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First Encounters: Repair Sequences in Cross-Signing

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Abstract

Most human communication is between people who speak or sign the same languages. Nevertheless, communication is to some extent possible where there is no language in common, as every tourist knows. How this works is of some theoretical interest (Levinson, 2006). A nice arena to explore this capacity is when deaf signers of different languages meet for the first time and are able to use the iconic affordances of sign to begin communication. Here we focus on other-initiated repair (OIR), that is, where one signer makes clear he or she does not understand, thus initiating repair of the prior conversational turn. OIR sequences are typically of a three-turn structure (Schegloff 2007), including the problem source turn (T−1), the initiation of repair (T0), and the turn offering a problem solution (T+1). These sequences seem to have a universal structure (Dingemanse et al. 2013). We find that in most cases where such OIR occur, the signer of the troublesome turn (T−1) foresees potential difficulty and marks the utterance with "try markers" (Moerman, 1988; Sacks & Schegloff, 1979) which pause to invite recognition. The signers use repetition, gestural holds, prosodic lengthening, and eyegaze at the addressee as such try-markers. Moreover, when T−1 is try-marked this allows for faster response times of T+1 with respect to T0. This finding suggests that signers in these "first encounter" situations actively anticipate potential trouble and, through try-marking, mobilize and facilitate OIRs. The suggestion is that heightened meta-linguistic awareness can be utilized to deal with these problems at the limits of our communicational ability.

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1. Introduction

1.1. Contact situations between sign language users: Cross-signing

The study of conversation between partners who have no shared language may at first seem an exercise in futility. However, Deaf[1] sign language users from different countries who do not share a common language, signed or written, are readily able to engage in such conversations, for instance during international events or when traveling. Such signed interactions, where communication emerges ad hoc between individuals without a shared language, have been designated "cross-signing" (Bradford, Sagara, & Zeshan, 2013; Zeshan, 2015). Importantly, cross-signing is distinct from International Sign, which can be considered a semi-conventionalized pidgin and has developed over a substantial time period as the main form of communication at international gatherings of Deaf people such as the congresses and events hosted by transnational organizations, including the World Federation of the Deaf or the European Union of the Deaf (Allsop, Woll, & Brauti, 1994; McKee & Napier, 2002; Supalla & Webb, 1995).

Cross-signing arises from the particular sociolinguistic situation of Deaf sign language users. Deaf people as a minority population use the visual-gestural mode of communication, while hearing people constitute the linguistic majority that relies on the auditory-vocal mode. There are relatively few hearing people who are keen on learning a sign language to communicate with Deaf people. As a result, there is a strong sense of kinship and shared identity among Deaf people internationally, commonly expressed as "Deaf like me" (Spradley & Spradley, 1985). For this reason, Deaf people who travel abroad tend to have a strong preference for interacting with other Deaf people. This study analyzes one of the central means used to create mutual understanding on the spot between in initial encounters between Deaf people of different countries.

Naturally, in conversation between two participants who have no shared language, communicative success cannot be presumed and communication trouble is frequent. All human communication involves metalinguistic awareness (as shown, e.g., by the choice of reference forms or linguistic register), but in these circumstances communication is by necessity metalinguistically rich as participants must strive to build meaning in a creative, local and collaborative manner to achieve mutual understanding. This involves a progressive series of steps towards increasing mutual understanding (Zeshan, 2015). An important aspect of this stepwise process is the function of *repair* mechanisms to address communication trouble, as well as the use of *try-markers*, which signal by their form the current signer's insecurity as to whether their addressee will be familiar with a particular form or referent (as in *the vegan restaurant?*, where rising intonation signals uncertainty about recognition).

As could be expected, repair sequences are common in these cross-signing interactions. In this study, we investigate how trouble is anticipated, recognized, and repaired by conversational partners. The study investigates such repair sequences capitalizing on insights from conversation analysis (CA), where repair sequences have been intensively investigated, albeit in situations involving a shared language (Sacks, Schegloff, & Jefferson, 1974; Schegloff, Jefferson, & Sacks, 1977; see also Dingemanse et al., 2015).

While work on the conversational infrastructure of signed languages has been sparse to date, initial reports suggest that despite potential differences between the auditory and visual language modalities, very similar turn-taking principles apply to signed languages as have previously been reported of spoken languages. This is, for instance, evidenced by the mechanisms that are in place to enable smooth turn transitions (Baker, 1977; Mesch, 2001), resolve overlap (Girard-Groeber, 2015; McCleary & de Arantes Leite, 2013), and optimize turn timing in signed conversations (De Vos, Torreira, & Levinson, 2015). In our view, CA methods are particularly well suited to the study of cross-signing as these interactions and the communicative strategies that feature in them are not easily understood outside the particularities of the sequential context in which they emerge.

1.2. Repairs in spoken and signed conversations

Within CA, *repair* denotes the operations participants use to address some trouble in communication (Schegloff et al., 1977). This includes "misarticulations, malapropisms, use of a 'wrong' word, unavailability of a word when needed, failure to hear or to be heard, trouble on the part of the recipient in understanding, [and] incorrect understandings by recipients" (Schegloff, 1987, p. 210). Repair is initiated by the speaker or the addressee; either way, repair is normally accomplished by the speaker of the trouble source (Schegloff et al., 1977).

The majority of repair actions (at least in spoken languages) are "self-initiated repair" (SR), that is, begun by the speaker of the trouble-source or repairable. Once initiated, there will usually be a repair solution, and the self-initiator is most likely to solve the problem. Less commonly, repair may be initiated by one participant, the recipient of the trouble-source, and completed by the other, the originator of the trouble, and the resulting sequence is known as "Other-initiated repair" (OIR) (Schegloff et al., 1977). The OIR sequence has three basic steps: the trouble source (T−1), the repair initiator (T0), and the repair solution (T+1) (Dingemanse et al., 2015). Three basic types of repair initiators have been attested across a range of languages: *open class*, for example, "sorry?", "huh?" or "what?" (where the exact nature or location of the trouble is unspecified); *restricted requests*, for example, category-specific questions ("who?"), or repeating the trouble-source turn portion that was not understood (where the locus of the trouble is identified), and *restricted offers*, which offer a candidate understanding, for example, "do you mean. . .?" (Dingemanse et al., 2015).

In signed conversations, receivers provide visual feedback to the producer by means of nods and facial expressions (Fenlon, Schembri, & Sutton-Spence, 2013). In signed languages, non-manual signals (albeit of a specific kind) are also used as open-class forms

of repair initiation. Depending on the language background of the receiver, such signals may include a raised or furrowed brow, a wrinkling of the nose, or blinking (Dively, 1998; Johnson, 1991). In this context of non-manual backchanneling, a blank expression combined with holding or freezing of the hands can be taken to signal trouble in seeing or understanding (Manrique & Enfield, 2015). Note that back-channel elicitation of repair is potentially "off-record"—it may signal likely problems in understanding but not overtly request repair.

