Pronouns and pointing in sign languages

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Abstract

Pointing signs are used for pronominal reference (among many other functions) in sign languages. Many pointing signs do not look very different from non-signers' pointing gestures (Kendon, 2004; Kita, 2003c). However, most sign language researchers, regardless of their theoretical perspective, assume that there is evidence for considering these pointing signs to be pronouns (i.e., distinct from pointing gestures used by non-signers). In this paper, we compare canonical properties of pronominal pointing signs in sign languages with (a) personal pronouns in spoken languages and (b) pointing gestures used by non-signers. We find firstly that the features that make pronominal signs difficult to characterise morphosyntactically are those features they share with pointing gestures and not with pronouns. Secondly, we find that the features that make pronominal signs difficult to characterise gesturally are those features they share with pronouns and not with pointing gestures. Therefore, we conclude that pronominal signs cannot be characterised exclusively either as personal pronouns, or as pointing gestures, but instead have characteristics of both. We discuss implications of this conclusion for linguistic theory and also for our understanding of linguistic diversity and linguistic universals.
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1. Introduction

Human languages display considerable structural diversity, and yet at a basic level they share many properties. These are the two main tenets behind the study of linguistic diversity and the search for linguistic universals. Given the enormous amount of diversity across languages, Evans and Levinson (2009) question whether there are any true linguistic universals at all. In doing so, they argue against some substantive universals that have been proposed in the literature, providing examples and evidence for each case. One such universal proposed by Pinker and Bloom (1990) is 'anaphoric elements', including pronouns and reflexives. Evans and Levinson argue that many languages lack reflexives and some also lack clear personal pronouns. They also note: "Sign languages like American Sign Language also lack pronouns, using pointing instead" (2009:431).

In a response to Evans and Levinson (2009), we previously noted that very few studies in the sign language literature make such a claim, and that, in fact, most sign linguists assume (and some have explicitly argued) that sign languages do have pronouns (Cormier et al., 2010).[1] Arguments for the presence of pronouns in sign languages have included the greater systematicity in use of pointing in sign languages when compared to gesture used by non-signers, together with

Fig. 1. (a) Pronominal sign directed to signer; (b) pronominal sign directed to addressee; and (c) pronominal sign directed to non-addressed referent.

the syntactic distribution of pointing signs (Meier and Lillo-Martin, 2010). Thus, in terms of Evans and Levinson's claim that sign languages use pointing instead of pronouns, we concluded that this assertion was too simplistic and that more research was needed.

In this paper, we aim to explore in more detail the question of whether sign languages have personal pronouns or whether they do not, and instead use pointing gestures (akin to pointing used by non-signers). We compare characteristics of pronominal signs in sign languages with characteristics of personal pronouns in spoken languages and with characteristics of pointing gestures used by non-signers. In doing so, we come to the conclusion that it can neither be argued that pronominal signs are unproblematically equivalent to personal pronouns nor that they are identical to pointing gestures, because closer examination reveals that they share features of both. We discuss the implications of this for linguistic theory and for our understanding of language diversity and linguistic universals.

2. Background: pronominal signs

Prior to the 1960s, sign languages were generally considered to be elaborated gestural systems and/or manual representations of speech (e.g., Sapir, 1921). Stokoe (1960) was the first to recognise and describe the sublexical structure of American Sign Language (ASL), and thus claim that it shared fundamental linguistic properties with spoken language. In the decades following Stokoe's work, there was a continuing emphasis on the status of sign languages as ''real'' languages, worthy of linguistic study in their own right (see, for example, Klima and Bellugi, 1979). Various theoretical frameworks were applied to sign languages, most of them within the generative tradition[2] (see Sandler and Lillo-Martin, 2006 for an overview); this approach also resulted in borrowing a considerable amount of linguistic terminology from spoken language studies.

One such example is the term 'pronoun.' One of the earliest references to pronouns and pronominal signs in a sign language is from Friedman (1975:946), who claims that ASL does not have lexicalised pronouns: ''The ASL lexicon contains no signs classifiable as 'pronouns'. The equivalent of pronominal reference is achieved by the signer's first establishing a frame of reference, in front of his body, within which he establishes points of reference identified with the objects, persons, and locations to which he will refer''. It seems that the main reason Friedman claims that pointing signs are not lexicalised in ASL is because of the multi-functionality of pointing: for locative purposes, associating locations in space with referents, etc. Furthermore, she argues, the use of pointing in ASL for reference-tracking purposes ''vastly differs from oral language'' (p. 947). Even so, Friedman does recognise that these signs have a pronominal function: ''An index which is oriented and moving towards the signer serves as the 1P pronoun'', while she claims that an index towards interlocutor ''serves as the 2P pronoun'', and an index away from the signer and interlocutor ''serves as the 3P pronoun'' (Friedman, 1975:948). Examples from British Sign Language (BSL) signers are shown in Fig. 1a–c.[3]

Despite Friedman's (1975:946) claim that ASL does not have 'pronouns' per se, there has been widespread usage of the term 'pronoun' to refer to these signs across different sign languages and within a variety of theoretical perspectives (e.g., Ahlgren, 1990; Alibasic Ciciliani and Wilbur, 2006; Berenz, 2002; Bos, 1995; Cormier, 2005, 2007; Deuchar, 1984; Engberg-Pedersen, 1993; Farris, 1998; Hatzopoulou, 2008; Klima and Bellugi, 1979; Liddell, 1990, 2000b, 2003; Lillo-Martin and Klima, 1990; McBurney, 2002; Meier, 1990; Petitto, 1987). Most of these analyses either assume or explicitly argue that pronominal signs are distinct from pointing gestures as used by non-signers. However, we question these assumptions here for several reasons. The role of gesture in sign language has been a matter of debate for some time (e.g., Liddell and Metzger,

1998; Schembri et al., 2005). In the early days of sign language research there was a perceived need to distance sign languages from gesture, to justify the linguistic status of sign languages as natural human languages (Kendon, 2008). Because this is no longer an issue, researchers have been more willing to consider the possibility that signers gesture (e.g., Emmorey, 1999), though questions remain about how, where and when gesture occurs, and the way that gestural elements interact with linguistic elements within sign language is hotly debated.[4]

This lack of consensus is exemplified by the notion of 'agreement' in sign languages. Sign languages such as ASL have verbs which undergo directional modifications to incorporate locations associated with core arguments. These are known in the literature as 'agreement verbs' (Meier, 2002; Padden, 1983; Rathmann and Mathur, 2002) or 'indicating verbs' (de Beuzeville et al., 2009; Liddell, 2000b, 2003). The former group of scholars propose that these verbs mark person agreement with arguments associated with different locations in the signing space. The latter group argue instead that (1) because of the manner in which they are directed and located in space, these signs are better analysed as fusions of linguistic and gestural material, and (2) these signs 'point to' present referents, or to locations associated with absent referents (Liddell, 2000b; Schembri and Cormier, 2009) in the same way as pointing gestures. This issue has received considerable attention within the sign linguistics literature (e.g., Lillo-Martin and Meier, 2011a and 8 commentary papers in a special issue of Theoretical Linguistics). The main issue of contention with agreement/indicating verbs is whether and how they mark grammatical person, an issue to which we will return in section 5.2.1.

