Super Monsters I:

Action and Attitude Role Shift in Sign Language*

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Preliminary Draft, April 18, 2014

This is Part I of a two-part paper on context-shifting operations in sign language. The abstracts of Part I and Part II are both enclosed below.

Super Monsters I: Action and Attitude Role Shift in Sign Language

Abstract. In sign language 'Role Shift', the signer can adopt another person's perspective to report a propositional attitude ('Attitude Role Shift') or an action ('Action Role Shift', often called 'Constructed Action'); this is overtly marked by various means, such as a rotation of the signer's body and/or eyegaze shift. This operation can be analyzed as an overt instantiation of the 'monstrous' mechanism of 'context shift' postulated for attitude reports in some spoken languages (Schlenker 2003, Anand and Nevins 2004, Anand 2006, Quer 2005). For Attitude Role Shift, we argue that this analysis brings new light to the typology of context-shifting operations: while some sign languages make it possible to 'mix perspectives' under Role Shift (Quer 2005), we argue that ASL and LSF obey the constraint that indexicals should 'shift together' (Anand 2006). Still, in ASL and LSF, data from Attitude Role Shift alone cannot fully exclude an alternative analysis based on quotation without context shift. By contrast, Action Role Shift, which has no known counterpart in spoken language, is not amenable to a quotational analysis because it is used to describe actions that don't involve any speech- or thought-acts; in that respect, the context-shifting operations we find in sign language are 'super monsters' that can shift the context outside of attitude reports. We develop a context-shifting analysis that applies both to Attitude and to Action Role Shift. (Shortcomings of this analysis are discussed in Part II, which extends the theory with an 'iconic component' that addresses them.)

Super Monsters II: Role Shift, Iconicity and Quotation in Sign Language

Abstract. While sign language 'Role Shift' can be analyzed as an overt instance of context shift, we argue that it has two broad properties that require a special treatment. First, Role Shift used to report attitudes ('Attitude Role Shift') has a quotational component which does not follow from a simple context-shifting analysis. Second, Role Shift used to report other actions ('Action Role Shift') has a strong iconic component: properties of signs that can be assigned to the reported situation (e.g. a happy face) must be so interpreted. We argue that both varieties of Role Shift should be analyzed as context shift, but with an important addition: the expressions that appear under Role Shift should be interpreted *maximally iconically*, i.e. so as to maximize the possibilities of projection between the signs used and the situation they make reference to (Role Shift is thus a 'super monster' not just in that it can shift the context outside of attitude reports, as was argued in Parit I, but also in that it has an iconic and thus hyperintensional component). This accounts both for the quotational character of Attitude Role Shift (in this case, maximal iconicity reduces to quotation), and for the fact that Action Role Shift has a strong iconic component. Finally, this analysis vindicates the view that some expressions may be simultaneously used and mentioned/demonstrated, as argued for instance in Recanati 2001.

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*[Full Acknowledgments to be added later]
ASL consultant for this article: Jonathan Lamberton. Special thanks to Jonathan Lamberton, who has provided exceptionally fine-grained data throughout this research; his contribution as a consultant has been considerable.
LSF consultant for this article: Ludovic Ducasse. Special thanks also to Ludovic Ducasse, who has provided very detailed judgments on complex sentences throughout this research.
Thanks to Kate Davidson and to audiences at NYU for helpful suggestions. The research leading to these results received funding from the European Research Council under the European Union's Seventh Framework Programme (FP/2007-2013) / ERC Grant Agreement N°324115–FRONTSEM (PI: Schlenker). Research was conducted at Institut d'Etudes Cognitives (ENS), which is supported by grants ANR-10-IDEX-0001-02 PSL* and ANR-10-LABX-0087 IEC.The research reported in this piece also contributes to the COST Action IS1006.

1 Introduction

1.1 Role Shift

Two strands of research on context-dependency have come together in recent years. In the semantics of spoken languages, considerable attention has been devoted to the phenomenon of *context shift*. The chief motivation lied in the behavior of indexicals. While these were traditionally thought to depend rigidly on the context of the actual speech act, it turned out that there are languages and constructions in which this is not so: some attitude operators appear to be able to 'shift the context of evaluation' of some or all indexicals (e.g. Schlenker 1999, 2003, 2011c, Anand and Nevins 2004, Anand 2006). In research on sign languages, there has been a long-standing interest in Role Shift, an overt operation (often marked by body shift and/or eyegaze shift) by which the signer signals that he adopts the perspective of another individual. Role Shift comes in two varieties: it may be used to report an individual's *speech or thought* – henceforth 'Attitude Role Shift'. Or it may be used to report in a particularly vivid way an individual's *actions* (henceforth 'Action Role Shift'; a more traditional term in sign language research is 'Constructed Action'). Attitude Role Shift has sometimes been analyzed as an overt instance of context shift because some or all indexicals that appear in that environment acquire a shifted interpretation (Quer 2005). On the basis of data from American and French Sign Language (ASL and LSF), we argue that this analysis brings new light to the typology of context-shifting operations: while some sign languages make it possible to 'mix perspectives' under Role Shift (Quer 2005, Herrmann and Steinbach 2012), we suggest that ASL and LSF obey Anand and Nevins's constraint that indexicals 'shift together'. Still, in ASL and LSF data from Attitude Role Shift alone cannot fully exclude an alternative analysis based on quotation without context shift (Maier, to appear). By contrast, Action Role Shift, which has no known counterpart in spoken language, is not amenable to a quotational analysis because it is used to describe actions that don't involve any speech- or thought-acts; in that respect, the context-shifting operations we find in sign language are 'super monsters' that can shift the context outside of attitude reports. We develop a context-shifting analysis that applies both to Attitude and to Action Role Shift. (Shortcomings of this analysis are discussed in Part II, which extends the theory with an 'iconic component' that addresses them. In Part II, we will thus see that Role Shift is a 'super monster' not just in that it can shift the context outside of attitude reports, but also in that it has an iconic and thus hyperintensional component.)

1.2 Elicitation Methods

In ASL and LSF alike, our elicitation method involved three steps.
(i) First, we elicited sentences of interest with a deaf native signer (Deaf child of Deaf, signing parents). Our emphasis was on the construction of controlled paradigms, usually of two to four sentences. All examples were videotaped.
(ii) Second, we showed the resulting videos to the same signer, asking him to rate the sentences on a 7-point scale.
(iii) Step (ii) was usually repeated several times, often on separate days, in order to assess the stability of our informant's judgments. Unless otherwise noted, ASL data are based on repeated judgments by a single Deaf signer (Deaf child of Deaf, signing parents), and similarly for LSF (the informant is also the Deaf child of Deaf, signig parents). Acceptability ratings were on a 7-point scale, with 7 = best and 1 = worst; all the ratings for sentences that didn't appear in earlier publications are found in Appendix V. Inferential judgments were often used as well, and were tailored to the sentences at hand.

One important note is in order about translations: part of the debate about Role Shift is whether it involves some variety of quotation. While we will argue that a quotational analysis has some flaws, we will still use translations involving quotation when this makes it easier to understand the behavior of some elements, such as shifted indexicals (when a translation with quotation is too

convoluted – as in the case of *wh*-extraction out of role-shifted clauses – we'll use translations with indirect discourse instead). No theoretical decision should be read into our translations.[1]

In the following, sign language sentences are glossed in capital letters (*-rep* indicates that a sign is repeated). Non-manual markings are omitted, except for Role Shift, which usually involves at least body shift and eyegaze shift (and possibly other non-manuals as well); it is notated by adding RS_a_____ above the role-shifted elements, where *a* is the perspectival origin of the Role Shift. Subscripts correspond to the establishment of locations ('loci') in signing space. Letters are assigned from right to left from the signer's perspective. Pronouns, glossed as *IX* (for 'index'), can point back towards previously established loci. In such cases, the locus is suffixed to the pronoun, so that *IX-a* is a pronoun that points towards (or 'indexes') locus *a*; the numbers *1* and *2* correspond to the position of the signer and addressee respectively (importantly, indexes can also be used to *establish* a locus). *IX-arc-a* refers to a plural pronoun indexing locus *a,* and *rep* is used when a sign is repeated. An expression which is signed in locus *a* is signed with *a* as a subscript; this is in particular the case of classifiers, e.g. CL_a stands for a classifier signed in locus *a*. *CL* is also suffixed at the end of the glosses for classifier verbs; thus *1-WALK-WITH-ENERGY(CL-ONE)* indicates that this ASL verb involves the index finger classifier, and *SHOW-CL* refers to an LSF classifier verb.

2 Attitude Role Shift I: Catalan and German Sign Language

As summarized in Quer, to appear a, Role Shift across sign languages is morphosyntactically characterized by non-manual markers such as the following: (i) 'temporary interruption of eye contact with the actual interlocutor and direction change of eye gaze towards the reported interlocutor'; (ii) 'slight shift of the upper body in the direction of the locus associated with the author of the reported utterance'; (iii) 'change in head position'; (iv) 'facial expression associated to the reported agent.' What semantics should be associated with these formal properties? In this section, we discuss the prospects of a theory in which Role Shift is an overt realization of context shift.[2]

Following much of the literature, we start with Attitude Role Shift, and argue (along with Quer 2005) that it can be taken to be an overt instantiation of context shift. The latter operation was postulated for a variety of constructions across languages in which a clause under an attitude verb could be shown not to involve standard direct quotation, and yet to allow some indexicals to be evaluated with respect to the context of the *reported* speech act (Schlenker 1999, 2003, 2011c; Anand and Nevins 2004, Anand 2006). Notably, Quer 2005 argued that in Catalan Sign Language (LSC) Attitude Role Shift is an overt realization of context shift. For such an argument to be cogent, however, two conditions are needed. First, it must be shown that at least some indexicals can be

[1] It must be added, however, that in Part II of the present study we will see that Attitude Role Shift genuinely has a quotational component.

[2] Because we are not certain that all four properties listed by Quer target the very same phenomenon, we will in our own data concentrate on instances of role shift that at least include body shift and eyegaze shift. But this does not entail that body shift is the most common way to realize role shift as standardly construed; Quer, to appear argues on the basis of Catalan sign language and German sign language data that this is in fact a relatively infrequent strategy. Thus Quer (to appear a) writes:
"In a small corpus study, Herrmann & Steinbach (2009, 2010) established for German Sign Language (DGS) that the only required articulation to mark role shift is eye gaze break, which seems sufficient to identify a discourse segment as role shift from a formal point of view. This is confirmed by signers' intuitions for LSC. The fact is that, even though marking by the whole array of non-manuals can be very obvious, sometimes it is extremely subtle, especially when only one marker is found."
Hermann and Steinbach 2012 write about their German Sign Language data:
"Out of 171 role shifts found in the data, 168 (98%) are marked by facial expressions, 147 (86%) show an eye gaze change towards the addressee of the reported situation. In 131 (77%) of the cases, we observe head movement towards the addressee of the reported utterance. Surprisingly, only 82 (48%) of the role shifts involve a kind of body lean."
They propose an implicational hierarchy as in (i), where Role Shift is taken to involve all the elements in (i)a, or just those of in (i)b, or the single element in (i)c.

(i) a. eye gaze + head position + body lean
b. eye gaze + head position
c. eye gaze

evaluated with respect to a shifted context under Role Shift. Second, an alternative analysis should be excluded in which the role-shifted clause is simply quoted – for quoted clauses are mentioned rather than used, which obviates the need to *evaluate* their content relative to a shifted context. (At this point, we assume that quotation must target an entire clause, and come back below to the possibility of a theory with 'partial quotation', as argued in Maier, to appear.) Quer (2005, to appear) answers both questions in a particularly straightforward fashion. First, some indexicals in Attitude Role Shift in LSC have a shifted interpretation, i.e. are intuitively evaluated with respect to the context of the reported speech act. Second, it is not the case that the entire role-shifted clause is quoted. This is because *other* indexicals can be evaluted with respect to the context of the actual speech act. This pattern is illustrated in (1), where the first person pronoun *IX-1* is evaluated with respect to the reported context (and thus refers to Joan), while *HERE* is evaluated with respect to the actual context.

(1) Catalan Sign Language (Quer 2005, to appear)

_____t _____RS-i
IXa MADRID$_m$ MOMENT JOAN$_i$ THINK IX-1$_i$ STUDY FINISH HERE$_b$
'When he was in Madrid, Joan thought he would finish his study here (in Barcelona).'

As emphasized by Quer, to appear, it is also possible to understand *HERE* as being shifted, as in (2); but the 'mixing of perspectives' found in (1) is particularly important in order to argue that there is context shift rather than standard quotation.

(2) Catalan Sign Language (Quer, to appear)

_____t _____RS-i
IXa MADRID JOAN$_i$ THINK IX-1$_i$ STUDY FINISH HERE MADRID
'When he was in Madrid, John thought he would finish his studies there in Madrid.'

In the end, Quer, to appear a suggests on the basis of syntactic evidence that Attitude Role Shift in Catalan Sign Language can involve *bona fide* quotation in addition to indirect discourse with some shifted indexicals. For present purposes, we are only concerned with cases that can be shown not to involve standard quotation.[3]

The same logic applies to data unearthed in German Sign Language (DGS) by Herrmann and Steinbach 2012. As they write, "temporal and local indexicals such as *TOMORROW* (...) need not be interpreted in the shifted context but can also be interpreted in the actual context", as is the case in (3) (we have kept their notation, whereby *3a<____>3b* indicates that the role-shifted clause is signed from the perspective of locus *a* and towards locus *b*, where both are third person loci).

(3)

3a< >3b
YESTERDAY PETER IX$_{3a}$ SAY: TOMORROW IX$_1$ ARRIVE (DGS)
'Yesterday Peter said that he will arrive tomorrow.'

In this case, *IX-1* is evaluated with respect to the reported context and gets a shifted interpretation, whereas *TOMORROW* can be interpreted with respect to the actual context. This 'mixing of perspectives' shows that we are not dealing with standard quotation.[4]

3 Attitude Role Shift II: American Sign Language (ASL)

In our ASL data, Quer's argument from 'mixing of perspectives' isn't applicable, because we haven't found any instances of Role Shift in which indexicals *fail* to be evaluated with respect to the shifted

[3] Quer, to appear a writes that "direct quotes in LSC can be preposed (topicalized)" in sentences that include a marker of direct discourse which is literally *SENTENCE SAME*. By contrast, "ungrammaticality results if we try to do the same with a role shift segment which is interpreted as indirect discourse".

[4] Herrmann and Steinbach 2012 note that note that "similar examples can also be found in reported speech in spoken languages like Slave (Northern Athapaskan, a language spoken in the Northwest of Canada), where first and second person indexicals in the complement clauses of verbs like 'to say' need not be interpreted in the context of the actual utterance but can be bound by the context of the reported utterance (for discussions and examples cf. Herrmann and Steinbach 2007; Quer 2005, 2011; Rice 1986; Schlenker 2003; Zucchi 2004)."

context (the consequences of this observation for the typology of context-shifting operations will be discussed below). Still, standard tests can in principle be used to distinguish indirect discourse from standard (i.e. full clause) quotation; we return below to the possibility that our cases involve partial quotation. As we will see, they yield a rather complex picture, parts of which are compatible with a quotational analysis. The analysis of Action Role Shift will in the end be rather crucial to argue for a context-shifting theory.

3.1 Extraction tests and NPI tests[5]

In English, quotations are typically thought to involve clauses that are *not* integrated to the rest of their environment because no grammatical dependencies can 'cross quotation marks', as is illustrated in (4) and (5).

(4) a. What did John say he understands _?
b. *What did John say 'I understand _'?
c. John said: 'I understand chemistry'.

(5) a. John didn't say he understands any chemistry.
b. *John didn't say 'I understand any chemistry'.
c. John didn't say: 'I understand chemistry'.

In (4)a, a dependency exists between the 'gap' after the embedded verb, which represents a missing object, and the interrogative word at the beginning of the sentence; but this dependency is impossible in (4)b, which involves a quotation (there is an irrelevant reading if the quotation marked are dropped, on which *I* refers to the actual speaker rather than to John; this reading could equally be obtained with the sentence *What did John say that I understand?*). In (5)a, there is a dependency between the negative polarity item *any* and the matrix negation (as is shown by the fact that the sentence becomes odd when the matrix negation is dropped: **John claimed that he understands any chemistry*). In (5)b, this dependency is made impossible by the quotation marks. One way to make sense of these facts is to posit that quoted material is mentioned/shown rather than used, and that for this reason it fails to be grammatically integrated to its broader environment.

3.2 Extraction tests in ASL: main data

Focusing for the moment on the extraction tests, it would appear that some ASL informants treats role-shifted clauses as being integrated to their syntactic environment. In (6), one of our early examples pertaining to this topic, we provide two informants' judgments on sentences involving both *wh*-extraction and embedded indexicals;[6] the extraction strategy used involves a clause-initial *wh*-word, doubled clause-finally by the same word (there are other extraction strategies, but this one is clear and well-accepted). As is standard (though not obligatory) in ASL, the extraction strategy involves a reduplicated *wh*-word, which appears both in sentence-initial and in sentence-final position. The result is still acceptable – and *HERE* is evaluated with respect to the context of the reported speech act (the same applies to *IX-1*, though this was not the main point of this initial test; we come back to this point below).

(6) *Context:* the speaker is in NYC

	RS_a_____	
7 IN LA WHO IX-a $JOHN_a$ SAY	IX-1 WILL MEET HERE	WHO

Informant JL (on a video on which he signed the sentence [ASL, 6, 316]): 7, *HERE* = LA
Informant 2 (on a video on which he signed the sentence with *IX-b* replacing *IN* [ASL, 6, 293]): 7, *HERE* = preferably LA [6, 294-295].[7]
'In LA, who did John say he would meet there [in LA]?'

[5] This section follows a similar development in Schlenker 2011c.
[6] JL is our main ASL informant. The other informant is deaf and started using ASL from birth with two older siblings who had already acquired it from Deaf school by the time he was born.
[7] Informant 2 gave *HERE* = LA with a rating of 5/7; *HERE* = NYC with a rating of 2.5/7.

These examples have one potential drawback: *MEET* is an 'agreement verb', i.e. a type of verb that was shown in Lillo-Martin 1991 to license null pronominal arguments.[8] Thus one could potentially try to re-analyze these data as involving a direct discourse with a null pronoun, yielding a result somewhat similar to: *In LA, who is the person about whom John said: 'I will meet him here'?*[9]

To control for this possibility, we obtained repeated judgments from our main informant on (7) -(8), which involve *wh*-extraction out of the construction *LIVE WITH*, which is a non-agreeing construction. The result is about as good with Role Shift as without it. Furthermore, it can be checked that without an overt complement argument, *LIVE WITH* is deviant, as in (9); and it remains degraded even when there is a salient (but unexpressed) antecedent, as in (9). This makes it very unlikely that (7) could involve standard direct discourse.

