The Division of Labor in Conversational Repair in a Family Sign Language from Guatemala: Who Makes It Work?

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Abstract

The term *repair* refers to strategies deployed by language users to resolve breakdowns in communication. In this study, I ask what strategies for conversational repair are deployed, and who takes responsibility for their execution, when a language is used in a small local signing ecology. I focus on signers from a single family within a larger speech community that does not use a national signed language and analyze conversations from four dyads of signers who engaged in a *director-matcher* referential communication task. I find that for three of the four dyads, there is a preference for *restricted* repairs that closely matches studies of repair in other signed and spoken languages. I also find a strong connection between participant role and repair type—with matchers more likely to use other-initiated repairs while directors produced self-repairs. The findings from this study highlight the complex relationship between participant identities and pragmatic strategies and the complicated social function of different types of repair in interaction.

Introduction

In his discussion of the uniquely human practice of *intersubjectivity*, or achieving mutual understanding, Sidnell (2014) identifies three

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primary structures in its "architecture," including turn construction, action sequencing, and repair. The term *repair* refers to strategies deployed by language users to resolve breakdowns in communication, and early work by Jefferson (1972) and Schegloff, Jefferson, and Sacks (1977) highlighted the centrality and frequency of these mechanisms to the functioning of human language. As Sidnell (2015, 180) points out, language itself would look quite different if "its users did not have recourse to the practices of repair." Repairs can be triggered by a variety of factors; language users can encounter problems with production or perception, for example, in noisy spaces for spoken languages or if their view is obstructed or distracted for signed languages. Problems can also be traced to issues with comprehension or reference resolution; a signer or speaker may use a word that an interlocutor does not know or a word that is ambiguous given the context. All of these potential sites of breakdown underscore the fact that although we tend to think of shared language as an effortless medium for interaction, conversations are often characterized by moments of misunderstanding and confusion. And while language users do have recourse to a range of repair strategies to ameliorate these misunderstandings, as Sidnell, Trần, and Vũ (2020) highlight, the burden of communicative labor is not always equally shared and interacts in complex ways with the social histories and identities of conversation participants.

In this study, I ask what strategies for conversational repair are deployed, and who takes responsibility for their execution, when a signed language is used in a small ecology. I focus on signers from a single family within a larger speech community that does not use a national sign language. The data come from a longitudinal project working with approximately twenty deaf individuals who live in Nebaj, Guatemala, population 76,485 (CELADE 2018). Some of the deaf people in the larger study sample are related to each other or know each other socially. To our knowledge, however, none use Lengua de Señas de Guatemala (LENSEGUA), the national sign language of Guatemala, or speak Spanish or Ixil, the predominate spoken languages in this community. This study documents repair strategies used by a small subset of the larger sample—signers from the Bernal family—as they engaged in a referential (director-matcher) communication task. The analysis of four dyads focuses on other-initiated

repairs (OIRs), described in detail below, and addresses the following questions: In the context of a referential communication task: (1) What is the frequency of the OIR? (2) Which signer introduces the OIR? (3) What is the distribution of different forms of OIR? and (4) How much individual variation exists in repair frequency and form across signers? Lastly, I discuss the relationship between signer identities and OIR form and distribution.

While early work on repair in interaction was often limited to examples from spoken English (Schegloff et al. 1977), later studies have assembled diverse crosslinguistic samples that include national signed languages like Argentinian Sign Language (LSA; Dingemanse et al. 2014, 2015; Dingemanse and Enfield 2015). The current study expands on a growing body of work documenting conversational repair in national signed languages (Crawley 2016; Dively 1998; Girard-Groeber 2015, 2020; Manrique and Enfield 2015; Manrique 2016;; Skedsmo 2020a, 2020b) as well as smaller micro-community signed languages (Omardeen 2021, 2022), homesign systems (Safar and de Vos 2022), and *cross-signing* interactions in which signers of different sign languages converse (Byun et al. 2020). Even with this recent attention, signed languages, in particular signed languages used in smaller *local* or *microcommunities*,[1] remain understudied. These kinds of languages are significant for typological studies because they help illuminate the relationship between community size, density, and interactional routines that shape pragmatic strategies. In communities like Nebaj, signers may encounter a wide variety of interlocutors with varying degrees of signing proficiency and willingness to engage in spontaneous signed interaction (Graif 2018; Goico 2020; Green 2022; Reed 2022). In many conversations, signers like those in the current study cannot be assured of mutual understanding and may have to rely on repetition and other strategies to communicate with less-proficient, less-willing sign interlocutors. These kinds of social encounters might increase the demands on signers to initiate or resolve repairs, rendering them a more frequent feature of daily interactions.

Other-Initiated Repairs: Form and Function

This study focuses on Other-Initiated Repairs (OIRs). In analyses of conversational repair, OIRs typically consist of a minimum of three

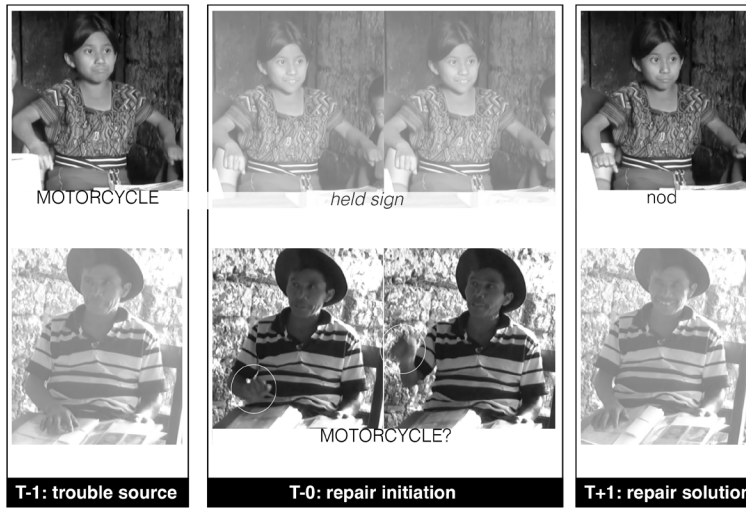

Figure 1. Turns in a minimal or simple trouble source, repair initiation, repair resolution sequence from the data.

turns, including the *trouble source* (T-1); the *repair initiator* (T-0); and the *repair resolution* (T+1) (Dingemanse, Kendrick, and Enfield 2016). This turn sequence is illustrated in an example from the data for this study in figure 1.[2]

In this example, a signer produces the sign MOTORCYCLE (figure 1, upper-left frame) with two hands that pantomime the revving motion used to drive a motorcycle. Her interlocutor signs back to her, repeating a version of the revving motion with one hand that also moves away from his body and in an upward trajectory (figure 1, lower-middle frame). As he produces this sign, he raises his eyebrows, producing an inquiry marker. The first signer continues to hold her two-handed sign for motorcycle as he clarifies her utterance with a repetition. After producing his sign for motorcycle, the second signer makes eye contact, and she confirms his clarification with a nod (figure 1, upper-right frame). The second turn in this exchange, the repetition for clarification, is considered T-0 or the repair initiation. The immediately preceding turn, when the signer originally produced MOTORCYCLE, is considered T-1 or the trouble source. The final turn, when the original signer confirms the repetition, is considered T+1 or the repair solution. Many repairs are resolved in three turns,

as illustrated in figure 1, but it is also possible to have multiple OIR sequences (Skedsmo 2020a ;; Rossi 2015; Safar and de Vos 2022).

