 1972/1999; Meir 1999), and (iii) from adjective to intensifier (Sexton 1999). For discussion of these and other phenomena, as well as for further references, the interested reader is referred to the overview articles by Pfau & Steinbach (2006, 2011), Wilcox et al. (2010), and Janzen (2012).

2.3   Grammaticalization of gestures

For the sake of completeness, we add to the picture a grammaticalization phenomenon which appears to be modality-specific. Interestingly, besides the more familiar pathways from lexical to grammatical element sketched in the previous section, sign languages have the unique possibility of grammaticalizing manual and non-manual gestures (van Loon, Pfau & Steinbach in press).

     Wilcox (2004, 2007) distinguishes two grammaticalization paths from manual gesture to sign. In the first path, the gesture first develops into a lexical element, which may then further develop into a functional element. It has been argued, for instance, that the origin of the ASL verb GO-TO, which was the source for the tense marker FUTURE, can be traced back to a very common gesture of the same form that was and still is used among non-signers in France (Janzen & Shaffer 2002). Similar proposals have been made for the ASL modal verbs CAN and MUST.[2] In the second path, grammaticalization proceeds directly from a gestural source to

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[2] The historical link between (Old) French Sign Language and ASL is due to the fact that Thomas Gallaudet, founder of the first school for the deaf (the American Asylum in Hartford, CT, founded 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.

a functional element, skipping the intermediate lexicalization stage. This process may be held responsible for the grammatical use of pointing signs (see Pfau & Steinbach (2006) and Pfau (2011) for a suggested grammaticalization chain; also see Section 6 for brief discussion) and of the 'palm up' gesture (McKee & Wallingford 2011; van Loon 2012).

In addition, affective non-manual gestures which commonly accompany spoken utterances may also grammaticalize. When used as grammatical markers, these non-manuals appear to be tightly linked to the syntactic structure of the utterance they accompany. In addition, their use and distribution (scope) is subject to language-specific constraints (see, for instance, Janzen (1999) for non-manual topic marking in ASL and Pfau (2008) for negative headshakes in DGS).

3 Agreement and agreement auxiliaries

Given that in the case studies discussed in Sections 5 and 6, we are focusing on the grammaticalization of agreement auxiliaries, a few words have to be said about the nature of agreement in sign languages. In most sign languages studied to date, certain verbs – the so-called 'agreeing' or 'directional' verbs – may be modified such that their movement and/or orientation features coincide with the actual loci of present referents or the loci introduced for non-present referents by means of the pointing sign INDEX. A constraint on agreement, observed in various sign languages, is that verbs only agree with arguments that are specified as [+human] (or possibly [+animate] (Janis 1995; Rathmann & Mathur 2002); see also footnote 14 below). In the example from Sign Language of the Netherlands (NGT) in (4a), for instance, the verb VISIT is characterized by a movement trajectory from the locus introduced for the referent BROTHER towards the signer, thus agreeing with a third person subject and a first person object, both specified as [+human]. Scholars are in disagreement whether the change affecting the verb really should be analyzed as an instance of agreement (see Lillo-Martin & Meier (2011) for a recent discussion). Irrespective of the analysis, however, it is clear that not all verbs can be modulated in this way. The NGT verb LOVE, for instance, is a so-called 'plain' verb (Padden 1988): it is body-anchored (as it is articulated on the signer's chest) and can thus not be displaced towards locations in the signing space.

(4) a. INDEX$_1$ BROTHER INDEX$_3$, TOMORROW EVENING INDEX$_3$ $_3$VISIT$_1$ [NGT]
         'My brother, he will visit me tomorrow evening.'

$$\overline{\qquad\qquad\qquad\text{top}\qquad\qquad\qquad}$$
     b. INDEX$_1$ PARTNER INDEX$_3$, LOVE $_3$**AUX**$_1$
         'My partner loves me.'

In the context of plain verbs, some sign languages – for instance, ASL and British Sign Language – rely on the semantics of the clause and/or the word order to assign grammatical roles to nominal arguments. Other sign languages, however, have developed a means to overcome the 'agreement gap' created by plain verbs. They make use of dedicated auxiliaries

which are capable of expressing the agreement relation whenever the main verb does not allow for modulation of movement or orientation features – we call these auxiliaries 'agreement auxiliaries', as their main function is indeed to spell out agreement. In the NGT example (4b), the plain verb LOVE thus combines with the auxiliary AUX, which is articulated with a bent B-hand moving from the location introduced for the subject referent PARTNER towards the object referent, the signer (Bos 1994:39), similar to what we described for the agreement verb VISIT in (4a).[3]

As for the grammaticalization of the NGT auxiliary, it has been argued that it grammaticalized from the spatial predicate GO-TO, which has the same handshape and can also target locations in the signing space (Bos 1994). Taiwan Sign Language (TSL), too, employs two agreement auxiliaries which have verbal sources, namely the lexical verbs SEE and MEET (Smith 1990). Finally, Greek Sign Language (GSL) and Catalan Sign Language (LSC) have auxiliaries that grammaticalized from the verb GIVE; these auxiliaries receive a detailed discussion in Section 4 (for a general discussion of the use and grammaticalization of sign language auxiliaries, see also Steinbach & Pfau (2007) and Sapountzaki (2012)).

While the V-to-Aux chain is extremely common cross-linguistically (Bybee et al. 1994; Heine & Kuteva 2002b), the use of auxiliaries whose main, if not only, function is to express agreement appears to be modality-specific. In spoken languages, the main function generally attributed to auxiliaries is to express tense, aspect, and modality (TAM) while agreement marking is usually considered an additional yet non-crucial feature of auxiliaries (Steele 1978). Still, it is interesting to note that the grammaticalization of the above-mentioned sign language auxiliaries involves modality-independent event schemas (Heine 1993) such as the Motion Schema (NGT, TSL) and the Action Schema (GSL, LSC).[4]

4   A generative perspective on grammaticalization

Roberts & Roussou (2003) present an elaborate attempt to account for grammaticalization in terms of a formal theory of syntax, namely the Principles and Parameters framework (Chomsky 1986) and its recent developments within the Minimalist Program (Chomsky 1995). Within this framework, synchronic cross-linguistic variation is taken to result from language-specific parameter settings, and diachronic change thus results from changes in specific parametric settings. "A change is initiated when […] learners converge on a grammatical system which differs in at least one parameter value from the system internalized by the speakers whose linguistic behaviour provides the input to the learners" (Roberts &

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[3] Note that Bos (1994) glosses the auxiliary as ACT-ON; here we choose to use the more neutral gloss AUX. Bos also notes that the NGT auxiliary, in contrast to its verbal source, is accompanied by the mouthing /ɔp/, a preposition corresponding to English 'on', which, however, would not be used with the verb *houden van* ('to love') in spoken Dutch.

