THE ROUTLEDGE HANDBOOK OF THEORETICAL AND EXPERIMENTAL SIGN LANGUAGE RESEARCH

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5

VERB AGREEMENT

Theoretical perspectives

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5.1 Introduction

To a greater or a lesser extent, all sign languages known to date have been shown to have ways to mark reference to arguments on verbal forms, either by linking the start and end points of the movement path of the verb, its hand orientation, or both, to the referential locations (also known as R-loci) associated with those arguments. The phenomenon has been referred to as 'directionality' from the very start of sign language research (e.g., Fischer & Gough 1978). This kind of marking, which is realized in just a section of the lexicon of verbs (so-called agreeing or agreement verbs), has been identified with grammatical agreement marking in a rather large part of the research. However, a competing view on its characterization has developed over the years that denies its characterization as agreement and rather considers it the blending of a gestural component with the lexical form of the verb (e.g., Liddell 2000, 2003; Schembri et al. 2018) and labels such verbs indicating verbs (from this perspective, forms gesturally point at or are oriented towards the locations where arguments are placed in real or surrogate space mapped from mental representations). This chapter offers a review of the scholarship that takes this type of argument encoding as grammatical agreement, and presents the formal analyses proposed and the arguments made to defend its linguistic nature by opposition to a gestural one.[1]

5.2 Properties of agreement in sign languages

The general definition of agreement in natural languages establishes that it is the phenomenon whereby an element (the target) matches another one in some grammatical feature(s) triggered by the latter (the controller) within a certain domain (Steele 1978; Barlow & Ferguson 1988; Bickel & Nichols 2007). Typically, agreement is local within a clause, where the morphosyntactic (or semantic) features of arguments such as person, number, or gender can determine the morphological marks on the verb, which covaries with them. Many sign languages have been reported to display this phenomenon. In this section, different properties associated with it will be described and exemplified.

5.2.1 Agreement markers

The most prominent exponent of agreement in sign languages is the realization of the phonological feature of movement path of the verb, known as directionality: if a verb is specified for path movement, it has the potential to agree with the referential locations associated with its external and internal arguments. In grammatical terms, this has been interpreted in some accounts as agreement with the person feature of the subject and the object arguments encoded in the associated locations, which are also exploited by the pointing signs realizing pronouns (see Perniss, Chapter 17; Kuhn, Chapter 21).[2] For a verb like GIVE-PRESENT in Catalan Sign Language (LSC), two possible agreement patterns are illustrated in (1): $_3$GIVE-PRESENT$_1$ (1a) and $_1$GIVE-PRESENT$_2$ (1b), illustrated in Figure 5.1a and 5.1b, respectively. Since this is a case of ditransitive predicate, the first referential location corresponds to the subject and the second one to the indirect object. Agreement marking also surfaces with transitive predicates, where the endpoint of the path agrees with the location associated with the direct object argument, as in (2).

(1) a. $_3$GIVE-PRESENT$_1$
          'She gave me a present.'
     b. $_1$GIVE-PRESENT$_2$
          'I gave her a present.'   (LSC)

(2) $_1$SUPPORT$_3$
      'I support her.'   (LSC)

a. $_3$GIVE-PRESENT$_1$ b. $_1$GIVE-PRESENT$_2$
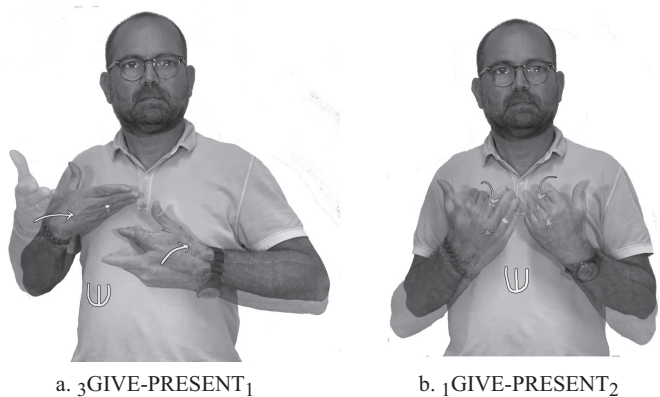
Figure 5.1   Two agreeing forms of the verb GIVE-PRESENT in LSC (© LSC Lab, Pompeu Fabra University)

A second marker of agreement is facing (of the fingertips, the palm or the whole hand) towards the object location. It often combines with path movement, as in (1), but it can be the agreement marker on its own as well, as in (3), illustrated in Figure 5.2.

(3) $_1$TAKE.CARE$_3$
      'I take care of her.'   (LSC)

$_1$TAKE-CARE$_3$

Figure 5.2 Agreeing form of the verb TAKE-CARE in LSC (© LSC Lab, Pompeu Fabra University)

5.2.2 Verb classes and agreement

Agreement markers do not appear on every verb form in sign languages. For American Sign Language (ASL), Padden (1983[1988]) established that verbs split in three morphological classes: (i) agreeing/agreement verbs, which overtly agree with subject and object arguments; (ii) spatial verbs, which agree with locative arguments, and (iii) plain verbs, which have invariant forms and do not encode agreement. Typically, research has mostly concentrated on the analysis of agreement verbs, which have been illustrated above in (1)–(3). Spatial verbs (ii) are inflected for their locative arguments, as in (4)–(5) from LSC. Figures 5.3a and 5.3b illustrate the respective verb forms.[3] Note that the verb in (4) inflects for the location of the goal argument, while in (5) it shows agreement with a body location that stands for the one of the intended referent.

(4) TOMORROW IX$_1$ CHILD BRING$_a$ SCHOOL IX$_a$
   'Tomorrow I will bring my child to school.'

(5) MONTH PAST IX$_3$ GET-SURGERY-ON$_{eye}$
   'Last week she got an eye-surgery.'   (LSC)

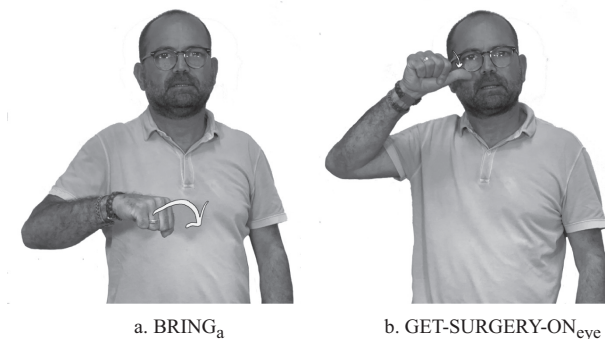a. BRING$_a$ b. GET-SURGERY-ON$_{eye}$

Figure 5.3 Agreeing forms of the verbs BRING and GET-SURGERY-ON in LSC (© LSC Lab, Pompeu Fabra University)

Next to these two classes of inflecting verbs, sign language lexicons also include verbs that do not carry any kind of inflection, because they are specified for a location (on the body – body-anchored signs – or in signing space) at the lexical level, thus being unable to modify its form for path or orientation. Examples of this type of verbs in LSC are THINK in (6), articulated at the forehead, or PASS (7), articulated in signing space, as illustrated in Figures 5.4a and 5.4b.

(6) IX3 THINK++
     'She keeps thinking.'

