

# *Parameters for Questions: Evidence from wh-Movement in ASL* 708

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In this paper I will present some data on the formation of wh-questions in American Sign Language (ASL). The data show that wh-movement in ASL exhibits a different pattern from wh-movement in English and other languages. I make several generalizations about wh-movement possibilities in ASL, and indicate where further data are necessary. I then go on to suggest two possible theoretical analyses of these data within the Government and Binding framework (Chomsky, 1981, 1986a, b, and others). This framework makes claims about the nature of language in terms of a system of Universal Grammar, which includes abstract principles that hold for all languages and parameters by which language differences are captured. If the theory of Universal Grammar accurately describes linguistic universals, they should be tested with data from signed languages. Thus, the theory of universal grammar can be informed by sign language data. Furthermore, sign language researchers can use the technical tools from such theories to help account for generalizations observed across a variety of languages.

## EVIDENCE FROM FOUR SPOKEN LANGUAGES

This section presents data from Chinese, French, English, and Italian, that has been used to motivate several parameters for questions. The next section presents data from ASL relevant to these proposals.

### *Chinese*

In English, wh-questions appear with a wh-word at the beginning of the sentence; thus, it is said that wh-movement is a syntactic operation in English. However, in Chinese, wh-phrases do not move in the syntax, as illustrated in sentence 1.

- (1) ni kanjian-le shei?  
you see-ASP who  
'Who<sub>i</sub> did you see <sub>t</sub>?'

Huang (1982) argues that, although Chinese does not display syntactic wh-movement, it does have wh-movement at the level of logical form, LF. In this way, the position of the wh-word at LF indicates its scope. As evidence for this proposal, Huang notes that the wh-element that is left *in situ* in syntax still has the scope that it would have if it were moved. Sentences 2a and 2b (Huang's 162, 163, p. 254) illustrate the scope-bearing property of wh-words in Chinese.

- (2) a. [Zhangsan wen wo [shei mai-le shu ]]  
 John ask I who buy-ASPbook  
 'John asked [me] who,  $t_i$  bought books.'
- b. [Zhangsan xiangxin [shei mai-le shu ]]  
 John believe who buy-ASP book  
 'Who<sub>i</sub> does John believe  $t_i$  bought books?'

As Huang explains, "The only surface difference among these sentences is in the choice of the matrix verb. . . . As the translation shows, the single difference in the choice of the verb is responsible for the fact that [2a] must be interpreted as a statement taking an indirect question, [and 2b] must be interpreted as a direct question" (1982, 254). Thus, the LF representations for English and Chinese both show that the question word has scope over the rest of the clause. The LF representation of sentence 1 is then as given in example 3.

- (3) [<sub>CP</sub> shei<sub>i</sub> [<sub>IP</sub> ni kanjian-le  $t_i$ ]]

Huang proposes to account for the difference between English and Chinese wh-questions by saying that there is a parameter associated with Move- $\alpha$ : by this parameter languages can choose whether wh-movement occurs in the syntax (English) or at LF (Chinese).<sup>1</sup>

### French

Although movement of wh-words is sometimes observed in French syntax, this movement is optional, as the examples in 4 show.

- (4) a. Qui as-tu vu?  
 b. Tu as vu qui?  
 'Who, did you see  $t_i$ ?'  
 (Lasnik & Saito, 1987)

This perhaps presents evidence for another parameter related to wh-movement: whether syntactic movement is obligatory when possible (English) or optional (French).<sup>2</sup>

### English

In English, extraction of a wh-element out of an embedded clause is, in general, totally acceptable, as illustrated in sentence 5.

- (5) [<sub>CP</sub> Who<sub>i</sub> did John tell Mary [<sub>CP</sub>  $t_i$ ; Bill saw  $t_i$ ?]]

This type of extraction is commonly analyzed as movement of the embedded *wh*-question word to the front of the embedded clause and subsequent movement to the front of the matrix clause. Each movement leaves a trace, indicated by co-indexed "r<sub>s</sub>." English *wh*-movement is constrained, however, by the principle of subadjacency, which states that such movement cannot cross more than one "barrier." For English, NP and IP can be considered barriers (for more on the notion of barrier, see below; for more on the barriers in English see Chomsky, 1986b; Grimshaw, 1986).<sup>3</sup> In sentence 5 no single movement crosses more than one bounding node. However, in sentence 6 the movement out of an NP violates subadjacency; hence, the sentence is ungrammatical.

