

Watch the attitude: Embedding and role-shift in ASL

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Abstract: Much of the work on attitude predicates, spawned by Hintikka (1962), treats them as a uniform class – quantifiers over possible worlds. However, recently a number of suggestions have been made that highlight different subclasses. Here we present novel data from American Sign Language (ASL) that support a differentiation made by Anand and Hacquard (2008) concerning the objectivity and subjectivity of their complements, while also bringing into focus a special property of Sign Languages – role shift.

1. Introduction

Consider the difference in (1):

- (1) a. John_a said, “I_a am busy.”
b. John_a said he_a is busy.

Both (1a) and (1b) can be reports of John uttering the statement “I am busy”; however, in (1a), the use of the 1st person pronoun to refer to John and 1st person verbal morphology agreeing with the subject reports the utterance in the words that John himself used, accomplished through quotation. By contrast, the use of the 3rd person pronoun in (1b) and 3rd person subject agreement signals a report of what John had uttered from the perspective of someone else, the speaker. Unlike quotation, this indirect speech report shows all properties of being fully integrated into the rest of the sentence through clausal embedding. We see then that in English, the person marking on the subject of the attitude report (John) serves as a way to reveal the type of discourse: 1st person marking signals direct discourse (quote), and 3rd person marking indirect discourse (a report). However, recent findings suggest that this diagnostic may not be fully cross-linguistically viable, since in languages like Ewe, Zazaki, Amharic and Slave, the 1st person pronoun instead of the 3rd occurs in reported speech contexts like (1b) (Clements 1975, Rice 1986, Schlenker 2003, Anand & Nevins 2004, Pearson *to appear*, i.a.). Such cases are sometimes said to be “monstrous”, to use an evocative term from Kaplan (1977): monstrous because an indexical expression that is usually (in English) evaluated with respect to the context of speech (1st person = the speaker) is instead evaluated with respect to another context, that of the reported speech (1st person = the subject). Investigations of the source of monstrosity have nearly all focused on the pronoun in question, including in cases of potential monsters in Sign Languages (SLs) as well. In this paper, we will mostly be concerned with American Sign Language (ASL), although we also discuss some extensions of our findings to other European Sign Languages. At the onset, we disclose that we will not be providing yet another theory of monsters in general or of monsters in SLs in particular. Instead, we use the aforementioned observations, whatever their analysis, coupled with novel data, as diagnostics for investigating two types of ways that embedding verbs can behave in English and, we show, in ASL.

- (2) a. JOHN_k IX_k SAY IX-1_k SMART^{RS-k}
 ‘John says ‘I am smart’’
 b. JOHN_k SAY IX-3_k SMART
 ‘John says he is smart’

In terms of notation, the line over the part of the utterance following SAY indicates a combination of body/eye-gaze/head shift performed by the signer.² IX is a pronominal point³ using the index finger that can be associated with a locus, an area of space associated (abstractly) with John. The descriptive intuition is that the signer ‘becomes John’ in some sense and, thus, utters [IX-1 SMART] (‘I am smart’) on John’s behalf. This is accomplished by the signer’s physical movement and/or break in eye gaze toward the locus associated with John. This is known in the SL literature as Role-Shift (RS).

The first question presented by this data is what exactly the nature of this RS is. Is it a semantic, syntactic, phonological, morphological, or pragmatic phenomenon? At first glance, it is rather tempting to view (2a) and (2b) as cases of direct vs. indirect discourse (as shown in the English translation), with RS marking the former but not the latter. However, as much literature has pointed out, matters are not that simple. When

¹Following the conventions in Sign Language Linguistics, all ASL glosses are in CAPS. The line above the utterance indicates the spread/duration of the non-manual marking associated with either role-shifted material (RS) or topicalization (t); the letter/number separated with a dash (e.g. -a) indicates the area of signing space dedicated to a particular referent (the Mom) and, thus, the locus of the shift.

² The convention as described above, albeit traditional, is problematic in one respect: e.g., *k* in (2) is serving both as notation for locus (where the signer role shifted) and semantics (for co-reference), thus conflating the two. This tradition stems from the early days of Sign Language research (as in, e.g., Lillo-Martin & Klima 1990). Aware of the problem, we proceed here with caution, keeping to the conventions of the literature for simplicity reasons while revealing additional interpretations of anaphoric expressions in the text. See Koulidobrova (in progress) for the focused discussion of the issues involved.

