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Other-initiated repair in Argentine Sign Language

Abstract: Other-initiated repair is an essential interactional practice to secure mutual understanding in everyday interaction. This article presents evidence from a large conversational corpus of a sign language, showing that signers of Argentine Sign Language (Lengua de Señas Argentina or 'LSA'), like users of spoken languages, use a systematic set of linguistic formats and practices to indicate troubles of signing, seeing and understanding. The general aim of this article is to provide a general overview of the different visual-gestural linguistic patterns of other-initiated repair sequences in LSA. It also describes the quantitative distribution of other-initiated repair formats based on a collection of 213 cases. It describes the multimodal components of open and restricted types of repair initiators, and reports a previously undescribed implicit practice to initiate repair in LSA in comparison to explicitly produced formats. Part of a special issue presenting repair systems across a range of languages, this article contributes to a better understanding of the phenomenon of other-initiated repair in terms of visual and gestural practices in human interaction in both signed and spoken languages.

Keywords: other-initiated repair; conversation analysis; sign language

The other-initiated repair system acts as the main guarantee of intersubjective understanding (Schegloff, 1992; Schegloff et al., 1977) playing a crucial role in any kind of human interaction, regardless of the semiotic system employed (Enfield, 2009a). The phenomenon of repair has been traditionally defined based on spoken language in terms of problems in speaking, hearing, and understanding, which can be initiated and carried out by either a speaker or hearer (Schegloff et al., 1977). Whether there is a conventionalized set of linguistic resources to indicate perceptual and understanding problems in a sign language based on naturally occurring data has been an open question.

On the other hand, research has progressed enormously in recent decades in the description, and analysis of sign language, including grammar, semantics, psycholinguistics, and typology, nevertheless there are still some research areas that are uncharted territory. One of these areas is the study of situated informal social interaction. Research in this area is now moving towards a broader cross-linguistic database and video-based methods of analysis. However, the main focus is still on spoken language, and sign language remains largely unexplored.

This article presents evidence from a large conversational videotaped corpus recorded in deaf associations and clubs in Buenos Aires, Argentina, showing that signers of Argentine Sign Language (Lengua de Señas Argentina or 'LSA') also use a variable and systematic set of linguistic formats and practices to indicate troubles of signing, seeing and understanding rather than speaking and hearing. The definition of the phenomenon of repair, one of the core mechanisms of linguistic interaction, has been expanded here to include the visual and gestural modality. It is described in this article as a natural practice in human interaction for handling problems

in producing, perceiving and understanding, regardless of modality. As such, speakers and signers can initiate repair to fix problems online during conversation. The general aim of this study is to contribute to the field of social interaction by providing evidence from a Latin American sign language.

The specific aims of this article are: (a) to describe a set of formats and practices used to initiate repair focusing on the multimodal visual-gestural components; (b) to provide a quantitative distribution of the formats found; (c) to introduce a previously undescribed practice of other-initiated repair (OIR), interpreted in this study as an implicit (off-record) way of initiating repair, and (d) to compare implicit to explicit (on-record) practices of OIR.

In what follows, we first provide a brief description of LSA. Second, we describe the data observed for this study based on a corpus of video-recorded of naturally occurring conversations in LSA. This section also refers to the sample of cases collected. Third, we report on quantitative distributional information of OIR, and then move to the description of the set of formats of OIR. This section begins by describing explicit (open and restricted) formats of OIR. It starts by describing minimal explicit and open resources, involving a broad set of exclusive uses of nonmanual markers (NMMs) to then continue with composite formats of intonational NMMs for questions and manual signs, using open question words with meanings similar to those in spoken language (e.g. *'What?'*). Then, we refer to restricted formats including content question words (e.g. *'Who?'*, *'Where?'*, etc.), repeat of the trouble source (repeating a person or place name to confirm understanding), and polar questions (presenting more than one alternative, such as, *'Do you mean X or Y'* type). In the second part of the section, we introduce an implicit practice to initiate repair, called the 'freeze-look' practice, and we compare implicit and explicit practices of OIR. In section 4 and 5, we expand the description of the OIR practice to the morphosyntactic resources involved, and we briefly point out other types of actions that can be produced using the same manual formats, but combined with distinct NMMs to indicate teasing or surprise for instance. Finally, we conclude by summarizing the findings and their implications for our understanding of OIR practices from a bodily-visual perspective. As a part of this special issue presenting repair systems across a range of languages, this article contributes from the sign language perspective with a broader aim to gain a better understanding of the phenomenon of repair in terms of visual and gestural practices in human interaction in both signed and spoken languages.

The LSA language

LSA is used in Argentina[1], mostly in the larger city of Buenos Aires, Greater Buenos Aires, Cordoba and Mendoza. Members of the LSA signing community have predominantly received oral-sign education. As a result, they are bilingual and bimodal in LSA and Argentinian Spanish. LSA is influenced in some ways by contact with Spanish, for example in the common use of Spanish words, either mouthed or fingerspelled. Members of the LSA community vary with respect to their specific background: a small minority are deaf with deaf parents, most of them are deaf with hearing parents, others are hearing but have learned to use the language, for example because their parents or other family members are deaf. Beyond the schooling system, deaf clubs and associations provide a context in which LSA is used and learned.

LSA was influenced by old Italian Sign Language (Lingua dei Segni Italiana) due to the large-scale immigration of Italians, among old teachers and deaf immigrants working in deaf schools[2] especially after the First World War (Veinberg, 1996). Previous work on the language includes a description of the grammar (Massone & Machado, 1992; Veinberg, S., 1993; Curiel & Massone, 2004), dictionaries (Massone, 1993; Curiel & Massone, 2004), and work on deaf bilingual education, interpretation among other relevant issues (Veinberg, 1996; Behares et al., 1990). The current article is part of a larger project by the author that studies the conversational structures of LSA.

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1 According to the last official report (INDEC) in 2010, there are nearly 300,000 hearing-impaired people in Argentina out of a total population of the country of over 40 million people (INDEC, 2010). However, there are no official surveys regarding LSA users since not all of them have received a bilingual education in LSA and spoken Spanish (Bittles & Black, 2010; Bittles et al., 1991; Tucci et al., 2010).

2 The first deaf school in Argentina and one of two first in Latin America opened in Buenos Aires in 1857.

Data collection and corpus

The corpus on which this work is based was constructed in accordance with a set of guidelines developed by and for the members of the comparative project being reported on in this special issue (see introduction for further information). Here are some key properties of the data:

**Table 1:** Key properties of the data collected for this study
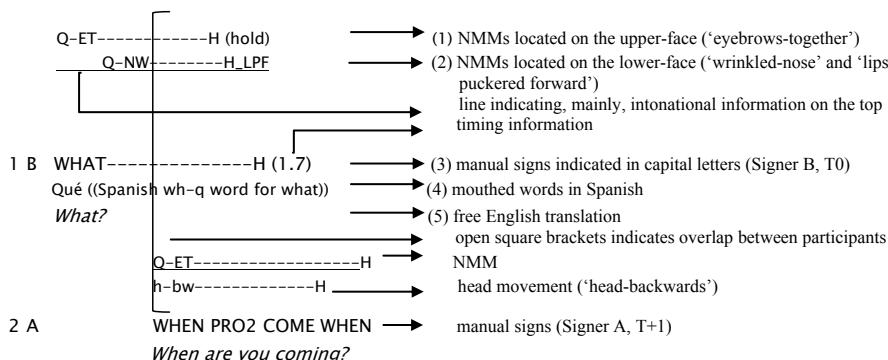
- Recordings were made on video.
- Informed consent was obtained from those who participated.
- Target behaviour was spontaneous conversation among people who know each other well (family, friends, neighbours, acquaintances), in highly familiar environments (homes, village spaces, work areas).
- Participants were not responding to any instruction, nor were they given a task—they were simply aware that the researcher was collecting recordings of language usage in everyday life.
- From multiple interactions that were collected in the larger corpus, the selection for analysis in this study was of a set of 10-minute segments, taken from as many different interactions as possible (allowing that some interactions are sampled more than once), to ensure against any bias from over-representation of particular interactions or participants.

The LSA data used in this study were sampled from a set of recordings in Buenos Aires, Argentina, made by the author between 2010 and 2012. A total of 11 dyadic (5) and multi-party (6) interactions were sampled for this study, with between 10 and 20 minutes sampled from each interaction, totalling 1 hour and 50 minutes of conversation. 59 signers between 20 and 80 years old participated in the sample selected (35 men and 24 women). All participants were adults and proficient in LSA.

Transcription of OIR cases

The transcription of the OIR cases included the information that we provide in the data examples below, using between a minimum of one line and a maximum of five lines. Two lines are distinguished for nonmanual markers (NMM), the first one for head movements (e.g. h-down 'head-down') and the second one for facial movements (e.g. ET 'eyebrows together'). The line below NMM information (see schema below) indicates the extension and alignment of NMM (above the line) in relation to manual makers (below the line) that are often produced in overlap. In general, one line is used for manual sign glosses (mainly lexical information, illustrated in line 3 below) giving single-word translations into English in capital letters. In some examples it is also relevant to include more information to indicate distinctive use of the separate hands. In these cases, one line is used for the right hand and another one for the left hand. Mouthing is also used frequently in OIR practices and it is indicated by a separate line (see line 4) after the manual glosses when it is relevant. The last line corresponds to the free English translation in italics. Here is an example, illustrating the distinct lines for representation of each of the formal aspects that we coded.

A large open bracket indicates when overlapping turns are produced between participants. At the end of line (3), the timing information of the duration of a sign is indicated between parentheses in seconds (1.7). In line (4), double parentheses contain additional comments from the transcriber (see Appendix A for a full description of conventions used in the examples in this article).

Besides the transcription of the cases described above, a summary of every example is also provided for easier access to the data, including only the main OIR sequence (T-1, T0 and T+1) in free English translation.

Formats for other-initiation of repair

Other-initiation of repair occurs in a conversational sequence with a minimum of three utterances. The first utterance, by Person (Signer/Speaker) A, is the *trouble source* turn (here referred to as T-1). This is followed by a *repair initiator* (here referred to as T0), produced by Person B. The repair initiator indicates that B has a problem of seeing, hearing or understanding, and is asking that it should be fixed or clarified in some way. Then Person A provides the *repair solution* (here called T+1). In this article, we survey forms that users of LSA use for initiating repair in T0 position. Our interest is not only in the specific linguistic resources that are used by signers of LSA for formulating other-initiation of repair, but also in the contextual principles for selection of one type of form over another, the kinds of functional outcomes that each type of form can have (that is, the repair operations that the forms elicit in T+1) and the type of trouble sources (T-1) that have led an addressee to initiate repair.