Within OIR sequences, studies often focus on repair initiation (T0), specifically on its form and function in the utterance. The primary formal distinction in many analyses of signed languages focuses on whether the sign is produced on the hands or with nonmanual markers like facial expressions. Other formal characteristics that can be considered when analyzing repair initiations include the use of repetition and the presence of explicit question words or inquiry markers. Functional categories of repair initiations are based on (1) how much information about the trouble source is specified (*open* versus *restricted*) and (2) what kind of information is solicited to resolve the trouble source (*request* versus *offer*) (see Dingemanse and Enfield 2015, 105).

In the first contrast, open repair initiations are contrasted with restricted repair initiations. Open repair initiations do not specify which part of the preceding turn was problematic or misunderstood, nor do they provide information about the nature of the misunderstanding. Open repairs can include generic markers of confusion, for example the English word *Huh?* or a generic nonmanual inquiry marker for signed languages. Restricted repair initiations include more specific information. The interlocutor provides more information about the location of the trouble within the turn or they are more explicit about their interpretation of the trouble source. These include specific follow-up questions like "Who?" or "Where?" in English, as well as *candidate understandings*, like "She went to the store?" These types are illustrated with examples in figure 2.

The second feature of repair initiations used to classify types and subtypes concerns the type of response solicited from the producer of the trouble source turn. This dimension reflects how the receiver who initiates the repair seeks more information from the producer. The receiver can make a *request*, in the form of a repetition or content question, to seek clarification. Alternatively, the receiver can make an *offer*—an interpretation of the trouble source—that the original producer can confirm or disconfirm. The offer can take the form of a full or partial repetition of the trouble source, or the receiver can produce a new form or alternative form as a candidate understanding. The original producer can then indicate that this is correct or

		What kind of information is solicited for the repair?	
		Requests *seeks specification: more information or clarification*	**Offers** *seeks confirmation/disconfirmation*
How much information is given about the trouble source?	**Open** *Indicates a problem, but does not specify source or nature of misunderstanding*	▪ Interjection *"Huh?"* ▪ Question Word *"What?"* ▪ Formulaic Expression *"Beg your pardon?"*	
	Restricted *Indicates a problem with understanding and provides information about the source or nature of misunderstanding*	▪ Repetition of trouble source *"Tomato?"* ▪ Content Questions *"Who?" "How many?"* ▪ Alternative Questions *"One tomato or two?"*	▪ Repetitions of trouble source *"Did you mean tomato?"* ▪ Candidate understanding *"Tomato like this one?"*

Figure 2. Types and subtypes of repair initiations.

incorrect—they can accept or reject the recipient's offer. Requests and offers are illustrated with examples in figure 2.

Other-Initiated Repairs: Frequency and Distribution

Early studies of conversational repair focused on documenting different strategies for achieving repair across turns with minimal attention to the frequency of repairs or the distribution of different types (Albert and de Ruiter 2018). More recent studies have quantified rates of repairs and considered crosslinguistic samples to evaluate the variation or similarity of repair strategies, in both frequency and distribution, between unrelated languages.

In a crosslinguistic dataset of naturalistic conversations from eleven spoken languages and one signed language, Dingemanse et al. (2015) found that all used a similar set of three repair initiators triggered by specific contexts in conversation. In this sample, OIRs occurred frequently, on average once every 1.4 minutes, and in all of the languages sampled, the three types of repairs described above—*open requests*, *restricted requests*, and *restricted offers*—comprised, on average, 92 percent of all repair initiations. Based on their findings, the authors propose a pragmatic universals hypothesis, which states that some aspects of language use may be the same across languages in spite of immense cultural variation and crosslinguistic grammatical differences. Subsequent studies of different kinds of signed languages have tested the

pragmatic universals hypothesis, documenting repair initiation strategies in national signed languages, local or microcommunity signed languages, homesign systems, and cross-signing.

In her study of LSA, Manrique (2016) presents an analysis of the distribution of OIRs in eleven conversations (five dyadic and six multiparty) recorded as part of a corpus of LSA used in Buenos Aires. She reports that the most frequent OIR types included open repairs, specifically nonmanual markers (23 percent of repair initiations), restricted repairs consisting of repetitions (26 percent of repair initiations), and offers (24 percent of repair initiations). Manrique also documents an implicit repair initiation, termed *freeze-look*, in which the signer refrains from producing any manual or nonmanual signs when their turn is anticipated. This absence of communicative engagement triggered repairs in 10 percent of the cases that Manrique found in the corpus. She also comments on the relatively high rate of open repairs, specifically nonmanual signs, noting that these require less articulatory effort and are maximally accessible to producers and recipients because they are articulated on the face. Ultimately, signers of LSA use almost all of the repair initiators documented for spoken languages, though some types—like *alternative questions*—were much less common and some types—like *formulaic questions*—did not appear in the sample.

In a similar study of Norwegian Sign Language (NTS), Skedsmo (2020a, 2020b) uses a corpus of multiparty conversations to study OIRs. In a dataset that included sixteen participants and three hours thirty-eight minutes of conversations, Skedsmo found that the most common repair initiations were *candidate offers* (56 percent). Using *implicit* (freeze-look), *restricted requests*, and *open non-manuals* were also common strategies. Skedsmo provides a detailed analysis of the sequencing of repairs, reporting that 68 percent of repairs described in the dataset (N = 112 repair initiations), were part of multiple OIR sequences. As with LSA, open explicit questions were rare and formulaic initiations, like "Beg your pardon?" in English, were not documented. These findings from two national sign languages suggest a general trend of parity between spoken and signed languages, with documented use of a similar range of repair initiation strategies. However, I now turn to recent studies of sign systems and languages

that diverge in their sociocommunicative context from national signed languages like LSA and NTS]. The first is a study of homesigners, deaf individuals who have not been exposed to a national or local signed language and use their own manual systems to communicate with family and friends (Brentari and Goldin-Meadow 2017). The second is a study of a microcommunity sign language. Lastly, I discuss studies of OIRs in cross-signing, when signers of different national sign languages interact in the absence of a shared language (Zeshan 2015).

Safar and de Vos (2022) provide one of the first detailed descriptions of OIRs in homesigner conversations. Taken from the Balinese Homesign Corpus and drawing on interactions between five signers and their interlocutors from the Buleleng regency of Bali, Indonesia, Safar and de Vos use a Conversation Analysis approach and find that signers use a variety of repair types and initiate repairs at rates similar to those reported for other sign languages. The most common repair types for Balinese homesigners were very similar to those reported for LSA, and included explicit open repairs (see figure 2 for description and spoken language examples of repair types), specifically nonmanuals (15 percent) as well as restricted repairs, specifically repetitions posed as offers for confirmation or disconfirmation (35.6 percent) and candidate understandings (38.6 percent). Formulaic expressions were not observed in homesign conversations, nor were alternative questions and open Wh-questions. There was a strong preference for restricted repair initiations in these conversations, similar to LSA, NTS, and the spoken languages documented in Dingemanse et al. (2015).

