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Indexicals under role shift in Sign Language of the Netherlands: Experimental insights

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Abstract

When reporting utterances, signers often use a construction known as quotation role shift (RS), where the signer embodies the author of the report while making use of a dedicated set of non-manual markers (RS-NMMs). First (IX-1) and second (IX-2) person pronouns in those constructions are often observed to *shift* their meaning to refer to the reported author and the addressee. This article focuses on the behavior of these pronouns in Sign Language of the Netherlands. We designed an experiment targeting the interpretation of IX-1 and IX-2 under RS-NMMs. Results obtained from 13 participants show that, while IX-2 is sensitive to RS-NMMs, the interpretation of IX-1 varies across signers but is not influenced by RS-NMMs. Building upon distinctive phonological, lexical and interpretive properties of these pronouns, we argue that the interpretation of IX-2 behaves as a genuine shifted indexical, while IX-1 is better analyzed as a logophor.

Keywords: role shift, indexicals, logophors, Sign Language of the Netherlands, signed reports

1 Introduction

Role shift (RS) is a phenomenon commonly observed in signed reports, where the signer assumes the perspective of an attitude holder (reported signer) rather than their own. On the phonological level, RS is commonly associated with a set of specialized non-manual markers (RS-NMMs) scoping over the report.¹ RS-NMMs include eye gaze shift, body leans, and head turns directed away from the interlocutor as illustrated in Figure 1 for American Sign Language (SL).²

RS is often discussed with respect to indexicals, i.e., context-sensitive elements, such as 1st- and 2nd-person pronouns, temporal and spatial deixis, which, in the context of reported speech, are observed to ‘shift’, that is to obtain their reference from the reported context rather than the actual context of the narrative. Consider quotation in English (e.g., *My wife said (to me_i): ‘Are you_{i/#j} fine?’*), where the 2nd-person indexical *you* is evaluated from the

1. Non-manual markers are facial expressions (e.g. brow raise, frowns, mouth patterns and eye gaze) and head and body movements that carry out various phonological, morphological, syntactic and discourse functions in SLs (Pfau and Quer 2010).

2. Emotive facial expressions reflecting the emotions of the attitude holder are also often included in RS-NMMs (Herrmann and Steinbach 2012a a.o.). Following Kimmelman and Khristoforova (2018), however, we analyze facial expressions as a part of the report itself rather than a marker of RS.

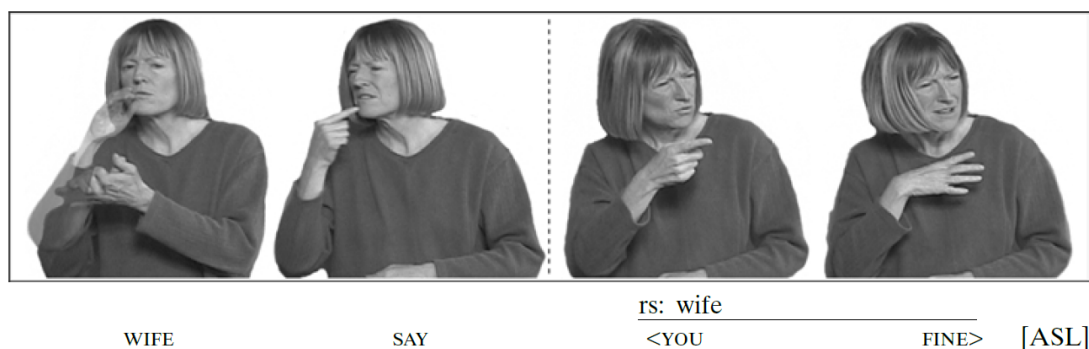


Figure 1: RS-NMMs in American SL (Lillo-Martin 1995, 369) ³

context of the original report rather than the context of utterance, i.e., referring to the reported addressee as opposed to an actual interlocutor. With respect to SLs, shifting indexicals are often observed in sentences under RS (Friedman 1975, Meier 1990). This similarity prompted a unified analysis of these phenomena treating RS as a particular case of context shift found in spoken indexical shifting languages such as Amharic, Zazaki, Slave and others (Schlenker 2003, Anand and Nevins 2004). The analysis suggests that in these languages, the matrix predicate introduces a context-shifting operator, also known as *monster operator* (hence the icon $\hat{\omega}$). It has been argued that RS-NMMs observed in sign language RS overtly realize this operator (Quer 2005, Schlenker 2017a, Schlenker 2017b a.o.):

- (1) [My wife said to me_i $\hat{\omega}$ [you_i fine?]]