³ Admittedly, this is an oversimplification. First, *IX* can occur in three types of positions in ASL – pronominal, postnominal, and alone – each of which have been given different analyses in the literature. For example, MacLaughlin (1998) argues that postnominal *IX*, as in (2a) where it follows ‘John,’ is an adverbial, pronominal *IX* is a definite article, and the stand-alone *IX* is a personal pronoun. Additionally, we are also ignoring here (for simplicity purposes) an additional complication: the differentiation between spatial loci and semantic indices, assuming, with much of the literature, that loci serve as morpho-phonological realization of indices. Both of these issues are orthogonal to the arguments in this paper but see Koulidobrova & Lillo-Martin (forthcoming) where the contribution of loci vs. indices to the interpretation of *IX* is discussed and arguments for the demonstrative view of *IX* instead are offered.

other properties of the language are considered, it is clear that (at least) when under RS, the 1st person indexical in IX-1 in (2a) behaves differently than the English ‘I,’ tentatively placing ASL onto the list of languages with ‘logophoric pronouns’ (Lillo-Martin 1995, following the insights from Clements 1975 on Ewe, but see Person 2013). In (some) such languages, the relevant lexical item has been suggested to be a ‘monster’ in being an indexical seemingly dependent on a context that is not the context of utterance, with RS appearing to mark something other than a quote, as has been argued for different sign languages by Zucchi (2004), Quer (2005), Herrmann & Steinbach (2012), and Schlenker (2014). In the literature concerning both of these issues, much rests on the verb introducing/ preceding the RS: whether it is necessarily overt (Lillo-Martin 1995), and whether it necessarily involves an attitude predicate (cf. Quer 2005, Schlenker 2014a-b). What has not, to our knowledge, been discussed in the literature is whether the type of attitude actually matters. In this paper, we document a property of RS, which, to our knowledge, has received no attention in the literature previously – the extent of the spread non-manual markings associated with RS depending on the type of attitude predicate. We demonstrate that this seemingly minor detail adds significantly to the overall picture of clausal embedding, since its effect can be observed in indexical behavior and syntax of the complement. Finally, we discuss what it means for RS to extend throughout an embedding verb as lexicalized non-manual marking, and how this supports the view that in the cases discussed here, RS arises through verb-dependent information stored in the lexicon.

2. Methodology

The novel data come from two sources: the initial (pilot) data-set is a set of four one-hour videos from Pyers (2004) recording four Deaf signers completing false-belief tasks with attitude verbs, which served as a springboard for creating more extensive traditional elicitations. The second set contains elicited sentences in contrast (1-4 separate trials) of an original sentence with the 1st and non-1st person IX and transformation with extraction (internal and external arguments as well as adjuncts). The sentences were played back to the signer (during a different session) and to other signers and judged both for grammaticality and possible context. A total of nine informants (8 Deaf, 1 Hearing native signer) viewed and judged test items in their respective languages: 5 users of ASL, 1 French SL, 1 Spanish SL, and 2 Catalan SL. The data were transcribed by a trained Deaf ASL transcriber.

3. Data

3.1 Puzzle 1

The first, previously undocumented, puzzle of RS that we are concerned with in this paper is the extent of its spread. Note that in (3), RS begins after SAY (as in (3a)) but on IMAGINE (as in (3d)). Alternative options are either deemed totally ungrammatical, as in the case of role shift on SAY in (3b), or awkward and unnatural as in the case of role shift starting after IMAGINE in (3c).

- (3) a. MOM SAY ^{RS-a} IX-1 BUSY

- ‘Mom_k says I_k am busy’
- b. *MOM SAY IX-1 BUSY
‘Mom_k says I_k am busy’
- c. ??MOM IMAGINE IX-1 BUSY
‘Mom_k imagines I_k am busy’
- d. MOM IMAGINE IX-1 BUSY
‘Mom_k imagines I_k am busy’



Figure 1: MOM SAY IX-1 BUSY
‘Mom_k says I_k am busy’



Figure 2: MOM IMAGINE IX-1 BUSY
‘Mom_k imagines I_k am busy’

This same pattern has also been confirmed for LSF and, while not specifically discussed, has appeared in published material on LSC SAY vs. THINK (4).

- (4) a. IXa MADRID JOAN_i THINK IX-1_i STUDY FINISH HERE MADRID
‘When he was in Madrid, Joan thought he would finish his studies there in Madrid.’
- b. ANNA_i 3-SAY-2 IX-1_i FED-UP LOSE+++
‘Anna told you that she was fed up with losing so often.’ (Quer 2011)

That is, as (3)-(4) demonstrate, RS descriptively starts *on* IMAGINE and THINK but *after* SAY.

3.2 Puzzle 2

(5) a. MOM SAY ^{RS-a}IX-1 BUSY = (3a)
 ‘Mom_k says I_{k/*1} am busy’

b. MOM ^{RS-a}IMAGINE IX-1 BUSY = (3d)
 ‘Mom_k imagines I_{k/1} am busy’

In (5a), under role shift the first person indexical IX-1 (‘I’) can only refer to the subject, MOM (‘mom’); in contrast, IX-1 in (5b) can refer to either MOM (when it is evaluated with respect to the context of the speech report – a shifted context) *or* the narrator (when it is evaluated with respect to the context of the utterance). The null embedder in (6), quite common in ASL, patterns with SAY.