The 'pointing' analysis within the agreement debate is equally relevant for an understanding of pointing behaviours more generally within sign languages. Pointing with an extended index finger has many functions within sign languages. These functions include use as a pronominal, adverbial (i.e., locative), and determiner. Locative pointing signs point to a location to refer to that (or some other) location; these have an adverbial function (meaning 'here', 'there' 'in this/that location', etc.). Determiners are linked to nouns and occur within a noun phrase; their function includes establishing a location in space for a referent which may or may not be referred to later. Demonstrative pointing signs (as subtypes of pronominal signs or determiners) point to a location to refer to an object or concept (meaning 'this, 'that', etc).[5] For the most part here, we set aside these other uses of pointing to focus on personal pronominal uses[6], although we recognise that pointing signs are often ambiguous between these various functions (Emmorey, 2002; Fenlon et al., 2013; Johnston, 2013). Indeed, the functional ambiguity of pointing in both gesture and sign is something that these two phenomena share, and an issue that appears to have been downplayed in the sign language literature.

In the remainder of this paper, we explore the nature of pointing signs which have a pronominal function (which we will continue to refer to as pronominal signs). We define pronominal signs as signs that point to present referents or to location(s) to refer to speech act participant(s). Specifically, we compare the form and function of pronominal signs with (a) personal pronouns in spoken languages and (b) pointing gestures used by non-signers. We focus on comparisons between pronominal signs and personal pronouns, excluding 'proforms' such as reflexives, reciprocals, interrogatives and indefinites (Bhat, 2004). Thus, unless otherwise noted, our use of 'pronoun' in the remainder of this paper will be restricted to personal pronouns in spoken languages. We also exclude pointing signs that function as determiners, adverbials and/or locatives, though we recognise that in practice, pointing signs may be ambiguous between these various functions. (For a description of both pronominal signs and proforms in sign languages, see Cormier, 2012.)[7] We begin by considering the core characteristics of personal pronouns and pointing gestures. We then compare pronominal signs with both personal pronouns and pointing gestures.

3. Characteristics of pronouns

Saxena (2006) provides a useful overview of the characteristics of pronouns. Pronouns are a special example of 'proforms': i.e., function words that replace lexical content-bearing syntactic units of a particular category. For pronouns, the units are for the most part other noun phrases. Pronouns are a closed class, with a small set of members, and their text frequency (in many languages, although by no means most) is high. Consistent with this frequency, they tend to have a fairly simple phonological structure (one or two syllables with simple consonants/consonant clusters, although more phonologically complex pronouns do exist).

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[4] Much of the debate revolves around different assumptions about what 'language' is and what 'gesture' is (cf. Kendon, 2004, 2008).

[5] Some researchers (e.g., Ahlgren, 1990; McBurney, 2004) have argued that sign languages lack personal pronouns but instead have only demonstrative pronouns. A comparison of pronominal signs in sign languages with (a) grammatically marked demonstrative pronouns in spoken languages and (b) pointing gestures used by non-signers would be useful. This is outside the scope of the present investigation, but we believe similar issues to those outlined in this paper would arise.

[6] We will compare pronominal signs with some of these other functions of pointing e.g. adverbials and determiners in section 5.2.2.

[7] Although many of the characteristics of pronominal signs described here are shared by possessive and non-possessive forms, there is very little research on possessive functions of pointing gestures (aside from Cooperrider, 2011 – see section 4), so we leave this for future research. (For an overview of possession in BSL and other sign languages, see Cormier and Fenlon, 2009.)

Bhat (2004) and Cysouw (2003) both provide extensive descriptions of pronominal systems in spoken languages from a typological perspective. It is clear from this crosslinguistic work that the essential features of pronouns can be difficult to pinpoint. Siewierska (2004) notes that the definition of 'pronoun' and the criteria for determining whether a particular element is a pronoun or not depends on what it is being compared or contrasted with, for example, nominals, anaphors (reflexives), and person agreement markers. Here we adopt the approach used in canonical typology (Corbett, 2005, 2006) by taking various linguistic descriptions of pronouns and trying to identify the most fundamental and shared characteristics of a pronoun. The characteristics that emerge from a survey of the literature include referentiality, paradigmatic structure, and syntactic distribution.

3.1. Referentiality

Referentially, pronouns act as 'shifters' (Bhat, 2004). They are dissociated from the referent, so that their reference may more easily shift in context. Because of this, pronominal reference can be ambiguous. The other primary characteristic of pronouns is that they are organised into paradigms associated with grammatical categories such as person, number, gender and case. This allows them to function as shifters while still allowing referent identification.

3.2. Paradigmatic structure

As noted above, pronouns are organised into paradigms associated with grammatical categories. The most common grammatical categories marked by pronouns include person, number, gender and case. Languages differ in terms of which grammatical categories are marked. Even within a language, different paradigms may differ in grammatical marking. (For example, English distinguishes gender in the 3rd person singular only.)

Cysouw (2003) notes that three-way person distinctions (1st vs. 2nd vs. 3rd person) and also two-way distinctions (1st and 2nd person vs. 3rd person, or 1st person vs. 2nd and 3rd person) are common. A two-way distinction (singular vs. plural) is very common for number. Some languages additionally mark dual, trial, paucal and/or quadral. Some languages do not mark for one or more of these grammatical categories at all (e.g., Pirahã, which does not mark number in its pronominal system; Everett, 1986). Case and gender marking are also common in many pronominal systems (see Bhat, 2004:109–117 for an overview).[8]

Of course, grammatical marking is not restricted to pronouns. Other lexical categories such as verbs and adjectives may also be marked for the same grammatical categories, e.g., in languages with agreement morphology, where the grammatical marking is often considered to have developed from a pronominal clitic (Corbett, 2006; Siewierska, 2004). Nouns may be marked for number, case and/or gender. However, plural marking on pronouns and in pronominal clitics is semantically different from plural marking on nouns (e.g., Benveniste, 1971; Bhat, 2004; Wechsler, 2010). Bhat (2004) notes that for marking non-singular number, 'plurality' is typical for nouns while 'conjunction' is typical for pronouns. Plurality emphasises similarity between referents; thus 'boy' and 'boys' refer to one versus more than one boy, respectively. Conjunction with pronouns, on the other hand, emphasises differences between roles held by referents. First person plurals typically involve conjunction, not plurality. Thus, in English, 'we' typically involves the speaker plus other second/third person referent(s), not multiple speakers. (Plurality is of course possible with first person plurals – e.g., in choruses – but is not typical.) An inclusive/exclusive distinction inherently involves conjunction and not plurality. Second person plural can involve either conjunction (addressee + non-addressed referents) or plurality (multiple addressees). Third person plurals are the only type of plural pronoun which necessarily involve plurality and not conjunction. We return to the notion of conjunction in plural pronominal signs in sign languages in section 5.2.2.

3.3. Syntactic distribution

Perhaps one of the most defining features of pronouns is their function and distribution within the grammar. Personal pronouns serve as verbal arguments, and they may substitute for noun phrases. Furthermore, personal pronouns function differently from anaphors (e.g., reflexives and reciprocals); this is captured within generative frameworks by Principles A and B of Chomsky's (1981) Binding Conditions. Levinson (1987, 1991) offers an alternative pragmatic explanation for these tendencies. Whatever the theoretical account, patterns such as those in (1) have been shown to be robust across many different languages, though counterexamples do exist (Huang, 2000; Levinson, 1991).