Sign language users (signers) coordinate a complex variety of body articulators besides hand movements to communicate, such as: facial action, eye gaze, head, body posture and 'mouth action signs'. Other-initiated repair can be produced by one of these articulators or, more commonly, by a synchronized combination of them. The components of sign language are analyzed as conjoined in unified composite utterances in which an interpreter takes multiple signs and draws them together into a unified meaningful package (Enfield, 2009b).

We distinguish the following types of repair initiator (see introduction to this special issue):

Table 2: Some basic format types for other-initiation of repair

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Explicit (on-record) types of initiators:

Open. Open type repair initiators are requests that indicate some problem with the prior talk while leaving open what or where the problem is exactly.

- *Non-manual markers (NMMs).* In sign language (see section 3.1.1.) this category includes non-manual markers (e.g., LSA *'eyebrows-together'* could be translated as *Huh?* in English), which could be comparable with *interjections* in spoken language produced with questioning intonation (e.g., English *Huh?*).
- *Question-word.* An item from the larger paradigm of question words in the language. Usually a thing interrogative, sometimes a manner interrogative. In LSA question-words are produced by manual signs.
- *Formulaic.* Expressions not incorporating interjection or question-word, often managing social relations or enacting politeness. The use of this format as initiator of repair has not been found in the LSA conversational corpus 2010-2012.

Restricted. Restricted type repair initiators restrict the problem space in various ways by locating or characterising the problem in more detail.

- *Request type (asking for specification/clarification).* Typically done by content question-words, often in combination with partial repetition.
- *Offer type (asking for confirmation).* Typically done by a repetition or rephrasing of all or part of T-1.
- *Alternative question.* Repair initiator that invites a selection from among alternatives. Within restricted, *external* repair initiators address problems about unexpressed elements of T-1; this 'external' function can be performed by all of the listed format types for 'restricted'.

Implicit (off-record) type of initiator:

- *'Freeze-look' response.* Notable or 'pointed' absence of response after a question has been asked. It is performed by an addressee by holding their hands and body in a still position and looking directly at the questioner at the time a response is expected. This practice prompts a questioner to re-do the question.

Table 3 classifies 213 OIR cases extracted from the LSA corpus. Around 90 percent of the cases are explicit OIR while only 10 percent are implicit. From the explicit types of OIR, restricted type repair initiators are nearly twice as frequent as the open type.

Table 3 Frequency of types of repair initiator in the LSA corpus

Type	Subtype		Frequency	Proportion
Explicit (on-record)	**Open**	Non-manual	51	23%
		Question-word	13	6%
		Formulaic	0	0%
	Restricted	Content q-word (asking for specification)	15	6%
		Repetition (asking for confirmation)	56	26%
		Offer (asking for confirmation)	52	24%
		Alternative question	3	1%
Implicit (off-record)	**Open**	'Freeze-look' response	23	10%

Explicit open request types

OIR has been described as an explicit, direct and 'official' way to initiate repair on another person's turn by indicating that there has been a problem of perception or understanding in interaction. It explicitly requests the producer of the trouble source to fix the problem by repeating or re-doing the previous turn. Open OIR leaves open or unspecified the location of the problem, in contrast with restricted OIR formats (see section 3.2. below) that specify the location of the problem. In the current study, explicit repair initiation formats (open and restricted) are distinguished from an indirect or less explicit practice to indicate problems of understanding (see section 3.3. below for a description of the 'freeze-look' practice; see also Manrique & Enfield, 2015).

Open explicit types in LSA include the use of minimal resources produced by one or more NMMs and the combination of manual (question-words) and NMMs (see section 3.1.2.).

Non-manual markers (minimal resources)

The LSA repair system incorporates many non-manual markers. They are the most frequent type of formats used in doing open OIR in LSA. In addition, they are the most minimal explicit linguistic forms in terms of articulatory effort. Another relevant characteristic is that these articulators are located mainly on the face providing faster, more direct and easier access by both the producer and recipient. One or more contractions of the facial muscles can produce these facial actions. Those produced in the upper part of the face are the most efficient signals of problems during face-to-face interaction in LSA. One of the reasons is that signers direct their attention to the face rather than the hands, which are generally perceived in peripheral vision (Bavelier et al., 2000; Proksch & Bavelier, 2002). For instance, drawing one's eyebrows together may indicate a problem of understanding about what has been signed before with no need to use manual signs. However, restricted formats do need to use manual signs to narrow down the location of the problem.

Non-manual markers in sign languages convey information through different channels such as facial action (eyebrow, forehead, eye gaze, nose, mouth, tongue and cheek), head, shoulder and upper-body positions. They can add grammatical and pragmatic information to manual signs. They are often combined with manual signs, as intonational or morphological markers, but they can also be used alone.

The use of non-manual markers alone to initiate repair in LSA can be compared with the use of non-vocal signals or communicative gestures in spoken languages. Consider, for instance, facial gestures, head and body movements to indicate signals of problems in perceiving or understanding in more focused face-to-face interaction (see Levinson, 2015 this issue). In spoken languages these signals are often combined with linguistic vocal forms to initiate repair, but they are used alone as well, and explicitly indicate problems during online interaction.

Non-manual markers in sign language can also be compared or related to the use of interjections in spoken languages. Interjections such as *huh?* in English can be compared in terms of minimal effort and

questioning prosody (as discussed by Dingemanse et al., 2013) with the use of eyebrows-together and eyebrows-raised actions in LSA (see examples in Extract 1, Extract 2 and Extract 3). Furthermore, voiceless mouthing such as the open mouth gesture in LSA resembles *Huh?* in English or *Ah?*, *Eh?* in Spanish for instance (Extract 9). More work needs to be done to compare non-manual gestures/markers in both signed and spoken face-to-face interaction. We now look at some examples of the use of non-manual markers in doing OIR in LSA.

Eyebrow movements can be used as 'prosodic' question markers in many sign languages, but their functions can vary across languages (Dachkovsky & Sandler, 2009; Wilbur, 2013; Zeshan, 2004). Among the different NMMs use to initiate repair in LSA, eyebrows-together and eyebrows-raised are the most common.

Extract 1 shows a composite OIR utterance consisting of raised eyebrows combined with head up and the upper-body leaning forward by Person B, who holds still this body posture toward Person A (line 4) requesting in this way that Person A fixes the problem. In this example, Person B (Figure 2, on the left) recognizes that Person A (on the right) is signing to him, but he realises this only after the beginning of A's turn. This is functionally similar to the interjection strategy used in spoken language (e.g., *Huh?* in English; see Dingemanse et al., 2013). This format is common when there is a seeing problem—i.e., when Person B has not (clearly) seen what Person A has just signed.

Summary: Extract 1

3	A	Did you finish?	T-1
4	B	Huh?	T0
5	A	{To pay} the money, did you finish?	T+1

Extract 1. ASAM_392140

```
1 A    HEY–B
       Hey

2 B    ((attending to another participant))


                              Q–ER
3 A    FINISH--------------------H   ((Figure 1))                              T–1
       Did you finish?
                                   h–bw
                                   Q–ER
4 B    ((Attending C)) Leaning forward-------H (( Figure 2))
                                                                              T0
            Huh?

                                     Q–ER
5 A                                MONEY FINISH=                               T+1
                                   {To pay the} money, {did} you finish?


6 B      =FINISH SEND READY
         I have finished it, I sent it, it's ready
```
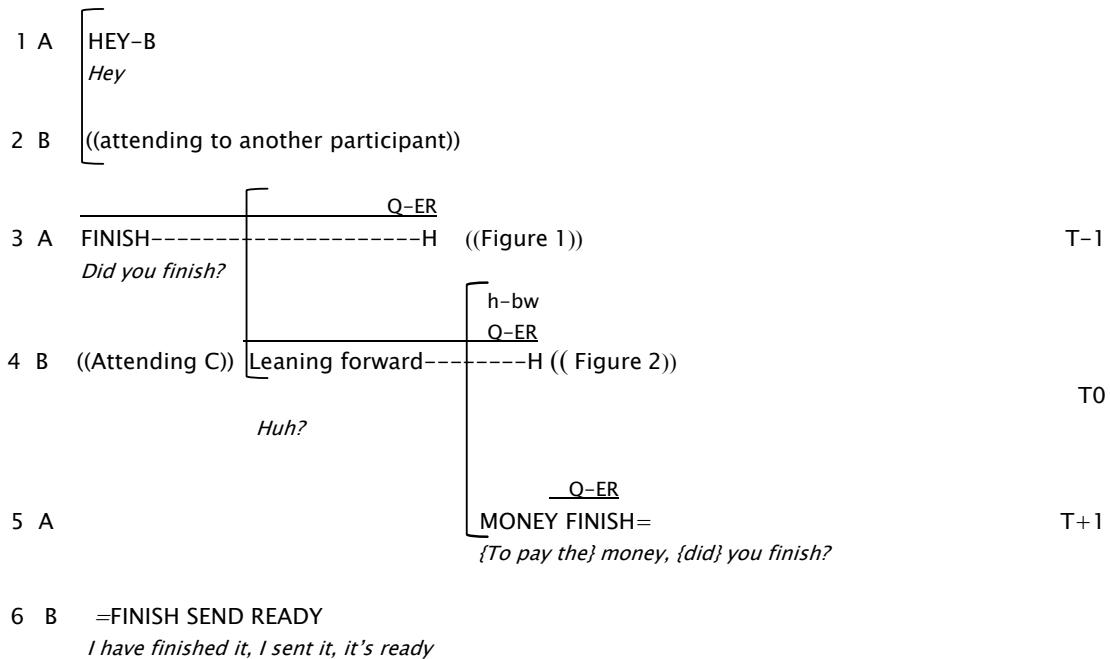
Figure 1. *'Did you finish?'*, Person A on the right asks Person B on the left (line 3).

Figure 2. *'Huh?'*, signer B on the left, initiates repair on A's previous turn by raising his eyebrows, head up and leaning forward (line 4).

