On verb ‘agreement’ in sign languages: Indicating verbs as typologically unique constructions

ABSTRACT

In this paper, we present arguments against the claim that the spatial modification of indicating verbs in sign languages represents an example of a morphological agreement system for marking grammatical person. We begin by reviewing Corbett's (2006) definition of canonical agreement, and explore how it appears to exclude indicating verbs in sign languages. We then examine the evidence for and against the agreement analysis of these constructions, with a focus on the claims made by Meier (2002) and Lillo-Martin and Meier (2011). Consistent with Liddell (2000), we argue that this aspect of sign language grammar represents a typologically unique, unimodal fusion of lexical items and pointing gestures functioning as a construction that is used for reference tracking, but is not an agreement system.

Keywords: sign language, agreement, directionality, deixis, multimodal, gesture
1. Introduction

The vast majority of the documented sign languages of deaf communities have a category of verbs that may be referred to as ‘indicating verbs’ (Liddell 2000), but are more widely known as ‘agreement verbs’ (or ‘agreeing verbs’) in the sign language linguistics literature (e.g., see Mathur and Rathmann 2012 for an overview). An analysis of this subset of verb signs as marking person agreement was first proposed for American Sign Language (ASL) by Padden (1983), building on earlier work by Friedman (1975), Kegl (1977, cited in Wilbur 1987), Fischer and Gough (1978) and Meier (1982). As we will see, a number of alternate proposals about the nature of agreement have been proposed since that time, including, for example, analyses based on case properties (Janis 1995; Meir 1998a, 2002), those that group person and locative marking together (Quadros and Quer 2008), and others that view the spatial modification of indicating verbs as part of a larger agreement system that includes nonmanual agreement (Neidle et al. 2000; Thompson et al. 2006; Steinbach 2011a; Hermann and Steinbach 2012).

An example of an indicating verb in the related sign language varieties used in Britain (British Sign Language, or BSL) and Australia (Australian Sign Language, or Auslan) is the sign glossed as $\text{PAY}^1$. In its citation form, this sign is produced with a movement away from the signer (see Figure 1). The movement and orientation of the dominant hand may be modified so that its movement is directed at physically present referents in the space around the signer’s body, or towards locations associated with absent referents. Thus, the dominant hand in the sign $\text{PAY}$ can be moved from a location in front of the signer towards the location of the addressee to mean ‘I pay you.’ To represent ‘you pay me’, the orientation of the

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$^1$ As is conventional in the sign language literature, we use English glosses in small caps to represent signs in a sign language.
dominant hand and direction of its movement is reversed, moving from the location of the addressee towards the signer’s body.

![Figure 1: BSL/Auslan indicating verb PAY.](image)

In many descriptions of indicating verbs, it is the modification of the initial and/or final location and/or orientation of the hand(s) that has been analysed as a morpheme marking person agreement (e.g., Padden 1983; Rathmann and Mathur 2002). The location and/or orientation modifications of the citation form’s formational structure have been widely considered to be analogous to the various suffixes that mark person agreement in spoken languages such as Spanish (e.g., *yo habl*-o ‘I speak’ versus *ella habl*-a ‘she speaks’).

A small number of researchers, however, have argued against the analysis of indicating verb signs as marking person agreement (Liddell 2003; Author et al. 2007). It was Liddell (1995) who first proposed that variation in the directionality of such signs does not mark agreement with a co-occurring noun phrase, but works as a reference-tracking device through the incorporation of a pointing gesture into the form of the sign. The hand configuration of a specific verb sign moves between locations in space, and those locations may be associated with present or absent referents. Thus, Liddell argues, any movement of the hand towards such a location signals an association with the referent in the same way as a pointing gesture by a non-signer (cf. Kendon 2004).
A number of other researchers have, however, explicitly defended the agreement analysis (e.g., Meier 2002; Sandler and Lillo-Martin 2006; Mathur and Rathmann 2010; Lillo-Martin and Meier 2011; Quer 2011; Rathmann and Mathur 2011; Wilbur 2013). One aim of this paper is to address some of the counter-arguments made by these scholars. In doing so, we find that these claims reflect some misunderstandings about the relationship between signed languages, spoken languages and co-speech gesture and thus appear to downplay some key differences between the nature of indicating verbs in sign languages and agreement systems in spoken languages. Furthermore, we build on Liddell’s (2003) proposed analysis of indicating verbs by suggesting that these represent a sign language equivalent to ‘multimodal’ constructions found in spoken languages (as proposed by e.g. Zima 2014).

1.1. Verb typology in sign languages

To discuss the notion of verb agreement in a signed language, it is necessary to first outline a typology of verb morphology in sign languages. Since the proposal was first made by Padden (1983), verbs in sign languages have been categorised by many scholars (e.g., Meir 2002; Aronoff et al. 2004a; Meier and Lillo-Martin 2010) into three main types that differ with respect to the morphosyntactic expression of arguments: (1) plain verbs, (2) agreement verbs and (3) spatial verbs.

Plain verbs are best understood as lacking the properties of agreement and spatial verbs. We have already discussed agreement verbs above. In contrast to agreement verbs, spatial verbs, such as BSL/Auslan put as shown in Figure 2, work in a similar way, but in these cases, the use of locations in space represents movement between physical locations and is not associated with animate arguments. In addition, a subset of spatial verbs (often referred to
as classifier constructions) include morphemic handshapes (known as ‘classifiers’) that represent classes of referent.²

![Image](image_url)

**Figure 2:** BSL/Auslan spatial verb PUT.

Unlike agreement and spatial verbs, plain verbs such as BSL/Auslan KNOW are relatively fixed in form. They cannot have their location modified to show associations between spatial locations and referents in the same way as agreement verbs (although their locations may be modified meaningfully in other ways), nor are there alterations in the handshape signalling different classes of referent.

Padden’s (1988, 1990) typology of verb classes has generated considerable debate amongst sign language researchers (Bos 1990; Johnston 1991; Engberg-Pedersen 1993; Janis 1995; Liddell 2000; Quadros and Quer 2008). Many of the criticisms centre around Padden’s claim that the functions of locations in agreement versus spatial verbs are distinct. Padden (1988) claimed that identical modifications to agreement and spatial verb signs (i.e., such as the movement in the examples PAY and PUT in **Figure 1** and **Figure 2**) are best analysed as reflecting different grammatical constructions, despite the lack of any