[4] In Section 6, we discuss a less common pattern, the grammaticalization of an auxiliary from the noun PERSON. A third source for agreement auxiliaries in sign languages – and actually the most common one – are (concatenated) pronouns (an English equivalent would be something like 'I trust my friend *ihim*', where the two pronouns *I* and *him* are fused into one prosodic word). Such auxiliaries are attested in e.g. Argentine Sign Language, Indopakistani Sign Language, Japanese Sign Language, and Catalan Sign Language.

Roussou 2003:11). This may happen "when the trigger for a particular parameter value is obscure or ambiguous" (p.33).

Crucially, parametrization is assumed to be restricted to the lexicon, more specifically, to features associated with functional categories (Chomsky 2000). According to Roberts & Roussou (2003:34), "parametric variation arises with respect to which features are spelled out and how". There are only three options: (i) a feature F may be left unrealized, that is, it does not require a PF realization and is thus not spelled out; (ii) F may be realized by the operation Move (i.e. by attracting another morpheme), when the lexicon does not provide a morphophonological matrix for F; (iii) F may be realized by the operation Merge (i.e. by lexical insertion) if the lexicon contains such a matrix for F. Merge is always preferred over Move, as it is more economical. In van Gelderen (2004, 2011b), this is formulated as the Late Merge Principle (LMP): Merge as late as possible.

In a nutshell, Roberts & Roussou argue that grammaticalization is basically "reanalysis 'upwards' along the functional structure" (2003:71), or, to put it differently, that grammaticalization is 'up the tree' (van Gelderen 2011a). Amongst other things, they show that (i) verbal elements are commonly reanalyzed as T- (e.g. (2) above) and subsequently as C-elements and that (ii) features typically associated with the DP-domain may become associated with functional heads in the clausal domain (e.g. D-to-C, as in the case of English *that*). That is, a lexical element L may be reanalyzed as a functional element F_1 which occupies a position higher in the structure, and a functional element F_1 may be reanalyzed as another functional element F_2 occupying a hierarchically higher functional head. Both processes may, but need not, apply in sequence (L $\rightarrow$ F_1 $\rightarrow$ F_2), and crucially, reanalysis never proceeds 'downwards'.

As an example of V-to-T reanalysis consider the French future suffixes which originate from a periphrastic construction involving the verb *avoir* ('to have'). Compare the present tense paradigm of *avoir* in (5a) to the suffixes attached to the verb *chanter* ('to sing') in (5b) (Roberts & Roussou 2003:49).

(5) a. *avoir*: *ai* (1SG), *as* (2SG), *a* (3SG)   [French]
            avons (1PL), *avez* (2PL), *ont* (3PL)

     b. *chanter*: *chanter-ai* (1SG.FUT), *chanter-as* (2SG.FUT), *chanter-a* (3SG.FUT)
            chanter-ons (1PL.FUT), *chanter-ez* (2PL.FUT), *chanter-ont* (3PL.FUT)

Simplifying somewhat, the relevant structural changes are listed in (6). First, the lexical verb *avoir* was reanalyzed as a future auxiliary (i.e. 'Merge over Move'), as illustrated in (6a). Subsequently, the future auxiliary in T was reanalyzed as an affix (6b), resulting in obligatory V-to-T movement, as observed in present-day French.

(6) a. [$_{TP}$ [$_T$ avoir [$_{VP}$ V t$_{avoir}$]]] > [$_{TP}$ [$_T$ avoir [$_{VP}$ V]]]
     b. [$_{TP}$ [$_T$ avoir [$_{VP}$ V]]]   > [$_{TP}$ [$_T$ V + Af [$_{VP}$ t$_V$]]]

The change from the Latin demonstrative pronoun *ille* to the French definite determiner *le* exemplifies reanalysis within the DP (Giusti 2001). Simplifying again, this reanalysis implies loss of Dem-to-D movement (again 'Merge over Move') going hand in hand with phonological reduction. The relevant structural change is sketched in (7).

(7)   [$_{DP}$ [$_D$ ille [$_{DemP}$ t$_{ille}$ [$_{NP}$ N]]]]   >   [$_{DP}$ [$_D$ (il)le [$_{NP}$ N]]]

In the next two sections, we demonstrate how similar processes – in particular, the principle 'Merge over Move' and functional reanalysis – can account for the development of agreement auxiliaries in sign languages. Roberts & Roussou also address the development of agreement markers (clitics and affixes) and argue that this process involves the reanalysis of a DP pronoun as a head in AgrS (plus adjunction of the verb to the position occupied by the clitic in the affix case). It is important to note, however, that in the following, we are not concerned with the development of agreement markers (which may well have developed from pronouns via cliticization; cf. Keller (1998) and Nevins (2011)), but rather with the emergence of auxiliaries that carry these markers. The first example, which has the lexical verb GIVE as its source, is the less complex one, as it parallels a development that is familiar from spoken languages. The second example, which involves the grammaticalization of the noun PERSON, appears highly exceptional cross-linguistically and requires us to make some additional theoretical assumptions.

Before turning to the discussion of the two grammaticalization paths, a remark on the theoretical implementation applied in this paper is in order. In the following, we adopt a model which assumes the presence of agreement projections in syntax (Pollock 1989), being aware of the fact that within recent developments of minimalist theory (Chomsky 1995, 2000), agreement projections have been eliminated given that they are taken to carry uninterpretable features. It is now generally assumed that the relevant agreement features (phi-features) are hosted by the functional heads T (subject agreement) and v (object agreement). Uninterpretable features have to be eliminated in the course of the derivation and this is achieved by the operation Agree, whereby a probe (the phi-set of T or v) seeks a goal, i.e. a lexical item with matching interpretable features. Under this account, movement of arguments to the specifiers of agreement phrases in order to check agreement features, as assumed in earlier generative accounts, is no longer necessary.

Attributing a crucial role to (un)interpretable features has also influenced the view on grammaticalization. Features associated with lexical items are not necessarily stable, and thus, within the minimalist model, grammaticalization is accounted for in syntax by processes of feature change and feature loss which are driven by a general feature economy: semantic features are first reanalyzed as interpretable features [iF] and then in a second step as uninterpretable ones [uF] which turn into probes that require elements to value their (uninterpretable) features (van Gelderen 2011ab).[5] Note that both the more traditional

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[5] Van Gelderen (2011a:53) argues "that it is economical for an item to be reanalysed with uninterpretable features, since these features keep the derivation going". The diachronic sequence of changes is shown in (i):

(i)   semantic feature > [iF] > [uF] > Ø

approach assuming 'Merge over Move' and the more recent one based on feature economy can account for the grammaticalization of agreement auxiliaries in sign language. In this paper, we implement the analysis of the sign language data in the more traditional approach (that is, in a model which assumes agreement phrases and feature checking), which we think is more illustrative for our purpose, but nothing depends on this decision.[6]

5 Case study I: GIVE

Our first case study focuses on the grammaticalization of the verb GIVE in GSL and LSC. It is a well-known fact that the predicate 'give', probably due to its transfer semantics, has a special status in many languages (Newman 1998). As for sign languages, it has, for instance, been shown that even in sign languages that lack agreeing verbs of the type described in Section 3, the verb GIVE may occasionally be directional (see e.g. Marsaja (2008:170) for Kata Kolok, a village sign language of Bali). Also, Wilcox (1998) describes metaphorical extensions of the verb GIVE in ASL, which can be used to express abstract transfer (as, for instance, in passing on knowledge or genetic inheritance of certain physical traits).