(7) IX2 PASS SURE
     'You will pass for sure.'   (LSC)

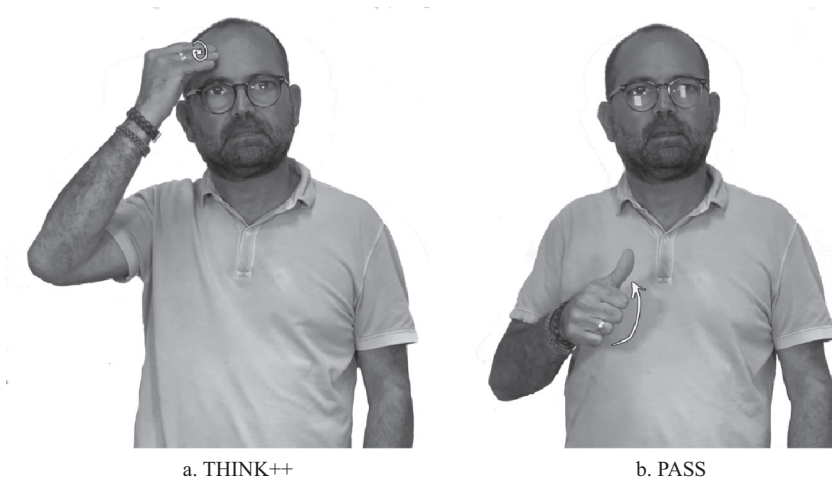a. THINK++   b. PASS

Figure 5.4   Forms of the verbs THINK and PASS in LSC (© LSC Lab, Pompeu Fabra University)

Within the class of agreement verbs that show path movement, a subclass is systematically identified where the path moves in the opposite direction, starting in the location of the object and ending in the location of the subject. This subtype of agreement verbs is called backwards and is exemplified with the LSC verbs CHOOSE and INVITE in (8) and (9) and illustrated in Figure 5.5.

(8) $_1$CHOOSE$_3$
     'She chose me.'

(9) $_2$INVITE$_1$
     'I invite you.'   (LSC)

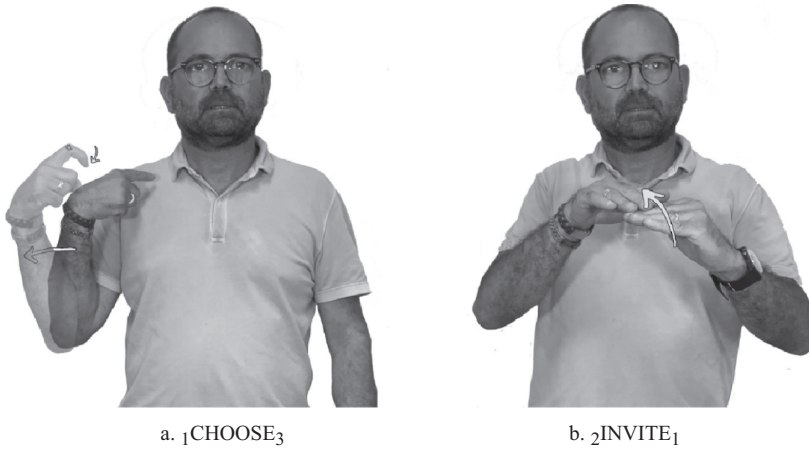a. $_1$CHOOSE$_3$ b. $_2$INVITE$_1$

Figure 5.5   Agreeing forms of the verbs CHOOSE and INVITE in LSC (© LSC Lab, Pompeu Fabra University)

In addition, some plain verbs that are articulated in signing space have the possibility to realize agreement with a location associated with an argument. For example, the in principle invariable PASS in LSC (7) can also be articulated at a certain location, as in (10) (Figure 5.6). In this example, the modified location of the verb denotes the subject argument, but it could also denote the object if the location referred to it. As will be reviewed below, the interpretation of this modification is split between those who do not consider it as integrating the morphological system of agreement and those that do.

(10)   IX3 $_3$PASS SURE
      'She will pass for sure.'   (LSC)

Figure 5.6   Agreeing form of the verbs PASS in LSC (© LSC Lab, Pompeu Fabra University)

In sum, from a morphological point of view, sign language verbs can in principle be classified in three main types and two subclasses for agreement verbs. Plain verbs can also instantiate agreement with a single argument. Table 5.1 summarizes the possibilities.

Table 5.1 Classification of verbs according to their agreement possibilities

	Class	Subclass	Main exponent
Inflecting	Agreement verbs	Regular	Subject to object path movement
		Backwards	Object to subject path movement
	Spatial verbs		Source to goal path movement / Location
Non-inflecting	Plain verbs		Potential agreement with a single location

5.2.3 Agreement auxiliaries

For some sign languages, an auxiliary predicate has been described that encodes the agreement relations of the lexical predicate it co-occurs with. Unlike typical spoken language auxiliaries, the ones instantiated in sign languages encode subject and object agreement, but not categories such as tense or mood, although in some sign languages some aspectual categories can be conveyed by the agreement auxiliary as well. In general, they combine with lexical plain verbs that do not carry agreement morphology, as illustrated in (11) from Argentine Sign Language (LSA), although they can co-occur with agreement verbs (inflected or uninflected) under special circumstances (e.g., emphasis), as well as with backwards agreement verbs. It is important to note that in the latter case the movement path of the auxiliary is the regular one from subject to object locations, namely in the opposite direction to the one of the lexical backwards verb, as exemplified in (12) from LSC.

(11) JOHN$_1$ MARY$_2$ LOVE $_1$AUX$_2$
      'John loves Mary.'   (LSA, from Massone & Curiel 2004: 80)

(12) $_3$AUX$_1$ $_1$INVITE$_3$
      'She invited me.'   (LSC)

According to Steinbach & Pfau (2007), agreement auxiliaries can be grouped in three classes, based on their origins in the process of grammaticalization: (i) those that stem from the concatenation of two pronouns realized as a pointing sign moving from the subject location to the object one; (ii) those that have grammaticalized from non-indexical nominals such as the noun PERSON in German Sign Language (DGS); (iii) those that derive from predicates such as GIVE in Greek Sign Language (GSL), MEET in Taiwan Sign Language (TSL), or GO-TO in Sign Language of the Netherlands (NGT). A sign language can have more than one agreement auxiliary, as in TSL or LSC. In the latter language, the auxiliary of type (ii), i.e., GIVE-AUX, is based on the root of GIVE and has a more restricted distribution than the one of type (i), because it carries an additional semantic layer of causative meaning, and it characteristically appears with psychological predicates as in (13). Figure 5.7a illustrates type (i), and Figure 5.7b displays type (ii) in LSC.

<div style="text-align:center">_____[da]</div>

(13) ₃GIVE-AUX₁ ANNOY
      'That annoys me.'   (LSC)

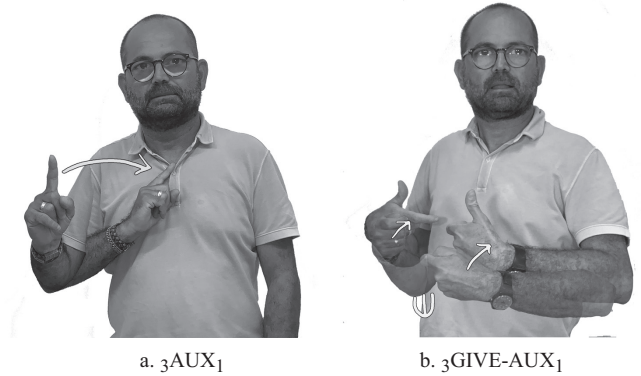a. ₃AUX₁   b. ₃GIVE-AUX₁

Figure 5.7   Agreeing auxiliaries AUX and GIVE-AUX in LSC (© LSC Lab, Pompeu Fabra University)

Since early sign language research had not dealt with these grammatical markers, their description and analysis has added new empirical evidence for the analysis of agreement systems in sign languages.