- (6) \*[<sub>CP</sub> Who<sub>i</sub> do you believe [<sub>NP</sub> the claim that [<sub>IP</sub> Bill saw t<sub>i</sub> ]]]?

### Italian

Rizzi (1982) examines *wh*-movement in Italian, and concludes that in Italian, NP and CP are bounding nodes, although IP is not. This is based on data that show that extraction out of a *wh*-island is possible in Italian. An example is given in 7.

- (7) Tuo fratello, a cui mi domando che storie abbiano raccontato, era molto preoccupato.  
'Your brother, to whom I wonder which stories they told, was very troubled.'

Rizzi thus concludes that there is a parameter associated with subadjacency, namely, the choice of bounding nodes. English has NP and IP, and Italian has NP and CP.<sup>4</sup>

Thus, we observe three parameters for questions: (1) whether *wh*-movement occurs in the syntax or at LF; (2) whether syntactic *wh*-movement is obligatory or optional when possible; and (3) which nodes are barriers (bounding nodes) for subadjacency. Let us now turn to the data from ASL, and see how it bears on these parameters.

## EVIDENCE FROM ASL

In American Sign Language, some *wh*-movement does take place in the syntax. This is illustrated in example 8.\*

- (8) a.  $\overset{whq}{\text{WHAT}_i \text{ MARY EAT } t_i}$ ?  
'What<sub>i</sub> did Mary eat t<sub>i</sub>?'  
\_\_\_\_\_

\*The following notation is used in the ASL examples:

SIGN Signs are written as uppercase English glosses with approximately the same meaning as the ASL sign.

<sub>s</sub>SIGN<sub>s</sub> Subscripts are used to indicate spatial relations. All nouns are marked with a subscript to indicate the locus with which they are associated (see Lillo-Martin and Klima, 1986). Verbs that are inflected for agreement are marked with a subscript at the beginning to indicate subject agreement, and/or a subscript at the end to indicate object agreement.

$\overset{whq}{\text{SIGN}}$  Grammatical facial gestures are noted with a line drawn over the signs that occur concurrently with the facial gesture. "whq" on such a line indicates the *wh*-question facial gesture; "r" indicates the topic facial gesture.

- b.  $\overline{\text{WHO}_i \text{ JOHN LIKE } t_i?}$  whq  
 'Who<sub>i</sub> does John like  $t_i$ ?'

- c.  $\overline{\text{WHO}_i \text{ JOHN TELL}_a t_i \text{ BILL 'LIKE' MARY?}}$  whq  
 'Who<sub>i</sub> did John tell  $t_i$  that Bill has a crush on Mary?'

However, *wh*-words are often found *in situ*, as illustrated in example 9.

- (9) a.  $\overline{\text{MARY SEE}_b \text{ WHO?}}$  whq  
 'Who<sub>i</sub> did Mary see  $t_i$ ?'

- b.  $\overline{\text{SALLY LOVE } b \text{ WHO?}}$  whq  
 'Who<sub>i</sub> does Sally love  $t_i$ ?'

- c.  $\overline{\text{BILL TELL}_b \text{ WHO JOHN 'LIKE' MARY?}}$  whq  
 'Who<sub>i</sub> did Bill tell  $t_i$  that John has a crush on Mary?'

Apparently, *wh*-words can always be left *in situ*. Alternatively, a strategy is employed that involves two sentences, as illustrated in sentence 10.

- (10)  $\overline{\text{BILL FEEL JOHN 'LIKE' SOMEONE. WHO PRONOUN?}}$  whq  
 'Who<sub>i</sub> does Bill think John has a crush on  $t_i$ ?'

In some sentences, a *wh*-word can be found at the right, as illustrated in sentence 11.

- (11)  $\overline{\text{WHO JOHN 'LIKE' WHO?}}$  whq  
 'Who<sub>i</sub> does John have a crush on  $t_i$ ?'

I believe the *wh*-words found at the right are best analyzed as a copy of the left *wh*-word, rather than a right COMP, though I will not provide any arguments for this hypothesis here.

The situations in which *wh*-words *can* move are, however, limited. The proper generalization seems to be that in most cases, a *wh*-word can be moved only if it is in the matrix sentence. *Wh*-words are generally not fronted out of embedded clauses. This is illustrated in example 12.<sup>5</sup>

- (12) a.  $\overline{* \text{WHO}_i \text{ BILL FEEL JOHN 'LIKE' } t_i?}$  whq

- b.  $\overline{* \text{BILL FEEL } a \text{ WHO}_i \text{ JOHN 'LIKE' } t_i?}$  whq

- c.  $\overline{\text{BILL FEEL JOHN 'LIKE' WHO?}}$  whq  
 'Who<sub>i</sub> does Bill think John has a crush on  $t_i$ ?'