Obviously, such metaphorical extensions may be the first step towards further abstraction and grammaticalization of the concept of giving. Accordingly, Heine & Kuteva (2002b:149–155) identify various grammaticalization chains with 'give' as source, amongst which the chains GIVE > BENEFACTIVE > DATIVE and GIVE > CAUSATIVE. The latter phenomenon is illustrated by the following examples from Khmer (Cambodia), where (8a) shows the lexical use of the verb *qaoy* ('to give') while (8b) exemplifies the grammaticalized, causative use of the same element (Matisoff 1991; in Heine & Kuteva 2002b:152).

(8) a. mənuh prɔh baan **qaoy** siəwphəw təw mənuh srɒy [Khmer]
person male PAST give book to person female
'The man gave the book to the woman.'

b. kñom twəə **qaoy** koət ruət
1.SG do give 3.SG run
'I made him run (maybe by scaring him inadvertently).'

While (8b) describes the causation of an action, in the examples discussed in the following, the causative meaning applies to mental states and changes thereof. One may speculate that the meaning expressed in (8b) is even further removed from the original transfer semantics of the verb, such that the grammaticalization chain would involve the following steps: give concrete object > give abstract entity (e.g. knowledge) > cause (change of) mental state (e.g. 'make clever') > cause action (e.g. 'make run').

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[6] Similarly, Roberts and Roussou maintain the existence of AgrS and AgrO positions, as they take the agreement projections "to correspond precisely to positions that represent the set of nominal features in the clause structure, thus establishing the predicate-argument relation". They add that one has to bear in mind that these positions "receive a new meaning and as such they need to be appropriately labelled" (Roberts & Roussou 2003:176).

5.1 From verb to auxiliary

Sapountzaki (2005:131f) shows that in GSL, the agreeing verb GIVE, the lexical use of which is illustrated in (9a), developed into an agreement auxiliary (9bc), which she glosses as GIVE-AUX. Crucially, unlike the NGT auxiliary in (4b), GIVE-AUX does not only spell out agreement features but expresses the additional meaning of causative change of state, similar to some causative uses of the English verb *make*.

(9) a.   INDEX$_1$ TEACHER BOOK $_1$**GIVE$_3$**   [GSL]
          'I give the book to the teacher.'

     b.   INDEX$_2$ $_2$**GIVE-AUX$_3$** BURDEN END
          'Stop being a trouble/nuisance to him/her!'

     c.   INDEX$_1$ SEA ALL-IN-FRONT-OF-ME SIT SUN SUN-SETS, WHAT?
          $_3$**GIVE-AUX$_1$** (gesture "oh, how nice!") BE-CALM, BE-HAPPY
          'When I sit in front of the sea and the sun sets, what is it like?
          It makes me calm and happy.'

A similar auxiliary has been described for LSC, where it is glossed as AUX-DA, based on a mouthing that usually accompanies this sign. As in GSL, this auxiliary is grammaticalized from the lexical verb GIVE (actually, the mouthing /da/ is a reduced form of the Catalan verb *dar* 'give'), and it combines exclusively with psychological predicates in order to express a causative result, as exemplified by (10) (Quer & Frigola 2006).

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                 /da/
                _____
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(10) EXAM $_3$**AUX-DA$_1$** NERVOUS   [LSC]
      'The exam makes me nervous.'

In Figure 1, we sketch the structural change underlying the observed functional change for the GSL case; exactly the same scenario can be applied to LSC (and, for that matter, to the Khmer example in (8b)). As a lexical verb, GIVE is merged within VP (the subscripts indicate that GIVE is an agreeing verb). It will subsequently move to the head of vP, which is specified as [+cause] given the causative semantics of the lexical predicate (Harley 1995), and further to AgrO (and AgrS). In contrast, the auxiliary GIVE-AUX is merged directly in v from where it moves further up to the agreement projections. Note that in this and some of the following figures, the arrow between the two structures indicates a diachronic functional change and is not meant to suggest that the right structure is derived from the left one.
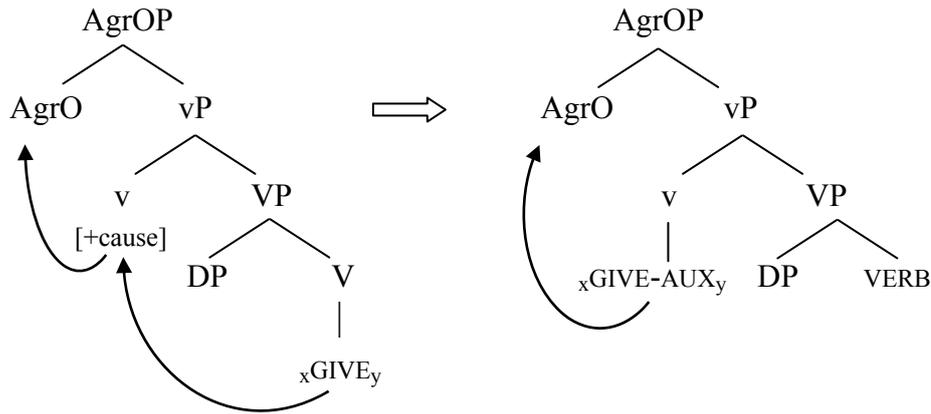
Figure 1. From lexical verb to causative auxiliary in GSL

5.2   Discussion

We assume that the grammaticalization of GSL GIVE-AUX (and LSC GIVE-DA) involves a structural change from V to the functional projection of V, little v. The basis for this change is the transfer semantics associated with the source verb GIVE on the one hand and its spatial properties on the other. GIVE appears to be an optimal candidate for this kind of grammaticalization since, in contrast to other agreement verbs, it expresses pure transfer from A to B without additional meaning.[7]

As has already been sketched in Figure 1, the structural change responsible for the grammaticalization of GIVE thus involves reanalysis of GIVE as a causative marker, which is merged as GIVE-AUX in the head of vP, instead of being moved to this position, as illustrated in (11a). This reanalysis is a clear instance of 'Merge over Move', comparable to what we described above for the French future auxiliary (6a). As a consequence of this reanalysis, the head of VP is vacant and thus becomes available for merger of another lexical verb. After being merged in v, GIVE-AUX (just like the agreement verb GIVE) has to move to AgrO and AgrS to check its agreement features.