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[8] Gender and case are not commonly marked in sign languages, although some examples have been described for a few sign languages (e.g., Fischer, 1996; Meir, 2003; Smith, 1990). We know of no claims of pointing gesture systems used by non-signers to mark gender and/or case distinctions (aside from Cooperrider, 2011 who reports a weak association between handshape in self-pointing gestures and case-marking in simultaneously-produced English pronouns). Therefore, we focus primarily on the grammatical categories of person and number.

Table 1
Dutch independent pronouns (Howe, 1996).

Singular		Plural	
1	ik	1 + 2	wij
		1 + 2 + 3	wij
		1 + 3	wij
2	jij	2 + 3	jullie
3	hij/zij/het	3 + 3	zij

Table 2
Dutch present suffixes (Cysouw, 2003).

Singular		Plural	
1	. . .-Ø	1 + 2	. . .-en
		1 + 2 + 3	. . .-en
		1 + 3	. . .-en
2	. . .-t	2 + 3	. . .-en
3		3 + 3	. . .-en

(1) a.   Josephine$_1$ likes her$_2$.
     b.   *Josephine$_1$ likes her$_1$.
     c.   Karen$_1$ likes herself$_1$.
     d.   *Karen$_1$ likes herself$_2$.

3.4. Relationship between pronouns as free morphemes and as bound morphemes

A final common (although probably not defining) feature of pronominal systems in spoken languages is that agreement systems generally emerge through grammaticalisation processes that begin with pronouns. Typically, over time, independent pronouns become cliticised onto lexical items such as nouns and verbs which then become grammaticalised into inflectional morphology (Corbett, 2006; Givon, 1976). Thus independent pronouns and agreement markers often share similar characteristics (e.g., phonology). However, pronouns and agreement markers often diverge over time such that their paradigmatic structure may differ. For example, Dutch independent pronouns have six different forms corresponding to three persons and singular/plural, while Dutch present tense suffixes have only two different forms – one for 2nd/3rd person singular and one for plural (all persons) – and first person singular has zero marking, as shown in Tables 1 and 2. Syntactic distribution between free and bound forms may also differ such that, for example, bound morphemes may occur with full NP arguments while free pronouns may not.

3.5. Pronouns: summary

Thus far we have seen that personal pronouns are inherently referential, typically associated with grammatical categories such as person and number, and often have a syntactic distribution different from anaphors such as reflexives and reciprocals. Finally, personal pronouns in spoken languages often become grammaticalised as clitics and/or inflectional agreement morphology.

Now that we have considered defining/typical characteristics of pronouns in spoken languages, we will consider characteristics of pointing gestures used by non-signers.

4. Characteristics of pointing gestures

Pointing gestures have not been studied in as much depth or across as many languages/cultures as pronouns have, but existing descriptions of pointing gestures allow us to consider them to some extent in terms of referentiality, paradigmatic structure, and syntactic distribution. Prototypical pointing is intentionally communicative, indicating direction, location, objects and/or people (Kita, 2003b). In terms of referentiality, it is clear that pointing gestures are not restricted to the 'here and now'. That is, referents of pointing gestures may be real or imagined (Kendon and Versante, 2003), concrete or abstract (McNeill, 1992, 2003; McNeill et al., 1993). The abstract use of space with pointing gestures is common, i.e. various meanings may be assigned to different locations in space and then those locations referred to

anaphorically by means of further pointing gestures (Gullberg, 1998; McNeill, 2003; McNeill et al., 1993). Furthermore, pointing gestures typically co-occur with, and importantly, are integrated with speech (Clark, 2003; Engle, 1998; Haviland, 2003; McNeill, 1992), although the specific nature of the integration in terms of synchrony of pointing gestures with particular grammatical elements (i.e. their syntactic distribution) is not well understood. In terms of reference, pointing gestures can serve to disambiguate reference in speech, but they can also be ambiguous themselves (Butterworth and Itakura, 2000).

In terms of form, a typical pointing gesture projects a vector from a body part (e.g., an extended index finger).[9] Various studies have shown that, although there is little evidence for paradigmatic structure to the degree that we find in pronominal systems, the form of manual pointing gestures (e.g., handshape, orientation, movement) may vary with their function. Kendon and Versante (2003) have argued that Neapolitan pointing gestures vary in form depending on specificity and concreteness, and a similar claim is made for pointing produced by British English speakers (Kendon, 2004). For Tzotzil (Mayan) speakers in Zinacantan (Chiapas, Mexico), Haviland (2003:161) suggests that a flat-handed pointing gesture indicates direction while a gesture using an extended index finger indicates an individual referent, and that the height of the pointing gesture gives information about proximity. Enfield et al. (2007) argue that Lao speakers in rural Laos use larger pointing gestures (i.e. the whole arm) to distinguish foregrounded information versus smaller pointing gestures articulated only with the hand, without arm/elbow outstretched, for backgrounded information. Wilkins (2003) notes that speakers of Arrernte (North Central Desert, Australia) use different pointing gestures to distinguish singular from plural referents (whereas spoken Arrernte has no obligatory number marking in noun phrases). Some of these distinctions such as proximity/distance and singular/plural have been noted by others as well (e.g., Birdwhistell, 1966; Eco, 1976). Furthermore, in data from dyadic interviews on American television, Cooperrider (2011) found a weak association between handshape and first person personal versus possessive pronouns, with the possessives slightly favouring co-occurrence of a flat rather than index handshape gesture to the self.

To summarise, pointing gestures are intentionally communicative and are used to indicate direction, location, and/or objects. They may refer to real or imagined referents, they co-occur with and are integrated with speech, and their form may vary with their function.

5. Pronominal signs compared with pronouns and pointing gestures

We now turn to a comparison of pronominal signs in sign languages with (a) (spoken language) pronouns and (b) pointing gestures used by non-signers. Specifically we consider referentiality, paradigmatic structure, participant roles (including person), number/plurality, grammaticalisation, and syntactic distribution.

5.1. Referentiality

Given that both pronouns and pointing gestures are communicative and referential, it is perhaps unsurprising that pronominal signs in sign languages are too. Pronouns, pointing gestures and pronominal signs are all dissociated from their referents and can therefore function as shifters. Even though pointing gestures and pronominal signs may both, for example, point towards the chest of the speaker/signer to represent a first person argument, this form can be associated with a referent other than the speaker/signer (see section 5.2.1 below). If we extend beyond personal, local reference, all three forms can indicate objects. All three can be ambiguous in reference. Although previously researchers have claimed that pronominal signs are referentially unambiguous and that this is a modality difference between pronominal reference in signed and spoken languages (Emmorey and Lillo-Martin, 1995; Lillo-Martin, 1997; Lillo-Martin and Klima, 1990; Lillo-Martin and Meier, 2011a; Neidle et al., 2000), there is insufficient evidence to support this claim. On the contrary, in a recent lexical frequency study of BSL based on 25,000 tokens, 789 pointing signs were identified as ambiguous in reference and/or function (Cormier et al., 2011).