(7) *Context:* The speaker is in NYC; the listener was recently in LA with John.

BEFORE IX-a JOHN IN LA [= while in LA], c.
RS_____
6.7 WHO IX-a SAY IX-1 WILL LIVE WITH HERE WHO

'While John was in LA, who did he say he would live with there?' (ASL, 14, 91)

(8) *Context:* The speaker is in NYC; the listener was recently in LA with John.

BEFORE IX-a JOHN IN LA [= while in LA],
7 WHO IX-a SAY IX-a WILL LIVE WITH THERE WHO
'While John was in LA, who did he say he would live with there?' (ASL, 14, 93)

(9) a. 5[10] IX-1 WILL MEET HERE.
b. 2 IX-1 WILL LIVE WITH HERE.
(ASL,14, 95)

(10) a. 6 IX-1 HAVE MEETING WITH $BILL_a$. IX-1 WILL MEET[11] HERE.
b. 7 IX-1 HAVE MEETING WITH $BILL_a$. IX-1 WILL MEET IX-a HERE.
c. 3 IX-1 HAVE MEETING WITH $BILL_a$. IX-1 WILL LIVE WITH HERE.
d. 7 IX-1 HAVE MEETING WITH $BILL_a$. IX-1 WILL LIVE WITH IX-a HERE.
(ASL, 17, 96)

3.3 Extraction tests in ASL: further controls

One might want to perform further controls to alleviate potential worries. First, can we show that *wh*-extraction is not syntactically unconstrained? The paradigm in (11) includes examples in which the role-shifted clause could be the argument of the main verb (= (11)a, d), and cases in which it couldn't be because the object position is filled by *SOMETHING IMPORTANT* or by *WHAT* (= (11)b). When wh-extraction is applied, as in (11), it appears to be blocked if the object argument of *SAY* is already occupied.[12] The contrast between (11)b and (11)a, d suggests that the constraint is structural:

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[8] We do not include loci in the gloss of *MEET* in (6) because it was signed in the 'neutral form' appropriate under Role Shift.

[9] Thanks to Kate Davidson for mentioning this possibility.

[10] As shown in Appendix IV, in 1 our of 3 trials our informant gave two possible ratings depending on whether an appropriate context was included. We computed the average using his rating *without* a context, since we tested independently how an appropriate context could ameliorate the sentence.

[11] In this paradigm, a non-agreeing form of *MEET* was used.

[12] We also have a test in whichi the object position of *SAY* was filled with *WHAT* instead of being filled with *SOMETHING IMPORTANT*. The resulting sentences with *wh*-extraction might be a bit better than those with

extraction out of the propositional object of the verb is permissible in (11)a, d, whereas extraction out of a non-integrated clause is degraded in (11)b. Unsurprisingly, semantic questions show that in all cases *IX-a* refers to John while *HERE* refers to LA. Still, these data must be interpreted with caution, since the contrasts are a bit more subtle than one might expect.

(11) *Context:* The speaker is in NYC; the listener was recently in LA with John, and the speaker saw videos of the trip...

WHILE THE-TWO-a,b IN LA,
'While the two of them [= including John][13] were in LA,

a. RS_____
7 IX-a JOHN SAY: IX-1 WILL LIVE WITH MARY HERE.
John said: 'I will live with Mary here.'.'

b. RS_____
7 IX-a JOHN SAY SOMETHING IMPORTANT: IX-1 WILL LIVE WITH MARY HERE.
John said something important: 'I will live with Mary here.'.'

c. RS_____
7 IX-a JOHN SAY REPEATEDLY: IX-1 WILL LIVE WITH MARY HERE.
John said repeatedly 'I will live with Mary here.'.'
(ASL, 19, 25)

(12) *Context:* The speaker is in NYC; the listener was recently in LA with John, and the speaker saw videos of the trip...

WHILE THE-TWO-a,b IN LA,
'While the two of them [= including John][14] were in LA,

a. RS_____
7 WHO IX-a JOHN SAY IX-1 WILL LIVE WITH HERE WHO?
who did John say he would live with there?'

b. RS_____
4 WHO IX-a JOHN SAY SOMETHING IMPORTANT IX-1 WILL LIVE WITH HERE WHO?

c. RS_____
6 WHO IX-a JOHN SAY REPEATEDLY IX-1 WILL LIVE WITH HERE WHO?
'who did John repeatedly say that he would live with there?'
(ASL, 19, 27)

Importantly, these data do not suffice to show that the deviant sentences are quotational, for the same readings are definitely available with non-quotational third person statements, as seen in (13). All they establish is that when a reported clause is not syntactically integrated because the object position of the attitude verb is already filled, *wh*-extraction is blocked, which suggests that the latter operation isn't unconstrained and requires, among others, syntactic integration.

(13) *Context:* The speaker is in NYC; the listener was recently in LA with John, and the speaker saw videos of the trip...

SOMETHING IMPORTANT, but since the syntactic analysis of the question-answer construction in ASL is not uncontroversial (Caponigro and Davidson 2011), we leave it out of the present study.

[13] We had intended the sentence to mean 'While John and you were in LA...', but on watching the video our informant notes that the second person locus does not appear to be indexed here.

[14] The same remark holds as in fn. 13.

6.7 WHILE THE-TWO-a,b IN LA, IX-a JOHN SAY SOMETHING IMPORTANT IX-a WILL LIVE WITH MARY THERE.
'While the two of them [= including John][15] were in LA, John said something important – namely that he would live with Mary there.' (ASL, 19, 31)

3.4 De Se Readings

While *IX-1* and *HERE* are usually taken to be indexical rather than anaphoric expressions, it is worth checking that the readings we obtained are those expected of shifted indexicals.[16] Given standard treatments (e.g. Schlenker 2003, 2011c; Anand 2006), we expect a shifted indexical under an attitude operator to yield a De Se reading; this is indeed what we find (though our informant initially revised his judgments, as shown in the raw data in Appendix IV). We asked our informant to assess the sentences in (14)a (no Role Shift) and (14)b (Role Shift) in a De Se scenario (= (15)) and in a non-De Se scenario (= (16)). Both sentences were acceptable and true in the De Se scenario, but in the non-De Se scenario the report with Role Shift was dispreferred, as is expected if the shifted first person pronoun *IX-1* only has a De Se reading.

(14) a. IX-a JOHN THINK IX-a SIGN GOOD
'John thinks that he signs well.'
b. RS_____
IX-a JOHN THINK IX-1SIGN GOOD.
'John thinks that he signs well. / John thinks: 'I sign well'.'
(ASL, 19, 133)

(15) Scenario A
We showed John lots of videos of people's hands signing – including videos of John signing. When we show him the video of his hands, John recognizes himself, and says: 'I sign well'
a. Judgments on (14)a: 7, true
b. Judgments on (14)b: 7, true

(16) Scenario B
We showed John lots of videos of people's hands signing – including videos of John signing. When we show him the video of his hands, John doesn't recognize himself, and says: 'He signs well'
a. Judgments on (14)a: 6, yes [but see Appendix IV]
b. Judgments on (14)b: 2, no [but see Appendix IV]

Unsurprisingly given current theories, the same generalizations can be obtained in examples that involve bound readings, as is shown in Appendix I.

4 Attitude Role Shift III: Comparison with Attitude Role Shift in French Sign Language (LSF)

We turn to a briefer discussion of the properties of Attitude Role Shift in LSF.

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[15] The same remark holds as in fn. 13.

[16] There are two reasons to perform rigorous De Se tests with Role Shift.
–First, recent work by Hazel Pearson (Pearson 2012) suggests that in some cases expressions that have the distribution of obligatorily shifted indexicals (namely Ewe logophoric pronouns) may still *fail* to be unambiguously De Se.
–Second, the existence of Action Role Shift, which does *not* involve any propositional attitude and hence any De Se reading, suggests that one should be particularly cautious when investigating shifted indexicals in sign language (it could be that they are shifted by virtue of an *extensional* rather than an *intensional* shifting operation, which might affect the results of De Se tests).

4.1 Shifting of All Indexicals

The first observation to be made is that under Attitude Role Shift all the indexicals we have tested appear to be obligatorily shifted. Thus while there is some amount of uncertainty about the point of evaluation of indexicals in standard indirect discourse, as in (17), there is no such uncertainty under Attitude Role Shift: both the first person pronoun and the time indexicals are obligatorily shifted in (18).

(17) *Context:* In 2010, I met Jean in LA. At the time, he often changed jobs and home bases.

DATE 2010 PLACE LA JEAN SAY
'In 2010, in LA, Jean said that

a. 7 **YEAR NOW** IX-a WORK PARIS.
this year [in 2013?] he would work in Paris.'

b. 7 **YEAR LAST** IX-a WORK PARIS.
last year [in 2012?] he would work (or had worked?) in Paris.'

c. 7 **YEAR NEXT** IX-a WORK PARIS.
next year [in 2014?] he would work in Paris.'
(LSF, 32, 70)[17]

(18) *Context:* In 2010, I met Jean in LA. At the time, he often changed jobs and home bases. 'In 2010, in LA, Jean said

a. RS_a_____
7 IX-1 **YEAR NOW** WORK PARIS.
'This year I work in Paris.'.'

b. RS_____
7 **YEAR LAST** IX-1 WORK PARIS.
'Last year I worked in Paris.'.'

c. RS_a_____
7 **YEAR NEXT** IX-1 WORK PARIS.
'Next year I will work in Paris.'.'
(LSF, 32, 72)

The same generalization can be obtained on the basis of the locative indexical *HERE*, which is obligatorily shifted under Attitude Role Shift, as shown in (19).

(19) *Context:* In 2010, I met Jean in LA. At the time, he often changed jobs and home bases.
Situation: En 2010 j'ai rencontré Jean à LA. Il changeait souvent de travail et de lieu de vie.

DATE 2010 PLACE LA JEAN SAY
'In 2010 in LA Jean said

a. 7 DATE 2014 IX-a WORK **HERE**.
that in 2014 he would work here [= in Paris].'

b. RS_a_____
7 DATE 2014 IX-1 WORK **HERE**.

[17] As shown in Appendix IV, one our of three trials, the informant mentioned that these sentences were ambiguous, with the temporal expressions evaluated with respect to the time of utterance *or* with respect to the time of Jean's speech act; in the other two trials, evaluation was with respect to the time of utterance.

In 2014 I will work here.'.'
(LSF, 32, 74)

We have similar data pertaining to the obligatory shifting of *NOW, TOMORROW, THE-DAY-BEFORE-YESTERDAY,* and (less clearly) *YESTERDAY* under Attitude Role Shift (in our data, these adverbials co-occur with *IX-1*, which also obligatorily shifts).[18]

Since all indexicals obligatorily shift under Attitude Role Shift, we cannot rule out the possibility that LSF Attitude Role Shift involves the kind of quotation which is found in English. In our ASL data, we could rule out this possibility because wh-extraction was permissible out of Attitude Role Shift. As we will now see, this is not the case in LSF (it will thus be for theory-internal reasons, related to the existence of Action Role Shift, that we will posit that role-shifted clauses in general don't just involve quotation[19]).

4.2 Failure of the Extraction Test

In LSF, our main informant dislikes extraction out of role-shifted clauses. The baseline is in (20): we used two patterns of *wh*-extraction out of standard indirect discourse, one with a single *WHO,* which appears in the post-verbal position, and another one with a doubled *wh*-word, with *WHO* appearing both at the beginning of the embedded clause and in the post-verbal position. To ensure that we obtained a matrix *wh*-question, we elicited the sentence by way of a transformation task, in which we showed the signer the transcription in (20)a, and asked him to form the question corresponding to the underlined word – which led to the two patterns in (20)b and (20)c. We checked by way of semantic questions that appear in Appendix III that the latter two were indeed interpreted as matrix questions.

(20) a. 7 PIERRE SAY IX-a LIKE MARIE.
'Pierre says he likes Marie.'

b. 7 PIERRE SAY IX-a LIKE WHO?
=> the speaker wants to know who Pierre likes
'Who did/does Pierre say he likes?'

c. 7 PIERRE SAY WHO IX-a LIKE WHO?
=> the speaker wants to know who Pierre likes
'Who did/does Pierre say he likes?'
(LSF, 34, 146)

A similar transformation task with a role-shifted clause failed (i.e. the informant just said that no corresponding question could be asked). We then asked the informant to sign the role-shifted clause with *WHO* added oustide of Role Shift, in the same positions as in the 'good' sentences in (20)b-c. The result was sharply deviant, as seen in (21)b-c.

(21) a. RS_a_____
7 PIERRE SAY IX-1 LIKE MARIE
'Pierre says/said that he likes Marie.'

b. RS_a_____
1 PIERRE SAY IX-1 LIKE WHO?

c. RS_a_____
1 PIERRE SAY WHO IX-1 LIKE WHO?
(LSF, 34, 149)

[18] Some relevant videos are 32, 44; 32, 5 (and 32, 8); 32, 46; and 32, 44 respectively. Of course one can never exclude the possibility that *other* indexicals might allow for shifting of perspectives. And as usual we can only make claims about our main informant's judgments.

[19] In Part II of the present study, we will show that Attitude Role Shift in ASL and LSF always has a quotational component.

We asked our informant to sign the sentences again, but this time with the *wh*-words under Role Shift. The result was acceptable but the meaning changed: we obtained embedded (or quoted) rather than matrix questions.

(22) a. RS_a _____
7 PIERRE SAY IX-1 LIKE MARIE.
'Pierre says/said: 'I like Marie.'

b. RS_a_____
7 PIERRE SAY IX-1 LIKE WHO?
=> Pierre wants to know who he likes
'Pierre says/said: 'Who do I like?''

c. RS_a_____
7 PIERRE SAY WHO IX-1 LIKE WHO?
=> Pierre wants to know who he likes
'Pierre says/said: 'Who do I like?''
(LSF, 34, 150)

Finally, we checked whether the results were any different if the interrogative word appeared in matrix position; without a copy of the interrogative word in the embedded position the result was degraded without Role Shift. But either way, interrogative extraction out of a role-shifted clause appears to be prohibited.

(23) a. 7 WHO PIERRE SAY IX-a LIKE WHO?
'Who did/does Pierre say he likes?'

b. 5.5 WHO PIERRE SAY IX-a LIKE?
'Who did/does Pierre say he likes?'
(LSF, 35, 4)

(24) a. RS_____
1 WHO PIERRE SAY IX-1 LIKE WHO ?

b. RS_____
2.5[20] WHO PIERRE SAY IX-1 LIKE ?
(LSF, 35, 6)

(25) RS _____
1 WHO PIERRE SAY IX-1 LIKE WHO ? (LSF, 35, 8)

We conclude that for our main LSF informant *wh*-extraction out of Attitude Role Shift is not permissible.

4.3 Conclusion and further controls

In Section 3, it seemed that Attitude Role Shift in ASL offers a good case for a context-shifting analysis: the *wh*-extraction test suggests that the examples under investigation do not involve standard (clausal) quotation; and the fine-grained interpretation of indexicals under Role Shift suggests that they genuinely have a shifted, De Se interpretation. By contrast, our main LSF informant does not seem to allow for *wh*-extraction of a role-shifted clause. This might show (i) that these have a pure quotational semantics; or (ii) that they don't have a quotational semantics, but that they are in a syntactic position from which material cannot be extracted; or that (iii) some other phenomon forces a

[20] This is the average of 2 judgments, as shown in Appendix IV. We got 2 additional judgments on a similar sentence filmed as part of video 35, 8, and in each case the sentence was given a 1.

quotational reading. (We will argue in Part II that the right solution is (iii): the semantics of Role Shift involves context shift, but it has a quotational component that seems to be more rigid for our LSF informant than for our ASL informant.)

Even for ASL, however, two cautionary notes should be added.

1. We discuss in Appendix II the behavior of the apparently quotational operator "" in ASL. In brief: (i) in our data, it behaves in every respect like Attitude Role Shift, except that it requires more of a context to be licensed; (ii) this might suggest that quotation *does* allow for wh-extraction in ASL. But the inference needn't go through: pending further investigation, it might also be that the 'quotational' operator in fact involves a variety of Role Shift (this possibility becomes more likely in view of results laid out in in Part II, where we argue that Role Shift simultaneously involves Role Shift *and* a quotational/iconic component).
2. More importantly, it turns out that our main informant has a word, *ANY*, which in some contexts displays a *bona fide* NPI behavior. We tested ASL counterparts of the integration test in (5). Unsurprisingly, in the absence of Role Shift, licensing from a matrix negation into the embedded clause was possible, just as in English. But with Role Shift the result was degraded, which argues for the *opposite* conclusion from the one we reached on the basis of *wh*-extraction test. We will discuss these data and their theoretical consequences in Part II.

5 The Importance of Action Role Shift

The upshot of our discussion of Attitude Role Shift is that some tests – notably *wh*-extraction in ASL – suggest that it is syntactically integrated in a way that quoted sentences in English are not. But the same facts didn't hold in LSF, and even in ASL the cautionary remarks made in Section 4.3 and in Appedix II suggest that our conclusions are provisional at best.

These difficulties might pave the way an analysis of Role Shift in terms of partial (i.e. less-than-clausal) quotation, for instance along the lines discussed Maier 2014, to appear. We believe that this conclusion would be incorrect. Our argument is as follows:

(i) Unlike Attitude Role Shift, Action Role Shift could not be analyzed in terms of quotation, for the simple reason that it is often used to describe situations that involve no propositional attitude whatsoever. For these cases, a mechanism akin to context shift must be posited.
(ii) Once this mechanism is in place for Action Role Shift, a minor modification of it can account for Attitude Role Shift.
(iii) In addition, we will see in Part II that both versions of the mechanism must be supplemented with an iconic component, whereby *elements that can be interpreted iconically in the scope of a Role Shift operator must be attributed to the role-shifted context*. We will argue that this general mechanism derives as a special cases the quotational component of Attitude Role Shift, while *also* accounting for the iconic but non-quotational component of Action Role Shift.

In the rest of this section, we motivate the conclusion in (i). The context-shifting component of the analysis is developed in Section 7, while the necessity of adding an iconic component is developed in Part II.

A terminological note is in order at this point. What we call 'Action Role Shift' is usually termed 'constructed action' in the sign language literature. Here is for instance how Lillo-Martin and Quadros 2011 introduce the notion (see also Liddell and Mentgzer 1998 for a justification of the terminology):

"The non-quotative use of RS reconstructs not the words/thoughts, but the actions of a particular referent. It has come to be known as constructed action (CA) (Liddell and Metzger, 1998). (...) Such examples often combine lexical signs, classifier signs, and (non-sign) mimics and gestures, along with facial expressions and body positions to represent those of the character whose actions are being described. The non-manual markings generally include mimicking the facial expression of the character; an actual shift of the position of the shoulders may or may not be seen. The shoulder shift is most likely to appear in quotational RS."