(11)   a. $[_{vP} [_v {}_xGIVE_y] [_{VP} [_v t_{GIVE}]]]$ > $[_{vP} [_v {}_xGIVE\text{-}AUX_y] [_{VP} [_v VERB]]]$

b. $[_{AgrOP} [_{AgrO} {}_xGIVE\text{-}AUX_y] [_{vP} [_v t_{GIVE\text{-}AUX}] [_{VP} [_v VERB]]]]$

> $[_{AgrOP} [_{AgrO} {}_xGIVE\text{-}AUX_y] [_{vP} [_v \varnothing] [_{VP} [_v VERB]]]]$

One may speculate that in a following step, GIVE-AUX will be merged even higher in AgrO, thus turning into a 'pure' agreement auxiliary void of causative semantics (11b) comparable to NGT AUX (4b) and other attested auxiliaries. In principle, in this case, little v would also become available for merger of another lexical or light verb. To the best of our knowledge, this functional change has not yet occurred in GSL or LSC – and there is, of course, no guarantee that it ever will. In (12), we provide an overview of the steps on the

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[7] Recall that even in sign languages lacking agreeing verbs altogether, the verb GIVE may occasionally be used as a directional agreeing verb.

grammaticalization path of GIVE argued for in this section, with the potential (but as yet unattested) second step between brackets.

(12) $_x$GIVE$_y$ $\longrightarrow$ [$_v$ $_x$GIVE-AUX$_y$] $\longrightarrow$ [$_{AgrO}$ $_x$GIVE-AUX$_y$]
        agreeing verb   causative auxiliary   pure agreement auxiliary

6   Case study II: PERSON

The claims made in the previous section are fairly straightforward, as the grammaticalization of GIVE is clearly reminiscent of V-to-Aux chains that are well-attested in spoken languages. We shall now turn to a slightly more complex case, the grammaticalization of the noun PERSON in DGS and LSC. Actually, grammaticalization of the noun 'person' is not at all uncommon cross-linguistically; as Heine & Kuteva (2002b:232f) point out, it probably exemplifies a more general process whereby generic nouns (such as 'man', 'person', 'thing') give rise to pronominal categories, for instance, indefinite pronouns ('somebody', 'someone') or first person plural pronouns (also see Haspelmath (1997) and Egerland (2010)). What makes the DGS/LSC case special, if not unique, is that the noun PERSON (Section 6.1) first turned into a determiner-like element (Section 6.2) and subsequently into an auxiliary (Section 6.3).

6.1   From noun to classifier

The noun PERSON is phonologically identical in DGS and LSC: it is signed with a L-hand in ipsilateral signing space with a straight downward movement. The examples in (13) and (14) illustrate the use of this noun in DGS and LSC, both by itself and in combination with a localizing INDEX (LSC examples provided by Gemma Barberà; note that the sign glossed as MATEIX is a type of determiner).

(13) a.   YESTERDAY MEETING INDEX$_3$, NINE **PERSON** BE-PRESENT$_3$ [DGS]
        'Yesterday at the meeting, there were nine people present.'

    b.   INDEX$_1$ THINK INDEX$_1$ [**PERSON** INDEX$_3$] KNOW
        'I think I know this person.'

(14) a.   **PERSON** MILLION WORLD ALREADY READ BOOK MATEIX   [LSC]
        'Millions of people have already read this book.'

    b.   [**PERSON** INDEX$_3$] POSS$_1$ FRIEND GOOD HEART
        'My friend is a good person.'

In both sign languages, the noun PERSON may combine with other signs in a compound-like structure to form agentive nouns. In DGS, PERSON always follows the sign it attaches to (15) while in LSC, it may precede (16ab) or follow (16cd) the modifying sign.[8]

(15) a. PAINT^PERSON   b. STEAL^PERSON   c. SPORT^PERSON   [DGS]
          'painter'   'thief'   'sportsman'

(16) a. PERSON^DRIVE   b. PERSON^BREAD   [LSC]
          'driver'   'baker'

      c. CUT-HAIR^PERSON   d. SHOP^PERSON
          'hairdresser'   'seller'

Note that we are not assuming that PERSON functions as an affix in these examples (in contrast to what has been argued for ASL; cf. Aronoff et al. (2005)). There are two ways to account for the examples in (15) and (16). On the one hand, one might assume that they do not exemplify grammaticalization but rather morphological compounding, with PERSON as the morphosyntactic and semantic head of the compound occupying N° (following this line of reasoning, in these examples, PERSON would behave like *man* in *sportsman*). On the other hand, the examples can also be taken to involve a process of grammaticalization if we assume that PERSON occupies the head of a classifier phrase (ClP) creating an individual, as sketched in Figure 2 (Borer 2005; Simpson 2005).[9] Note that the broken arrow in the left structure indicates that we are not dealing with syntactic movement but rather with a functional change; following this change, PERSON is no longer merged in N° but in the higher functional position Cl°. Consequently, the head of the NP in the structure on the left is free for merger of another noun yielding the nominal classifier constructions in (15) and (16). Also note that the syntactic movement of the noun or noun phrase in the right structure to a higher position indicated by the black arrow is obligatory in DGS but optional in LSC.

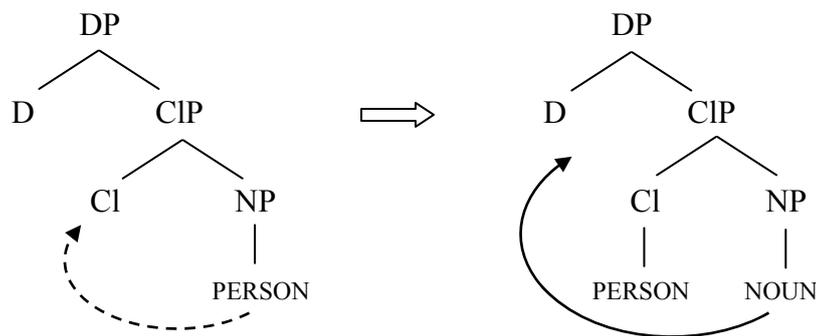

Figure 2. From noun to classifier in DGS and LSC

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[8] A similar phenomenon has been described for other sign languages, including NGT (where PERSON is phonologically identical) and ASL (where PERSON is a two-handed sign). In both NGT and ASL, PERSON appears to consistently follow the modifying sign.
[9] We are indebted to an anonymous reviewer for pointing out this possibility to us.

The classifier analysis proposed in Figure 2 has two advantages over the compound analysis. First, it can account for the word order variation attested in LSC more easily than the compound analysis. Second, it provides optimal structural input for the next grammaticalization step: Having entered the functional domain of DP, PERSON can move further up the tree and develop into a determiner occupying D°, as we are going to show in the next subsection. If we analyze PERSON in (15) and (16) as the morphosyntactic head of a compound, we either have to assume that the whole compound moves to D° or that PERSON is syntactically detached from the first part of the compound. Both assumptions are not well motivated.

