Answering negative questions in American Sign Language*

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1. Introduction

Languages vary in the way that discourse particles can be used to answer negative polar questions (Pope 1972). In a polarity-based system like Swedish, positive *yes* answers express positive polarity (1b) whereas negative *no* answers express negative polarity (1a). By contrast, in a truth-based system like Korean, a positive *yes* answer confirms the truth of the negative proposition (2a) whereas a negative *no* answer disconfirms the truth of it (2b).

(1)	Är 'Ar	du inte trött? e you not tired?'	Swedish
	a.	Nej (jag är inte trött). (Lit.) 'No, I am not tired.'	
	b.	Jo. (Lit.) 'Yes, I am tired.'	(Holmberg 2015)
(2)	An 'Ar	himtule? e you not tired?'	Korean
	a.	Ung (an himtule). (Lit.) 'Yes, I am not tired.'	
	b.	Ani (himtule). (Lit.) 'No, I am tired.'	(Dorothy Ahn, p.c.)

In yet another class of languages, answer particles can be used to convey both interpretations. As illustrated by English in (3), positive *yes* answers and negative *no* answers can

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express positive or negative polarity respectively. In addition, the answer particles *yes* and *no* can confirm or disconfirm the truth of the negative proposition, as shown in (4).

(3)	Are you not tired? (4)			Are you not tired?		
	a. b.	No, I am not. Yes, I am.		a. b.	Yes, I am not. No, I am.	

As far as we can tell, sign languages have not yet been discussed with regard to this typology. Our first goal, therefore, is to discuss how American Sign Language (ASL) fits into the typological picture of answers to negative questions. Our second goal is then to compare the answering of negative polar questions at the discourse level and below the discourse level, that is, within the same clause, in order to understand whether constraints that we see exist at the level of syntactic/semantic structure or discourse level pragmatics. In Section 2, we begin by providing some relevant background on ASL. We then present new data on the answering of negative questions in ASL. Section 3 shows that comparing the answering of negative questions at the discourse level and below the discourse level leads to several new insights on the semantics/syntax/pragmatic interface in sign languages. Finally in Section 4, we turn to our proposal for possible answers to negative questions in ASL.

2. The answering of negative questions

2.1 Background on polar questions and negation

Following convention, we write manual signs in capital letters using rough English glosses and we note non-manual marking above the glosses with a line. The extension of the line indicates the duration of the non-manual marker, and on the right side of the line we note the type of the non-manual marker.

Before introducing negative polar questions, we provide some background on polar questions and negation in ASL. Polar questions are distinguished from declarative sentences through non-manual marking. Specifically, (5) shows that matrix polar questions look identical to their corresponding declarative sentences in word order. However, while no specific non-manual marker is required in a declarative sentence, positive polar questions co-occur with brow-raising.¹ The picture in (6) illustrates the polar question in (5b).

- (5) a. ZOE PLAY VIDEO-GAMES. 'Zoe plays video games.'
 - b. ZOE PLAY VIDEO-GAMES? 'Does Zoe play video games?'

¹While non-manual marking co-occurs with the whole interrogative clause in (5b), it does not have to. Non-manual marking only has to occur at the end of an interrogative clause; it can be omitted at the beginning.



To express negation, ASL uses both manual negative signs like NOT and non-manual marking, in this case a headshake non-manual marker. A signer can negate a sentence by using the headshake non-manual marker simultaneously with the manual sign NOT and the scope of the former can vary, as shown in (7). However, (8) shows that while the headshake nonmanual marker can negate a sentence on its own, manual negative signs cannot.

(7)	a.	headshake JOHN NOT BUY HOUSE. 'John is not buying a house.'	
	b.	headshake JOHN NOT BUY HOUSE. 'John is not buying a house.'	(Neidle et al. 2000)
(8)	a.	*JOHN NOT BUY HOUSE .	
	b.	JOHN BUY HOUSE. 'John is not buying a house.'	(Neidle et al. 2000)

2.2 Answering negative questions in dialogue

Although the expression of negation and the realization of questions in sign languages are two topics that have gained wide attention in the literature (Petronio and Lillo-Martin 1997, Wood 1999, Neidle et al. 2000, Zeshan 2006, among many others), as far as we know no one has investigated the answering of negative questions in sign languages yet. We now provide a novel set of data from ASL in which we compare the answering of negative questions in dialogue (this section) and at the level of clausal embedding (Section 2.3).