The same pattern of results can be found in adjunct *wh*-questions, as illustrated in examples 13 and 14.

(13) a.  $\overline{\text{WHY}_i \text{ } \text{BILL} \text{ } \text{LEAVE } t_i?}$ <sup>whq</sup>

b.  $\text{BILL} \text{ } \text{LEAVE } \overline{\text{WHY}?}$ <sup>whq</sup>  
'Why<sub>i</sub> did Bill leave *t<sub>i</sub>*?'

(14)  $\overline{\text{WHY} \text{ } \text{BILL FEEL } \text{JOHN} \text{ } \text{LEAVE?}}$ <sup>whq</sup>

\*'Why<sub>i</sub> does Bill think John left *t<sub>i</sub>*?'  
'Why<sub>i</sub> does Bill think *t<sub>i</sub>* John left?'

Single-clause adjunct questions (13) can have the *wh*-word fronted or *in situ*. An adjunct *wh*-word at the beginning of a multi-clause sentence (14) can be interpreted only as questioning the matrix; it cannot have an interpretation in which the *wh*-word has been fronted out of the embedded clause. These data indicate that in adjuncts as well as arguments, a *wh*-word can remain *in situ* or can be fronted in a matrix clause, but cannot be fronted out of an embedded clause.

In general, a *wh*-word from an embedded clause also cannot simply move to the beginning of the embedded clause, as illustrated in example 12b above. However, as should be expected, *wh*-movement within an embedded clause under a matrix verb like *WONDER* is allowed (in fact, required), as illustrated in sentence 15.

(15)  $\text{JOHN WONDER } \overline{\text{WHO}_i \text{ } \text{BILL 'LIKE' } t_i.}$ <sup>whq</sup>  
'John wonders who<sub>i</sub> Bill has a crush on *t<sub>i</sub>*.'

This shows that ASL has embedded questions; furthermore, the matrix verbs that select for embedded questions are limited as in English (for example, *WONDER*, *ASK*, *KNOW-WELL*).

As sentence 15 indicates, scope arguments can be used to show that even though in many cases ASL does not show syntactic *wh*-movement, it, like Chinese, does have *wh*-movement at LF. For example, the scope difference between sentences 16a and 16b is the same as the difference in English, giving evidence that *WHO* moves to have scope over the entire sentence in 16b but not 16a. Notice that in ASL, this scope difference is also reflected in the scope of the facial gestures accompanying the signs.

(16) a.  $\text{JOHN } \overline{\text{ASK}_i \text{ } \text{WHO} \text{ } \text{BUY } \text{BOOK.}}$ <sup>whq</sup>  
'John asked (me) who<sub>i</sub> *t<sub>i</sub>* bought the book.'

b.  $\overline{\text{BILL THINK } \text{WHO} \text{ } \text{SEE}_c \text{ } \text{MARY?}}$ <sup>whq</sup>  
'Who<sub>i</sub> does Bill think *t<sub>i</sub>* saw Mary?'

In sentence 16a, the *wh*-word *WHO* has scope only over the lower clause, while in 16b, *WHO* has scope over the entire sentence, as indicated in the translation.

As Huang argues, a natural description of these facts is to assume that in LF, wh-movement takes place, raising the wh-words so that they appear in the proper COMP, c-commanding the segments of the sentences over which they have scope.

Following Huang again, we can see evidence that subjacency does not apply at LF in ASL, just as in Chinese. Examples 17 and 18 show that a wh-word can remain *in situ* in an island in syntax. The LF movement of these wh-words would violate subjacency if that principle applied at LF.

(17) a.  $\overline{*}_a \text{WHO}_i \text{ } \overline{b} \text{JOHN WONDER } \overline{c} \text{WHO LOVE } t_i \text{ } ?$  whq

b.  $\overline{a} \text{JOHN WONDER } \overline{b} \text{WHO LOVE } \overline{c} \text{WHO?}$  whq  
 'Who<sub>i</sub> does John wonder who<sub>j</sub> t<sub>j</sub> loves t<sub>i</sub>?'