(6) MOM ^{RS-a}(IX-1) BUSY
 ‘Mom_k is like I_{k/1} am busy’

The aforementioned behavior of IX-1 under IMAGINE is replicated in (7) for the LSC THIS under THINK.

(7) LAST YEAR ^tJOAN_i IX-3 ^{RS-i}THINK IX-1_i STUDY FINISH YEAR THIS#
 ‘Last year Joan thought that he would finish his studies {this year/then-that year}’
 [LSC] (Quer 2011)

In their possible interpretations, then, ASL IX-1 and LSC THIS# resemble the Zazaki *εz* and *t̥i* in (7), discussed at length in Anand & Nevins (2004).

(8) Heseni_i (m̥i_k-ra) va kε εz_{i/k} dεzletia [Zazaki]
 Hesen.OBL (I.OBL -to) said that I rich.be-PRES
 Hesen said that {I am, Hesen is} rich.’ (Anand and Nevins 2004)

To briefly summarize then: we observe two types of differences between the predicates in ASL (and potentially also LSC): IMAGINE and SAY differ with respect to a) the extent of RS, and b) interpretation of the indexical under it. The question is what is behind this asymmetry?

4. Analysis

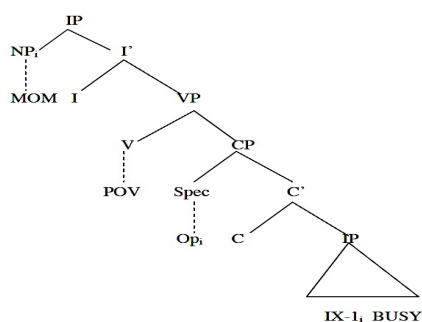
In principle, there are at least three possible solutions to the question above. First, it is possible that what is behind the asymmetry in (5) is due to a property of the RS itself: perhaps, as in accounts by Quer (2005, i.a.), Zucchi (2004), Schlenker (2014), and Davidson (2015), there is something in the syntax or semantics of RS that forces (or blocks) different interpretations of indexicals for exactly the same reason as forcing (or blocking) the presence of the relevant non-manuals on the predicate. An alternative explanation may be found in the syntax of the utterance: perhaps the asymmetry in (5)

results from different types or sizes of complements (cf. Lillo-Martin 1995, et seq., Moulton 2009, Kratzer 2006, Saito 2012, i.a.). Finally, the culprit may be the embedding predicate itself, as in Hintikka (1962), Anand & Hacquard (2009, et seq.), i.a. In what follows, we explore each of these possibilities in turn, beginning with syntax, and demonstrate that a focused inquiry into the nature of the embedding predicate yields the best result.

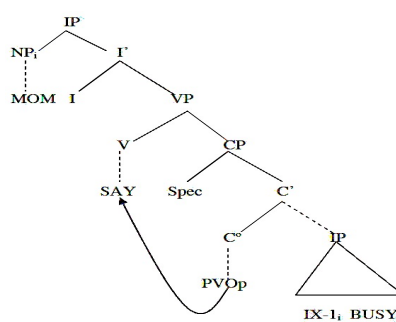
4.1. Role shift

In terms of syntax, to our knowledge, two accounts of RS exist, illustrated in (9) below.

(9) a. Lillo-Martin (1995)⁴



b. Quer (2011) (adpt. Quer 2005)



The first one is Lillo-Martin (1995), the original focus of which is the interpretation of the 1st person indexical (_IPRONOUN in her terms but IX-1 here) and the null embedding predicate (as in (6)) loosely translated into English as the quotative ‘*be like*.’ Lillo-Martin dubs the latter the Point Of View (POV) predicate and argues for the logophoric status of the former. She follows the analyses of apparently similar phenomena in West African languages like Ewe and Gokana: on that view, POV is either a special complementizer (like Ewe’s ‘*be*’) or an attitude verb that takes as its complement a CP hosting an operator *Op* which forces the co-indexation between the indexical below and the subject of the POV. The CP is thus (role-)shifted into the ‘point of view’ of the relevant individual. POV can be substituted with any other attitude (such as SAY and IMAGINE) without any changes to the syntax and the binding configuration. In this, Lillo-Martin argues, ASL joins the category of languages allowing the 1st person indexical to be interpreted as shifted (see (8)). Let us explore the implications of this account for the data in (5): if POV is a phonologically null verb introducing the role-shifted CP, presumably other types of embedding attitudes will do the same. This means that the non-manuals associated with RS are unexpected on the verb IMAGINE. Additionally, since the embedded indexical is bound by *Op*, a non-shifted

⁴ Following Padden (1986), Lillo-Martin (1995), refers to the phenomenon *reference*, rather than *role*, shift, focusing on the semantic effects. Here, we employ the descriptive label deliberately, since, as we have shown, the reference does not actually always shift.