6.2   Acquiring spatial properties: from noun/classifier to indexical sign

In both, the nominal and classifier (agentive) use, PERSON itself may be localized in signing space, as illustrated by the examples in (17). In other words, instead of combining PERSON with a localizing INDEX, as observed in (13b), in (17a), the signer articulates PERSON at a specific location in the signing space, which is subsequently targeted by the agreeing verb HELP. The same phenomenon is illustrated for LSC in (17b) (adapted from Barberà (2012:266)). Functionally, this strategy is equivalent to that employed in (13b) and (14b).

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

(17)   a.   INDEX$_2$ **PERSON$_3$** $_2$HELP$_3$ [DGS]
            'Are you going to help this person?'

       b.   INDEX$_1$ $_1$OFFER$_3$ ONE **PERSON$_{3\text{-ipsi}}$** PEN-DRIVE COMPUTER PEN-DRIVE   [LSC]
            $_1$OFFER$_{3\text{-ipsi}}$, BECAUSE **PERSON$_{3\text{-ipsi}}$** ALWAYS++ WORK […]
            'I will offer a pen-drive to a person/someone since he/she/this person
            always works (with computers).'

In the previous section, we argued that while in its nominal use, PERSON still functions as a noun, it functions as a classifier in its agentive use. When localized in signing space, both the noun and the classifier are endowed with spatial features (and we therefore gloss them as PERSON$_x$). Note that in both DGS and LSC, other nouns that are lexically specified for the PoA feature [neutral space] (e.g. HOUSE, CHILD) can be localized in a similar fashion.

    We assume that both the noun and the classifier PERSON$_x$ acquire their spatial features through movement to the functional position within DP which hosts the locative feature – i.e. D° in the accounts of Bertone (2007) and Brunelli (2011).[10] In other words, we are dealing with an instance of N-to-D or Cl-to-D movement, the former of which is illustrated in Figure 3. Note that the black arrow between the two structures indicates that the structure on the right

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[10] Alternatively, one might assume that INDEX$_x$ cliticizes to PERSON, leading to subsequent fusion of the two signs whereby PERSON contributes handshape and movement features while INDEX$_x$ contributes the place of articulation feature; that is, PERSON INDEX$_x$ → PERSON$_x$.

is indeed the result of a movement operation specified on the left; that is, the two structures are derivationally related.
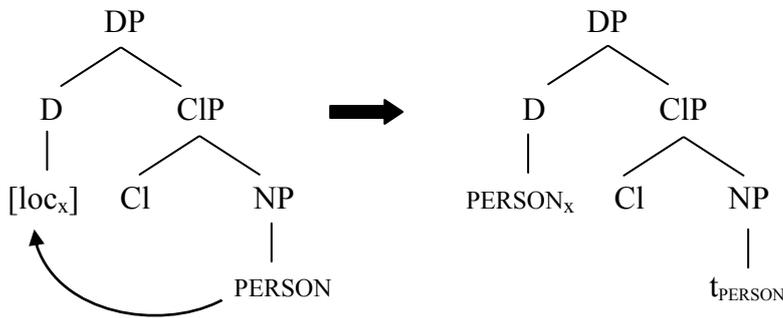

Figure 3. Spatial localization of the noun PERSON: N-to-D movement

Once PERSON is endowed with spatial features, the stage is set for the crucial next step in its grammaticalization: $PERSON_x$ loses its categorial features (decategorization) and becomes a purely indexical sign that is merged in D°. At this point, the head of NP becomes available for merger of another noun (parallel to what we suggested for VP in (11a)). As an indexical sign, $PERSON_x$ behaves like a localizing INDEX, that is, it serves to localize referents in the signing space, one important difference being that $PERSON_x$ only combines with nouns specified as [+human] while INDEX freely combines with animate, non-human referents (e.g. DOG) and non-animate referents (e.g. BIKE). This constraint on the use of $PERSON_x$ suggests that it retains at least some of the semantics of the source noun, that is, it has not (yet) fully desemanticized (cf. also footnote 14). The use of the indexical $PERSON_x$ is illustrated for DGS in (18) and Figure 4.

(18) a. [WOMAN **PERSON₃**] TOMORROW INDEX₁ ₁VISIT₃   [DGS]
           'I will visit the/that woman tomorrow.'

      b. [MAN **PERSON_neutral**] SIT TELEVISION SMOKE
           'The man is sitting in front of the television and smokes.'

MAN   PERSON_centr

Figure 4. Combination of [+human] referent and indexical $PERSON_x$ in (18b)

In our DGS data, the indexical $PERSON_x$ typically follows the noun it localizes, but we also find some examples where $PERSON_x$ precedes the noun. Likewise, the LSC data suggest that in

such cases, movement of the noun to a position above PERSON$_x$ is optional, as PERSON$_x$ may either precede (19a) or follow (19b) the noun it accompanies (Barberà 2012:169, 234). The difference in linearization might be related to definiteness (cf. Neidle & Nash (2012) for a similar observation on INDEX in ASL). We assume (following Brunelli (2011:86f)) that in its non-referential use, PERSON$_x$ is base-generated in D° and that the noun optionally moves to a position above D°.

(19) a. TODAY INTERVIEW ONE [**PERSON$_{3\text{-ipsi}}$** WOMAN]. IX$_{3\text{-ipsi}}$ KNOW ENGLISH   [LSC]
          'Today (I) have an interview with a woman. She knows English.'

    b. IX$_{3\text{-ipsi}}$ [WOMAN **PERSON$_{3\text{-ipsi}}$**] CHARACTER IS/EXACT JEW
         'This girl was a Jew.'

The structures in Figure 5 illustrate the option in which the noun precedes PERSON$_x$. Once PERSON$_x$ has grammaticalized into a D-element, the position within NP becomes available for another noun. The NP subsequently raises to a higher position within the structure, be it SpecDP or the specifier of some other intervening functional projection.
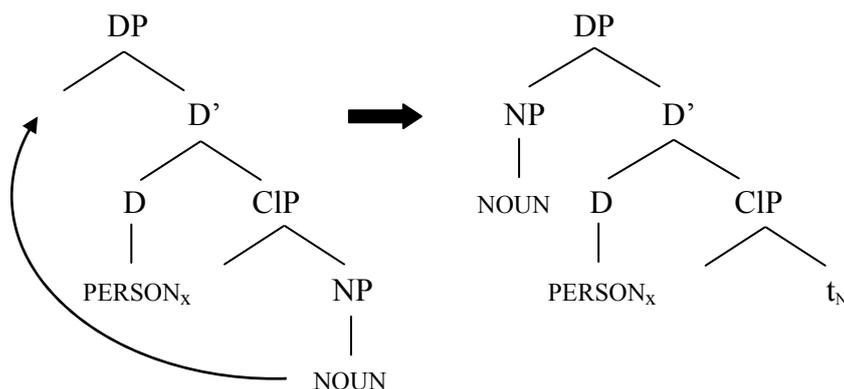
Figure 5. Combination of lexical noun with indexical PERSON$_x$ (following the noun)

Clearly, PERSON$_x$ climbed up the syntactic tree (N-to-Cl-to-D), losing semantic and categorial features in the process, as is characteristic for grammaticalization processes. Still, PERSON$_x$ remains within the same maximal projection, DP.