5.2.4 Non-manual agreement

Next to the manual marking of agreement, for ASL non-manual marking of agreement has been described and analyzed (Bahan 1996; Neidle et al. 2000). The overt non-manual markers with transitive verbs are head tilt and eye gaze towards the location of the subject and object arguments, respectively, and they are argued to co-appear with any type of verb, irrespective of the morphological ability to display manual agreement inflection. In line with their general analysis of non-manual markers, Neidle et al. (2000) propose that they are the overt realization of functional heads, and in this case they originate in AgrS° and AgrO° and spread over the manual material in the c-command domain of each projection, as represented in (14). Figure 5.8 shows that the head is tilted to the right of the signer, where the subject has been localized, and eye gaze is directed to the object location on the left. It is claimed that, given that AgrS° dominates AgrO°, the onset of head tilt is slightly earlier than that of eye gaze, despite their linear contiguity. With intransitives, both head tilt and eye gaze can mark agreement with the single argument.

<div style="text-align:center">_____head tilt$_i$</div>
<div style="text-align:center">_____eye gaze$_j$</div>

(14)   JOHN$_i$ [+agr$_i$] $_{AgrS}$ [+agr$_j$] $_{AgrO}$ LOVE MARY$_j$
       'John loves Mary.'   (ASL, adapted from Bahan 1996: 118)

Figure 5.8   Non-manual agreement markers in ASL (ASL, Bahan 1996: 120; © Ben Bahan, reproduced with permission)

This type of non-manual agreement has only been described for ASL. Zwitserlood & van Gijn (2006) empirically discarded its existence in NGT. Some objections have been raised with respect to its characterization and analysis in ASL as well (for some descriptive and conceptual issues, see Sandler & Lillo-Martin (2006: 42-46)). From an experimental perspective, Thompson et al. (2006) tested the validity of eye gaze as agreement marker in ASL with an eye tracking experiment, and the results did not support the generality of the analysis for all types of verbs (see Hosemann, Chapter 6, for details).

5.3 Theoretical analyses

Two main theoretical approaches to agreement in sign languages can be identified in the scholarship devoted to the topic: one that ascribes the properties of agreement systems and agreement verbs to the thematic structure of predicates, and another one that treats agreement in purely syntactic terms. In addition, an alternative approach to the phenomenon in terms of clitic morphosyntax has also been pursued. In the next subsections, the main representative accounts of those lines of analysis are reviewed.[4]

5.3.1 Thematic approaches

In line with Friedman's (1975) early proposal, Meir (1998, 2002) offers a detailed account of verb classes and agreement in Israeli Sign Language (ISL) that takes thematic properties as the basis for the system. The basic assumption is that inflecting verbs morphologically incorporate a morpheme that denotes the path movement or trajectory traversed by a referent from a Source to a Goal. This is quite transparent for spatial predicates such as MOVE in the LSC example (15), where the movement path starts at the Source location and ends at the Goal location:

(15) IX_1 SON $BRISTOL_{a\,a}MOVE_b$ $BARCELONA_b$
     'My son moved from Bristol to Barcelona.'   (LSC)

Meir argues that this type of marking is the instantiation of a directional morpheme DIR encoding the movement path. One central contribution in her system is the idea that the so-called 'agreement verbs' are the result of the combination of this directional morpheme with the verbal roots, which are not inherently marked for agreement but rather incorporate the marking from DIR. They do not have spatial semantics, but verbs like GIVE, PAY or SEND in ISL semantically encode physical transfer, while TEACH, TELL or INFORM encode abstract transfer. Transfer is taken as the metaphorical type of motion that explains the combination of these verb roots with the directional morpheme. Plain verbs are defined as those that denote neither motion nor transfer. From this perspective, Padden's verb classes are not primitive but derived from the restrictions imposed by their lexical semantics.

Meir's (1998, 2002) account is cast in Jackendoff's (1997, 1990) Lexical Conceptual Structures (LCS) representing the lexical-semantic information and Predicate Argument Structures (PAS) encoding the argument-taking properties of the predicate. Slots on the LCS are mapped into the level of PAS by means of linking rules, by which more prominent positions on the LCS are mapped into more prominent positions of the PAS. LCSs capture the predicate-argument relations through two thematic relations, namely spatial (Source, Theme, Goal) and affectedness (Agent, Patient). Accordingly, they are structured in two tiers: the spatial tier and the action tier. In verbs of transfer the motion component is encoded on the spatial tier, whereas the affectedness relation is represented on the action tier, as illustrated in (16) for a predication like 'I gave you the book' (Meir 2002: 432).

(16)   *Lexical Conceptual Structure of Verbs of Transfer*

   Spatial tier: CAUSE ([α], [GO ([BOOK]γ, [$_{Path}$ FROM [α] TO [β]])])
   Action tier: AFF ([I]$^{\alpha}$, [YOU]$^{\beta}$)

As Meir (2002: 417) states, "[s]yntax does not figure prominently in the analysis" because the domain where the agreement relation obtains is the more general one between a head and its dependents, which is encoded in the lexicon. An important advantage of this analysis is that it generalizes not only over the two alleged classes of spatial and agreement verbs, but it is also able to account for the behavior of backwards agreement verbs without any additional explanation: the transfer movement in verbs like TAKE or CHOOSE is from Source to Goal, even if the path looks reversed from the point of view of syntactic arguments (it goes from object to subject). This is foreseen in the reversibility of the linking relations of the path arguments: FROM [α] TO [β] is the path specification for regular agreement verbs, and FROM [β] TO [α] the one for backwards agreement verbs.

At the morphological level, Meir dissociates path marking from orientation marking and puts forth the idea that facing (orientation) of the hand in fact instantiates syntactic marking of the object argument. In this way, the independent mechanisms are brought under the following morphological principles (Meir 2002: 425):

(17)   *Principles of Sign Language Agreement Morphology*
   a.   The direction of the path movement of agreement verbs is from Source to Goal.
   b.   The facing of the hand(s) is towards the object of the verb (whichever of Source or Goal is not subject).

The dissociation of these two exponents is empirically supported by their independent behavior with different verbs types: while with regular and backward agreement verbs the path moves in opposite directions but always from the Source location to the Goal location, the hand remains oriented towards the object argument (the Goal with regular agreement verbs and the Source with backward agreement verbs).

Bos (2017 [1998]), working within the same framework on NGT, makes a germane proposal to Meir's, but with some differences. One main point of divergence in her analysis is that the initial location of the movement path is not always determined by the Source argument: it can also be determined by the Theme, as is often the case with backward agreement verbs like TAKE or FETCH. According to Bos (2017: 240), "[w]ith backwards verbs that have a Goal, Theme, and Source argument, agreement of the beginning point may shift from the Source to the Theme, when the Source argument is missing". She interprets this as a modality effect, arguing that the interpretation or marking of Theme and Source is merged in space. This same fact was pointed out independently by Quadros & Quer (2008: 541) for LSC and Brazilian Sign Language (Libras), but not only with backwards verbs: both regular verbs like PRESS or BEAT and backward verbs like INVITE, CHOOSE, or SUMMON are clear transitives.

The thematic approaches to verb agreement in sign languages unify all types of inflecting verbs under spatial semantics, be it literal or abstract/metaphorical as in the case of transfer predicates. Still, spatial verbs that select for a location argument, such as STAY in LSC (18) do not follow immediately from the general account, because no movement path is involved (for a discussion of single argument agreement, see Section 5.3.2.1 below).

(18) UNIVERSITY GALLAUDET STAY$_a$ YEAR TWO
      'He stayed at Gallaudet University for two years.'   (LSC)

Padden (1983[1988], 1990), adopting a syntactic perspective (see Section 5.3.2.1 below for details), rejects a unified approach to spatial and agreement verbs on the basis of three main empirical arguments:

(i)   The interpretation of the movement path in the two classes of verbs is different: with spatial verbs, it is interpreted as actual movement between locations (19b), but with agreement verbs, the initial and final point of the path simply agree with the person features (R-loci) of the respective arguments (19a).