Let us first consider the answering of negative questions in dialogue. Pragmatically, we know that negative questions cannot occur out of the blue. In particular, to produce a negative question *not* p?, we need contextual evidence against p (Büring and Gunlogson 2000).² To license the use of the negative question in (9b), we thus present a first sentence,

²Some languages, including English, allow two types of negative questions (Romero and Han 2004, a.o.): negative questions with low negation (LowNeg-Q) illustrated in (i), and negative questions with high negation (HighNeg-Q) illustrated in (ii). While LowNeg-Q do not necessarily convey speaker bias for p, HighNeg-Q do (Romero and Han 2004,a.o.). That is, the question in (ii) conveys that the speaker believed that the addressee likes coffee. It is worth noting that the ASL questions we are investigating in this paper do not

in (9a) by "Amy", to provide evidence against p. Now, (9c) shows that when answering a matrix negative polar question, NO can convey two interpretations: it can either agree with the polarity of the question (9ci), or disconfirm the truth of the negative proposition (9ci).³

- (9)a. Context: headshake Amy: ZOE PLAY VIDEO-GAMES NEVER 'Zoe never plays video games.' b. Negative question: brow-raise Ben (to Zoe): IX Zoe NEVER? 'You never play video games?' Possible answers: c. headshake Zoe: NO, IXZoe NEVER (i) 'No, I never play video games.' headshake
 - (ii) Zoe: $\overline{\text{NO}}$, IX_{Zoe} ONCE-IN-A-WHILE 'No, I play video games once in a while.'

When answering polar questions in dialogue, ASL thus patterns just like English in not strictly following the truth-based system or the polarity-based system. So far, we have just looked at polar questions at the discourse level, when one participant in a conversation poses a question to their interlocutor. However, ASL allows another type of questionanswer pair where the same person can sign a question and its answer. We turn to this construction next.

2.3 Answering negative question-answer clauses

In ASL, as in many other sign languages, we find a construction that consists of two parts: a Q-constituent conveying a question and a A-constituent conveying an answer to that question. We follow Caponigro and Davidson (2011) in referring to these as Question-Answer Clauses (QACs). As previously mentioned, in contrast to a question-answer pair in dialogue, a QAC requires the same person to produce both parts.

necessarily need to convey speaker bias for p, suggesting that these are the equivalent of English LowNeg-Q. Whether ASL allows two types of negative questions, as English, will be investigated in future work.

(i)	Do you not like coffee?	LowNe	g-Q

(ii) Don't you like coffee?

³For sake of readability, when mentioning ASL data within the main text, we do not indicate the type of non-manual marker that co-occurs with the manual sign. However, each piece of data should be read as headshake including the latter. For instance, NO should be read as $\frac{1}{NO}$.

HighNeg-Q

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ASL allows two types of QACs: constituent QACs, in which the Q-constituent is a *wh*-question, and polar QACs, in which the Q-constituent is a polar question. Examples of constituent and polar QACs are given in (10a) and (10b) respectively. As with polar questions in dialogue, brow-raising is an obligatory part of QAC structure: in this case, it serves to mark the Q-constituent of the QAC. This is illustrated in (11) for the polar QAC.

- (10) a. $\begin{bmatrix} Q-constituent & \overline{AMY BUY WHAT}, \\ What Amy bought is a book.' \end{bmatrix}$
 - b. $\begin{bmatrix} Q-constituent & \overline{I \text{ LAUGH}} \end{bmatrix}$, $\begin{bmatrix} A-constituent & \overline{NO} \end{bmatrix}$ 'I was not laughing.' (Caponigro and Davidson 2011)
- (11) Polar QAC(10b)



Interestingly, we found that negative QACs are more restricted than negative questions in dialogue: when used to answer a negative QAC, the answer particle NO can only convey one interpretation. Specifically, (12b) shows that while NO can disconfirm the truth of the negative proposition, it cannot agree with the polarity of the question.