Manual forms of open OIR in signed languages include gestures such as the palm-up gesture (Dively, 1998). In the context of tactile signing, such as between deafblind persons, tactile cues such as tactile hand waving, light pressure, or tactile signing of "what?" or "What did you say?" are used as open forms of OIR to indicate a problem in understanding (Mesch, 2001). Even in conversations using spoken languages, repair initiations involving gestures occur. These may be manual, such as cupping a hand to the ear (Mortensen, 2012) or non-manual, such as a head tilt and raised eyebrows (Seo & Koshik, 2010). Mortensen (2012) calls these embodied repair initiations "visual initiations of repair." They are open forms as they do not necessarily specify the problematic part of the utterance (except perhaps through timing of the action) but merely signal a problem in hearing or understanding.

In spoken languages, repetition can count as open-class if the whole utterance is repeated or restricted if just part of the original utterance is repeated. In parallel with speakers, sign language users can also initiate restricted repair sequences by full or partial repetition of the trouble source turn, or by offering a candidate understanding, or, more rarely, using question words (e.g., Dively, 1998; Johnson, 1991). This paper is focused on restricted repair sequences, which are the most frequently used type of OIR in the cross-signing data. In this context, we have also been interested in metalinguistic awareness, which includes phonological, morphosyntactic, and pragmatic levels (Silverstein, 2001; Tunmer & Bowey, 1984), and evidence of all three of these is found in the cross-signing data. But here it is useful to focus specifically on the lexical level as a locus of metalinguistic awareness because of the importance of resolving the meaning of individual lexical signs that are not shared by sign-interlocutors. In ordinary conversation, unknown or unconventional words may be a relatively minor source of trouble, but in cross-signing this is a central problem of course.

2. Methodology and data

2.1. Data collection

The data for this study were collected in 2003–2005 in the context of an international research group working on the linguistic typology of sign languages at the Max Planck Institute for Psycholinguistics. This group included Deaf signers from different countries who joined the group at various points during this period and initially had no shared language with the other members of the group. Participants whose data constitute the data

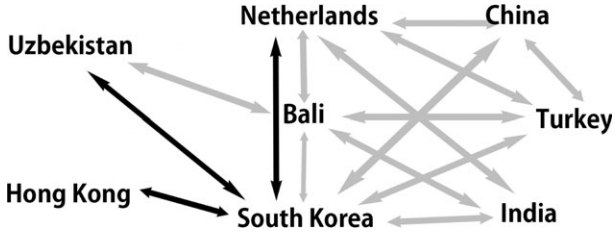


Fig. 1. Cross-signing participant configurations (bold arrows show the interactions relevant to this study).

corpus come from China, Hong Kong, India, Indonesia, South Korea, the Netherlands, Turkey, and Uzbekistan. They met in various dyadic interactions, as illustrated by Fig. 1.

This corpus consists of 10 h and 28 min of video recordings of periodic meetings between participants. Recordings took place at the very first encounter between participants, after 1 week, and after 1 month. However, this study involves only the initial encounters between signers as these most clearly reflect the emergent properties of cross-signing before accommodation or lexical convergence between signers had taken place. The analyses here are based on a selection of three dyads amounting to 1 h and 20 min of video data (see Table 1) that were annotated using ELAN video annotation software (Sloetjes, 2013). Section 2.3 provides details on the coding scheme used for the sequential analyses and how this was implemented using the software.

In these interactions, participants were asked to freely converse with each other, without any particular instructions as to the content of the conversations. At the point of the recording, they had been made aware of the general aim, that is, to document how signers would interact when meeting for the first time in the absence of a shared language. They also knew which country their interlocutor was from and that they were going to be working together on a project investigating the linguistic typology of sign languages. Beyond this context, they did not know anything about each other.

At the time of the video recordings, these data were opportunistically gathered as a by-product of a research project on sign language typology involving an international group of sign language users. Participants subsequently gave their consent for the use of these recordings for research purposes. This study has ethical approval through Radboud University's Ethical Committee (Project code EC2012-1304-098).

2.2. Linguistic profiles of participants

The four participants of this study come from South Korea, Uzbekistan, the Netherlands, and Hong Kong, and they are referred to in the examples as A, B, C, and D, respectively. The Korean participant is one of the authors of this article, and this affords particular insight into the data. As argued in Zeshan (2015), the complexities of cross-signing can be understood better if we include an element of introspection from the perspective of those present in the conversation. This has motivated the choice of the subset of three dyadic conversations investigated here, as the Korean participant is present in all

Table 1
Summary of data

Dyad	Signers' Countries of Origin	Recording Length (min)
1	South-Korea–Netherlands	37
2	South-Korea–Uzbekistan	10
3	South-Korea–Hong-Kong	33

of them. The other three participants are selected here for analysis on the basis of diversity of their personal and linguistic backgrounds.

All participants are males in their mid-twenties to early thirties who attended Deaf schools offering sign bilingual education, that is, a special education school where sign language is the medium of instruction alongside teaching reading and writing in the local language of literacy. Two of the participants are "native" sign language users as they have Deaf parents. The other two come from hearing families; they use a sign language as their main and preferred language, although they acquired it later in life through the school setting. A minority of Deaf people also have considerable skills in speech and lipreading, but this was not the case for any of the participants in this study.

The participants have had varying amounts of experience in international settings prior to the data collection. The participant from Korea had attended the international Deaf Way II conference in the United States, gaining about 20 days of exposure to American Sign Language (ASL) and International Sign. The Uzbek participant had grown up in Uzbekistan, where Russian Sign Language is used, but had lived in Germany for the past 14 years and learned DGS (German Sign Language). He was the only participant who had strong skills in two separate signed languages. The Dutch participants had attended both the Deaf Way II conference and a conference of the World Federation of the Deaf in Canada. Finally, the participant from Hong Kong had often travelled to Taiwan, learning some Taiwan Sign Language and developing skills in making language accommodations.

2.3. Data annotation

The video annotation software ELAN was used to code for the following parameters: (a) try-markers (e.g., holds, mouthing, repetition, slowing); (b) types of OIR (restricted, open); (c) OIR sequences through T−1, T0 and T+1; (d) repair initiations at T0 (e.g., repetition, added mouthing, hand waving); (e) language resources for making the repair (e.g., repetition, fingerspelling, substitution, explanations, examples, and iconic-indexicality, see Byun, in preparation); (f) gesture movement phase (e.g., hands being raised to prepare for signing); and (g) non-manual markers (e.g., eye gaze, mouthing, headshake).