(19) a. $_1$GIVE$_2$
          'I give you.'
      b. $_a$CARRY-BY-HAND$_b$
          'I carry it from here to there.'   (ASL, Padden 1990: 124)

(ii) Distributive or exhaustive marking on an argument is interpreted differently depending on the verb type: with an agreement verb, it is interpreted as plural and the locations of the reduplicative morpheme are irrelevant (20a), whereas with a spatial verb, they are interpreted in a locative fashion (20b).

(20) a. $_1$GIVE$_3$++
'I give it to (each of) them.'
b. PUT$_a$ PUT$_b$ PUT$_c$
'I put them there, there and there.' (ASL, Padden 1990: 125)

(iii) Reciprocal marking consisting in the simultaneous realization with both hands of the duplicated path in opposite directions only combines with agreement verbs to yield the reciprocal interpretation (21a). The same superficial type of marking applied to spatial verbs leads to a literal locative interpretation of the two opposite paths (21b).

(21) a. $_a$GIVE$_b$/$_b$GIVE$_a$
'They gave something to each other.'
b. $_a$PUT$_b$/$_b$PUT$_a$
'I put them in each other's place.' (ASL, Padden 1990: 126)

Rathmann & Mathur (2008: 204) add further arguments to Padden's distinction.[5] For the interaction of verb class and reciprocal marking in DGS, see Pfau & Steinbach (2003).

One of the main advantages of the thematic approaches is that they unify regular and backwards agreement verbs: within this type of analysis, the only difference between the two lies in the mapping of the Source and Goal arguments onto opposite slots on the affectedness tier, as explained above. However, the distinction needs to be specified at the lexical level in any case, and the idiosyncrasy of backward verbs is simply restated in their differing LCSs, which makes the account lose its claimed generality.

Another apparent advantage of thematic approaches consists in the unification of spatial and agreement verbs based on the same explanation: both denote literal or abstract/metaphorical motion. To this it has been objected that in many cases of agreement verbs the denotation of a transfer relation has to be stretched to such a point that it loses explanatory force (Quadros & Quer 2008; Quer 2010; Pfau et al. 2018). Take, for instance, the transitive agreement verbs PRESS, BEAT, INVITE, CHOOSE, or SUMMON in LSC and Libras already mentioned above, or the verb CHEAT in LSC: it is hard to conceive of a transfer relation in the meaning of these predicates, without losing the core notion of transfer. In parallel, one would expect that the semantics of transfer would require the presence of agreement right away, but we know that the diachrony of verbs shows shifts from the plain class to the agreement class (e.g., PHONE and FAX in several sign languages, which started out as plain and became an agreement verb; see Meir (2012, 2016) on this type of change in ISL), but not the other way round. In addition, there are some lexical items that show agreeing and plain behavior within the same language, as is the case of BORROW in LSC (Quadros & Quer 2008: 548) or TRUST in DGS (Pfau et al. 2018: 14). Moreover, if transfer semantics (and its concomitant morphological realization as a directional morpheme encoding the motion component of the transfer) were the factor determining verb class with respect to agreement, one would expect to be able to identify agreement verbs as a group cross-linguistically. However, despite many overlaps in individual items across the lexicons of different sign languages (e.g., GIVE or TAKE), the agreement behavior of lexical predicates cannot be predicted from the single

semantic notion of transfer, even if the phonological specification as a body-anchored sign is put aside. In addition, cases are also found of predicates that, despite sharing the same semantics across two different languages, have lexicalized directionality in opposite ways: ASK in LSC is backwards, while it is a regular agreement verb in Libras; ASK-FOR is regular in LSC but backwards in LSC (Quadros & Quer 2008: 548). Pfau et al. (2018: 13–14) also point out that there are agreement verbs such as EXPLAIN in DGS (and LSC) with a meaning of transfer that only mark it through orientation, and not with path, contrary to expectation under a thematic approach.

Agreement auxiliaries did not feature in the first analyses of agreement because ASL does not have one, but research has shown that they are not rare across sign languages (see Section 5.2.3 above). This type of auxiliary contributes very valuable evidence for the analysis of agreement as a grammatical phenomenon. First, because they stem from the grammaticalization of agreement features exclusively and thus agree with the relevant person features of subject and object, and not Source-Goal. This becomes clear when they co-occur with a backwards agreement verb: while the lexical verb's path moves from Source to Goal, the auxiliary moves in the opposite direction, namely from the subject to the object locations, as exemplified in (22) for LSC.

(22) IX_{3a} IX_{3b} $_{3a}AUX_{3b}$ $_{3b}TAKE_{3a}$
      'She picked him up.'   (LSC, Quer 2011: 193)

This important piece of evidence was pointed out by Mathur (2000), Rathmann (2000), and Steinbach & Pfau (2007) for DGS, Smith (1990) for TSL, Bos (1994) for NGT, and Quadros & Quer (2008) for Libras and LSC; therefore, it turns out to be a rather robust property of sign language agreement auxiliaries. Its relevance lies in the fact that the auxiliary cannot be taken to instantiate the semantics of movement or transfer, since it has no lexical meaning to assign thematic roles or an underlying LCS. It is the pure instantiation of agreement based on syntactic functions, and at least it must be treated as such, irrespective of the treatment that agreement on lexical predicates receives (Quadros & Quer 2008; Quer 2010, 2011; Steinbach 2011). Quite significantly, agreement auxiliaries co-occur with plain verbs, many of which do not have transfer or motion semantics. A relevant case would be that of most psychological predicates such as LIKE or BOTHER, which tend to be morphologically plain and stative in their basic denotation and involve theta-roles other than Source and Goal. In addition, agreement can be used in DGS to extend the argument structure of single-argument predicates like WAIT and LAUGH (Steinbach 2011: 215).

Agreement auxiliaries also highlight an important property: they can only agree with [+animate] or [+person] arguments, as illustrated by the contrast in (23) adapted from Quer (2011: 193). This characteristic further underscores the fact that they cannot be reduced to the Source-Goal analysis of agreement marking by path movement: while the verb TAKE can agree with an inanimate object, the co-occurrence of an auxiliary agreeing with it renders the sentence ungrammatical.

(23) a. $BOOK_x$ $_xTAKE_2$ ($*_2AUX_x$)
          (Intended: 'Pick up the book!')
      b. $CHILD_3$ $_3TAKE_2$ $_2AUX$
          'Pick up the child!'   (LSC, Quer 2011: 193)

Despite the appealing simplicity of thematic approaches to sign language agreement, they face a number of empirical and analytical challenges, some of which have been addressed by alternative analyses with a syntactic basis. The most relevant ones are reviewed in the next subsection.

5.3.2 Syntactic approaches

Under the label of syntactic approaches, a number of different analyses are grouped that share the assumption that sign language agreement is determined by syntactic properties like subject and object syntactic functions. Beyond this, the analyses differ significantly in implementation, theoretical assumptions, and level of detail. Three main groups of approaches will be reviewed here on the basis of some representative works: (i) the foundational ideas of the syntactic approach by Padden (1983[1988], 1990) and related contributions; (ii) minimalist analyses of agreement in different sign languages (Costello 2015; Pfau et al. 2018; Lourenço 2018); (iii) a reinterpretation of agreement marking as clitic (Nevins 2011).

5.3.2.1 Foundations of a syntactic approach

The most influential piece of work for the scholarship on sign language agreement is probably Padden (1983[1988], 1990), focusing on ASL. The establishment of the three morphological classes described in Section 5.2.2 (plain, spatial, and agreement (= agreeing/ inflecting)) and the distinction between types of agreement (spatial vs. grammatical, see Section 5.3.1) has been replicated in virtually all languages that have been looked at for agreement. The essence of Padden's analysis is that agreement in ASL is triggered by syntactic functions such as subject and object, and not by the thematic roles Source and Goal, as proposed early on by Friedman (1975) and later developed in the thematic approaches to agreement reviewed in Section 5.3.1.