This analysis predicts that every indexical within the scope of the context-shifting operator will be interpreted relative to the reported context, and, hence, no shifted reading is predicted to be possible outside of the scope of RS-NMMs, and conversely, no unshifted reading is expected to be possible within their scope. We therefore also expect that all indexicals within a single reported context will ‘shift together’, as an eponymous constraint proposed by Anand and Nevins (2004) suggests.

However, previous studies on Catalan SL (Quer 2011), German SL (Herrmann and Steinbach 2012b), Russian SL (Kimmelman and Khristoforova 2018), and Hong-Kong SL (Gan 2021) have shown that RS-NMMs are neither necessary nor sufficient for the indexicals to shift. In fact, these studies reveal that indexicals within the scope of RS-NMMs do not always ‘shift together’. Thus, one indexical can be interpreted as shifted, while another one in the same clause remains unshifted. Consider example (2) from Russian SL (RSL). Note that the sentence is uttered in Moscow (*M*):

- (2) IX-3_a WOMAN PAST ST.PETERSBURG TELL_b MAN IX-3_b IX-1 WORK HERE
 ‘A woman_i when she was in St. Petersburg_{SP} told a man: “I_i work here_{SP/M}”.’
 (Kimmelman and Khristoforova 2018, 9)

In (2), the 1st-person indexical IX-1 refers to the speaker of the embedded context (the woman), hence the interpretation of the pronoun is shifted. However, according to Kimmelman and

3. Glossing conventions: signs are glossed in SMALL CAPS; IX-1/2/3_{a/b} refers to a pointing sign, with numbers referring to the person and letters contrasting ipsi- and contralateral directions of the pointing. In verbs, number/letter indices specify subject/object agreement: the first subscript indicates the person of the subject and the second subscript the person of the object. Non-manual markers are specified above the glosses with the underscore specifying their scope.

Khristoforova (2018), the locative indexical *HERE* is interpreted by RSL signers as ambiguous between a shifted reading (denoting St. Petersburg, the reported location) and an unshifted one (the location of utterance, Moscow), despite being scoped over by RS-NMMs. These and similar findings in other SLs suggest that RS-NMMs do not necessarily guarantee the shifted interpretation of indexicals, and that indexicals might have different interpretations even within one reported utterance. These observations already call for a refinement of the classical version of the shifting operator analysis.

In what follows, we outline our experiment targeting interpretation of 1st- and 2nd-person indexicals IX-1 and IX-2 in signed reports in the Sign Language of the Netherlands (NGT) with and without RS-NMMs. We also discuss challenges that our data introduces to the existing formal analyses of indexical shift under RS, and propose our own solutions to those challenges.

2 Experiment

The present study is built upon an experiment conducted in two phases, each targeting specific sets of conditions. Both phases combined two methods – (i) a felicity judgement task and (ii) an interpretation task. Phase I involved 13 participants, all of whom were native deaf NGT signers (26 - 58 y.o.; 5 males) coming from central and southern regions of the Netherlands (Amsterdam, Utrecht, Voorburg, Zoetemeer).⁴ 10 participants from the same group also took part in Phase II of the study.

2.1 Procedure

Eleven participants took part in the experiment onsite, while the remaining two participants participated online via Zoom. Both onsite and online participants completed the experiment by filling out an online questionnaire on a website specifically created using the jsPsych library (Leeuw 2015).

First, participants became acquainted with information regarding data sharing and general instructions, which were provided in NGT. Subsequently, essential information was presented to establish a context for the stimuli. Specifically, they were introduced to four main characters: T., M., C., and J., and learned their corresponding sign names. In a video, character T. narrated that the four characters were friends who had attended a party together the day before. This preamble is crucial to establish a context in which J., T., M., and C. are likely to engage in gossip about who said what to whom during the party, thereby creating a pragmatic environment where reference ambiguity of the pronouns is potentially possible. Afterwards more specific instructions were provided, followed by a training phase. In the course of the main part of the questionnaire, participants were presented with the randomized target stimuli (three lexical variants per condition value; see details below) interspersed with six baseline stimuli serving as a control for participants' understanding of the task.