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² A number of scholars have proposed that classifier handshapes are a type of noun class agreement morpheme, marking agreement between the verb and its arguments (Supalla 1982; Glück and Pfau 1998; Zwitserlood 2003; Benedicto and Brentari 2004). This analysis is problematic for many of the same reasons we discuss here for indicating verbs – i.e. it is not formal/semantic features of the noun phrase identifying the referent that solely determine the sign’s handshape or the location that the verb moves from/toward.
formal difference between the two uses of space. Her argument is based primarily on the differences in meaning. In a sense, this makes Padden's system of classification somewhat inconsistent. The difference between plain verbs on one hand, and agreement and spatial verbs on the other, does indeed reflect differences between the two with respect to their morphological use of space. This distinction between agreement and spatial verbs is, however, not based on morphological differences in spatial patterning, only semantic ones (Engberg-Pedersen 1993). Due to the lack of any difference in form, researchers working on several sign languages have found it difficult to distinguish consistently between the use of space to signal person agreement and to express locative relations (Engberg-Pedersen 1986; Johnston 1989; Bos 1990; Johnston 1991; Quadros and Quer 2008) (although Padden does in fact discuss the fact that some plain verbs may indeed be modified spatially, so even the distinction between plain and agreement verbs is somewhat problematic). It is not clear, for example, how various modifications of the BSL/Auslan sign LOOK (shown in Figure 3) ought to be analysed. When the signer alters the orientation of the hand in this sign so that the fingers are pointing to his left, does the signer intend to mean “I looked to my left” or “I looked at Mary on my left”? In most cases, if the location on the left is associated with Mary in the context, then it may be easiest to assume that the second meaning is intended, but there do not appear to be any formal differences in the modifications to this sign that can distinguish the person agreement and locative meanings.
1.2. Definitions of agreement

In general, the term *agreement* in linguistics, first used in this sense by Bloomfield (1933), refers to the presence of some co-variation in form between different lexical items in a sentence that serves to express grammatical relationships such as gender, case, person and/or number. As pointed out by Corbett (2006), some theories of language assume that a verb ‘agrees’ with its subject argument, for example, regardless of the presence of observable agreement morphology (e.g., Neidle et al. 2000; Aronoff and Fudeman 2005). This syntactic form of agreement is not the focus of the discussion here; we focus instead on the overt morphological expression of agreement only. A number of different definitions of agreement have been proposed in the linguistics literature (Ferguson and Barlow 1988; Lehmann 1988; Mel’cuk 1993; Corbett 2006), and it must be said that the task of creating a robust, cross-linguistically valid definition has been made all the more difficult by patterns of agreement varying considerably across different languages, with important differences in both the way it is morphologically expressed and in permissible patterns of variation in its use.

For the purposes of this paper, we will focus on a definition of overt morphological expression of agreement that draws on major typological work on the topic (Corbett 2006). Corbett (2006) adopts a kind of meta-definition that attempts to draw together the essential
elements of agreement proposed in the literature. In particular, Corbett (2006) argues that the definition first proposed by Steele (1978: 610) captures key aspects of the phenomenon: “…agreement commonly refers to some systematic co-variance between a semantic or formal property of one element and a formal property of another”. This encapsulates a general consensus in the literature about the nature of agreement: the key features are some kind of covariance, that this sharing of properties is systematic and that it reflects formal or grammatical features.

For Corbett (2006), the element that controls the agreement is referred to as the *controller*. In example (1), the controller is the subject noun phrase ‘the laptop’. The element whose form co-varies in the presence of the controller is the *target*, and the target varies to reflect formal or semantic *feature(s)* of the controller: here the target verb ‘works’ shows agreement in number features. ‘The laptop’ is singular, and so the agreement morphology on the verb reflects this with the suffix –s. The domain of the agreement is the clause and there are no conditions for this agreement to take place (e.g., the animacy of the referent of the controller noun phrase is not relevant here, as it might be in agreement systems, for example, in the West Chadic language, Miya, or in Turkish; see Corbett, 2006).

(1) The laptop works.

In a footnote, Corbett (2006: 264) observed (and later Cysouw (2011) supported this observation for agreement/concord) that indicating verbs in sign languages do not appear to show co-variance between controller and target, unlike what is explicitly claimed by some in the sign language linguistics literature (e.g., Janis 1995). It is this claim that we wish to explore further in this paper.

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3 Cysouw (2011) refers to Corbett’s notion of such covariance as *agreement/concord*, to distinguish it from *agreement/inflection*, in which the latter is restricted to subject-verb covariance only.

4 The controller may be an object noun phrase in some languages (Corbett, 2006).
1.3. Canonical agreement

Corbett (2006) presents a detailed overview of the essential features of what he calls ‘canonical’ agreement: the best and clearest examples of agreement according to the criteria in the literature. Gender agreement in the Italian noun phrase is one such example of canonical agreement, as in examples (2) and (3).

(2) il nuov-o quadr-o
    DEF.M.SG new-M.SG picture(M)-SG

    ‘the new picture’

(3) la nuov-a tel-a
    DEF.F.SG new-F.SG painting(F)-SG

    ‘the new painting’

These examples exemplify canonical agreement because the controller (i.e., the noun) is present, it has overt expression of the features of singular gendered nouns in Italian (i.e., the noun endings -o vs. -a), and it triggers consistent patterns of agreement (e.g., the feminine nouns trigger feminine agreement). The target (the adjective) has bound morphemes expressing the agreement marking (i.e., an affix rather than a clitic or free morpheme), and represents a clear case of inflection. This gender marking is obligatory and it doubles up on the marking on the noun itself (i.e., it is redundant). This agreement marking on the target is regular and productive, it applies to all cases of adjectives, and it is controlled by a single controller (i.e., the noun). The domain is asymmetric (i.e., the gender of the adjective depends on that of the noun), and it is local (in that the agreement applies within the noun phrase: agreement marking of elements that are closer together in the clause is canonical). There are no other conditions (such as the animacy of the noun) that are relevant here in determining the presence of the agreement marking. We discuss the relevance of these criteria for indicating verbs in sign languages below.
1.4. Relevance of gesture

As we will argue, building on Liddell (2000, 2003), the agreement analysis is not the only possible account of directionality patterns in this class of verbs in sign languages. Patterns found in co-speech gesture are highly relevant here. Decades of research on co-speech gesture have shown that these gestures have a systematic and conventionalised relationship with speech (e.g., Kendon 2004; Ozyurek 2012). This relationship varies across languages and cultures (e.g., Kita and Ozyurek 2003) and takes time to develop in children (e.g., Mayberry and Nicoladis 2000). Also, recent experimental and brain imaging studies have shown that the human brain processes semantic information from both speech and gesture using overlapping areas of the brain (e.g., Ozyurek et al. 2007).

Of particular relevance to an understanding of indicating verbs is the use of pointing gestures. Work on pointing gestures by Kendon (2004), Cooperrider (2011), Wilkins (2003), and Kita (2003a) indicate that there are regularities in the use of pointing, and that this class of gestures may interact in patterned ways with grammar, culture and conceptual structure. For example, Kendon (2004) explores systematic behaviour in the use of seven specific finger, hand and arm configurations in the co-speech gesture of British English and Italian speakers. Cooperrider (2011) finds that the use of body-directed pointing gestures by American English speakers reflects information structure in the co-occurring speech, with elements exhibiting contrastive stress significantly more likely to co-occur with pointing gestures. Wilkins (2003) claims that different pointing gestures used in central Australia by speakers of the Pama-Nyungan language Arrernte (an index finger versus a five digits extended hand configuration) show singular/plural distinctions that are absent in co-occurring Arrernte noun phrases and reports that his failure to correctly use pointing behaviour while speaking has been raised by native speaker consultants. Additionally, Wilkins (2003) notes that speakers of Arrernte use a specific pointing gesture meaning
‘motion towards that location’ and that this contrasts with other pointing gestures indicating ‘being at a location’. Similarly, Kita (2003a) discusses claims that some communities, such as the Barai and Yimas, traditionally used lip-pointing with no recorded use of pointing with the fingers. Also, Ozyurek and colleagues (Ozyurek 1998; Ozyurek and Kita 2000; Kuntay and Ozyurek 2006) have documented a demonstrative pronoun in Turkish (su) which is unspecified for distance and is used when the addressee’s visual attention is not yet on the object referred to. Once joint visual attention is engaged (e.g. by a pointing gesture or eyegaze towards the object), then bu or o is used instead (roughly equivalent to proximal this and distal that in English, respectively). Lastly, to indicate a specific time of the day, speakers of Nheengatú point to a position along the east-west axis of the sun (Floyd 2016).