One of the main arguments in favor of a syntactic account is based on a generalization about the realization of the agreement pattern: while object marking seems obligatory, subject marking is optional. The comparison of regular and backwards agreement verbs provides the crucial evidence: the argument for which the marking can be omitted is the subject in both classes, namely the initial location of the path in regular agreement verbs and the final location in backwards verbs. A thematic approach is unable to state a generalization of subject marking omission for both classes, since, the omitted argument is the Source one with regular agreement (24), whereas it is the Goal one with backwards agreement (25).

(24) WOMAN GIVE$_1$ NEWSPAPER
      'The woman gave me a newspaper.'   (ASL, Padden 1983[1988]: 137)

(25) a. IX$_{1\,3}$TAKE-OUT FRIEND SISTER
          'I'm taking out my friend's sister.'
      b. * IX$_1$ TAKE-OUT$_1$ FRIEND SISTER   (ASL, Padden 1983[1988]: 138)

In her account, Padden (1990) left out of agreement proper cases of plain verbs that are articulated at a referential location (cf. (10) above), as in her example (26), where the ASL verb WANT is articulated at three different locations. According to her, the sentence is ambiguous between two interpretations, depending on whether the location is interpreted as the plural subject or the object argument, as reflected in the two possible translations of example (26).

(26) WOMAN WANT$_{3a}$ WANT$_{3b}$ WANT$_{3c}$
      'The women are each wanting.'
      'The woman wants this, and that and that one, too.'   (ASL, Padden 1990: 121)

Padden argues that these are not examples of plain verbs displaying agreement, but rather cases of verbs that contain pronoun clitics. The main argument for this analysis comes from the fact that this localization strategy is not exclusive to verbs and can be found with adjectives and nouns as well, as in (27).

(27) I SEE DOG$_a$ DOG$_b$ DOG$_c$
      'I see a dog here, there and there, too.'   (ASL, Padden 1990: 122)

Low selectivity with respect to their host is taken to be a core property of clitics, as opposed to inflectional morphology like agreement. Cliticization, though, is limited to verbs that are not body-anchored, and they can co-appear with overt full pronouns. From this perspective, the distinction between plain and agreement verbs must be maintained, despite the surface similarities in the cases just discussed. Later syntactic analyses, though, will question this distinction and will subsume plain verbs articulated at a referential location as instances of single agreement (see Section 5.3.2.2).

Engberg-Pedersen (1993) also questions that cases like (26) are instances of agreement proper (semantic, in her view) and proposes instead that they are examples of pragmatic agreement, whereby the relation between the predicate and its argument is not specified and in particular it occurs when contrast is at play. Pragmatic agreement can only be marked for one argument and only by location, never by orientation, unlike agreement proper. Meir (1998: 99) also considered these cases as a discourse-level phenomenon, not part of sentence-level grammar.
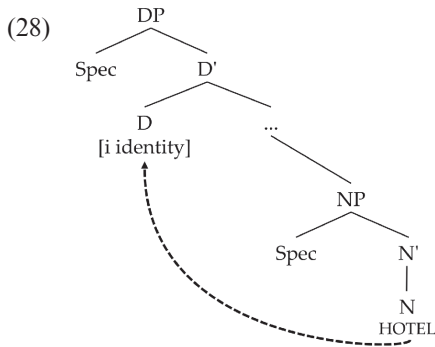
5.3.2.2 *Generative syntactic analyses*

Based on Padden's foundational ideas, which were cast in a Relational Grammar framework, several pieces of work have worked them out in explicit and detailed analyses within generative syntax, especially within the Minimalist Program (Chomsky 1995, 2000). Albeit close in many respects, they differ in concrete assumptions and execution. Three of them will be reviewed in turn: Costello (2015), Pfau et al. (2018), and Lourenço (2018). For a more semantically oriented account, although grounded in a formal syntactic analysis, see Gökgöz (2013).
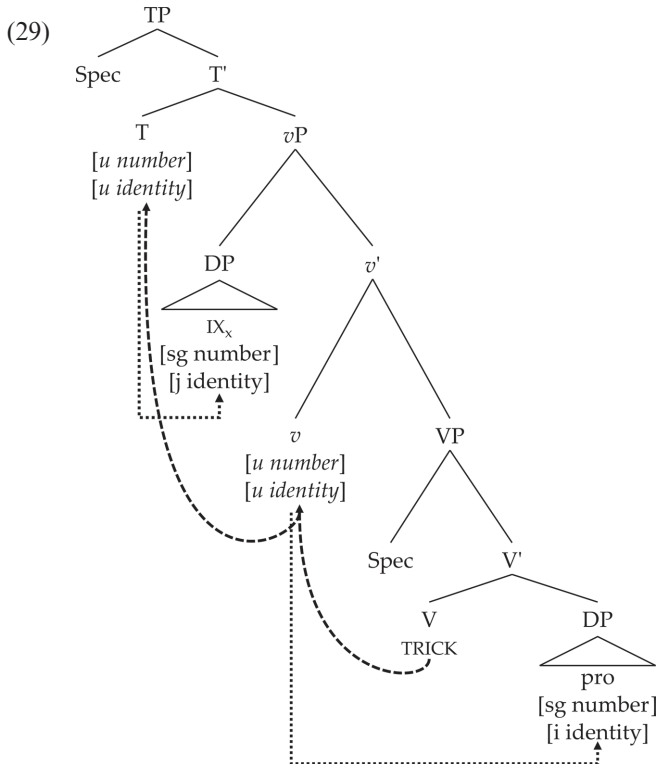
5.3.2.2.1. Costello (2015). One of the main departures of Costello's (2015) proposal with respect to previous accounts lies in the assumption that it is not the person feature what drives agreement, but rather an 'identity' phi-feature, analog to other phi-features like person, number, and gender, but different from them: "the semantic distinction generates categories in the extreme, distinguishing one referent (in its own category) from another" (Costello 2015: 279). Identity comes close to the notion of referential index. Its morpho-phonological expression may be optional or alternatively result in a null form. The identity feature is argued to be hosted in D°, the head of DP, and it is not inherent to a noun, just assigned to it. It may be realized manually as a pointing or non-manually as eye gaze or head tilt.

The point of departure is thus a shift in perspective by placing the burden of agreeing forms on the nominal identity feature across nouns and verbs.