Omardeen (2021, 2022) conducted an analysis of OIRs in a microcommunity signed language used by deaf and hearing signers in Providence Island, located off the coast of Colombia. The total island population is 4,500, with thirteen deaf residents, and a history of signing and deaf inhabitants stretching back to the eighteenth century (Washabaugh 1986, cited in Omardeen 2022). Omardeen analyzes 224 instances of OIRs from five dyads in conversation (just over one hour of video data) (Omardeen 2022, 134). She finds a similar preference for open nonmanual repair initiations (7 percent), restricted repetitions (23 percent) and candidate understandings (58 percent). The tendency to use restricted repair initiations was strongest in Providence Island Sign Language (PISL), compared to all of

the other signing communities analyzed, with just over 90 percent of repair initiations.

Byun et al. (2018) analyzed fifty-one OIR sequences from three dyads of signers (approximately an hour and a half of video). The dyads contained the same signer, paired with signers who knew a different sign language (signers were from South Korea, the Netherlands, Uzbekistan, and Hong Kong). The dyads were filmed interacting during the first meeting of an international research working group. The most frequent OIR subtype in the cross-signing context was repetition (67 percent of all initiations). Although this restricted format was common, the other frequent restricted repair strategy of offering a candidate understanding was absent in cross-signing. Byun et al. (2018) documented extensive use of *try markers* (Schegloff 2007), cues that a speaker uses in anticipation that their utterance may be misunderstood, thus marking the form with rising intonation or another prosodic cue (Byun et al. 2018, 320–23). Try markers often precipitate an OIR sequence and, as Byun et al. suggest, reflect the metalinguistic skills of their producer who is monitoring the attention and comprehension of their interlocutor.

The findings from the Balinese homesign and PISL studies extend the trends documented for LSA and NTS—suggesting that OIRs may have similar patterns of use across languages and across modalities, including a wide array of signed languages and signed systems. For these signed languages and homesign systems, there was a pragmatic preference for open repairs, specifically nonmanual markers and restricted requests, especially repetitions. Cross-signing OIR sequences were also characterized by frequent nonmanuals and repetition. The most substantial variation in OIRs in these signed languages and systems appeared in the frequency of candidate understandings as a repair initiator. These were the most common strategies for PISL and were frequently used in NTS, but were absent from cross-signing and somewhat less frequent in Balinese homesign and LSA. It is possible that candidate understandings are only an effective strategy under particular communicative circumstances, and signers in the cross-signing conversations were reluctant to produce an offer or candidate understanding because they were aware that they lacked a shared language with their interlocutor and determined that it was more effective

to repeat the confusing turn and solicit clarification from the signer who produced the original utterance. Candidate understandings, as a type, are somewhat more tenuous in interaction, given that they may introduce more confusion, if the producer of the trouble source fails to connect the candidate understanding with the part of their utterance that was confusing. I discuss this discrepancy further in the data for this study in the Discussion section.

Participants and Field Site

All participants live in the town of Nebaj, Guatemala. Nebaj is located in the northwest highlands of the country and is the commercial and financial center of the region. As noted in the Introduction, no standardized signed language is in use in this community. LENSEGUA, the national sign language of Guatemala, is used by deaf communities in Guatemala City and Quetzaltenango, larger cities located four to six hours from Nebaj (Parks and Parks 2008). Community characteristics and more detail about deaf individuals and signing in the area can be found in Horton (2018) and Horton (2020). For this study, five participants were filmed in their home. Four of the participants are from the "Bernal" family,[3] shown in figure 3.

Lucia and Sara are deaf, while Abel and Ramon are hearing. Lucia and Abel are Sara and Ramon's parents and all four live together in the same household. Ana, the fifth participant is hearing, is their neighbor

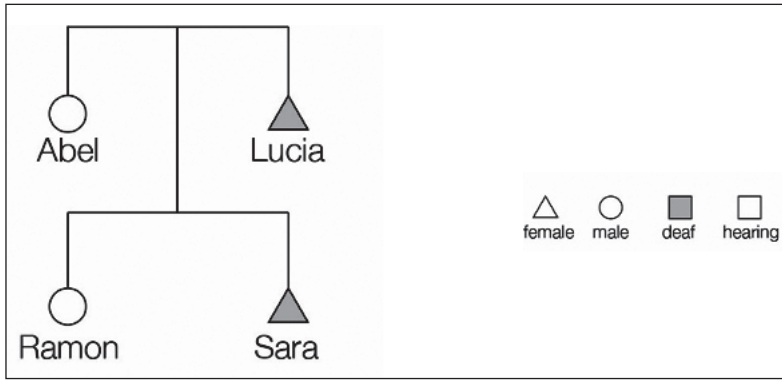

Figure 3. Family tree diagram.

who frequently played with Sara and attended the same school. At the time data were collected, Sara was ten years old, Ramon was fourteen years old, and Ana was eight years old. Sara, Ana, and Ramon attend their local elementary school and have literacy skills in Spanish. Sara and Ramon's parents, Lucia and Abel, attended a few years of school (per their report) and have limited literacy skills. Abel and Lucia both work outside the home. Lucia does laundry for other families and occasionally works at a tortilla shop. Abel tends their *milpa*, or plot of farmland, a short distance from the house, and also travels to the coast seasonally for paid labor. He is gone for two to four months at a time. When they are together at home, many interactions occur in sign because that is the only way for Lucia and Sara to access the conversation. Lucia and Sara also sign with their neighbors and vendors who stop by to sell fruit and other goods. Ramon and Abel report generally good comprehension of Lucia and Sara's signing. I have observed Ramon signing frequently and fluently with Sara, helping her with her schoolwork and serving as an informal interpreter or broker for his mother and sister.

Data

The data for this study were collected in the summer of 2015. At this time, I had known the Bernal family for two years and had visited their home repeatedly to spend time together and collect video data. I was introduced to them by a friend who knew them through their neighbor and often accompanied me during my visits to their home. When in Nebaj, I communicate with hearing-speaking people using Spanish and with signing people using signs that I have learned from interacting with them over time. To obtain consent from participants, I discussed the study with a hearing family member who knew the deaf participants well, explaining that I wanted to record their conversations and different activities like looking at books together. For the Bernal family, I described this to Abel and Ramon, and they then signed an explanation of the study to Lucia and Sara.

For this study, the conversational data was primarily between immediate family members, but I was always present during the conversations, as was the video camera. The interactions were shaped by my presence, the camera, and the communicative task I provided

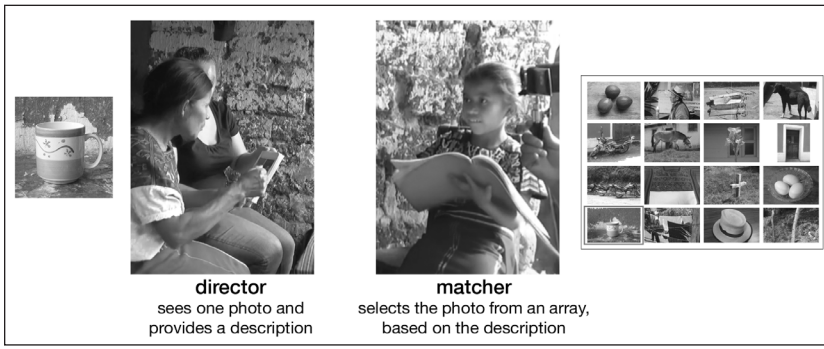

Figure 4. Director-matcher task.