Quer (2005) – the alternative account developed for LSC – views the POV differently. For him, it is a context-shifting operator (Schlenker 2003) overtly realized as RS. Crucially, the POV operator (POVOp, hosted by the C^0) always composes with the embedder attitude, so RS markings would be predicted over the embedding predicate. Let us see how this account fares in light of the data in (5). As SAY does in (9b), POVOp – the context-shifting operator – combines with IMAGINE in (5b) (details aside). This means that the indexical must obligatorily shift, which, we know from (5b) does not necessarily occur. Thus, this mechanism appears too coarse. Additionally, the fact that the RS markings do not spread over the embedder in (5a) is now unaccounted for: in (9b), the difference between SAY and IMAGINE with respect to non-manuals over the attitude predicate is not predicted. So we see that no syntactic analysis thus far offers the flexibility required to account for different patterns of both pronominal binding and role shift extent across verbs. Thus, we turn to semantics.

Semantic approaches to RS available to date (Zucchi 2004, Quer 2005, Herrmann and Steinbach 2012, Schlenker 2014) vary in details but have two characteristics in common: RS applies to a full semantic proposition/syntactic clausal IP and changes the context of evaluation of material it scopes above, as in (10) below (from Schlenker 2014).

$$(10) \quad [[RS_i \text{ IP}]]^{c,s,\text{non-manual}} = \lambda x'. \lambda w'. [[IP]]^{<x',w'>,s,w'}$$

This view has two problems in accounting for the pattern of sign language role shift seen above: the issue of the extent of RS over IMAGINE remains unexplained, since the main verb should scope over RS, as does the difference in the interpretation of indexicals: why must indexicals shift under SAY but not IMAGINE?

Davidson (2015) provides a semantic account that follows Lillo-Martin's (1995) intuition that RS signals something like that of English 'be like.' More specifically, she argues that RS is an adverbial modifier, similar to the English 'like this,' that can simply be pronounced simultaneously with the embedding predicate. The account thus predicts RS on the embedding predicate as in (10): the role-shifted material *demonstrates* how the action that is signaled by the verb in the embedded clause was performed by the main

⁵ We have ignored here a technical detail of Lillo-Martin's analysis: POV is not (necessarily) the main clause verb but, rather, a part of the first embedded clause containing a null subject (p. 163). This explains why it can co-occur with an overt verb in the matrix clause but does not affect our proposal in any significant manner. To illustrate: keeping faithful to the analysis, we would say that irrespective of the type of the main clause predicate, non-manual markings associated with POV (as the verb of the first embedded clause) will always begin *after* the matrix verb. Nor does this detail in Lillo-Martin's proposal affect predictions regarding the shift in reference: since, on that account, the null subject of the POV is coreferential with the matrix subject, reference to any other individual is unexpected.

subject, from the subject's perspective. On this view then, cases where RS begins after the embedder must be something else – e.g. a traditional quotation as in (1a). However, this path to the analysis of (1a) is also problematic: not all cases with RS starting after the embedded clause can be dismissed as instances of quotation, since through standardly assumed diagnostics some appear to show properties of being indirect discourse. Secondly, this account does not capture the various interpretational possibilities of the embedded indexical with IMAGINE – namely, while Davidson (2015) predicts the embedded IX-1 to refer to the agent of imagining, the source of reference to the speaker remains unaccounted for.

Note that all of the analyses outlined above, despite their differences, face the same problem with respect to the data in (5): they treat (5a) and (5b) on a par. This is the consequence of a hypothesis that RS itself will account for the asymmetry between the IMAGINE and SAY cases – something RS cannot do simply because it occurs in both.

4.2. Complement clause

In this section we explore the possibility that the difference between (5a) and (5b) is syntactic in that it reveals a complement of a different size/type.

4.2.1. Indirect discourse

Before we spend any time considering the size/type of the clausal complement – and whether the asymmetry in (5) is derivable from it – let us first clarify our reasons for thinking that in cases like (5) we are dealing with fully integrated clausal complements in the first place, and not quotation. Consider an account that treats either the SAY or IMAGINE case as a quotation. First, we might predict that quotation differs from true embedding in that for cases of true clausal embedding, RS necessarily spreads over the embedder because it composes with the predicate, while in the case of quotation/direct speech, it does not because it is part of the quote. This account would be consistent with Quer (2005), where the POVOp composes with the attitude predicate itself, or with Schlenker's (2003) account of the context shifting operator doing the same. For Davidson (2015), this would be expected if the role shift over the predicate were acting as a modifier of the verb. Perhaps this might even be the reason that some cases of what appears to be clausal embedding involve role shift on the verb that embeds declarative (Petronio and Lillo-Martin 2007) and even interrogative clauses (Davidson and Caponigro, to appear), of which we have more to say below.

