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## Response: The apparent reorganization of gesture in the evolution of verb agreement in signed languages

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We thank Irit Meir for her commentary on our target article; her results add new substance to the discussion of directional verbs in signed languages that we and ten commentators began in the previous issue of this journal (Lillo-Martin & Meier 2011, and subsequent commentary). In our article, we concluded that directionality is a kind of linguistic person marking, but along with others (Liddell 2000, 2003; Rathmann & Mathur 2002) we have considered the physically-realized locations of (non-first) endpoints of directional verbs to be gestural. For example, the form of the ASL directional verb GIVE is phonologically specified, except for the endpoints of the path movement and the orientation of the fingertips, which are determined by the conceptualized locations of the verb's arguments (its subject and indirect object).<sup>1</sup> Other verbs, such as ASL TELL, have just one movement endpoint that is phonologically unspecified; the initial location of this verb is anchored to the chin, but the final location is associated with the referent of the grammatical object. Why do we and others assume that (non-first) locations involved in directionality are gestural? One reason is because the endpoint locations are not phonologically listable (Rathmann & Mathur 2002); that is, there is not a finite inventory of locations that can be used to mark agreement.

Meir reports data showing that, across three successive generations of ISL signers, verbs of transference have become directional. For members of the first

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<sup>1</sup> Following I. Meir's (2002) own analysis, the initial point of the path movement of a doubly-agreeing form of GIVE (e.g., <sub>s</sub>GIVE<sub>i</sub> 'he gave me') is associated with the source, whereas the terminal point is associated with the goal; the fingertips face toward the grammatical object and away from the subject. This allows her to explain the association between directionality and verbs of transference. For further discussion, see our target article (where our notational conventions are also discussed).

generation of Israeli signers, the endpoints of directional verbs were lexically specified; those endpoints were not available to point to the arguments of directional verbs (nor were they available to mark agreement between the verb and its arguments). With historical change, the endpoints of directional verbs have ceased to be fixed – they have lost their lexical specification – and instead have become free to point to locations associated with arguments of those verbs. Older signers do not show agreement; members of the youngest generation do. The surprising conclusion is that, with time and with the emergence of morphosyntactic processes that are agreement-like on our view and on that of Irit Meir, ISL verbs (or at least the endpoints of those verbs) have in some sense become more gestural, not less. They point more. Verbs such as GIVE can now point to two arguments, whereas for first-generation Israeli signers those verbs could point to no arguments. Engberg-Pedersen (1993) reports a similar historical trajectory across generations of users of Danish Sign Language.

Meir's account of the historical development of agreement contrasts with that presented by Pfau & Steinbach (2006; see also Steinbach 2011). Pfau & Steinbach speculate that agreement forms in sign languages derive from personal pronouns, which were themselves derived from demonstrative pronouns – a path similar to that taken in many spoken languages. In support of this position, Pfau & Steinbach point out that the locations used by pronominal pointing signs and the locations used in directional verbs are the same. Nevins's (2011) suggestion that directionality might be analyzed as cliticization is also consistent with this view.

To the best of our knowledge, it is true that the locations used for pronominal points and for directional verbs are generally the same. Yet, if those pronominal points are the basis for the directional modification of verbs, then the fact that verbs differ with respect to the height of their articulation (Liddell 1990; Schlenker 2011) whereas pronominal points are generally articulated within the same plane (a little above the waist) means that further historical changes must be postulated.<sup>2</sup> In addition, the so-called backwards verbs could only have developed after the grammaticalization process. In backwards verbs, the starting location of the verb is not the location associated with the argument (the subject) that would generally precede the verb (assuming SVO basic word order, as in ASL); the location associated with the subject is instead used as the verb's endpoint (see Figure 14 in Lillo-Martin & Meier 2011).

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<sup>2</sup> In our target article (Lillo-Martin & Meier 2011: 115), we propose that the locations of agreement verbs in the horizontal plane (x and z values) are determined by rule, but that height (y) is lexically specified. This may suggest one approach to the problem of how free pointing signs might be incorporated into verbs. However, this analysis must be worked out at a later date.

Given these considerations, it would be most useful to have more evidence regarding the actual path of development for signs involving heights other than the typical plane, and for backwards verbs. Such evidence might serve to distinguish the competing hypotheses regarding the historical development of agreement.

Under either analysis, the conclusion we draw from the historical data presented by Irit Meir is that, with time, the use of the categorical/discrete/digital elements within signs as well as the use of the gestural/continuous/analogic elements within those same signs can each become more systematic, perhaps in tandem. A similar argument was made in Meir (2002). With time and with changes across generations of emerging signed languages, verbs point more. In the emergence of Nicaraguan Sign Language (NSL) since 1977, second-cohort signers – especially second-cohort signers who had early sign exposure – showed an increase in the number of spatial modulations per verb. These second-cohort signers showed increased use of spatial modulations to achieve discourse coherence (Senghas & Coppola 2001). There is also evidence for the systematization of the free-standing points that are present within the NSL sign stream; later cohorts are more likely to use points as nominals, whereas the frequency of locative points holds steady across cohorts. Later cohort signers are also more likely to use a nominal-like point in construction with a verb (Senghas & Coppola 2011). Even within relatively mature signed languages such as ASL, non-directional signs can move into the class of directional verbs. In particular fingerspelling loans, such as N-O ‘no’ or F-B ‘feedback’, sometimes become nativized as directional verbs (e.g., SAY-NO-TO) that can mark, or point to, the locations associated with two arguments (Battison 1978; Padden 1998). The same phenomenon has been reported in other signed languages such as Australian Sign Language (Cormier, Tyrone, & Schembri 2008) and Taiwan Sign Language (Chen 2007).

In sum, what we may be seeing in ISL, Danish Sign Language, and perhaps many other sign languages as well, is a shift from globally iconic signs of transference that have presumptive gestural origins towards directional verbs with systematized gestural elements at each endpoint of the path movement. We may also be seeing a shift from holistically-organized signs that were largely mimetic to later forms with embedded sublexical gestural units.<sup>3</sup> At the outset, the endpoints of the directional path in ISL had no special significance; at the end of the process

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<sup>3</sup> Doubly-agreeing verb forms (e.g., ASL <sub>a</sub>GIVE<sub>b</sub>, ‘She gave him’) display a different kind of iconicity, one based on spatial relationships, rather than the mimetic qualities apparently true of verbs such as GIVE at the outset of the grammaticization path sketched by I. Meir (Meir, Padden, Aronoff, & Sandler 2007; also Meir 1982).

they do.<sup>4</sup> Moreover, at the end of this grammaticization process, pointing within verbs (or what we have termed ‘person marking,’ or more speculatively ‘agreement’) has clear syntactic consequences in signed languages, syntactic consequences that are manifest in word order, the use of auxiliary-like elements (in some signed languages), the position of negative signs, and the occurrence of null arguments. These syntactic consequences are similar to the correlates of rich agreement morphology in spoken languages. We trust that further research on signed languages will shed more light on these structures and on their historical development.

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<sup>4</sup> Fingerspelling loans arrive at the same resolution, but instead of starting out in gesture, their origins lie in manual representations of the local orthography that do not have the characteristics of typical signs, e.g., by virtue of the highly sequential organization of English orthography (Rathmann, Mathur, & Meier 2002).

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