But the terminology is in part ambiguous. For instance, Metzger 1995 notes that "evidence suggests taht in ASL, constructed dialogue is a form of a constructed action", which might blur the distinction between Role Shift used to report actions vs. attitudes – and we'll see that attitude reports with Role Shift have different grammatical properties than action reports with Role Shift. To emphasize the fact

that that Role Shift is involved in both cases (as defined by Quer, to appear a, cited above), we prefer to use the terms 'Attitude Role Shift' for instances of the operation that serve to report a thought or speech act, and 'Action Role Shift' for instance that serve to report a non-attitudinal action.

5.1 Action Role Shift in ASL

5.1.1 Basic properties

A simple example of Action Role Shift in ASL is given in (26)b, which contrasts with standard third person report in (26)a.

(26) IX-a JOHN OFTEN MEET-MEET [POOR PEOPLE]$_b$, IX-1 KNOW LOTS PEOPLE IX-arc-b IX-a FINISH
'John often meets poor people. I know lots of people that he

a. 7 GIVE-b-rep MONEY.
has given money to.'

b. RS$_a$_____
7 1-GIVE-b-rep MONEY.
has given money to.'
(ASL, 18, 98)

The same data are replicated in (27)a-b, but in the scope of a negative quantifier – which shows clearly that Action Role Shift can arise under binding, as the argument of *GIVE* couldn't be deictic (since the quantifier in (26) is positive, it is a bit less easy to exclude a deictic reading with a plural denotation for the argument of *GIVE;* note that Attitude Role Shift can also arise in the scope of quantifers, as shown in Appendix I). A negative sentence with Action Role Shift seems to lead to slightly degraded acceptability for our ASL informant, but the result is still on the 'acceptable' side.

(27) IX-a JOHN OFTEN MEET-MEET [POOR PEOPLE]$_b$, BUT IX-1 NOT-KNOW ANYONE IX-arc-b IX-a FINISH
'John often meets poor people, but I don't know any of them he

a. 6.8 a-GIVE-b MONEY.
has given money to.'

b. RS$_a$_____
6 1-GIVE-b MONEY.
has given money to.'
(ASL, 14, 108)

In (26)b-(27)b, the signer shifts his body to adopt John's position, in locus *a*, in the realization of the verb give. As a result, this verb appears with a (shifted) first person agreement marker. In addition, this clause is clearly integrated with the rest of the discourse, since the object of *GIVE* (corresponding to locus *b*) is bound by a quantifier.

A minimal contrast between Attitude Role and Action Role Shift is presented for ASL in (28). In (28)a, an instance of Attitude Role Shift, the signer shifts his body to adopt the position the arrogant French swimmer (in locus *a*) right after the verb *SAY*. In (28)b, which reports an action rather than a speeech or thought act, no attitude verb is used, and Role Shift starts after the third person pronoun *IX-a*. In both cases, a first person pronoun or agreement marker appears inside the role-shifted clause, and is interpreted with respect to the shifted context.[21] For comparison, both sentences are signed without Role Shift at all in (29).

[21] Additional sentences in this video (14, 233), which involved a happy face on the part of the speaker, are discussed in Part II.

(28) SEE [THAT ARROGANT FRENCH SWIMMER]$_a$ IX-a? YESTERDAY IX-a ANGRY.
'Do you see that arrogant French swimmer? Yesterday he was angry.
RS$_a$_____
a. 6.2 IX-a SAY IX-1 WILL LEAVE.
He said he would leave.'

RS$_a$_____
b. 7 IX-a 1-WALK-WITH-ENERGY(CL-ONE).
He walked away with energy.'
(ASL, 14, 233)

(29) SEE [THAT ARROGANT FRENCH SWIMMER]$_a$ IX-a? YESTERDAY IX-a ANGRY.
'Do you see that arrogant French swimmer? Yesterday he was angry.

a. 7 IX-a SAY IX-a WILL LEAVE
He said he would leave.'

b. 7 IX-a WALK-WITH-ENERGY(CL-ONE)
He walked away with energy.'
(ASL, 14, 231)

It should be noted that there are ill-understood constraints on Action Role Shift, which is not acceptable in all contexts. One possibility is that it must be licensed by the fact that some expressions its scope can have an iconic interpretation – which is the case of the classifier construction WALK-WITH-ENERGY(CL-ONE) in (29)b. This is also the case of the example in (30)b, where the sign for 'break down' has a clear iconic component. We will come back to this point in Part II (we will argue that role-shifted clauses must be interpreted 'maximally iconically', and we will leave open whether there is a requirement that in addition *something* in them should be interpreted iconically).

(30) a. 7 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY IX-a ANGRY, IX-a DOOR PUNCH-rep [BREAK DOWN]-CL+rep.
=> the French swimmer did/will in fact break doors.

b. 7 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY IX-a ANGRY, IX-a DOOR
RS$_a$_____
PUNCH-rep, [BREAK DOWN]-CL+rep.
=> the French swimmer did/will in fact break doors.

'Did you see that arrogant French swimmer? Yesterday he was angry, he was breaking doors.'
(ASL, 18, 102)

Importantly, we included in some of the trials for (30) an inferential task designed to determine whether the sentence was understood as an action report or as an attitude report. In this respect, there was no contrast between the version with and without Role Shift: both were understood with an actuality entailment, to the effect that doors were or would in fact be broken.

5.1.2 Constraints on indexicals

- *IX-1*

It was noticed in the literature that Action Role Shift (= 'non-quotative role shift' or in some uses 'constructed action) differs from Attitude Role Shift (= 'quotative role shift') in that full first person pronouns are acceptable with a shifted reference in the latter context but not in the former; by contrast, first person agreement marker are acceptable with a shifted reference in both environments. In their review of the literature, Lillo-Martin and Quadros 2011 provide the following minimal pair, where the translation makes clear that (31)a is interpreted as an attitude report whereas (31)b is interpreted as an action report.

(31)

```
                              _____________________________RS:friend
                              ___top____
a.      FRIEND (SAY)          <b-OLYMPICS,      IX(self) 1-WATCH-b>
        'My friend was like, "The Olympics, I watch."'

                                                 __RS:friend
                              ___top___
b.      FRIEND,               b-OLYMPICS        <1-WATCH-b>
        'My friend was watching the Olympics.'
```

(ASL, Lillo-Martin and Quadros 2011)

This pattern is replicated in our own data. In (32) and (33), we compared examples with first person vs. null pronouns in subject and possessor positions. As soon as a first person subject pronoun was used, an attitude reinterpretation arose; the same effect was seen, less clearly, when a first person possessive pronoun was used in the absence in the absence of a first person subject pronoun.

(32) YESTERDAY IX-1 1,a-MEET JOHN$_a$ /MEET IX-a JOHN$_a$[22], IX-a
'Yesterday I met John. He
a. RS$_a$_____
6 1-EMAIL-rep FRIENDS.
=> John did/will email people
was emailing his friends.'

b. RS$_a$_____
4 1-EMAIL-rep POSS-1 FRIEND.
=> John said he was emailing people [but see the detailed inferentail judgments in Appendix IV]
said he was emailing his friends.'

c. RS$_a$_____
6 IX-1 1-EMAIL-rep FRIENDS.
=> John said he was emailing people
said he was emailing his friends.'

d. RS$_a$_____
6 IX-1 1-EMAIL-rep POSS-1 FRIEND.
=> John said he was emailing people
said he was emailing his friends.'
(ASL, 19, 214)

(33) YESTERDAY IX-1 MEET IX-a JOHN$_a$. IX-a
'Yesterday I met John. He

a. RS$_a$_____
6 1-CONTACT-rep FRIEND.
=> John did/will in fact contact people
was contacting his friends.'
b. RS$_a$_____
3.5 1- CONTACT-rep POSS-1 FRIEND.
[unclear whether John said he was contacting people, or did/will in fact contact people; possibly the former]
[It is unclear whether this is an attitude or an action report.]
c. RS$_a$_____
5.4 IX-1 1- CONTACT-rep FRIEND.
=> John said he was contacting people
said he was contacting his friends.'

[22] The first version was signed in a., the second in b., c., d.

d. RS_a_____
6 IX-1 1- CONTACT-rep POSS-1 FRIEND.
=> John said he was contacting people
said he was contacting his friends.'
(ASL, 19, 218)

The same generalization can be seen with subject pronouns in the contrast between (30)b above, which did not give rise to an attitude interpretation, and (34), which does. The latter fact seems to be due to the presence of addition of a full first person pronoun in the scope of Role Shift.[23]

(34) 6.3 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY IX-a ANGRY, IX-a DOOR

RS_a_____
IX-1 PUNCH-rep, [BREAK DOWN]-CL+rep.
=> the French swimmder said he was breaking/would break doors
and he was saying that he would break doors!' (ASL, 19, 143)

It is of some importance to note that in (32) and (33) the object *FRIEND* is also under Role Shift. Thus it is not just the case that *any* lexical material (besides the verb) triggers an attitude reinterpretation – and thus it is plausible that the first person pronoun is responsible for it in the example where it appears under Role Shift. (We will see that our LSF informant's judgments might be different – he appears to dislike any non-verbal material under Role Shift.)

It is interesting to investigate whether other indexicals give rise to similar contrasts. An initial investigation suggests that with our main ASL informant *TOMORROW* triggers an attitude reinterpretation, and *HERE* and *THIS MORNING* sometimes do. In all cases, indexicals received a shifted interpretation under Role Shift (and sometimes outside of Role Shift too).

- *HERE*

(35)a and (35)a show that *HERE* displays the behavior of an indexical (rather than of an anaphoric expression) when it appears outside of Role Shift: in such cases, it must refer to the place of utterance (= Paris, because the sentences were elicited while our ASL informant was in Paris). (35)b and (36)b show that *HERE* is acceptable in Attitude Role Shift, but also under Action Role Shift (though it seems to be a bit less acceptable there). When it comes to interpretation, our informant's judgments were unstable: in Action Role Shift *HERE* sometimes did and sometimes didn't give rise to an Attitude reinterpretation, as can be seen in the full ratings provided in Appendix IV. Of course in Attitude Role Shift the data are simpler: an attitude report reading is obtained, and both indexicals (*IX-1* and *HERE*) get a shifted interpretation.

(35) *Context:* The sentences were elicited in Paris.
a. 7 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY LONDON IX-a ANGRY, IX-a DOOR HERE PUNCH-rep [BREAK DOWN]-CL+rep.
=> the French swimmer did in fact break doors.
'See that arrogant French swimmer? Yesterday in London he was angry. He is breaking doors here [= in Paris].'

[23] The example in (34) has the advantage of making it possible to check that it is the presence of a first person pronoun under Role Shift, rather than the repetition of a pronoun (third person *IX-a* without Role Shift, followed by first person *IX-1* under Role Shift) which is responsible for the attitudinal interpretation. For as seen in 0b, in this particular structure the repetition of a third person pronoun is compatible with an action interpretation. Hence it is likely that in (34) it is the first person pronouns that forces the attitudinal interpretation.

(i) SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY IX-a ANGRY, IX-a DOOR
'See that arrogan French swimmer? Yesterday he was angry,
a. PUNCH-rep, [BREAK DOWN]-CL+rep
b. IX-a PUNCH-rep, [BREAK DOWN]-CL+rep
and he broke doors.' (ASL, 19, 174)

b. 5.6 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY LONDON IX-a ANGRY, IX-a

RS_a_____
DOOR HERE 1-PUNCH-REP, [BREAK DOWN]-CL+rep.
=> unstable judgments: the French swimmer said he was breaking doors / did in fact break doors.
'See that arrogant French swimmer? Yesterday in London he was angry. He repeatedly broke doors there [= in London] / he said: 'I (will) break doors here [= in London].'
(ASL, 18, 117)

(36) *Context:* The sentences were elicited in Paris.
a. 7 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY LONDON IX-a ANGRY, IX-a SAY DOOR HERE IX-a PUNCH-REP [BREAK DOWN]-CL-rep
'See that arrogant French swimmern? Yesterday in London he was angry, he said he would repeatedly break doors here [= in Paris].'

b. 7 SEE IX-A ARROGANT FRANCE SWIMMER. YESTERDAY LONDON IX-A ANGRY, IX-A

RS_a_____
SAY DOOR HERE IX-1 PUNCH-rep, [BREAK DOWN]-CL-rep
'See that arrogant French swimmern? Yesterday in London he was angry, he said he would repeatedly break doors there [= in London].'
(ASL, 18, 109)

- *THIS MORNING*

The generalizations are similar with *THIS MORNING:* without Role Shift, it behaves like a standard indexical; under Role Shift, is has a shifted interpretation, but it is unclear whether it triggers an attitude reinterpretation (judgments were not stable). In addition, it must be observed that under Action Role Shift *THIS MORNING* is a bit degraded.

(37) a. 7 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY LONDON IX-a ANGRY, IX-a THIS MORNING DOOR PUNCH-rep [BREAK DOWN]-CL-rep
=> the French swimmer did/will in fact break doors
'See that arrogant French swimmer? Yesterday in London he was angry, and this morning [= today] he is breaking doors.'

b. 5 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY LONDON IX-a ANGRY, IX-a
RS_a_____
THIS MORNING DOOR PUNCH-rep, [BREAK DOWN]-CL-rep.
=> unclear inferences: the French swimmer said he was breaking/would breaking doors /did/will in fact break doors.
'See that arrogant French swimmer? Yesterday in London he was angry, and yesterday morning he was breaking doors. / he said: 'I will break doors'.'
(ASL, 19, 165)

(38) a. 7 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY LONDON IX-a ANGRY, IX-a SAY THIS MORNING DOOR IX-a PUNCH-REP [BREAK DOWN]-CL-rep.
'See that arrogant French swimmer? Yesterday in London he was angry, he said that this morning [= today] he would break doors.'

b. 7 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY LONDON IX-a ANGRY, IX-a
RS_a_____
SAY THIS MORNING DOOR IX-1 PUNCH-REP, [BREAK DOWN]-CL-rep.
'See that arrogant French swimmer? Yesterday in London he was angry, he said: 'This morning I am breaking/broke doors'.'
(ASL 19, 164)

- *TOMORROW*

Under Action Role Shift, *TOMORROW* triggers an indirect discourse reinterpretation, and also gets a shifted reading, as shown in (39)b (note that the control sentence in (39)a is degraded, and that the interpretation of *TOMORROW* is unclear). Under Attitude Role Shift, *TOMORROW* systematically receives a shifted interpretation, as shown in (40).

(39) a. 4.8 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY LONDON IX-a ANGRY, IX-a TOMORROW DOOR PUNCH-rep [BREAK DOWN]-CL-rep.
'See that arrogant French swimmer? Yesterday in London he was angry. [Today? tomorrow?] he is/will be breaking doors.'

b. 6 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY LONDON IX-a ANGRY, IX-a
RS_a_____
TOMORROW DOOR 1-PUNCH-rep, [BREAK DOWN]-CL-rep.
'See that arrogant French swimmer? Yesterday in London he was angry. He said: 'Tomorrow I will break doors.'.'
(ASL, 18, 119)

(40) a. 6.7 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY LONDON IX-a ANGRY, IX-a SAY TOMORROW DOOR IX-a PUNCH-rep [BREAK DOWN]-CL-rep.
'See that arrogant French swimmer? Yesterday in London he was angry. He said that tomorrow [or: today?] he would break doors.'

b. 7 SEE IX-a ARROGANT FRANCE SWIMMER. YESTERDAY LONDON IX-a ANGRY, IX-a SAY
RS_a_____
TOMORROW DOOR IX-1 PUNCH-rep, [BREAK DOWN]-CL-rep.
'See that arrogant French swimmer? Yesterday in London he was angry. He said: 'Tomorrow I will break doors.'
(ASL, 18, 111)

We conclude that the first person agreement marker is shiftable under Action Role Shift, that the full first person pronoun triggers an attitude reinterpretation, and that other indexicals we have tested behave like the full first person pronoun or give rise to unstable judgments.

5.2 Action Role Shift in LSF

Our about Action Role Shift in LSF are more complex. In brief:

1. In the absence of overt attitude reports, Role Shift is possible in LSF. In some cases, it is understood as an action report – thus Action Role Shift clearly exists in LSF.

2. At least some instances of Action Role Shift involve agreement verbs, with the effect that first person agreement markers are interpreted with respect to a shifted context.

3. In some cases, Role Shift without an attitude operator is still understood as an attitude report, and apparently in some cases as a mixed report of an action *and* of an attitude. Usually overt indexicals trigger an attitude interpretation, and are obligatorily shifted.

4. But many things appear to trigger an attitudinal interpretation of Role Shift. In some cases, nouns under Role Shift trigger this reinterpretation; and in some of our data there are minimal contrasts among bare verbs, with some of them triggering (at least sometimes) an attitudinal reinterpretation, and others not.

It is worth adding that in virtually all the cases we have considered, when indexicals are acceptable under Role Shift, without overt attitude operators/interpretation, they have a shifted meaning.[24]

Due to 3., we cannot draw strong conclusions from the fact that overt indexicals trigger an attitude reinterpretation: this might be due to their overt nature, or to the fact that they are indexicals.

To illustrate points 1. and 2., consider (41)b, which is a role-shifted version of (41)a. *CATCH* is an agreement verb, realized with a different origin in the first and in the third person; and as far as we can tell in the role-shifted version the movement starts from the signer's role-shifted position.[25] Importantly, the inference we obtain is that the wolf *in fact* caught the sheep, which suggests that in this case an attitude reinterpretation is not obligatory (nor necessarily possible).

(41) a. 7 WOLF IX-a SHEEP a,b-THE-TWO FRIEND. LAST-YEAR IX-a HUNGRY.
IX-a a-CATCH-b EAT-rep.
'The wolf and the sheep are friends. Last year, the wolf was hungry. He caught the sheep and ate it.'

b. 6.7 WOLF IX-a SHEEP FRIEND a,b-THE-TWO. LAST-YEAR IX-a HUNGRY.
RS_a _____
IX-a 1-CATCH-b DEVOUR-rep.
'The wolf and the sheep are friends. Last year, the wolf was hungry. He caught the sheep and devoured it.'
(LSF, 37, 53; similar video and similar judgment in 40, 74)

To illustrate points 3. and 4, consider the following paradigm. In (42), an all-purpose verb *SHOW* is compared to a classifier version *SHOW-CL*, which displays with which hand position the relevant object was shown. The latter is entirely acceptable under Action Role Shift, with an inference that the action in fact took place; the former is less acceptable (in one session the informant mentioned that one doesn't understand what justifies Role Shift), and it is unclear whether it gives rise to an attitudinal reinterpretation.