6.3 Exploiting spatial properties: from indexical sign to auxiliary

As pointed out in Section 3, some sign languages employ agreement auxiliaries to express agreement in the context of plain verbs. and these auxiliaries commonly grammaticalize from verbs (e.g. GO-TO in NGT, SEE and MEET in TSL, GIVE in GSL and LSC) or concatenated pronouns (e.g. in TSL, LSC, and Indopakistani Sign Language; see footnote 4). Interestingly, in DGS and LSC yet another grammaticalization path is attested, as these sign languages feature an agreement auxiliary which developed from the noun PERSON (Steinbach & Pfau

2007). This auxiliary is glossed as PAM (*Person Agreement Marker*) in DGS (Rathmann 2000) and as AUX-PERSON in LSC (Quer & Frigola 2006). While neither the lexical noun PERSON (13/14), nor the classifier PERSON (15/16), nor the indexical PERSON$_x$ (18/19) exhibits a directional movement, the agreement auxiliaries PAM and AUX-PERSON express the agreement relation by path movement from subject to object locus and orientation of the fingertips towards the object (Steinbach & Pfau 2007, Pfau, Salzmann & Steinbach 2010; de Quadros & Quer 2010).

Let us first consider the use of PAM. The examples below illustrate that PAM may be used with plain verbs (20a) and adjectival predicates (20b). It may display agreement for all person features, may inflect for plural (by means of reduplication or addition of an arc-movement on the horizontal plane), and may be used in reciprocal constructions (Pfau & Steinbach 2003). Interestingly, however, PAM does not inflect for aspect.

(20) a. A-N-N-A INDEX$_{3a}$ POSS$_{3a}$ PARTNER TRUST $_{3a}$**PAM$_{3b}$**   [DGS]
          'Anna trusts her husband.'

     b. INDEX$_1$ POSS$_1$ BROTHER INDEX$_{3a}$ PROUD $_1$**PAM$_{3a}$**
          'I am proud of my brother.'

$$\overline{\hspace{3cm}\text{/štolts/}}$$

     c. POSS$_1$ BROTHER INDEX$_{3a}$ INDEX$_1$ PROUD$^\wedge$$_1$**PAM$_{3a}$**
          'I am proud of my brother.'

The realization of PAM in example (20a) is illustrated in Figure 6, where both the beginning and the end point of the movement trajectory are shown. Note that the subject Anna has been localized in ipsilateral signing space by means of an INDEX; the object, however, is localized by means of PAM.

TRUST $_{3a}$PAM$_{3b}$

Figure 6. Realization of agreement auxiliary PAM in example (20a)

Occasionally, PAM cliticizes to a lexical host (20c), as signaled by a number of assimilation phenomena which commonly accompany cliticization (Sandler 1999): (i) the adjective PROUD (which is articulated at the nose) and PAM show one continuous movement contour; (ii) we observe optional regressive handshape assimilation, that is, the handshape of PAM spreads onto PROUD; and (iii) the mouthing associated with the lexical host spreads over PAM. In other words: the lexical host and PAM form one prosodic word.

The use of the LSC auxiliary AUX-PERSON appears to be more restricted (Quer & Frigola 2006). For the most part, it agrees only with first and second person arguments (21a), and frequently, it agrees with only the object (21ab). Just like PAM, AUX-PERSON can inflect for plural (distributive), but in contrast to PAM, it can (sometimes) inflect for aspect. Moreover, unlike PAM, AUX-PERSON is not used in reciprocal constructions (examples provided by Gemma Barberà). Note that in (21b), the auxiliary combines with an inflected agreeing verb, not with a plain verb;[11] it is thus only the directional movement which indicates that we are in fact dealing with an auxiliary and not with an indexical sign preceding the noun STUDENT (also note that STUDENT is localized by a post-nominal INDEX).

(21)   a.   INDEX$_1$ FORGET **AUX-PERSON$_2$** NEVER   [LSC]
             'I will never forget you.'

                          _____ top
       b.   THEME HISTORY, TEACHER $_3$EXPLAIN$_3$ **AUX-PERSON$_3$** STUDENT IX$_{3PL}$
             SEVERAL-TIMES
             'The teacher explained to the students the theme of history plenty of times.'

What makes the above data interesting from a typological point of view is the fact that cross-linguistically, the N-to-Aux chain attested in DGS and LSC – or, more precisely, the final step on this grammaticalization chain, i.e. D-to-Aux – is highly uncommon if not non-existent (Heine 1993). Kuteva (2001:22), for instance, states that "all lexical sources for auxiliary verb constructions involve verb meanings which are relatively concrete and basic to human experience". We return to this striking typological pattern in Section 6.4.[12]

The structural change from DP-internal indexical sign to agreement auxiliary is sketched in Figure 7. Recall from Figure 2 above that the broken arrow in the left structure indicates that we are not dealing with syntactic movement but rather with a functional change (in contrast to Figures 3 and 5 above). Crucially, in this grammaticalization step, PERSON$_x$ exits the DP and is inserted under AgrO – now glossed as PAM signalling its new function (see right structure in Figure 7). From this position, it moves further up to AgrS, undergoing Spec-head-agreement with the relevant argument in both positions (also remember that the functional change as well as the movement operation might be reformulated in terms of merger and feature checking in v (object agreement) and T (subject agreement)).

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[11] This type of 'double agreement' is also occasionally observed in DGS (Steinbach & Pfau 2007), see also footnote 14 below.

[12] Note, however, that although spoken languages do not grammaticalize auxiliaries from pronouns, the development of pronouns into copulas is attested in many languages such as Modern Hebrew and creole languages (cf. e.g. Diessel 1999; Arends 1986); that is, in certain contexts, pronouns can be grammaticalized as verbal elements. We thank an anonymous reviewer for making us aware of this point.
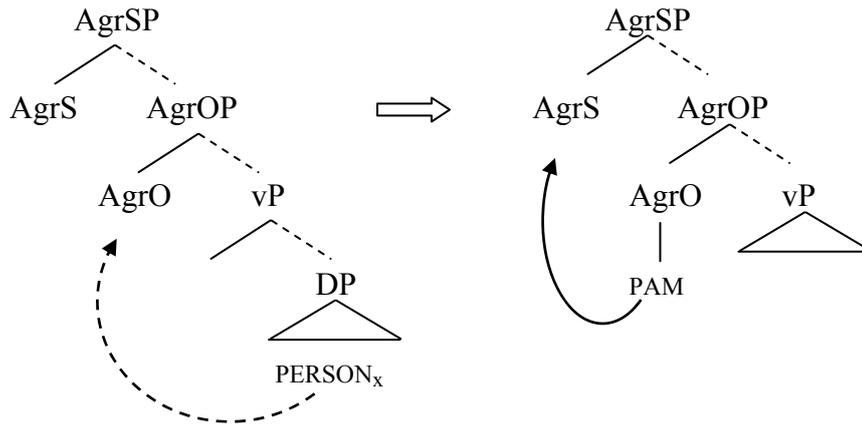
Figure 7. Functional change from DP-internal indexical sign to agreement auxiliary

6.4 Discussion

In (22), we provide an overview of the steps on the grammaticalization path of PERSON argued for in the previous sections. As mentioned in Section 6.1, we assume that the agentive use of PERSON in DGS and LSC involves a grammaticalized nominal classifier construction.