2.2 Stimuli

All stimuli were recorded from two deaf research assistants (enacting T. and M.) each paired with a hearing research assistant (featuring C. and J., respectively), who acted as an addressee. Depending on the testing condition, each stimulus either included a video with

4. For more detailed information regarding the sociolinguistic characteristics of the participants, please refer to our page on the OSF platform.

the context sentence (e.g., T. signing a simple sentence to C. as in (3a)) and a video with the target sentence (e.g., M. reporting to J. what T. signed to C. as in (3b)), or only the target sentence without any context.

- (3) (a) IX-1 LOVE CYCLING T to C
'I love cycling.'
- (b) YESTERDAY T. C. MEET. T. SAY IX-1 LOVE CYCLING M to J
'Yesterday T. and C. met. T. said I love cycling.'



Throughout the experiment, participants could watch the videos multiple times. For each stimulus, two tasks were presented consecutively: the felicity judgment task and the interpretation task both described below.

2.2.1 Felicity judgements

First, each stimulus was presented for the felicity judgment. If the target sentence was provided without a context, participants were asked to rate the acceptability of the sentence on a 5-point Likert scale, where "1" indicated that the sentence was entirely unacceptable and "5" indicated that the participant would themselves sign the sentence exactly as shown in the video. If the context video was included, participants were asked to determine if the target sentence effectively reported the context sentence. This evaluation was also conducted using the 5-point scale. The results presented in section 3 include only the analysis of the stimuli which received the score 3 and above. The results of felicity judgements themselves won't be addressed in the paper for the sake of space; the summary of the results for this task can be found on our page on the OSF platform.

2.2.2 Interpretation task

After completing the felicity judgment task, participants immediately proceeded to the interpretation task for the same stimulus. In this task, a GIF file extracted from the target video, displaying a pronoun, was provided (see Figure 2). The objective was to select an appropriate referent for the given pronoun based on the interpretation of the target stimulus. Participants could choose from a list of characters: T., C., M., and J., each represented by a GIF with their respective sign names. Additionally, a "None of the above" ("Geen daarvan" in Dutch) option was available if none of the characters seemed suitable as a referent for the pronoun. Participants had the option to select multiple characters if they considered the reference of the pronoun to be ambiguous. The presentation order of the GIFs in the character list was randomized for each stimulus.

2.2.3 Testing conditions

The experiment covered three sets of conditions aimed at studying the interpretation of IX-1 and IX-2, the effect of RS-NMMs on interpretation, and the influence of context. To comprehensively explore potential interactions, all combinations of these condition values were included.



Condition I: *pronoun type*. This condition examines how the person features of the pronoun influence whether its interpretation shifts towards the local context of the speech report. For each value of this condition, three lexically distinct items were used. The values included:



Figure 2: Screenshot of the web page displaying interpretation task. The text in the center of the image translates from Dutch as: ‘You can put more than one tick (i.e., choose more than one character) if you find it necessary.’

- the report contains a 1st-person pronoun IX-1 in the subject position as in (3); the pronoun is expected to refer either to the actual signer M. (actual context; non-shifted) or to the reported signer T. (local context; shifted), or to be ambiguous between the two.
- the report contains a 2nd-person pronoun IX-2 in the subject position as in (4); the pronoun is expected to refer either to the actual addressee J. (if non-shifted) or to the reported addressee C. (if shifted), or to be ambiguous between the two.
- the report contains two pronouns: IX-1 in the subject position (referring either to T. or to M.) + IX-2 in the object position (referring to C. or to J.) as in (5).

The first two values of Condition I were tested in Phase I, the last one – in Phase II.

- | | | |
|-----|--|---|
| (4) | (a) IX-2 SIGN VERY.WELL
‘You sign very well!’ | T to C |
| | (b) YESTERDAY T. C. MEET. T. SAY IX-2 SIGN VERY.WELL
‘Yesterday T. and C. met. T. said You sign very well.’ | M to J |
| | |  |
| (5) | (a) IX-1 MISS IX-2
‘I miss you!’ | T to C |
| | (b) YESTERDAY T. C. MEET. T. SAY IX-1 MISS IX-2
‘Yesterday T. and C. met. T. said I miss you.’ | M to J |
| | |  |

Condition II: RS-NMMs

This condition was designed to study the effect on RS-NMMs. Thus half of the stimuli did not feature any RS-NMMs, as in examples (3 - 5), meaning that the body, eye gaze and the head of the signer were oriented neutrally, that is towards the actual addressee. The other half of the stimuli contained RS-NMMs, that is involved a head and body turn and the eye gaze directed away from the actual addressee, as in (6).