Another result of a view that the complement of SAY or IMAGINE could be a quotation is the interpretation of the 1st person indexical. Consider (11), where the utterance beginning with '*John says*' is attributed to Bill.

- (11) a. Bill_c: John_a says, "I_{a,*b,*c} am busy." ≈ (1a)
 b. Bill_c: John_a says he_{a,b,*c} is busy." ≈ (1b)

In writing, quotations clearly mark direct discourse and, thus, suggest the interpretation of the indexical in (11a), dismissing potential alternatives. However, in spoken language without quotation scope being marked, the interpretation of the indexical is ambiguous: it can refer either to John_a or to Bill_c, depending on when the quotation begins. This option disappears with the 3rd person pronoun in (11b): while it can refer to John_a or to some other individual in discourse (subscripted *b* here), but reference to the narrator (Bill_c) is impossible. Let us set the reason for the ambiguity aside for a moment and focus on the observation: only when interlocutors hear an utterance containing quotation might they interpret the 1st indexical as picking out the narrator.

The two consequences outlined above result in the following prediction: if one of the predicates in (5) is actually followed by a quotation, we may expect that it is the predicate over which RS does not spread and which allows the indexical in its scope to have more than one interpretation, perhaps if the quotation starts after the indexical. This, however, is the wrong result: between the two predicates under examination (SAY and IMAGINE), the one over which role shift does not spread is SAY but the predicate that allows multiple interpretations is IMAGINE. Further, as we have discussed elsewhere (Koulidobrova & Davidson, under review), both pass other diagnostics for clausal embedding, namely long-distance extraction, as seen in (12).

- (12) a. RS-a
 WHO WOMAN SAY YESTERDAY ~~WHO~~ BUSY WHO
 ‘Who did the woman say yesterday was busy?’

- b. RS-a
 WHO WOMAN THINK YESTERDAY ~~WHO~~ BUSY WHO
 ‘Who did the woman think yesterday was busy?’

Thus, we set this possibility aside and return to the puzzle under the assumption that the complement of SAY and IMAGINE in (5) is clausal – i.e. (5a) and (5b) are best described as cases of clausal embedding. This leaves us with two routes for exploration: either the culprit is the complement or the embedding predicate itself. We turn to former possibility next.

4.2.2. Does the size matter?

Overt complementizers are known to be able to reveal the amount of structure in the embedded clause. For instance, Japanese complementizers *no*, *ka*, and *to* head CPs of different sizes (Saito 2010). Bošković (1997) argues that the size of the clausal complement can be detected based on the obligatory presence or absence of the complementizer in topicalized structures (as in (13)): e.g., because ‘*that*’ in cases like (13b) is unavoidable, embedded topicalization always involves a CP.

- (13) a. John, Mary likes
 b. Peter does not believe *that* John, Mary likes
 c. *Peter does not believe John, Mary likes

- (14) a. $\overline{\text{JOHN}}^t$ MARY LIKE
 ‘John, Mary likes’
 b. SEEM YESTERDAY MARY BACK TOMORROW
 ‘It seemed yesterday that Mary would be back tomorrow’

Nevertheless, with a modification, the diagnostic remains helpful. Despite the lack of phonological form, there is more subtle evidence of the presence of the additional layer: a subset of verbs, such as FEEL in (15a), allows embedded topicalization while another subset does not (see (15b)), suggesting, according to Bošković (1997), that some verbs (e.g. FEEL) require a CP complement and others (e.g. THINK) a TP.

- (15) a. BILL FEEL [_{CP} [_{TP} ^tJOHN [_{TP} MARY LIKE]]] ≈ (13b)
 ‘Bill feels that John, Mary likes’
 b. *BILL THINK [_{TP} [_{TP} ^tJOHN MARY LIKE]] ≈ (13c)
 ‘Bill thinks that John, Mary likes’. (Bošković 1997)

Turning to SAY and IMAGINE, we find that they replicate the asymmetry in (15).

- (16) a. BILL SAY [_{CP} [_{TP} JOHN MARY LIKE]]
 ‘Bill imagines that John, Mary likes’
 b. *BILL IMAGINE [_{TP} [_{TP} JOHN MARY LIKE]]
 ‘Bill thinks that John, Mary likes’.

On Bošković’s diagnostic then, (16) serves as evidence that IMAGINE takes a TP complement. Armed with hope then, and considering the observation regarding IMAGINE in (5), we expect a generalization in (17) to hold.

- (17) RS markings extend over the embedding predicate with a TP complement.