To analyze the timing of subsequent turns, we have adopted the Kita, van Gijn, and van der Hulst (1998) gesture phase coding system, which differentiates between four gestural movement phases of the hands. Using the example of the sign BROTHER (Fig. 2), there is a phase of preparation in which the hand is rising, not yet at the location of the

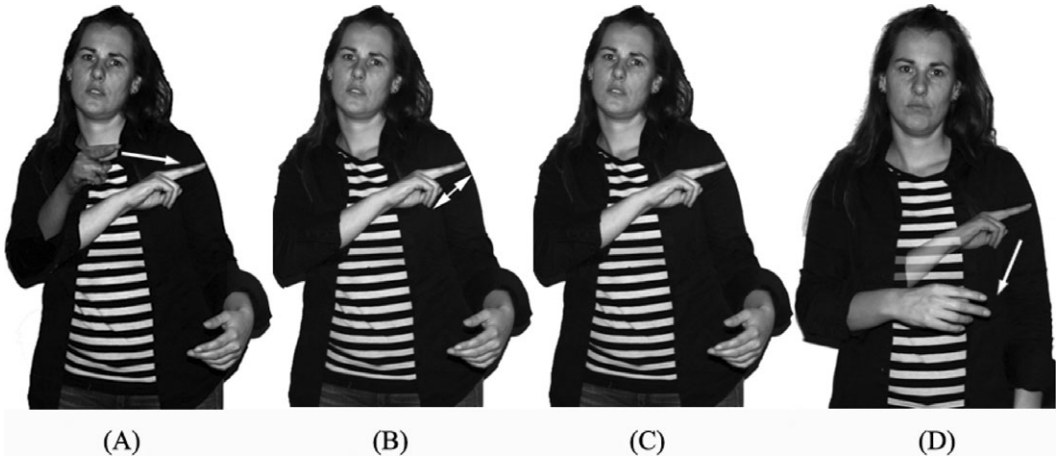


Fig. 2. Gesture movement phases of the sign SIBLING in Sign Language of the Netherlands (A: Preparation, B: Stroke, C: Hold, and D: Retraction) (adapted from De Vos et al., 2015).

sign itself but already with the initial handshape forming. This is followed by the second phase, the stroke, in which the sign itself is produced. In the third phase, the terminal handshape of the sign may be held at the end. Finally, the hand is lowered in the fourth phase of retraction.

In Sections 3 and 4, we discuss in detail the characteristics of repair sequences in these cross-signing interactions, including the various resources that are used to initiate repair, the anticipation of repair as evidenced by try-marking, as well as the timeframe within which repair is resolved in cases where try-marking is either present or absent on the trouble source turn.

3. Try markers in cross-signing

3.1. Try markers in spoken and signed languages

In their analysis of spontaneous conversation of English, Sacks and Schegloff (2007, p. 26 [1979]) first described try-markers as the use of rising intonation, followed by a brief pause to indicate that the "form being used will on this occasion, for this recipient, possibly be inadequate for securing recognition."

In cases where the recipient has been able to identify the referent, try-marking has been observed to lead to acknowledgments such as an "uhuh" or a nod during the following pause. In more problematic cases, when the recipient does not insert such a response, the speaker will attempt to offer further descriptors.

Moerman (1988, p. 39) argues that in spoken Thai, rising intonation rarely features in try-marked turns, but short pauses are more common. In addition, Moerman (1988, p. 191) suggests that stretching the final continuant or adding the particle/ni/in sentence-final position may project possible further talk by the current speaker, thus prompting a back-

channeling signal from the interlocutor. In Kata Kolok, a rural signing variety in the north of Bali, squinted eyes may be combined with pointing signs to check the interlocutor's familiarity with the indicated location, effectively functioning as try-marking of the locative references (De Vos, 2012, p. 374). Like spoken try-marked turns, such expressions often evoke a single nod in return. Thus, it seems that there are language-specific strategies that function as try-makers on an interactional level yet there are also common semiotic features attested such as questioning prosody as well as a brief pause of the try-marked constituent in question (Clark, 1996).

Due to the nature of cross-signing, numerous lexical signs will be unfamiliar to the interlocutor, and turns are thus frequently try-marked. In the following section we describe the various formal strategies that have been identified as try-markers in the cross-signing dataset.

3.2. Try markers in the cross-signing data: Form and patterns of occurrence

A try-marker explicitly invites a grounding sequence (i.e., the overt intentional establishment of common ground in an interaction, cf. Clark, 1996), which may be either an affirmative response token or a request for clarification (OIR). Although try-markers are not obligatory on T−1 for a repair initiation to occur, as it is always possible for the addressee to initiate repair, the frequency of try-markers at T−1 in OIR sequences is striking.

Out of a total of 51 OIR sequences coded in the data, 39 sequences (76%) appear with a try-marker in T−1, while 12 sequences (24%) appear without a try-marker. In cross-signing, try-markers have discrete forms, and the formal properties of try-markers that occur at T−1 are summarized in Table 2. The data reveal that eye contact occurs in 100% of all try-markers at T−1, clearly an obligatory form. As a close second, the use of a hold, that is, holding the sign in final position for an extended duration, as a try-marker at T−1 occurs so frequently (at 97%) that it is practically obligatory. Other formal properties of try-markers with frequent occurrence are added mouthing and repetition. In six cases (15%), T−1 included an explicit question as to whether the interlocutor is familiar with a particular sign.

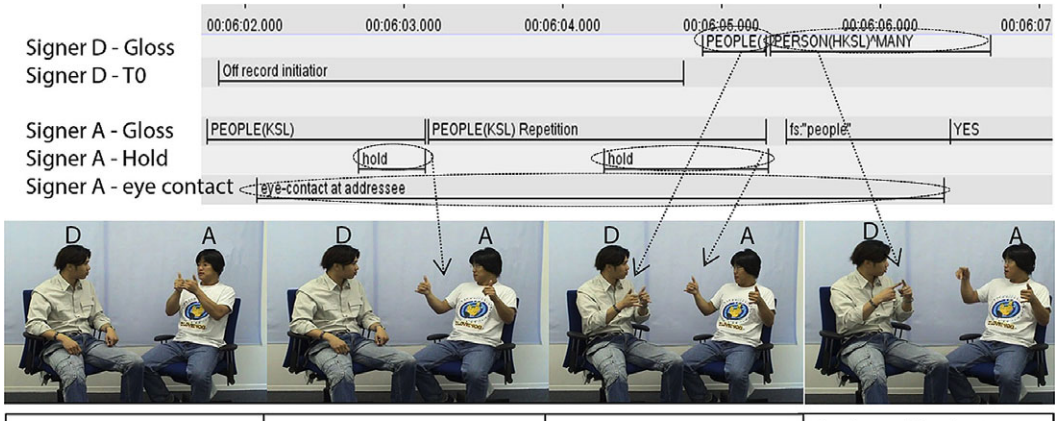
These data demonstrate that try-markers in cross-signing typically have several co-occurring formal features, with the canonical form consisting of eye contact and hold, and additional frequent, but optional, features in the form of repetition and mouthing. As shown in the bottom row of Table 2, some of the same formal features also occasionally