(6) (a) IX-1 LOVE CYCLING T to C
'I love cycling.'

(b) YESTERDAY T. C. MEET. T. $\frac{\text{RS-NMM}}{\text{SAY IX-1 LOVE CYCLING}^5}$ M to J
'Yesterday T. and C. met. T. said I love cycling.'

**Condition III: context**

Finally, all stimuli were presented with the original quote recorded from T. or without it. Unlike the previous conditions, this condition was not randomized. Thus, participants first saw all of the stimuli without a quote and then, in the second part of the experiment, the same target stimuli with a quote. The presentation order in both parts was randomized. The quotes were constructed in such a way that the pronouns in the target sentence would have to be interpreted as shifted for the report to be felicitous.

3 Results

The results of the experiment revealed an unexpectedly high level of variation across participants. This variation is, however, not random, but allows for identifying patterns of behavior consistent across three different groups of participants (Groups 1: 6 participants; Group 2: 3 participants; Group 3: 4 participants). In what follows, the results will be presented separately for these three different groups for the ease of readability. Note, however, that the grouping is based purely on a post-hoc visual examination of the results rather than on a formal cluster analysis. The grouping was made based on the results of Phase I, that is for the sentences involving a single pronoun. The results for individual participants for all conditions can be found on the project page on the OSF platform.

Another rather unexpected property observed in the results is that RS-NMMs appeared to impact the interpretation of IX-1 and IX-2 in different ways. Let us start from stimuli involving IX-1 illustrated in (3) above. The results of the interpretation task for IX-1 are plotted in Figure 3 averaged over Groups 1-3. Different colors illustrate the proportions of shifted, non-shifted and ambiguous interpretations of the 1st-person indexical, thus interpreted as referring to the reported signer T. (light green color), to the actual signer M. (dark cyan) or ambiguous between the two readings (violet), respectively. Different columns within one Group represent the values of the RS-NMM condition.

The results shown in Figure 3 reveal that the RS-NMMs did not have an effect on the interpretation of IX-1 for all participants.⁶ At the same time, there is a variation in how participants

5. The scope of the RS-NMMs was determined by the deaf research assistants enacting M. according to their own intuition. This also aligns with our observation in the corpus NGT (Crasborn and Zwitserlood 2008), where RS-NMMs, if present, commonly begin on the speech predicate and scope over the report.

6. The proportions of the ambiguous and non-shifted interpretations in Group 3 seem to suggest that the RS-NMMs do add ambiguity to the interpretation of IX-1. However, due to the small amount of data-points per Group, the significance of this effect is hard to assess.

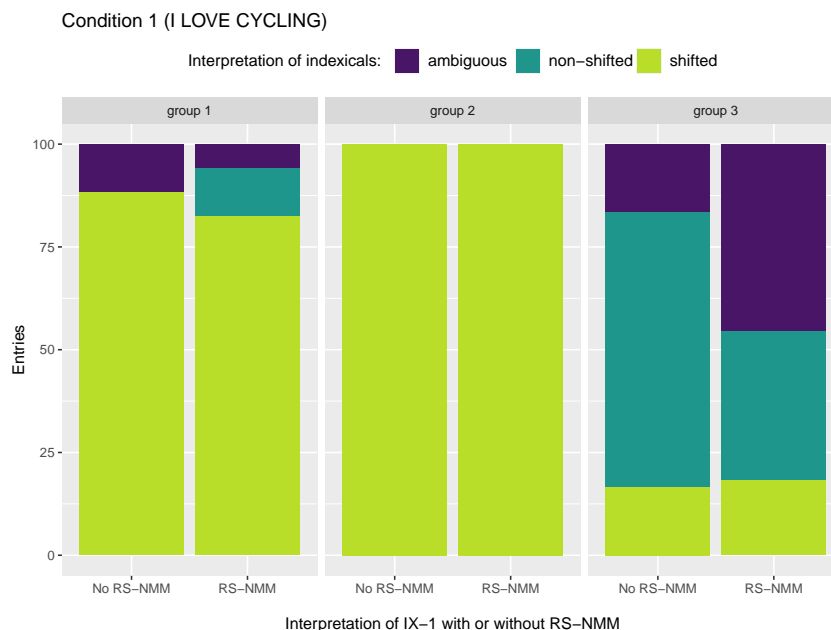


Figure 3: Interpretation task results for the stimuli with IX-1 grouped by different patterns of interpretation (Groups 1-3) and different values of RS-NMMs.

interpret IX-1. Specifically, participants from Groups 1 and 2 consistently interpret IX-1 as shifted, i.e., referring to the reported signer T. In contrast, participants from Group 3, on the contrary, interpret IX-1 as non-shifted, that is referring to the actual signer M., or as ambiguous between shifted and non-shifted interpretations.