Furthermore, all three can indicate real or imagined referents. Importantly, this latter characteristic initially provided the basis for arguing that pronominal signs have the same status as spoken language pronouns (and are different from pointing gestures), since it has been assumed by some sign language scholars that pointing gestures only indicate specific, present referents (cf. Malaia and Wilbur, 2010).

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[9] Any body part which projects a vector can point, including the arm/hand but also the head, foot (Cooperrider and Núñez, 2009) and even "metaphorical body parts such as imagined 'eidola' beaming from the eyes" (McNeill, 2003:293). In fact, eyegaze with or without other pointing gestures plays an important role in pointing; gaze may be directed towards the target direction, location or object, and/or there may be mutual gaze between the gesturer and the addressee (Clark, 2003). In some cultures lip pointing is also common (Enfield, 2001; Sherzer, 1973).

5.2. Paradigmatic structure

Pronouns in spoken languages have paradigmatic structure, i.e. their form systematically varies with function. Form may vary with function in pointing gestures as well, although it is unclear how systematic this is. In this section, we focus on paradigmatic structure associated with person/participant roles and with number/plurality in pronouns, pointing gestures and pronominal signs. We begin with the marking of participant roles in sign languages, which has been the subject of some debate. As we will argue later, much of this debate reflects the fact that pronominal signs appear to pattern more like pointing gestures than pronouns in terms of participant role marking.

5.2.1. Person/participant roles in sign languages

The earliest work on the pronominal system of ASL assumed a three-person system (Friedman, 1975; Padden, 1983), similar to that found in many spoken languages. The claim was that a point to the addressee was a second person pronoun, a point to a non-addressed participant (or location associated with a non-addressed participant) was a third person pronoun, and a point to the signer's body was a first person pronoun. This analysis was later considered problematic since there is no finite, listable set of non-first person forms or location values (e.g., Meier, 1990; Rathmann and Mathur, 2002), a characteristic shared with pointing gestures. Although both pointing gestures and ASL pronominal signs have a fixed location for first person (the chest), this is not true of non-first person pointing behaviour, which may be directed towards a large and varying number of locations in the space around the signer/speaker. This presents the 'listability' problem of a theoretically infinite number of 'second person' or 'third person' location values (i.e., locations associated with referents other than the signer) that can be assigned to a pronominal sign. This observation led to other proposals that moved away from a person analysis and instead analysed the locations associated with pronouns and agreeing verbs as variables ('loci') whose content derives from discourse (Cormier et al., 1999; Lillo-Martin and Klima, 1990). Similarly, Janis (1995) proposed a locative analysis of agreement (with no reference to person) in which nominals are assigned locative case and verbs agree with these locations. More recently, other analyses have attempted to address the 'listability' problem by postulating an abstract person morpheme, which contains or makes connection with some kind of gestural component (e.g., Lillo-Martin and Meier, 2011a; Rathmann and Mathur, 2002), although the details of these relationships between person morphemes and gestural elements are not entirely clear.[10]

Following on from earlier work claiming a three-person distinction in sign languages as noted above, Berenz (2002), Alibasic Ciciliani and Wilbur (2006) and Meurant (2008) have argued that cues other than location values, such as alignment or misalignment of eyegaze with head, chest and hand orientation, systematically distinguish second versus third person in the sign languages of the American, Brazilian, Croatian and French Belgian deaf communities. However, similar patterns have been found in pointing gestures used by non-signers (see, for example, Kita, 2003a), so any analysis arguing for grammatical second versus third person marking would need to take this into account. Furthermore, in an eye-tracking study with ASL signers, Thompson (2006) found no consistent patterns in eyegaze behaviour distinguishing pronominal signs directed towards addressees from pronominal signs directed to non-addressed participants, thus going against claims noted above about an eyegaze-based distinction between second and third person forms in pronominal signs, at least in ASL.

An alternative analysis, initially proposed by Meier (1990), is that sign languages such as ASL show no person distinctions among non-first person pronouns, but do have distinct first person behaviour. This analysis is based on a number of arguments. First, as mentioned above, first person pronominal signs are specified for a particular place of articulation (in ASL and many other sign languages, the signer's chest). This is unlike pronominal signs referring to addressees and non-addressed participants, which are not directed towards fixed locations. Second, first person pronominal signs, as discussed above, do not necessarily always refer to the signer. In quotative/mimetic constructions in sign languages (known as 'role shift', or 'constructed action'), a first person pronominal sign may refer to the quoted individual or his/her actions, rather than the signer him/herself. Third, Meier notes that ASL has an idiosyncratic first person plural form which is not directed towards referents (or locations associated with referents) but consists of two points towards the signer's own chest, as opposed to singular and 'second'/'third' person pronominal signs which essentially point towards locations associated with their referents. Currently, a two-person system (first and non-first) is widely accepted by many researchers working on a variety of sign languages (e.g., Emmorey, 2002; Engberg-Pedersen, 1993; Farris, 1998; Nilsson, 2004; Rathmann and Mathur, 2002; Todd, 2009).

Others such as Liddell (2000a,b, 2003) and McBurney (2002) have argued that pronouns are composed of discrete morphemic elements (e.g., handshape) which combine with gestural elements (e.g., location/direction). Liddell (2003)

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[10] Rathmann and Mathur (2002) and Lillo-Martin and Meier (2011a) attempt to provide evidence for such analyses from agreement/indicating verbs (e.g. idiosyncratic forms, object marking on verbs) but we do not find their proposals convincing.

adopts this gestural analysis for non-first person reference. McBurney (2002) explicitly applies this gestural analysis to argue that person marking is lacking altogether in sign languages such as ASL.

There are other ways of considering Meier's (1990) arguments for first person. Firstly, Meier notes that ASL has a phonologically specified, stable location for first person forms (i.e., the chest). We offer an additional alternative explanation – that the locations of 'first person' pronominal signs are no different to pointing gestures that refer to oneself. Such gestures for referring to the self in many (especially Western) cultures are directed towards the gesturer's chest (Morris, 1994), which may explain why a point to the chest is the first person singular pronominal form in so many sign languages. There are exceptions, however. Meier and Lillo-Martin (2010) note that the first person pronoun in Japanese Sign Language may be a point to the nose (Smith and Ting, 1979). Interestingly, however, the same form is used by Japanese non-signers as a gesture for "me" (Poyatos, 2002:26). Thus, although the Japanese Sign Language point to the nose has been used as evidence of linguistic first person marking, the fact that this is also the gesture used by Japanese non-signers to refer to the self suggests that the location towards which signers point to refer to the self is culturally rather than grammatically determined, and may not serve to distinguish pronominal signs from pointing gestures.

Meier (1990) also argues for first person based on how the pronominal sign ME functions within role shift. That is, within role shift (as mentioned above, a discourse strategy used for direct quotation or reported action marked usually by a change in eyegaze, facial expression, head position and/or body position), the pronominal sign ME refers not to the signer but to the quoted person, as in (2a).[11] This argument hinges on the fact that the pronominal sign ME functions as a shifter, as in an English version of (2a), shown in (2b).