However, as will shortly become evident, (17) does not hold.

In their examination of embedders, Davidson & Caponigro (2015) establish three classes of ASL verbs:

- (18) a. Declarative clause embedders: THINK, REALIZE, SURPRISE, AGREE
 b. Propositional (extensional) embedders: KNOW, GUESS, REMEMBER, FORGET, FIND-OUT, TELL
 c. wh-/polar interrogative (intensional) embedders: ASK, WONDER, CURIOUS,

Table 1. Interaction of ‘*believe*’ and ‘*assume*’ with epistemics (from Anand & Hacquard 2009)

<i>Believe</i>	<i>Assume</i>
Require sentient subjects (as in (19b)).	Do not require sentient subjects (as in (19a)).
License subjective epistemic modals (as in (20b)).	License objective epistemic modals (as in (20a)).
Propose adding the matrix clause to the common ground (are “about” the main clause subject)	Propose adding their complement to the common ground (i.e. proffer their content)

Anand & Hacquard argue that the paradigm in (20)-(21) reflects a subjectivity requirement that certain predicates impose on their complements, captured in the semantics by having *beliefs* be evaluated with respect to an event involving doxastic alternatives held by the subject, the attitude holder. The class of verbs that exhibit this type of behavior includes *believe*, *think*, *wonder*, and *imagine*, among others. In contrast, *claims* (and *assumptions*) are evaluated with respect to alternatives that are active in the common ground after the claim is accepted by all (i.e. not specific to the subject). The verbs that behave this way are *claim*, *assume*, and *mean*, among others. Note that the issue under discussion in Anand & Hacquard (2009) is not embedding per se; rather, it is the characteristics of different types of attitudes stemming from semantics and resulting in various effects on the discourse. In the following sections we will apply these distinctions to the ASL embedding data, taking a first look at semantics, then pragmatics.

4.3.1 Semantic subjectivity requirement

Anand & Hacquard (2009) argue that the different behaviors of *believe*- and *assume*-verbs in Table 1 arise from the difference in what each class of verbs reports on: doxastics (e.g. *believe*) report mental states while profferings (e.g. *claim*, *assume*) report discourse moves – i.e. the attempt to update the common ground. Anand & Hacquard assume the view of modal semantics in Hacquard (2006): modals are relative to an event of evaluation, and the epistemic accessibility relation is licensed by an event with propositional content. Attitudes can be modeled as predicates of events, and these events, in turn, have a set of propositions associated with them – $\text{CONTENT}(e)$, or $\text{CON}(e)$ as below, picks out such a set, which for *believe* contains doxastic propositions (22). Therein lies the interaction with epistemics.

- (22) a. $f_{\text{epistemic}}(e) = \lambda w'.w'$ is compatible with $\text{CON}(e)$
b. $[[\text{believe}]] = \lambda e.\lambda p.\lambda x.\lambda \text{non-manual.Holder}(x,e) \ \& \ \text{belief}'$

In other words, the content of believing is dependent on the attitude holder. Not so with proffering verbs: their attitude holders serve as discourse participants. Anand & Hacquard argue that since proffering verbs report attempts to make their complements non-controversial, they induce objective stance: the complement of the proffer must be evaluated with respect to the proposed common ground (below, $\text{Goal}(e)$ is a predicate which returns a conversational goal of event e , and $e_{CG-\text{non-manual}}$ is a common ground state which results from the acceptance of a proposition by all of the participants) (23).

$$(23) [[\text{claim } e \text{ } p]] = \text{claim}'(e) \& \forall \text{non-manual compatible with Goal}(e) \\ [\forall w' \in \cap \text{CON}(e_{CG-w'})[p(w')=1]] \quad (\text{Anand \& Hacquard 2009 [32]})$$

Let us now apply (22)-(23) to the ASL cases in (5). For IMAGINE (as in (24a) and like BELIEVE, etc.), the content of the attitude predicate contains a set of propositions for which there is a variety of doxastic relationships that hold for one who is said to have the attitude (here, the mother). For SAY (as in (24b) and like CLAIM, etc.), the content of the attitude predicate is based on a projection of the common ground that would result from adding the embedded proposition (*that mom is busy*) to the common ground.