When no phonological material is inserted in D, the specific value of the identity feature is realized through the spatial marking of the noun itself, because of N moving to the D head as represented in (28) for the localized sign HOTEL in Spanish Sign Language (LSE) (Costello 2015: 289).
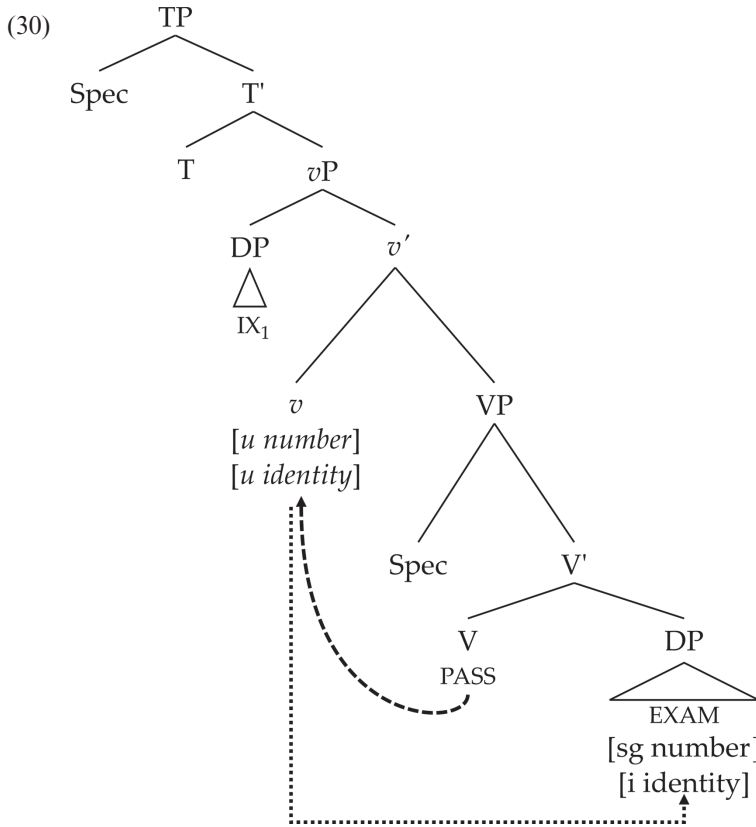
(28)

```
                    DP
                  /    \
              Spec      D'
                      /    \
                    D       ...
              [i identity]    \
                  ⤴            NP
                            /     \
                        Spec       N'
                                    |
                                    N
                                  HOTEL
```

Within this analysis, verb agreement arises through the valuation of the unvalued identity (and number) features of the *v* head: *v* probes into the identity (and number) feature of its internal argument, as goal of the Agree relation, and its values are copied onto the probe, after which V moves to the *v* head; after merging of T, this head probes into the features of the external argument in [Spec, *v*P] and its unvalued identity feature gets valued. After further movement of the V+*v* head to T, the verbal form will spell out the identity features of the subject and the object arguments as two different locations, resulting in the well-known exponence of agreement. The working of agree for a verb like TRICK in LSE are schematized in (29) (Costello 2015: 292).

(29)

```
                    TP
                   /  \
               Spec    T'
                      /  \
                    T      vP
              [u number]   /  \
              [u identity] DP   v'
                          /\   /  \
                         IXₓ  v     VP
                    [sg number] /  \
                    [j identity] Spec  V'
                                      /  \
                          v          V    DP
                    [u number]    TRICK   /\
                    [u identity]        pro
                                   [sg number]
                                   [i identity]
```


For Costello (2015), agreement auxiliaries follow naturally from this analysis if it is assumed that the auxiliary is inserted in *v* and the lexical verb stays in situ: in this way, the auxiliary acquires the same agreement markings through the two Agree operations as just seen in the case of a lexical agreement verb.

Given this framework, the cases of plain verbs showing agreement with a single argument (cf. Section 5.3.2.1) and analyzed as instances of cliticization and not of agreement in Padden (1990) are derived in Costello's account by the same set of assumptions as cases of agreement and not as an instance of some other mechanism. Therefore, the verb PASS in LSE, which is plain, in a sentence like IX₁ EXAMₓ PASSₓ 'I passed the exam' can agree with its internal argument in the way illustrated in (30) (Costello 2015: 290):

(30)

TP
Spec   T'
T vP
DP v'
IX$_1$

v
[*u number*]
[*u identity*]

VP
Spec   V'
V   DP
PASS
EXAM
[sg number]
[i identity]

Costello's approach has the clear advantage over previous accounts of encompassing all the agreement phenomena in a unified way. His proposal states that syntactic agreement always takes place (in LSE, but arguably in other sign languages as well), even in cases where it does not result in its morphological manifestation. Absence of agreement marking might be due to two circumstances: (i) the identity feature takes a default value and no phonological expression of localization is encoded; (ii) the phonological specification of the verb blocks its modification for agreement marking. As for backwards verbs, the suggestion is made that they may

> involve a spatial mapping (or a metaphorical extension of such a mapping) that impacts on the form of the verb (rather than the fact that the arguments are locative). The underlying agreement process, however, remains the same for all types of argument.
>
> (Costello 2015: 294)

This account also acknowledges the existence of pragmatic agreement for cases like (26), but does not consider it agreement proper, since it involves vague associations between different elements: similar locations are assigned to different identity values, but the association is not created in syntax, but rather at the phonological level and resolved in pragmatics.[6]

5.3.2.2.2. Pfau et al. (2018). Pfau et al. (2018) developed another detailed syntactic analysis of agreement in DGS (extendible to other sign languages) within the Minimalism Program framework (Chomsky 2000 a.o.). It strictly takes agreement to be the result of the operation Agree, according to which agreement is a process that copies phi-features from controllers (goals) onto agreement targets (probes).

In the case of a two-place predicate, the operation Agree applies twice: *v*, the head of *v*P, which has uninterpretable phi-features, probes into the object argument, with interpretable features, and copies them; the T head, also endowed with uninterpretable features, probes into the subject DP and copies its valued features. The processes are represented in (31) (Pfau et al 2018: 19).

(31)
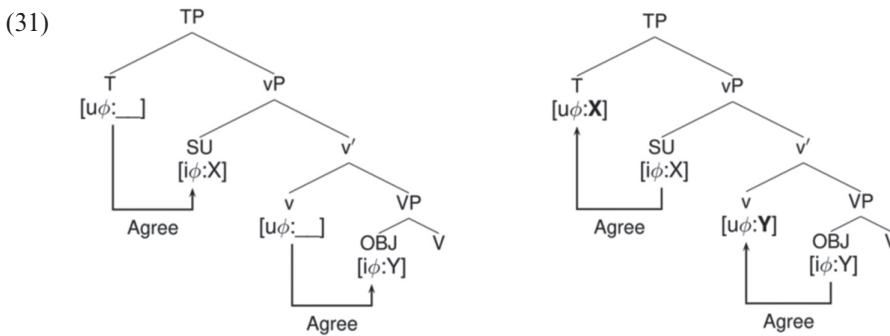
Verb movement to *v* and further to T is taken to result in a complex head as the one represented in (32). Under the assumptions of Distributed Morphology, the roots and features that syntax works with are interpreted at Phonological Form, where Vocabulary Insertion takes place. In the case of (32), the exponents of agreement and the verb root are inserted, resulting in the usual path marking of subject and object agreement.

(32)
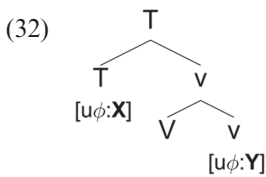
This will be the linearized form in DGS, despite it being head final, which imposes a derivation of a regular agreement verb as in (33). Note that the notation [*v*] in the tree means that a verb has to enter Agree with *v*, [*T*] indicates that a head has to enter Agree with T.

(33)
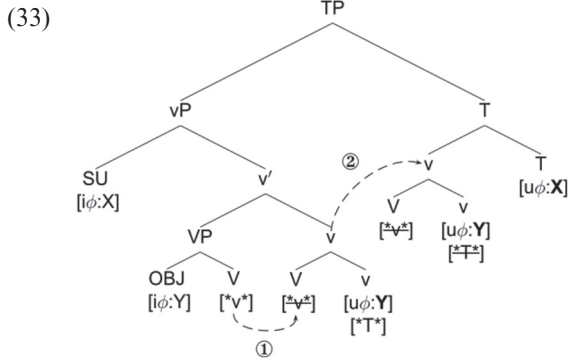
Pfau et al. (2018) propose that *v* always has [*T*], so it has to move to the T head. Plain verbs, though, lack [*v*] and consequently do not head-move to v. From this they derive the fact that plain verbs co-occur with an agreement auxiliary that carries the agreement morphology. They draw the parallel with synthetic vs. analytic forms, where the agreeing lexical verb would correspond to the synthetic form and the plain verb together with the agreement auxiliary to the analytic form.[7] As a further argument for the patterns of verb movement proposed, it is pointed out that negative headshake is co-articulated with the complex head the agreement verb creates, while it only combines with the auxiliary co-occurring with a plain verb.