(22) PERSON $\longrightarrow$ PERSON $\longrightarrow$ PERSON$_x$ $\longrightarrow$ [NOUN PERSON$_x$] $\longrightarrow$ $_{(x)}$PAM/AUX-PERSON$_y$
      noun   classifier   localized noun   indexical use   agreement auxiliary

The structural changes relevant in the grammaticalization of PERSON are listed in (23). (23a) illustrates the grammaticalization of the classifier PERSON. The transition from a lexical noun (or classifier) to an indexical sign is illustrated in (23b). First, PERSON acquires spatial features by virtue of N-to-D or Cl-to-D movement (23b). In a subsequent step, PERSON$_x$ is merged directly in D° and the now vacant head of NP may be occupied by another lexical noun (23c); note that this structural change exemplifies an instance of 'Merge over Move', as also commonly observed in the grammaticalization of D-elements in spoken languages. In the final grammaticalization step in (23d), PERSON$_x$ exits the DP and is merged in AgrO – this seems to be a modality-specific step of grammaticalization (we only mention PAM in (23c), but exactly the same holds for LSC AUX-PERSON). The auxiliary may raise from AgrO to AgrS to check features of the subject, but this movement is optional, as subject agreement is optional in both LSC (as has been illustrated in (21)) and DGS.

(23) a. [$_{DP}$ D [$_{ClP}$ [$_{NP}$ PERSON]]]   > [$_{DP}$ D [$_{ClP}$ PERSON [$_{NP}$ NOUN]]]

       b. [$_{DP}$ D [$_{ClP}$ [$_{NP}$ PERSON]]]   > [$_{DP}$ [$_{D}$ PERSON$_x$] [$_{ClP}$ [$_{NP}$ t$_{PERSON}$]]]

           [$_{DP}$ D [$_{ClP}$ PERSON [$_{NP}$ NOUN]]]   > [$_{DP}$ [$_{D}$ PERSON$_x$] [$_{ClP}$ t$_{PERSON}$ [$_{NP}$ NOUN]]]

       c. [$_{DP}$ [$_{D}$ PERSON$_x$] [$_{ClP}$ [$_{NP}$ t$_{PERSON}$]] > [$_{DP}$ [$_{D}$ PERSON$_x$] [$_{ClP}$ [$_{NP}$ NOUN]]

       d. [$_{DP}$ [$_{D}$ PERSON$_x$] [$_{ClP}$ [$_{NP}$ NOUN]] > [$_{AgrSP}$ [$_{AgrS}$ $_x$PAM$_y$] [$_{AgrOP}$ [$_{AgrO}$ t$_{PAM}$]]]

The grammaticalization of PERSON in DGS and LSC thus involves processes of reanalysis (N-to-Cl-to-D) and structural changes ('up the tree') that also characterize grammaticalization processes in spoken languages (Roberts & Roussou 2003). While these modality-independent properties are clearly a welcome result, we still have to account for the fact that the two sign languages under investigation employ a grammaticalization chain, i.e. N-to-Cl-to-D-to-Aux, the last step of which is highly marked from a typological point of view. We suggest that a noun like PERSON makes for a convenient source for the development of an auxiliary in sign languages, in contrast to spoken languages, because it is endowed with certain phonological and semantic properties that are prerequisites for the expression of agreement in sign languages.

First, as for phonological properties, it is important to note that the determiner PERSON$_x$ in (23c) is an indexical sign that can be freely localized in the signing space, that is, just like its nominal source, it has the PoA feature [neutral space]. As pointed out previously, signs that are specified for articulation on (or near) the body cannot show agreement. In addition, PERSON$_x$ involves a path movement. While the movement is lexically specified for [straight] and [down] on the vertical plane, it can still be recruited in the expression of (abstract) transfer on the horizontal plane. In other words: the path movement need not be added but is only modulated. Also, the handshape and orientation features of PERSON are convenient for agreement marking, as the selected fingers (index and thumb) point outward and are thus easily oriented towards an object locus.[13]

Second, the nominal source in (23a) as well as the determiner in (23b) are semantically specified as [+human]. As pointed out briefly in Section 3, the feature [+human] is relevant for agreement in DGS (and some other sign languages), as verbs generally agree only with human referents. While the specification [+human] also characterizes other nouns such as CHILD, WOMAN, or MAN, PERSON has the advantage of being void of any additional semantic specification. Hence, the final grammaticalization step in (23c) is – at least – not blocked by semantic constraints.[14]

Recall from Section 3 that auxiliaries in spoken languages are predominantly TAM-markers, and as such they tend to grammaticalize from verbs, exploiting the universal event schemas put forward by Heine (1993) – notably, the same is true for some sign language

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[13] One exception (for right-handed signers) are contexts in which a subject referent is located on the contralateral side of the signing space and an object referent on the ipsilateral side (that is, the opposite from what is depicted in Figure 6), as in this context, the realization of agreement would require an uncomfortable adduction of the wrist. In such a situation, DGS signers tend to articulate PAM with their non-dominant hand (dominance reversal).

[14] Murmann et al. (2013) conducted a questionnaire study to investigate the following two questions: (i) Does PAM only combine with arguments referring to human entities (or at least to entities ranked high on the animacy scale), and (ii) can PAM only be combined with plain verbs or can it also be combined with (un)inflected agreement verbs? The results of this study show (i) that PAM, like agreement verbs, is disfavored in sentences with inanimate objects. However, it can be used in sentences with objects ranked high on the animacy hierarchy such as humans and pets. Concerning the combination of PAM with agreement verbs, the results show (ii) that with inflected agreement verbs, PAM is the disfavored option. By contrast, with uninflected agreeing verbs, PAM receives a higher rating than zero marking. Nevertheless, a sentence containing PAM and an uninflected agreement verbs is still judged much worse than the corresponding sentence containing only the inflected agreement verb without PAM. In sum, the DGS agreement auxiliary PAM is sensitive to the animacy hierarchy and has not yet become a general marker of agreement across all verb types.

auxiliaries. In contrast, the sign language auxiliaries under discussion are agreement markers. Once we take into consideration that sign language agreement, as opposed to agreement in spoken languages, is essentially a spatial concept which crucially depends on phonological (and semantic) properties of a verb or auxiliary as well as on semantic properties of the arguments (Meir 2002), the unusual grammaticalization chain underlying the development of PAM and AUX-PERSON appears in a different light. Taken together, phonological and semantic properties of a sign may be more important for the development of agreement markers in sign languages than event schemas and grammatical category.[15]

Note, however, that the availability of a (phonologically similar or even identical) noun PERSON, which allows for spatial modification and the use as an indexical sign, is no guarantee for the development of an agreement auxiliary. In NGT, for instance, the noun PERSON can also be employed to localize [+human] nouns, as illustrated in (24) (Crasborn et al. 2008:59).