(2) a.   BOY SAY <LOOK-FOR ME>rs:boy (BSL)
     b.   The boy said, "Are you looking for me?" (English)

McBurney (2002:361) argues that this is not sufficient evidence for first person by assuming Liddell's (2000b) theory of mental spaces in sign languages: "Role playing or not, indexes still point to entities within a grounded mental space, and referents are identified not through abstract person features, but through gestural deixis." Further evidence supporting McBurney is found in the use of gesture by non-signers within direct quotation. Clark and Gerrig (1990) consider quotations to be types of demonstrations. Such demonstrations include representations of linguistic utterances (the type that are normally considered to be examples of direct speech) but also non-linguistic sounds and gestures. One can easily imagine a hearing non-signer uttering (3) while also producing a pointing gesture towards herself. The pointing gesture produced during the quotation would refer not to the speaker but to the boy being quoted. Indeed, gestures which point to the self used with second and third person referents in English have been documented by McClave (2001) and Cooperrider (2011). Thus this particular function of shifting reference appears to be shared across pronominal signs, pointing gestures, and pronouns (as shown in 2a and 2b above, and 3 below).[12]

(3)   The boy said "Are you looking for me?"<pointing to self>.

Meier's final argument highlights the idiosyncratic form of the first person plural pronominal sign WE in ASL which involves sequential points to either side of the signer's chest (as shown in Fig. 2) rather than pointing to locations associated with the referents involved. Similar forms produced at the signer's chest that do not point to other participants have been documented for other sign languages as well, including BSL (Cormier, 2007), Italian Sign Language (Radutzky, 1992), South African Sign Language (Penn et al., 1992), Hong Kong Sign Language (Tang, 2007), and Israeli Sign Language (Savir, 1992). For these languages, the first person plural form WE could be construed as evidence for a grammatical first person category distinct from non-first person in the plural.[13]

Other sign languages such as Indo-Pakistani Sign Language (IPSL) and Kata Kolok (a village sign language used in Bali, Indonesia) appear not to have a lexicalised first person plural pronominal sign. Kata Kolok uses a series of points to

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[11] As is conventional in the sign language literature, signs are glossed in small caps. Hyphens are used to join English words in cases where more than one English word is needed per sign. Pointing signs are glossed as INDEX. Subscripts with INDEX (e.g. INDEXa or INDEXb) indicate locations in space. Role shift is indicated with angled brackets with the referent identified afterwards as a subscript. Unless otherwise specified, glossed examples are from BSL.

[12] This could mean that this function does not rely at all on grammatical first person marking or it could mean that pointing gestures used by non-signers are more systematic than previously assumed (cf. "emerging morphosemantics" in pointing gestures, Kendon, 2004:224).

[13] A study of pointing gestures used by non-signers in first person plural contexts could help shed light on whether having a lexicalised non-indexic form is enough evidence to argue for a first person category in the plural for some sign languages. The few studies which have examined plural pointing gestures (specifically in first person plural contexts) suggest that such gestures are not very common and when they are used, may point to any of the included referents within the first person plural context (Cooperrider, 2011; Zwets, 2009).

Fig. 2. ASL pronoun WE.

the included referents for plural pronominal reference, so first person plural reference is expressed with a point to the signer followed by points to the other referents rather than a lexicalised first person plural form (De Vos, 2012; Marsaja, 2008). IPSL has a 'transnumeral' pronominal sign (an extended index finger pointing sign) which can be used for singular and plural; a point towards the signer's chest can refer to the signer or the signer plus others, depending on the context. McBurney (2002) uses the existence of this transnumeral form in IPSL to argue against person distinctions, claiming that if there were a grammatical difference between first and non-first person in IPSL, then one might expect that number marking would also reflect first/non-first distinctions and goes on to argue against first/nonfirst distinctions across all sign languages in general. We agree with McBurney that there is insufficient evidence to posit a first/non-first distinction in sign languages which appear to lack a lexicalised first person plural pronominal sign, such as IPSL (and also Kata Kolok) but would argue that the lexicalised first person plural pronominal sign in sign languages such as BSL and ASL constitutes good evidence for a distinction between first and non-first person in the plural. However, given the arguments above, we see no convincing evidence for a first/non-first distinction in the *singular* for pronominal signs in any sign language described to date.

The reason why a first person plural form becomes lexicalised in some sign languages (in contrast to the singular) is likely related to the semantics of first person plural; as noted above in section 3.2, first person plurals inherently involve conjunction rather than plurality. However, even non-first person plural marking may affect the way in which pronominal signs function as pointing signs. We explore plural marking next.

5.2.2. Number and plurality

Just as plural pronouns in spoken languages often involve conjunction (which emphasises differences between referents) rather than plurality (which emphasises similarities between referents), so too do plural pronominal signs in sign languages. For example, the BSL first person plural pronoun WE (shown in a two-handed form in Fig. 3c; a one-handed form is also possible), and number-incorporated plural forms such as THREE-OF-US (Fig. 3d) involve the signer plus other second/third person referent(s), not multiple speakers.[14] However, plural pronominal signs also have a pointing function and thus display some characteristics that are different from plural pronouns in spoken languages. For instance, in studies on plural pronominal signs in ASL and BSL, Cormier (2005, 2007) found that plural pronominal signs have less of a pointing function than singulars. That is, plurals generally point less precisely to their referents than singulars, and the higher the number of referents, the lower the level of indexicality. For example, dual pronominal signs such as TWO-OF-US in Fig. 3a are indexic (i.e. point to their referents) to a similar degree to singular pronominal signs. However plural forms such as those shown in Fig. 3 are less indexic – that is, they point to their referents less directly – than singular pronominal signs.

Corpus data have also shown some systematic differences in palm orientation between singular and plural pronominal signs in BSL. Previous researchers have claimed different palm orientations for different functions of pointing in several

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[14] It is unlikely that number-incorporated forms such as THREE-OF-US/YOU/THEM and FOUR-OF-US/YOU/THEM should be considered to correspond to trial and quadral marking that occurs in some spoken language pronouns. McBurney (2002) argues that a larger derivational system of number incorporation exists for many sign languages across several semantic domains beyond pronominals including time, money and age. However, it is also possible that these signs are number signs which take on pronominal and spatial properties. This interpretation seems feasible for pronominal uses of numbers THREE and up, in contrast to the dual pronominal sign for which there is evidence of grammatical marking; at least in BSL and ASL, the dual form has a different movement than the number-incorporated pronominal signs, its indexicality is different (it points to both of its referents more precisely than other number-incorporated pronominals), and (in ASL) the dual form uses a variant of the handshape used in the numeral TWO (Cormier, 2007).
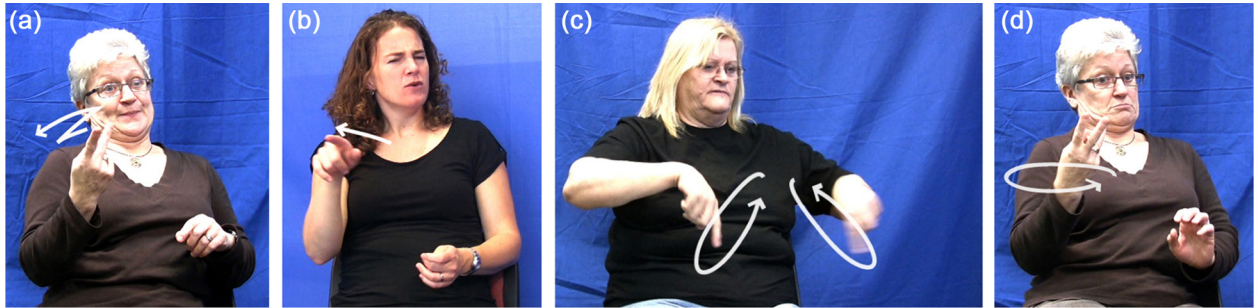
Fig. 3. Plural pronominal signs (BSL). (a) TWO-OF-US, (b) YOU (pl), (c) WE (two-handed version) and (d) THREE-OF-US.

sign languages. For instance it has been noted for several sign languages that nominal points (e.g., pronominal signs and determiners as in (4a) and (4b)) are produced with the palm facing sideways, while adverbial points (specifically, locative markers as in (5)) are produced with the palm facing down (e.g., Engberg-Pedersen, 1993; Pfau, 2010).