(42) RECENTLY $WOLF_b$ IPHONE FIND HAPPY. SHEEP IX-b b-CALL-a.
'Recently the wolf was happy to find an iPhone. He called the sheep.
a. RS_b___
4.3 IX-b IPHONE SHOW.
=> unclear inference
He [= the wolf] showed [or: said/thought he was showing/would show] the iPhone to him.'
b. RS_b_____
7 IX-b IPHONE SHOW-CL.
=> the wolf in fact showed the iPhone to the sheep
He [= the wolf] showed the iPhone to him.'
(LSF, 39, 26)

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[24] In one session, the example in (i) was an exception to this generalization (see also fn 27 for another possible exception). But this judgment appears to be an outlier: in the other 3 sessions in which the paradigm was tested, the judgments patterned with our generalization (what complicates matters is that in some cases *HERE* is unshifted when it appears outside of Role Shift [video 39, 46]).

(i) RECENTLY $WOLF_b$ IPHONE FIND HAPPY. SHEEP IX-b b-CALL-a.
a. RS_b_____
7 IX-b IPHONE HERE SHOW. (*HERE* = unshifted in 1 session; shifted in 3 sessions)
b. RS_b_____
7 IX-b IPHONE HERE SHOW-CL. (*HERE* = unshifted in 1 session; shifted in 3 sessions)
'Recently the wolf was happy to find an iPhone. He called the sheep – and there [or: here] showed him the iPhone.'
(LSF, 39, 32)

[25] We write 'as far as we can tell' because this is not a trivial judgment to make: in standard first person examples the movement starts from a position close the signer's chest; under Role Shift as in (41)b this is less clear.

In (43), *IPHONE* is signed under Role Shift. Both sentences are now acceptable, but both give rise to a partial or total attitudinal reinterpretation.

(43) RECENTLY $WOLF_b$ IPHONE FIND HAPPY. SHEEP IX-b b-CALL-a.
'Recently the wolf was happy to find an iPhone. He called the sheep.
a. RS_b_____
6.7 IX-b IPHONE SHOW.
=> the wolf said/thought he was showing/would show the iPhone to him
He [= the wolf] said/thought he would show/was showing the iPhone to him.'
b. RS_b_____
7 IX-b IPHONE SHOW-CL.
=> the wolf said 'iPhone' and showed the iPhone (see full ratings in Appendix IV).
He [= the wolf] said '(an) iPhone' and showed it.'
(LSF, 39, 37; see also LSF, 39, 27)

In (43)a, a simple attitudinal reinterpretation is obtained; in (43)b, our informant gave a mixed response, and explained that 'iPhone' was quoted but that the action of showing it was real – which he illustrated with an example of a scene in which the wolf said 'Oh an iPhone', picked it up and showed it.[26] When a full first person pronoun is included under Role Shift, as in (44), a full attitudinal reinterpretation is obtained.[27]

(44) RECENTLY $WOLF_b$ IPHONE FIND HAPPY. SHEEP IX-b b-CALL-a.
'Recently the wolf was happy to find an iPhone. He called the sheep.
a. RS_b_____
6 IX-b IPHONE IX-1 SHOW.
=> the wolf said/thought he was showing/would show the iPhone to him
He [= the wolf] said/thought he would show/was showing the iPhone to him.'
b. RS_b_____
6 IX-b IPHONE IX-1 SHOW-CL.
=> the wolf said/thought he was showing/would show the iPhone to him
He [= the wolf] said/thought he would show/was showing the iPhone to him.'
(LSF, 39, 28)

Finally, in some cases it would seem that the presence of an indexical *per se* plays a role in (partly) triggering an attitudinal reinterpretation under Role Shift. Thus despite the presence of *DOOR* under Role Shift, (45)a is interpreted as an action report; by contrast, (45)b can be interpreted as an attitude report, presumably because the first person possessive was added under Role Shift.

(45) IX-2 SEE SWIMMER GERMAN ARROGANT? YESTERDAY FURIOUS.
'You see that arrogant German swimmer? Yesterday he was furious.
a. RS_a_____
6.3 FOR-THIS IX-a GO-BALLISTIC IX-a HOUSE DOOR BREAK OPEN.
=> the arrogang German swimmer in fact broke the door
That's why he went ballistic and broke open the house door.'

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[26] This was in particular recorded in the explanations given in video 40, 50. Note that in our recent sessions on Action Role Shift, we took two measures to clarify the inferential judgments. First, we asked our informant to give possibles examples of the scenes that were reported. Second, we sometimes asked our informant to briefly repeat the (written) inferential question in LSF at the beginning of the signed version of his answer so as to make sure that there was no ambiguity in that question.

[27] As shown in Appendix IV, in one session our informant gave low ratings (= 4) to both sentences, saying that there was an ambiguity as to who *IX-1* referred to (= the wolf or the signer).
We should add that we have further examples in which an attitudinal reinterpretation is triggered by a possessive first person pronoun rather than by an embedded subject first person pronoun. Specifically, in modifications of (41)b in which *SHEEP* or *FRIEND POSS-1* is added as the object of *DEVOUR* under Role Shift, *SHEEP* gives rise to an unclear interpretation (action or attitude report depending on the session), whereas *FRIEND POSS-1* triggers an attitude reinterpretation (video 37, 62 vs. 37, 60).

b. RS_a_____
7 FOR-THIS IX-a GO-BALLISTIC IX-a HOUSE POSS-1 DOOR BREAK OPEN.
=> the arrogant German swimmer said that he was breaking (2 trials) / did in fact break the door
That's why he went ballistic and said: 'I am breaking open the door of my house."
(LSF, 36, 72; see also 35, 62[28])

These results should be taken as very preliminary. First, the contrast between two versions of 'show' (*SHOW* vs. *SHOW-CL)* will not follow from anything in the present article – though we will revisit it in Part II. Second, it is equally unclear why *IPHONE* under Role Shift appears to be sufficient to trigger an attitude reinterpretation – again a problem that we'll only begin to address in Part II. Third, our informant was in several cases uncertain as to the 'action' or 'attitude' nature of the reports, which suggests either that there are possible ambiguities in the stimuli, or that our inferential questions were insufficiently clear. Finally, we have quite a few cases in which a full indexical appears under Role Shift without an overt attitude operator, and the resulting sentence is just deviant. Examples are given in (53)-(53). (52)a is a simple instance of Action Role Shift, understood as an action report. In (52)b and in (53)a-b, various overt indexicals are added, and all lead to decreased acceptability (whether this is because they are non-verbal or because they are indexical is left open here). For whatever reason, a mechanism of attitudinal reinterpretation does not appear to be readily available in this case.[29] Clearly, more work will be needed on Action Role Shift in LSF.

(52) IX-2 SEE SWIMMER GERMAN ARROGANT? YESTERDAY FURIOUS.
'You see that arrogant German swimmer? Yesterday he was furious.

a. RS_a____
6.6 FOR-THIS IX-a DOOR BREAK.
=> the German swimmer did break the door
That's why he broke a door!'
b. RS_a_____
3 FOR-THIS IX-a DOOR IX-1 BREAK.
(LSF, 32, 20)

(53) IX-2 SEE SWIMMER GERMAN ARROGANT? YESTERDAY PLACE LONDON FURIOUS.

a. RS_a_____
1.5 FOR-THIS IX-a DOOR BREAK THERE.

b. RS_a_____
1.5. FOR-THIS IX-a DOOR BREAK HERE.
(LSF, 32, 31)

6 Obligatory Shifting and Shift Together[30]

6.1 Varieties of context dependency across sign languages

We have now seen several patterns of context shifting across sign languages.
–In Catalan and in German Sign Language (LSC and DGS), earlier investigators found examples in which under Attitude Role Shift a given clause contains (i) one indexical with a shifted meaning, and

[28] Video 35, 62 involved similar sentences signed with more neutral facial expressions than 36, 72. Acceptability ratings were on average lower, less consistent, and inferential judgments were unclear. We leave an analysis of the difference between the two videos for future research.
[29] It is likely that the precise choice of non-manuals is crucial in triggering an attitudinal reinterpretation. We lave this question for future research.
[30] The beginning of this section borrows from Schlenker 2011c.

(ii) another indexical with a non-shifted meaning. Furthermore, some indexicals appear to be obligatorily shifted, while others have several possible readings. These data cannot be explained on the assumption that Attitude Role Shift is just standard (clausal) quotation. While they might be explained by the hypothesis that Attitude Role Shift involves partial quotation, the latter would need to be parametrized in order to explain why some expressions can be partially quoted but others cannot be.

–In ASL, all the indexicals we investigated are obligatorily shifted when they appear under Role Shift. The data we considered are thus harder to distinguish from standard (clausal) quotation). But we found two arguments against a simple quotational analysis: (i) it does not easily account for the fact that *wh*-extraction is possible out of a role-shifted clause; (ii) more importantly, it fails to extend to Action Role Shift, which displays some of the same properties as Attitude Role Shift but does not involve any speech or thought reports.

–In LSF, as in ASL, in acceptable clauses under Attitude Role Shift, indexicals receive a shifted interpretation. Unlike what we found in ASL, the wh-extraction test (= argument (i)) failed to show that these constructions are not instances of simple quotation. Still, the existence of Action Role Shift (= argument (ii)) yields an indirect – if weaker – argument against a simple quotational analysis.

Our generalizations about ASL and LSF can be stated more precisely as follows:

(54) Role Shift and Context Shift in ASL and LSF
a. ASL and LSF allow for Attitude Role Shift and Action Role Shift.
b. All indexicals can appear under Attitude Role Shift in both languages, and all must have a shifted reading.
c. First person agreement verbs can appear under Action Role Shift in both languages, and they obligatorily have a shifted interpretation. Other indexicals display different patterns:–Several indexicals in ASL trigger an attitude reinterpretation when they appear under Role Shift without an attitude verb.
–LSF indexicals in LSF sometimes trigger an attitude reinterpretation; sometimes they are unacceptable; and sometimes their interpretation (shifted vs. unshifted) is unclear.

Interestingly, LSC and DGS on the one hand and ASL and LSF on the other differ along a dimension that has been important for studies of context-shifting in spoken languages. In one type (LSC and DGS), different indexicals may be evaluated with respect to different contexts. By contrast, in ASL and LSF all indexicals that are acceptable must be evaluated with respect to the shifted context.

6.2 Shift Together in Spoken Languages[31]

In important work, Anand and Nevins 2004 and Anand 2006 showed that in Zazaki, and Indo-Aryan language of Turkey, some verbs are *bona fide* context-shifting operators. But they argued that when the context of evaluation of a clause is shifted, all the indexicals that are found in it must be evaluated with respect to the same context – a constraint they labeled 'Shift Together':

(55) Shift Together (Anand & Nevins 2004)
If an indexical is shifted in the scope of a modal operator, all other indexicals in the same clause must be shifted as well.

... attitude verb ... δ [... shifted indexical$_1$ .... shifted indexical$_2$ ...]

First, they showed that standard quotation could not account for their data because shifted indexicals could co-occur with wh-extraction or NPI licensing from outside the embedded clause, as shown in (56) and (57) (it can be shown independently that *kes* is indeed a negative polarity item):

[31] Part of the discussion borrows from the survey article in Handbook of Semantics.

(56) Extraction in Zazaki

i. čɛnɛkɛ [kɛ Hɛseni va **mɨ** *t* paci kɛrda] rindɛka
girl that Hesen said I *t* kiss did pretty.be-PRES
'The girl that Hesen said {Hesen, I} kissed is pretty.' (Anand and Nevins, 2004)

ii. Piyaa-o [kɛ Rojda va kɛ **mɨ** *t* paci kɛrd] Ali biyo
Person that Rojda said that I *t* kiss did Ali was
'Ali was the person that Rojda said {Rojda, I} kissed.' (Anand and Nevins, 2004)

(57) NPI licensing in Zazaki

a. Rojda ne va kɛ **mɨ** kes paci kɛrd
Rojda not said that I anyone kiss did
'Rojda didn't say that she kissed anyone.' (Anand and Nevins, 2004)

b. Tawa Alii va kɛ **mɨ** kes paci kɛrd
Q Ali.OBL said that I anyone kiss did
'Did Ali say that I kissed anyone?' OR
'Did Ali say that he kissed anyone?'

Second, they showed that despite this embedded indexicals has to obey Shift Together:

(58) Zazaki obeys Shift Togeter

vɨzeri Rojda Bill-ra va kɛ **ɛz to**-ra miradiša (Anand and Nevins, 2004)
yesterday Rojda Bill-to said that I you-to angry.be-PRES
'Yesterday Rojda said to Bill, "I am angry at you." '
'Yesterday Rojda said to Bill, "AUTH(c) is angry at ADDR(c)." '
'*Yesterday Rojda said to Bill, "AUTH(c) am angry at you." '
'*Yesterday Rojda said to Bill, "I am angry at ADDR(c)." '
(AUTH(c) and ADDR(c) refer to the author and addressee of the actual context)

For Anand and Nevins 2004 and Anand 2006, a covert context-shifting operator is optionally present under the verb *say* in Zazaki. When it is absent, the embedded clause behaves like an English clause in standard indirect discourse. When the context-shifting operator is present, it shifts the context of evaluation of *all* indexicals within its scope – hence the fact that we cannot 'mix perspectives' within the embedded cluase.

In Schlenker 2003, by contrast, a context-shifting analysis of attitude reports was developed in which different indexicals could be evaluated with respect to different contexts. The arguments were rather preliminary. On the one hand, it was observed on the basis of scant data that two occurrences of a first person feature that occur in the same embedded environment may be evaluated with respect to different contexts, which suggests that *Shift together* fails to hold.

(59) Amharic first person pronouns (apparently) fail to obey Shift Together (Anand 2006)

John lɨj-e ay-ɨttazzəzəññ alə
John son-my NEG.3s-obey.mkimperf-1sO say.PERF.3sm
Johni said, "my son will not obey AUTH(c)." '
'Johni said, "AUTH(c)'s son will not obey me."

Anand (2006) re-analyzed these data by positing an ambiguity: the Amharic first person marker may behave as an unshiftable indexical, or as a logophoric element, which according to Anand falls under a different generalization. Be that as it may, Schlenker 2003 also treated the Russian present tense as a shiftable indexical; if this analysis is correct, Russian must be allowed to 'mix perspectives' in embedded clauses. Thus in (60) the present tense is evaluated with respect to the shifted context, but the third person pronoun isn't (since it denotes the speaker of the reported context).

(60) Shifting is possible under attitude verbs

petja$_i$ skazal, čto on$_i$ plačet [Russian]
Pejta$_i$ said that he$_i$ is-crying
'Petja said that he was crying [at the time of his utterance]'

6.3 Shift Together in sign languages

The typology we found in sign language argues for an ecumenical view – some languages obey 'Shift Together', other languages allow for 'Mix Perspectives'. Specifically, Shift Together clearly fails to

hold in LSC and DGS, while it seems to hold – in particular under Attitude Role Shift – in ASL and LSF, since there shifting is obligatory.

Since the ASL and LSF indexicals were obligatorily shifted when they were acceptable under Role Shift, it is unsurprising that when several indexicals co-occur under Role Shift they shift together. In fact, some of the examples we already discussed simultaneously made the desired point. This was for instance the case of our ASL example with *wh*-extraction, *IX-1* and *HERE* in Attitude Role Shift (6)b: both indexicals obligatorily received a shifted interpretation. Similarly, we saw in (38)b that under Attitude Role Shift both *IX-1* and *THIS MORNING* were obligatorily shifted, and in (40)b that *IX-1* and *TOMORROW* were both obligatorily shifted as well. Under Action Role Shift, the generalization is harder to test in our data because examples that involve two indexicals have at least one overt one – and this usually triggers an attitude reinterpretation rather than action report reading.

In LSF, the data are clear for Attitude Role Shift: in (18) and (19), discussed above, two indexicals are found under Attitude Role Shift, and both indexicals must receive a shifted interpretation – which is expected since when indexicals appear singly under Role Shift they are obligatorily shifted (and as noted above, we have similar data pertaining to the simultaneous shifting of *IX-1* on the one hand, and *NOW, TOMORROW, THE-DAY-BEFORE-YESTERDAY,* and (less clearly) *YESTERDAY* on the other). Here too, testing the same phenomena under Action Role Shift is complex due to the attitude reinterpretation or deviance that overt indexicals often appear to trigger.

7 A Context-Shifting Analysis of ASL and LSF Role Shift

In the rest of this piece, we will focus on ASL and LSF Attitude and Action Role Shift, leaving aside data from German and Catalan Sign Language. This has the advantage of allowing for a simple formal framework in which context dependency is treated by way of implicit parameters, as in Anand 2006 and Anand and Nevins 2004. (Frameworks that allow for 'Mix Perspectives' must make provisions for indexing of context arguments with context-shifting operators. One way to achieve this result is by having context variables in the object language, as in Schlenker 2003. See also Schlenker 2011c for a way to capture on this basis a typology in which some constructions force 'Shift Together' while others allow for 'Mix Perspectives' [based on a suggestion by Ede Zimmermann].)

We believe the implementation we will offer is compatible with insights expressed by other authors. In particular, Liddell and Metzger 1998 provided an analysis of 'constructed action' (and in particular of what we call Action Role Shift) in the framework of Mental Space theory (see also Liddell 1998). What they call a 'blend' is 'a process that operates over two mental spaces as inputs. Structure from the two input spaces is projected to a third space (...). The blend inherits partial structure from each of the input spaces and also includes structure which belongs only to the blend.' A blend makes it possible for a sentence to have simultaneously access to the actual context and to the perspective associated with another speech or thought act, with an action. We state our analysis within standard model-theoretic semantics because this framework has the advantage of delivering precise predictions about truth conditions and inferences, and also of requiring explicit decisions about the possible points of evaluation of different types of indexicals.

7.1 Theoretical directions

Our data from Attitude Role Shift in ASL and LSF have the hallmarks of a standard argument for a context-shifting analysis. We will argue that Action Role Shift also involves the shift of a context parameter, but that the context obtained in this way is not of the 'right type' for most indexicals; more specifically, we will posit that most indexicals come with a presupposition that the context with respect to which they are evaluated is a context of speech or of thought – a condition which is not usually guaranteed to hold in Action Role Shift.

Now one could argue that Attitude Role Shift involves *bona fide* context shift while Action Role Shift doesn't. In fact, Zucchi 2004 provides an analysis of some instances of Action Role Shift in LIS by positing an operator that does not shift the context, but rather assigns to first person pronouns under Role Shift the value of the shifted perspectival center. This analysis could not account for Attitude Role Shift in ASL and LSF, since in that environment all indexicals – most of which are not

variable-like – have a shifted reading. Still, Zucchi's analysis might initially seem appealing to account for Action Role Shift in ASL and LSF: in our data, only the first person agreement marker freely shifts in such circumstances, and Zucchi's operator could target first person pronouns without affecting *bona fide* indexicals. But this analysis would miss an important fact: in ASL and LSF, Action Role Shift has an effect on *all* indexicals. Specifically, under (apparent) Action Role Shift ASL indexicals that fail to shift tend to trigger an attitude reinterpretation, while LSF indexicals tend to have the same effect or to just be deviant. A theory that leaves the context parameter untouched by Action Role Shift would fail to account for this effect. By contrast, our context-shifting theory will posit that (i) the context parameter is shifted as a result of Role Shift, but that (ii) it fails to get a value that is 'appropriate' for some indexicals.