(24) VILLAGE INDEX$_{3a}$ [BOY **PERSON$_{3a}$**] LIVE INDEX$_{3a}$ [NGT]
       'There was a boy who lived in a village.'

Still, NGT PERSON has not taken the final step in (23c), a likely reason being that NGT opted for a different, and cross-linguistically more common, grammaticalization path, that is, the path from spatial verb GO-TO to agreement auxiliary (based on Heine's (1993) Motion Schema), as has been illustrated in (4b).

7   Conclusion

The above discussion reveals that, in general, grammaticalization phenomena in sign languages can be accounted for within modality-independent generative theories of syntactic change. In particular, we demonstrated that the grammaticalization of two different kinds of sign language agreement auxiliaries involves reanalysis 'upwards' along the functional structure – in line with what has been suggested for spoken language grammaticalization (Roberts & Roussou 2003; van Gelderen 2004, 2011ab).

As for the GSL/LSC agreement auxiliaries GIVE-AUX/GIVE-DA, their development can be characterized as a structural change from V to the functional projection of V, little v (V-to-Aux) – with the potential to move higher up in the tree to the next functional projection AgrO. By contrast, the grammaticalization of the DGS/LSC agreement auxiliaries PAM/AUX-PERSON involves two crucial transitions: first, the lexical noun/classifier PERSON turns into the indexical sign PERSON$_x$ (N-to-Cl-to-D); subsequently, PERSON$_x$ exits the DP and is inserted under AgrO (D-to-Aux). We have suggested that this second modality-specific step is

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[15] Note that phonological and semantic properties are even crucial for the development of agreement auxiliaries that are grammaticalized from verbal sources: The GSL/LSC auxiliary $_x$GIVE-AUX$_Y$ can, for example, be traced back to the prototypical agreement verb GIVE, which is endowed with all phonological and semantic features necessary to express agreement. Likewise, the NGT auxiliary $_x$AUX$_Y$, which has developed from the spatial verb GO-TO inherited the relevant phonological and semantic features of its source.

facilitated by the spatial nature of sign language agreement. Both grammaticalization paths argued for in this paper are repeated in (25) and (26) for the reader's convenience.

(25) $_x$GIVE$_y$ ⟶ [$_v$ $_x$GIVE-AUX$_y$] ⟶ [$_{AgrO}$ $_x$GIVE-AUX$_y$]
        agreeing verb   causative auxiliary   pure agreement auxiliary

(26) PERSON ⟶ PERSON ⟶ PERSON$_x$ ⟶ [NOUN PERSON$_x$] ⟶ $_{(x)}$PAM/AUX-PERSON$_y$
     noun   classifier   localized noun   indexical use   agreement auxiliary

Clearly, other grammaticalization phenomena that take as input a lexical sign – some of which were briefly mentioned in Section 2.2 – can be explained along similar lines, for instance, the grammaticalization of tense and aspect markers from verbs (i.e. V-to-Tns/Asp) and of intensifiers from adjectives (i.e. structural change from A to the functional projection of A, Degree).

However, accounting for the grammaticalization of gestures poses additional challenges. Here, we only wish to offer a few speculations concerning this issue. Presumably, once a gesture has entered the lexicon of a sign language, it may acquire additional functions associated with functional heads higher in the structure, no matter whether this gesture initially fulfils a lexical function (i.e. it undergoes lexicalization prior to grammaticalization) or is turned directly into a grammatical marker. As pointed out in Section 2.3, the former sequence of changes has been claimed to be responsible for the emergence of the ASL tense marker FUTURE (26a) (Janzen & Shaffer 2002). The latter path may take manual and non-manual gestures as input. As for a manual gesture, it has, for instance, been proposed that gestural pointing has entered the grammar of sign languages as a locative or demonstrative pronoun before grammaticalizing further into a personal pronoun and an agreement marker (26b) (Pfau & Steinbach 2006; Pfau 2011). As for a non-manual gesture, Janzen (1999) suggests that a communicative non-manual gesture (viz. raised eyebrows) started out as a grammatical yes/no-question marker in ASL and then developed further into a non-manual marker accompanying topic constituents (26c).

(26)   ①   ②   ③
    a. gesture 'go to'   ⟶ verb GO-TO   ⟶ tense marker FUTURE

    b. pointing gesture ⟶ locative/demonstrative ⟶ pronoun ⟶ Agr

    c. non-m. gesture   ⟶ yes/no-question marker ⟶ topic marker

As mentioned before, accounting for step ② (as well as subsequent steps) is pretty straightforward in the framework adopted here. Step ② in (26a), i.e. V-to-T, has already been discussed. Step ② in (26b) involves a structural change from a lower to a higher functional head within DP – presumably Dem-to-D – that is also common in spoken languages. The same is true for step ③ of this grammaticalization chain, whereby a pronominal element turns into a bound agreement marker – possibly via cliticization. Even step ② in (26c) can be

accounted for along similar lines. Given that in cartographic approaches to phrase structure, it is assumed that a topic phrase sits above an interrogative phrase within the left periphery of the clause (Rizzi 2001), the grammaticalization of topic marking may involve Inter-to-Top reanalysis.

The real challenge thus lies in accounting for step ①: how do the gestures that constitute the source for the grammaticalization processes get integrated into the syntactic structure? There are at least two strategies for explaining this integration. One way to go might be to argue that the relevant manual and non-manual elements are actually never used as gestures by signers. That is, signers may encounter co-speech gestures in their environment but, when using the same elements themselves, they immediately merge them in the syntactic structure – be it as a lexical or functional head. According to this view, the alleged modality-specific first step thus becomes irrelevant. However, such an explanation seems unlikely, as it has been shown that signers do employ manual and non-manual gestures (Emmorey 1999). Alternatively, one might adopt the view of gesture researchers who argue that co-speech gestures sometimes function as words, even in spoken languages (Ladewig 2011; Müller et al. in press), and as such participate in the syntactic derivation. This line of reasoning implies that step ①, rather than being irrelevant, is in principle attested in both modalities (even though it need not affect the same gestures). Still, it seems likely that this step is considerably more common in visual-gestural languages, as these share the same modality with gesture. We leave the gesture integration issue, i.e. step ① in (26), for future investigation; ideally, such studies will be conducted in cooperation with gesture researchers.

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