(12)Context: a. headshake Amy: ZOE PLAY VIDEO-GAMES NEVER 'Zoe never plays video games.' b. *Negative QACS:* brow-raise (i) Zoe: $[Q-constituent \ IX_{Zoe} \ PLAY \ VIDEO-GAMES \ \overline{NEVER}],$ headshake NO ONCE-IN-A-WHILE A-constituent 'I do play video games once in a while.' brow-raise Zoe: *[*Q*-constituent IX_{Zoe} PLAY VIDEO-GAMES NEVER], (ii) headshake [A-constituent NO NEVER] ('I never play video games.')

The intriguing asymmetry that we have found between the answering of negative questions in dialogue and negative QACs is summarized in Table (13).

	In dialogue	In QACs
headshake		
\overline{NO} can agree with the (negative)	\checkmark	*
polarity of the question.		
headshake		
$\overline{\text{NO}}$ can disconfirm the truth of	\checkmark	\checkmark
the negative proposition.		

(13) Summarizing the answering of negative questions in ASL

This pattern is robust: it has been verified with three Deaf signers and for three negative signs (NEVER, NOTHING and NONE). Examples of well-formed negative QACs containing NONE and NOTHING are given in (14a) and (14b) respectively.

(14)	a.	[<i>Q</i> -constituent I EXPERIENCE 'I do have some experience	brow-raise $\overline{\text{NONE}}$], [<i>A</i> -constituent (with interpreting).'	headshake NO H	IAVE]
	b.	$[Q-constituent \ I \ HOMEWORK$ 'I do have some homework.'	brow-raise NOTHING], $[A-constituen]$	headshake $t \overline{NO}$	HAVE]

2.4 **Positive answers**

Up to now, we have focused on negative NO answers. One may wonder whether positive YES answers pattern as negative NO answers. In particular, is the answering of negative QACs more restricted than the answering of negative questions in dialogue when one uses positive answer particles? In fact, Deaf signers we consulted preferred to use negative answer particles to answer negative questions; while the pattern for negative NO answers was robust, we observed more variation in the data when using positive answer particles. Specifically, not all signers could use the answer particle YES as an answer to a matrix negative polar question. When it comes to QACs, though, we found a similar pattern as for negative NO answers: none of the signers could use the positive answer particle YES to agree with the (negative) polarity of the question, as shown in (15).

(15) *[$_{Q-constituent}$ I PLAY VIDEO-GAMES $\frac{\text{brow-raise}}{\text{NEVER}}$], [$_{A-constituent}$ $\frac{\text{head nod headshake}}{\text{YES}}$ $\frac{\text{NEVER}}{\text{NEVER}}$] ('I never play video games.')

3. New insights on the semantics/syntax/pragmatic interface in sign languages

We now show that comparing the answering of negative questions in dialogue and in QACs leads to some new insights on the semantics/syntax/pragmatic interface in sign languages.

3.1 Structure of QACs

Previous analyses of QACs can be divided into two groups. On the one hand, Hoza et al. (1997) argue that QACs consist of a matrix interrogative clause followed by a matrix declarative clause, and therefore form a question-answer pair at the discourse level. On the other hand, Wilbur (1994, 1996) and Caponigro and Davidson (2011) argue that QACs are declarative clauses: they form a syntactic and a semantic unit. More specifically, Wilbur (1994, 1996) claims that they are the ASL equivalent of pseudoclefts whereas for Caponigro and Davidson (2011), they are embedded question-answer pairs (and differ in important ways from English-type pseudoclefts).

A number of arguments have been provided to show that the Q-constituent of a QAC is not a matrix interrogative clause. One difference between matrix interrogative clauses and embedded interrogative clauses concerns the availability of *wh*-doubling. While a *wh*-word can occur both in situ and at the end of a matrix interrogative clause (as illustrated in (16)), (17a) shows that it cannot be doubled in an embedded interrogative clause. Crucially, a *wh*-word cannot occur twice in the Q-constituent of a QAC either (Wilbur 1994, Petronio and Lillo-Martin 1997), as shown in (17b).⁴

- (16) JOHN BUY WHAT YESTERDAY WHAT ?'What did John buy yesterday.'
- (17) a. *HE ASK JOHN BUY WHAT YESTERDAY WHAT . ('He asked what John bought yesterday.')
 - b. *[Q-constituent JOHN BUY WHAT YESTERDAY WHAT], [A-constituent BOOK]. ('What John bought yesterday was a book.')

In addition, Wilbur (1994) observes that the non-manual marking occurring with the Q-constituent of QACs (i.e., brow raising) differs from the non-manual marking occurring with matrix *wh*-questions (i.e., brow furrowing). This again suggests that the Q-constituent of a QAC is not a matrix interrogative clause.

However, these arguments all concern constituent/wh QACs. As polar questions do not contain wh-words, wh-doubling cannot be used to distinguish matrix polar questions from embedded polar questions and polar QACs. In addition, as previously mentioned, polar QACs and matrix polar questions share the same non-manual marking (i.e., brow raising). We now provide new arguments showing that polar QACs, just as constituent QACs, do not consist of a matrix interrogative clause followed by a matrix declarative clause. The first argument is based on the availability of verb-doubling. As pointed out by Davidson and Caponigro (2016), while verbs can occur both in situ and at the end of a matrix polar question, they cannot occur twice in an embedded polar question. This is illustrated in (18). Crucially, we show that polar QACs behave in this respect as embedded polar questions.

⁴We have omitted non-manual marking in these examples as it is not directly relevant to the point we are making.

That is, verb-doubling is not allowed in the Q-constituent of a QAC either, as shown in (19), suggesting that the Q-constituent of a polar QAC is an embedded interrogative clause.⁵

- (18) a. YOU LIKE SALAD LIKE ? 'Do you like salad ?'
 - b. *MOM WONDER BROTHER LIKE SALAD LIKE . ('Mom wonders whether her brother likes salad.')
- (19) *[Q-constituent I LIKE SALAD LIKE], [A-constituent NO HATE] ('I do not like salad.')

The second argument is based on the answering of negative questions. By comparing the answering of negative questions in dialogue and in QACs, we showed in Section 2 that answers to negative QACs are more restricted than answers to negative questions in dialogue (see Table (13)). This again suggests that polar QACs do not consist of a matrix interrogative clause followed by a matrix declarative clause.

With this evidence that polar QACs are not question-answer pairs at the discourse level, we now turn to the other proposals. Recall that Wilbur (1994, 1996) has argued that QACs are the ASL equivalent of pseudoclefts. An example of an English pseudocleft is provided in (20). However, polar QACs cannot be analyzed as pseudoclefts as pseudocleft analysis specifically excludes structures involving polar questions, as shown in (21).

- (20) [What John bought] was [a book].
- (21) a. *[Whether John bought a book] is [no/he didn't].
 b. *[Should John get a car] is [yes/he should]. (Caponigro and Davidson 2011)

Our data thus provide evidence in favor of Caponigro and Davidson's (2011) analysis, according to which QACs are embedded question-answer pairs. Caponigro and Davidson (2011) propose that a QAC like (22a) has the structure in (22b). That is, syntactically a QAC is a declarative clause with a silent copula (e_{BE}) that takes an interrogative CP as its subject (i.e., the Q-constituent) and an IP (which can be partly elided) as its complement (i.e., the A-constituent).⁶

(22) a.
$$[Q-constituent \overline{MEG LAUGH}], [A-constituent \overline{NO}]$$

'Meg was not laughing.'

⁵Once again, we have omitted non-manual marking in these examples as it is not directly relevant to the point we are making.

⁶The assumption that QACs contain a silent copula is consistent with the fact that the copula is always silent in ASL.



3.2 Non-manual marking

Investigating negative questions in ASL further suggests that there are open questions regarding the interaction of different types of non-manual marking in non-declarative sentences. Looking at the expression of negation, Zeshan (2006) argues that sign languages can be divided into two typological classes: manual dominant languages and non-manual dominant languages. In non-manual dominant languages like ASL, she claims that the occurrence of non-manual markers is obligatory, negative signs being unable to negate a sentence on their own, as shown in (23). By contrast, in manual dominant languages like Italian Sign Language (LIS) or Turkish Sign Language (TID), manual negation is claimed to be required to negate a sentence. This is illustrated in (24) for LIS.

headshake LAY VIDEO-GAMES NEVER. ever plays video games.'	
LAY VIDEO-GAMES NEVER .	
headshake O CONTRACT SIGN.	LIS
beadshake CONTRACT SIGN NOT . did not sign the contract.' (Geraci 2	2006)

Although it is true in ASL that the occurrence of the headshake non-manual marker is obligatory in declaratives, we observed that it is not mandatory in negative polar questions. In particular, signers could use the brow-raise non-manual marker - characteristic of polar questions - instead, as shown in (25).⁷

⁷It is worth noting that for some negative questions, signers used another type of non-manual marker, different from the brow-raise non-manual marker. Further investigation of the different types of non-manual markers used in negative questions is left for future work.

 (25) brow-raise YOU NEVER ?
 'You never play video games?'

3.3 Double negation readings

Finally, negative questions turn out to provide a way to express wide scope readings of negation and double negation readings. In particular, we observed that question-answer pairs (whether in dialogue or in QACs) can give rise to double negation readings even in a language like ASL that usually does not allow these readings. Example (26) illustrates the fact that ASL shows strong negative concord (Wood 1999, Fischer 2006). That is, when two negative signs (NOT and NOTHING in (26)) co-occur in a sentence, they yield one semantic negation: (26) means that the signer does not have any homework.

(26) I $\frac{\text{headshake}}{\text{NOT}}$ HAVE HOMEWORK $\frac{\text{headshake}}{\text{NOTHING}}$. 'I do not have any homework.'

Now, our data discussed in Section 2 show that when a negative NO answer is used to answer a negative question, it can convey a double negation reading. That is, the two negations (the one introduced by the negative question and the one introduced by the negative NO answer) can cancel each other out and the sentence can yield a positive reading. For instance, Zoe's answer in (27) means that she plays video games once in a while.⁸

(27)	a.	<i>Ben:</i> IX <i>Zoe</i> NEVER? 'You never play video games?'	
		handshaka	

b. Zoe: $\overline{\text{NO}}$, IX_{zoe} ONCE-IN-A-WHILE 'No, I play video games once in a while.'

This is consistent with what has been found for *wh*-questions in other negative concord languages (Fălăuş and Nicolae 2016). Example (28) shows that when the neg-word *nimeni* is used as a fragment answer to a negative *wh*-question, it can convey two interpretations: a negative concord (i.e., single negation) reading, and a double negation reading.

(28)	Cir wh 'W	ne nu a venit? o not has come 'ho didn't come?'	Romanian
	a.	Nimeni. 'Nobody came You're the first one here.'	Negative Concord reading
	b.	Nimeni. 'Nobody didn't come Everybody's here.'	Double Negation reading

⁸While we illustrate this point with a question-answer pair in dialogue, the same is true of negative QACs.

We conclude that negative questions in ASL provide three new insights: they provide new evidence that polar QACs are not discourse level question-answer pairs, they suggest that the requirements on negative non-manual marking interact with polar question nonmanuals, and double negation readings arise in a way unexpected from the rest of ASL but in line with what has been found in other negative concord systems. We turn in the next section to a proposal for our primary data pattern (the interpretation of answers to negative questions in dialogue and in QACs) which is consistent with these observations.

4. Toward an analysis

Recall that by comparing the answering of negative questions in dialogue and in QACs, we uncovered the following pattern: while the answer particle NO can convey two interpretations when used to answer a matrix negative question, it can only disconfirm the truth of the negative proposition when used to answer a negative QAC (see Table (13)). This data pattern poses a challenge for Caponigro and Davidson's (2011) proposal. Having provided evidence in favor of their syntactic analysis (see Section 3.1), we now show that their semantic analysis is too permissive as it predicts that both answers should be available in polar QACs, contrary to facts. We illustrate their proposal in (29). The intuition they follow is that a QAC asserts the identity of two propositions: the proposition associated with the Q-constituent and the proposition associated with the A-constituent. More specifically, they propose that a polar QAC like (29) has the structure in (29a) and is interpreted as in (29b).⁹ Note that under this analysis, nothing would prevent NO from agreeing with the polarity of the question when used to answer a negative QAC.



⁹For composition details, we refer the reader to (Caponigro and Davidson 2011, 357-358).

b. The unique complete true answer to 'Was Meg laughing?' in w is identical to the proposition 'that Meg was not laughing'.

To account for the possible answers for negative questions in ASL, the theory must be restricted to rule out NO expressing negative polarity in negative QACs. One might hypothesize that that NO cannot agree with the polarity of the question in negative QACs is due to a restriction on embedding: in particular, one could think that NO cannot be embedded in ASL (as is the case in English) or NO can only convey one interpretation when embedded. However, (30) shows that when embedded, NO can convey both interpretations: it can either agree with the polarity of the question, as shown in (30a), or it can disconfirm the truth of the negative proposition, as shown in (30b).¹⁰

(30) Ben (to Zoe): AMY IX_{Amy} PLAY VIDEO-GAMES $\frac{\text{brow-raise}}{\text{NEVER}}$? 'Does Amy never play video games ?'

> a. *Zoe:* IX_{Zoe} THINK NO, IX_{Amy} NEVER 'I think that she never plays video games.'

> > headshake

b. $Zoe: IX_{Zoe}$ THINK \overline{NO} , IX_{Amy} ONCE-IN-A-WHILE. 'I think that she does play video games once in a while.'

It has often been mentioned that constituent QACs seem to place in focus the A-constituent. Wilbur (1994, 1996) quite clearly argues for this by analogizing QACs to pseudoclefts, which are focusing structures. Caponigro and Davidson (2011) suggest that pragmatically, the QAC is an overt subpiece of a discourse-tree modeled through Questions (Under Discussion - Roberts 1996) and their focused Answers. Along these lines, we hypothesize that polar QACs are used to express focus, but in particular, contrastive focus. Instances of contrastive focus in English and in ASL are given in (31) and (32) respectively. Example (32) shows that in ASL, contrastively focused elements may occur in sentence initial position together with some non-manual markers. Similarly, we propose that in polar QACs, the focused answer occurs in sentence-initial position and the rest of the proposition can be elided.

- (31) a. Did Lisa see Zoe?
 - b. No, LOU saw Zoe.
- (32) a. YOU READ CHOMSKY BOOK 'Did you read Chomsky's book?'

b. NO, BOOK STOKOE I READ 'No, I read Stokoe's book.'

(Lillo-Martin and Quadros 2008)

¹⁰A note of caution is in order, however, because embdding can be generally difficult to separate in ASL from quotation or juxtaposition due to lack of complementizers, etc.

Further evidence for the hypothesis that polar QACs are used to express contrastive focus comes from the example in (33). An answer to a polar question can only get a contrastive reading if the answer particle is followed by another expression (expression that is contrastively focused). Interestingly, (33) shows that simple negative answers to negative QACs are felt insufficient. Under our hypothesis, polar QACs being used to express contrastive focus, the constituent following the answer particle must be focused and therefore cannot be elided.

(33) # [$_{Q-constituent}$ I PLAY VIDEO GAME $\frac{\text{brow-raise}}{\text{NEVER}}$], [$_{A-constituent}$ $\frac{\text{headshake}}{\text{NO}}$] ('I do play video games once in a while.')

If polar QACs are used as a means of contrastive focus in ASL, we would then expect to find negative answer particles that disconfirm the truth of the negative proposition, in order to provide contrast between the Question and the Answer; answer particles that agree with the polarity of the question wouldn't allow for a contrast between the two. If this is the source of the restriction, it would mean that there is nothing special about answer or questions in dialogue and in QACs, but rather the overall use of QACs as a mechanism for contrastive focus that rules out a set of readings.

5. Conclusion

By investigating the polarity particle system of ASL from the perspective of negative questions, we have learned something new both about the typology of sign language negation and the structure of QACs. We have seen that, like English, ASL polar answer particles illustrate both a polarity-based system and a truth-based system. Unexpected from the typology in Zeshan (2006) in which ASL is a non-manual dominant sign language, we found that negative headshake was not obligatory in negative polar questions. We also uncovered a pattern, which seems so far to be quite robust, that negative answers to negative questions within QACs have only a contrastive reading, not showing the ambiguity found in discourse level question-answer pairs. We hypothesize that this is due to the pragmatic restrictions of QACs to focus, and in the case of polar QACs to provide contrastive focus. Since varieties of focus are in general an understudied area within formal semantics and pragmatics, we hope that our data can provide some additional insight for building a theoretical model.

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