Regarding IX-2, however, there is a notable influence of RS-NMMs on the interpretation for Groups 1 and 3. Consider the distribution of shifted (interpreted as reported addressee C.), non-shifted (interpreted as actual addressee J.), and ambiguous interpretations of IX-2, as illustrated in Figure 4.

Figure 4 reveals that Group 2 remained faithful to the shifted interpretation of indexicals, regardless of the presence of RS-NMMs. Conversely, Groups 1 and 3, in contrast with their preferences for IX-1 in Figure 3, displayed sensitivity to the RS-NMMs when interpreting signed reports containing IX-2. Specifically, if RS-NMMs were present, participants from Groups 1 and 3 tended to opt for a non-shifted interpretation of IX-2. Meanwhile, in the absence of RS-NMMs, these participants leaned towards a non-shifted or ambiguous interpretation. In sum, while RS-NMMs did not affect the interpretation of IX-1 for all participants (even though the interpretation itself appeared to be different across Groups), for IX-2, the presence of RS-NMMs seemed to enforce a shifted interpretation of IX-2 in the majority of the participants.

This difference in RS-NMMs sensitivity between IX-1 and IX-2 straightforwardly predicts that signers in Groups 1 and 3 may violate the Shift Together Constraint when both IX-1 and IX-2 are present in the sentence. The prediction is that these signers will be sensitive to the RS-NMMs when interpreting IX-2 but not IX-1. As illustrated in Figure 5, this prediction is borne out.

Figure 5a depicts the proportions of instances where the divergent interpretations of IX-1 and IX-2 within a single sentence lead to mixed readings of indexicals, allowing one indexical to be interpreted as shifted, while the other being interpreted as non-shifted. For Group 1, this would often entail a shifted interpretation of IX-1 alongside a non-shifted or ambiguous interpretation of IX-2 in sentences without role shift. For Group 3, this would involve a non-

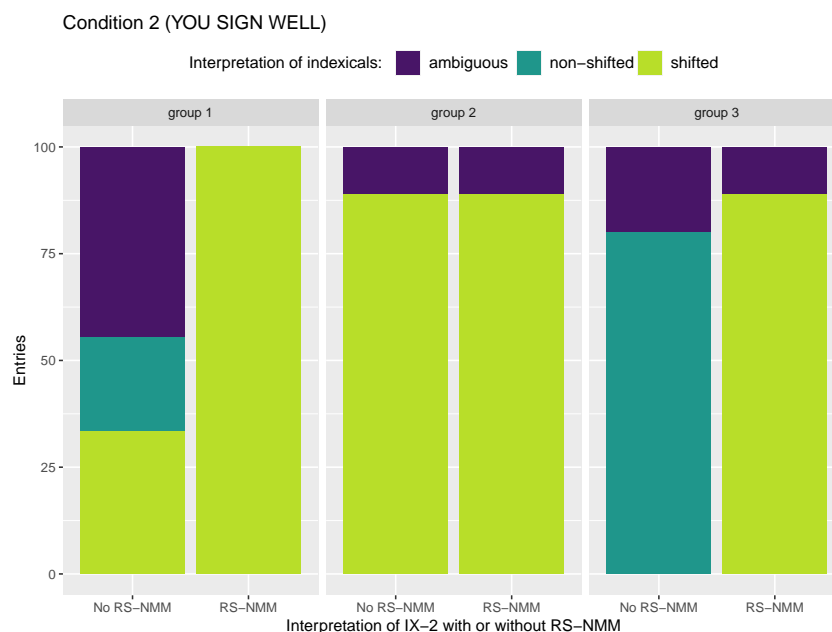


Figure 4: The results of the interpretation task for the stimuli involving IX-2 grouped by different patterns of interpretation (Groups) and different values of the RS-NMM condition.