How can a unified analysis of Attitude and Action Role Shift be developed? The two constructions differ in that the former is intensional while the second is extensional. Technically, we will follow standard analyses of context shift (e.g. Schlenker 2003, 2011c) in assuming that attitude verbs take as argument centered propositions, ones obtained by an operation of 'abstraction over contexts'. If we start from Action Role Shift, we can take the Role Shift operator to replace one context parameter with another, without triggering any intensional abstraction. If so, intensional abstraction must be triggered by independent means in the case of Attitude Role Shift. By contrast, if we start from Attitude Role Shift, we may want the Role Shift operator to deliver a centered proposition, and thus to trigger intensional abstraction 'from the start'; if so, we will have to ensure that in Action Role Shift this centered proposition is fed the appropriate individual and world arguments to play an extensional role.

Let us examine both options in greater detail.

Option 1. We can take as a starting point the behavior of Action Role Shift, and assume that the Role Shift operator simply replaces the 'old' context parameter with a new one, as in the rule sketched in (61).[32] For simplicity, we adopt a system in which there are world parameters but not time parameters; and we take contexts to be just pairs of the form <agent of the context, world of the context>. With these assumptions, the semantics of the Role Shift operator can be defined as in (61):

(61) If c is a context, s an assignment function and w a world parameter, and if *IP* is a clause,
$[\![RS_i\ IP]\!]^{c, s, w} = [\![IP]\!]^{<s(i), w>, s, w}$

When this lexical entry is adopted, we can obtain the desired meaning for Action Role Shift *if* we posit that an individual abstractor is added to guarantee that the role-shifted clause obtains a predicative type and can thus take an individual arugment, as is illustrated in the Logical Form in (62).

(62) IX-a λa RS_a [1-WALK-WITH-ENERGY $Ø_1$]

For Attitude Role Shift, something else is needed to trigger the intensional abstraction by which a centered proposition is obtained as the value of the embedded clause. This can be effected by a special operator (or by the semantics of the attitude verb) – for instance by the operator Op_i in (63), which will have the effect of binding the index i of RS_i in configurations such as (64).

(63) $[\![Op_i\ IP]\!]^{f, s, w} = \lambda x'.\ \lambda w'.\ [\![IP]\!]^{f, s[i \to x'], w'}$

(64) IX-a SAY Op_i RS_i [IX-1 WILL-LEAVE]

Option 2. An alternative is to treat the Role Shift operator as an intensional construction, one that immediately delivers a centered proposition by way of a 'diagonalization operator' that simultaneously shifts the context and the world parameter, as in (65) (note that the index i plays no semantic role in this analysis, unlike what is the case in Option 1).

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[32] Anand and Nevins 2004 also assumed a modal framework with context parameters (rather than context variables), and they posited an operator that replaces the context parameter with one whose coordinates are obtained from the world parameter (intensional abstraction was assumed to be triggered by composition rules when a clause was embedded under an attitude operator). By contrast, in (61) the 'new' elements of the context parameter are obtained from the Role Shift operator.

(65) $[\![RS_i\ IP]\!]^{c, s, w} = \lambda x'\ \lambda w'\ .\ [\![IP]\!]^{<x', w'>, s, w'} = 1$

When this option is chosen, the analysis of attitude reports is straightforward, but one must guarantee that in the case of Action Role Shift an individual and a world argument are provided to the role-shifted clause so it can yield a truth value in the end.

For reasons that will become apparent in Part II, we go with Option 2 in the body of this paper, but we develop Option 1 in Appendix III; both options are equally appropriate to handle the data we discuss in this part.[33]

7.2 A Context-Shifting Analysis: First Version

We will now sketch an implementation of our analysis within a trivalent model-theoretic framework, with the third value called # (the trivalence is necessary because we wish to analyze some cases of Action Role Shift as triggering a presupposition failure). To simplify notations, in the metalanguage we write as *leave'* the value of an object-language expression such as *LEAVE* (we assume that *leave'* takes its world argument in subscript notation, and its individual argument in functional notation – hence notations such as $leave'_w(x)$). For the rest, we assume a standard type-theoretic intensional logic with individual assignment functions, world and context parameters; and we take contexts to be just pairs of an individual and a world:[34]

(66) a. Let D be a set of individuals and let W be a set of possible worlds. The set of contexts is $C = D \times W$, and if $c \in C$ with $c = <x, w>$, we write the author coordinate of c as c_a (= x) and its world coordinate as c_w (= w).
b. As is standard, the type of individuals is written as e and the type of worlds is written as s.

Within this general framework, the definition of truth is entirely standard, as shown in (67).

(67) Definition of Truth (to be refined in (85))
If a sentence S is uttered by an individual x in a world w and if the assignment function s propertly represents the referential intentions of x in w with respect to the values of free variables in S,
S results in a presupposition failure iff $[\![S]\!]^{<x, w>, s, w} = \#$. If S does not result in a presupposition failure, S is true if and only if $[\![S]\!]^{<x, w>, s, w} = 1$

To develop Option 2, we define the context-shifting operator in (68):

(68) Semantics of $\overset{RS_i}{IP}$, written as $RS_i\ IP$

Let c be a context, s an assignment function and w a world. Then for any index i and clause *IP*,
$[\![RS_i\ IP]\!]^{c, s, w} = \lambda x'\ \lambda w'\ .\ [\![IP]\!]^{<x', w'>, s, w'}$

On this treatment, RS_i is a standard diagonalization operator within a Kaplanian logic of demonstratives (as noted, the subscript *i* plays no semantic role in this account; we keep it because it reflects how the Role Shift is realized). Hence we can follow simple analyses developed in the

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[33] Briefly, we go for Option 2 because a crucial rule in Part II will make reference to 'maximally iconic' interpretations of role-shifted clauses. This analysis is motivated by strong iconic effects found in Action Role Shift, but also by strong quotational effects seen in Attitude Role Shift. Now to derive the latter it is necessary to state that the role-shifted clause should maximally resemble some features of situation of speech/thought described by the relevant clause. This can achieved if we have a rule that requires that the form of $RS_i\ IP$ must maximally resemble some aspects of the situation corresponding to the relevant attitude *in the world of evaluation w*. For this reason, it is important that the world of evaluation of $RS_i\ IP$ should be the same as the world of evaluation of the attitude verb. This is unproblematic in Option 2, but not in Option 1: the latter requires that in Attitude Role Shift the construction $RS_i\ IP$ should be further embedded under an intensional operator Op_i which simultaneously binds the variable i *and shifts the world of evaluation*, as is the case in (63).

[34] This yields a broader class of contexts than in standard Kaplanian frameworks, as the contexts may be *improper*: the author of the context need not be an individual who exists and is speaking in the world of the context; see for instance Schlenker 2011c for discussion

literature to account for shifted indexicals (e.g. Schlenker 2003, 2011c, Anand and Nevins 2004, Anand 2006). The application of this context-shifting operator outside of attitude reports is unusual: to our knowledge, all formal discussions of context shift in the literature involve attitudes of some sort or other. But the analysis turns out to be unproblematic once it is assumed that sign language has access to covert world pronominals which can be 'fed' as arguments of the role-shifted clause in descriptions of actions.

❑ *Attitude Role Shift*

We start with the case of Attitude Role Shift. Consider (69)a, analyzed as in (69)b (since we leave time dependencies out of the present discussion, we treat *WILL-LEAVE* as a single atomic unit).

(69) RS_a_____
a. IX-a SAY IX-1 WILL LEAVE

b. IX-a SAY RS_a [IX-1 WILL-LEAVE]

We start with the standard assumption on the interpretation of first person pronouns in (70), which allows us derive the meaning of the role-shifted clause, as in (71):

(70) Let c be a context, s an assignment function and w a world. Then:
$[\![\text{IX-1}]\!]^{c, s, w} = c_a$

(71) Let c be a context, s an assignment function and w a world of evaluation.
$[\![RS_a\ [\text{IX-1 WILL-LEAVE}]]\!]^{c, s, w}$
$= \lambda x'.\ \lambda w'.\ [\![\text{IX-1 WILL-LEAVE}]\!]^{<x', w'>, s, w'}$
$= \lambda x'.\ \lambda w'.\ [\![\text{WILL-LEAVE}]\!]([\![\text{IX-1}]\!]^{<x', w'>, s, w'})$
$= \lambda x'.\ \lambda w'.\ \text{will-leave}'_{w'}(x')$

The final truth conditions can be obtained once we avail ourselves of a standard De Se semantics for attitude verbs, as in (72).

(72) a. Let $SAY_w(x)$ be the set of contexts compatible with what individual says in world w.
For object p of type <e, <s, t>> (where s is the type of worlds), for any individual x, for any context c, assignment function s and world w,

$[\![\text{SAY}]\!]^{c, s, w}(p)(x) = \#$ iff for some $c' \in SAY_w(x)$, $p(c'_a)(c'_w) = \#$. If $\neq \#$, $[\![\text{SAY}]\!]^{c, s, w}(p)(x) = 1$ iff for every $c' \in SAY_w(x)$, $p(c'_a)(c'_w) = 1$.
b. An analogous rule can be defined for *THINK*, replacing $SAY_w(x)$ with $THINK_w(x)$.

With these tools in hand, we can give a complete derivation of the truth conditions of (69)a, analyzed as in (69)b.

(73) $[\![(69)b]\!]^{c, s, w}$
$= [\![\text{SAY}]\!]^{c, s, w}([\![RS_a\ [\text{IX-1 WILL-LEAVE}]]\!]^{c, s, w})([\![\text{IX-a}]\!]^{c, s, w})$
$= [\![\text{SAY}]\!]^{c, s, w}(\lambda x'.\ \lambda w'.\ \text{will-leave}'_{w'}(x'))(s(a))$
$= 1$ iff for every $c' \in SAY_w(s(a))$, $\text{will-leave}'_{w'}(c_a) = 1$; 0 otherwise.

In other words, we obtain a De Se reading according to which in every context c' compatible with what the agent s(a) says in the world of evaluation w, the agent of c' will leave in the world of c'. This seems appropriate: as we argued in Section 3.4, ASL role-shifted clauses under attitude verbs are indeed read De Se.

There has been a subtle debate in spoken language semantics to determine whether in the absence of dedicated De Se constructions (such as control and logophoric pronouns), standard English-style pronouns are only read De Re, or are ambiguously De Re or De Se. The majority opinion seems to be for an ambiguity view (see for instance Schlenker 2011c for a brief survey). We will not attempt to address the empirical side of the question for non-role-shifted clauses in sign language. But on a formal level it is worth noting that De Re and De Se readings without Role Shift can be obtained on the basis of the covert operator Op_i (optionally binding an individual variable *i*) defined as in (74).

(74) For any clause *F*, context c, assignment function s and world w,
$[\![Op_i\ F]\!]^{c, s, w} = \lambda x'.\ \lambda w'.\ [\![F]\!]^{c, s[i \rightarrow x'], w'}$

To see that the entry in (74) predicts an ambiguity, consider the two Logical Forms in (75).

(75) a. No Role Shift, De Se Reading
IX-a SAY Op_a [IX-a WILL-LEAVE]

b. No Role Shift, De Re Reading
IX-a SAY Op_i [IX-a WILL-LEAVE]

In (75)a, the empty operator *Op_a* binds the embedded pronoun *IX-a*, with the result that the latter gets a De Se reading, as shown in (76)a. In (76)b, the empty operator *Op_i* gets a different index, with the result that it doesn't bind any individual variable in the embedded clause, and that *IX-a* gets a De Re reading.[35] (Note that in all cases, the empty operator abstracts over a world parameter).

(76) a. Denotation of the complement of *SAY* in (75)a
$[\![Op_a$ [IX-a WILL-LEAVE] $]\!]^{c, s, w}$ $= \lambda x'.\ \lambda w'.\ [\![$ IX-a WILL-LEAVE$]\!]^{c, s[a \rightarrow x'], w'}$
$= \lambda x'.\ \lambda w'.$ x' will leave in w'; 0 otherwise

b. Denotation of the complement of *SAY* in (75)b
$[\![Op_i$ [IX-a WILL-LEAVE] $]\!]^{c, s, w}$ $= \lambda x'.\ \lambda w'.\ [\![$ IX-a WILL-LEAVE$]\!]^{c, s[i \rightarrow x'], w'}$
$= \lambda x'.\ \lambda w'.$ s(a) will leave in w'; 0 otherwise

- *Action Role Shift*

Let us turn to Action Role Shift, illustrated in (77)a, which we analyze with a Role Shift operator as in (77)b.

(77) RS_a_____
a. IX-a 1-WALK-WITH-ENERGY(CL-ONE)

b. **w*** IX-a RS_a [1-WALK-WITH-ENERGY(CL-ONE) **$Ø_1$**]

In order for (77)b to yield an interpretable sentence, it must include two unpronounced elements, which appear in bold.
–Because our Role Shift operator is intensional, its output is a meaning of type <e, <s, t>>. The argument *IX-a* can 'fill' the individual slot, but we still need a world argument to obtain a truth value in the end. We assume that the object language contains an unpronounced world term *w**, which is intended to denote the world of evaluation and is defined below.[36]
–In line with Schlenker et al. 2013, we take a directional verb that indexes a locus *i*, such as *i-WALK-WITH-ENERGY*, to trigger a presupposition that its argument has the same denotation as *i*. In line with Lillo-Martin 1991 and Lillo-Martin and Meier 2011, we take directional verbs to license null arguments, hence the presence of the null pronoun *$Ø_1$*, which we take to denote the speaker of the context.

Our main semantic assumptions are outlined in (78), and they allow us to provide truth conditions for (77)b in (79).

(78) Preliminary assumptions (to be extended and refined in (87))
For any context c, assignment function s, and world w:
a. $[\![$1-WALK-WITH-ENERGY$]\!]^{c, s, w}$(x) = # unless x = c_a. If ≠ #, $[\![$1-WALK-WITH-ENERGY $]\!]^{c, s, w}$ (x) = 1 iff x walks with energy in w.
b. $[\![Ø_1]\!]^{c, s, w} = c_a$

[35] In more sophisticated accounts of attitude reports, De Re readings are obtained by a more complex mechanism of quantification over implicit descriptions; see for instance Schlenker 2011c for a recent overview in connection with the De Re/De Se distinction.
[36] An alternative would have been to define a syncategorematic rule by which (77)a can be 'fed' the world parameter as a world argument. We find the solution adopted in the text to be more transparent.

c. If $i \neq 1$, $[\![\text{IX-i}]\!]^{c,s,w} = s(i)$
d. $[\![\text{IX-1}]\!]^{c,s,w} = c_a$
e. $[\![\text{w*}]\!]^{c,s,w} = w$

(79) Let c = <x, w> be the context of utterance, s an assignment function that represents the speaker's referential intentions.
$[\![(77)\text{b}]\!]^{<x,w>,s,w}$
$= [\![\text{RS}_a\ [\text{1-WALK-WITH-ENERGY(CL-ONE)}\ \emptyset_1]]\!]^{<x,w>,s,w}\ ([\![\text{IX-a}]\!]^{<x,w>,s,w})\ ([\![\text{w*}]\!]^{<x,w>,s,w})$
$= [\lambda x'.\ \lambda w'.\ [\![\text{1-WALK-WITH-ENERGY(CL-ONE)}\ \emptyset_1\ ]\!]^{<x',w'>,s,w'}](s(a))\ (w)$
$= [\![\text{1-WALK-WITH-ENERGY(CL-ONE)}]\!]^{<x',w'>,s,w'}(s(a))(w)$
= walk-with-energy'(s(a))(w)

The analysis is straightforward and delivers the intuitively correct truth conditions: despite the context shift, the sentence ends up claiming that the denotation of the subject pronoun *IX-a* walked away with energy in the world of the context c.

7.3 Typology of indexicals and Refinements of the Analysis

❑ *A simple presuppositional analysis*

As we saw, all indexicals we have tested in ASL and LSF are permissible in Attitude Role Shift, but only one of them – the first person agreement marker – was consistently acceptable under Action Role Shift. One could initially try to capture this contrast as a lexical difference between indexicals that are presupposed to be evaluated with respect to a speech/thought context and indexicals that can be evaluated with respect to any context whatsoever; this mirrors the distinction between 'proper contexts', whose author is the agent of a speech act in the world of evaluation, and 'improper contexts', which fail this condition (e.g. Predelli 1998). We illustrate the lexical entries for ASL in (80) (note that we do not include the unpronounced world term *w** in this list because the semantics we gave it in (78)e is world- rather than context-dependent, and thus does not qualify as an 'indexical'); first person agreement verbs and the null first person pronoun $\emptyset_1$ impose no particular requirements on the context with respect to which they are evaluted, whereas other indexicals 'want' to be evaluated with respect to a context of speech/thought. (As noted before, we do not provide a formal treatment of time dependency in this piece – or for that matter of locations *per se*; for present purposes, we can take temporal and locative expressions to denote elements of the set D of individuals).

(80) a. $[\![\text{1-WALK-WITH-ENERGY}]\!]^{c,s,w}(x) = \#$ unless $x = c_a$. If $\neq \#$, $[\![\text{1-WALK-WITH-ENERGY}\ ]\!]^{c,s,w}(x) =$ 1 iff x walks with energy in w.
b. $[\![\emptyset_1]\!]^{c,s,w} = c_a$
c. $[\![\text{IX-1}]\!]^{c,s,w} = \#$ unless c is the context of a speech or thought act. If $\neq \#$, $[\![\text{IX-1}]\!]^{c,s,w} = c_a$
d. $[\![\text{TOMORROW}]\!]^{c,s,w}$ = unless c is the context of a speech or thought act. If $\neq \#$, $[\![\text{TOMORROW}]\!]^{c,s,w}$ = the day following the time of c
e. $[\![\text{HERE}]\!]^{c,s,w}$ = unless c is the context of a speech or thought act. If $\neq \#$, $[\![\text{HERE}]\!]^{c,s,w}$ = the place of c

–Under some appropriate assumptions, all indexicals will be acceptable under the attitude verbs *SAY* and *THINK*. The necessary assumptions are stated in (81)a-b:

(81) Let $\text{SAY}_w(x)$ and let $\text{THINK}_w(x)$be the set of contexts compatible with what individual says and thinks in world w.
a. For every world w and individual x, for every context c in $\text{THINK}_w(x)$ is a context of speech/thought.
b. For every world w and individual x, for every context c in $\text{SAY}_w(x)$ is a context of speech/thought.