Table 2
Frequencies of formal features of try-markers at T−1 of OIR sequences

Formal Characteristics of T−1	Eye Contact	Hold	Mouthing	Repetition	Explicit Question
Try-marking at T−1 39 (100%)	39 (100%)	36 (97%)	19 (49%)	17 (44%)	6 (15%)
No try-marking at T−1 12 (100%)	6 (50%)	3 (25%)	2 (17%)	—	—

occur in non-try-marked turns, but they do not have the function of try-marking in these cases.

Example 1 shows the use of a try-marker in the conversation between the signers from Korea and Hong Kong. In this example, signer A uses two try-marked utterances in sequence, both of which are marked by eye contact and hold, thus inviting a grounding response by the receiver with the aim of identifying whether the message was understood correctly. Thus, try-markers provide the receiver with an opportunity to signal understanding or request clarification and are an explicit strategy for the current signer to ascertain if the receiver has understood one's message. As marked in the ELAN transcript, signer D provides the expected feedback such as a head nod, which is taken as a form of off-record repair.



Signer A produces the Korean sign PEOPLE for the first time, making eye contact and holding the sign in final position. Signer D does not respond, keeping a blank expression, i.e. off record repair.	A then repeats the sign more slowly, sustaining eye contact and questioning expression, again holding the sign in final position.	At A's repetition, D copies the sign and holds it in final position along with A.	As signer A begins to fingerspell 'people' and articulates P-E-O, signer D offers his understanding using a kanji-based sign for 'person' and then the sign for 'many'. Signer A stops spelling and affirms that signer D has understood the meaning.

Example 1 Try-marker with eye-contact, hold, and repetition

Try-makers are evidence of metalinguistic awareness on the part of the signer using them. During cross-signing, signers continuously entertain hypotheses about what the interlocutor may be able to understand, and they keep track of signs whose meaning has been "agreed" between participants just as speaking interlocutors implicitly come to agree on reference forms (Schober & Clark, 1989) (Zeshan, 2015, describes this process of meaning negotiation in detail). Try-marking occurs when signers are aware that the signs they are using may constitute a trouble source for their interlocutor. Furthermore, our analyses of the timing of OIR sequences indicate that try-marking of T−1 can expedite the process of communicative repair as such. The implications of our data for the issue of meta-linguistic awareness are explored further in Section 4.

4. Repair in cross-signing

4.1. Other-initiated repair in cross-signing data: Formal characteristics

Misunderstandings can originate at different levels of communication, including at the level of metacommunicative actions (Clark, 1996; Dingemanse, Blythe, & Dirksmeyer, 2014; Robinson & Kevoe-Feldman, 2010). In cross-signing, since there is no shared code, the trouble sources are likely in the first instance to involve the level of meaning of individual signs. In line with this, in the cross-signing data it was found that there is a preference for restricted repair initiators, as the receiver would interrupt to enquire about the meaning of specific signs. In the current dataset of 51 OIR sequences, only three instances concerned open-class repair initiations.

Open-class repair initiators in the cross-signing data included signing "what?", or "I don't understand." A second type of open repair initiator is the use of off-record repair (see Examples 1 and 3), that is, a non-occurrence of the expected backchanneling such as nodding and facial expressions given by the receiver that indicates attention and understanding (Manrique & Enfield, 2015). Non-manual signals such as a frown can also effectively function as open repair initiators. Finally, the data contain a third type of repair initiator, a small wave or gesture towards the speaker with a questioning expression, which also falls in the open-class category.

Restricted repair initiators in the data frequently involve *repetition*. That is to say, the receiver copies a sign accompanied by a simultaneous questioning expression, for example, raised eyebrows and/or a head tilt. This may be accompanied by pointing to the sign with the other hand. These phenomena would seem to correspond to someone repeating a trouble-source word in spoken languages with rising intonation.

Table 3 shows the frequencies of repair initiators and their subtypes within all 51 OIR sequences. The first row shows the frequency by form of the repair initiator. The following rows show a breakdown of frequencies according to whether or not there has been a preceding try-marker at T−1. The columns break down the repair initiators by abstract character (e.g., repetition) or concrete form (e.g., body lean). Note that here "off-record initiators" often consist of withholding of expected affirmative back-channels.

In our data, repetition of the trouble source was the most frequent repair strategy, while candidate understandings were in fact less frequent (cf. Schegloff et al., 1977). In some

Table 3
Types and frequencies of repair initiation at T0

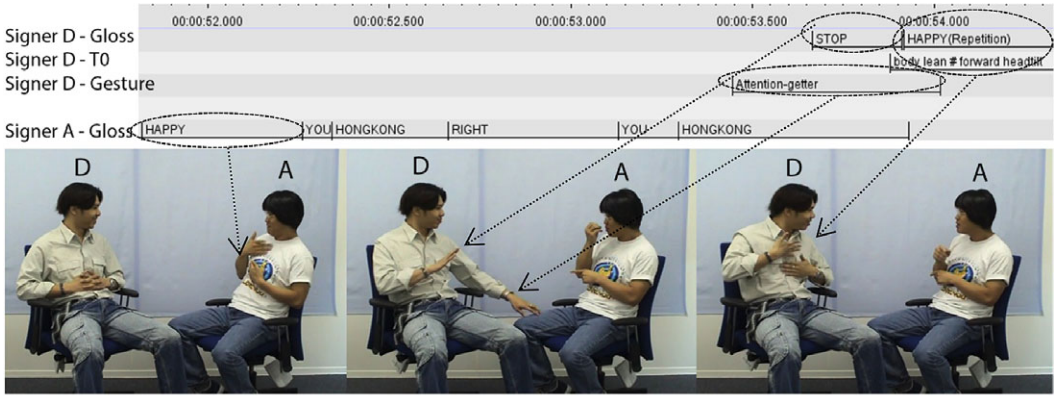
	Repetition	Candidate Understanding	Attention-Getter	Head Movement	Facial Expression	Body Lean	Off-Record Repair	Tentative Acknowledgment
All T0s	34 (67%)	6 (12%)	11 (22%)	35 (69%)	18 (35%)	17 (33%)	11 (22%)	8 (16%)
Try-marking of T−1	25 (64%)	6 (15%)	3 (8%)	25 (64%)	15 (38%)	8 (21%)	10 (26%)	8 (21%)
No try-marking of T−1	9 (75%)	—	8 (67%)	10 (83%)	3 (25%)	9 (75%)	1 (8%)	—