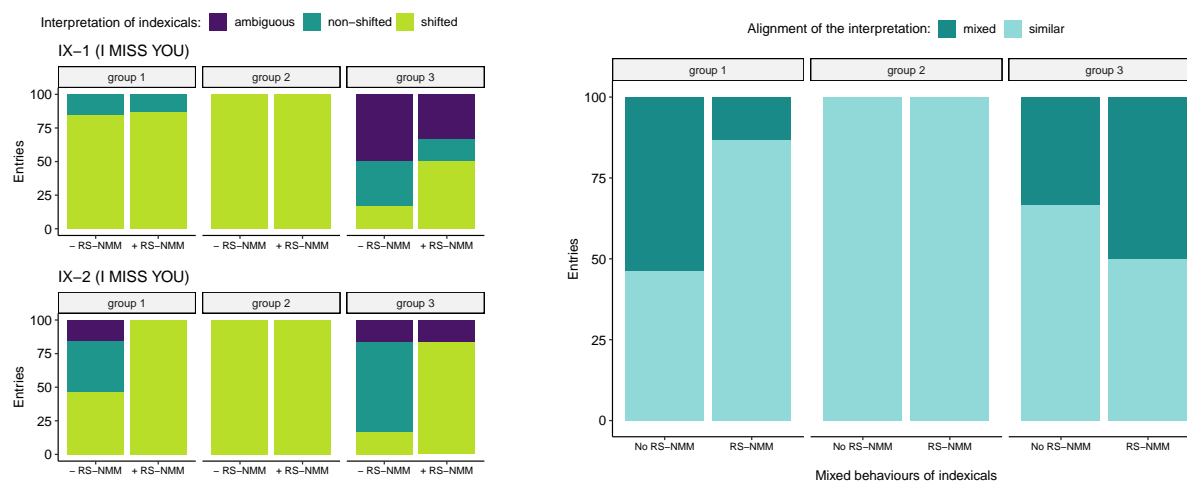
shifted or ambiguous interpretation of IX-1 combined with a shifted interpretation of IX-2 in sentences with role shift. As anticipated based on earlier findings, Group 2 consistently prefers a shifted interpretation, thereby preventing mixed readings from arising.

For the sake of space, we refrain from discussing the presence of context (in the form of the original quote), which, however, did not significantly influence the overall distribution of the interpretations of any of the indexicals within the report. It did, however, influence the felicity score, specifically in cases where the interpretation of the indexical(s) mismatched the content of the quote, which always favoured the shifted reading. See a more detailed results for this condition at the OSF repository.

Summing up the results, our experiment revealed a high degree of variation among NGT signers in terms of how they interpret 1st- and 2nd-person indexicals within the scope of RS-NMMs. This variation, however, is not random, allowing us to identify groups of participants sharing interpretive strategies: Groups 1, 2 and 3. Across all three groups, RS-NMMs did not affect the interpretation of IX-1: Groups 1 and 2 consistently interpreted IX-1 as shifted, whereas Group 3 oscillated between unshifted and ambiguous interpretations. In case of IX-2, RS-NMMs did impact the interpretation of the indexical in Groups 1 and 3, thereby revealing a deep asymmetry between the shifting behavior of IX-1 vs. IX-2, often leading to instances of mixed indexicality in sentences involving both indexicals.

4 Discussion

The asymmetry between the interpretive properties of IX-1 and IX-2 poses a particular challenge to the theory. For the majority of participants, IX-2 displays sensitivity to RS-NMMs exactly in the way predicted by the context-shifting operator analysis outlined above: the RS-NMMs trigger the shifted interpretation of the indexical. This is, however, not the case for IX-1, which stays immune to the effects of the RS-NMMs, something that cannot be straightforwardly accounted for by the standard analysis.



(a) Interpretation task results for sentences involving IX-1 + IX-2.

(b) Proportions of mixed indexicality (one indexical is shifted, one is not).

Figure 5: The results for the interpretation of the stimuli involving IX-1 and IX-2.

The behavior of IX-1 is particularly striking in light of the shifting hierarchy of indexicals developed in Deal (2020), which predicts that a language would not allow 2nd-person shifting without also allowing 1st-person shifting. According to Deal (2020), shifty languages make use of either person-shifting operators, or author-shifting operators, but there is no evidence of a language making use of an 2nd-person-only shifting operator. This asymmetry between IX-1 and IX-2, vividly manifested in mixed indexicality illustrated above, speaks in favor of a discrepancy inherent to the lexical specifications of IX-1 and IX-2, but not to the nature of RS-NMMs itself. A way to accommodate this, while maintaining a refined version of an operator approach for IX-2, is to suggest that IX-1 is not an indexical in the the same sense that IX-2 but rather shares lexical properties with logophoric elements found in spoken languages.