This pointing behaviour not only co-occurs with a spoken verb phrase consistently, it can provide more precise information than what it spoken (i.e. a time of the day) and Nheengatú speakers appear to be sensitive to incorrect variations in form and meaning pairs (e.g. when presented with other possible interpretations in an elicitation task).

Thus, as noted by Ozyurek (2012), characterisations of language which only take into account aspects expressed through speech do not offer a sufficiently comprehensive view of the human language capacity. Instead both speech and gesture should be included in our descriptions of particular languages, because the evidence suggests that gestures are an integral part of language. Like Liddell (2003), we argue that this is also true of sign languages, particularly in some aspects of their organisation, such as indicating verbs. If directionality in indicating verbs is a type of co-sign gesture rather than a person agreement marker, then we predict that we will find more in common with directionality in co-speech gesture than with agreement systems in spoken languages. It is important to note, however, that there is no real analogy for indicating verbs in the speech and gesture package as it is only in sign languages where symbolic and deictic elements occur in the same modality, and
verbs may *themselves* be modified spatially to reflect associations with present and absent referents.

2. Re-examining the arguments for an agreement analysis

2.1. What controls directionality in indicating verbs?

In the sign language linguistics literature, it is has been proposed that the directionality in indicating verbs reflects the grammatical person of the verb’s arguments (Padden 1983; Lillo-Martin and Meier 2011). We will focus here on these accounts, rather than others which explore issues of how to determine which verbs participate in this directional modification (e.g., Janis 1995; Meir 1998b, 2002), which – like Padden (1983) and Liddell (2003) – we assume to be lexically determined. Under person agreement analyses (first proposed by Padden 1983), first person is associated with the signer’s body, second person with the location of the addressee, and third person is either the location of some physically present third person argument, or at some locus associated with an absent third person argument. Other analyses distinguish only two persons: first and non-first, conflating reference to addressee and non-addressed participants but reflecting that fact that any number of locations in space around the signer may be associated with absent second and/or third person arguments (e.g., Meier 1990; Lillo-Martin and Meier 2011). Padden (1983) suggested that the particular form for third person agreement when the referent is absent is dependent on a number of conditions, including that the third person argument is assigned to a location in the space around the signer’s body. For example, in the BSL/Auslan clause in (4), the subject argument WOMAN is followed by a pointing sign that is directed towards a particular locus, and WOMAN is thus associated with this location in space. The ‘agreement’ is then marked in the verb sign SEND, with its initial location associated with the subject locus, creating a clause meaning ‘the women sends flowers to someone’. All subsequent reference to the subject
argument should use the same locus. In this analysis, directing an indicating verb from the initial location assigned to the subject noun phrase to some other location (not here assigned to a particular object argument) is considered analogous to adding a person agreement affix, as in Italian.

\[(4)\quad \text{WOMAN PT} \rightarrow \text{SEND}^{R-L} \text{FLOWER}\]

‘The woman sends the flowers to someone’.

In (4), BSL/Auslan signs meaning WOMAN have a fixed location on the body (in one lexical variant for example, the extended index finger strokes the cheek), and thus the sign is associated with a locus in the signing space by the use of a pointing sign that follows it. Alternatively, some nominal signs in BSL and Auslan do not have a fixed location on the signer’s body, such the BSL/Auslan sign CHILD. With this sign, it is possible to produce the sign in a particular locus rather than use a pointing sign to associate it with the locus. Thus, in (5), there is no pointing sign as part of the noun phrase, and the directionality of the sign TELL involves the use of the same locus as the sign CHILD to create a clause meaning ‘the child tells his father’.

\[(5)\quad \text{CHILD}^{1L} \rightarrow \text{SEND} \rightarrow \text{R FATHER}^{5}\]

‘The child tells his father.’

In (5), we see the closest approximation in sign language indicating verbs to Steele’s definition of agreement, in that some formal property of this particular instantiation of the BSL/Auslan sign CHILD (i.e., the fact that it is produced here at a locus on the signer’s left) co-varies with some formal property of the associated verb sign TELL→R.

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5 We adopt Liddell’s (2003) notation for directionality here. The sign CHILD with a downward arrow followed by the superscript ‘L’ represents the fact that the entire sign is produced on the left of the signing space, while the horizontal arrow followed by the superscript ‘R’ represents the fact that the sign TELL moves from the signer’s body towards a location on the right. A horizontal arrow followed by the superscript ‘1’, ‘2’, ‘3’ represents signs that are directed towards locations associated with the signer, addressee and non-addressed participants respectively. A horizontal arrow followed by the superscript ‘X’ or ‘Y’ indicates any location in space.
Liddell (2000, 2003) has argued, however, that the directionality of indicating verbs is often controlled by the real or imagined location of the referent, not by any feature that might be construed as a formal or semantic property of a controller noun phrase. Indeed, the use of space by signs within the noun phrase itself, such as the directionality of the pointing sign in example (4), and the spatial displacement of the noun CHILD in example (5), may be controlled by the same mental representation of the spatial location of the referent. Consider the BSL/Auslan clause in (6). As is also true of ASL (Liddell 2000), if this were produced in the presence of the referent of the object argument in question (i.e., if the actual mother being referred to was standing near the signer and the addressee), then the sign ASK→Y would begin its movement at the chin and move towards the location of the mother standing nearby. We can see that, in this instance, the location of the referent of the object noun phrase MOTHER is not a formal nor a semantic property associated with the noun phrase itself. It is a transient property of the referent (because the mother can move to another location), not of the noun phrase in clause (6). It is not the case that spatial modification of the indicating verb ‘agrees’ with any of the linguistic properties of the relevant noun phrase, and it certainly cannot be said that it ‘agrees’ with the location of the actual referent herself, as the location of the mother in the real world does not form part of the grammar of BSL/Auslan.

(6) PRO→1 ASK→Y MOTHER

‘I asked mother (something).’