cases, these repair-initiating repetitions were slower in production and formally smaller than the original trouble source, but no clear pattern has been identified as to whether this had any consequences for how that repair initiation was dealt with by the participants (cf. Curl, 2005). As with the form of try-markers discussed in Section 3.2, some of the repair-initiating forms co-occur. For instance, the attention-getting gesture (hand wave, tap or pausing gesture) could co-occur with a forward-leaning body posture, followed by repeating the sign in question. Interestingly, body leans are commonly found in repair sequences of Argentine Sign Language (cf. Floyd, Manrique, Rossi, & Torreira, 2014). Off-record repair, by definition, always occurs on its own and is not combined with any of the other forms (Manrique & Enfield, 2015). Conversely, in our data, signers produce repetitive nodding with a puzzled facial expression, indicating they are not confident they understand fully. This is interesting in particular as nodding is normally associated with acknowledgments, but by combining it with a puzzled look cross-signers are able to convey that the grounding sequence initiated by the try-marker has not come to completion. In our dataset, such tentative acknowledgments are therefore often taken as repair initiations on behalf of their interlocutor. Aside from head nods, T0s also included other head movements such as forward head tilts, chin raises and side-to-side headshakes. Notably, restricted offers, also known as candidate understandings, do not occur on their own in our dataset and are only attested in addition to repetition of the trouble-source (cf. Dingemanse et al., 2014).

The data show that regardless of the presence or absence of a try-marker, the most frequent form of repair initiation at T0 is repetition, with an overall occurrence rate of 67% (75% in sequences without try-marker and 64% in sequences with try-marker). Repetition is associated with restricted repair because repeating a sign is equivalent to asking for clarification of the meaning of this particular sign only.

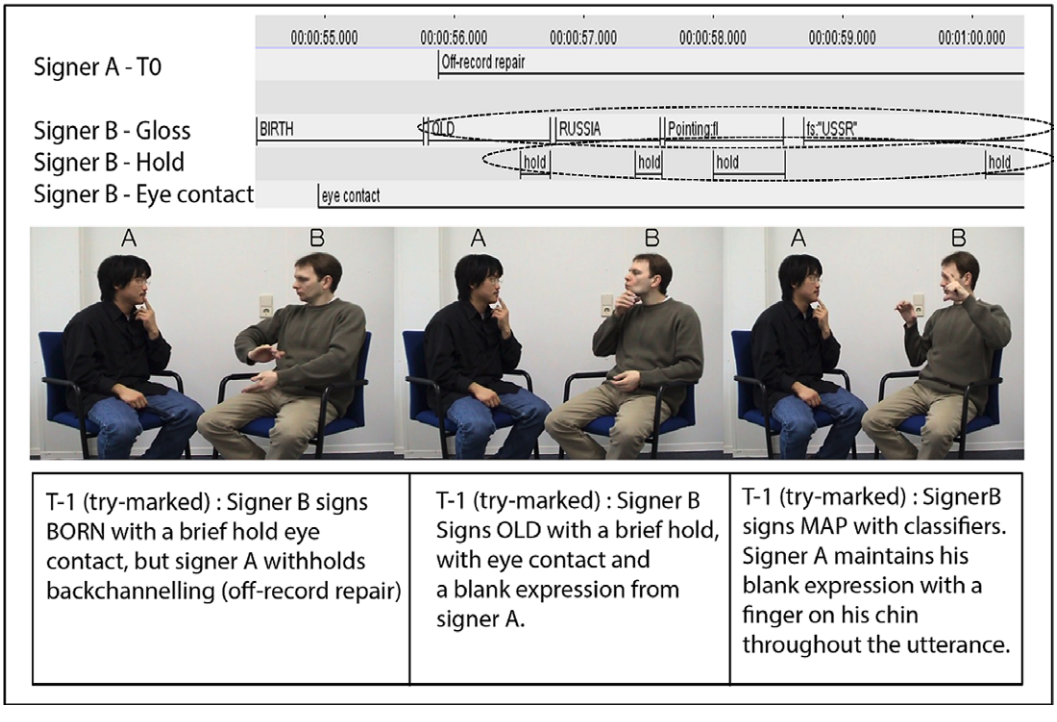
The other repair initiators found in the data show distinct patterns according to their occurrence in OIR sequences with and without try-markers. The attention-getting hand wave gesture occurs much more often in contexts where there has been no preceding try-marker. In other words, if no try-marker is used at T−1, the receiver must take responsibility for requesting clarification, and the attention-getting hand wave gesture is a common way of doing that. Leaning forward towards the interlocutor's signing space is another way to signal an interruption for clarification, and therefore it occurs more frequently in the absence of try-markers, although forward body lean is also present in a minority of OIR sequences with try-markers (21%). Conversely, off-record repair is most likely to be taken to be a repair initiator only if preceded by a try-marker (there is only one exception of absence of back-channeling without preceding try-marker). This pattern arises from the fact that try-markers make relevant an acknowledgment of understanding, and in the absence of such a signal, subsequent moves are taken as a repair initiation. In our data, a try-marker at T−1 is often followed by a blank expression instead of the back-channeling normally expected if the receiver understands; this happens in 26% of OIR interactions with try-markers. Alternatively, the try-marker may be responded to with an inclined body orientation and repeated head nods indicating that more information is desired, as the receiver is still processing the message. These nods are called "tentative acknowledgments" here, and they occur only if there has been a try-marker at T−1.

Examples 2 and 3 show OIR sequences without a try-marker and with a try-marker, respectively. In Example 2, the repair initiators are attention-getting gesture, forward head/body lean, and repetition. In Example 3, there is a sustained absence of (affirmative) back-channeling from signer A (the off-record initiating mentioned above), while signer B uses several try-markers and communicative strategies to try and convey the intended meaning.



T-1(no try-marker): Signer A produces the sign HAPPY without a try-marker.	T0 : Signer D interrupts with a tap and pausing gesture and repeats the sign HAPPY to ask for meaning.