   Backwards verbs also require a particular treatment in this account. As discussed earlier in Section 5.2.3, subject and object grammatical functions are not reversed, but the movement path is, since it goes from the object location to the subject location. The account resorts to Müller's (2009) treatment of ergativity, which relies on the fact that the two operations that *v* engages in (Agree with the internal argument and Merge to introduce the external argument) are ordered in the opposite way to accusative syntax: in ergative alignment, Merge of the external argument precedes Agree with it, whereas in accusative alignment, Agree of *v* with the internal argument precedes Merge of the external one. The result of Merge before Agree with ergative alignment is reflected in (34):

(34)
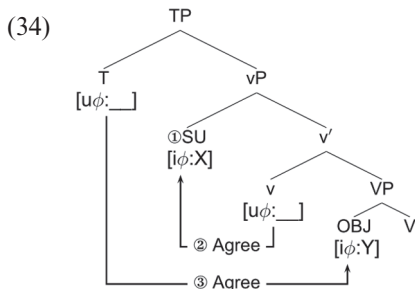
As a consequence of this, *v* probes into the subject valued features and copies their values onto its unvalued features. Next, T probes into the object and copies its features. In this way, the agreement features are distributed differently in backwards agreement verbs and give rise to the reverse movement path when linearized.

Note that this account has to posit two different types of *v*, one occurring with accusative linearization and another one with ergative linearization, which must be coupled to regular agreement verbs and backwards verbs by some sort of selection. This is clearly a lexical property of individual items, whereas split ergativity systems are typically triggered by tense/aspect or information structure properties. Even if there seem to be some instances of ergativity splits linked to lexical items, the question still remains why backwards verbs are a restricted class and some lexical items recur across sign languages, as noted in Meir (1998) for ISL and ASL, and in Quadros & Quer (2008) for Libras and LSC.[8] A further drawback of this account of backwards verbs is that it cannot account for subject omission across regular and backwards verbs, unless an additional assumption is made concerning uniform case assignment to external arguments previous to Agree that an impoverishment rule can target (Pfau et al. 2018: 27).

The authors also address the issue of agreement by orientation, which according to them cannot be treated as a case of multiple exponence, given that it is stable across regular and backwards agreement verbs in marking the object argument. They argue that this agreement marker constitutes an independent incomplete probe on *v* that is restricted to person: it triggers the first Agree operation probing into the object both with regular and backwards verbs, and that is why it behaves in the same way in both verb classes. Once this Agree operation with the object takes place, the rest of the derivation unfolds differently for regular than for backwards agreement verbs, as summarized above (for details, see Pfau et al. 2018: 28–29).

5.3.2.2.3 Lourenço (2018). Focusing on the analysis of Libras, Lourenço (2018) partially departs from the received view by positing that what marks agreement in sign languages is not the directional movement path, but solely the matching of the initial and the final points of the verb with the locations of its arguments. He names this process co-localization. His definition of verb agreement is the one in (35).

(35) *Verb agreement in sign languages*: A verb shows agreement with its argument(s) when the location of the verb is changed in order to match the location of the argument(s), a process called co-localization.

The relevant feature in agreement is [location], which is part of the phi-feature bundle. Its semantic import amounts to semantic mapping between an entity and an abstract geometrical point. The [location] feature is not tied to particular nouns or entities but is inserted in the numeration as a discourse option. It will be merged on D during the computation, though.

Unlike in the other accounts reviewed above, Lourenço (2018) assumes that the loci of phi-probes are Cº (percolating down to the head of TP) and *v*º. Given that Libras shows syntactic asymmetries between agreement and plain verbs, it is argued that the differences are in fact present in the syntactic derivation. Typical plain verbs, namely those body-anchored, have a lexically valued specification for [location], namely [location *val*], and since they are valued for this feature, they cannot be modified. By contrast, agreement verbs potentially have two unvalued [location] features. The actual patterns found across verb classes depending on the number of Place of Articulation (PoA) features that can be specified in their Prosodic Feature representation are summarized in (36).

(36) a. Double agreement verbs: Two underspecified slots for PoA –

[location: ___]VERB[location:___]

  b. Single agreement verbs: One underspecified slot for PoA – VERB[location:___]

  c. Non-agreeing verbs: No underspecified slot for PoA – VERB

Note that under single agreement verbs, Lourenço includes verbs that have a path with one location lexically specified and another one that can agree with a subject or an object location, but also verbs without path that can be articulated at a point in space: if their location feature is unvalued, they can agree with one argument (Padden's clitic cases discussed above).

Lourenço's (2018) account of agreement is based on Baker's (2008: 155) Case-Dependency of Agreement Parameter, which states that a functional head only agrees with a DP if this same head assigns Case to this DP. He assumes that in Libras this parameter is set positively and that it is a nominative-accusative language, where these cases are assigned to subject and object, respectively. It follows that the first agreement slot of the verb will mark agreement with the nominative subject DP and the second agreement slot with the accusative object: the [location:__] feature in T agrees with the nominative marked argument, and the [location:__] feature in *v* agrees with the accusative marked argument, as represented in (37) (Lourenço 2018: 155).

(37)
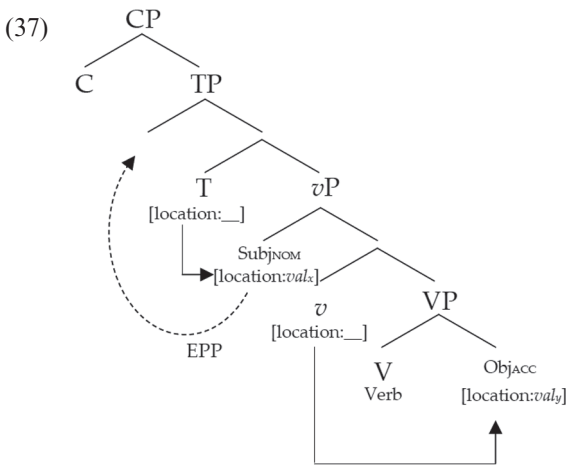
Since V in Libras in independently argued not to move to *v* and T, affix hopping is argued to take place and resolved at PF to give the actual agreeing form of the VERB by spelling out the [location__] values on it.

In ditransitive constructions, the indirect object argument is taken to be merged above the direct object DP as the specifier of an ApplicativeP, and *v* is assumed to assign inherent dative case to it and structural accusative case to the direct object DP. Since the [location__] feature on *v* will probe into the valued feature of its closest argument, agreement will be with the indirect object, as standardly observed for ditransitives across sign languages.

This analysis also tackles the class of backwards verbs with an ergative analysis but based on the Case assignment assumptions (the Case-Dependency of Agreement Parameter) adopted in the system (unlike Pfau et al.'s (2018) account, based on the

ordering of Merge and Move and of the subsequent Agree operations). Since the first agreement slot in backwards verbs is with the object, it is T that must assign structural nominative case to the object (for this to happen v must move to T in order to create a transparent domain –namely, a larger vP phase– for Case assignment by T to the object). As for the subject, it is argued to receive inherent ergative case: v assigns inherent ergative case to the external argument.