Unlike the example in (5), in many instances there is no relationship between the locus towards which an indicating verb is directed and any properties of the associated noun phrase. In the clause in (6), the specific lexical variant of the sign MOTHER is produced on the ipsilateral side of the forehead. The sign ASK→Y, however, may be directed to any location away from the signer, and not at the location of the sign MOTHER at all. Furthermore, if the signer is representing a child asking his or her own mother, then the height of the child’s
mother in relation to the child may be represented by directing the sign $\text{ASK}^{\rightarrow Y}$ away and up from the signer’s body, as in Figure 4. Thus, the locus towards which the verb $\text{ASK}^{\rightarrow Y}$ is directed here does not reflect any formal property of the associated noun phrase at all (i.e., it is not directed to the ipsilateral forehead location of the sign $\text{MOTHER}$), nor any semantic properties, given that the height of the individual concerned is not part of the semantics of the sign $\text{MOTHER}$ (cf. Liddell 2000).

Consider also example (7) (cf. Johnston 1991; Liddell 2007), produced in BSL or Auslan.

Here, the location associated with the potential controller noun phrase ($\text{PRO}^{\rightarrow 2}$) and the verb $\text{LOOK AT}^{x \rightarrow \text{back-of-head}}$ are clearly dissociated. The sign $\text{PRO}^{\rightarrow 2}$ is directed towards the addressee, while the sign $\text{LOOK AT}$ is displaced to a location behind the signer’s body, and oriented towards the back of the signer’s head, as shown in Figure 5. An agreement analysis would have to explain what the back of the signer’s hand in $\text{LOOK AT}$ agrees with, because it cannot be said to agree with the location associated with the addressee.

(7) \textsc{YESTERDAY PRO}^{\rightarrow 2} \textsc{LOOK AT}^{x \rightarrow \text{back-of-head}} \textsc{WHY} \[bf\]

‘Why were you staring at the back of my head yesterday?’
Unlike the examples shown thus far, the controller noun phrase need not be present in the clause. Research on variable subject presence in ASL and Auslan, for example, has shown that a majority of clauses in spontaneous narratives lack a subject noun phrase (Wulf et al. 2002; Author et al. 2011). In our own work on indicating verbs in BSL, we found that more than half of verbs with an absent controller subject noun phrase were modified (Author et al. under review). Indicating verbs occurring in such clauses in sign languages have been compared to pro-drop languages that exhibit agreement (e.g., Lillo-Martin 1991). This is one type of non-canonical agreement described by Corbett (2006), since canonically the controller should be present. However, the same problems arise with this analysis. It is not formal/semantic features of the missing noun phrase that determine the location that the verb points from/toward; it is the location (or assumed/imagined location) of the referents that determines where the verb points.

A number of researchers have discussed the pointing nature of the directionality in indicating verbs, while maintaining support for an agreement analysis. Schlenker (2011: 234), for example, outlines a formal semantic analysis that integrates the deictic properties of both pronominal signs and indicating verbs into ‘…the larger domain of anaphoric
constructions in natural language’. Schlenker argues that this analysis is compatible with an agreement analysis, but it is equally compatible with the indicating verb system as a reference-tracking device that does not actually mark person agreement. Schlenker (To appear) extends this analysis to integrate directionality in sign languages and directionality in co-speech gestures. However, incorporating gesture into formal analyses still does not address the issue that associations with the location of a present referent, or with an absent referent conceptualised as present, do not represent semantic or formal properties of the noun phrases that represent the referent, as pointed out by Liddell (2011). Rathmann and Mathur (2011) and Lillo-Martin and Meier (2011) also recognise a role for gesture in their proposals, with both suggesting that structural organisation of sign languages interfaces with the gestural system. Rathmann and Mathur (2011) insist that this interaction between gesture and verb signs is mediated by the grammar, and that the process is, despite this, still best analysed as agreement marking. As we will see below, at least part of their argument for maintaining the agreement analysis reflects a misunderstanding of the work on this topic by Corbett (2006). In a critical response to Lillo-Martin and Meier (2011), Liddell (2011) argues that their work is not fully developed, and that their attempts to integrate gesture into their analysis of indicating verbs does not take into account ‘…the multiplicity of ways signers conceptualize space’ in sign languages. Even among those publications which recognise some role for gesture within the indicating verb system (e.g., Lillo-Martin and Meier 2011; Rathmann and Mathur 2011; Schlenker 2011; Mathur and Rathmann 2012; Schlenker To appear), there is little if any reference to research on co-speech gesture. Moreover, Liddell’s (2003) account of grammar, gesture and meaning in American Sign Language provides accounts for the full range of possible spatial modification of lexical elements in sign languages (such as those in pronominal signs and noun signs, described in (4) and (5) above),
some of which are left unexplained in the work by Rathmann and Mathur (2011) and Lillo-Martin and Meier (2011).

2.2. Canonical agreement and indicating verbs

There appears to be some confusion in the sign language literature about the notion of canonical typology in Corbett (2006) and its application to agreement. Mathur and Rathmann (2010) assert that indicating verb systems fulfil most of the key criteria for canonical agreement (a claim repeated in Rathmann and Mathur 2011). Lillo-Martin and Meier (2011), however, claim that indicating verbs represent a non-canonical form of agreement.

Cysouw (2011) argues that directionality of indicating verbs is so non-canonical that it can hardly be considered agreement at all. Cysouw systematically works through Corbett’s (2006) features outlined in 1.3 above. He shows how indicating verb systems show relatively few canonical features of agreement. In terms of controllers, if one accepts the claim made by Mathur and Rathmann (2010) that the object noun phrase FATHER in example (5) is the controller that triggers the directional marking in TELL, then, unlike what is expected of canonical agreement, this noun phrase does not need to be present in the clause (i.e., object drop is possible), it does not need to have overt expression of features (neither person nor location is marked here on the object noun), and it does not lead to consistent patterns of directionality (e.g., the sign TELL may be directed towards a number of different locations, depending on the location of a present referent, or the conceptualised location of an absent referent). Cysouw (2011) suggests that the target (in (5), the verb TELL) has a bound morpheme expressing the directionality (i.e., an affix rather than a clitic or free morpheme). This directionality is, however, not obligatory but it may double up on the marking on the noun itself (i.e., like canonical agreement, it may be redundant). Unlike canonical agreement, however, the marking on the target is not regular and productive (there are some idiosyncratic
forms described in the sign language literature, as noted below). Uncanonically too, it does not apply to all cases of verbs, as only a subset exhibit directionality.

Quer (2011) rightly argues that the degree of canonicity is not the key issue at stake in considering the appropriateness of an agreement analysis. It is the nature of the directionality in indicating verbs, and what controls this directionality, that represents the most critical aspect of the debate, as we argue in §2.1 above.

### 2.3. Idiosyncratic forms of first person indicating verbs

Meier (1990) argues for a first-person versus non-first-person distinction in ASL. Meier notes out that there are certain fixed forms for first person pronouns and verbs while non-first person forms exhibit variable pointing/gaze. In ASL, for example the verb CONVINCE modified for non-first person object is produced in neutral space while modified first person object form is produced on the neck, as shown in Figure 6 (modelled on Figure 10 from Lillo-Martin & Meier 2011), as used in examples (8) and (9). Meier argues that the form in Figure 6a varies in where it may be located/directed in space, while the form in Figure 6b is fixed.