(see "The Communication Task"). As such, these interactions were not fully spontaneous, naturalistic data. However, they provide examples of conversational data between familiar interlocutors who had engaged in similar tasks and had experience being recorded in this informal setting.

The Communication Task

The data for this study are conversations between dyads of signers engaged in a director-matcher communication task (see figure 4). For this task, one signer had a book of photos of familiar items, including animals, foods, locations, people, and tools that I used to elicit lexical signs. All signers except Ana used this photo book multiple times in previous sessions, describing the photos to me. For several dyads, I sat next to the director and showed them each photo, which they then described to the matcher. The signer with the photo book was considered the *director* for the task and described each photo individually to their interlocutor. Their interlocutor was considered the *matcher* for the task. The matcher had an array of twelve to sixteen photos.

After the director described one photo, the matcher indicated which photo they thought had just been described by pointing to it or holding it up. The director then provided feedback to indicate whether the matcher had selected the correct photo. There were sixty-one photos in the photo book, for this analysis; the first thirty *trials* or photos were annotated.

Table 1. Dyad characteristics

Dyad Label	*Director*	*Matcher*	*Total Time for Task*	*Time annotated**
A	Sara	Lucia	13:56	8:00
B	Sara	Abel	14:17	6:30
C	Ramon	Sara	13:21	6:45
D	Ana	Sara	14:29	11:30

*First 30 trials annotated for all dyads except Sara and Ramon, in which the first 31 trials were annotated

Dataset

The dyads are described in table 1. Sara was a participant for all four dyads, serving as the matcher in the interactions with her brother, Ramon, and friend, Ana. In the conversations with her father, Abel, and mother, Lucia, Sara was the director and Abel or Lucia were the matchers, choosing from the photo array. The total time annotated for the study is described in table 1.

Annotation and Coding

All videos were annotated and coded in Elan, a time-synced linguistic annotation software (ELAN, 2022). Instances of repair were identified using the "next-turn proof procedure" (Sacks, Schegloff, and Jefferson 1974; Sidnell 2010) from conversation analysis methods. We started by identifying turns in which the interlocutor appeared to indicate misunderstanding or confusion, then analyzed the preceding and following turns to identify the trouble source turn that preceded the confusion. All coding was completed by the author who was present when the data were collected.

Repair sequences were coded for the following: initiator type, initiator role, repair subtype, repair repetition, and repair form. Initiator type included options for explicit open, explicit restricted, or implicit. Initiator roles included director or matcher.

Repair subtype categories were based on other studies of OIRs (Safar and de Vos 2022; Omardeen 2022) and included options for freeze-look, nonmanual only, open question, formulaic phrase, restricted question, restricted repetition offer, restricted repetition request, alternative question, candidate understanding, and unclear. One subtype that was generated as a consequence of the referential communication task occurred when signers who were acting as the

Figure 5. Examples of nonmanual markers of inquiry.

matcher pointed out photos from their array while producing nonmanual inquiry markers. These were coded as candidate understandings. The signer was offering an interpretation of what the director signer had described to them, but, similar to repetition offers, did not introduce new information or signs into the exchange with this strategy. The director signer could confirm or disconfirm that the matcher signer had made the correct selection.

Repair repetition was coded to indicate whether the repair included any repetition, full or partial, from the trouble-source turn. Repair form included options for manual-only signs, nonmanual-only signs, and manual/nonmanual signs. Examples of frequent nonmanual markers are provided in figure 5.

Finally, this study does not focus on three aspects of repairs that have been central to some other studies, including multiple repair sequences (Skedsmo 2020a), try markers, and repair timing (Byun et al. 2018). Because I did not develop criteria for segmenting single versus multiple repair sequences based on prosodic or other cues, each repair was counted individually. I hope to explore these characteristics more in future work.

Examples of Repairs

In this section, I present some detailed examples of the different repair types annotated in the dataset, including restricted repairs that consisted of a repetition (confirmation), restricted repairs that consisted of a signed candidate understanding (confirmation), and a restricted repair with an alternative question (specification).

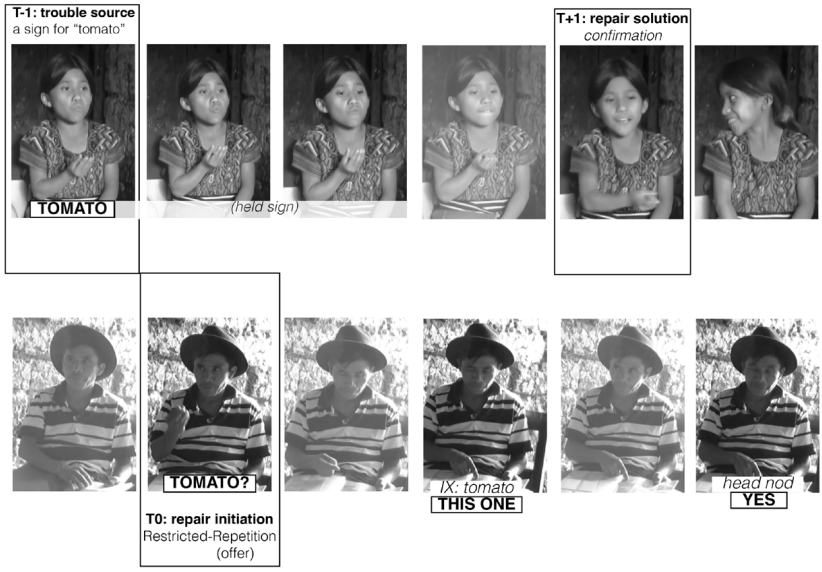

FIGURE 6. Example of a restricted repair—including a repetition offered for confirmation. Dyad B; 02:26.08–02:30.60.

Restricted Repairs: Repetition. An example of a restricted repair that included a repetition of the previous sign is presented in figure 6.

Sara has seen a photo of a tomato and produces a sign for TOMATO for her father, Abel, who is trying to select that photo from an array. As Sara holds the sign for TOMATO, Abel repeats it back to her, raising his hand and making eye contact. He produces this sign, identical in form to Sara's sign, as an offer for her to confirm or disconfirm. Sara continues to hold her sign, and Abel takes this as confirmation of his repetition. He then selects the correct photo from the array and checks in again with Sara, making eye contact. She affirms that this is the correct selection, and he nods. Abel frequently produced repetitions as a repair strategy, repeating Sara's signs back to her before selecting the photo from his array (see figure 7, second row).

Restricted Repairs: Candidate Understandings. An example of a restricted repair sequence with a signed candidate understanding is provided in figure 7.