(4)   Nominal pointing signs
   a.   INDEX$_a$ NOT-LIKE ICE-CREAM
         'S/he doesn't like ice cream.'
   b.   BOY INDEX$_a$ NOT-LIKE ICE-CREAM
         'The boy doesn't like ice cream.'

(5)   Adverbial pointing sign
          BEEN FIND KEY INDEX$_a$
          'I found my keys there.'

However, Fenlon et al. (2013) report that, in a dataset of 646 BSL non-first person pronominal and locative signs from 211 deaf BSL signers, plural pronominal signs pattern differently from singulars in palm orientation. Singular pronominal signs and determiners favoured palm sideways orientation, while plural pronominal signs and adverbials favoured palm down orientation.[15] Thus in this dataset, plural pronominal signs pattern with adverbials rather than with other nominal pointing signs (i.e. singular pronominal signs and determiners).

To summarise, studies have shown that plural pronominal signs have less of a pointing character than singulars in BSL and ASL, and that there are systematic differences in palm orientation between singular and plural pronominal signs in BSL. To what extent might these same patterns might be found in pointing gestures?

5.2.3. Paradigmatic structure in pointing gestures?

As noted above in section 4, some studies have shown that the form of pointing gestures (including handshape, palm orientation, movement of hands, and/or distinctive movements of other body parts) may vary between different pointing functions, including singular/plural distinctions. However, it is unclear just how productive and systematic these patterns are within or across cultures. More research on pointing gestures produced by a variety of language users and cultures is needed.

5.3. Comparing grammaticalisation

As noted above in section 3.4, agreement systems in spoken languages generally emerge by grammaticalisation processes in which pronouns begin as free morphemes and change over time to become clitics and then bound morphemes on nominals and verbs (Corbett, 2006; Givon, 1976). There is no evidence that agreement/indicating verbs in sign languages are the result of the fusion of pronoun and verb (Schembri and Cormier, 2009) as in grammaticalisation processes in spoken languages. Pronominal signs and agreement/indicating verbs instead involve similar uses of gestural space. Although there is abundant evidence of assimilation in pronominal signs (e.g., Fenlon et al., 2013), it is not

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[15] These patterns pertain only to pronominal signs directed away from the signer ('non-first person'). Pronominal signs directed towards the signer were not included in the analysis as motoric factors affect orientation for these signs.

clear that, in all cases, we see evidence of intermediate steps (e.g., cliticisation) as there tends to be with classical processes of grammaticalisation.[16] For example, different first person object forms of agreement/indicating verbs in BSL, such as GIVE ('X gives me'), REMIND ('X reminds me') and LOOK-AT ('X looks at me') are directed towards different parts of the body. If these verb forms were grammaticalised combinations of a verb and first person pronominal sign, it would be expected that they would all be directed towards the signer's chest, i.e. the location of first person pronominal signs. This is true for GIVE ('X gives me') but not for REMIND ('X reminds me') and LOOK-AT ('X looks at me') which are directed towards the signer's shoulder and face, respectively. Furthermore, new BSL indicating verbs have emerged in the last decade (e.g., SEND-TEXT-MESSAGE) which have never been documented as occurring in an intermediate stage in which the pronominal sign was fused to the verb.

As has been noted previously, gesture taking on linguistic properties (i.e. gesture becoming language) is not quite the same process as lexical items becoming grammaticalised in spoken languages (i.e. an already-linguistic element becoming more "linguistic" – i.e. grammaticalised into morphemes) (Cormier et al., 2010). Nevertheless, it might be argued that pronominal signs in sign languages represent grammaticalised forms of locative pointing gestures: indeed, this has been tentatively claimed by Pfau and Steinbach (2006) for sign languages generally, and also by Senghas and Coppola (2010) with regard to the emergence of pronominal signs in Nicaraguan Sign Language.[17] If this were the case, then one would expect to see a number of key changes in the phonology, morphosyntax and semantics as pointing gestures grammaticalise into pronominal signs, in keeping with what is found in grammaticalisation processes more generally (Hopper and Traugott, 2003).

First, grammaticalised pointing ought to be phonologically reduced compared to the original pointing gesture. Indeed, Fenlon et al. (2013) note that pronominal signs in the BSL Corpus data appear to be shorter in duration relative to adverbial locative pointing signs, and they show greater assimilation effects (i.e., the 1-handshape which occurs in the citation form of singular pronominal signs is more likely to assimilate to the handshape of a neighbouring sign which may have any number of fingers extended). Unfortunately, there are no data comparing non-signers' pointing gestures for indicating locations with those for tracking referents in discourse, although recent research suggests that pointing gestures used to refer to oneself show variation in hand configuration (i.e. handshapes other than the prototypical 1-handshape) similar to those found in sign languages (Cooperrider, 2011). Second, pronominal signs should be more obligatory elements than pointing gestures. Certainly, frequency of use of pronominal signs in sign languages does appear to be a distinguishing feature when compared to the less frequent use of pointing gestures by non-signers (Cooperrider, 2010; Cormier et al., 2011; Johnston, 2012; Zwets, in preparation). Third, pronominal sign usage should involve semantic bleaching, as meaning becomes more abstract and grammatical. Some (e.g., Senghas and Coppola, 2010) have argued that the move from gestural pointing at referents in real world locations to the more abstract uses of pointing we see in sign languages (in which indicating arbitrary locations can be associated with absent, imagined or metaphorical referents) might reflect this aspect of grammaticalisation. Similarly, Zeshan (2000) notes that in Indo-Pakistani Sign Language pointing signs directed to high locations refer to institutions, cities and countries while those directed to low locations refer to animate referents. Adult non-signers do, however, make use of abstract pointing gestures (e.g., McNeill, 1992), as noted in section 4, and similar patterns in the use of height according to different functions have been documented (Enfield, 2009; Haviland, 2000), so it is not clear if these patterns represent a significant difference between pointing gestures and pronominal signs.