Example 2 Other-Initiation of Repair without try-marker at T−1



T-1 (try-marked) : Signer B signs BORN with a brief hold eye contact, but signer A withholds backchannelling (off-record repair)	T-1 (try-marked) : Signer B Signs OLD with a brief hold, with eye contact and a blank expression from signer A.	T-1 (try-marked) : SignerB signs MAP with classifiers. Signer A maintains his blank expression with a finger on his chin throughout the utterance.

Example 3 Other-initiation of repair with try-marker at T−1

4.2. Types and timing of OIR sequences

In cross-signing, restricted OIR sequences can be further classified based on the timing of the respective turns: T−1, T0, and T+1. De Vos et al. (2015) discuss the timing of turn-taking in spontaneous signed conversations, using the gesture phases shown in Fig. 2 above (preparation, stroke, hold, and retraction). They report that in question-answer sequences of Sign Language of the Netherlands, signers optimize stroke-to-stroke turn boundaries, and overlapping holds, preparation, and retraction phases are not treated as intrusive to the ongoing discourse. In the normal case, the beginning of a turn-initial stroke starts approximately 200 ms after the turn-final stroke of the preceding turn has ended, just like spoken turns typically occur with a 2–300 ms gap. Cross-signers, in the normal case of repair initiation, also minimize the offset between the end of the final stroke of T0 and the beginning of the first stroke of T+1. In addition, our analysis reveals that try-marking on T−1 facilitates the occurrence of fast-track repair sequences in which T0 and T+1 effectively coincide. This is when T+1's turn-initial stroke coincides with turn-final stroke of T0. Conversely, repair solutions may be delayed at T+1, when the

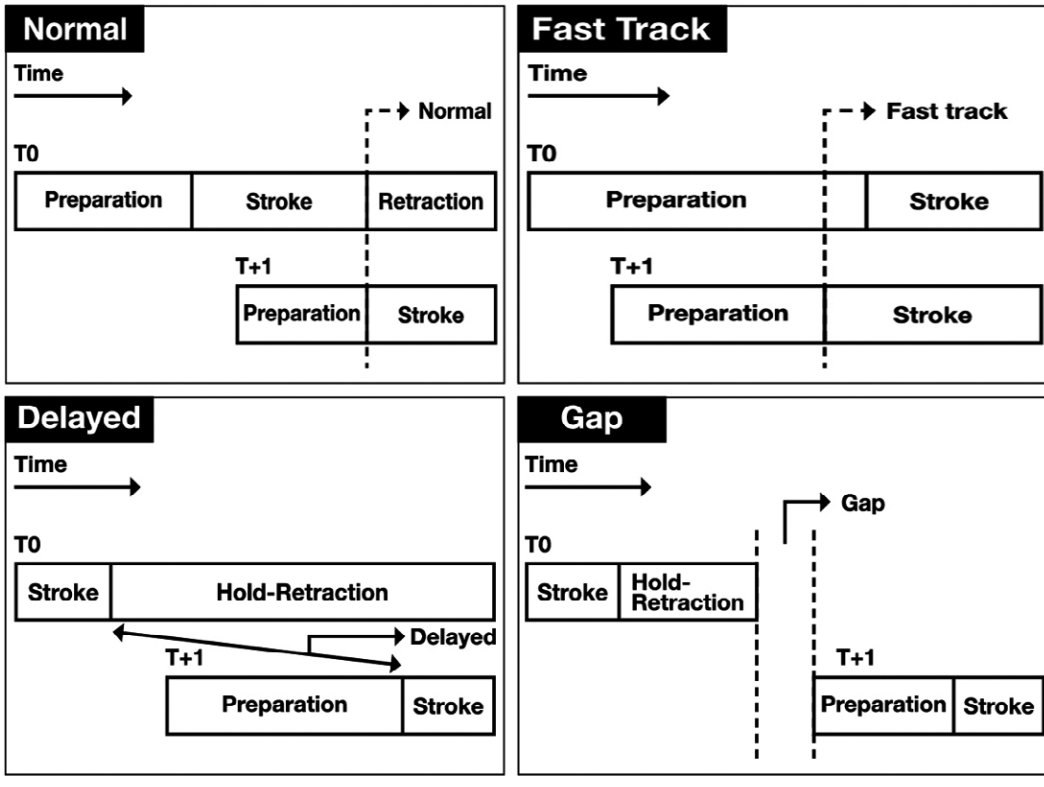


Fig. 3. Timing of T+1 in relation to T0.

Table 4
The timing of Repair in T+1 in relation to Initiation in T0, according to the categories in Fig. 3

	Fast Track	Normal	Delay	Gap	Total
Timing of T+1	15 (35.7%)	7 (16.7%)	12 (28.6%)	8 (19.0%)	42 (100%)
Try marking of T−1	15 (44.7%)	7 (20.6%)	6 (17.6%)	6 (17.6%)	34 (83.9%)
No try-marking of T−1	—	—	6 (75%)	2 (25%)	8 (19.1%)

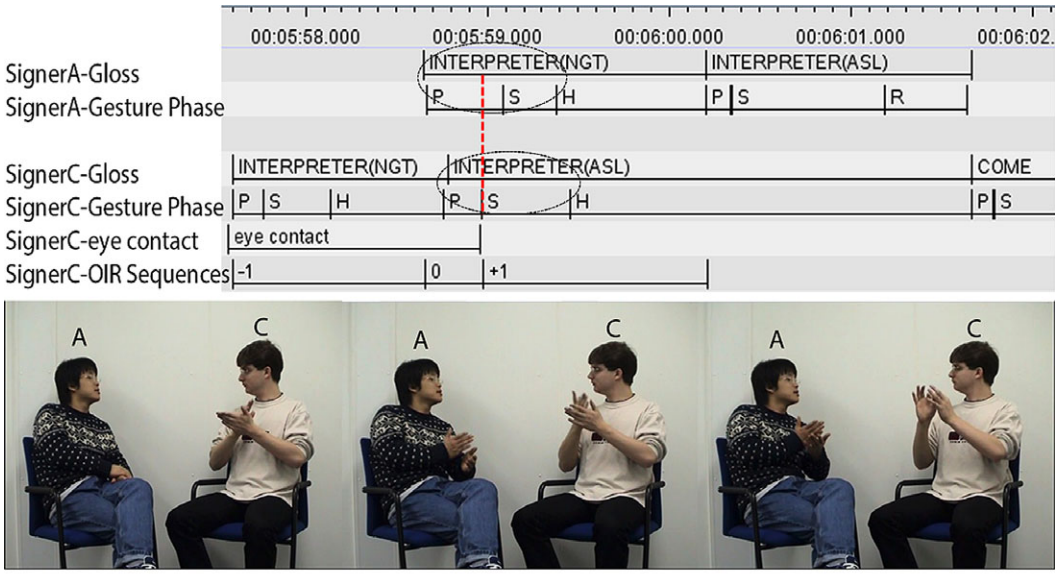
preparation phase of T+1 is initiated after the final stroke of T0 has ended, but the hands are still held up the air. When T0 is not initiated until after the retraction of T0, we have considered those cases a gap in the communication. Fig. 3 below represents all four timing categories graphically.

Table 4 summarizes the types and timings of 42 OIR sequences. The remaining nine OIR sequences have only non-manual behaviors in some of the relevant turns, without any manual signs. Therefore, the timing categorization could not apply because it relies on the timing of gesture phases which are defined as being manual behaviors. Although non-manual behaviors also occur at specific times, they are outside the scope of the data in Table 4.

4.2.1. Fast track repair sequences

In the data, it was often found that after T−1, rather than waiting until the stroke phase of T0 is complete, the signer responds by offering a solution (T+1) very quickly, at the initial preparation phase of the receiver's repair initiation. In effect, the repair initiator and its solution are produced simultaneously. The term *fast track repair sequence* is used here for this latter type of interactional sequence. Our data reveal that such fast track repair sequences, where T+1 and T0 coincide, only occur in the presence of try-markers. Hence, it seems that try-markers directly facilitate fast resolution of trouble in communication, when a signer anticipates trouble and marks out signs as foreseeably potentially troublesome.

Example 4 illustrates a fast track repair sequence which occurred in the context of one of the signers bringing up the issue of sign language interpretation. Signer C starts off by using his native sign[2] INTERPRETING^{NGT} which he try-marks by making eye contact with his interlocutor and holding the sign. Signer A begins to respond by repeating the sign with a forward head tilt, thus initiating repair. In the absence of an acknowledgment such as a nod, Signer C can project this forthcoming repair initiator and immediately provides the ASL sign INTERPRETER^{ASL}. In Example 4, the overlap pattern between the preparation, stroke, and hold phases (P, S and H) of signs is visible in the time-aligned ELAN annotations, together with screen shots of the signs for INTERPRETER. The dashed line indicates the start of the stroke of T+1, which aligns with the preparation phase of T0.



T-1 (try-marked): Signer C articulates the NGT sign INTERPRETER and holds it, with eye contact.	T0: Signer A brings hands into the preparation phase of a repetition of the sign.	T+1: Before signer A has finished producing the repetition of the sign (whilst still in the preparation phase), signer C switches to the ASL sign INTERPRETER.

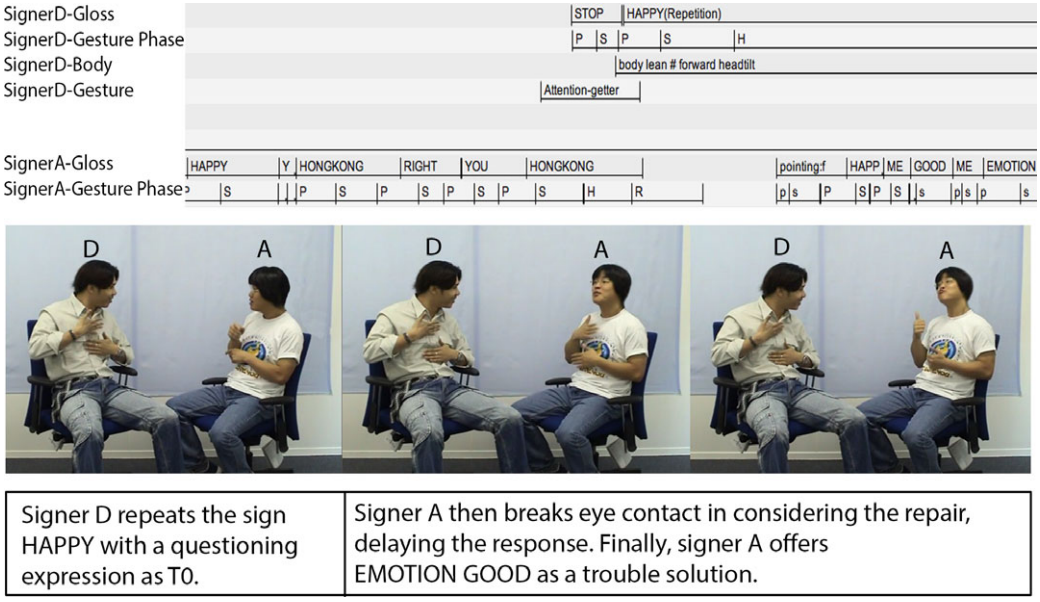
Example 4 Fast track repair sequence

4.2.2. Repair sequences with delayed response

In addition to fast track sequences, there is also evidence of occasional delays in the timing of repair sequences in the data. Such sequences with delayed response are associated with the absence of try-markers, although delayed responses and gaps do occur under both circumstances. The high percentage of delayed responses where there is no try-marker makes sense from an interactional point of view. As the signer of the trouble source does not expect nor anticipates the repair initiation, it takes more time to come up with a repair strategy. Note that in spoken interaction repair-initiators tend to be systematically delayed in just these circumstances (Kendrick, 2015).

One example of delay concerns a difficulty in the expression of the concept of happiness (Example 5). In this excerpt, signer A uses his native sign HAPPY^{HKSL} when talking about meeting other young signers in Hong Kong. In the absence of try-marking, Signer C initiates repair with an attention-getting gesture followed by a repetition and subsequent hold of the sign HAPPY^{HKSL} while he leans forward. Signer A then breaks eye contact

in considering the repair initiation, delaying the response, before offering EMOTION GOOD as a trouble solution.

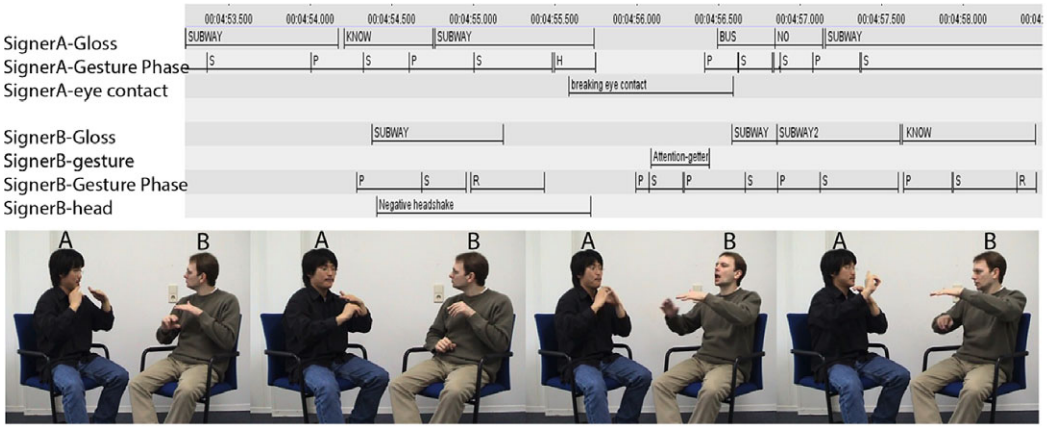


Signer D repeats the sign HAPPY with a questioning expression as T0.	Signer A then breaks eye contact in considering the repair, delaying the response. Finally, signer A offers EMOTION GOOD as a trouble solution.

Example 5 Delayed repair sequence

4.2.3. Gaps in repair sequences

Breaking eye contact with the interlocutor is typical of a gap after T0. In such cases, neither participant is actively producing signs, nor is receptive to signs. The effect of breaking eye contact is to allow the current signer extra time for metalinguistic processing, as he or she considers further options how to resolve the communication difficulty. In a sense, this is the opposite of try-marking. While try-marking signals to the interlocutor "you are welcome to interrupt here for clarification," breaking eye contact signals "don't interrupt me now, I am thinking." Example 6 illustrates such a lapse in the conversation where the repair solution comes markedly late after the repair initiation.



T0: Signer B repeats SUBWAY, not understanding.	Signer A continues the hold of the sign, breaking eye contact in thinking.	T+1 Signer A offers repair solution by signing 'it is not a bus, it is a subway'.	Acknowledgement: Signer B indicates understanding and repeats the sign SUBWAY and nods simultaneously.

Example 6 Repair sequence with gap

All types of repair sequences have in common the goal of achieving intersubjectivity, that is, establishing the knowledge and mutual agreement that both interlocutors share the newly introduced conventions (in most cases, a sign whose agreed meaning was in doubt), both as producers and receivers in the communication (Tomasello, 2003). The present data differ from available studies on spoken languages in that intersubjectivity is minimal at the beginning, as there is no shared language. At the same time, deaf signers in these interactions are able to improve the level of intersubjectivity with considerable success, and it seems that this is enabled by some particular affordances of the signed modality. For example, the spatial iconicity of sign languages enables the interpretability of some signs, while signed output allows for a higher level of simultaneity compared to speech, and simultaneity of both interlocutors' output is exploited in the fast-track repair sequences.

5. Conclusions

In this study we have analyzed first encounters between deaf sign language users who do not have shared competence in any sign language. Unlike speakers of unrelated languages, signers are able to communicate successfully about a range of topics, including academic and personal life. Miscommunication, and the chance thereof, are nevertheless a continuous challenge to the flow of the ongoing conversation given the lack of conventional signs. Our analyses focus on how signers signal and anticipate such trouble in ongoing conversation.

The data investigated here show several interesting patterns that differ from what has been found in previous research. First of all, cross-signing interactions have a very high percentage of restricted repair through repetition of the trouble source, presumably due to the fact that there is no shared language available in the interaction. Therefore, grounding is essential to the interaction, and there is a particular challenge with respect to understanding lexical signs used by the interlocutor (Clark, 1996; Zeshan, 2015). Moreover, grounding sequences which are sequential in spoken languages (Clark & Brennan, 1991) can partly overlap in signed conversation, as is evident in the fast-track repair sequences discussed here.

This research has investigated the use of try-markers within the context of signed repair sequences. The canonical form of try-markers, with eye contact and hold of the sign in its final position, is equivalent to the typical try-marking intonation patterns in spoken languages. Data provide evidence that try-markers create a welcoming environment for repair and can expedite the process of repair, facilitating fast track repair sequences. Such sequences, characterized by a timing overlap between T0 and T+1, only occur in the presence of try-markers. These findings on the relationship between T0 and T+1 qualify the general observation that repair initiations in spoken languages tend to occur after a brief gap of silence after T−1, more than twice the duration of silence preceding responses to polar questions (Kendrick, 2015).

In this research, we have also been interested in the issue of metalinguistic awareness, and the occurrence of try-markers is overt evidence for metalinguistic reasoning: Signers use try-markers when signers anticipate understanding problems. This implies that signers are monitoring their own output with respect to how likely their signs are to be understood by the interlocutor. In the process, they use metalinguistic reasoning to decide which signs are likely trouble sources, resulting in the use of try-marking for those signs.

Another aspect of metalinguistic skills is the range of repair strategies employed by signers after a trouble source has been flagged up. Initial observation suggests that signers differ as to the range of strategies they have at their disposal to overcome communication difficulties. For instance, strategies of clarification include using a sign from another sign language, fingerspelling, mouthing, drawing or writing in the air, and circumlocution with highly iconic signs or gestures. In effect, cross-signing prompts multimodal behavior, as signers exploit linguistic and interactional creativity (Zeshan, 2015).

It is tempting to see cross-signing as a window into the development of other types of signed communication, such as the development of "home sign," that is, the ad hoc gestural communication of deaf individuals growing up in an environment without any other deaf people or sign language users present (Goldin-Meadow & Mylander, 1998). When home signers are brought into contact for the first time, usually as children in a newly established school for the deaf, their signed communication becomes successively enriched and conventionalized (Kegl, Senghas & Coppola, 1999). However, it is important not to jump to conclusions because deaf home signing children may well differ from cross-signers in terms of cognitive resources and meta-linguistic strategies, as the cross-signers in this study are already fully fluent in a sign language. Thus, the signed modality alone is not enough to presume that the same processes, for example, for creating intersubjectivity, are at work, and this is a matter of empirical research. On the other

hand, International Sign (IS), being used by adult signers as an international lingua franca (McKee & Napier, 2002; Rosenstock, 2008), is likely to have parallels with cross-signing in its development because the sociolinguistic context is very similar, and cross-signing is claimed to be "a window into the past of the development of IS" in Zeshan (2015, p. 254).Within cross-signing, the extent and patterns of individual differences between signers as to the resources and strategies used for repair need to be subject to future research. Moreover, it is also acknowledged here that OIR sequences can have more complex patterns, for example, repeated repair attempts. These have not been fully studied in the current research and need further exploration in future.

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Notes

1. The capital letter is commonly used to signify group identification as a member of the signing community, in this case spanning cultures.
2. In this paper we have indicated the use of lexical signs from conventional sign languages by abbreviations in superscripted small caps directly following the sign. NGT stands for *Nederlandse Gebarentaal*/Sign Language of the Netherlands, ASL for American Sign Language, and HKSL for Hong Kong Sign Language.

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