4.1 IX-1 as logophor

Logophors are standardly defined as pronouns referring to the person whose words, thoughts, knowledge, or emotions are being reported (Culy 1994). Canonical logophoric languages like Ewe possess dedicated logophoric forms distinctive from other pronominal elements in the language. However, in some languages, a link between logophoricity and 1st-person can be traced despite logophors not carrying 1st-person features under standard assumptions. For instance, in Donno Sɔ (Niger-Congo; Mali), subject logophors license 1st-person agreement on the embedded predicate. In yet another language, Aqusha Dargwa (Nakh-Daghestanian; Daghestan, Northern Caucasus), 1st-person subject agreement in complex clauses involving reports can cross-reference a 3rd-person logophoric subject, and hence act as a logophoric marker, in spite of not having distinct logophoric markers in its pronominal inventory (Ganenkov 2021). The hypothesis that IX-1 could realize a logophoric pronoun in SLs has been discussed for American SL (Lillo-Martin 1995) and Swedish SL (Nilsson 2004).

Based on the available cross-linguistic and cross-modal evidence, Blunier (2023) proposes a unified analysis of both indexical-shifting and logophoric systems based on the idea that logophoric pronouns are essentially 1st-person element that lack an ACTUAL feature, allowing them to remain underspecified with respect to the context in which they are interpreted (cp. Schlenker 2003). Pronouns are conceived as variables augmented with mor-

phosemantic person features, semantically interpreted as presuppositions, cf. Cooper 1983; standard indexicals are complex elements composed of a person feature and an ACTUAL feature, enforcing reference to the utterance context:

- (7) (a) $\llbracket \text{ACTUAL} \rrbracket^{g,c,i} = \lambda x : x \sqsubseteq s(c) \vee a(c).x$
 (b) $\llbracket \text{AUTHOR} \rrbracket^{g,c,i} = \lambda x : s(c) \sqsubseteq x \vee s(i) \sqsubseteq x.x$
 (c) $\llbracket \text{PARTICIPANT} \rrbracket^{g,c,i} = \lambda x : s(c) \sqsubseteq x \vee a(c) \sqsubseteq x \vee s(i) \sqsubseteq x \vee a(i) \sqsubseteq x.x$

The ACTUAL feature ensures that the referent of the variable is included or equals a participant coordinate (author or addressee) of the actual context (or utterance context). ACTUAL and AUTHOR can be distributed over distinct pronominal forms (e.g. in languages with dedicated logophoric pronouns like Ewe) or they can be syncretic, i.e., the 1st person being specified with an AUTHOR feature only, allowing the pronoun to be interpreted as the speaker/author of either index and context. This is the case of Aqusha Dargwa and other ‘shifty’ languages, including, as we argue, NGT. The feature systems are schematized in Table 1.

Table 1: Person feature systems for three types of languages.

Logophoric languages (Ewe)	Unshifty languages (English)	NGT
1: [AUTHOR, ACTUAL]	1: [AUTHOR, ACTUAL]	1: [AUTHOR]
LOG: [AUTHOR]	2: [PART, ACTUAL]	2: [PART, ACTUAL]
2: [PARTICIPANT]	3: []	3: []
3: []		

With respect to NGT, the behavior of IX-1 in signed report could be given a similar semantics as the 1st person in indexical-shifting languages such as Aqusha Dargwa. Namely, a variable presuppositionally restricted with AUTHOR compatible with both the author of the actual context (the actual signer) and the author of the reported context (the reported signer), hence being ambiguous between a genuine indexical and a logophor. This ambiguity is straightforwardly reflected by the form of IX-1, which is realized as a pointing gesture towards the chest of the signer. Under RS-NMMs, the sign stays anchored to the body of the signer, unlike 2nd-person pronominal pointing, which inevitably departs from the actual addressee as a direct consequence of body, head and gaze movement within RS-NMMs. We are now in a position to properly assess the context-shifting operator analysis. As the behavior of IX-2 across participants shows, the context-shifting operator analysis makes a correct prediction for this element: whenever RS-NMMs take scope over IX-2, the addressee parameter is shifted towards the reported addressee. However, this is not quite so for the 1st person: IX-1 is insensitive to RS - a fact that is essentially unproblematic in the case of Group 1 in light of the logophoric analysis of IX-1 but is problematic for Group 3, where signers assign an indexical meaning to the 1st person, while systematically shifting the 2nd person. As mentioned before, this fact challenges the hierarchy of operators proposed by Deal (2020) and outlined in (8a-c). The hierarchy predicts (8d) not to be attested, meaning that there should be no single $\llbracket \alpha \rrbracket^{g,c,i}$ that could only shift the *addressee* context parameter, while leaving the *author* parameter untouched. Yet, in order to account for the NGT data, it seems that we need to allow such an operator to be active in NGT.