5.4. Syntactic distribution of pronominal signs

One characteristic of pronominal signs that perhaps makes them most similar to pronouns in spoken languages is their syntactic distribution. Pronominal signs serve as verbal arguments (as in (6)) and they may substitute for noun phrases (thus (7a) can be used instead of (7b) or (7c)). They also have different distributions from noun phrases in some cases, as in subject pronoun copy, shown in (8), which has been documented in various sign languages. Furthermore, pronominal signs and reflexives have different distributions in ASL (Meier and Lillo-Martin, 2010; Padden, 1983), as shown in (9). Under a generative account, pronominal signs (like pronouns) are subject to binding conditions. Levinson (1987, 1991) argues that these patterns can also be explained by general pragmatic principles. Pointing and other gestures clearly

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[16] Nevins (2011), in a commentary on Lillo-Martin and Meier (2011a), proposes that the directionality of agreement/indicating verbs is due to cliticisation synchronically, but we maintain there is no evidence that there have been intermediate steps showing the progression from verb + pronoun to verb marking agreement – only the two endpoints.

[17] The patterns that we describe in this section assume that grammaticalisation processes in sign languages have the same characteristics as grammaticalisation in multimodal speech, including processes that begin with lexical items (the classical sense of grammaticalisation in spoken languages) and also processes that begin with non-lexical material such as visible gestures or non-lexical vocalisations including prosody and which may not have gone through a lexical stage (Heine and Kuteva, 2007; Wichmann, 2006).

have pragmatic functions and are therefore subject to pragmatic principles (e.g., Enfield et al., 2007; Goodwin, 2000; Kelly et al., 1999; Kita, 2009).

(6)   Pronominal signs as verbal arguments
        INDEX$_a$ NOT-LIKE INDEX$_b$
        'S/he$_a$ doesn't like him/her$_b$.'

(7)   Pronominal signs substituted for noun phrases
     a.   [INDEX$_a$]$_{NP}$ NOT-LIKE ICE-CREAM
          'S/he$_a$ doesn't like ice cream.'
     b.   [INDEX$_a$ BOY]$_{NP}$ NOT-LIKE ICE-CREAM
     c.   [YOUNG BOY]$_{NP}$ NOT-LIKE ICE-CREAM

(8)   Subject pronoun copy
     a.   [INDEX$_a$]$_{NP}$ NOT-LIKE ICE-CREAM [INDEX$_a$]$_{NP}$
          'S/he$_a$ doesn't like ice cream.'
     b.   *[INDEX$_a$ BOY]$_{NP}$ NOT-LIKE ICE-CREAM [INDEX$_a$ BOY]$_{NP}$
     c.   *[YOUNG BOY]$_{NP}$ NOT-LIKE ICE-CREAM [YOUNG BOY]$_{NP}$

(9)   Pronominal signs and reflexives
     a.   MOTHER LIKE INDEX$_a$
          'Mother likes her/him/it.'
          *'Mother likes herself.'
     b.   MOTHER LIKE SELF$_a$
          'Mother likes herself.'
          *'Mother likes her/him/it.'

Pointing gestures can, in certain cases, be used by non-signers to fill the same function as a pronoun, that is, supplementing and also substituting for deictics such as pronouns (Haviland, 1993). Clark and Gerrig (1990) give an example produced by a nine-year-old boy in the noise of a waterfall, in which an entire clause is replaced by gestures, first a pointing gesture and then a gesture demonstrating taking a photo, as shown in (10). It is also common for speakers to answer questions with just a pointing gesture without any speech, where the pointing gesture could be construed as substituting for a noun or pronoun, as in (11). In certain contexts, it may even be appropriate to stop talking and use some kind of pointing gesture instead of a pronoun, as in (12). However these cases are generally pragmatically marked in some way – that is, there is likely a reason for a gesture instead of a pronoun (e.g., the noise prevents speech as in (10), or a pronoun alone would not suffice to identify the correct referent as in (11), or the speaker may be trying to be subtle as in (12)).

(10)   Herb! [points to Eve] + [puts an imaginary camera to his eyes and clicks the shutter].

(11)   Q: Who are you looking for?
        A: <pointing gesture to person>

(12)   Are you looking for <points head in direction of a person>?

Although there may be cases such as these where pointing gestures are used instead of pronouns, it seems that English speakers, at least, do not regularly stop an utterance, use a pointing gesture instead of using a pronoun, and then finish the utterance. Instead, pointing gestures in non-signers appear primarily to be used as co-speech gestures, i.e. simultaneously with speech (e.g., Enfield, 2009; McNeill, 1992). Overall, then, in terms of syntactic distribution, pronominal signs are clearly more like pronouns than pointing gestures.

There are also many other uses of pointing in sign languages and some of these may be more similar to pointing gestures used by non-signers in terms of syntactic distribution. For example, pointing signs can be used as part of pointer buoys, constructions in which the non-dominant hand points at a location associated with some important element in discourse while the dominant hand signs the primary content (for ASL examples of pointer buoys, see Liddell, 2003: 250–260). Given that pointer buoys are used simultaneously with other lexical signs, it could be that pointer buoys are a closer analogue to co-speech pointing gestures than pronominal signs.

To summarise, pronominal signs function similarly to both pronouns and pointing gestures in terms of referentiality. Pronominal signs overall appear to share more characteristics of pointing gestures than pronouns in the marking of participant roles. In terms of expression of number/plurality, systematic differences between singulars versus plurals and

Table 3
Summary comparison of pronominal signs with pronouns and pointing gestures.

	Pronominal signs are like pronouns	Pronominal signs are like pointing gestures
Referentiality	✓	✓
Participant roles	✗	✓
Number/plurality	✓	?
Syntactic distribution	✓	✗
Grammaticalisation	?	?

? = Further evidence needed to confirm.

differences across sign languages suggest that pronominal signs are more similar to pronouns than pointing gestures, although further evidence from pointing gestures referring to multiple referents is needed. Pronominal signs are clearly more similar to pronouns in syntactic distribution than pointing gestures. Finally, there is limited evidence that pronominal signs participate in grammaticalisation patterns in the same way that pronouns in spoken languages do. These patterns are summarised in Table 3.

6. What next?

There is much research that can help shed further light on similarities and differences between pronominal signs, pronouns, and pointing gestures, for example, crosslinguistic/crosscultural patterns. There is immense crosslinguistic diversity in the phonology and morphosyntax of pronouns across spoken languages (Cysouw, 2003). There is some evidence of specific patterns of pointing gestures within particular cultures (Kita, 2003c; Wilkins, 2003), but there has been little crosscultural comparison of pointing gestures. The high degree of crosslinguistic similarity with pronominal signs compared to pronouns could reflect the lesser tendency of grammatical categories to be marked on pronominal signs, and/or reflect the similarity between pronominal signs and pointing gestures.

Indeed, there have been some differences identified among sign languages in the ways that pronominal signs point, in addition to the differences in indexicality of first person plural pronouns in ASL and BSL as noted above. For instance, Marsaja (2008) and De Vos (2012) report that, unlike many sign languages, Kata Kolok (described above in section 5.2.1) uses pointing for real-world locations but prefers to establish locations for absent referents on the non-dominant hand rather than pointing to locations in space. As noted above in section 5.3, Senghas and Coppola (2010) argue that locative pointing gestures may have developed into pronominal signs as verbal arguments in Nicaraguan Sign Language. It is clear that more crosslinguistic research is needed on pronominal signs, particularly in non-European sign languages, village sign languages, emerging sign languages and/or other sign languages used by deaf communities outside of urban areas.[18]

Finally, it is important to note that pointing gestures of all types typically co-occur with speech and therefore referential information may be conveyed by speech and pointing gestures together. Studies suggest that pronouns and pointing gestures do not necessarily co-occur simultaneously. For instance, Cooperrider (2011) found that in a corpus of 8 hours of data from television, only 3% of 'I' tokens and 6% of 'me' tokens co-occurred with a pointing gesture to the self, and 48% of self-points occurred when the spoken pronouns were produced with contrastive stress, suggesting that pointing to the self is not very common and occurs in pragmatically marked contexts. Still, it is clear that speakers use pointing gestures with speech (even if not simultaneously with pronouns specifically) and that pointing gestures and speech form a package of referential content (e.g., Enfield, 2009). The extent to which pointing gestures and speech convey the same, complementary, or different referential information is still not well understood. More research on pointing and speech as a package would also help us understand pronominal and other types of pointing in sign languages as well.