In this example we can distinguish two different problems of seeing. In the first one (line 1-3), Person B is not attending when Person A is trying to get B's attention and signing. Then, Person A, who is looking at B, solves this problem by holding his hands up, combined with a questioning face (raised eyebrows), until B looks at him (line 3). Once Person B looks at Person A, A redoes his previous turn by near-repeating the question (line 5) produced in the trouble source (line 3). In contrast, in the second seeing problem in the OIR sequence, Person B recognizes that Person A is directing his attention towards him and that A has signed to him. However, B does not know what has been signed in the previous utterance produced by A, except for the manual sign that A held waiting for B's attention. B deals with it by initiating repair (line 4). In the next turn, Person A solves the problem by signing first the reference that was omitted ('*To pay the money*'), and then by repeating the question produced in the trouble source ('*Did you finish?*').

Extract 2 shows a different eyebrow action, bringing the eyebrows together, combined with a head movement toward Person A. Person A mouths a fish name (sole, *lenguado* in Spanish) that is harder to recognize than a manual sign, even though Person B is looking at A. Then, Person A fixes the problem by repeating the name of the fish, using mouthing again and simultaneously adding fingerspelling.

Summary: Extract 2

1 A	What about sole?	T-1
2 B	Huh? ((Eyebrows-together combined with head movement))	T0
3 A	Sole ((finger-spelling and mouthing instead of sign as in line 16))	T+1

Extract 2. ASAM_990990

```
            h–bw
           Q–ET
  1 A   L sole ((lenguado))                                        T–1
       What about Sole?


            h–bw
           Q–ET
  2 B                                                              T0
       Huh?


  3 A   L–E–N–G–U–A–D–O/lenguado––H  PT–––––––H                    T+1
       Sole


       (…)


  4 B   OM PRO1 LIKE NOTHING+ PRO1 LIKE NOTHING
       Ahh, I do not like any of it, I do not like it.
```

In Extract 3, both eyebrow movements just described —eyebrows raised and eyebrows together— are performed consecutively (line 2). In line 1, there is a problem of seeing when Person A starts a new turn

(Figure 3, left side of the table) and Person B (right side of the table) is not looking at A. Then, in line 2, Person B recognizes that Person A is signing to him and initiates repair by raising his eyebrows first, followed by eyebrows together and the manual sign *'wait'*. Person B's non-manual and manual signs are held until Person A solves the problem by repeating the partially missed turn, adding a clarification at the end of T+1 (line 3).

Summary: Extract 3

1	A	I'm not gonna tell them, right? ((While B is eating and not looking at A))	T-1
2	B	Huh? What? Wait.	T0
3	A	I'm not gonna tell them, you take care there are thieves ((in the neighbourhood where his friend is going to move))	T+1

Extract 3. ASAM_616130

```
            Q-ER              Q-ER-H
1  A  PRO1 SAY-NOT PRO3 PRO1 |PU------H  ((Figure 3))                    T-1
      I'm not gonna tell them, right?

                            Q-ER-ET
2  B                       |WAIT---H= ((Figure 4 and Figure 5))          T0
                            Huh? what? Wait

3  A  =PRO1 SAY-NO |PRO3 PU TAKE-CARE THIEVES                            T+1
      I'm not gonna tell them, you take care there are thieves
      ((referring to the neighbourhood where his friend is going to move))

4  B            |PU
                Sure.
```


Figure 3. *'I'm not gonna tell them, right?'*, Person A (left) asks Person B (right), while B is eating and not looking at A in line 1.

Figure 4. *'Huh?,* Person B (right) initiates repair on Person A's prior turn using three consecutive formats (line 2). First, B raises his eyebrows; second he brings his eyebrows together; and third, he raises his left hand *'Wait'* (see Figure 5).

Figure 5. *'Huh?, wait'* Person B (right) raises his eyebrows (see Figure 4); second he brings his eyebrows together and raises his left hand *'Wait'* (line 2).

The next example, Extract 4, is a similar case with two consecutive initiators of repair. Here, in the second initiation of repair the recipient adds wrinkled nose, an open mouth gesture resembling an interjection in spoken language, and a pointing gesture with his index finger up (Figure 7). In the first initiation, Person B raises his eyebrows and leans forward.

Summary: Extract 4

1	A	Hey, Who is R ((sign name))? (...)	T-1
3	B	Huh? Wait, what?	T0
4	A	Who is R? How do you know him?	T+1

Extract 4. ASAM_ 591060

<pre>
                 Q–ET
1 A   HEY R ET–WHO   T–1
        Hey, who is R ((sign name))?

                  Q–ET
2   NO │C PT–THERE NO
    No,│C there, no?
                          Q–ER–H   Q–WN
3 B   │((leans–forward)) OM PT–UP ((Figure 6 and Figure 7))   T0
        Huh? Wait, what?

                      Q–ET
4 A   R WHAT–como know–him   T+1
        Who is R? How do you know him?

        nod: NO++
5 B   PRO3++ ((mouthing))
        No, I don't know him, he knows him
</pre>

Figure 6. *'Huh?'*, Person B (left) initiates repair on Person A's previous turn by raising his eyebrows and head first, line 3.

Figure 7. *'Wait, what?'*, Person B, also in line 3, after raising his eyebrows and head at the beginning of line 3, opens his mouth (OM) and raises his index finger up.

Wrinkled nose (WN) is another common non-manual marker format to initiate repair in LSA. It is less frequent in the LSA conversational corpus than eyebrow movement formats and it can also work as intensification marker. An example is shown in Extract 5 where the wrinkled nose action is produced alone, with the arms in resting position. As in the previous examples the solution is provided by a partial repeat adding the missed reference (*'COLONIA'*, summer school for kids, line 3).

Summary: Extract 5

1 A	Now, ((has it)) finished?	T-1
2 B	Huh?	T0
3 A	Now, the summer school for kids	T+1

Extract 5. Swimming_pool_ 526292

<pre>
           Q–ET
1 A   │NOW FINISH   T–1
       │*Now, ((has it)) finished?*
                   h–bw
2 B   │((Looking toward A)) WN   T0
        Huh?

3 A   NOW PT–THERE COLONIA   T+1
       Now, there, the summer school for kids

4 B   nod: YES+++
       Ah, yes.
</pre>

Also among the non-manual markers used for OIR in LSA are four types of mouth signs (Bickford, 2008; Woll, 2009): puckered lips forward, puffed cheeks out, open-mouth and closed mouth downward. The last two types are functionally similar to interjections in spoken language, such as *huh? hm?* or *ah?, eh? hmm?* (in spoken English and Spanish respectively). Note that the facial actions in sign language, LSA in this case, are more 'pronounced' than in spoken language. They are less frequent than eyebrow actions in the LSA corpus. They are often combined with other non-manual markers and frequently function as intensifiers.

'Lips puckered forward' (LPF) is produced with both lips pushed forward. It is a similar facial action to lip pointing in spoken language (Enfield, 2009b, p. 90-110). In LSA, LPF can be coordinated with other facial and head movements. An example is shown in Extract 6. Person B (line 2, Figure 8, on the left) uses only his lips puckered forward as indication of a problem during the interaction. Before the OIR in line 2, Person B is attending to Person A, while he is drinking *mate*[3] with his right hand, and keeping his left hand in a resting position. In line 3, Person A solves the problem by partially repeating T-1, the trouble source of the sequence, and adding more information specifying the reference of the verb ('*THE-ASSEMBLY*').

Summary: Extract 6

1	A	Has the decision been made?	T-1
2	B	Huh? ((gazing A, no-answer))	T0
3	A	The decision of the assembly	T+1

Extract 6. CAS_51440

			h-bw-H		
			Q-ET		
1	A	WHAT DECISION/decision MAKE-PAST READY------------------H (1.4)			T-1
		Has the decision been made?			
			eyes-blink		
2	B	((drinking and holding mate with one hand))	((gazing A)) LPF ((Figure 8))		T0
			Huh?		
3	A	FINISH DECISION ASSEMBLY DETERMINATION			T+1
		The decision of the assembly.			
4	B	nod: yes++			
		Yes, yes.			

Figure 8. *'Huh?'*, Person B, on the left, initiates repair on Person A's previous turn by pushing his lips forward, line 2 (T0).

The mouth action of puffing out one's cheeks combined with eyebrows together is another common format to indicate understanding problems in LSA. This mouth gesture has been described and analyzed

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3 Mate is an Argentinian drink, similar to green tea.

in other sign languages including ASL, NGT, and BSL, with a range of functions when combined with a manual sign (see Sutton-Spence & Woll, 1999; Crasborn et al., 2008; Lewin & Schembri, 2013).

In Extract 7, Person B initiates repair with puffed cheeks out, combined with lifting his head up and bringing his eyebrows together (Figure 10, line 2). This composite action is held for nearly 3 seconds, until Person B (with help from Person C) fixes the trouble source (line 3 and 4).

Summary: Extract 7
1　A　Hey, what has happened with Blue Eyes ((sign name))? I haven't seen him.　　　　T-1
2　B　Huh?　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　T0
3　A　Blue-eyes, what has happened with him?　　　　　　　　　　　　　　　　　　T+1

Extract 7. ASAM_107207

```
                                     Q-ER
    1  A   HEY WHAT BLUE-EYES PRO3 NO SEE-PRO1-NOT ((Figure 9))              T-1
           Hey, what has happened with Blue-eyes ((sign name))? I haven't seen him.


                        h-bw
                     Q-ET-H
    2  B   Puffed-cheeks------H (3.0) ((Figure 10))                         T0
           Huh?
                              Q-ET-H
    3  A   BLUE-EYES PU PRO3 SN WHAT-H                                      T+1
           Blue-eyes, what has happened with him?


    4  C   SN ((corrects the sign name-SN- that Person A produces in the previous turn))


           nod: yes++
    5  B    KNOW-NOT
           Ah, yes, I don't know.
```

In line 3, signer A fixes the problem by partially repeating the trouble source turn and changing the position of the question-word *'What?'* It is located at the beginning of the utterance in the trouble source and shifted to the end of the utterance in the solution turn.

Figure 9. *'What has happened with Blue-eyes (sign name)? I haven't seen him'*, Person A (left) asks Person B (right) about another person, line 1 (T-1).

Figure 10. *'Huh?'*, Person B (right) initiates repair on Person A's previous turn by puffing his cheeks out and simultaneously bringing his eyebrows together and lifting his head up (line 2).