(81)a can be justified by a kind of 'awareness' condition: if a context c is compatible with what x thinks in w, then c is itself a context of thought. This would enforce patterns of reasoning of the form: *If x thinks that p, x thinks that x is thinking and also that p* (though all we need for the theory is the weaker condition: *If x thinks that p, x thinks that x is thinking or speaking, and also that p*).
(81)b can be justified by a kind of 'manifestation' condition: if a context c is compatible with what x say in w, then c is itself a context of speech or thought. This would enforce patterns of reasoning of the form: *If x says that p, x says that x is thinking or saying something, and also that p*.

(81)b is harder to justify on intuitive grounds than (81)a.[37]

–Under Action Role Shift, the presupposition that the context of evaluation of some indexicals is one of speech/thought will usually fail – though one could also make the necessary *accommodation* to satisfy this presupposition. But on closer inspection, this analysis fails to explain why in ASL we *fail* to get an inference that the action was in fact taken (we are more cautious about LSF, where inferential judgments were less clear). To make this concrete, consider (82)a, analyzed for simplicity as (82)b (where *EMAIL-rep-FRIENDS* is treated as an intransitive verb). In a nutshell, if *a* denotes John and *w** denotes the actual world c_w, we just predict that the presence of *IX-1* triggers a presupposition that the derived context <John, c_w> is a context of speech or thought. But the actuality entailments of the extensional context would *still* follow: when this presupposition is satisfied (by way of accommodation), the sentence would still entail that John did in fact email his friends. By contrast, the intuitive result we obtained from our informant is that it does *not* follow that John emailed his friends, only that he *said/thought* that he did.

(82) RS_a_____
a. IX-a IX-1 1-EMAIL-rep FRIENDS

b. w* IX-a RS_a [IX-1 1-EMAIL-rep-FRIENDS]

c. Suppose (a), analyzed as (b), is uttered by an individual x in a world w. As is standard in trivalent accounts, we assume that a predicate denotation yields # if one of its arguments is itself #.

$[\![(b)]\!]^{<x, w>, s, w}$ = $[\lambda x'. \lambda w'. [\![\text{IX-1 1-EMAIL-rep-FRIENDS}]\!]^{<x', w'>, s, w'}]([\![\text{IX-a}]\!]^{<x, w>, s, w})([\![\text{w*}]\!]^{<x, w>, s, w})$
= $[\![\text{IX-1 1-EMAIL-rep-FRIENDS}]\!]^{<s(a), w>, s, w}$
= $[\![\text{1-EMAIL-rep-FRIENDS}]\!]^{<s(a), w>, s, w}([\![\text{IX-1}]\!]^{<s(a), w>, s, w})$
= 1-

Thus given (80)c
$[\![(b)]\!]^{<x, w>, s, w}$ = # iff <s(a), w> is not a context of thought or speech. Otherwise,
$[\![(b)]\!]^{<x, w>, s, w}$ = s(a) repeatedly emails friends in w.

[37] In some cases, the inference is necessary for purposes of presupposition projection. The (real life) example in (ib) might be a case in point. Its direct discourse counterpart is in (ia).

(i) a. George Wallace: I believe we should put down riots in the streets. <u>In saying this</u>, I will be called a racist.

b. George Wallace has said that he believed we should put down riots in the streets. He also said, that <u>in saying this</u>, he would be called racist. (Obtained on January 7, 2014 at http://news.google.com/newspapers?nid=1356&dat=19680806&id=4tMpAAAAIBAJ&sjid=TwUEAAAAIBAJ&pg=4136,1139368)

The underlined expression of the second sentence presumably triggers a presupposition that the speaker indeed said something (for instance, the relevance inference is preserved in negative environments, e.g. in *I doubt that, in saying that the riots should be put down, Wallace will be called a racist)*. Within a dynamic analysis, the desired presupposition is satisfied in (ia) if we assume that the contexts that 'survive' the update with the first clause are not just ones in which the speaker holds certain beliefs, but rather contexts *that correspond to a speech event* and in which Wallace holds the relevant beliefs. The same analysis could be applied to the second sentence of (ib), where *in saying this* appears in the scope of *said*. A simple-minded analysis of presupposition projection in the second sentence would yield a requirement that each context compatible with Wallace's claims is one in which something was said. For the first sentence of (ib) to license the presupposition of the second sentence, we need to assume that each context compatible with what Wallace says is itself a context of speech. This licenses an inference of the form: *If Wallace says that p, Wallace says that Wallace is saying something, and also that p*. Of course it would remain to be seen whether this kind of rule is needed in full generality rather than to handle this special case.

❑ *A more complex presuppositional analysis*

In order to obtain more adequate results, we will now distinguish formally between two types of contexts:
–Primitive contexts, of the form $<x^c, w^c>$, where x is an individual, w is a world, and the superscript C indicates that there are speech or thought contexts. (Formally, we can take $x^c = <x, c>$, and $w^c = <w, c>$, where c is a single, distinguished object.)
–Derived contexts, of the form <x, w>, where x is an individual and world is a world.
The necessary assump5tions are stated in (83).

(83) Contexts
Let D be the set of individuals, let W be the set of possible worlds, and let c be a distinguished object outside of D and outside of W.
a. Primitive contexts are members of $C^+ = (D \times \{c\}) \times (W \times \{c\})$.
b. Derived contexts are members of $C = D \times W$, where D is the set of individuals and W is the set of possible worlds.
c. Revised definitions of c'_a and c'_w
If $c' \in C$, c'_a = the first coordinate of c'; c'_w = the second coordinate of c'.
If $c' \in C^+$, c'_a = the first coordinate of the first coordinate of c'; c'_w = the first coordinate of the second coordinate of c'.

In our type-theoretic system, e refers to the type of individuals and s to the type of worlds. Because we now have 'normal' individuals and worlds and 'contextual' individuals and worlds, these types will have to be redefined:

(84) Types
Let D, W and e be as in (83).

a. Standard definition:	e = D;	s = W
b. Revised definition:	$e = D \cup (D \times \{c\})$	$s = W \cup (W \times \{c\})$

The definition of truth in (85) guarantees that the initial context of evaluation counts as a 'primitive context'. The semantic stipulations in (86) guarantee that all the contexts compatible with an individual's claims or thoughts count as primitive contexts.

(85) Definition of Truth (revised)
If a sentence S is uttered by an individual x in a world w and if the assignment function s propertly represents the referential intentions of x in w with respect to the values of free variables in S,
S results in a presupposition failure iff $[\![S]\!]^{<x^c, w^c>, s, w} = \#$. If S does not result in a presupposition failure, S is true if and only if $[\![S]\!]^{<x^c, w^c>, s, w} = 1$.

(86) Let x be an individual and let w be a possible world, and let $SAY_w(x)$ be the set of contexts compatible with what individual says in world w and let $THINK_w(x)$ set of contexts compatible with what individual thinks in world w. Then $SAY_w(x)$ and $THINK_w(x)$ are sets of primitive contexts, i.e.:

$SAY_w(x) \subseteq (D \times \{c\}) \times (W \times \{c\})$
$THINK_w(x) \subseteq (D \times \{c\}) \times (W \times \{c\})$

Within this modified system, we can state the extended and revised lexical entries in (87).

(87) Revised lexical entries
Let c be a (primitive or derived) context, let s be an assignment function, let w be a possible world and let x be an individual.
a. $[\![1\text{-WALK-WITH-ENERGY}]\!]^{c, s, w}(x) = \#$ unless $x = c_a$. If $\neq \#$, $[\![1\text{-WALK-WITH-ENERGY}]\!]^{c, s, w}(x) = 1$ iff x walks with energy in w.
b. $[\![\emptyset_1]\!]^{c, s, w} = c_a$
c. $[\![IX\text{-}1]\!]^{c, s, w} = \#$ unless $c \in C^+ (= (D \times \{c\}) \times (W \times \{c\}))$. If $\neq \#$, $[\![IX\text{-}1]\!]^{c, s, w} = c_a$[38]
d. $[\![TOMORROW]\!]^{c, s, w} = \#$ unless $c \in C^+$. If $\neq \#$, $[\![TOMORROW]\!]^{c, s, w}$ = the day following the time corresponding to c.

[38] Note that by (83)c, c_a does not contain a diacritic even though the coordinates of c, which belongs to C^+, do contain diacritics, since c is of the form $<x'^c, w'^c>$.

e. $[\![\text{HERE}]\!]^{c, s, w}$ = # unless $c \in C^+$. If ≠ #, $[\![\text{HERE}]\!]^{c, s, w}$ = the place corresponding to c.
(Note that lines d. and e. only make full sense within an extension of the present system with times and locations.)
f. $[\![w^*]\!]^{c, s, w} = w$

The entries for the expressions in (87)a, b, f are identical to what they were before, and they do not impose any special constraints on the types of contexts they can depend on. Things are different in (87)c-e: *IX-1*, *TOMORROW* and *HERE* are taken to yield presupposition failures unless they depend on primitive contexts.

At this point, our analysis predicts a simple presupposition failure when *IX-1*, *TOMORROW* or *HERE* appear under Action Role Shift, as is illustrated in (88). For simplicity, we consider a plain verb (rather than the agreement verb *1-EMAIL-rep*, which appeared in our earlier examples with first person agreement).

(88) a. w* IX-a RS_a [IX-1 LEAVE]
b. Let c be a primitive context, with world coordinate c_w, and let s be an assignment function. As before, we assume that a predicate denotation one of whose arguments is # yields # as a value.
$[\![(a)]\!]^{c, s, c_w}$
$= [\lambda x'. \lambda w'. [\![\text{IX-1 LEAVE}]\!]^{<x', w'>, s, w'}](s(a))(c_w)$
$= [\![\text{IX-1 LEAVE}]\!]^{<s(a), c_w>, s, c_w}$
$= [\![\text{LEAVE}]\!]^{<s(a), c_w>, s, c_w}([\![\text{IX-1}]\!]^{<s(a), c_w>, s, c_w})$
$= \text{leave}'_{c_w}(\#)$
$= \#$

Note that accommodation is not a plausible process to 'save' this sentence: there is no plausible way to accommodate the assumption that the derived context $<s(a), c_w>$ is primitive, since whether a context is primitive or not depends on the operators by which it was introduced, and hence on the linguistic properties of the sentence, which should be common knowledge and not subject to accommodation.

As noted, in ASL sentences with full first person pronouns under Role Shift without an overt attitude operator can be rescued by an attitude reinterpretation. Our account does not capture this fact yet, but the addition in (89) will.

(89) Rescue strategy in ASL
If a sentence results in a presupposition failure because it contains a role-shifted clause RS_a ___ which is not embedded under an attitude operator, re-interpret that clause as ~~*SAY*~~ RS_a ___ , where ~~*SAY*~~ is a covert version of *SAY*.

Let us illustrate. As seen in (88), (90)a results in a presupposition failure when evaluated with respect to the parameters c, s, c_w. The rescue strategy in (89) can thus be applied, leading to the Logical Form in (90)b, with the truth conditions in (90)c.

(90) a. w* IX-a RS_a [IX-1 LEAVE]
b. w* IX-a ~~SAY~~ RS_a [IX-1 LEAVE]
c. $[\![(b)]\!]^{c, s, c_w}$
$= [\![\sout{\text{SAY}}\ RS_a\ [\text{IX-1 LEAVE}]]\!]^{c, s, c_w}(s(a))(c_w)$
$= [\![\sout{\text{SAY}}]\!]^{c, s, c_w}(\lambda x'. \lambda w'. [\![\text{IX-1 LEAVE}]\!]^{<x', w'>, s, w'})(s(a))(c_w)$
$= [\![\sout{\text{SAY}}]\!]^{c, s, c_w}(\lambda x'. \lambda w'. \#$ unless $<x', w'> \notin C^+$; otherwise, $\text{leave}'_{w'}(x'))(s(a))(c_w)$
$= \#$ iff for some $c' \in \text{SAY}_{c_w}(s(a))$, $p(c'^{c}_{a})(c'^{c}_{w}) = \#$; otherwise, 1 iff for every $c' \in \text{SAY}_{c_w}(s(a))$, $p(c'^{c}_{a})(c'^{c}_{w})$
$= 1$, with $p = \lambda x'. \lambda w'. \#$ unless $<x', w'> \notin C^+$; otherwise, $\text{leave}'_{w'}(x')$,
Since by construction for every $c' \in \text{SAY}_{c_w}(s(a))$, $<c'^{c}_{a}, c'^{c}_{w}> \in C^+$, the failure conditions are never met, and thus:
$[\![(b)]\!]^{c, s, c_w} \neq \#$, and $[\![(b)]\!]^{c, s, c_w} = 1$ iff for every $c' \in \text{SAY}_{c_w}(s(a))$, $\text{leave}'_{c'_w}(c'_a)$

8 Conclusion

Two positive conclusions can be drawn from our investigations.

(i) As we saw, Attitude Role Shift could be treated in terms of quotation or context shift. We gave some cautious arguments against an analysis in terms of standard quotation because in ASL *wh*-extraction is possible out of role-shifted clauses under attitude verbs, but this argument does not exclude an analysis in terms of partial quotation. The main argument against a quotational analysis is that it is *insufficiently general*, as it fails to account for Action Role Shift. The latter presents its own complexities, since most indexicals *cannot appear under it*, both in our ASL and in our LSF data. But it would be misguided to propose an analysis without context shift, since the fact that Action Role Shift *blocks* the appearance of most indexicals suggests that it does in fact affect them. Our final analysis captures this observation: most indexicals are required to depend on 'primitive contexts' and yield failures when they are evaluated under a non-primitive one; first person agreement markers are more liberal, and can be evaluated under any context whatsoever.

(ii) While most of our discussion focused on ASL and LSF, the typology of context-shifting constructions found in sign language illuminates broader questions about context-dependency in language.
–First, we saw that the typological contrast between German and Catalan Sign Language on the one hand, and American and French Sign Language on the other, seems to mirror a typological difference found in spoken languages between languages that allow attitude reports to 'mix perspectives' and ones that require that indexicals 'shift together'. A word of caution should be added, however: in the future, comparative work on all four languages should be conducted *with the very same elicitation techniques* in order to ensure that the differences we found are not due to methodological rather than substantive differences.
–Second, the existence of Action Role Shift adds something to the typology that has been described for spoken languages, since no uncontroversial cases of context shift without attitude reports have been described in that domain. If no such cases can be found, it will remain to ask why this is.

Several questions are left for future research at this point.

(i) First, we have not attempted to develop a *general* framework that can handle Role Shift data from American, French, German and Catalan sign languages. Since in the latter two languages indexicals that appear in a given role-shifted clause may be interpreted with respect to different contexts, it seems likely that a more expressive framework is needed than was the case in the present piece. It would seem reasonable to posit context *variables* (rather than context parameters in the object language) for these cases. The question, then, is how an analysis with context *parameters* can in the end be restated within an analysis with context *variables*; or to put it generally, how an intensional analysis can be reconstructed within an extensional one. See for instance Schlenker 2011c for a brief discussion of this point.

(ii) Second, our final analysis encoded in the semantics – by way of a distinction between 'primitive' and 'derived' context – the requirement that some indexicals should be evaluated with respect to the actual or to a reported speech act, rather than with respect to some other context. In analyses with context variables (or some equivalent based on tuples of variables), the same type of constraints were stated by way of diacritics that appeared in the object language, and were in some cases subject to rules of feature agreement. This was in particular the case in the analyses developed in Schlenker 1999 and Stechow 2002. In effect, for lack of variables the present analysis had to put the diacritics in the semantics rather than in the syntax – hence the appearance of semantic objects of the form <x, c> (notated as x^c). Here too, future research should develop a more general framework to capture the full typology of indexical dependencies.

(iii) Third, even when concentrating on single informant with repeated judgments, we saw that in LSF there was some uncertainty as to the correct generalizations concerning Action Role Shift. And some points that seemed to be established are entirely mysterious on the present approach. While we can explain why overt indexicals lead to deviance or lead to an attitude reinterpretation under (apparent) Action Role Shift in LSF, the fact that non-indexical nouns sometimes trigger the same kind of reinterpretation process (as in (43)a) is mysterious (and the mixed pattern found in (43)b is even more surprising).

(iv) In addition, the main generalizations should of course be tested with further informants. When our ASL and our LSF informants have stable judgments that converge, it is reasonable to infer that the relevant patterns are rather robuts. When they diverge, this may be due to robust differences between ASL and LSF as such, or to more tenous differences across *informants* – ones that could in principle be replicated internal to ASL or internal to LSF; in such cases, obtaining more data is of clear import.

Finally, the present analysis has several shortcomings. These are laid out in Part II, where an upgraded version of the present analysis will be developed. Let us mention some of the problems that will be raised:
–Even within ASL, it turns out that further tests of indirect discourse based on NPI licensing yield results that *contradict* those based on *wh*-extraction. In this respect, the data do *not* fit the simple pattern we predict at this point.
–More importantly, ASL and LSF Attitude Role Shift has a strong quotational component which is entirely missed by the present analysis.
–Finally, ASL and LSF Action Role Shift has a strong iconic which is equally missed by the present analysis.
Part II accounts for these problems within an extension of the present analysis in which Role Shift can make reference to iconic conditions.

Appendix I.
De Se Readings and Binding

In order to assess the availability of De Se and non-De Se readings under binding in ASL, we asked our informant to assess the sentence in (91) under different scenarios.

(91) 19, 136
10 BOY IX-arc-a EACH-a-rep THINK
a. IX-a SIGN GOOD.

b. RS_a_____
IX-1 SIGN GOOD.
(ASL, 19, 136).

–In Scenario 1, each of the relevant agents has a non-De Se thought about himself. The report in standard indirect discourse is taken to be acceptable and true; the report with a Role Shift and an embedded first person pronoun is judged to be degraded and false. This suggests that the first person pronoun under Role Shift is obligatorily read De Se.

(92) Scenario 1: We showed 10 boys lots of videos of people's hands signing – including videos of each of them signing. None of them recognizes himself, and says [about himself]: 'He signs well'
Assessment of (91)a: 6; true
Assessment of (91)b: 2; not true

–In Scenario 2, some agents have a De Se thought about themselves, while others have a non-De Se thought about themselves. The report in standard indirect discourse is judged to be acceptable and true, while the report with a first person pronoun under Role Shift is taken to be degraded and false – again an argument that the role-shifted first person pronoun is only read De Se.

(93) Scenario 2: We showed 10 boys lots of videos of people's hands signing – including videos of each of them signing. Some of them recognize themselves, and each of those says: 'I sign well'. Some of them don't recognize themselves, and each [about himself]: 'He signs well'
Assessment of (91)a: 6; true [but see the full ratings in Appendix IV]
Assessment of (91)b: 2.5; not true

–In Scenario 3, by contrast, each of the relevant agents has a De Se thought about himself. In this case starndard indirect discourse and Role Shift with a first person pronoun are entirely acceptable, and true. The contrast between this case and Scenarios 1 and 2 suggests that the role-shifted first person pronoun is indeed read De Se.