- (24) a. $[[\text{MOM IMAGINE IX_a BUSY}]=1 \text{ iff Holder}(\text{mom},e) \& \text{imagine}'(e,\text{non-manual}) \& \forall w' \in \cap \text{CON}(e)[\text{Busy}(\text{mom})(w')]]$,
 where $\cap \text{CON}(e) = \text{DOX}(\iota x \text{ Holder}(x,e), \text{World}(e))$
 b. $[[\text{MOM SAY IX_a BUSY}]=1 \text{ iff Holder}(\text{mom},e) \& \text{say}(e,\text{non-manual}) \& \forall w' \in \text{Goal}(e) [\forall w'' \in \cap \text{CON}(e_{CG-w'})[\text{Busy}(m))(w'')]]$,
 where e_{CG} = proposed common ground state resulting from accepting $\text{Busy}(m)$ to CG

We now have the tools to differentiate the two classes of verbs. Although we will have to leave it to future work, we note that this discussion suggests that the ASL predicates are expected to interact with epistemics; testing this prediction is currently under way.⁶

4.3.2. Pragmatics

In terms of discourse structure, Anand and Hacquard suggest that utterances involving doxastic vs. proffering embedding verbs appear to have different pragmatic foci (answer different Questions Under Discussion (QUD), Roberts 1996): with doxastics, what is up for discussion is the truth of the main clause, while with proffering verbs, what is up for discussion is the truth of their complement. Here is the intuition then: if what is up for discussion is the content of the main clause, then we might expect the accompanying RS

⁶ Preliminary data suggest that we are on the right track here:

- (i) YESTERDAY MARY THINK/??ASSUME EARTH MAYBE FLAT
 ‘Yesterday Mary thought/??assumed that the Earth might be flat’

to spread into the main clause as well, to extend *over* the embedding predicate (as in (25a)). If, on the other hand, what is up for discussion is the content of the complement only, this too is marked by RS – starting *after* the attitude predicate (as in (25b)).

- (25) a. MOM SAY ^{RS-a} BUSY
 ‘Mom said [mom] busy’
 → Pragmatic focus = that mom is busy
- b. MOM THINK ^{RS-a} BUSY
 ‘Mom thinks [mom] busy’
 → Pragmatic focus = that mom thinks she is busy

Our reasoning for this hypothesis involves the system of reference tracking in ASL and other sign languages (cf. Schlenker 2011). In particular, in ASL an individual introduced into discourse receives a (typically arbitrary) locus assignment – a dedicated area of signing space used for reference to the individual in question, as in (26) below. This assignment can be accomplished through either the indexical point ‘IX’ (see section 2) or by simply signing the name of the individual in that space.

- (26) ‘Marie_i teaches ASL. She_i is skilled.’
 a. MARIE a-IX TEACH ASL. a-IX SKILLED.
 b. a-MARIE TEACH ASL. a-IX SKILLED.

How this assignment is established in the first place remains a matter of some debate in the literature orthogonal to the issues discussed here. What is relevant, however, is the following: assignment of spatial loci (and its later use in anaphoric relations) is not restricted to individuals; propositions too may be assigned loci as well.

In general, the assignment of propositions to loci works in the same way as the assignment of discourse referents to loci, which can be done either with an overt IX or with non-manuals. Non-manually, body shift serves this purpose, for example, with a rightward shift assigning the proposition to the rightward area of signing space, labeled *a* in (27) vs. leftward area labeled in (27) as *b*. Importantly, there is no real ‘role’ here to shift into – the shift in (27b) cannot be immediately captured in terms of (9).

- (27) a. a-GET #a-JOB DISJ/shift b-GO b-GRADUATE-SCHOOL. a-IX I CAN b-IX IMPOSSIBLE
 ‘Get a job or go to graduate school? The former I can do, but the latter is impossible.’
- b. ^{-a} MOM BUSY. ^{-b} DAD SLEEP
 ‘Mom is busy {and/or} Dad is sleeping’

We suggest then that one reason the role shift extends over the doxastic matrix predicate is that in doxastic contexts, what is up for discussion is the entire proposition (in particular, the truth of the matrix clause); as such, the *whole clause* is likely to be the target for later anaphora and, thus, is assigned a locus. In turn, in proffering contexts, it is the *complement* that is the most likely target of later anaphora, and therefore, a locus is assigned to the complement only. For example, consider a context in which the question under discussion is *Is Mom busy?* One might very well address this QUD by using a proffering verb with the answer *Mom is busy* as its complement, as in (25a). In ASL, if this answer BUSY ‘Mom is busy’ is assigned to a spatial locus, then it can be further discussed, if necessary, through simple pronominal reference by pointing back to that location using the indexical point IX. If, on the other hand, the question under discussion is *Does Mom think she is busy?*, then one might address this QUD through the doxastic example in (25b) – the ASL statement MOM THINK BUSY. Since the mother’s attitude, and not the clausal complement, is what is of concern, interlocutors would most naturally want to assign the whole matrix clause to a spatial locus, not just its complement. While we think this may be on the right track, we acknowledge that there is an element of flexibility predicted by this line of reasoning: in particular, when the context changes, differences in non-manual markings than the ones in (5) may be available. We tentatively suggest that this question could be addressed in an experimental setting by varying contexts in which these two verb types appear (some which later refer to the whole proposition, and some which later refer only to the complement) and investigating whether role shift changes accordingly. We leave this for future research.