Extract 8 and Extract 9 show a third type of mouth practice produced with the mouth open. There is some ambiguity as to whether it is a gesture or a mouthing action, as it resembles the vocal interjection *'Ah?/Eh?'*, used to initiate repair in spoken Spanish.

In Extract 8, Person B initiates repair with an open mouth gesture (line 3). This action is combined with eyebrows raised and leaning forward. This on-record initiation is preceded by a delayed off-record 'freeze-look' response (0.6 seconds) (for more details on off-record 'freeze-look' response see section 3.3. below).

The trouble source is produced by a pointing sign indicating the location of a place together with mouthed name of the place by Person A (line 1). Person A maintains the pointing sign until Person B does an on-record open OIR. At the beginning of line 2, when the mouthing is produced, there is an overlap of both signers that could interfere with Person B lip-reading.

Person A fixes the trouble source by repeating the mouthed reference of the place (line 4). The trouble source seems to be a seeing problem more than an understanding one. Person A has not used finger spelling as in the previous examples.

Summary: Extract 8

```
1 A   There ((mouthing name of a place))                          T-1
3 B   Huh? ((Signing in overlap)) ((Freezes leaning forward slowly))   T0
4 A   ((Repeats the name of the place using mouthing))            T+1
```

Extract 8. ASAM_ 1905382

```
1 A   PT–THERE------------------------------------------H              T-1
      Mouthing–place–name
      There, (name of a place).


                                  leaning forward slowly
2 B   ((signing in overlap)) ((freeze–look)) (0.6)      ((Figure 11))


      leaning forward–H
              Q–ER
3 B   OM                  ((Figure 12))                                 T0
      Huh?


4 A   –PT–THERE-------------------------H                              T+1
      mth–(…)
      There ((Repeats the name of the place))


5 B   nod: YES++
      mth: it–seems–so
      Yes, yes, it seems so.
```


Figure 11. Person B, on the right, performs a *freeze-look* before the explicit initiation of repair (line2).

Figure 12. *'Huh?'*, Person B, on the right, initiates repair by opening her mouth, accompanied with leaning forward and a hand retraction of the previous held sign, line 3 (T0).

Extract 9 shows another example of open mouth to initiate repair combined with head movement (head up) and eyebrow movements (eyebrows raised). In this example there is a group of friends chatting about factories and companies that are re-opening. Person B initiates repair on Person A (line 2), who mouths a company name (line 1). Then, Person A fixes the sequence by repeating the name of the company, but using fingerspelling instead (line 3). (See similar trouble source and resolution in Extract 2).

Summary: Extract 9

1 A	((Mouthing (mth) of a company's name))	T-1
2 B	Huh?	T0
3 A	Um, umm… Cele(..)	T+1

Extract 9. ASAM_ 61480

1 A   mth: (company's name)   ((Figure 13))   T-1
       (Company's name)

                                  h–bw–H
                                  Q–ER–H (0.9)
2 B   ((holding hands from previous turn))   ((Figure 14))   T0
       OM--------------H
       Huh?

3 A   H– (hesitation) C-E⌐ L–E mth–(…)   T+1
       Um, umm… Cele(..) |

                            | h–bw–H
                            |─────────────────────────
4 B | HEY PT NO+ THERE–IS–NOT
                            └ mth:(company's name)
                              Ah, {you mean} ((mouthing a company's name)), *no, it's not that one.*

Figure 13. (*'Company's name'*), Person A, on the left side of the arrow, mouths the name of a company to Person B, on the right of the arrow, line 1 (T-1).

Figure 14. *'Huh?'*, Person B, on the right of the arrow, initiates repair on Person A's previous turn by opening his mouth and lifting his head up, line 2 (T0).

As has been shown already, head movements are another important resource to initiate repair in LSA. The head movement can be up, down, toward one of the sides, or tilt. These occur mostly in combination with other manual and non-manual markers. Most frequently, a head-upward action is combined with eyebrows together moving downwards, while a head-downward action is combined with raised eyebrows. The head movement also depends on the previous position of the head, contrasting both movements.

The most frequent head movement to initiate repair in LSA is head upward (see Extract 1, Extract 5, Extract 7 and Extract 9). Extract 10 shows another case initiated with a head upwards movement combined with eyebrows together (Figure 16, line 2) and with the hands held or suspended in the form of the previous manual sign configuration. This example is a pursuit case preceded by an off-record initiation of repair (see section 3.3. on off-record OIR).

This sequence begins with a question from Person B, holding the sign configuration until the answer is given. Person B keeps his manual and non-manual markers suspended (Figure 15 and Figure 16). This may be because Person A has not yet provided a satisfactory answer to Person B. Then B, while maintaining his hands suspended, initiates repair by moving his head upwards and bringing his eyebrows together. Person B also suspends this non-manual configuration until A provides the solution of the trouble source (line 3).

Summary: Extract 10
1 A I sent it ((the documents)) to the office at the congress. ((Answer to a question))   T-1
2 B Huh?   T0
3 A I paid, I don't know. ((Mouthing))   T+1

Extract 10. CAS_ 579890

    1 A PU Congress ((Answer to a question)) ((Figure 15))   T-1
           I sent it ((the documents)) to the office at the congress.

                              h–bw–H
                              Q–ET–H
    2 B ((holding previous signs))   ((Figure 16))   T0
           Huh?

           mth: (...)
    3 A PAY PU––––––––––––––––––H   T+1
           mth: (...)
           I paid {it}, I don't know. ((Mouthing))

           OM–H
    4 B PT–NOW NOT GIVE NOT   ((Figure 17))
           Ah, you don't have it yet.

    5 A NO
           No

Figure 15. *'I sent it ((the documents)) to the office at the congress.'* Person A, on the left, answers a question from Person B, on the right. But, A's answer is not satisfactory to Person B who continues holding his body question posture from previous turn, line 1 (T-1).

Figure 16. *'Huh?'*, Person B, on the right, initiates repair on Person A's previous turn by bringing his eyebrows together and raising his head-up, without retracting the end of the previous sign, line 2 (T0).

Figure 17. *'Ah, …'* Person B (left) releases his body position (line 4) by pointing toward Person A and opening his mouth wide giving an uptake after the resolution of the sequence.

The trouble sources of the cases described have been different problems of seeing related to attention (Extract 1, Extract 3 and Extract 4), lip-reading difficulties (Extract 2 and Extract 9) and understanding problems (Extract 5, Extract 6, Extract 7 and Extract 8). Generally, the solution provided in response to an open type repair initiator is a partial or full repeat of the trouble source turn. Sometimes the solution turn is a reformulation or reinforcement of the trouble source turn, for example by repeating a mouthed utterance while adding simultaneous fingerspelling to the mouthed trouble source (as shown in Extract 2 and Extract 9).

LSA presents multiple resources to initiate open-class repair with non-manual markers including: eyebrow actions, mouth signs or gestures, wrinkled nose, lips puckered forward, puffed cheeks, squinted eyes, head and upper-body movements. Among the different types of non-manual markers, facial actions present more possibilities of articulation compared with head and upper-body movements. In addition,

they display different types of movements. Facial actions are contractions of the facial muscles, whereas head and upper-body movements are inclinations or bended positions forward, backward or to one side. Their linguistic status is also different. Head and upper-body movements are often used as intensifiers performing contrastive movements, for instance, raised eyebrows with head down.

Among the non-manual markers, those located on the upper part of the face—eyebrow actions, and head movements—are more frequent than those located in the lower part of the face. Eyebrow actions are conventionalized formats for interrogative utterances in LSA (Veinberg, 1993) and in other sign languages (Dachkovsky & Sandler, 2009; Wilbur, 2013; Zeshan, 2004). The use of other resources is less frequent in the LSA corpus and has not been described as part of the question system in LSA; these include wrinkled nose, lips puckered forward, puffed cheeks, etc., with other pragmatic uses marking different levels of intensity, or used as morpheme particles in LSA as well as in other sign languages.

Non-manual markers in LSA present a bigger repertoire of choices compared to the spoken languages also described in this special issue. It does not mean that speakers do not use some of these resources (such as eyebrow actions, head movements, leaning forward, among others) to indicate problems of understanding during interaction. These resources in spoken languages have not been traditionally described as part of the linguistic resources of the language, but as gesture or co-speech gesture. Also, the types of interactions are more diverse and the attention could be more distributed in spoken language since eye contact is not a requirement for interaction. Instead sign language interaction is more focused, and the maintenance of mutual eye contact is a prerequisite for interaction and a distinctive resource that is part of the structure of sign interaction. In addition, as has been mentioned at the beginning of this section, signers direct their attention to the face rather than the hands.

Manual question-word: *'What'* combined with non-manual markers

LSA has different forms to indicate word-question forms, with meanings such as *'what', 'when', 'where', 'who' and 'which'*. The word-question based format *'What?'* is the prototypical form for initiating open repair. It involves manual (one-hand) and non-manual (eyebrows together) actions combined. This can also be accompanied with leaning forward and head movement to emphasize an utterance depending on the sequence, and on the distance and body position of the participants. Timing information is also important for OIR in LSA. A repair initiator is usually held in a static position until the solution of the trouble source is satisfactorily provided (see Floyd et al., 2014).

Extract 11 shows an open type wh-question word format *('What?')* to initiate repair (Figure 19, line 4). The question pronoun 'what' is a manual sign produced generally with only one hand, putting the fingers of one hand together with an upward movement. It is combined with bringing the eyebrows together and leaning forward toward the other signer. All these coordinated manual and non-manual marker movements are held static until the trouble source is solved (line 5).

Summary: Extract 11

3	A	Why did the oldest of your sons leave?	T-1
		I haven't seen him anymore he disappeared he travels lot.	
4	B	What?	T0
5	A	Your son, the oldest, he has left?	T+1

Extract 11. ASAM _161970

```
                        Q–ER
1 A   CHILDREN TWO GOOD
      Are your two children OK?


                               nod: YES +
2 B   GOOD VERY–GOOD VERY–GOOD
      Good, very good very good.


                                                    Q–ET
3 A   WHY OLDEST LEAVE–PAST SEE DISAPPEAR LEAVE LEAVE LEAVE=  ((Figure 18))        T–1
      Why did the oldest of your sons leave?
      I haven't seen him anymore he disappeared he travels lot.


           leaning–forward
                 Q–ET–H
4 B   =WHAT ––––––––––––H   ((Figure 19))                                           T0
      What?


          h–bw          leaning–forward
          Q–ET              Q–ER–H
5 A   =PRO2 SON OLDEST LEAVE–PAST––––H                                              T+1
      Your son, the oldest, {has he} left?


6 B                  THE–OLDEST SHIP SHIP WORK
                     The oldest works at a ship he works at a ship.
```


Figure 18. '*Why did the oldest of your sons leave?*', Person A (left) asks Person B (right) a question, line 3 (T-1).