![Figure 6: One lexical variant of ASL CONVINCE modified for (a) non-first person object and (b) first person object.](image-url)
With non-first person forms as in Figure 6a, there is a lack of a relationship between controller noun phrase properties and directionality as for the other verbs discussed above. It is possible that there may be a case for ‘agreement’ with first person as in Figure 6b; however, research is needed to show how the use of a fixed first-person versus variable non-first person differs from pointing gestures in which there appear to be similar fixed versus non-fixed forms (e.g., Cooperrider 2011). Additionally first person indicating verbs are the most problematic in terms of arguing for agreement as part of a grammaticalisation process (see §5 below for more).

2.4. Patterns of directionality in indicating verbs within/across sign languages

One argument for directionality as agreement reflects the suggestion that if the directionality of indicating verbs was gestural, then one would expect to see considerable variation with respect to the locations towards which indicating verbs may be directed (Aronoff et al. 2000; Meier 2002). Yet, the directionality of indicating verbs appears to be constrained: for example, the ASL indicating verb GIVE<sub>X→Y</sub> is directed towards locations associated with the referent represented by the ‘indirect object’ and ‘subject’ noun phrases, but not to the location associated with the referent of the ‘direct object’ (Aronoff et al. 2000; Meier 2002; Lillo-Martin and Meier 2011).

It is unclear why Aronoff, Meir and Sandler (2000) made this suggestion, as the nature of the directionality of the sign GIVE<sub>X→Y</sub> appears to be, in fact, at least partly predictable from its semantics, and has little relation to whether or not the directionality is itself gestural in nature. The sign GIVE<sub>X→Y</sub> refers to acts in which individuals transfer ownership of an item from themselves to another person. This transfer does not occur between the theme of the
verb and the recipient, so there is no reason to think that the path movement in the sign would work this way. Padden (1983) contrasted the transfer within ASL $\text{GIVE}^X\rightarrow^Y$ with a similar sign, which she called $\text{PASS-BY-HAND}$, which could in fact move from the location associated with the theme to the recipient’s location, as it iconically represents what the hand is doing when someone picks up and object and hands it to another person. In fact, Taub (2001) argued that much of the directionality of indicating verbs in ASL is iconically-motivated as it typically represents physical interactions between animate referents, or more abstract interactions represented metaphorically as if they were a physical interaction. Taub (2001) explores how each case involves different trade-offs between iconicity and metaphor, and different combinations of each, together with verb semantics, result in cross-linguistic differences we see across sign languages. This may partly explain some of the constraints that Aronoff, Meir and Sandler (2000) discuss. For example, although the sign $\text{BELONG-TO/OWN}$ in BSL is a stative verb that does not involve a typical interaction, this sign is an indicating verb that can move between the locations associated with the source and goal. Similar arguments can be made for so-called backwards verbs – i.e. verbs that move from object to subject (e.g. $\text{TAKE}$, $\text{INVITE}$, $\text{BORROW}$, etc in many sign languages) – which have been proposed to be potentially problematic for agreement analyses (cf. Quadros and Quer 2008; Lillo-Martin and Meier 2011). This argument in Aronoff, Meir and Sandler (2000) also appears to assume that adult pointing gestures are themselves not conventionalised nor constrained in any way. As noted in §1.4, this does not appear to be the case.

Meier (2002) and Lillo-Martin & Meier (2011) pointed out that the set of indicating verbs within a language cannot be predicted from formal or semantic properties alone (e.g. in ASL, $\text{HATE}^X\rightarrow^Y$ is an agreement verb while $\text{LIKE}$, which involves a movement away from chest, could be but is not an agreement verb). They also note that the set of indicating verbs differs cross-linguistically. For example, the sign $\text{EXPLAIN}^\rightarrow^Y$ is an indicating verb in BSL/Auslan,
but a sign that might be glossed as EXPLAIN in ASL is not. Additionally, some sign languages, such as German Sign Language (DGS), use a ‘person agreement marker’ (see Steinbach and Pfau 2007; Steinbach 2011b). This is a non-specific indicating auxiliary verb that is used in combination with a plain verb to indicate who does what to whom.

Although we argue that indicating verbs represent a fusion of a lexical element with a pointing gesture, this does not mean that which verbs are indicating verbs should be predictable nor that they will not vary cross-linguistically. The way that the set of indicating verbs behaves in each language is conventionalised. Liddell (2003) proposed that each sign language’s set of indicating verbs and/or auxiliaries and their properties are listed in the mental lexicon, and thus they may vary from one sign language to the next. In fact, this is something that may not be unique to signed or spoken language, as the use of pointing gestures used by non-signers may also vary from culture to culture, as noted in §1.4.

Additionally, Meier (2002), Lillo-Martin and Meier (2011) and Author (2002, 2007) have argued that expressions of numerosity in the verbal and pronominal systems of ASL and BSL affect the interaction with pointing, and that this may also have bearing on the status of directionality in sign languages. Again, whether an indicating verb can point and/or express numerosity, how it points, what form that takes phonologically and/or how it shows number are all conventionalised aspects of specific lexicalised verbs. The key issue here in deciding whether we have evidence for an agreement system is whether the directionality of the pointing itself (i.e., the varying features of the target) does or does not reflect semantic or formal properties of a controller noun phrase.6

6 Elsewhere we have argued that the directionality of pronominal signs also does not reflect grammatical person marking (at least not in the singular) (Author et al., 2013). The same arguments apply to grammatical person marking of directional verbs as well, regardless of whether one considers these to be agreement systems or not (cf. Liddell 2011; Lillo-Martin and Meier 2011).
2.5. Syntactic properties of indicating verbs

Meier (2002), Lillo-Martin and Meier (2011) and Sandler and Lillo-Martin (2006) have pointed out that the use of indicating verbs appears to have syntactic consequences, and thus must be represented in the syntax of individual sign languages. For example, Quadros and Lillo-Martin (2010) argued that null arguments and constituent order interact with the use of indicating verbs in ASL and Brazilian Sign Language (Libras, or LSB). Their research suggested that, although the basic constituent ordering in these languages appears to be subject-verb-object in clauses with plain verbs, constituent ordering appears more flexible in clauses with indicating verbs. In particular, the orders subject-object-verb and object-subject-verb appear to be acceptable in these clauses, and subject and object drop also appear more likely. Although no specific empirical studies into this issue in ASL have been conducted, recent studies on a set of 2145 clauses in New Zealand Sign Language (Author et al., 2011) and 1630 indicating verb tokens in BSL (Author et al., under review) do appear to lend this claim some support. Furthermore, in LSB, indicating verbs also interact with the order of negative signs. Clauses with indicating verbs are reported to take a preverbal negator, whereas those with an indicating verb see the negator appear in clause final position (Quadros 1999). Indeed, recent work on indicating verbs in BSL suggests that directional modification of these verbs is more likely to be found in clause final, rather than clause medial, positions (Author et al. under review). Thus, this body of work suggests that indicating verbs must be represented in the syntax, and that this adds support for the claim that their directionality represents a grammatical process.