It seems then that this path of analysis may capture the difference in (5) – i.e. the solution to the puzzle in section 3.1 concerning the extent of role shift. However, can the aforementioned solution derive the reference options in (5) (the puzzle in section 3.2)? Consider that in both (5a) and (5b), the pronominal in the scope of an attitude predicate is interpreted as the attitude holder – the mother. Further, we now have two propositions, each of which corresponds to some QUD and can serve as an anaphoric expression, interpreted, as expected, relative to the attitude holder. For the proposition ‘IX-1 BUSY’ in (5a), the holder of the attitude (of saying) is MOM; for ‘MOM IMAGINE IX-1 BUSY’ in (5b), the holder of the attitude (of saying) is the signer herself. At any rate, the indexical is interpreted relative to the author/narrator. While this path requires careful examination, at least in broad strokes, it offers the solution to the puzzle in 3.2, concurrently providing independent support, if not the details of analysis, to the claim in Anand & Nevins (2004) that various (types of) predicates dictate shifting possibilities of indexicals. We leave the details for future research.

4.4 Lexical role shift

Although the discussion in this paper has been focused on embedding, the main argument here (following that in Anand & Hacquard 2009) is that the difference between (5a) and (5b) is best captured not with the analysis of embedding but, rather, with careful examination of the embedding predicates – i.e. the lexical semantics of certain verbs and the resulting pragmatics. In fact, this is not the first mention of lexical properties of certain embedding verbs in the literature. One such example was discussed in Petronio &

- (28) a. ^{wh}WHO BUY COMPUTER
‘Who bought a computer?’
- b. ^{wh}*WHO BUY COMPUTER
‘Who bought a computer?’ (Petronio & Lillo-Martin 1997 [74])
- (29) a. ^{ponder}ANN WONDER ^{wh}WHO LIKE PHILIP
‘Ann wonders, “Who likes Philip?”’
‘Ann wonders, (so would you tell me) who likes Philip?’
- b. ^{head nod/ponder}ANN WONDER WHO LIKE PHILIP.
‘Ann wonders who likes Philip.’
- c. ^{head nod}ANN CURIOUS WHO YOU LIKE.
‘Ann is curious who you like.’ (Petronio & Lillo-Martin 1997 [79])

In (28a), a matrix wh-question receives ‘brow furrowing’ non-manual marking, typically associated with wh-questions in ASL, across the entire utterance. However, if the question is preceded by an attitude predicate, there are two options: *ponder* non-manual marking just on WONDER plus *wh* non-manual marking over the remainder (as if it is a quoted matrix question), and *ponder* non-manual marking over the whole clause, including WONDER, as in the case of indirect discourse/clausal embedding. In the current context, an important property of this kind of reported non-manual marking in embedded clauses in ASL is that it varies from predicate to predicate. For example, the non-manual marking in (29b) is different from (29c), and these in turn are different from the non-manual marking seen with other clausal embedding verbs like KNOW, DON’T KNOW, etc. Caponigro and Davidson (2011) even suggest that the non-manual marking in Question-Answer Clauses / rhetorical questions might be the influence of the embedding predicate (the copula BE) on the embedded question. In any case, there has been a history of discussion regarding embedded clauses in ASL, and they are notable for having a non-manual marking that varies according to the individual predicate.

We suspect that some, if not all, cases of what we have been calling role shift throughout this paper are part of the same family as the non-manual marks on these verbs, especially in the cases where it extends over the matrix verb (as in doxastics). One reason we find this worth considering as a unified phenomenon is that, if it is the case that role shift on doxastics is the same as role shift in other cases of embedded discussed in previous literature, this lends further support for our argument to put the difference in the lexical entry for these verbs. In other words, this non-manual marking is not an overt existence of a separate role shift “operator”, but rather something that comes with each verb as part of its phonology. As the type of the non-manual is entirely verb specific, we take this to necessarily stem from the lexicon, not a similar operator in each case. We do not sacrifice explanatory power by resorting to the lexicon in this case, but instead use it as a source of

5. Conclusions

In this paper we have discussed two types of embedding predicates as suggested by Anand and Hacquard (2009): *doxastics* and *profferings*. We show evidence for this same distinction in ASL through two different means: (i) the flexible interpretation of the usually indexical first person singular subject pronoun in doxastics verbs but not proffering verbs and (ii) the spreading of non-manual marking associated with role shift over the matrix predicate in the case of doxastic verbs but not proffering verbs. We presented a series of arguments supporting the hypothesis that this behavior is due to the semantics of the verbs and not the syntax of the clauses or the relationship between the indexical expression and the verb. Finally, we discussed some of the possible reasons that these patterns may arise given the lexical semantics of the verbs, especially from the pragmatic and semantic perspective.

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