(94) Scenario 3: We showed 10 boys lots of videos of people's hands signing – including videos of each of them signing. Each of them recognizes himself, and says: 'I sign well'
Assessment of (91)a: 7; yes
Assessment of (91)b: 7; yes

Appendix II.
Wh-extraction out of Role Shift and Quotation in ASL

In this Appendix, we provide data pertaining to wh-extraction out of standard indirect discourse, Attitude Role Shift, and the quotational operator "". It is striking that, of our main ASL informant, the latter two constructions behave on a par.

We start with cases of extraction out of standard indirect discourse. The *wh*-word can appear in sentence-initial or in sentence-final position, or in both (doubling with the interrogative word in sentence-initial and in situ leads to deviance, however).

(95) *Context:* The speaker is in NYC; the listener was recently in LA with John.

BEFORE IX-a JOHN IN LA,
a. 6.7 WHO IX-a SAY IX-a WILL LIVE WITH THERE
b. 6 IX-a SAY IX-a WILL LIVE WITH THERE WHO
c. 7 WHO IX-a SAY IX-a WILL LIVE WITH THERE WHO
d. 3.7 WHO IX-a SAY IX-a WILL LIVE WITH WHO THERE
'While John was in L.A., who did he say he would live with there?'
(ASL, 14, 93)

The very same patterns of acceptability are found under Attitude Role Shift, which suggests that in ASL the latter allows for *wh*-extraction (unlike what we saw in our LSF data).

(96) *Context:* The speaker is in NYC; the listener was recently in LA with John.

BEFORE IX-a JOHN IN LA,
a. RS_a_____
5.7 WHO IX-a SAY IX-1 WILL LIVE WITH HERE ?
b. RS_a_____
6.3 IX-a SAY IX-1 WILL LIVE WITH HERE WHO?
c. RS_a_____
6.7 WHO IX-a SAY IX-1 WILL LIVE WITH HERE WHO ?
d. RS_a_____
2.7 WHO IX-a SAY IX-1 WILL LIVE WITH WHO HERE ?
'While John was in L.A., who did he say he would live with there?'
(ASL, 14, 91)

Finally, the same patterns are also found without (visible) Role Shift but with the use of the quotational operator "". Thus we must conclude that either (i) "" is not really a quotation operator, but rather a variety of Role Shift; or that (ii) it is genuinely a variety of quotation – in which case we must conclude that quotation marks do not block *wh*-extraction in ASL.

(97) *Context:* The speaker is in NYC; the listener was recently in LA with John.

BEFORE IX-a JOHN IN LA,
a. WHO IX-a SAY ""IX-1 WILL LIVE WITH HERE ?
b. IX-a SAY ""IX-1 WILL LIVE WITH HERE WHO ?
c. WHO IX-a SAY "IX-1 WILL LIVE WITH HERE" WHO ?
d. WHO IX-a SAY ""IX-1 WILL LIVE WITH WHO HERE ?
Approximate translation: 'While John was in L.A., who did he say he would live with there?'
(ASl, 14, 89)

Appendix III. An Extensional Role Shift Operator

In this Appendix, we define a Role Shift operator that shifts the context parameter without simultaneously abstracting over some parameters. As before, we disregard all time dependencies, and relativize truth to a context c, an assignment function s and a world of evaluation w. The semantics of the Role Shift operator is defined in (98). We assume that it affects the value of the entire *IP* constituent which is its sister, and for simplicity we write RS_i before the constituent it applies to rather than above it. (In principle, the two notations could encode different things; our present notation suggests that RS_i applies to an entire constituent, whereas the standard notation would make it possible to indicate that the domain of RS_i applies to a string that need not be a constituent.) As in the main text, we assimilate contexts to pairs of the form <agent of the context, world of the context>.

The extensional Role Shift operator is defined in (98):

(98) Semantics of RS_i *IP*, written as RS_i *IP*

Let c be a context, s an assignment function and w a world. Then for any index i and clause *IP*,
$[\![RS_i\ IP]\!]^{c, s, w} = 1$ iff $[\![IP]\!]^{<s(i), w>, s, w} = 1$

The effect of the operator RS_i is quite simple: it shifts the context parameter from c to a new context c' obtained by putting together the world of evaluation w and the individual s(i) whose perspective is adopted. Note that nothing in this rule guarantees that the new context <s(i), w> is a context of speech or of thought.

❑ *Action Role Shift*

Let us see how this rule can account for the case of Action Role Shift in (99)a, already discussed above. We start with the smaller constituent in (99)b, written in operator notation as in (99)c:

(99) a. IX-a RS_a 1-WALK-WITH-ENERGY(CL-ONE)

b. RS_a 1-WALK-WITH-ENERGY(CL-ONE)

b'. RS_a 1-WALK-WITH-ENERGY(CL-ONE)

To obtain an interpretation, we first need to make some assumptions about the interpretation of directional verbs. In line with Schlenker et al. 2013, we take a directional verb that indexes a locus *i*, such as *i-WALK-WITH-ENERGY*, to trigger a presupposition that its argument has the same denotation as *i*. In line with Lillo-Martin 1991 and Lillo-Martin and Meier 2011, we take directional verbs to license null arguments. For simplicity, we restrict attention to a first person version of *1-WALK-WITH-ENERGY,* which we take to license a null argument $Ø_1$, with the semantic assumptions in (78), copied in (100):

(100) Assumptions (to be refined)
For any context c, assignment function s, and world w:
a. $[\![\text{1-WALK-WITH-ENERGY}]\!]^{c, s, w}(x) = \#$ unless $x = c_a$. If $\neq \#$, $[\![\text{1-WALK-WITH-ENERGY}]\!]^{c, s, w}(x) = 1$ iff x walks with energy in w.
b. $[\![Ø_1]\!]^{c, s, w} = c_a$
c. If $i \neq 1$, $[\![\text{IX-i}]\!]^{c, s, w} = s(i)$
d. $[\![\text{IX-1}]\!]^{c, s, w} = c_a$
e. $[\![w^*]\!]^{c, s, w} = w$

In this way, we obtain for (99)b' the meaning in (101):

(101) Meaning of (99)b'
$[\![RS_a\ [\text{1-WALK-WITH-ENERGY}\ Ø_1]]\!]^{c, s, w}$
$= [\![\text{1-WALK-WITH-ENERGY}\ Ø_1]\!]^{<s(a), w>, s, w}$,
$= [\![\text{1-WALK-WITH-ENERGY}]\!]^{<s(a), w>, s, w}([\![Ø_1]\!]^{<s(a), w>, s, w})$,

= [[1-WALK-WITH-ENERGY]]$^{<s(a), w>, s, w}$(s(a)),
= 1 iff s(a) walks with energy in w; 0 otherwise.

We can easily account for the 'real' sentence in (99)a by assuming that the initial pronoun *IX-a* triggered λ-abstraction, as in the representation in (102)b, where we have used the operator notation, and we have included the null argument licensed by the directional verb. (Note that we assume that the same locus can have free and bound uses, which is probably needed on independent grounds when one analyzes bound readings of various sentences with ellipsis and *only*-constructions; see for instance Schlenker 2013.)

(102) RS_a_____
a. IX-a 1-WALK-WITH-ENERGY(CL-ONE)

b. IX-a λa RS_a [1-WALK-WITH-ENERGY $Ø_1$]

The derivation of the final truth conditions is straightforward, as shown in (103):

(103) [[(99)b']]$^{c, s, w}$ = [[λa RS_a [1-WALK-WITH-ENERGY $Ø_1$]]]$^{c, s, w}$([[IX-a]]$^{c, s, w}$)
= λx [[RS_a [1-WALK-WITH-ENERGY $Ø_1$]]]$^{c, s[a->x], w}$(s(a))
= λx [[1-WALK-WITH-ENERGY $Ø_1$]]$^{<s(a), w>, s[a->x], w}$(s(a))
= λx. [# iff x ≠ s[a->x](x); 1 iff x walks with energy in w](s(a))
= 1 iff s(a) walks with energy in w.

❑ *Attitude Role Shift*

Let us now consider the case of Attitude Role Shift. We will posit that the very same operation is at work as in Action Role Shift, but that in addition an operator *Op* associated with an empty complementizer has the effect of abstracting over an individual argument and a world parameter, as in (104). (Alternatively, we could have assumed that a syncategorematic rule of intensional abstraction, rather than the complementizer itself, is responsible for this result.)

(104) For any clause *F*, context c, assignment function s and world w,

[[Op_i F]]$^{c, s, w}$ = λx'. λw'. [[F]]$^{c, s[i -> x'], w'}$

We can immediately apply this lexical entry to the case of Attitude Role Shift in (105)a-b, which has the Role Shift operator RS_a, whose individual argument is bound by the empty operator Op_a. Since we leave time dependencies out of the present discussion, we treat *WILL-LEAVE* as a single atomic unit.

(105) RS_a_____
a. IX-a SAY IX-1 WILL LEAVE

b. IX-a SAY Op_a RS_a [IX-1 WILL-LEAVE]

We start by computing the meaning of the role-shifted clause without the empty operator Op_a; the result is given in (106), which is obtained in the same way as (100):

(106) [[RS_a [IX-1 WILL-LEAVE]]]$^{c, s, w}$ = [[IX-1 WILL-LEAVE]]$^{<s(a), w>, s, w}$(s(a))
= 1 iff s(a) will leave in w; 0 otherwise.

Applying the rule in (104), we obtain the value of the sister of *SAY:*

(107) [[Op_a RS_a [IX-1 WILL-LEAVE]]]$^{c, s, w}$
= λx'. λw'. [[RS_a [IX-1 WILL-LEAVE]]]$^{c, s[a-> x'], w'}$
= λx'. λw'. s[a-> x'](a) will leave in w'; 0 otherwise
= λx'. λw'. x' will leave in w'; 0 otherwise

The denotation defined in (107) is a centered proposition, which is isomorphic to a set of contexts – which is precisely the right kind of object to 'feed' to an attitude verb in order to obtain a De Se reading. The final truth conditions can be obtained once we have availed ourselves of a standard De Se semantics for attitude verbs, as in (108).

(108) Let $SAY_w(x)$ be the set of contexts compatible with what individual says in world w.
For object p of type <e, <s, t>> (where s is the type of worlds), for any object x of type e, for any context c, assignment function s and world w,

$[\![\text{SAY}]\!]^{c, s, w}(p)(x) = \#$ iff for some $c' \in SAY_w(x)$, $p(c'_a)(c'_w) = \#$. If $\neq \#$, $[\![\text{SAY}]\!]^{c, s, w}(p)(x) = 1$ iff for every $c' \in SAY_w(x)$, $p(c'_a)(c'_w) = 1$.

With these tools in hand, we can give a complete derivation of the truth conditions of (105)a, analyzed as (105)b.

(109) $[\![(105)b]\!]^{c, s, w}$
$= [\![\text{SAY}]\!]^{c, s, w}([\![Op_a\ RS_a\ [\text{IX-1 WILL-LEAVE}]]\!]^{c, s, w})([\![\text{IX-a}]\!]^{c, s, w})$
$= [\![\text{SAY}]\!]^{c, s, w}(\lambda x'.\ \lambda w'.$ x' will leave in w'; 0 otherwise$)(s(a))$
$= 1$ iff for every $c' \in SAY_w(s(a))$, c'_a will leave in c'_w.

In other words, we obtain a De Se reading according to which in every context c' compatible with what the agent s(a) says in the world of evaluation w, the agent of c' will leave in the world of c'. This seems appropriate: as we argued in the main text an in Appendix I, in ASL role-shifted clauses under attitude verbs are indeed read De Se.

There has been a suble debate in spoken language semantics to determine whether in the absence of dedicated De Se constructions (control, logophoric pronouns), standard English-style pronouns are only read De Re, or are ambiguously De Re or De Se. The majority opinion seems to be for an ambiguity view (see for instance Schlenker 2011c for a brief overview). We will not attempt to address this question for non-role-shifted clauses in sign language. Suffice it to say that the mechanisms we have put in place can in principle predict an ambiguity, as illustrated in (110).

(110) a. No Role Shift, De Se Reading
IX-a SAY Op_a [IX-a WILL-LEAVE]

b. No Role Shift, De Re Reading
IX-a SAY Op_i [IX-a WILL-LEAVE]

In (110)a, the empty operator Op_a binds the embedded pronoun *IX-a*, with the result that the latter gets a De Se reading, as shown in (111)a. In (110)b, the empty operator Op_i gets a different index, with the result that it doesn't bind any individual variable in the embedded clause, and that *IX-a* gets a De Re reading, as shown in (111)b.[39] (In all cases, the empty operator abstracts over a world parameter, as we noted above).

(111) a. Denotation of the complement of *SAY* in (110)a
$[\![Op_a\ [\text{IX-a WILL-LEAVE}]\ ]\!]^{c, s, w}$ $= \lambda x'.\ \lambda w'.\ [\![\text{IX-a WILL-LEAVE}]\!]^{c, s[a \to x'], w'}$
$= \lambda x'.\ \lambda w'.$ x' will leave in w'; 0 otherwise

b. Denotation of the complement of *SAY* in (110)b
$[\![Op_i\ [\text{IX-a WILL-LEAVE}]\ ]\!]^{c, s, w}$ $= \lambda x'.\ \lambda w'.\ [\![\text{IX-a WILL-LEAVE}]\!]^{c, s[i \to x'], w'}$
$= \lambda x'.\ \lambda w'.$ s(a) will leave in w'; 0 otherwise

Finally, the typology of indexicals under Role Shift could be obtained in the same way as in the main text: some indexicals come with a presupposition that they are dependent on a speech or thought context, whereas others can depend on any context whatsoever; or in the diacritic-based analysis we ended up, some indexicals must depend on a primitive context, whereas others can also depend on derived contexts.

[39] In more sophisticated accounts of attitude reports, De Re readings are obtained by a more complex mechanism of quantification over implicit descriptions; see for instance Schlenker 2011c for a recent overview in connection with the De Re/De Se distinction.

Appendix IV: Ratings

Ratings are given on a 7-point a scale, preceded by the initials of the informant and date (in year.month.day format) in which they were obtained. Judgments are arranged by chronological order, and in each case we provide:

–Column 1: number of the example cited in the text (the video in which the sentence appeared is cited in the text and is not repeated below).

–Columns 2 and up: video on which the judgment was recorded, followed by the initials of the informant and date (in *year.month.day* format, followed by *-2* if this was the second session of the day), followed by the rating. For instance, the table below would entail that the judgment for example (147)a in the text was recorded in video 14, 182; this judgment was given by informant JL on October 20, 2012 (i.e. 12.10.20), and the rating obtained was of 7. A second judgment for the same sentence was recorded in video 14, 192, and was obtained on October 21, 2012, with a rating of 7 as well.

(147)a	14, 182	[JL 12.10.20]=	7	14, 192	[JL 12.10.21]=	7
b			7			7

Some inferential questions that mattered for the analysis are also mentioned below (in English translation for questions that appeared in French).[40]

(6)	6, 317	[JL 10.09.22]=	7	here = LA? yes here = NYC? no	6, 362	[JL 10.09.25]=	GOOD[41]	I = John here = LA

(7)			6			7				7	

(8).			7			7				7	

(9)a.	14, 96	[JL 12.10.16]=	6	17, 45	[JL 13.05.07-2]=	2/7	Note: [a] without context is a 2. With prior context such as a previous sentence "I have a meeting later today," it becomes a 7.	17, 95	[JL 13.05.15]=	7 (with proper context)	
b.			2			2	This is different from [a] because WITH is included and thus requires an object.			2	

(10)a.	17, 97	[JL 13.05.15]=	7		19, 107	[JL 13.09.07]=	5	
b.			7				7	
c.			4				2	
d.			7				7	

(11)a.	19, 26	[JL 13.08.16]=	7		19, 41	[JL 13.08.19]=	7		19, 108	[JL 13.09.07]=	7	
b.			7				7				7	
c.			7				7				7	

Meaning: 1. Who does IX-1 refer to? 2. What does HERE refer to?

(12)a.	19, 28	[JL 13.08.16]=	7	1. John; 2. LA	19, 42	[JL 13.08.19]=	7	1. John; 2. LA	19, 109	[JL 13.09.07]=	7	1. John; 2: LA
b.			5	1. John; 2. LA			4	1. John; 2. LA			3	1. John; 2: LA
c.			7	1. John; 2. LA			6	1. John; 2. LA			5	1. John; 2: LA

(13)b.			7				7				6	

Meaning: 1. How acceptable is the sentence on a 7-point scale? 2. Is the sentence true in this scenario?

(15)a.	19, 134	[JL 13.09.08]=	7	yes	19, 145	[JL 13.09.10]=	7	yes
b.			7	yes			7	yes

Meaning: 1. How acceptable is the sentence on a 7-point scale? 2. Is the sentence true in this scenario?

(16)a.	19, 135 + 19, 137	[JL 13.09.08]=	~~7~~ corrected judgment in same session [spontaneous] = 6		no corrected judgment in same session [spontaneous] = yes	19, 146	[JL 13.09.10]=	6	yes
b.			~~2~~ corrected judgment in same session [spontaneous] = 2		no corrected judgment in same session [spontaneous] = no			2	no

Meaning: Which year does the boldfaced expression refer to? [give several answers if the sentence is ambiguous]

(17)a.	32, 71	[LD 13.07.16]=	7	le sens est confus. On peut comprendre qu en 2013 jean travaille sur Paris - ou annee 2010 pour jean	33, 2	[LD 13.08.08]=	7	temps par rapport a Ludovic 2013	34, 121	[LD 13.12.13]=	7	2013
b.			7	le sens est confus. On risque de comprendre qu en 2012 jean a travaille sur Paris ou annee 2009 pour jean			7	temps par rapport a Ludovic 2012			7	2012
c.			7	le sens est confus. On risque de comprendre qu en 2014 jean va travaille sur Paris ou annee 2011 pour jean			7	temps par rapport a Ludovic 2014			7	2014

Meaning: 1. Which year does the boldfaced expression to? [give several answers if the sentence is ambiguous] 2. What does the pronoun denote? [[Informant's name]? Jean?

(18)a.	32, 73	[LD 13.07.16]=	7	2010 - Jean	33, 3	[LD 13.08.08]=	7	2010 jean	34, 122	[LD 13.12.13]=	7	2010 - jean
b.			7	2009 - Jean			7	2009 jean			7	2009 - jean
c.			7	2011 - Jean			7	2011 jean			7	2011 - jean

Meaning: 1. Which year does the boldfaced expression refer to? [give several answers if the sentence is ambiguous] 2. What does the pronoun denote? [[Informant's name]? Jean?