7. Discussion

Given the history of sign language linguistics, it is not surprising that the earliest work on pronominal signs in sign languages attempted to find parallels with spoken language pronouns. This work contributed to the (then) much needed body of evidence to support the idea of signed languages as human languages. However, fairly recent research showing

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[18] Evidence from child development may also help shed light on some of these issues. Indeed, a comparison between the acquisition of pronominal signs, acquisition of pointing gestures with speech, and acquisition of pronominal reference in spoken languages would be very useful; we leave this for future research.

systematic patterns in pointing gestures (e.g., Kita, 2003c) allows us to now reconsider some of the earlier assumptions about pronominal signs as being completely equivalent to spoken language pronouns. Pronominal signs clearly share canonical properties of both pronouns and pointing gestures.[19]

The fact that pronominal signs share core properties of both pronouns and pointing gestures has important implications for our understanding of linguistic diversity and language universals. If we only compare pronominal signs with pronouns in spoken languages, then we indeed find (as we have seen here) that pronominal signs share many characteristics of pronouns found in spoken languages. However, pronominal signs are quite different in how they mark participant roles compared to pronouns in spoken language. This remains true whether arguing for a three person system, a two person system, or a system with no person but only spatial loci, because of the inherently gradient nature of spatial reference. By opening up the comparison to a different kind of referential system – in this case, pointing gestures – we can see more clearly which characteristics are shared by which systems. When we consider that marking of participant roles is a characteristic shared with pointing gestures and not with spoken language, then the "problem" of person in sign languages simply vanishes. This is consonant with the reasoning behind those analyses of pronouns (and also agreement/indicating verbs) which argue that these signs are simultaneous fusions of language and gesture (Liddell, 2003; McBurney, 2002).

Such an approach is problematic for those linguistic theories which assume a sharp division between central aspects of language (such as grammar) and other aspects of human behaviour (e.g., Newmeyer, 1998). In such models of the human language capacity, the core properties of language are seen as autonomous and independent from gesture, intonation, prosody and other so-called 'paralinguistic' elements. Indeed, under "syntacto-centric" accounts (see Jackendoff, 2002 for a discussion of syntactocentrism), the fact that pronominal signs clearly behave like pronouns in terms of syntactic distribution might be considered sufficient to downplay any gestural component and analyse them as fully grammaticalised morphemes. But if language is seen to arise from and conform to the same general processes that drive other human behaviours, then such a sharp division between language and gesture is not needed (Kendon, 2008; Sweetser, 2007). Cognitive-functional theories of language take into account all aspects of natural language understanding and use. The types of processes that underpin language structure are not specific to language but are applicable in many cognitive domains – e.g., categorisation, chunking, analogy, and rich memory storage (Bybee, 2010). Under a cognitive/functionalist view, language and gesture can co-exist in the same structure (as in pronominal signs). Furthermore, this holds not only for the visual–corporal modality, but also traditionally 'paralinguistic' elements in the vocal-aural modality – e.g., prosody and intonation (Okrent, 2002). Indeed, when considering linguistic diversity and language universals, it is important that language is seen as a multimodal system (Cormier et al., 2010; Enfield, 2009; Levinson and Evans, 2010).

Interestingly, a growing number of sign language researchers, even those working within formalist approaches to linguistic theory, have adopted analyses in which there is some role for gesture within pronominal systems and other devices that exploit directionality and/or spatial reference within sign languages (e.g., Lillo-Martin, 2002; Lillo-Martin and Meier, 2011a,b; Rathmann and Mathur, 2002). It will be interesting to see how widely these analyses are accepted, given that formalists have claimed that syntax is autonomous from other aspects of cognition and communication (e.g., Newmeyer, 1998). An account that includes a role for gesture is less problematic for those working within cognitive/functional frameworks.

In addition to implications for linguistic theory, this research also raises questions of the relationship of language structure to language age. In contrast with sign languages, spoken languages are not seen to arise independently, spontaneously and rapidly. Some believe that spoken language only emerged once and that all spoken languages are descended from a single ancestor (Ruhlen, 1994). In general, the spoken languages we see today are all assumed to have histories of many thousands of years (or to be creolised from older languages). Sign languages, on the other hand, clearly arise spontaneously, and rapidly, and in many cases, independently of other languages. Furthermore, the oldest sign languages in use today are likely to be no more than several centuries old. It may be that as sign languages mature, gestural elements such as pointing may undergo further grammaticalisation such that pronominal signs take on more linguistic properties over time. However, grammaticalisation processes in sign languages (as indeed in spoken languages) are not necessarily unidirectional (Haspelmath, 2004; Janzen, 2012). In addition, it may be that the sociolinguistic nature of signing deaf communities, in which a significant proportion acquire sign languages as second languages or as delayed first languages, may mean that such sign languages are inherently 'creoloid' and grammaticalisation processes never fully unfold (Fischer, 1978; Trudgill, 2011). Considering both signed and spoken languages in terms of historical language change will give us a clearer picture of grammaticalisation processes as they occur in human language generally.

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[19] This is not surprising if we consider the shared function of all three as symbolic indexicals (Enfield, 2009; Johnston, 2013).

8. Conclusion

The term 'pronoun' has been used (for the most part, uncontroversially) within sign language linguistics to refer to what we are calling pronominal signs. We have compared pronominal signs in sign languages with canonical features of pronouns used in spoken languages and with characteristics of pointing gestures accompanying speech. Such comparisons lead us to two complementary conclusions. Firstly, the features that make pronominal signs difficult to characterise morphosyntactically (e.g., how participant roles are expressed) are those features they share with pointing gestures and not with pronouns. Secondly, the features that make pronominal signs difficult to characterise gesturally (e. g., syntactic distribution) are those features they share with pronouns and not with pointing gestures. Therefore, it is clear that pronominal signs cannot be characterised exclusively either as pronouns, or as pointing gestures. The intermediate position occupied by pronominal signs indicates the relevance of sign language linguistic research beyond this specific subdomain of linguistics to linguistic theory more generally. Linguistic theories which view language as integrated with other aspects of human communicative behaviour can account for a strong role of gesture in language compared to formalist/nativist views of language. Furthermore, sign linguistic research calls for a need to consider the contrasting typological properties of spoken languages and sign languages and the fact that linguistic theory needs to take greater account of modality (Meier et al., 2002). The relationship between modality and linguistic form should be as important to linguists working with spoken languages as to sign linguists. Only sign language research can help to establish what the real universals of human language are and also to illuminate for all linguists how the instantiation of language in a particular modality shapes language itself.

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