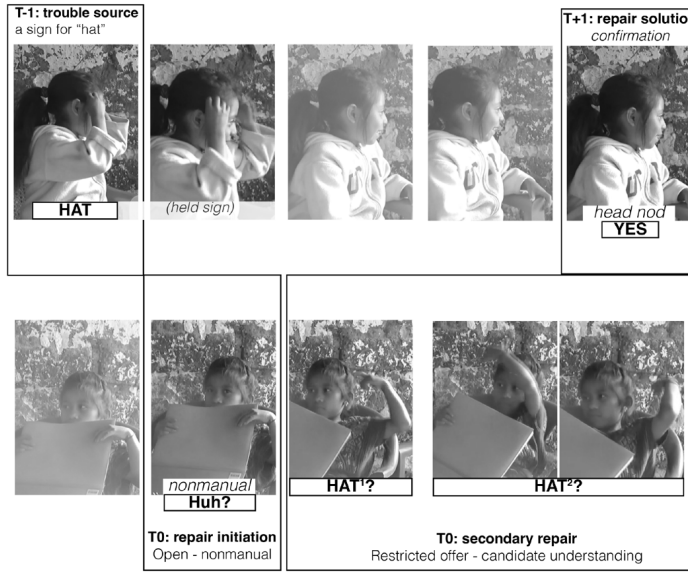

Figure 7. Example of a restricted repair—including a candidate understanding offered for confirmation. Dyad D; 03:52.13–03:56.38.

In this example, Ana has seen a photo of a hat traditionally worn by men in Nebaj. She produces a sign for HAT that looks like the gripping of the brim of a hat with both hands and placing it on her head. Sara initially offers a nonmanual expression indicating confusion and breaking eye contact with Ana to look up and to her left. Ana discontinues her sign and Sara produces a different sign for HAT, the one that she typically uses, which consists of her hand in a C-handshape (HAT[1]), held at the side of her head to indicate the shape of the brim of the hat. She then traces the shape of the hat over her head (HAT[2]). Ana confirms this candidate sign with a nod, and Sara selects the photo of a hat from the array in front of her. Sara was the most frequent producer of candidate understandings, a pattern I discuss further below, as this seems to be related both to Sara's role as a matcher and her social history with her communication partners in Dyads C and D (her brother and friend).

Restricted Repairs: Alternative Questions. I now present an example of one of the less-frequent repair strategies in the dataset: restricted re-

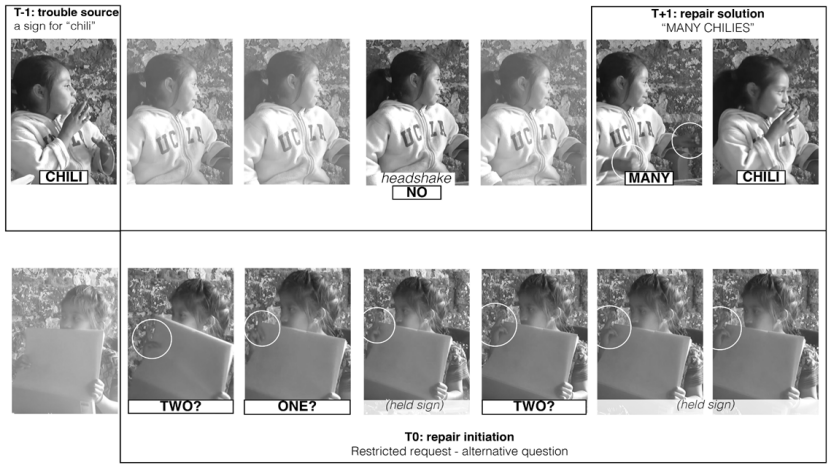

FIGURE 8. Example of a restricted repair—including a request (alternative question) that seeks more specification. Dyad D; 01:26.6–01:31.7.

quests. This is a frequent repair initiation in many spoken languages, (Dingemanse and Enfield 2015), but seems to be less common for signed languages. One example of a restricted request or alternative question is provided in figure 8.

In this example, Ana describes a photo of a pile of chilies with her sign for CHILI by waving her hand in front of her mouth and incorporating a nonmanual component that pantomimes blowing with her lips. Sara is very familiar with the range of photos in the photo book and knows that there are multiple photos of chilies, including a photo of one chili as well as a photo with multiple chilies (arranged in either a row or a pile). To clarify which photo of chilies Ana has seen, Sara produces an alternative question to Ana. She holds up two fingers, then one finger, trying to determine whether this is the photo of a single chili or multiple. She repeats her sign for ONE, and Ana negates this, shaking her head. Ana then further specifies that there are multiple chilies in the photo with a sign for MANY that includes opening and closing both hands, followed by her sign for CHILI again. Based on this additional information, Sara selects the correct photo from the array.

This example illustrates one of the contextual dimensions that contributed to repair selection in this dataset and reflects the diversity

of factors that can influence pragmatic strategies (Bortfeld et al. 2001; Dingemanse and Enfield 2015, 111). Sara used her prior knowledge of the referential communication task itself to frame a restricted request for further specification from Ana that allows her to be more accurate with her selection.

Results

We begin this section with a brief overview of the communication task itself, providing a description of accuracy rates across the thirty trials. We then address the research questions outlined in the introduction: (1) What is the frequency of OIR? (2) Which signer introduces the OIR? (3) What is the distribution of different forms of OIR? and (4) How much individual variation exists in repair frequency and form across signers?

Task Accuracy

In general, matchers were very accurate at selecting the correct photo from the array, based on the description provided by the director. Figure 9 shows all trials and the number of guesses that were necessary to select the correct photo.

Acting as the matcher, Sara was particularly efficient and accurate in the conversations with her brother, Ramon, and her friend, Ana, selecting the correct photo on the first try in twenty-eight out of

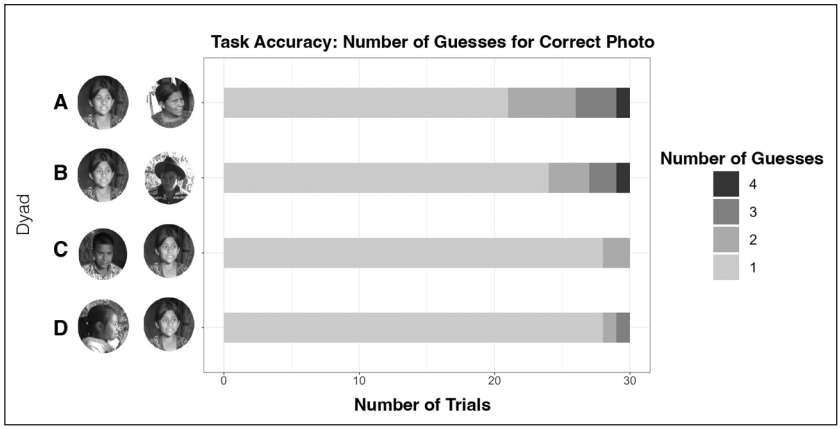

Figure 9. Task accuracy results.

Table 2. Rates of repair sequences

Dyad	*Director*	*Matcher*	*Total Repairs*	*Rate of Repairs*
A	Sara	Lucia	12	1/40.0 s
B	Sara	Abel	23	1/17.0 s
C	Ramon	Sara	11	1/36.8 s
D	Ana	Sara	26	1/26.5 s
	TOTAL		72	1/27.3 s

thirty trials. Almost all trials were resolved with one or two guesses, with slightly lower accuracy rates between Sara and her mother, Lucia, who was the matcher and had some errors based on Sara's description of three photos from the set.

Frequency of Other-Initiated Repairs

In the total dataset, seventy-two instances of OIRs were identified. Repair sequences thus occurred frequently in these conversations but were somewhat variable across the dyads. Rates of repair sequences are presented in table 2.