(18) a.  $\overline{*}_a \text{WHO}_i \text{ } \overline{b} \text{JOHN } \overline{c} \text{KISS } \overline{d} \text{SALLY BEFORE } t_i \text{ } \overline{e} \text{LEFT?}$  whq

b.  $\overline{a} \text{JOHN } \overline{b} \text{KISS } \overline{c} \text{SALLY BEFORE } \overline{d} \text{WHO } \overline{e} \text{LEFT?}$  whq  
 'Who<sub>i</sub> did John kiss Sally before t<sub>i</sub> left?'

The generalizations that can be made to describe the facts illustrated above include: (1) wh-movement in ASL can occur in the syntax; but (2) syntactic movement is optional; and (3) syntactic wh-movement in ASL is constrained by something stricter than subjacency in English or Italian. These first two generalizations fit in with the first two parameters discussed above with relation to data from Chinese, French, and English. However, neither the English setting nor the Italian setting on the third parameter can account for the ASL facts in generalization 3. How can these facts be accounted for within a principles-and-parameters theory as described above?

## ANALYSES

I will present two possible accounts for these facts and related ones within the Government and Binding theory, approaching the question raised by generalization 3. Is there an additional parameterization of subjacency that can be used to account for ASL?

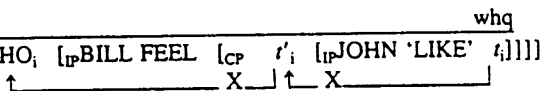
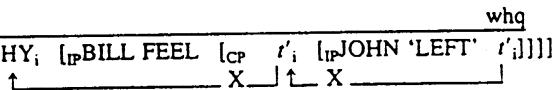
In earlier analyses of subjacency, the barriers (bounding nodes) relevant for each language were merely stipulated: NP and S were the bounding nodes for English, and NP and S' were the bounding nodes for Italian. Within this framework, the right results for ASL could come from stipulating that NP, S, and S' are all bounding nodes for ASL (along with some additional assumptions about the relevant derivations). However, current approaches try to motivate the bounding nodes through the theory of barriers. Although this makes the analysis of ASL more complex, it is important to try to advance the theory in this way.

The definitions for barriers and subjacency proposed by Lasnik and Saito (in preparation) are given in propositions 19 and 20.

- (19)  $\gamma$  is a barrier for  $\beta$  if
- (i)  $\gamma$  is a maximal projection,
  - (ii)  $\gamma$  is not an A-binder
  - (iii)  $\gamma$  is not L-marked, and
  - (iv)  $\gamma$  dominates  $\beta$
- (20)  $\beta$  is subjacent to  $\alpha$  if for every  $\gamma$ ,  
 $\gamma$  a barrier for  $\beta$ ,  
 the maximal projection immediately dominating  $\gamma$  dominates  $\alpha$

To account for the ASL data described above, we could parameterize the definition of barriers given in definition 19 and say that for ASL, (iii) is not relevant. Condition (iii) excuses complement CPs from barrierhood, since they are L-marked.<sup>6</sup> However, if (iii) does not apply in ASL, then complement CPs will be barriers, since with this parameterization whether  $\gamma$  is L-marked won't make a difference as to whether it is a barrier. It is also necessary to stipulate that VP is never a barrier. Otherwise, extraction of an object in a single-clause sentence would not even be available. This is part of Lasnik and Saito's framework, and they discuss several parts of the theory from which it might follow.

With this stipulation, movement will never be allowed out of embedded clauses in ASL. This analysis is illustrated in example 21, for the sentences in 12a and 14. WHO can move to the SPEC of the embedded COMP, because this movement crosses one barrier (IP), and the landing site is within the maximal projection immediately dominating IP. But then WHO would have to cross the barrier CP and go beyond the maximal projection immediately dominating CP (that is, VP), in order to land in the matrix SPEC of COMP.<sup>7</sup> Hence, the movement is ruled out.

- (21) a.  $*[{}_{CP} \text{WHO}_i [{}_{IP} \text{BILL FEEL } [{}_{CP} t'_i [{}_{IP} \text{JOHN 'LIKE' } t_i]]]]$   

- b.  $*[{}_{CP} \text{WHY}_i [{}_{IP} \text{BILL FEEL } [{}_{CP} t'_i [{}_{IP} \text{JOHN 'LEFT' } t'_i]]]]$   


Notice that if this analysis is correct, it makes a prediction regarding the relative status of sentences 21a and 21b. Sentence 21a is only a subjacency violation, since the trace of movement can meet the ECP by being properly governed by the verb SEE. But sentence 21b is also an ECP violation, since the trace of movement of the adjunct WHY is not properly governed. Following reports that subjacency violations are usually more mild than ECP violations, sentence 21b should be somewhat less acceptable than 21a. Here the facts are unclear to me.