More recently, Wilbur (2013), following Gökgöz (2013), has argued that directionality in sign languages does not fit the requirements for grammatical agreement because various syntactic tests (e.g. involving word order, conditionals, negation) applied to plain verbs, directional verbs and classifier verbs show that directional verbs pattern with
handling classifier verbs in these constructions but not plain verbs. The alternative analysis instead proposed by Gökgöz (2013) and supported by Wilbur (2013) involves an abstract “operator” that applies to object marking in both directional verbs and in classifier verbs, but not plain verbs:

Tests like these support Gökgöz’s analysis of object marking as operator mechanisms in contrast to agreement or clitic doubling. His analysis provides an explanation for the linguistic irritant that so many linguists have noted, namely that unlike typical verb agreement, in sign languages some verbs simply do not show it (plain verbs) or only agree with objects, or agree with both objects and subjects, but unlike spoken languages, don’t agree with just subjects. If it is not agreement after all, these facts are explained. Note, though, that the alternative provided by his analysis to ‘not being agreement’ is not ‘therefore it’s gesture’ (Wilbur 2013: 251).

Wilbur suggests that this likely constitutes a type of concord rather than agreement (cf. arguments by Cysouw 2011 against concord as noted above). Another possible explanation for Gökgöz’s findings may be linked to the shared gestural origins of handling constructions and many lexical signs involving handling (Author et al., 2012). This likely includes many directional verbs, either literally (e.g. verbs of transfer like GIVE) or metaphorically (e.g. verbs like ASK in which the notion of transfer is more abstract).

There appears to be no a priori reason, however, to assume that indicating verbs should not interact with the syntax of specific sign languages in the way that Meier (2002), Lillo-Martin and Meier (2011) and Wilbur (2013) claim. After all, it is only the patterns in the use of directionality in indicating verbs that are influenced by the real-world location of present referents or imagined locations of absent referents, and not other linguistic properties of these verbs. In fact, there is a good deal of evidence to suggest that the grammar of individual spoken languages and co-speech gesture also interacts in language-specific ways, as noted in §1.4 above.
3. The acquisition evidence

Meier (2002) claimed that the mastery of directionality of indicating verbs for present referents is not reached until around age 3, and that mastery of this system for absent referents is later still. Meier notes that this is similar to the acquisition of complex morphological systems (Slobin 1985) and uses this extended time course of development of these aspects of ASL grammar to argue for the morphological status of directionality in indicating verbs.

However, this does not take into account the time course required for acquisition of co-speech gesture, particularly mastery of the relationship between language and co-speech gesture. As noted by Gullberg, de Bot and Volterra (2008), the development of the adult speech-gesture system is not yet fully described and more studies are needed to understand how this emerges. Some studies do suggest that acquisition of speech and gesture may not be as simple as might otherwise be assumed. In particular, it seems that deictic pointing gestures may not be acquired at the same time or in the same way as other types of gestures. For example, Mayberry and Nicoladis (2000) followed five French-English bilingual children from ages 2;0 to 3;6 and found that the use of iconic and beat gestures correlated with speech development, whereas pointing gestures did not. Coletta (2004), however, suggested that children aged 6 and over use more metaphoric, beat and abstract deictic gestures than younger children. Additionally, in their study on the acquisition of the Turkish demonstrative şu described in §1.4, Kuntay and Ozyurek (2006) found that six-year-old children who had acquired adult-like use of the proximal and distal pronouns bo and o had not yet acquired adult-like use of şu. They attribute this to children’s still underdeveloped ability to combine this demonstrative pronoun in speech with conversational management of visual attention required by appropriate use of şu. Given the complexity of acquisition of speech along with deictic co-speech gestures, there is no a priori reason to assume that the acquisition of the
complex fusion of symbolic and deictic elements in indicating verbs in sign languages should be a milestone that is relatively early in a child's sign language development, even if a gestural analysis of directionality is assumed.

4. Neurolinguistic evidence

Meier (2002) listed a number of case studies of deaf aphasics that indicate more left-hemisphere involvement than right-hemisphere for indicating verbs, suggesting that mastery of these verbs patterns like other linguistic abilities.

Nevertheless, there is some evidence for right-hemisphere involvement in comprehension (Poizner et al. 1987), and in syntactic processing (Neville et al. 1997) of indicating verbs in ASL. Additionally, in another study, Capek et al. (2001) showed deaf native ASL signers sentences containing indicating verb errors. This ERP study found left hemispheric activity in these participants similar to that seen in hearing people reading or listening to syntactic violations in English. However, indicating verb errors in which the verb was directed to a new location, not previously associated with a referent, elicited bilateral responses. Thus, these neurolinguistic studies provide an unclear picture with regard to the grammatical versus gestural nature of directionality in indicating verbs (cf. Van Lancker Sidtis 2006).

It is worth noting that the neural processes involved in gesture production and comprehension are themselves not well understood. A recent review of the literature suggests that sign language and co-speech gestures recruit similar areas in the left hemisphere for production, and similar neural substrates for comprehension (Emmorey and Ozyurek 2014). Similar electrophysiological responses to semantic and syntactic violations have been identified. This literature thus suggests that “…the brain’s general infrastructure for language and communication treats meaningful information coming from all channels and formats in
highly similar ways” (p. 657). Thus, neurolinguistic evidence may not serve to provide evidence either for or against the agreement analysis of spatial modification of indicating verbs.

5. Nonmanual agreement

Thus far we have focused primarily on the notion of agreement in how indicating verbs use space, since it is this directionality in this class of verb that is most strongly argued to involve grammatical agreement by linguists. However other phenomena beyond spatial modification have also been proposed as involving agreement in sign languages – including use of nonmanual markers such as eyegaze as well as the face, head and body.

One such nonmanual marker that has received much attention in the sign language literature is eyegaze. Neidle et al. (including Bahan 1996; Lee et al. 1997; Neidle et al. 2000), Thompson (2006), and Thompson et al. (2006, 2009) have argued for eyegaze as a grammatical non-manual marker of verb agreement in ASL – i.e. that signers regularly shift their eyegaze towards the location associated with object arguments and that this constitutes a nonmanual instantiation of agreement features.\(^7\) One problem with these studies is that other possible explanations for this shift in eyegaze are acknowledged (Thompson et al., 2006) but dismissed. Thompson et al. claim that eye gaze marking the point of view and which imitates the gaze of the referent cannot account for the patterns that they find with agreement verbs, because they suggest that Liddell’s (2003) account would predict that directed eye gaze should also co-occur with plain verbs and pronouns, and yet it is not found in their data. Liddell (2003) does not, however, make this claim. It may be that the use of space in indicating verbs when referring to absent referents, in which the hands are directed towards a

\(^7\) For Neidle and colleagues, eyegaze is used as a grammatical marker of agreement with all verb types; Thompson and colleagues argued that eyegaze is a grammatical marker of agreement only with agreement verbs.
location associated with an imagined referent, triggers eye gaze patterns that imitate the subject argument’s gaze because it involves a greater degree of enactment than is required for plain verbs and pronouns. For example, Author et al. (2015a) found that in an analysis of indicating verbs from the BSL Corpus, whether or not verbs were spatially modified significantly favoured co-occurrence of constructed action, i.e. defined as the use of manual and/or non-manual articulators to represent the actions of or emotions expressed by the same articulators of an identifiable referent, following criteria set out by Author et al. (2015b).