- (8) (a) $\llbracket \alpha \rrbracket^{g,c,i} = \llbracket \alpha \rrbracket^{g,i,i}$ (attested in Matses)

- (b) $\llbracket \overset{\text{smiley}}{\text{pers}} \alpha \rrbracket^{g,c,i} = \llbracket \alpha \rrbracket^{g, \langle \mathbf{s}(\mathbf{i}), \mathbf{a}(\mathbf{i}), l(c), t(c) \rangle, i}$ (attested in Uyghur)
- (c) $\llbracket \overset{\text{smiley}}{\text{auth}} \alpha \rrbracket^{g,c,i} = \llbracket \alpha \rrbracket^{g, \langle \mathbf{s}(\mathbf{i}), a(c), l(c), t(c) \rangle, i}$ (attested in Slave)
- (d) $\llbracket \overset{\text{smiley}}{\text{add}} \alpha \rrbracket^{g,c,i} = \llbracket \alpha \rrbracket^{g, \langle s(c), \mathbf{a}(\mathbf{i}), l(c), t(c) \rangle, i}$ (attested in NGT)

4.2 Competition between forms

A logophoric analysis of IX-1 explains why IX-1 is immune to the effects of RS-NMMs; its inherent morphosemantic ambiguity also explains the interpretive variation observed within our groups, with some signers using it mostly to refer to the reported signer (Groups 1 and 2), while others (Group 3) using it to refer to the actual signer. However, the motivations behind this variation is still to be explained: why would signer use different referring strategies to begin with? We informally asked our participants from Group 3 after the experiment how they would produce a sentence with a report reading, namely ‘T._i said T._i loves cycling’. Participants replied that they would use a null pronoun \emptyset or the anaphoric form SELF to refer to the attitude holder instead of IX-1 as in the stimuli. Similarly, we asked participants from Group 1 about how they would produce an indexical meaning, where T. is telling about M.’s passion for cycling. The reply was that a proper name (a sign name or a fingerspelling) is to be used to refer to the actual speaker.

A way to make sense of these referring heuristics is to suggest a competition between referential forms, similar to one suggested by Ahn (2019) in her analysis of anaphoric expressions in ASL. The central idea is that, within a given language, available anaphoric forms compete for reference due to economy principles (such as Grice’s (1975) maxim of brevity or the efficiency principle of Meyer (2013)), enforcing speakers to select the most appropriate (defined here in terms of both structural economy and informativity) element that can unambiguously circle out the intended referent compatible with the features of the NP it co-refers with. Roughly, if ψ and ϕ are anaphoric elements and ψ is part of the set of ‘stronger’ alternatives to ϕ , the use of ϕ will trigger the inference that the referent of ψ is disjoint in reference with the co-referring NP. We suggest that in NGT, null forms and SELF may compete with IX-1 for reference to an attitude holder in the context of reported utterances:

- (9) $\emptyset < \text{SELF} < \text{IX-1} < \text{NAME/N-A-M-E}$

Given informativity and complexity constraints, elements on the left should be preferred over elements further right. Signers from Group 3 may therefore have judged IX-1 alongside their formal alternatives (Katzir 2007), i.e., their null- and SELF-counterparts, in order to unambiguously refer to the attitude holder. Similarly, participants from Group 1 may have adopted the same strategy, preferring to use the more complex expressions NAME/N-A-M-E in order to unambiguously refer to the actual speaker.

5 Conclusion

Our study revealed a deep asymmetry between the shifting behavior (sensitivity to RS-NMMs) of the 1st- and 2nd-person pronouns IX-1 and IX-2 in NGT. While IX-2 received a shifted interpretation strictly under RS-NMMs as context shift-operator analysis would predict, the interpretation of IX-1 appeared to be insensitive to RS-NMMs. This discrepancy can be explained by assuming IX-1 to be inherently ambiguous in NGT due to its featural makeup, similar to that of a logophor. To resolve this ambiguity, NGT signers resort to different strategies in order to achieve anaphoric reference.

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