If this parameterization is the appropriate way to account for the differences in syntactic *wh*-movement between ASL and English, the question of learnability should be addressed. Notice that if a signing child mistakenly assumes that ASL has the English setting on this parameter, he has no positive evidence to tell him that this is not so. On the other hand, if a child assumes the ASL setting first, positive evidence in the form of grammatical long-distance extraction informs a child learning an

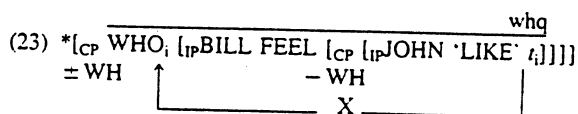
English-type language to change the parameter setting. As long as the facts in generalization 3 are kept distinct from the facts in generalizations 1 and 2 and (b), this parameter is a case where the subset principle (Berwick, 1985; following Dell, 1981) will apply, since only short extraction is allowed with the ASL setting, but short and long extraction are both available with the English setting.

However, there is no motivation for this parameterization apart from the facts discussed above. If part (iii) of sentence 19 can be parameterized, why cannot parts (i), (ii), and (iv)? Perhaps some or all of these are parameterized, but no proposals have been made to this effect as far as I am aware. Let me pursue another possible method of accounting for the ASL data.

Various authors have proposed filters that produce the effect that [+ WH] elements must be found in [+ WH] COMPs, and cannot be in [- WH] COMPs, at various levels (for example, Lasnik and Saito, 1984). Tiedeman (1987) extends this notion as in proposition 22.

- (22) An element marked [ $\alpha$ F] for any given feature, F, cannot land on a landing site marked [- $\alpha$ F].

Tiedeman's proposal opens the door to a second possible analysis for the ASL data. Under this analysis, the definition of barriers can be left as given in proposition 19, but ASL will differ from English in that for ASL, all verbs that select sentential complements subcategorize for [- WH] complements. Since [+ WH] elements cannot land even on a [- WH] SPEC of COMP, this prohibits long-distance movement, as illustrated in sentence 23. WHO could not land in the embedded SPEC of COMP, which is [- WH]. But since the embedded IP is a barrier, WHO has to land in CP. Movement all the way to the matrix violates subadjacency.



Under this account, there still is no independent reason for claiming that ASL has no bridge verbs. However, independent facts about other constructions can be examined for corroborating evidence. If, for various constructions in addition to wh-questions, there is evidence that ASL complements are marked [- WH], then this supports this analysis.

The learnability question can again be raised. If children believe that all verbs select complements unmarked for [WH], then a child learning ASL has no positive evidence that ASL verbs select [- WH] complements: hence unmarked for [WH] cannot be the initial choice. However, notice that children need to learn the [WH] selection of verbs anyway, since even in English, some verbs select [ $\neq$  WH], and others select complements unmarked for [WH]. Notice also that this account places language variation in the lexicon, where languages are most distinct. This is in line with the lexical parameterization hypothesis (Wexler and Manzini, 1987).

Both of these accounts handle the island and adjunct facts reported above. In addition, data from other kinds of  $\bar{A}$  movement can be handled by both of these accounts, with additional reasonable assumptions. First consider topicalization. Example 24 shows that topicalization is also subject to the same boundedness restrictions as wh-movement.<sup>5</sup>



- (24) a.  $\frac{t}{\text{MARY}_i}$  JOHN 'LIKE'  $t_i$ .  
'Mary<sub>i</sub>, John has a crush on  $t_i$ .'
- b.  $\frac{t}{\text{MARY}_i}$  BILL FEEL JOHN 'LIKE'  $t_i$ .  
'Mary<sub>i</sub>, Bill thinks John has a crush on  $t_i$ .'