Figure 19. '*What?*', Person B (right) initiates repair on Person A's prior turn with a wh-question word combined with eyebrows together, line 4, (T0).

Intensifier for question word

Extract 12 provides another example of a prototypical case of open type repair initiation adding extra elements as intensifiers. In line 2, Person B initiates open OIR with a general question word using two hands instead of the standard format with only one hand (see previous example). Additionally, Person B uses eyebrows together combined with wrinkled nose, intensifying the use of intonational question markers as well. Both instances of intensification indicate the possibility of different levels of intensity in LSA.

Summary: Extract 12

1 A	My wife lives here.	T-1
2 B	What?	T0
3 A	My father and mother live there, but my wife lives here.	T+1

Extract 12. CH_65385

```
1  A    [WIFE WOMEN HERE HOUSE THERE++---H (0.4)                           T-1
         My wife {lives} here, my {parents} house is there.

                       Q-WN
2  B    RH:WHAT-------H (0.8) PU    ((Figure 20))                          T0
        LH:WHAT-------H
        What?

3  A    RH: FATHER MOTHER------H                                          T+1
        LH: -THERE-----H (0.7) THERE
        There, my father and mother {live} there

                                              h-down-H
                                                     Q-ER
4  B    SN-FANTA-FE PT-THERE---------------H SANTA-FE
        mth:santa-fe
        In Santa Fe there?


                                              nod: YES
5  A                                          RH: SANTA-FE---H
                                              LH: PT-THERE-H SOUTH-H
                                              Yes, there, Santa Fe,


6  B    VENADO-TUERTO SOUTH SANTA-FE
        venado-tuerto
        Venado Tuerto Santa Fe South


        leaning backwards
7  B    OM---H
        Ah!
```


Figure 20. *'What?'*, Person B (right) initiates repair by wrinkling his nose and bringing his eyebrows together in combination with a general question sign produced in parallel with both hands instead of the standard format with only one hand.

In both examples, Person A fixes the problem by near-repeating the question. The solution turns are not verbatim repeats of the trouble source. In Extract 11 Person A specifies the reference of the trouble source *'Your son, the oldest'* (line 5) that was omitted in the trouble source by only signing '*...the oldest...?',* and then near-repeats the question '*...{has he} left?'*. Extract 12 is similar, where Person A specifies the person reference in the solution turn, *'my father and mother....'*. This example is upgraded to a restricted type of initiation after Person A provides the solution to the open repair initiation.

Restricted formats

In more than half of the OIR cases in LSA, repair is initiated with a restricted type repair initiator (see Table 3). Restricted formats indicate more precisely where the trouble source is located. They can narrow down the problem by using different means such as: content question word (who?, where?, when?, etc.); repetition of a reference that is unclear (e.g. hard to see) or is ambiguous (such as the name of a person, place or a word). Problems of seeing are a frequent trouble source of open formats in LSA. Hearing and seeing problems can be compared, but they are not the same phenomenon. Hearers distribute their attention between auditory and visual input, while signers use only visual information depending on eye contact between participants to communicate (Baker, 1977; Baker & Padden, 1978; Siple, 1978; Muir & Richardson, 2005; Emmorey et al., 2009).

Content question words (asking for clarification/specification)

Class-specific 'WH' or content question words are restricted formats of OIR that localize more precisely the item of the prior turn to be repaired; for example, *'who?', 'where?', and 'when?'*. LSA signers may use content question signs when they have problems recognizing the reference of a sign-name, place-name or a particular sign to refer to an object or situation. Content question words are combined with non-manual markers, with eyebrows together and raised being the most frequent formats. However, the use of content question signs is not frequent in the LSA corpus, accounting for less than 10 percent of the cases.

Additionally, signers also use mouthing in Spanish for question words that can be produced together with or without manual question words. Mouthing can also work as an intensifier, and can be produced when the hands are not free. Among the different content question words, *'who?'* is the most frequent format and it has also been described for other languages as one of the most common initiators of this type (Sidnell, 2010; Dingemanse & Enfield, 2015 introduction to this special issue). However, the use of the interrogative pronoun *'what?'* followed by a noun to specify a reference is the most frequent format in the LSA corpus (see figure below).

Table 4. Frequencies of restricted repair initiators ('WH' question words) in LSA

'WH' category	Frequency (n/15)
Person	5
Place	1
Thing	7
Time	2

Extract 13 shows a pursuit case with two different content question words by Person B. The first one is produced in line 2 (*'where?'*) and the second one in line 4 (*'who?'*). In line 2, the initiation of repair *'where?'* is produced once, but Person B holds it and simultaneously lengthens/pursues by puckering her lips forward. In line 4, the content question word *'who?'* is produced twice. The first time, Person C is not looking at Person B and she holds the content question word until C looks at her. Then B repeats the content question word in combination with mouthing *'who?'* that she also holds until the completion of the solution turn in line 5.

Summary: Extract 13

1 A	Well, we have one motorcycle and two cars	T-1
2 B	Where? Where?	$T0_1$
3 A	There is no motorbike, only cars	T+1
4 B	Who? Who?	$T0_2$
5 A	((Sign name))	T+1

Extract 13. Ayrolo_843386
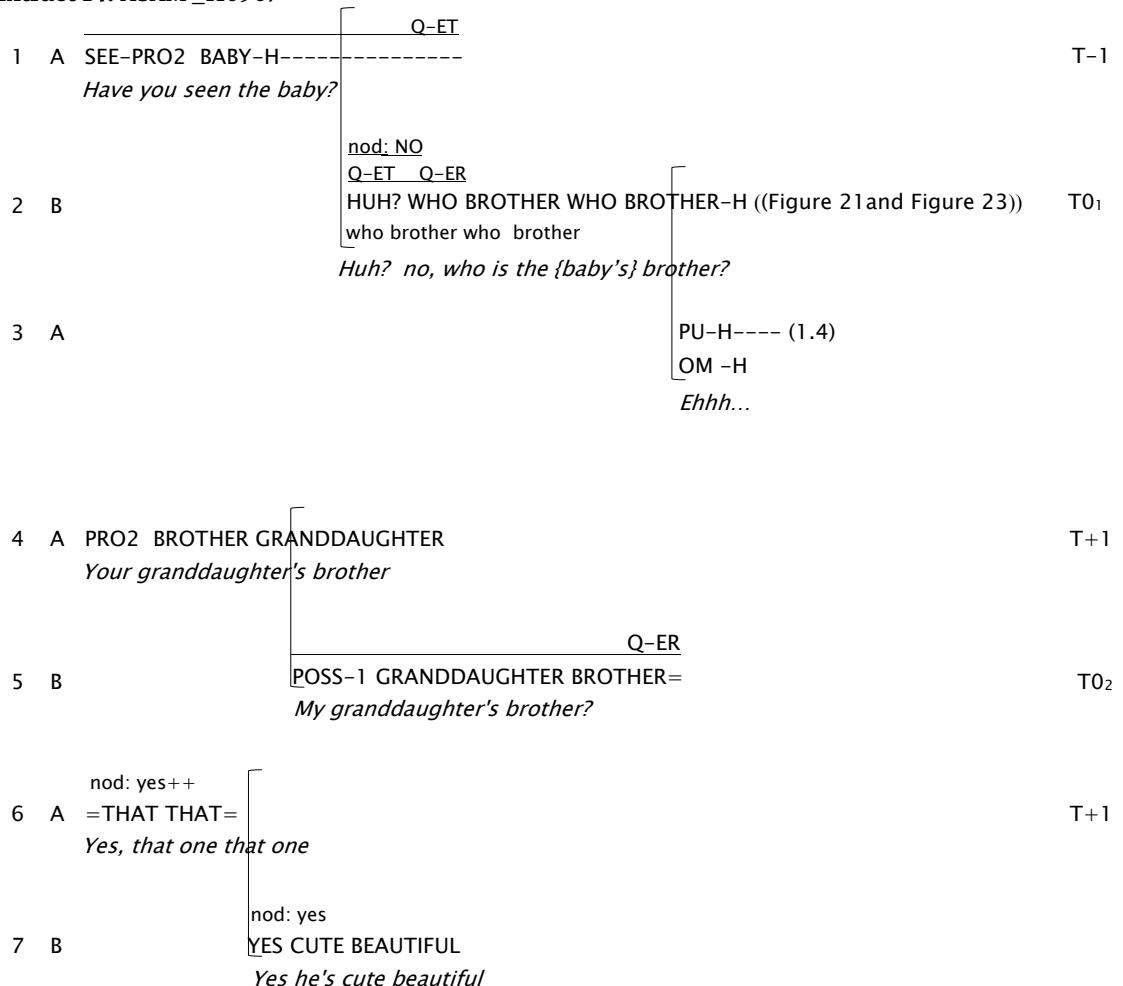
```
 1  A   WELL MOTORCYCLE–ONE TWO–CARS                                    T–1
         Well, we have one motorcycle and two cars


               _____Q–WN_____LPF____
 2  B   WHERE––––––––––––H (1.7)                                        T0₁
         Where? Where?


 3  C   MOTO THERE–IS–NOT ⌐CAR ((not looking at B)) ((looking at B))   T+1
         There is no motorbike,│only cars
                               │
                               │                        ⌐Q–ET
 4  B                          │WHO––––––––H (0.6)    WHO–┼––H (0.6)    T0₂
                               └                     mth: who?
         Whose {cars}? Whose?
                                                        │
 5  C                                                   └SN+–– H        T+1
                                                        (Sign name)

 6  B   head–up                                                        
         Ah!
```

Content question words can also occur in combination with repeated material from the trouble source turn or previous turns specifying even more precisely the location of the problem. Extract 14 shows a pursuit case that in the first initiation (line 2) combines a content question word with repeated material from a previous turn, *'Who is the (baby's) brother?'*, targeting an ambiguous person reference produced in line 1 *'the baby'*. Person B understands the question but she does not recognize to which baby is her friend referring. The question word *'who?'* is used in combination with eyebrows together and head upward movement (Figure 21 and Figure 22) produced in initial and final position (this has been described as the most prototypical word order for questions in LSA (Curiel & Massone, 2004)).

Summary: Extract 14
   ((Chatting about B's grandchildren))
1 A   Have you seen the baby? ((previously referring to B's grandchildren))   T-1
2 B   Huh?, no, who's the {baby's} brother?   T0₁
4 A   Your granddaughter's brother   T+1
5 B   My granddaughter's brother?   T0₂
6 A   Yes, that one that one   T+1

Extract 14. ASAM _110907

```
                              Q–ET
1  A   SEE-PRO2  BABY-H----------------                                    T–1
       Have you seen the baby?

                          nod; NO
                          Q–ET   Q–ER
2  B                      HUH? WHO BROTHER WHO BROTHER–H ((Figure 21 and Figure 23))   T0₁
                          who brother who  brother
                        Huh?  no, who is the {baby's} brother?

3  A                                             PU–H---- (1.4)
                                                 OM –H
                                                Ehhh…


4  A   PRO2  BROTHER GRANDDAUGHTER                                          T+1
       Your granddaughter's brother

                                            Q–ER
5  B                      POSS-1 GRANDDAUGHTER BROTHER=                      T0₂
                          My granddaughter's brother?

       nod: yes++
6  A   =THAT THAT=                                                          T+1
       Yes, that one that one

                        nod: yes
7  B                    YES CUTE BEAUTIFUL
                        Yes he's cute beautiful
```

Extract 14 also shows a second restricted format of repair initiation in line 5. This is produced by a full repeat of the repair solution of the first initiation of repair in the extract (line 4): *'My granddaughter's brother?'* In this case, Person B is not asking for clarification but confirmation (see section 3.2.2 for more details and cases of asking for confirmation).

Figure 21. *'Huh?'*, in line 2 Person B (left) first raises her eyebrows combined with a head upward movement.

Figure 22. *'Who?'*, secondly in line 2 Person B (left) initiates repair with a content question word combined with eyebrows together.

Figure 23. *'Who?'*, thirdly Person B (left) holds the content question sign (right hand) plus index finger, *'brother'* on the other hand.

Furthermore, the general question word *'What?'* can also be used as a restricted format only if it is combined with further material from the trouble source that needs to be further disambiguated, clarified or specified. Extract 15 and Extract 16 present cases of general question word (*'What..'*) combined with repeated material from the trouble source. In line 2, the repeated material from the first example is a noun, (*what*) police?' that was signed in the trouble source and signer B is asking for clarification. Similar to Extract 14, it is also

a pursuit case where the second initiation is asking for confirmation by partially repeating the first-offered repair solution.

Summary: Extract 15

1	A	Hey, there was an explosion inside the police station, there	T-1
2	B	What police?	$T0_1$
3	A	The police there, after the guard, there opposite	T+1
4	B	There? Opposite? I didn't know	$T0_2$
5	A	Yes, opposite	T+1

Extract 15. Swimming_pool_1028720

```
                                               ┌ET-H
     1  A   HEY POLICE INSIDE BOMB THERE INSIDE PU:THERE---┼----H                    T-1
           Hey, there was an explosion inside the police station, there

                                               h-down---------------H
                                               Q-ET-WN--------------H
     2  B                                       └WHAT POLICE--------H                 T0₁
           What police?
```

     3 A   POLICE-THERE BOMB THERE GUARD LOC-ONE-BLOCK OPPOSITE--H　　　　　T+1
           The police there, after the guard, there opposite

```
           h-down                   h-bw
                  Q-ER
```

     4 B   THERE OPPOSITE PRO1 KNOW-NOT-ANYTHING　　　　　　　　　　　T0₂
           There? Opposite? I didn't know

```
           nod: YES ++                           .
```

     5 A   OPPOSITE----H　　　　　　　　　　　　　　　　　　　　　T+1
           Yes, opposite

```
                              h-bw
```

     6 B   PRO1 KNOW-NOT-ANYTHING
           I didn't know

In a second example, the repeated material (line 3) to initiate repair is a personal pronoun, literally Person B signs 'they *what?*' to ask for specification. It can be better translated as '*who are they?*' or '*from where are they?*'

Summary: Extract 16

1	A	They discuss what they have to do, they are good	T-1
3	A	{Who are} they/{from where} are they?	T0
4	B	They {are} both from CAS	T+1

Extract 16. CAS_ 553706

```
                                              LPF
                                  _____

1  A   PRO3 (DISCUSS) WHAT (DISCUSS-MOD) GOOD                                    T-1
       They discuss what they have to do, they are good,


2      OTHER OK ARGUE ⌈PRO1 NO
       the rest also discuss, everything is Ok, great, but when they are arguing
       I don't want to participate
                                                      ⌈h-bw
                                                       Q-WN

3  B                      PRO3 WHAT PRO3 WHAT----------------------H            T0
                          Who are they/from where are they? ((lit. They what they what?))


4  A                                        ⌊PRO3-TWO CAS PRO3-TWO              T+1
                                             They {are} both from CAS ((deaf association))

           nod: YES++
           _____

5  B   OM PRO3-TWO
       Ah, they both
```

Several pursuit cases have been described in this section. In Extract 13 we saw two initiators of the same type, *'where?'* followed by *'who*?'. Extract 14 and Extract 15 presented 'upgrading', where in both asking for clarification first, followed by asking for confirmation in the second initiation. The last two cases show the relation between two different types of restricted other-initiator of repair. Many more complex cases of repair sequences show that when a solution uptake is not given by the person who initiated repair, it can be upgraded from open formats to more restricted formats as it has been described as well for spoken languages (Sidnell, 2010). In addition, an initiation of repair can be also upgraded from implicit to explicit initiation of repair (see section 3.3.).

Offer type (asking for confirmation)

Offering a candidate understanding (or a candidate seeing/hearing) is an OIR strategy that asks for confirmation. Interactants can offer a candidate understanding of what was said when a reference is not clear or it is elided for some reason and it needs to be confirmed to assure mutual understanding. Another way of initiating repair that asks for confirmation is to fully or partially repeat the trouble source turn. As in the previous formats presented, asking for confirmation is also characterized by combining manual signs as candidates with non-manual markers adding a 'questioning' component.

Extract 17 shows a pursuit case with two initiators of repair asking for confirmation. Two friends are having dinner in a buffet, and chatting about a job that Person A has begun recently. The first one is a partial repeat of the verb from the trouble source *'polish?'* in combination with eyebrows together produced by Person B in line 2 (Figure 25). But Person B appears to have problems recognizing the sign, or understanding what was specifically intended. The second initiator is a new noun candidate understanding produced in line 4, *'(of) cars?'*, combined with raised eyebrows. These are different strategies marked also with distinct non-manual question markers. In addition, they are also solved differently. Person A solves the first initiation of repair by repeating twice the sign *'polish'*, adding the word *'glass'* to specify the verb. This is in contrast to the second repair (line 5), where Person A's solution is simple confirmation of the candidate understanding offered.

Summary: Extract 17

1	A	I have to think, the trip goes and back, and I'm working polishing	T-1
2	B	Polish?	$T0_1$
3	A	I {work) polishing glass	T+1
4	B	{of} cars?	$T0_2$
5	A	Yes, yes	T+1

Extract 17. ASAM_244140

1	A	PRO1 THINK GO BACK GO WORK NOTHING POLISH PRO1= ((Figure 24))	T−1
		I have to think, the trip goes and back, and I'm working polishing	

Q–ET
2	B	=POLISH ((Figure 25))	$T0_1$
		Polish?	

nod: YES YES
3	A	=PRO1 POLISH GLASS POLISH=	T+1
		I {work} polishing glass	

Q–ER
4	B	=CAR−−−−−−H ((Figure 26))	$T0_2$
		{*of*} *cars?*	

5	A	nod: YES YES	T+1
		Yes, yes	

Figure 24. '...*I'm working polishing*', Person A (left), trouble source of the OIR sequence (line 1).

Figure 25. '*Polish?*', Person B, repeats a verb produced by Person A in the previous turn combined with eyebrows together (line 2).

Figure 26. '{*of} cars?*', Person B initiates a second repair by offering a candidate understanding in combination with his eyebrows raised (line 4).

Extract 18 shows another example in which the OIR is made up of repeated material from the previous turn, seeking confirmation. In this case, Person B repeats a sign-name with 'questioning' marked by putting the eyebrows together, indicating that he has not recognized that name (line 2). This partial repeat does not get a confirmation as solution but a description of the person to be recognized by B.

Summary: Extract 18

1	A	She ((sign-name-a)) looks like sign-name-b, beautiful.	T-1
2	B	((Sign-name-a?)) ((Repeats sign-name))	T0
3	A	She has short hair, and uses a lot of make up, but this other needs more	T+1

Extract 18. ASAM_1161000

```
1    A    PRO3 THE-SAME SIGN-NAME (FOUR/shake) THE-SAME BEAUTIFUL=                    T-1
          She ((sign-name)) looks like sign-name, beautiful.


                            Q-ET
2    B    =Sign-name-------+----H ((FOUR-shake))    ((Figure 27))                    T0
          Sign-name?


3    A                     SHORT-HAIR [PRO3 USE A-LOT-OF MAKE-UP PRO32 NEED MORE      T+1
                           She has short hair, and uses a lot of make up,

                           but this other needs more


         nod: YES-ER    YES-ER--------------------H  h-bw   ((Figure 28))
4    B
          Ahh, yes   yes, ahh
```


Figure 27. '*Sign-name?*', Person B, middle, initiates repair by repeating a sign-name produced by Person A in line 1.

Figure 28. '*Ahh!*'. Person B, middle, provides uptake of the OIR sequence in line 4.

Other cases of partial and full repetition are described in the previous section (3.2.2, see Extract 14 and Extract 15).

Alternative question type

Alternative question is another format to initiate repair, by offering more than one option to be confirmed. Among the formats that have been presented, alternative question is similar to candidate understanding, trying new options that have not been presented in the trouble source or previous turns involved in the OIR sequence.

Extract 19 and Extract 20 illustrate this format. In Extract 19 two women are chatting about the location where A's son is working. Person A tries to indicate Person B where her son is working and Person B offers two neighbourhoods as possible candidates (line 4). Extract 20 shows a similar case, which is also referring to locations. However, Person B in Extract 20 performs the initiation of repair by using pointing signs combined with sign-names for place reference (line 5).

Summary: Extract 19

```
3  A   There, opposite San Martin square                          T-1
4  B   Place Retiro or Recoleta place?                            T0
5  A   No, Retiro Retiro, there square,
       there opposite San Martin square opposite square then      T+1
```

Extract 19. ASAM _263652

```
1   A    NOW WORK HOTEL M-A-R-I-O-T PT:LOC BUENOS-AIRES PT:LOC (2.0)
         Now {he} works at hotel m-a-r-i-o-t, here {in} Buenos Aires here


                                                        nod
2   B    AHH YES KNOW LITTLE REMEMBER-NOT NAME
         Ahh yes, I know very little {the city}, I do not remember the names {of the streets}


3   A    PT:LOC SQUARE SAN-MARTIN OPPOSITE (1.0) SQUARE-- = (2.0)   ((Figure 29))      T-1
         There, opposite to San Martin square


                                                        Q-ER
4   B    =PLACE RETIRO OR RICO L-E-T-A PLACE NO=  ((Figure 30 and Figure 31))          T0
         {In} Retiro or Recoleta?


5   A    =NO RETIRO RETIRO PT:LOC SQUARE PT:LOC SQUARE SAN MARTIN OPPOSITE  THEN       T+1
         No, {in} Retiro Retiro, there {in the} square, there opposite to San Martin square

6   B        RETIRO NEAR RICO L-E-T-A RICO AREA
         {In} Retiro near Recoleta area?


7   A    LOC:THERE              nod: YES++   nod: YES+
         There, yes yes, yes yes
```


Figure 29. *'Here, Buenos Aires'*, Person A (right), produces a trouble source turn, line 1.

Figure 30. *'Retiro'?*, Person B offers a candidate understanding for place reference combined with eyebrows raised as question marker (line 4).

Figure 31. *'Recoleta?'*, Person B offers the second alternative for candidate understanding combined with eyebrows raised, (line 4).

Likewise, the second example shows a place reference problem of understanding. In this case, the body configuration of the initiation of repair (line 5) includes two pointing signs, *'Here?'* (i.e., Buenos Aires) and *there*, adding *Córdoba?*, a province in Argentina. Both are produced with the index finger of the right hand (RH). Both pointing signs are produced with eyebrows raised, but changing the head position to mark the different options, downwards first and then upwards with the second alternative. Additionally, Person B maintains the second pointing sign, hand up on the right (*'there?'*), head and eyebrows in position while producing the personal noun *'Córdoba?'* with the other hand to specify the content of the pointing sign *'there?'*. Both are visually available by holding them simultaneously until Signer B confirms one of the options.

Summary: Extract 20

2 A   I told them everything and I went with all the papers to the National Modelo. Yes.   T-1

5 B   Here {Buenos Aires} or there in Córdoba.   T0

6 A   I {have done it} here, here {Buenos Aires}.   T+1

Extract 20. CAS_332129

1 A   PRO1 SAY-PRO3 COMPLETE GO TAKE
    I told them everything and I went with all the papers

2 A   PLACE NATIONAL M-O-D-E-L-O---H YES   T-1
    to the National Modelo. Yes.

        ——————— ET —————— ER+h-bw

3 B   BEFORE +
    A long time ago.

        ———————————— h-bw
        —— Egz-B ———— EO

4 A   PT-THERE----H PRO1-SA Y------------H YES+=
    There, I say

      ————————— h-down | ——— h-bw ——— h-down   nod: YES+
      ————————————————— | Q-ER

5 B-RH =PT-HERE--------------H OR PT-THERE-------H   ((Figure 32 and Figure 33))   T0
  B-LH: CORDOBA   NO PT-HERE
                         mth: cordoba
  Here (Buenos Aires) or there in Córdoba. Ah, no, here

                 ————— h-down
                 ————— ET

6 A   PRO1+ HERE+++++++++++++   T+1
      mth: here+++++++++
    I (have done it) here, here (Buenos Aires).
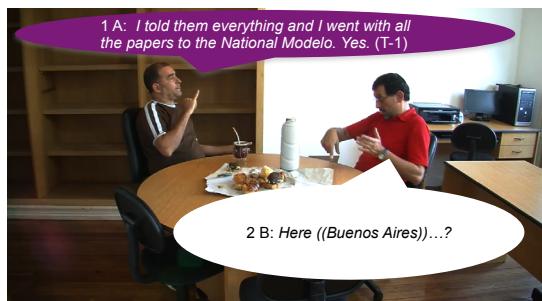
Figure 32. *'Here…'*, Signer B (right) initiates repair with two pointing signs using his right index finger first in combination with eyebrows raised and head downwards (line 5, first part of the utterance, see next figure).

Figure 33. *'…or there, Córdoba?'*, Signer B (right) initiates repair with two pointing signs (see previous frame for the first pointing sign). In this second pointing sign, he changes the position of his head upwards and produces a place reference sign with the other hand (*'Córdoba'*), maintaining both signs held until Signer B (left) confirms one of the options (*'Here, here'*).

    In both cases the participants marked their alternative questions with eyebrows raised and shifting their head position, maintaining still the rest of their body configuration for both candidates. Also, in both examples the resolution of the sequence is confirmed by selecting one of the options.

Freeze-look response (off-record open initiator of repair)

When researchers have referred to OIR practices they have mostly referred to explicit and direct ways to initiate repair on other participant's turns. These are 'official' and thus non-deniable ways to signal perceptual and understanding problems. The aim of this section is to expand the OIR system to include less explicit, more indirect strategies to indicate problems of understanding, thus distinguishing between on-record OIR and off-record OIR within open formats. This section describes a common strategy for open off-record initiation of repair in LSA (see Manrique & Enfield, 2015 for a detail description of this practice).

In contrast to on-record initiation of repair, the *freeze-look* response is an implicit way to indicate difficulties in understanding (Manrique & Enfield, 2015). When we say that a person performs a freeze-look, we mean that the person's body is briefly held still in a signing or non-signing position, while they are looking directly at the other person. This suspended or frozen posture is maintained until either the person upgrades by using an explicit repair initiator, or until the signer of the trouble source can fix the problem. A clear context for examining this practice is in cases where the trouble source turn is a first pair part of a question-answer sequence, where a specific response or feedback is solicited or expected. In this kind of example, the freeze-look occurs in the position where the response would have been given. There is a distinction between this practice and various non-OIR practices where signers/speakers indicate that an answer is coming late, for example by producing a thinking facial gesture, word searching, etc., indicating that there is no need to redo the question.

Extract 21 shows a case of a freeze-look in a question-answer sequence, which is then upgraded to an explicit open initiation of repair (line 4). Person A asks a question to Person B (line 1). Person B does not answer the question or initiate repair explicitly on A's question, but holds still and looks directly at Person A, while Person A is also looking at B waiting for an answer. Then, Person A repeats the question to B.
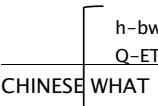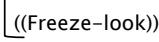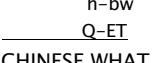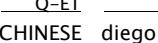
Summary: Extract 21

1	A	Who is the Chinese?	T-1
2	B	((Freeze-look))	TO$_1$ (off-record)
3	A	Who is the Chinese?	T+1
4	B	Huh?	TO$_2$ (on-record open class)
5	A	The Chinese	T+1
6	B	Chinese? Ah, Diego, Diego from the supermarket.	

The sequence shown in lines 1-3 clearly has the same structure as an open type OIR sequence. A first piece of evidence for this is that in response to the freeze-look, Person A repeats the question to B, as might be expected in response to an open OIR such as 'Huh?'. A second piece of evidence is that after the solution turn (line 3), Person B upgrades the freeze-look to an on-record OIR, indicating that the solution provided by Person A has not been sufficient to solve the problem and showing that the freeze-look is ranked below explicit OIRs in terms of 'strength' (see Manrique & Enfield, 2015).

The freeze-look behavior does not always have to be re-done or produced together with another on-record type of OIR. It also occurs alone with satisfactory resolution in the next turn of the prior trouble. In Extract 22, Person A (on the right) initiates a question in overlap with Person B (on the left), who maintains his manual and non-manual markers sign configuration holding his body still during and after Person A's question (line 1 and 4) for approximately 0.7 seconds until Person A can offer a solution.

Extract 21. Swimming_pool_ 381107

```
                  h-bw
                  Q-ET
1  A   CHINESE WHAT                                               T-1
       Who is the Chinese?

                  ((Freeze-look))                                T0₁
2  B
```

$$T0_1$$

```
                  h-bw
                  Q-ET
3  A   CHINESE WHAT                                               T+1
       Who is the Chinese?
```

```
              h-tilt
                Q-ET
4  B                                                             T0₂
       Huh?
```

$$T0_2$$

```
                Q-ET
5  A   CHINESE                                                   T+1
       Chinese?
```

```
            Q-ET                                        h-bw
6  B   CHINESE   diego CHINESE-diego   SUPERMARKET-
       Chinese? Ah, Diego, Diego from the supermarket
```

Summary: Extract 22

2 A {Has} he taken {something from} you?   T-1
3 B ((freeze-look, holding previous signs-hands-holding-up))   T0
4 A {Has} he taken {something from} you?   T+1

Extract 22. ASAM _278908
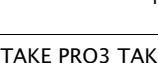
```
1   B   PRO3 WORK HERE-OR-THERE-----H
        He works (in different places) here and there
```

```
                  h-down
                   Q-ER
2   A   TAKE PRO3 TAKE PRO2                                       T-1
        {Has} he taken {something from} you?
```

```
3   B   ((freeze-look, holding arms up from the previous turn, 0.7)) ((Figure 34))

                                                                 T0
```

```
                  h-down
                   Q-ER
4   A  TAKE PRO3 TAKE PRO2  ((Figure 35))                        T+1
       {Has} he taken {something from} you?
```

```
5   B   GIVE PAY-MONEY PU---H
         He has paid, {I don't know}.
```

```
            nod
6   A   eyes-blink
        Ah, Ok.
```

Figure 34. *{Has} he taken {something from} you*?, Person A, on the right, interrupts B to ask a question related to what Person B has been referring before (line 1). Person B, on the left, holds his body still in the previous signing position (line 3), until Person A fixes the problem (line 4, figure 35).

Figure 35. *{Has} he taken {something from} you?*, in line 4 Person A, on the right, solves the problem by repeating the entire question produced in line 2 (Figure 4) to Person B. Person B, on the left, holds still his body position until almost the end of the repetition of the question.

In line 4, Person A repeats the entire question *'(Has) he taken (something from) you?'* showing that he treated B's freeze-look as a signal of a problem requiring solution by repetition (Figure 35). Then, Person B answers quickly before A finishes repeating the question. In the next turn, Person A accepts B's answer as satisfactory by blinking and nodding (line 6), in contrast with the previous example where Person B needs to initiate repair explicitly after the repetition of the question.

The freeze-look is a phenomenon that is expected not only in other sign languages. It has also been recognized in some spoken languages. A clear example is described in Yélî Dnye, a spoken language from Papua New Guinea (see Levinson, 2015 this issue). In the same way, other spoken languages might also perform this practice given that speakers also use gestures and visual attention in their interactions. However, the frequency of use is also expected to be higher in sign language due to their characteristic intense focused face-to-face interactions in everyday life. Further research needs to be done to compare signed and spoken languages in relation to this issue.

Morphosyntactic resources involved in OIR sequences

LSA uses different morphosyntactic resources to indicate OIR. Many of them have been described in this article, including morphological non-manual devices, especially facial resources such as mouth morphemes (see section 3.1.1. for more details).

Word order plays an important role in the use of repair in LSA where the prototypical word order is SOV. Curiel & Massone (2004) have described that the interrogative pronoun WHAT ('qué' in Spanish) is located in final position. The authors also stated that the different wh-question words (who, where, when, etc.) are distinguished by the use of mouthing in Spanish (quién, dónde, cuándo, etc.), except the pronoun WHAT. Even though, LSA uses different manual signs to distinguish different question words. In contrast, questions that initiates repair are produced in initial position in *the LSA conversational corpus* data (see Extract 13, Extract 14, Extract 16 and section 3.1.2.). This finding shows a clear distinction between 'looking forward' questions (e.g. asking for new information) and 'looking backward' ones (repair-like questions).

Turn-final hold

Sign language has complex morphology involving both simultaneous and consecutive structure due to its use of multiple articulators. It is possible to suspend (hold) a linguistic element on one hand while continuing signing with the other hand. Hold is described for this study as any meaningful maintenance of a stationary bodily configuration in contrast with a dynamic disengagement or retraction, regardless

of the exact nature of the configuration. It includes manual and non-manual 'post-stroke holds' ...which interactants display orientation to the not-yet-resolved status of the problem (Floyd et al., 2014). In this study, eye gaze direction is an obligatory component of the use of holds in the OIR system. The functional analysis of holds has been expanded for the study of OIR in LSA. Holds, as part of the OIR system, are a cross-linguistic resource available to both signers and speakers in face-to-face interaction, especially in situations where the participants are not involved in other parallel activities.

Holds in sign language have been analysed in various ways, including: as a morphological basic unit of signs (Liddell & Johnson, 1989; 1992) a phonological phenomenon (Corina & Sandler, 1993), a grammatical category (Miller, 1994) and a type of 'spreading' at the prosodic, morphosyntactic and discourse level (Sáfár & Crasborn, 2013). More recent work has examined the use of the hold in natural interaction in both signed and spoken languages (Park-Doob, 2010; Manrique, 2011; Oloff, 2012; Sikveland & Ogden, 2012; Groeber & Pochon-Berger, 2014; Floyd et al., 2014).

In the case of the repair system in LSA a hold is always maintained by Person B until a resolution or indication of upcoming solution of the trouble source is given. All the linguistic elements mentioned in this article are characterized by being held still from the initiation of repair. Among the morphosyntactic resources mentioned here, the use of turn-final hold of all or part of the linguistic material produced to initiate repair is one of the most important resources in LSA. It is always accompanied with gaze toward the person or object of the trouble source as a strategy to pursue the resolution of the OIR sequence (see also Stivers & Rossano, 2010). This body behavior from Person B displays that the solution of a problem is pending and that it needs to be solved by the producer of the trouble source. Once the producer of the trouble source solves or starts solving the problem, the person who initiates repair can: (a) release the hold showing that her or his request has been addressed or solved satisfactory, (b) continue holding in the same position or (c) upgrade to a more specific initiator of repair.

Actions

The formats mentioned as part of the set of resources for OIR are not used exclusively for the pure function of other-initiation of repair, but they can also be used for other type of actions. In the LSA corpus, OIR formats are used to indicate surprise, disbelief or disagreement, teasing, and also act as a way to pursue a response or to secure somebody's attention. A few examples have been presented in this article:

– Surprise can be indicated by the use of eyebrows raised, leaning backwards and opened mouth. Extract 19, in line 4, shows a case where Person B raises his eyebrows with tilted head in the uptake turn to indicate surprise. More cases have been observed in the LSA corpus.
– Pursuing a response by gazing, puckered lips forward (Extract 13), holding question markers, use of palm-up, etc. Extract 12, for instance, shows a pursuit case where Person B initiates repair multiple times using palms-up as a strategy of pursuing a response.
– Attentional markers, mainly, eye gaze, eyebrow and head movements, among other strategies have been illustrated in this article. Extract 1, lines 2 and 4, for instance, is a case where the trouble source of the sequence is a problem of seeing. Person B is not attending to the question produced by Person A and he initiates repair by raising his eyebrows and lifting his head (see other similar cases in section 3.1.1.).

Conclusion

My aim in this article has been to investigate whether sign language features a systematic and conventionalized set of linguistic formats to indicate perceptual and understanding problems during interaction. Based on a large conversational corpus of LSA, it is now possible to show evidence of a conventionalized and rich visual-gestural set of linguistic formats as initiators of repair. Including a sign language as part of a cross-linguistic comparative study of other-initiated repair has required expanding the traditional definition of repair to include bodily-visual components of human interaction.

From the 12 languages surveyed in this subproject, LSA has shown a higher frequency of use of repair

initiators. They were produced from a minimum of 6 cases to a maximum of 41 cases every 10 minutes of video recorded data. This suggests an exceptional level of maintenance of intersubjective mechanisms in sign language interaction, characterized by a constant need for visual access as a fundamental condition for mutual understanding.

This study has presented and described a systematic bodily-visual inventory of distinctive open and restricted types of repair initiators in LSA. This system has the same functionality as other repair systems found in spoken unrelated languages (see description of Chapala, English, Italian, Icelandic, Lao, Murrinh-Patha, Russian, Siwu and Yélî Dnye in this issue; see also Dingemanse et al 2015), with the exception of formulaic practices ('I beg your pardon?' etc.) that have not been found in the LSA corpus. Regarding the trouble source turn (T-1), the LSA data include cases of seeing problems, in contrast with the commonly described 'hearing problems' that occur in spoken languages. Another common trouble source identified in this study has been the use of mouthing. Solution turns are characterized by the production of full or partial repeats, as well as confirmation and clarification, often using fingerspelling to solve seeing and mouthing problems. This study has also shown linguistic formats of repair initiators displaying other types of actions in addition to problems of understanding such as surprise and teasing. These findings are in line with the proposed universal character of the OIR structural system of language use that allows us to secure and maintain mutual understanding in everyday interaction, independently of the cultural-specific characteristics of each language (Schegloff, 2006; Dingemanse et al., 2015).

A significant finding to emerge from this study is the observation of turn-final hold and the freeze-look practice. Holds are an important resource in the repair system in LSA. They are produced in more than 90 percent of OIR cases. This is not exclusive to LSA, nor to sign languages: LSA has been compared directly with two unrelated spoken languages showing a considerably higher frequency of use in LSA (see Manrique, 2011; Floyd et al., 2014). Another significant finding concerns the freeze-look practice, introducing a distinction between off-record and on-record OIR resources, and expanding the traditional typology of formats to initiate repair (see Manrique & Enfield, 2015 for detailed discussion). The freeze-look is an implicit (off-record) way of indicating problems of understanding by maintaining the whole body in a still position while looking directly at the person who produced the trouble source. It is characterized as a notable absence of response or feedback, which is interpreted as problematic, especially after a question has been asked, and it is solved in the same way as explicit OIR. With further research, it may turn out that this practice is common in other languages, signed and spoken.

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Appendix: Key to Glosses

CAPITAL LETTERS = sign glosses

Egz = eye gaze

EO = eyes wide opened

ER = eyebrows raised

ET = eyebrows together

F-I-N-G-E-R-S-P-E-L-L-I-N-G = finger spelling is indicated by hyphen between letters

G: gesture = followed by a description of the meaning of the gesture, e.g. G:I-don't-mind

G:MM = mouth closed and corners turned down.

H = hold

(sign x)--------H = approximate duration of hold

h-down = head downwards

h-tilt = head tilt

h-bw = head backwards

HEY-signer (A/B) = One of the signers use one of the getting attentional strategies to call to another signer.

HYPHENATED-WORDS = represent a single sign and more than one English word

LOC = locative

lowercase letters = mouthing translation

LPF = lips puckered forward

MOD = idioms

mth:(reference) = mouthing reference

NEGATIVE-VERB = glossed with the negation in a post verb position, e.g. KNOW-NOT

nod = head nod

NSP = non-signing position

NW = nose wrinkled

OM = mouth wide open

POSS-1 = possessive 1st person (mine)

PRO1 = PRO: pronoun, 1: first person, 2: second person, 3: third person

PT = pointing

PU = palms up

Q = question

SN (description) = sign name

+ = repetition of a manual sign or it can also be used as indication of a simultaneous production of NMMs, for instance: a head downwards and eyebrows movement (ET+h-bw).

Conventions used from oral transcription in spoken languages based on Gail Jefferson (2004; 2015:xiii-xvi).

[ ]   Square brackets mark the start and end of overlapping speech. It has been adapted in LSA extracts to indicate only the start of overlapping sign turns between participants ([) using one bigger bracket for both turns instead of single ones for every turn.

(0.5)   Parentheses indicate numbers to measure pauses in seconds. It has been adapted in LSA extracts to indicate the duration of final-turn hold and 'freeze-look' response.

((text)) Double parentheses contain additional comments about actions noted in the transcript, including non-verbal actions.

(...)   Intervening material.

=   'Latching': no gap between participants' turns.

{   }   Curly brackets indicates added text added by the transcriber that is not present or has not been produced in the original language. This additional text helps to make the translation in English easier to understand.

-        Hyphen is used as a cut-off marker after a word or part of a word.