When I consider these rates, I note that repairs were most frequent in the conversation between Sara and her father, Abel, occurring at more than twice the rate of repairs for the conversations between Sara and her mother and Sara and her brother.

Repair Initiation and Participant Role

I now consider the relationship between repair initiation and participant identity. As discussed above, these conversations were part of a referential communication task, which presented explicit roles for participants to occupy. For this part of the analysis, I also include self-repairs ($N = 17$). Self-repairs are considered the preferred strategy in many interactions and occur when the producer of the trouble source corrects themselves, without any prompting from their interlocutor (Schegloff et al. 1977). I include these repairs because there appears to be an association between participant roles and repair type (self-repairs versus OIRs).

Figure 10 shows the rates of repairs for the participants in each dyad. Each row of the chart represents all of the repairs for one participant, identifiable based on their role (director or matcher) and dyad (A, B, C, D). See table 1 for participant names.

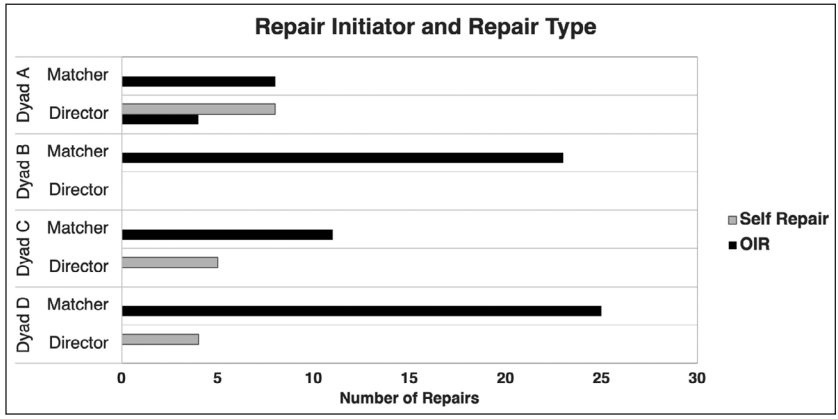

Figure 10. Participant roles and repair initiation.

As figure 10 illustrates, there is a strong association between the participant role and the repair type. The OIR sequences I have discussed so far were overwhelmingly introduced by the matcher. Most matchers only introduced OIR-type repairs, though the frequency of these sequences varied. Participants in the director role, in contrast, produced almost exclusively self-repairs (in Dyads C and D). Sara—the director in Dyads A and B, and the matcher in Dyads C and D—produced a significant proportion of all of the repair sequences and was the only participant to produce both OIRs and self-repairs.

The relationship between the designated participant roles in the context of the referential communication (director-matcher) task could be considered an advantage or a limitation of this study. I elaborate on this in the Discussion section and also consider how the participant roles in this task might be interacting with other relationships and identities of the signers in the study.

We now turn to the distribution of types and subtypes of OIRs. We begin by comparing rates of *open*, *closed*, and *implicit (open)* types of OIR, followed by the more detailed subtypes of *restricted* repairs. All types for the whole dataset are summarized in the Appendix. In the following sections, we present the results for each dyad because there was substantial variation across dyads in the types of OIRs that were most common. In the Discussion section, we consider possible explanations for this variation.

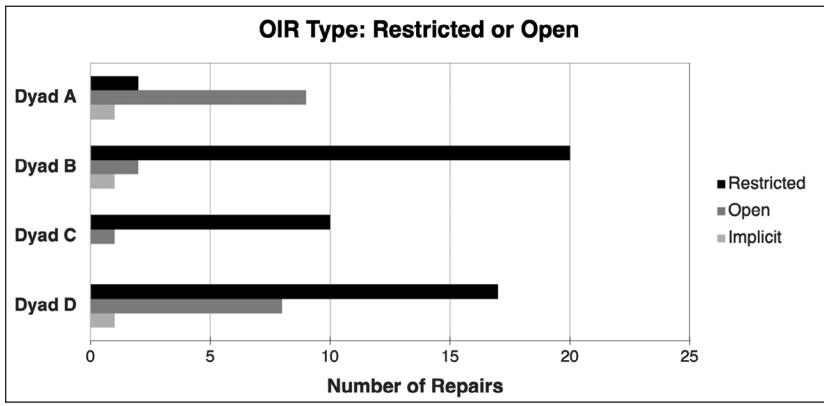

FIGURE 11. OIR types.

Other-Initiated Repair Types

Figure 11 shows each dyad's distribution of OIR types. These types are introduced in figure 2. Restricted repairs include information about the source of the misunderstanding, like repeating a sign that was confusing or asking a specific follow-up question, like, "She went to the store?" Open repairs indicate that there has been some confusion or misunderstanding, but they do not specify the source of the problem. Examples of open repairs include general question indicators like raised eyebrows or the general question "Huh?" in English. Lastly, freeze-look, the implicit repair strategy described in Manrique (2016), was also documented here. This is an open repair strategy but lacks an explicit linguistic encoding.

For Dyads B, C, and D (Sara and her father, Abel, her brother, Ramon, and her friend, Ana), restricted repairs were the most common OIR initiator. Restricted repairs were almost exclusively used in the conversations between Sara and her father (Dyad B) and Sara and her brother (Dyad C). This is similar to the signed languages discussed above, in which restricted repairs were preferred. For Dyad A (Sara and her mother, Lucia), the majority of OIR sequences were initiated with open strategies. We elaborate possible sources for the unique pattern of OIRs in Dyad A in the Discussion section.

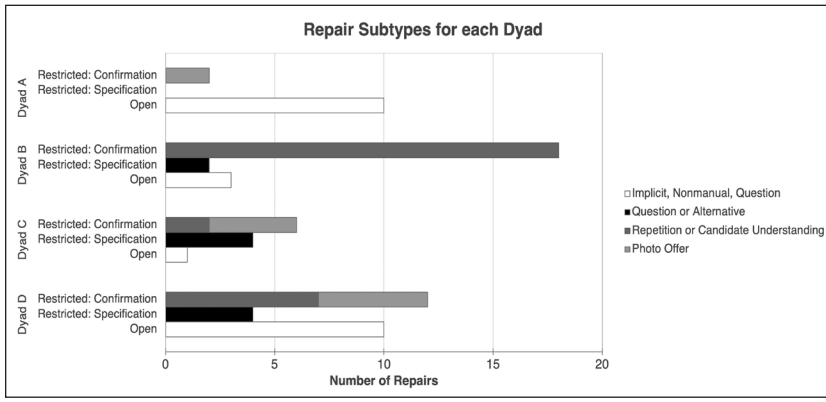

Figure 12. Repair subtypes.

Other-Initiated Repair (OIR) Subtypes

Figure 12 shows the distribution of subtypes of restricted repairs (grey and black bars) with open repairs (white bars) also presented for comparison. These types are introduced in figure 2, but they are distinguished based on the type of reply solicited in the repair. Restricted repairs that seek confirmation only require the producer of the trouble source to confirm or disconfirm the interlocutor's interpretation. An example of a restricted confirmation repair is a repetition of the sign from the trouble source. The signer can nod to confirm that the person has interpreted their utterance correctly, or shake their head to indicate that there is an ongoing communication breakdown.