Finally, Lourenço (2018) defends that what had been analyzed as an agreement auxiliary of the indexical type in Libras is in fact a topic marker indicating that subject and object have been moved to topic position. His main argument is that the argument nominals appearing before the auxiliary and the auxiliary itself are marked with eye gaze and raised eyebrows, two non-manual markers that are typical for elements in topic position (cf. Kimmelman & Pfau, Chapter 26). In addition, it is in complementary distribution with a postnominal pointing index co-appearing with the nominals in topic position. For these reasons, Lourenço does not consider it an auxiliary, but rather and indexical topic marker, to be glossed as $_x$IX$_y$. It is the spelling out of topics features in a functional head under CP, where the topic nominals are hosted as well. It is thus not connected to the agreement system, and consequently the direction of the path is always the same, irrespective of the verb type (regular or backwards agreement). One question that remains unanswered, though, is why the path must always move from the subject to the object location, whereas topic nominals can be in principle ordered freely, and the grammatical functions of the elements in A-positions they are linked to are only determined at TP level. The path seems to be linked to the TP-internal predication, and not simply to topic-marking. In any case, the account holds for Libras, but not for other sign languages where the agreement auxiliary does not occupy a topic position or bears the corresponding topic marking. Be that as it may, it raises the interesting question whether elements that look very similar on the surface across different sign languages can have very different morphosyntactic properties.

5.3.2.3 *Clitic analysis*

Although Fischer (1975) already pointed to the phenomenon of agreement as cliticization of pronouns onto verbs, most research after that has taken for granted that the phenomenon at stake is actually agreement (with a few other exceptions like Keller (1998) or Barberà (2015)). However, Nevins (2011) has laid the ground for a clitic analysis on the basis of a number of morphosyntactic arguments stemming from the study of bona fide clitics in different spoken languages.[9] For him, what has been so far thought of as agreement are in fact incorporated pronominal clitics.

The properties of clitics Nevins focuses on are the following ones: (i) they are prosodically weak pronouns; (ii) they can show distinctions for person only, and number can be dissociated from them; (iii) they may double NP arguments; (iv) clitic hosts show low selectivity; (v) the combinations of host and clitic are not interpreted as forming a paradigm, in contrast to agreement; (vi) clitics tend to 'compete' in clitic clusters (syntagmatic property); (vii) they do not vary with tense; (viii) subject clitic doubling may be optional or obligatory, unlike agreement.

Nevins adheres to the view that sign language verb classes reduce to two, plain and non-plain, as argued for by Quadros & Quer (2008). Plain and non-plain verb classes would correspond to clitic hosting and non-clitic hosting verbs. For him clitics include both locative and person clitics, so no distinction is made between spatial and agreement

verbs. As clitics, they are D heads coupled with their associated argument, in line with the big DP hypothesis. He argues that what have been considered odd properties of sign language agreement can be automatically accounted for under a clitic analysis. Among those properties, we find the following ones (for the full list and discussion, see Nevins (2011: 181)): subject marking is optional; number marking can be dissociated from person marking; marking of the indirect object has preference over the direct object; locative marking exists.

As Pfau et al. (2018: 17–19) point out, some of the arguments brought up to support a clitic analysis against an agreement analysis are not decisive. First, optionality of subject marking can be reanalyzed as default marking of agreement, where the path starts at a default location. This sound reinterpretation of the facts leads to defending that under Preminger's (2009)[10] diagnostic to discern between agreement and clitics, sign language agreement falls on the agreement side, in contrast to Nevin's conclusion. Second, there seems to be no person competition between markers of internal arguments, since indirect object marking always prevails over direct object marking, something that is also attested for agreement and furthermore can be explained by the higher hierarchical position of indirect object above the direct object. Third, tense is not morphologically marked in the vast majority of sign languages, so invariability with respect to tense cannot be used as a criterion. Moreover, it is unclear whether non-finite domains exist in sign languages, thus weakening the argument of combinability of clitics with non-finite verbs, as opposed to agreement. Fourth, Pfau et al. (2018) argue that the unification of spatial and agreement verbs cannot account for the different interpretation of path in the two classes. Fifth, the clitic analysis has nothing to say about the behavior of backwards agreement verbs, unlike the thematic analysis or the minimalist syntactic analysis by Pfau et al. (2018) and Lourenço (2018), because there is no evidence that the arguments project in an inverse order vis-à-vis the regular agreement pattern. Sixth, when combined with the verbal stem, clitics would phonologically assimilate completely to it, only contributing the location parameter. This situation seems quite unusual, given what is known about phonological assimilation processes in sign languages. Seventh, in order to obtain the right ordering of clitics and verbs, one would need additional machinery like verb raising. Lastly, there is no evidence of an intermediate stage of cliticization between pronominal signs and cliticized forms, either synchronically or diachronically, or for a sign language whose emergence has been documented from its origins like Nicaraguan Sign Language (NSL) (Senghas & Coppola 2001).

To these objections, it can be added that if clitics are characterized by no or low selectivity by their hosts, it remains unexplained why they can only be hosted by agreement and spatial verbs and not by plain verbs. It could be counterargued that phonological specifications block cliticization because of body-anchoring, but within the plain group, there are cases like the ASL verb WANT that allow for localization at a referential location, thus arguably an instance of cliticization (Padden 1990; see Section 5.3.2.1 above). Note as well that agreement by hand orientation/facing in combination with path or on its own is left out of the account.

5.4 Conclusion

Formal approaches to agreement in sign languages, despite the different perspectives taken, have jointly contributed crucial and very rich evidence to support the linguistic status of this phenomenon. Experimental research on agreement (Hosemann, Chapter 6)

opens further perspectives on it. The strength of the individual analyses is not undermined by the existence of empirical or methodological challenges, which every linguistic account faces. The theoretical tools used further reinforce the view that current theorizing on sign language grammars must benefit from the rich scholarship on agreement in a broad variety of spoken languages. The complexities that agreement by itself raises in both sign and spoken languages cannot but help better understand its properties and the range of variation of its instantiations vis-à-vis related phenomena. When languages of the manual-visual modality enter the empirical pool, we advance not only in understanding the impact of language modality but also the core properties of agreement in natural language tout court.

Acknowledgments

Notes

1 For a good review of gestural approaches to agreement, see Pfau et al. (2018: 7–11).

2 In morphophonological terms, the initial and final locations of the verb syllable are aligned with the corresponding argument locations (Sandler 1989).

3 Here we put aside classifiers as a particular type of predicates in the native lexicons of sign languages (for details, see Tang et al., Chapter 7) and focus on lexical spatial predicates that can potentially agree with arbitrary locations.

4 For formal approaches that take into consideration the gestural component of agreement and pronouns, see, for instance, Rathmann & Mathur (2008), Mathur & Rathmann (2012), and Lillo-Martin & Meier (2011).

5 For arguments against Rathmann & Mathur's (2008) evidence for the agreement/spatial distinction, see Quadros & Quer (2008: 542–543).

6 For these cases, Costello (2015: 297) proposes that the verb does not acquire its identity feature as with single argument agreement, but rather through a process of nominalization: instead of merging with a vP projection, it merges with an nP one that nominalizes it. The DP projection on top of it has a valued identity feature that will be pragmatically associated in a loose way with that of another DP.

7 The authors recognize that unlike in synthetic/analytic splits in spoken languages, typically triggered by tense/aspect or voice, the one in DGS is only determined by lexical factors (Pfau et al. 2018: 22).

8 Quadros & Quer (2008: 545–546) propose that backwards verbs are a sort of hybrid, in the sense that due to their classifier origin they retain the path marking of spatial verbs, but can still agree with the person features of their arguments.

9 Nevins' (2011: 183) interpretation of agreement marking as clitics refers to manual marking. In addition, he suggests that the non-manual agreement postulated for ASL (see Section 2.4) might be a case of agreement proper.

10 In Nevin's (2011: 184) rendition, Preminger's (2009) diagnostic establishes that "in the environment where the element serving as the target for agreement can be moved past [a] clause boundary, and the agreement morpheme on the verb changes to default, the morpheme is an agreement marker; otherwise, it is a clitic (i.e., pronominal)".

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