Following Lasnik and Saito, topicalization can be analyzed as adjunction, but this movement needs to go through the embedded COMP. Example 25a shows that the barriers analysis extends straightforwardly to these cases. Example 25b shows that the features analysis does too, if we assume (following Lasnik and Saito) that topicalized elements are marked [+ TOP].<sup>9</sup>

- (25) a.  $*[\text{CP} [\text{IP} \text{MARY}_i [\text{IP} \text{BILL FEEL} [\text{CP} t_i [\text{IP} \text{JOHN 'LIKE' } t_i ]]]]]$
- b.  $*[\text{CP} [\text{IP} \text{MARY}_i [\text{IP} \text{BILL FEEL} [\text{CP} [\text{IP} \text{JOHN 'LIKE' } t_i ]]]]]$   
- TOP  
X

One possible test between these two analyses would be to check movement out of NP or PP. If such movement were ungrammatical, then the barriers approach would be more appropriate, since the NP and PP would be  $X^{\text{max}}$ 's, which would count as barriers. However, if the sentences were acceptable, the features account would be better, since under this account NP and PP would not count as barriers.

The problem that confronts us is that movement out of NP or PP is perhaps ruled out on separate grounds. There is a dearth of real prepositions in ASL (see, for example, Fischer, 1987), and complex NP structures are similarly hard to find. I have not been able to elicit the appropriate sentences, and thus must leave this issue for future research.

However, the ASL data can also provide some support for Lasnik and Saito's analysis of topicalization. In sentences 26a and 26b we see that topicalization and *wh*-elements can occur in the same clause.

- (26) a.  $\frac{t}{\text{MARY}_i}$   $\frac{\text{wh}_q}{\text{WHO}_j \text{ SEE}_k t_i$ ?  
'Mary<sub>i</sub>, who<sub>j</sub>  $t_i$  saw  $t_j$ ?'
- b.  $\frac{t}{\text{MARY}_i}$   $\frac{\text{wh}_q}{t_i \text{ SEE}_k \text{ WHO}_j$ ?  
'Mary<sub>i</sub>, who<sub>j</sub>  $t_i$  saw  $t_j$ ?'

Lasnik and Saito allow topicalized elements in COMP in the matrix clause, even though topicalized elements can also be adjoined. The analysis of sentences 26a and b will then have the topicalized element in COMP, and the *wh*-elements *in situ*. However, sentences 27a and 27b show that while a *wh*-element is in SPEC of COMP, no topicalized element can be adjoined to IP.

(27) a.  $\frac{\text{whq}}{*_{\text{a}}\text{WHO}_i \text{bMARY}_j, t_i \text{aSEE}_b t_j} t ( \frac{\text{whq}}{\text{Who}_i, \text{Mary}_j, t_i \text{ saw } t_j} )$   
 'Who<sub>i</sub>, Mary<sub>j</sub>, t<sub>i</sub> saw t<sub>j</sub>?'

b.  $\frac{\text{whq}}{*_{\text{a}}\text{WHO}_i \text{bMARY}_j, t_j \text{bSEE}_a t_i} t ( \frac{\text{whq}}{\text{Who}_i, \text{Mary}_j, t_j \text{ saw } t_i} )$   
 'Who<sub>i</sub>, Mary<sub>j</sub>, t<sub>j</sub> saw t<sub>i</sub>?'

The reason that the sentences in 27 are out is that the subject trace is not properly governed. In sentence 27a, WHO is too far away to govern its trace (since there are two IP barriers between them). In 27b, MARY cannot properly govern its trace since it is not an X<sup>0</sup>.

## CONCLUSIONS

In conclusion, data from ASL taken with data from other languages indicates that wh-movement is constrained by at least three parameters: (1) whether Move- $\alpha$  affects wh-phrases in the syntax or at LF; (2) whether wh-movement is obligatory when possible or optional; (3) the restrictions on how far wh-phrases can move, which might be stated as a parameterization of the definition of barriers, or as the features specified by lexical items taking sentential complements. This supports these parameters as part of Universal Grammar, and the inclusion of signed languages within the range of languages studied to determine the possible parameters within the theory of Universal Grammar. Although more work is necessary to determine the full range of parameters for questions, this paper demonstrates the importance of evidence from ASL.

## NOTES

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1. Even for those languages that have wh-movement in the syntax (for example, English), there is evidence for LF wh-movement in certain structures. For example, in English multiple wh-questions, one wh-word is left *in situ*, as illustrated in example (i).

(i) Who bought what?

Although the object wh-word "what" is left *in situ*, the same scope arguments can be applied to argue that the LF representation of (i) is as given in (ii).

(ii) [<sub>CP</sub> who<sub>i</sub> [<sub>CP</sub> what<sub>j</sub> [<sub>IP</sub> t<sub>i</sub> bought t<sub>j</sub>]]]

2. