First encounters: Repair sequences in cross-signing

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1. Introduction

1.1 Contact situations between sign language users: Cross-signing

The study of conversation between partners who share no common language may at first seem an exercise in futility, but this is precisely what the current study addresses. While this is not a common phenomenon among users of spoken languages, Deaf sign language users from different countries who do not share a common language, signed or written, readily 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-conventionalised 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 organisations including the World Federation of the Deaf or the European Union of the Deaf (Allsop, Woll & Brauti 1994; Supalla & Webb 1995; McKee & Napier 2002).

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, when Deaf people visit another country they often have an immediate connection with Deaf people there as they are also in such a minority setting. There is a strong sense of kinship and shared identity, commonly expressed as “Deaf like me”(Spradley & Spradley 1985). For this reason, Deaf people who travel tend to have a strong preference for interacting with other Deaf people rather than meeting hearing people. This study aims to capture and analyse initial encounters between Deaf people of different countries, and to document how means of mutual understanding are created on the spot.

In conversation between individuals with no common language, the communication is by necessity metalinguistically rich as participants must invent novel means to achieve mutual understanding. As could be expected, communication breakdowns are common in the participants’ interactions. In the present study we investigate how such breakdowns are recognised by conversational partners and how they are repaired, as a window into metalinguistic awareness. The study investigates such repair sequences capitalising on insights from Conversation Analysis (CA), where communication breakdown has been investigated in situations involving a common language (Sacks, Schegloff & Jefferson 1974; Schegloff, Jefferson & Sacks 1977).

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, identical 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; McIlvenny 1995; Mesch 2001; Groeber & Pochon-Berger 2014), resolve overlap (McCleary & de Arantes Leite 2013; Girard-Groeber 2015), and optimize turn timing in signed conversations (de Vos, Torreira, & Levinson 2015). In our view, CA is a particularly well-suited to the study of cross-signing as these interactions and the communicative strategies that feature in them are poorly understood outside the sequential context in which they emerge.

1.2 Repairs in spoken and signed conversations

Within Conversation Analysis, *repair* is how an interlocutor interrupts a conversation 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 1987:210). Repair is initiated by the speaker or the addressee; when and by whom the repair is initiated is of interest to conversation analysts (Kitzinger 2013).

The majority of repair actions (at least in spoken languages) are "self-initiated repair" (SR), i.e. begun by the speaker of the *trouble-source* or *repairable* (Kitzinger 2013). 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 speech act participant and completed by another. "Other-initiated repair" (OIR) is by a participant other than the speaker of the trouble-source (Kitzinger 2013). The most frequent OIR in spoken languages is when the recipient calls attention to the fact that there is a problem, but leaves the actual repair to the speaker (Bolden 2011). The OIR process has three basic steps. The trouble-source turn is called T-1, the repair initiator is T0, and the repair itself is labelled T+1 (Dingemanse & Enfield 2015). The repair initiator utterances may be: *open class* OIRs, e.g. "sorry?", "huh?" or "what?"; *restricted* OIRs, e.g. category-specific questions ("who?"); or repeating the trouble-source turn portion that was not understood, e.g. a single word (Kitzinger 2013; Dingemanse & Enfield 2015). Additionally, OIR may contribute more substantially, e.g. by re-phrasing the trouble-source to check understanding ("you mean…") (Kitzinger 2013).

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, such non-manual signals (NMS) are also used as open class forms of repair initiation. Depending on the language background of the receiver, these NMS may include a raised or furrowed brow, a wrinkling of the nose, or blinking (Johnson 1991; Dively 1998; Manrique 2011). 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 2014).

Manual forms of open-class OIR in signed languages include gestures such as a palm-up gesture that could mean several of the wh-questions but does not specify which one (Dively 1998). In the

context of tactile sign language, such as between deafblind persons, tactile cues such as tapping are used as open class 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 initiatives of repair", or VIR. They are open class 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 parallel with speakers, sign language users also initiate restricted repair sequences by full or partial repetition of the trouble source turn, offering a candidate understanding, or, more rarely, using wh-questions (e.g. Johnson 1991; Dively 1998; Manrique 2011). Restricted repair sequences are the most frequently used type of OIR in the cross-signing data, as the repair sequences often serve to resolve the reference of particular signs that are not shared between sign-interlocutors. This paper is focused on restricted repair initiations, as the resolution of such sequences specifically draws on metalinguistic awareness.

In this research, we have also been interested in metalinguistic awareness, which includes phonologogical, morphosyntactic and pragmatic levels (Tunmer & Bowey 1984; Silverstein 2001), and evidence of all three of these is found in the cross-signing data. In addition, it is useful here to focus specifically on the lexical level as a locus of metalinguistic awareness because of the importance of resolving the meaning of individual signs within this type of communication.

In relation to the present study, a practical definition of metalinguistic awareness is in terms of the participants' awareness of their *interaction* and modification thereof, depending on the interlocutor and their respective perceived needs. That is, a signer will attend to the expressed message to analyse and alter it according to their perception of how it will be received. Alternately, the same message will be attended to, analysed by the receiver, and fed back for possible further alteration. This relationship between participants within the communicative situation is the most apt definition of metalinguistic awareness in the context of cross-signing. While all speakers and signers attend to their message and the interlocutor's message in any communication, cross-signing is particular in that the absence of a common language requires much more extensive and complex processes of self-monitoring, mutual monitoring, and manipulation of the linguistic form of the message, as signers try to establish successful mutual understanding (Zeshan 2015).

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 did not share a common language with the other members of the group. Participants whose data constitute the data corpus come from Uzbekistan, the Netherlands, Hong Kong,

South Korea, Indonesia, India, China, and Turkey. They met in various dyadic interactions as illustrated by Figure 1.

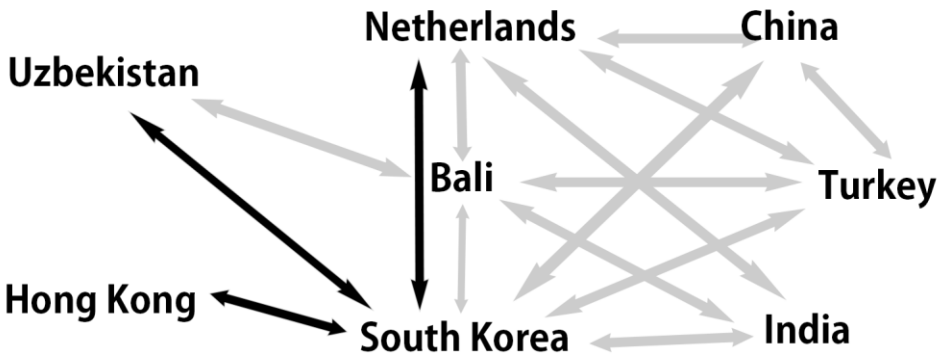


Figure 1. Cross-signing participant configurations

This corpus consists of 10 hours and 28 minutes of video recordings of periodic meetings between participants. Recordings took place at the very first encounter between participants, after one week, and after one month. However, the present 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 recordings as well as their lengths for the initial encounters of each dyad are listed in Table 1. The analyses here are based on a selection of three dyads amounting to 1 hour and 20 minutes of video data 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.

Dyad	**Signers' countries of origin**	**Recording length**
1	South-Korea - Netherlands	37 minutes
2	South-Korea - Uzbekistan	10 minutes
3	South-Korea - Hong-Kong	33 minutes

Table 1. Summary of data

In these interactions, participants were asked to freely talk to each other, without any particular steer 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, generating these data was a by-product of the research project on sign language typology and its unique set-up in the context of an international group of sign language users, rather than intentional data collection in its own right. Participants subsequently gave their consent for the use of these recordings for research purposes. The current 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 Uzbekistan, the Netherlands, Hong Kong, and South Korea. Their personal details, including family background and languages used at various proficiency levels, are included in Table 2.

The Korean participant is one of the authors of this article, and this affords a unique 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 sub-set of four dyadic conversations investigated here, as the Korean participant is present in all 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 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 have Deaf parents, which is why their language background includes "native" sign language. 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 US, 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 (WFD) 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.

Personal Background	Language Background
Signer A: **Family background:** Deaf parents and siblings **International experience:** Attended Deaf Way II conference	**Native**: Korean Sign Language **Intermediate**: (Written) Korean **Minimal**: (Written) English, American Sign Language, International Sign
Signer B: **Family background:** Deaf parents and siblings **International experience:** Moved from Uzbekistan to Germany	**Native**: Russian Sign Language **Fluent**: DGS (German Sign Language), (written) German **Intermediate**: (Written) English, International Sign
Signer C: **Family background:** Hearing parents **International experience:** Attended Deaf Way II and WFD conferences	**Fluent**: Sign Language of the Netherlands, (written) Dutch **Minimal**:(Written) English, International Sign
Signer D: **Family background:** Hearing parents **International experience:** Has often travelled to Taiwan	**Fluent**: Hong Kong Sign Language **Intermediate**: Taiwan Sign Language

Table 2. Personal and socio-linguistic backgrounds of the participants

2.3 Data annotation

As mentioned above, the ELAN programme was used for annotation of the data. Working with ELAN involves establishing a tier structure, where the annotation tiers can be defined flexibly by the researcher. For instance, one of the tiers identifies the T-1, T0 and T+1 phases of OIR. Figure 2 shows an example of annotated data.

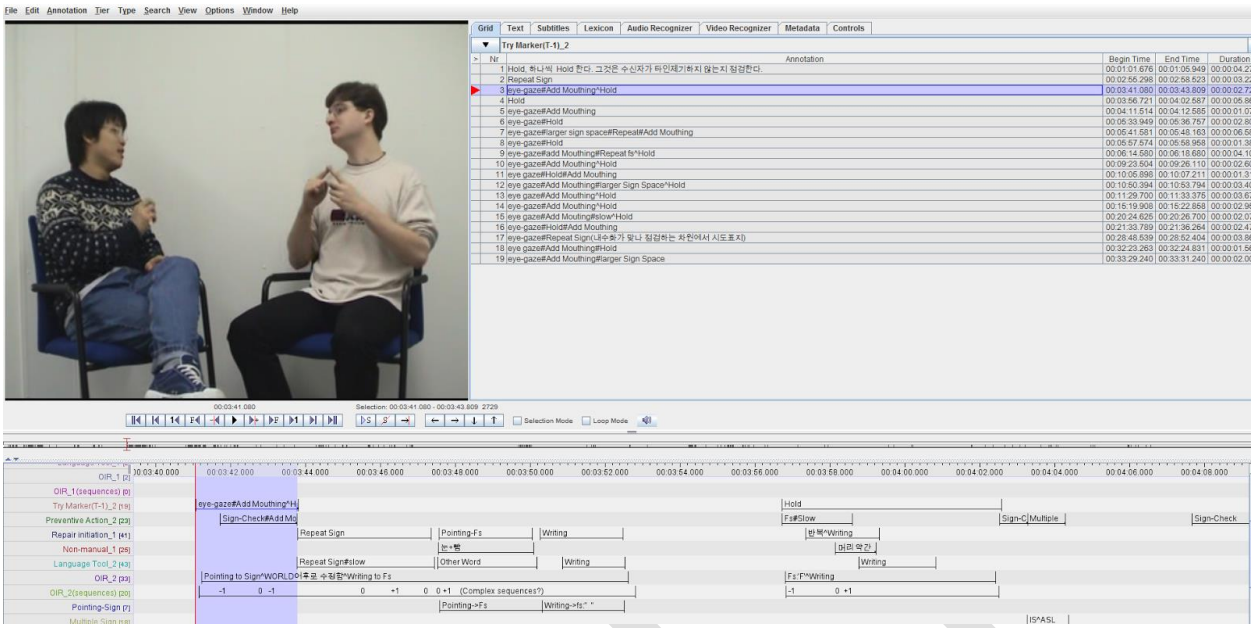


Figure 2. Data annotation with ELAN

The annotation tiers, each of which occurs twice (i.e. on a separate tier for each participant as in 'Non-manual_1' and 'Non-manual_2'), include try-markers (e.g. holds, mouthing, repetition, slowing); types of OIR; OIR sequences through T-1, T0 and T+1; repair initiations at T0 (e.g. repetition, added mouthing, hand waving); language tools for making the repair; gesture movement phase (e.g. hands being raised to prepare for signing); and non-manual markers (e.g. eye gaze, mouthing, headshake).

In order to analyse the timing of subsequent turns we have adopted the Kita et al. (1998) gesture phase coding system, which differentiates between four gestural movement phases of the hands. Using the example of the sign BROTHER[NGT] (Figure 4), there is a phase of preparation in which the hand is rising, not yet at the location of the 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.

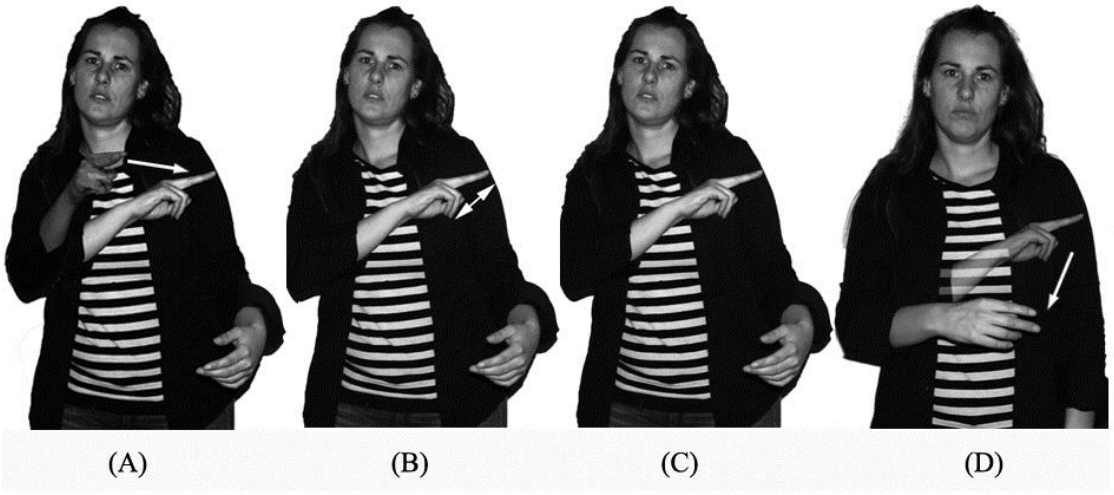


Figure 4. Gesture movement phases of the sign BROTHER^{NGT} (Preparation, Stroke, Hold, and Retraction) (Adapted from de Vos et al. 2015)

3. Try markers in cross-signing

3.1 Try markers in spoken and signed languages

In their analysis of spontaneous conversation of English, Sacks & Schegloff (2007:26 [1979]) first described 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." A typical example of such *try-marking* is provided in Example 1 below where the try-marked 'Fords' has been underlined.

Example 1

A: ...well I was the only one other than the uh, the Fords,

Uh Mrs. Holmes Ford? You know uh

[the the cellist?

B: [Oh yes, She's she's the cellist.

A. Yes

B: yes

A: [Well she and her husband were there…

Example 3 from Sacks & Schegloff 2007:26

In cases where the recipient has been able to identify the referent, try-marking has been observed to lead to recognitionals such as an 'uhuh' or a nod during the following pause. In more problematic cases, when the recipient does not insert a recognitional, the speaker will attempt to offer further descriptors. This is exemplified by the initial turn of speaker A in example 1, where, in the absence of a response by speaker B, a second attempt 'Uh Mrs. Holmes Ford? You know uh', and a third attempt '[the the cellist?' is added to clarify reference.

Moerman (1988:39) argues that in spoken Thai, rising intonation rarely features in try-marked turns, but short pauses are more common. Additionally, Moerman (1988:191) suggests that stretching the final continuant or adding the particle /ni/ in sentence-final position may project further talk by the current speaker, thus prompting recognitionals from the interlocutor. Thus it seems that there are language-specific strategies that function as try-makers on an interactional level.

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, 2012a:374). Like spoken try-marked turns, such expressions often evoke a single, recognitional nod in return. Due to the very 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 data set.

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

In the present data, try-markers typically appear within the context of an OIR sequence on T-1, the trouble-source turn. Out of a total of 51 OIR sequences coded in the data, 39 sequences (76%) appear with a try-marker, 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 4. 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, i.e. 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 6 cases (15%), T-1 included an explicit question as to whether the interlocutor is familiar with a particular sign.

Formal characteristics of T-1	Eye contact	Hold	Mouthing	Repetition	Explicit question
Try-marking of T-1 39 (100%)	39 (100%)	36 (97%	19 (49%)	17 (44%)	6 (15%)
No try-marking of T-1 12 (100%)	6 (50%)	3 (25%)	2 (17%)	-	-

Table 4. Frequencies of formal features of try-markers at T-1 of OIR sequences

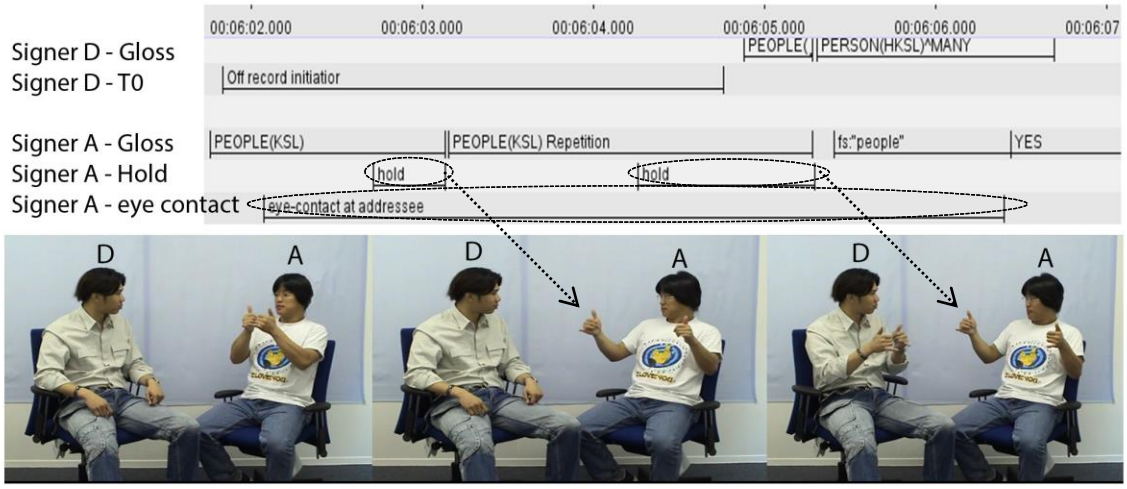
These data demonstrate that try-markers in cross-signing typically have several co-occurring formal features, with the canonical form consisting of eye contact and hold, and additional frequent, but

optional, features in the form of repetition and mouthing. As shown on the right-hand column of Table 4, some of the same formal features also occasionally occur in the 12 non-try-marked turns, but do not have the function of try-marking in these turns.

Example 2 shows the use of a try-marker in the conversation between the signers from Korea and Hong Kong. As shown in this excerpt, several try-marked utterances can co-occur. In example 2, signer A uses two try-marked utterances in sequence, both of which are marked by eye contact and hold.

Although try-markers are not obligatory for OIR, as it is possible for the receiver to initiate repair with an open-class indication that something was not understood, the frequency of try-markers in OIR sequences is striking. A try-marker explicitly invites an OIR from the receiver, that is, the eye contact and hold signal an invitation for interruption by the receiver with the aim of identifying whether the message was understood correctly. Thus try-markers provide an explicit strategy to ascertain if the receiver has understood one's message.

Example 2: Try-marker with eye-contact, hold, and repetition



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.

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 keep track of signs whose meaning has been "agreed" between participants (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. Thus there are clearly metalinguistic processes involved with respect to the internal reasoning that leads signers to expect that the receiver may not understand the message. Furthermore, our analyses of the timing of OIR sequences indicate that try-marking of T-1, invites repair initiation, and expedites the process of communicative repair as such. The implications of our data for the issue of meta-linguistic awareness are explored further in Section 5.

4. Repair in cross-signing

4.1 The role of repair in cross-signing interactions

In the context of conversation between two participants who have no shared language, communication does not occur automatically or smoothly. Meta-linguistic consideration is required on the part of the speaker regarding how to form an expression before production and how to consciously monitor the developing communication, in order to establish successful communication with the receiver. This involves a progressive series of steps towards increasing mutual understanding (Zeshan 2015). An important aspect of this holistic process is the function of *repair* mechanisms to address communication trouble.

Repair is particularly important in the description of cross-signing as communication trouble happens so frequently in this context. Without repair, meaningful communication would be impossible, and any description of the phenomenon of cross-signing would lack a significant aspect. Repair thus plays a critical role in understanding the process towards effective communication. As stated above, the domain of repair includes two principal categories: *self-initiated repair* (SR) and *other-initiated repair* (OIR).

The phenomenon of SR is overwhelmingly preferred in conversations taking place in a conventional language shared by participants. When a shared language is used in conversation, it is easier for the speaker to recognise a problem in production and take the initiative to repair it, as memory of the use of that language can be accessed. In addition, OIR is found in conversation involving a shared language, but to a much lesser degree than SR (Schegloff, Jefferson & Sacks 1977). In the context of cross-signing, the prevalence of these two categories is reversed because there is no such memory available and the means of communication is being created on the spot, with a need for feedback from the receiver in order for the speaker to decide whether the message is being understood. This can involve current feedback from the receiver, or remembering recent forms that were understood and so are selected again.

Thus, the ad hoc improvised nature of cross-signing is a major cause for the significantly greater incidence of OIR compared to SR in this context; without a shared language, it is more difficult for the signer to judge how the expressed message will be received, and more interaction is required for the resolution of problems.

4.2 Other-initiated repair in cross-signing data: Formal characteristics

In cross-signing, there is a particularly high incidence of trouble sources at the lexical level, related to the meaning of lexemes. Consequently, in the cross-signing data it was found that there is a preference for restricted repair initiatives, as most trouble sources were lexical and the receiver would interrupt to enquire about the meaning of specific signs. In the current data set of 52 OIR sequences, only 3 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-class repair initiator is the use of off-record repair, that is, an interruption of the expected feedback such as nodding and facial expression given by the receiver that indicates attention and understanding (see also Manrique 2014 on Argentine Sign Language). Non-manual signals such as a frown can also function as open-class 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 under the open-class category.

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

As explained above, the initiation of repair occurs at T0 in the OIR sequence, and the repair initiator takes different forms. Table 5 shows the total frequencies of repair initiators within all 51 OIR sequences, followed in the rows below by a breakdown of frequencies according to whether or not there has been a preceding try-marker at T-1. As with the form of try-markers discussed in section 3.2, some of the repair initiators can also co-occur together. 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 Argentinean Sign Language (cf. Floyd et al. 2014). Off-record repair, by definition, always occurs on its own, and is not combined with any of the other forms (cf. Manrique 2014). Conversely, in our data, signers produce repetitive nodding with a puzzled facial expression, indicating they are not confident they understand fully. In our data set, such tentative continuers are also often taken as initiations or repair on behalf of their interlocutor.

	Repetition	Attention-getter	Body lean	Off-record repair	Tentative Continuer
All T0s	34 (67%)	11 (22%)	17 (33%)	11 (22%)	8 (16%)
Try-marking of T-1	25 (64%)	3 (8%)	8 (21%)	10 (26%)	8 (21%)
No try-marking of T-1	9 (75%)	8 (67%)	9 (75%)	1 (8%)	0 (0%)

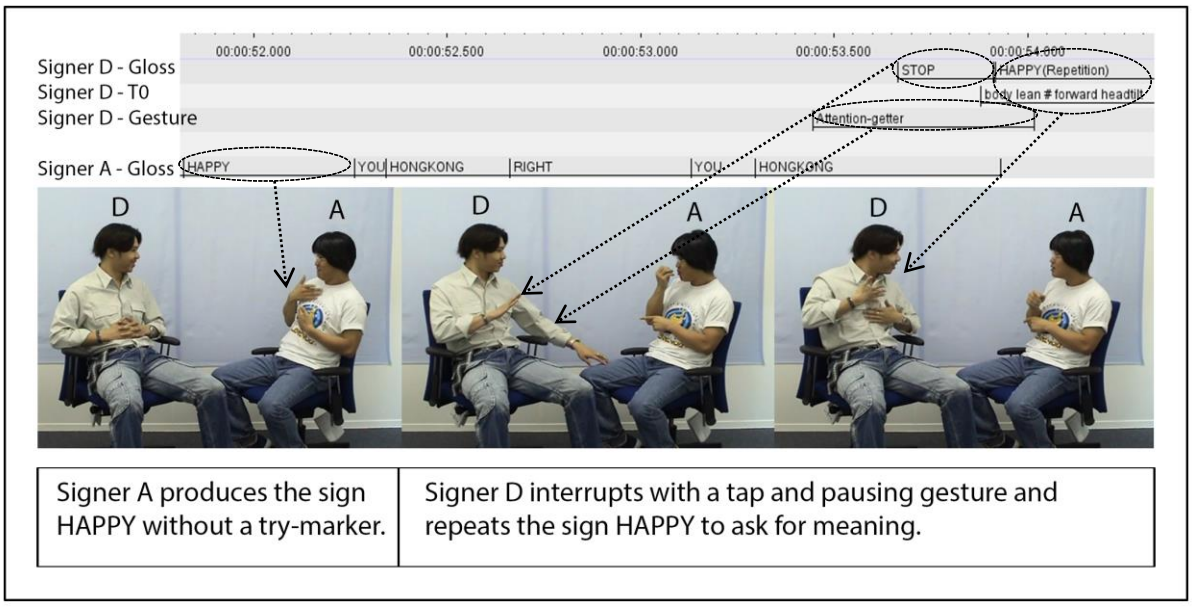
Table 5. Types and frequencies of repair initiation at T0

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 prevalence of restricted repair is due the high level of uncertainty about lexical items used by the interlocutors in the particular communicative setting of cross-signing, something that would not happen if there was a shared language in use between interlocutors.

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 a recognitional response, 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 continuers" here, and they occur only if there has been a try-marker at T-1.

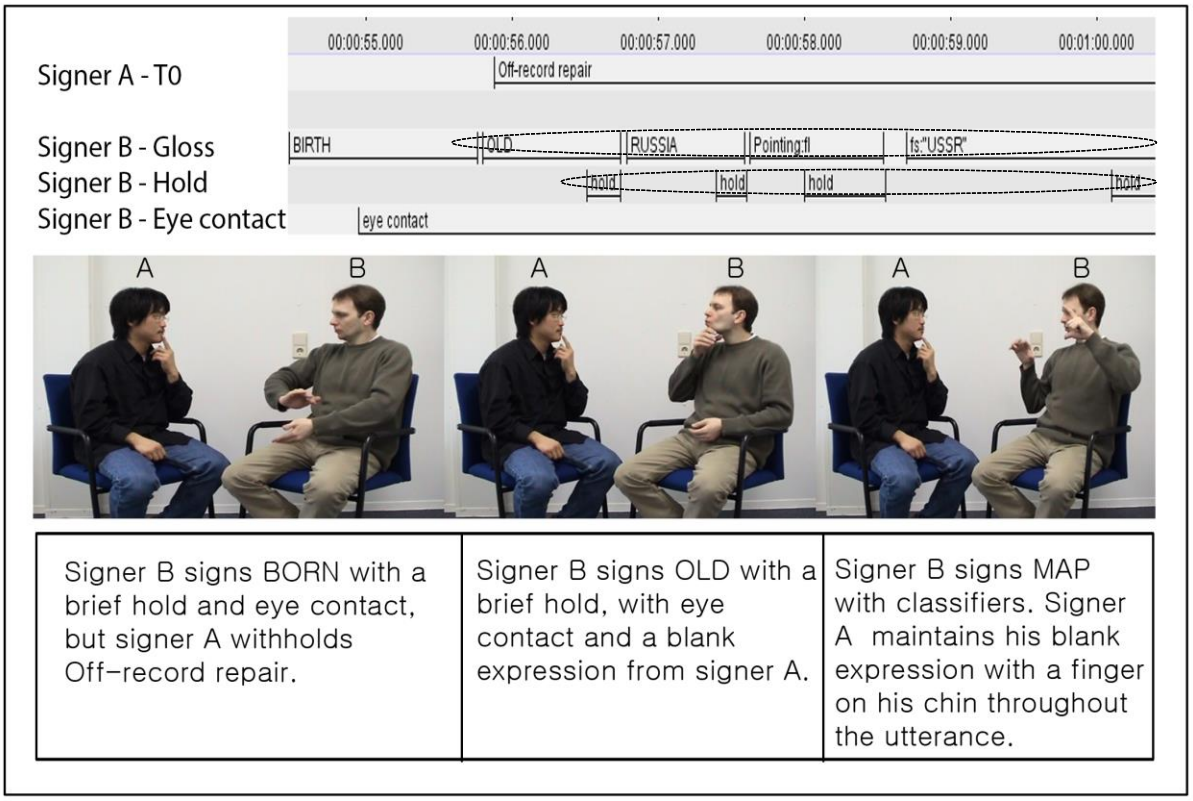
Examples 4 and 5 show OIR sequences without try-marker and with try-marker respectively. In example 4, the repair initiators are attention-getting gesture, forward head/body lean, and repetition. In example 5, there is a continuous absence of back-channeling from signer A, while signer B uses several try-markers and communicative strategies to try and convey the intended meaning.

Example 4: Other-Initiation of Repair without try-marker at T-1



Signer A produces the sign HAPPY without a try-marker.	Signer D interrupts with a tap and pausing gesture and repeats the sign HAPPY to ask for meaning.

Example 5: Other-initiation of repair with try-marker at T-1



Signer B signs BORN with a brief hold and eye contact, but signer A withholds Off-record repair.	Signer B signs OLD with a brief hold, with eye contact and a blank expression from signer A.	Signer B signs MAP with classifiers. Signer A maintains his blank expression with a finger on his chin throughout the utterance.

4.3 Types and timing of OIR sequences

In cross-signing, restricted OIR sequences can be classified further 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 Figure 4 above (preparation, stroke, hold, and retraction). They report that in question-answer sequences of Sign Language of the Netherlands, signers optimise stroke-to-stroke turn boundaries, and overlapping holds, preparation, and retraction phases are not treated as intrusive to the on-going discourse. In the normal case of OIR sequences, cross-signers also minimise the offset between the end of the final stroke of T0 and the beginning of the first stroke of T+1. Analysis of our data reveals that try-marking on T-1 facilitates the occurrence of fast track repair sequences in which T0 and T+1 effectively coincide. Conversely, OIR sequences may be delayed at T+1, or there may be a gap in the communication.

Table 5 summarises the types and timings of 42 OIR sequences. The remaining nine OIR sequences have only non-manual behaviours 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 behaviours. Although non-manual behaviours also occur at specific times, they are outside the scope of the data in Table 5.

The data reveal an interesting distribution in relation to try-markers. Fast track sequences only occur in the presence of try-markers. Hence seems that try-markers directly facilitate fast track sequences, as the signer of the trouble source anticipates having to provide additional repair. Conversely, sequences with delayed response are more strongly associated with the absence of try-markers, although delayed responses and gaps do occur under both circumstances. The high percentage of delayed responses under conditions where there is no try-marker makes sense from an interactional point of view. As the signer of the trouble source does not expect or anticipate the repair initiation, it takes more time to come up with a repair strategy. The different types and timings of OIR sequences are discussed in more detail below.

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

Table 6. The timing of T+1 in relation to T0

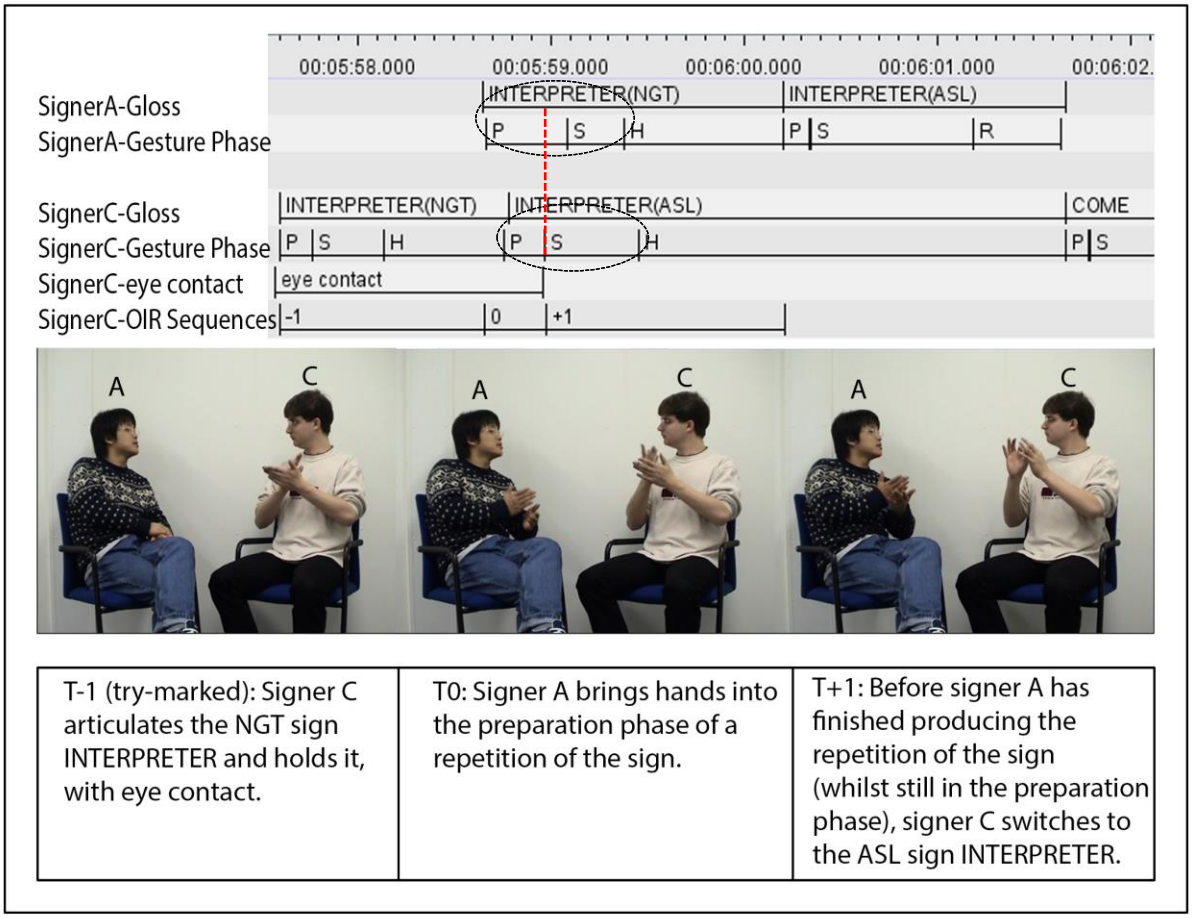
Fast track repair sequences

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 OIR sequence* is coined here for this latter type of interactional sequence.

An example of such fast track OIR sequences 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 INTERPRETING[NGT] which he try-marks by making eye contact with his interlocutor and holding the sign. Such a phrase-final hold creates an impression similar to a pause in spoken language as described for try-marked expressions in both English (Sacks & Schegloff 1979) and Thai (Moerman 1988). Signer A responds by repeating the sign and adds a forward head tilt, thus initiating repair. In the absence of a recognitional response such as a nod, Signer C projects this repair initiator and provides the ASL sign INTERPRETER[ASL]. Unlike the description by Sacks & Schegloff (1979), the second turn of this sequence (T+1) is actually not try-marked, and does not evoke an explicit recognitional, yet the interaction continues smoothly. Example 6 the overlap pattern between the preparation, stroke and hold phases (P, S and H) of signs 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.

Example 6: Fast track repair sequence

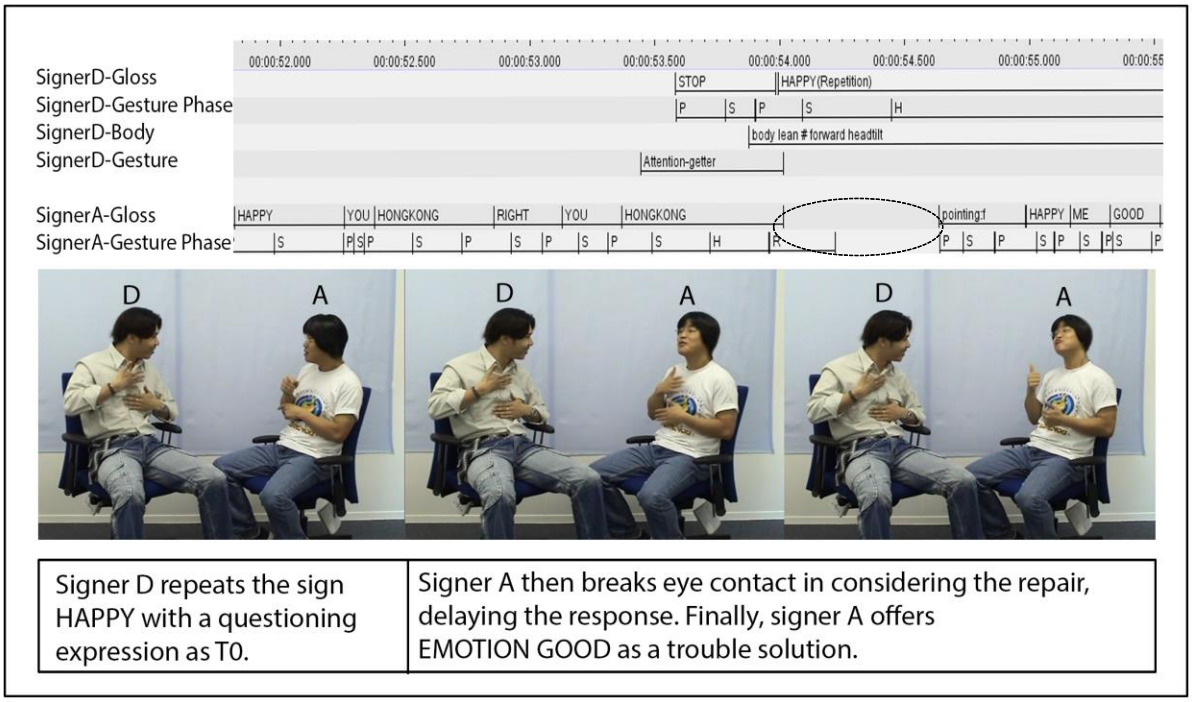


T-1 (try-marked): Signer C articulates the NGT sign INTERPRETER and holds it, with eye contact.	T0: Signer A brings hands into the preparation phase of a repetition of the sign.	T+1: Before signer A has finished producing the repetition of the sign (whilst still in the preparation phase), signer C switches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

Repair sequences with delayed response

In addition to fast track sequences, there is also evidence of delays in the timing of OIR sequences in the data. One example of delay concerns a difficulty in the expression of the concept of happiness (Example 7). In this excerpt, signer A uses his native sign HAPPY^{HKSL} when talking about meeting other young signers in Hongkong. 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.

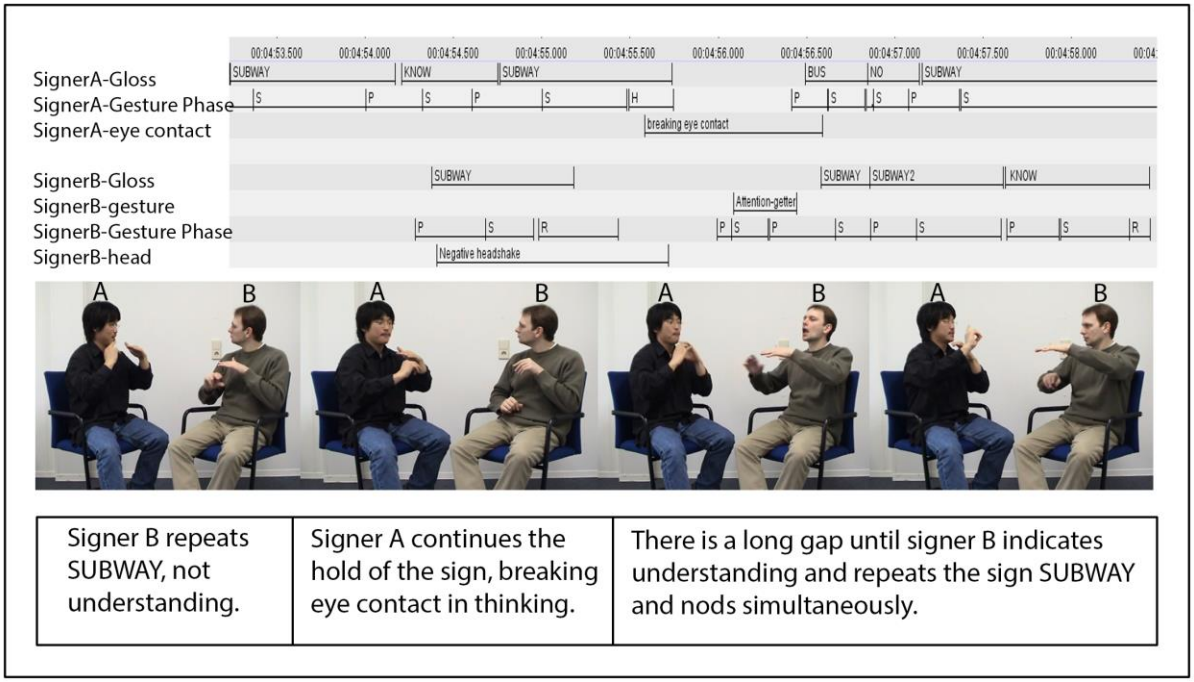
Example 7: Delayed repair sequence



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.

Breaking eye contact with the interlocutor is typical of delayed OIR sequences. The effect of breaking eye contact is to allow the signer extra time for metalinguistic processing, as the signer 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". Finally, a different type of delay occurs when there is a gap in the conversation, that is, neither of the participants is active in producing any signs.

Example 8. Repair sequence with gap



Signer B repeats SUBWAY, not understanding.	Signer A continues the hold of the sign, breaking eye contact in thinking.	There is a long gap until signer B indicates understanding and repeats the sign SUBWAY and nods simultaneously.

5. Conclusions

In this study we have analysed first encounters between deaf sign language users who do not know a common 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 thread to the flow of the ongoing conversation given the lack of conventional lexical items. 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 other-initiated repair (OIR) as compared to self-initiated repair (SR), which is the opposite of what is found in conversations where both interlocutors share the same language. Secondly, restricted repair is particularly prevalent in cross-signing. Both these features are due to the fact that there is no shared language available in the interaction. Therefore, OIR is essential to the interaction, and there is a particular challenge with respect to understanding lexical items used by the interlocutor.

The data also show a strong preference for repetition as the main repair initiator at T0, often in combination with non-manual behaviours. This strategy is used irrespective of whether or not there is a try-marker at T-1. Again, this reflects the fact that a major obstacle for this type of ad hoc

communication is the use of lexical items whose meaning is not shared between participants in the interaction.

For the first time, this research has demonstrated the use of try-markers within the context of signed OIR 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 provided evidence that try-markers create a welcoming environment for OIR and can expedite the process of repair, facilitating fast track OIR sequences. Such sequences, characterised 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 add to the general observation that OIRs tends 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. Zeshan (2015:254) maintains that cross-signing interactions involve at least the following metalinguistic processes: "deciding which linguistic items, structures, and other communicative strategies to use; making best guesses about the intended meaning of the interlocutors' signed output; monitoring and interpreting the interlocutor's non-verbal responses such as non-manual back-channel responses; and keeping track of those signs and structures that have entered the shared repertoire they have with a particular interlocutor at a given point in time." The occurrence of try-markers is overt evidence for such metalinguistic reasoning. Signers use try-markers as an anticipatory behaviour for repair sequences. 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 in order 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 behaviour, as signers exploit linguistic and interactional creativity (Zeshan 2015).

The extent and patterns of individual differences between signers as to the tools and strategies used for repair needs to be subject to future research. Moreover, it is also acknowledged here that OIR sequences can have more complex patterns, e.g. repeated repair attempts. These have not been fully studied in the current research and need further exploration in future.

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