Similarly, Author et al. (2009a) also found that modification of indicating verbs significantly favoured the presence of constructed action in Auslan, using one or more of Engberg-Pedersen’s (1993) notions of shifted attribution of expressive elements, shifted reference, and/or shifts of the body, head or gaze, whereby signers take on characteristics of referents in the discourse. Although Author et al.’s (2009a) notion of constructed action was not restricted to shifts in eyegaze for the purpose of constructed action, they did include eyegaze as a possible marker of constructed action. Given the crosslinguistic similarities in the use of constructed action across sign languages (Lillo-Martin 2012; Author et al. 2009b), it seems plausible that the use of eyegaze described by Neidle et al. and Thompson et al. could also (or perhaps alternatively) be explained by use of constructed action via eyegaze. However, Neidle et al. did not consider constructed action as a possible explanation for the patterns they describe, and as noted above, Thompson et al. (2006) dismissed it. Thus it is very difficult to know if these studies on ASL are describing the same or different phenomena from those in BSL and Auslan. Arguments about the use of eyegaze to grammatically mark agreement in sign languages need to be able to show how this is different from the use of eye

Some researchers (e.g., Hosemann 2011) have attempted to distinguish between eyegaze functioning as agreement versus eyegaze used for constructed action and role shift; others have argued that constructed action itself is a type of nonmanual agreement (e.g., Hermann and Steinbach 2012). Both of these analyses are problematic - see Author et al. (2015b) for more.
gaze alone as marking constructed action. Furthermore, the same argument about the relationship between whether directionality of eye gaze is conditioned by formal and/or semantic properties of the controller noun phrase applies here as much as it does to the use of space in indicating verbs. Additionally, and importantly, any argument for the use of eyegaze (including Neidle et al., Thompson et al.) and also other nonmanual markers (e.g., Hermann and Steinbach 2012) for grammatical agreement would need to show how these patterns are different from what non-signers do in multimodal speech (Kita 2003b; Sidnell 2006). So far, to our knowledge, no such evidence has been presented.

6. Emerging sign languages and grammaticalisation

Various studies have provided evidence that indicating verb systems arise in fully-fledged sign languages. For example, some studies have shown that directional verbal gestures emerge in home sign systems and in modified forms of Signing Exact English used by deaf children not exposed to ASL, but appear under-developed compared to ASL (Supalla 1991; Goldin-Meadow et al. 1994). Additionally, there are reports of language change in younger versus older signers of established sign languages (e.g., Engberg-Pedersen 1993 for Danish Sign Language), perhaps comparable it to the ongoing grammaticalisation of ‘gonna’ in English (Tagliamonte and D'Arcy 2009). Note, however, that a recent corpus-based study of the use of indicating verbs failed to find any evidence of the increasing use of modification across different age groups in BSL (Author et al. under review), suggesting that the indicating verb system is stable in this older, established sign language. In contrast, indicating verbs have been claimed to be much more frequent and systematic in sign language ‘creoles’ than ‘pidgins’, as seen in the first and second cohorts of Nicaraguan Sign Language users (Senghas and Coppola 2001), and in younger sign languages as they develop through different stages – e.g. Israeli Sign Language (Meir 2016). Indicating verbs are apparently rare
in ‘village sign languages’ (i.e., sign languages used by deaf and hearing members of a small close-knit community), such as Al-Sayid Bedouin Sign Language, Providence Island Sign Language, and Kata Kolok (Aronoff et al. 2004b; Marsaja 2008; De Vos 2012; Nyst 2012).

In at least one case, the lack of indicating verbs is accompanied by lack of referential pointing to absent human referents in the language generally: de Vos (2012) reports that Kata Kolok signers prefer establishing and maintaining reference via pointing to fingers on the non-dominant hand (i.e., list buoys, see Liddell, 2003) rather than pointing to locations in space. In the case of Al-Sayid Bedouin Sign Language, signers appear to point to locations in space for reference and they modify verbs spatially to represent actual motion and location, but it is reported that they do not use space for verbs of transfer (Aronoff et al. 2004b). Quer (2011) finds it paradoxical that Al-Sayid Bedouin Sign Language has developed locative marking but not directional marking on verbs in this way. Quer notes: “one could expect that such a basic gesture as pointing would be easily grammaticalized, contrary to fact” (p. 195). Given all the evidence noted above, there is no reason to expect grammaticalisation of pointing to be easy or to emerge quickly in any sign language, given that the development/emergence of pointing gestures with speech certainly does not “come for free” in non-signers. Claims such as this reveal that there is (still) a fundamental misunderstanding amongst sign language linguists about the role of gesture in language.

All of the patterns noted above suggest that indicating verbs develop as pointing gestures are incorporated into verb signs as part of an emerging linguistic system, and may continue to develop through analogic processes of language change (although this process may slow considerably in older sign languages like BSL). Increasing conventionalisation provides evidence of an emergent subsystem of the grammar, but not necessarily an agreement system. Agreement systems generally emerge by means of a separate but related process – grammaticalisation (Givon 1976; Corbett 2006). The typical grammaticalisation
path for agreement systems is that full pronouns become cliticised onto verbs, and then later these cliticised pronouns become inflectional morphemes. Although cliticisation has been claimed to be a possible source of or explanation for verb directionality in sign languages (Meier and Lillo-Martin 2011; Nevins 2011), there is actually no evidence that a grammaticalisation pathway involving an intermediate stage of cliticisation is followed in sign languages (cf. Liddell 2003: 72). Many first person forms in particular are clearly not the result of the fusion of the first person pronoun $\text{PRO}^{\rightarrow 1}$ (directed to the centre of the signer’s chest) and a verb. For example, BSL/Auslan $\text{REMIND}^{\rightarrow 1}$ moves from a forehead location to one on the ipsilateral shoulder, BSL/Auslan $\text{EXPLAIN}^{\rightarrow 1}$ reverses its alternating circular movement in neutral space; and BSL/Auslan $\text{LOOK-AT}^{\rightarrow 1}$ is directed to a location on the signer’s face. Likewise, as noted above in §2.3, ASL $\text{CONVINCE}^{\rightarrow 1}$ is directed toward the neck. None of these first person object forms are directed towards the location of the first person pronoun, i.e. centre of the signer’s chest. Pronouns and indicating verbs instead involve similar uses of gestural space. Furthermore, it is not clear that handshake assimilation in pronouns is part of a process of grammaticalisation (e.g., Bayley et al. 2002; Author et al. 2013), though this too been analysed as cliticisation (Sandler and Lillo-Martin 2006).

7. Sociolinguistic variation and language change

Signing communities are sociolinguistically very different from spoken language communities, due to the very low numbers of native signers in most communities and related to this, interrupted transmission across generations (e.g., Author et al., 2007). This leads to much apparent idiosyncratic variation with respect to all aspects of language use, including morphology. As relatively young languages (Newport and Supalla 2000), many of the morphosyntactic properties of sign languages do not appear to be highly grammaticalised and
thus are often optional. For example, large scale quantitative studies of indicating verbs in both the BSL and Auslan corpus data show that spatial modification of such signs to reflect the location of real or imagined referents averages to at most around 60% (Author et al. under review; Author et al. 2009a).