Restricted repairs that seek specification require the signer who produced the trouble source to give some additional clarification or information. An example of a restricted specification repair would be if the signer asked a follow-up question, like, "Do you mean one or two motorcycles?" because this prompts their interlocutor to provide a specific piece of clarifying information.

The signers in Dyad A (Sara and Lucia), as noted in the preceding section on repair types, did not use many restricted repairs in their interaction. For the remaining three dyads, restricted repairs that sought confirmation were the most common strategy. These are broken down in figure 12 into two types—restricted confirmation re-

Table 3. Initiator role and repair for each dyad

Dyad	*Director*	*Matcher*	*OIR Frequency*	*Primary Initiator*	*Director self repair*
A	Sara	Lucia	Low	Director and Matcher	Yes (Sara)
B	Sara	Abel	High	Matcher (Abel)	No
C	Ramon	Sara	Moderate	Matcher (Sara)	Yes (Ramon)
D	Ana	Sara	Moderate	Matcher (Sara)	Yes (Ana)

pairs that were repetitions or candidate understandings (dark grey bars) and restricted confirmation repairs that were photo offers, in which the matcher showed the director the photo what they thought had been described (light grey bars). For this study, this was considered one strategy for expressing a candidate understanding (see discussion of coding in Methods section).

Summary of Descriptive Results

I summarize the characteristics of each dyad and the findings for repair strategies in tables 3 and 4. Table 3 focuses on the relationship between participant role and repair initiation.

Based on table 3, I note that Dyad A offers a profile of pragmatic preferences somewhat distinct from the other dyads. There were fewer instances of OIRs between Sara and Lucia (see table 2), and they were distributed differently across the participant roles (see figure 10) —principally because Sara initiated more repairs as the director than in any of the other dyads. Qualitatively, many of the repair sequences between Sara and Lucia centered less on the resolution of reference or the immediately preceding description of a photo, and more on the task itself, for example, finding the correct array of photos for Lucia to choose from and reinforcing the directions for the task itself. In other contexts, however, Lucia seems to tend to prefer open repairs. She frequently used an open question marker, illustrated in figure 13, in which one or both hands are flipped, palm-up (Cooperrider, Abner, and Goldin-Meadow 2018). The signer also often makes eye contact and raises or jerks their chin in an upwards movement. This is generally interpreted to mean that the recipient signer should elaborate or provide more information.

Figure 13. A generic, open question sign.

Unlike Dyad A, Dyads B, C, and D showed similar trends in that the matcher tended to initiate OIR sequences. Dyad B, with Sara and her father, had the highest rates of OIRs, and Sara, as the director, was less likely to initiate self-repairs. Her father consistently used repetitions of her signs to verify the photo that he was about to select. Dyads C and D, with Sara and her brother and friend, were similar, though we discuss some differences in the Discussion section. But in both of these conversations, Sara initiated a lot of OIRs of different formats, and Ramon and Ana, as the directors, provided some self-repairs when they saw that Sara was unable to select a photo based on their original description.

Table 4 summarizes the types and subtypes of repairs that were most common for each dyad.

We find unique profiles for each dyad in table 4. Similar to the participant roles illustrated in table 3, for Dyad A, the preference for open repairs and open questions was unique within this dataset. As mentioned above, Sara's father, as the matcher, frequently used

TABLE 4. Repair form preferences

Dyad	*Director*	*Matcher*	*Preferred Repair Type*	*Preferred Repair Subtype*
A	Sara	Lucia	open	open question
B	Sara	Abel	restricted repair (confirmation)	repetition
C	Ramon	Sara	restricted repair (confirmation and specification)	candidate understanding/ restricted question
D	Ana	Sara	restricted repair (confirmation)	candidate understanding/ open non-manual

repetition as an OIR. In contrast, Sara tended to provide candidate understandings when she initiated OIR sequences with her brother and friend in Dyads C and D. I discuss the multiple functions of candidate understandings below.

The summary tables illustrate that each dyad in the study had unique pragmatic preferences that led to distinct patterns of repair during the referential communication task. I now turn to a discussion of these patterns as well as of the impact of the task itself on the frequency and form of repairs.

Discussion

We begin this section with a brief vignette describing a repair interaction between Lucia and Sara that was observed on a different day during a less structured interaction. Near the end of a visit, Lucia invited my friend and I into the house for *b'oxhb'ol*, a local snack made from wrapping *guiskil* leaves around a lump of masa and then boiling. Sara was helping her mother in the kitchen, and Lucia asked her to fetch a plate to serve the food from the pot, signing PLATE. Sara returned, but apparently had not selected the plate that Lucia had in mind, so she clarified, providing additional description about the size and shape of the plate and a deictic form toward the cabinet. Sara went back to the cabinet and brought the correct item.

This exchange illustrates the ways in which language functions in typical naturalistic conversation in this household. Language is used to achieve something, to tell someone what to do, to request something, or to report on an event happening somewhere else. In this sense,

language is not typically an end in itself, but a means to achieve some other end (Hanks 1996, 203). Further, in the story above, Lucia, as the adult in the home, and host to me and my friend, clearly occupied the role of authority, providing direction to Sara, her child. In this exchange, their social roles were understood and performed within expected daily routines.

In this discussion section, we consider how the referential communication task for this study violated many of these norms and thus reshaped the ways that signing happened between interlocutors. We begin by discussing the participant roles and their relationship with repair frequency and repair form, followed by the implications of the referential task.

Repair: Who Makes It Work and How Do They Do It?

In the Nebaj family sign language, all of the signers had some prior experience with the photos used in the director-matcher task, however, Sara was most familiar with them and appeared to have the best memory of the range of photos in the set. This knowledge prompted specific questions to disambiguate photos that might otherwise be confused, for example, because there were multiple photos of the same item in different quantities (see figure 8). To use this kind of repair strategy, however, she needed to be familiar with both the set of photos and the parameters of the task. Sara's prior experience facilitated the *specificity principle* described in Dingemanse et al. (2015, 7), in which people are predicted to choose the most specific repair initiator possible given the circumstances, with the understanding that open repairs are less specific than restricted repairs.

In contrast to Sara, Lucia did not have as much experience with written materials and this type of activity. Because she did not recall that there were multiple photos of the same item, she was unlikely to use repair initiators that targeted the difference between two photos of the same item that differed based on quantity (e.g., one tomato versus many). Given this, it made sense that Lucia tended to prefer open repairs, even though she was in the participant role of matcher, because she expected that Sara would anticipate her communicative needs and provide the additional information she required. This asymmetry in the labor of establishing mutual understanding is common

across conversations and connected to the ethics of these kinds of interactions.

In a recent study of *natural signs* used in Nepal, Green (2022) highlights the ways in which signed conversations are an inherently ethical enterprise. Though the ethical nature of interaction has been analyzed in prior work (Garfinkel 1963; Goodwin 2006; Keane 2016; Sidnell 2010), Green points out that this characteristic is particularly salient where some sign systems and sign languages are in use, noting, "While all communication requires that addressees make inferences about what is meant beyond what is said . . . understanding [in natural sign] and being understood, even at the level of reference, are always in question" (Green 2022, 22). Because understanding is somewhat tenuous in natural sign conversations, mutual comprehension requires an ethical commitment on the part of all interlocutors, regardless of their sign proficiency and experience. Green points out that deaf signers can automatically be rendered "senseless" or "incomprehensible" by some interlocutors, who refuse to engage them as competent communication partners, even when their signing is transparent or legible to other nonsigners.

Weaponized Confusion: The Diverse Functions of Candidate Understandings

The choice of a repair initiator is impacted by a range of factors, including the social relationship between the interlocutors and the social aims of the person initiating the repair. Signers who interact with a wide variety of deaf and hearing communication partners experience interactions in which their interlocutor may have variable experience and variable commitment to the success of the interaction. Repair strategies must be carefully calibrated in these circumstances, with consideration of not only the communicative skill but also the desire of the communication partner.

The social hierarchy between Sara and her mother, in which she was treated as an authority and granted the bulk of the communicative labor, played out differently in Sara's conversations with her brother, Ramon, and friend, Ana. Ramon and Ana are hearing signers who interact with Sara frequently, but as directors, they sometimes used signs for familiar items that did not match Sara's signs for the items in the photos. In these instances, Sara would often use a candidate

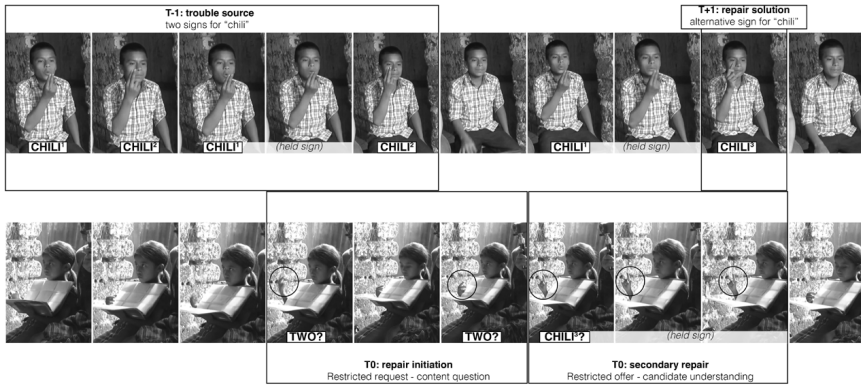

Figure 14. Example of an OIR with a candidate understanding.

understanding in which she produced her sign for the item. She appeared to know what they wanted to refer to, but clarified with her sign nonetheless. I illustrate one of these sequences in figure 14 (see also figure 7).

In this example, Sara's brother, Ramon, describes a photo of a chili. He uses a sign for CHILI that includes two extended fingers held upright. He then produces an alternate version, adding a nonmanual blowing or puffing of his lips. Similar to the exchange with Ana about the photo of chilies, Sara initiates a repair by asking about the quantity of chilies. She holds up two fingers to ask whether this is the photo that has one or multiple chilies. Her brother then repeats the sign CHILI with two fingers. At this point, Sara offers a candidate understanding, using her sign for CHILI, which is made with only one finger. Her brother then provides the repair solution by repeating Sara's sign for CHILI (with one finger) back to her. At this point, she is able to select the correct photo. Importantly, though, Ramon adjusted his sign to match the one that Sara had introduced in her repair.

Sara's conversational move mobilized the OIR to do more than initiate a repair. Her candidate understanding sign also reinforced her position of authority and expertise regarding standards of well-formedness (Singleton, Morford, and Goldin-Meadow 1993). Similarly, Sara would frequently respond to Ana's signs with confusion or

nonmanual indicators of misunderstanding that appeared designed to highlight Ana's inadequacies as a signer. When she occupied the role of matcher, with her similar-aged brother and friend, Sara's OIRs were carefully deployed to highlight any time the director provided a description that was insufficient or inaccurate.

The Context of Repair: Implications of a Referential Communication Task

As Hanks (1996, 201) notes in his discussion of participant frameworks and the social context of interaction, to use language is to "take up a position in a social field in which all positions are moving and defined relative to one another." The referential communication task in which signers participated for this data established roles with particular communicative objectives. These objectives anticipated and constrained signers' conversational moves in some ways, including conversational repairs. The nature of the task influences, for example, the turn-taking framework of the interaction, predisposing the signer in the director role to begin with the first turn, describing the photo, and then look to their interlocutor, the matcher, for a response.

If we consider the relationship between repairs and participant roles, based on the results in figure 10 and summarized in table 3, OIR sequences were almost always initiated by the matcher. This follows naturally from the structure of the task. Since the aim of the matcher is to correctly choose a photo based on the utterance of the director, it is reasonable that they indicate when the director's utterance was confusing or insufficient for them to complete this task successfully. This division of labor is not as immanent in routine interactions, and the likely OIR initiator might be more linked to age and status; for example, see Sidnell et al. (2020).

To understand the intersection of participant role and individual social identity in this particular social ecology, we can consider the rates of repairs from each of the matchers within the dyads. While both Lucia and Abel, Sara's parents, acted as the matcher, the discrepancy in their rates of OIR sequences is quite striking. While Abel routinely responded to Sara's descriptions as the director with a brief restricted repair consisting of a repetition of her sign, Lucia rarely produced repairs, and when she did, they tended to be open repairs

that did not specify the source of her confusion. This is interesting, given that Lucia is a deaf signer who has been signing her whole life, while Abel is hard of hearing, but speaks Ixil in most of his interactions. Though both occupied the same participant role, the outcome in terms of both frequency and form was shaped by their relationship to the task and to Sara.

In terms of the implications of this for other studies of repair, this kind of task could help to understand how different participants take up the director versus the matcher role in the task and how that impacts both their rate of repair initiation and the form of repairs they choose. To do a full comparison, it would be useful to have participants occupy the roles of director for some conversations and matcher for others. However, the point above about the differences between Abel and Lucia underscores that there does not seem to be a direct causal relationship between participant role and either the frequency of repairs or the form that they will take. Instead, patterns of repair seem to vary between dyads, even within the prestructured roles of the task, suggesting that the task still captures the social factors and histories that impact how signers converse in more naturalistic conversation.

Notes

1. There are many terms used to describe different types of signed languages based on their social circumstances, the number of signers, and their contexts of use. These terms, and their implications, are discussed in other publications (Hou and de Vos 2022; Moriarty and Hou 2023; Braithwaite 2020). For this study, we use the term *local* or *microcommunity* to reflect the fact that there are a small number of signers who use the language.

2. For all figures showing examples from the data, image stills were captured from video frames. The top row shows one signer in sequence. The bottom row shows their interlocutor at the same frame (often the two signers were captured on different cameras that were synced for coding and annotation). Signs glosses are provided in all caps, and significant nonmanuals are noted. Where signs were held across multiple frames, the bar for the sign gloss extends across the images.

3. All names are pseudonyms.

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Appendix

TABLE 1 Repair Subtypes in Nebaj Family Sign Language

Repair Type		Repair Subtype	*N*	Percentage
Explicit	Open	Nonmanual Only	14	19%
		Question	7	10%
		Formulaic	0	0
		Total Open	**24**	**33%**
	Restricted	Content Question	5	7%
		Repetition—Request	2	3%
		Alternative Question	2	3%
		Repetition—Offer	15	21%
		Candidate Understanding	23	32%
		Total Restricted	**47**	**65%**
Implicit	Open	Freeze-look	3	4%