(19)a.	32, 75	[LD 13.07.16]=	7	paris jean	33, 4	[LD 13.08.08]=	7	Paris Jean	34, 123	[LD 13.12.13]=	7	Paris - Lui = Jean
b.			7	la jean			7	LA Jean			7	LA - Moi = Jean

Meaning: 1. (for b. and c.): Does one understand: (i) that Pierre wants to know who he likes? (ii) that the speaker wants to know who Pierre likes? 2. (for b. and c.): Display a possible answer to the question.

(20)a.	34,	[LD	7		35,	[LD	7		35,	[LD	7	

[40] When restrictions appear, such as *only for b. and c.*, these refer to the examples *in the order in which they appeared on the video* assessed by the informant. Thus when we only reproduce a subpart of the paradigm in this article, these letters need *not* correspond to those we use here.

[41] In these somewhat ancient sessions, JL used words to describe levels on his own 7-point scale, with the following strict correspondence:

bad	unacceptable	borderline unacceptable	borderline acceptable	soso	ok	good
1	2	3	4	5	6	7

	148	13.12.13]=			1	13.12.16]=			33	13.12.18]=			
b.			7	le locuteur veut savoir qui Pierre aime = marie			7	ii locuteur veut savoir qui Pierre aime> Marie			7	ii locuteur veut savoir qui Pierre aime>> Marie
c.			7	le locuteur veut savoir qui Pierre aime = marie			7	ii locuteur veut savoir qui Pierre aime> Marie			7	ii locuteur veut savoir qui Pierre aime>> Marie

Meaning: 1. (for b. and c.): Does one understand: (i) that Pierre wants to know who he likes? (ii) that the speaker wants to know who Pierre likes? 2. (for b. and c.): Display a possible answer to the question.

(21)a.	34, 151 [PS says '34, 148', but the judgment is about 34, 149; 34, 148 is a judgment video]	[LD 13.12.13]=	7		35, 2	[LD 13.12.16]=	7		35, 34	[LD 13.12.18]=	7	
b.			1				1	Pierre veut savoir qui il aime> on le sait pas car il le sait pas			1	transfert et question bizarre
c.			1				1	Pierre veut savoir qui il aime> on le sait pas car il le sait pas			1	transfert et question bizarre

Meaning: 1. (for b. and c.): Does one understand: (i) that Pierre wants to know who he likes? (ii) that the speaker wants to know who Pierre likes? 2. (for b. and c.): Display a possible answer to the question.

(22)a.	34, 152 and 34, 153 (redundantly due to a technical problem)	[LD 13.12.13]=	7		35, 3	[LD 13.12.16]=	7		35, 35	[LD 13.12.18]=	7	
b.			7	Pierre veut savoir qui il aime> On ne sait pas			7	Pierre veut savoir qui il aime> Marie			7	i Pierre veut savoir qui il aime > mystere
c.			7	Pierre veut savoir qui il aime> On ne sait pas			7	Pierre veut savoir qui il aime> Marie			7	i Pierre veut savoir qui il aime > mystere

Meaning: 1. (for b. and c.): Does one understand: (i) that Pierre wants to know who he likes? (ii) that the speaker wants to know who Pierre likes? 2. (for b. and c.): Display a possible answer to the question.

(23)a.	35, 5	[LD 13.12.16]=	7	Le locuteur veut savoir qui Pierre aime> Marie	35, 36	[LD 13.12.18]=	7	ii locuteur veut savoir qui Pierre aime>> Marie
b.			5	il manque kk chose pour terminer la question-Le locuteur veut savoir qui Pierre aime> Marie			6	ii locuteur veut savoir qui Pierre aime.>> Marie - il manque kk chose a la fin de la phrase

Meaning: 1. (for b. and c.): Does one understand: (i) that Pierre wants to know who he likes? (ii) that the speaker wants to know who Pierre likes? 2. (for b. and c.): Display a possible answer to the question.

(24)a.	35, 7	[LD 13.12.16]=	1	trop bizarre	35, 37	[LD 13.12.18]=	1	
b.			1	trop bizarre			4	la phrase nest pas terminee

Meaning: 1. (for b. and c.): Does one understand: (i) that Pierre wants to know who he likes? (ii) that the speaker wants to know who Pierre likes? 2. (for b. and c.): Display a possible answer to the question.

(25)	35, 9	[LD 13.12.16]=	1		35, 38	[LD 13.12.18]=	1	Pierre et qui ?? contradictoire ?

(26)a.	18, 99	[JL 13.07.17]=	7		19, 14	[JL 13.08.15]=	7		19, 115	[JL 13.09.07]=	7	
b.			7				7				7	

(27)a.	14, 109	[JL 12.10.17]=	7	18, 60	[JL 13.07.16]=	6		18, 97	[JL 13.07.17]=	7		19, 13	[JL 13.08.15]=	7		19, 114	[JL 13.09.07]=	7	
b.			7			5				6				6				6	

(28)a.	14, 234	[JL 12.10.22]=	6	17, 57	[JL 13.05.08]=	6		18, 92	[JL 13.07.17]=	6		19, 8	[JL 13.08.15]=	6		20, 2	[JL 13.10.15]=	7	
b.			7			7				7				7				7	

(29)a.	14, 232	[JL 12.10.22]=	7	17, 56	[JL 13.05.08]=	7		18, 91	[JL 13.07.17]=	7		19, 7	[JL 13.08.15]=	7		20, 1	[JL 13.10.15]=	7	
b.			7			7				7				7				7	

Meaning: Do we understand that the French swimmer (i) said he was breaking/would break doors? (ii) did/will in fact break doors?

(30) a.	18, 103	[JL 13.07.17]=	7		19, 16	[JL 13.08.15]=	7		19, 117	[JL 13.09.07]=	7		19, 142	[JL 13.09.08]=	7	i i	19, 150	[JL 13.09.10]=	7	i i	19, 172	[JL 13.09.12]=	7	i i
b.			7				7	(...)			7				7	i i			7	i i			7	i i

Meaning: 1. Who did the emailing? 2. Whose friends were emailed? 3. Do we understand that John (i) said he was emailing people? (ii) did/will in fact email people?

(32)a.	19, 215	[JL 13.09.15]=	7	John; John's friends; ii	19, 222	[JL 13.09.19]=	5	John; John's friends; ii
b.			5	John; likely John's friends; likely i (ii if my friends not John's - judgement in this case would be 3)			3	John; John's friends; likely i
c.			6	John; John's friends; i			6	John; John's friends; i
d.			6	John; John's friends; i			6	John; John's friends; i

Meaning: 1. Who did the contacting? 2. Whose friends were contacted? 3. Do we understand that John (i) said he was contacting people? (ii) did/will in fact contact people?

(33)a.	19, 219	[JL 13.09.15]=	7	John; John's friends; ii	19, 224	[JL 13.09.19]=	5	John; John's friends; ii
b.			4	John; likely John's friends; unclear			3	John; John's friends; likely i
c.			5	John; John's friends; i			6	John; John's friends; i
d.			6	John; John's friends; i			6	John; John's friends; i

Meaning: Do we understand that the French swimmer (i) said he was breaking/would break doors? (ii) did/will in fact break doors?

(34)	19, 144	[JL 13.09.08]=	7	i	19, 151	[JL 13.09.10]=	6	i	19, 173	[JL 13.09.12]=	6	i

Meaning: Do we understand that the French swimmer (i) said he was breaking/would break doors? (ii) did/will in fact break doors?

fn. 23, (i)a.	19, 175	[JL 13.09.12]=	7	ii
b.			7	ii

Meaning: 1: Who does the pronoun refer to? (Jon? the arrogant French swimmer?) 2. Which city does *HERE* refer to? (Paris? London?) 3. Do we understand that the French swimmer (i) said he was breaking/would break doors? (ii) did in fact break doors?

(35) a.	18, 118	[JL 13.07.17]=	7	swimmer; Paris; did break doors	19, 23	[JL 13.08.15]=	7	1: swimmer; 2: Paris; 3: did break doors	19, 124	[JL 13.09.07]=	7	swimmer; Paris; ii	19, 198	[JL 13.09.13]=	7	swimmer; Paris; ii	19, 231	[JL 13.09.19]=	7	swimmer; Paris; ii
b.			6	swimmer; London; did break doors			6	1: swimmer; 2: London; 3: did break doors			5	swimmer; London; ii			5	swimmer; London; likely i			6	swimmer; London; i

Meaning: 1. Who does the pronoun refer to? (Jon? the arrogant French swimmer?) 2. Which city does *HERE* refer to? (Paris? London?

(36)a.	18, 110	[JL 13.07.17]=	7	swimmer; Paris	19, 19	[JL 13.08.15]=	7	1: swimmer. 2: Paris (possibly London)	19, 120	[JL 13.09.07]=	7	swimmer; Paris
b.			7	swimmer; London			7	1: swimmer. 2: London			7	swimmer; London

Meaning: 1. Who does the pronoun refer to? (Jon? the arrogant French swimmer?) 2. What day does THIS MORNING refer to? 3. Do we understand that the French swimmer (i) said he was breaking/would break doors? (ii) did/will in fact break doors?

(37)a.	19, 167	[JL 13.09.11]=	7	swimmer; today; ii	19, 197	[JL 13.09.13]=	7	swimmer; today; ii	19, 230	[JL 13.09.19]=	7	swimmer; today; ii
b.			5	swimmer; more likely yesterday; ii			4	swimmer; yesterday; likely i			6	swimmer; yesterday; i

Meaning: 1. Who does the pronoun refer to? (Jon? the arrogant French swimmer?) 2. What day does *THIS MORNING* refer to?

(38)a.	19, 166	[JL 13.09.11]=	7	swimmer; today	19, 196	[JL 13.09.13]=	7	swimmer; today	19, 229	[JL 13.09.19]=	7	swimmer; today
b.			7	swimmer; yesterday			7	swimmer; yesterday			7	swimmer; yesterday

Meaning: 1. What can one infer from the sentence? (i) On can infer that the wolf <u>in fact</u> showed his iPhone to the lamb? (ii) One can only infer that the wolf <u>said/thought</u> that he was showing/would show his iPhone to the lamb? 2. What does *HERE* denote? [note that *lamb* ('agneau') was in error, it should have been *sheep* ('mouton')]

fn. 24 (i)a.	39, 43	[LD 14.03.27]=	7	1.ii 2 ici = place du loup	39, 60	[LD 14.04.01]=	7	1.ii 2.bureau de Philippe	39, 98	[LD 14.04.02]=	7	1.ii 2 ici =le lieu de la perte de l iphone	40, 33	[LD 14.04.04]=	7	1.ii 2.ICI = lieu de la retrouvaille
b.			7	1.i puis ii 2			7	1.ii puis i			7	1.ii puis i 2 ici			7	1.ii puis i 2.ICI =

				ici = place du loup				2bureau de Philippe				=le lieu de la perte de l iphone				lieu ou l iphone sera montre

Meaning: 1. Who does the pronoun refer to? (Jon? the arrogant French swimmer?) 2. What day does TOMORROW refer to? 3. Do we understand that the French swimmer (i) said he was breaking/would break doors? (ii) did/will in fact break doors?

(39) a.	18, 120	[JL 13.07.17]=	5	swimmer; today (day after london); did break doors	19, 24	[JL 13.08.15]=	5	1: swimmer; 2: (speaker's) today (...); 3: said he would break doors	19, 125	[JL 13.09.07]=	4	swimmer; unclear, day after today more likely; unclear: if day after today = i, if today = ii	19, 199	[JL 13.09.13]=	4	swimmer; tomorrow (day after today); ii	19, 232	[JL 13.09.19]=	6	swimmer; tomorrow; ii
b.			6	swimmer; today (day after london); said he would break doors			7	1: swimmer; 2: (speaker's) today; 3: said he would break doors			5	swimmer; today; i			6	swimmer; today; likely i			6	swimmer; today; i

Meaning: 1. Who does the pronoun refer to? (Jon? the arrogant French swimmer?) 2. What day does TOMORROW refer to?

(40)a.	18, 112	[JL 13.07.17]=	7	swimmer; TOMORROW = tomorrow, i.e. 2 days after London (less likely reading but possible = today)	19, 20	[JL 13.08.15]=	6	[Note: WILL would be helpful here. Or use pause/head nod as in (b)]. 1: swimmer; 2: (speaker's) today (possibly tomorrow)	19, 121	[JL 13.09.07]=	7	swimmer; day after today (more likely; with meaning = today it is more logical but less grammatical)
b.			7	swimmer; TOMORROW = today, i.e. day after London			7	1: swimmer; 2: (speaker's) today			7	swimmer; today	

Meaning: Does one understand: (i) that the wolf caught the sheep? (ii) that the speaker caught the sheep? (iii) that the wolf said/thought that he was catching/would catch the sheep?

(41)a.	37, 54	[LD 14.02.06]=	7	i loup attrape,	38, 04	[LD 14.02.10]=	7		40, 73	[LD 14.04.15]=	7	i	40, 93	[LD 14.04.17]=	7	i
b.			7	i loup attrape,			7				7	i			6	i

Meaning: What can one infer from the sentence? (i) On can infer that the wolf in fact showed his iPhone to the lamb? (ii) One can only infer that the wolf said/thought that he was showing/would show his iPhone to the lamb? [note that *lamb* ('agneau') was in error, it should have been *sheep* ('mouton')]

(42)a.	39, 35	[LD 14.03.27]=	4	ii mais syntaxe bizarre	~~39, 52~~ corrected in 39, 53	[LD 14.04.01]=	~~7~~ informant asks to correct judgment upon seeing video 39, 27- 4	~~ii~~ informant asks to correct judgment upon seeing video 39, 27 peut etre a ajouter "je te" ii	40, 48	[LD 14.04.14]=	5	montrer standand , pourquoi transfert? i
b.			7	i			7	i			7	i

Meaning: What can one infer from the sentence? (i) On can infer that the wolf in fact showed his iPhone to the lamb? (ii) One can only infer that the wolf said/thought that he was showing/would show his iPhone to the lamb? [note that *lamb* ('agneau') was in error, it should have been *sheep* ('mouton')]

(43)a.	39, 38	[LD 14.03.27]=	7	ii	39, 55	[LD 14.04.01]=	7	ii, une discussion dans l'ascenseur	40, 50	[LD 14.04.14]=	6	a ajouter 'lui dit' pour reprendre sa parole - ii
b.			7	ii iphone puis i montre ci			7	i puis ii, par exemple, le loup dit l iphone, puis il le cherche dans sa poche et le montre au agneau			7	ii puis i

Meaning: What can one infer from the sentence? (i) On can infer that the wolf in fact showed his iPhone to the lamb? (ii) One can only infer that the wolf said/thought that he was showing/would show his iPhone to the lamb? [note that *lamb* ('agneau') was in error, it should have been *sheep* ('mouton')]

(44)a.	39, 39	[LD 14.03.27]=	7	ii	39, 56	[LD 14.04.01]=	7	ii	40, 51	[LD 14.04.14]=	4	pb de transition - confusion je qui ? loup ou ludovic
b.			7	ii car MOI montre ci			7	ii, dans ce cas, le loup va montrer concretement son iphone			4	pb de transition - confusion je qui ? loup ou ludovic

Meaning: 1. Does one understand that the arrogant German swimmer (i) in fact broke the door? (ii) said he was breaking the door? 2. Is one talking about the house (i) of the arrogant German swimmer? (ii) of the speaker? (iii) of somebody else?

(45)a.	36, 73	[LD 14.01.29]=	7	1. action 2. une maison	37, 02	[LD 14.01.30]=	7	action	40, 95	[LD 14.04.17]=	5	1.i joue plus - 2.iii on ne sait pas a qui appartient la maison
b.			7	1. dire 2. la maison du nageur			7	action, maison nageur			7	1.ii 2.i

Meaning: 1. Does one understand that the arrogant German swimmer (i) in fact broke the door? (ii) said the was breaking the door? 2. (b. only) What does the pronoun IX-1 denote? (i) [Informant's name]? (ii) the German swimmer?

(52)a	32, 21	[LD 13.07.09]=	7		32, 51	[LD 13.07.15]=	7		34, 124	[LD 13.12.13]=	7		35, 48	[LD 13.12.20]=	5 emplacement de porte un peu bizarre		36, 06	[LD 14.01.20]=	7	
b			5				1				4	pronom bizarre			2 confusion lui et moi ? Tranfert qui ?				3	
Question 1 - a			i				i				i - action				i il a casse la porte				i action	
Question 1 - b			i				i				i - action				on ne comprend pas qui a casse la porte : le nageur ou Ludovic				i action	
Question 2 (b. only)			ii				ii				nageur allemand				apparement Ludovic				moi = Ludovic ?	

Meaning: 1. What does the last word of the sentence denote? (i) London? (ii) Paris? 2. Who is breaking / broke / will break a door? (i) The German swimmer? (ii) [Informant's name]?

(53)a	32, 33	[LD 13.07.09]=	1	ambigu nageur	32, 57	[LD 13.07.15]=	1	ambigu	32, 88	[LD 13.07.16]=	1		33, 12	[LD 13.08.08]=	3	Londres - Nageur Allemand
b			1	Londres nageur			1				1				3	Paris - Nageur Allemand

Meaning: Is the sentence true in this scenario?

(92)a.	19, 138	[JL 13.09.08]=	6	yes	19, 47	[JL 13.09.10]=	6	yes
b.			2	no			2	no

Meaning: Is the sentence true in this scenario?

(93)a.	19, 139 + 19, 141	[JL 13.09.08]=	~~4~~ corrected judgment in same session [spontaneous] = 6	yes (mostly) corrected judgment in same session [spontaneous] = yes	19, 148	[JL 13.09.10]=	6	yes
b.			~~2~~ corrected judgment in same session [spontaneous] = 2	no corrected judgment in same session [spontaneous] = no			3	no

Meaning: Is the sentence true in this scenario?

(94)a.	19, 140	[JL 13.09.08]=	7	yes	19, 149	[JL 13.09.10]=	7	yes
b.			7	yes			7	yes

(95)a.	14, 94	[JL 12.10.16]=	6	17, 44	[JL 13.05.07-2]=	7		17, 94	[JL 13.05.15]=	7	
b.			6			6				6	
c.			7			7				7	
d.			4			2				5	

(96)a.	14, 92	[JL 12.10.16]=	5	17, 43	[JL 13.05.07-2]=	6		17, 93	[JL 13.05.15]=	6	
b.			6			6				7	
c.			6			7				7	
d.			3			2				3	

(97)a.	14, 90	[JL 12.10.16]=	4	17, 43	[JL 13.05.07-2]=	5		17, 92	[JL 13.05.15]=	5	
b.			7			7				6	
c.			6			6				6	
d.			4			3				2	