Additionally, Engberg-Pedersen (1993) proposed that these modifications also interact with language-internal factors such as the frequency of a lexical unit, its frequency of occurrence in a context or linguistic construction that is typical of the modification, and the sign’s semantic or formal characteristics when modified. The research on indicating verbs in Auslan and BSL relating to frequency is mixed. Author et al. (2009a) found that different Auslan verbs were modified at different rates, with high frequency forms (e.g. LOOK, SAY, COME, ARRIVE, GO) showing spatial modification significantly more often than less frequent verbs, supporting Engberg-Pedersen’s (1993) claim. However, lexical frequency was not found to be a significant predictor of modification of indicating verbs for BSL (Author et al. under review). Findings relating to indicating verbs and constructed action have been clearer – i.e., indicating verbs in both Auslan and BSL were significantly more likely to be modified for the patient when co-occurring with constructed action. This finding in particular certainly appears to lend some support to the notion that signers use of spatial locations associated with absent referents involves imagining that the referent is actually present, as proposed by Liddell (2003). This theory would predict that there should be a correlation with constructed action, which involves similar engagement with mental representations of present or absent referents. As noted above, such a correlation has been found both with Auslan (Author et al. 2009a) and BSL (Author et al. 2015a; Author et al. under review). Corpus-based approaches such as these will assist us in identifying these language-internal and external influences and thus enable us to more accurately characterise sign language grammars.
8. An alternative analysis

Thus far we have provided a wide range of arguments for why indicating verb systems are not agreement systems. Instead, building on the work of Liddell (2003), we propose that they are a sign language-specific construction which involve a fusion of a lexical item and a deictic gesture. We use the term *construction* following Goldberg (1995, 2003): we take indicating verbs to be conventionalised pairings of form and meaning that consist partly of a lexical sign specified for a particular handshape, orientation, and movement combination that has specific semantic properties, and partly of a deictic gesture which has its own pragmatic properties. Thus, indicating verbs constitute a structured composite construction of sign and co-sign gesture, similar to multimodal constructions of speech and co-speech gesture that have been proposed by Zima (2014) under the framework of Construction Grammar. This is similar to proposals involving composite utterances of speech and gesture (Enfield 2009) and their application to sign languages (Johnston 2013; Wilcox and Xavier 2013).

In Construction Grammar (e.g., Goldberg 1995; Goldberg 2003), constructions are symbolic units or signs which constitute a pairing of form and meaning. In this theory, a construction is the only unit of grammatical representation. There is a continuum from schematic complex constructions (corresponding to syntactic rules in other, especially generative theories) to substantive atomic constructions, that is, words (corresponding to the lexicon in other theories). Constructions are organised in a network, chiefly by taxonomic relations and part-whole relations. Mental representation of a construction is determined not only by the (non)predictability of the constructional properties, but also by token and type frequency (Bybee 1985).

Within this framework, Zima (2014) conducted a study that included investigations of the use of the semi-lexicalised English constructions [V(motion) in circles] and [all the way from PREP Y]. The data were collected from an audio-visual corpus of spontaneous
language samples from a range of discourse types. This work was inspired partly by recent work on multimodal constructions within Construction Grammar (e.g., Steen and Turner 2013). It was also partly inspired by the existing gesture studies literature on motion event descriptions (McNeill and Duncan 2000; Kita and Ozyurek 2003; Hickmann et al. 2011) which found that such spoken language descriptions were relatively often accompanied by gesture. In the case of [V(motion) in circles], for example, specific motion verbs (e.g., go, swim, fly) occurred preceding the prepositional phrase in circles. Of 202 examples in the audio-visual corpus, just over 60% were accompanied by a gesture, most commonly involving an index finger moving in a circular motion. With the example [all the way from PREP Y], the phrase all the way from preceded a noun phrase which included a prepositional phrase (e.g., Long Beach to Lancaster). Around 80% of the 199 examples in the dataset were accompanied by a gesture in which the hands initially point to one location in the space around the speaker, then move across to point to another location in space.

Given the relatively high frequencies of specific co-speech gestures with these spoken language phrases, Zima (2014) proposes that this provides evidence that these multimodal constructions are at least partly entrenched as a unit in the minds of these speakers and may be partly conventionalised in the speech community. Construction Grammar theory proposes two important factors that reflect both this individual entrenchment and socio-cultural conventionalisation of constructions: (1) recurrence and (2) idiosyncracy. Recurrence refers to the fact that frequency of usage leads to an individual perceiving such co-occurrences as a relatively fixed combination of form and meaning which is stored in the individual’s memory as a unit. The spoken English motion constructions from Zima (2014) occurred with gesture 60-80% of the time in the corpus. In Author et al. (under review), indicating verbs in BSL occurred with pointing (i.e. with modification) at a similar rate, and even in the most conservative analysis still constituted the majority of uses. As a result of recurrence, specific
formal and/or semantic/pragmatic properties come to be associated with these units, sometimes in a way that cannot be attributed to the compositional properties of its components. This is the second factor reflecting entrenchment and conventionalisation – i.e. idiosyncracy. For example, specific semantic uses of English motion constructions – e.g. [all the way from PREP Y] to refer to actual distance – further encouraged use of co-speech gesture (86% of all instances) in Zima’s (2014) study, whereas temporal or metaphoric uses ranged from 56% down to 33.3%. Likewise, indicating verbs in BSL also show idiosyncratic behaviour, with signs like PUSH the least likely to be modified (42%, 5/12) and PAY (77%, 20/26) the most likely (note that signs that showed no modification at all were excluded from the analysis) (Author et al. under review).

This work by Zima (2014) on multimodal constructions in English points the way to an understanding of indicating verbs as constructions combining lexical and gestural elements. The frequent combination of deictic gesture and signs certainly seems to reflect entrenchment in the minds of individual signers and conventionalisation of these combinations in signing communities, and the fact that these particular combinations vary from one sign language to the next, and show some idiosyncratic properties, also matches what would be predicted in a Construction Grammar account. The crucial difference for sign languages is that indicating verbs are unimodal (rather than multimodal) fusions of lexical items and deictic gesture. Specifically, in an indicating verb like BSL/Auslan [GIVEˣ→ʸ], the lexical item GIVE is lexically specified for handshape, orientation and movement, but the initial and final locations are deictic and thus variable.

9. Conclusion

In this paper, we have discussed the various arguments used to support the claim that the spatial modification of indicating verbs in sign languages represents an example of a

morphological agreement system for marking grammatical person. We began by reviewing Corbett's (2006) definition of canonical agreement, and explored how it appears to exclude indicating verbs in sign languages. We then examined the evidence for and against the agreement analysis of these constructions, with a focus on the claims made by Meier (2002) and Lillo-Martin and Meier (2011). We conclude by offering an alternative analysis under a Construction Grammar framework – that the indicating verb system is a typologically unique construction, analogous to multimodal constructions in speech, which combines deictic gestures and lexical items and is used for reference tracking, but is not an agreement system.

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(Removed for review for anonymisation)

Competing Interests

The authors declare that they have no competing interests.

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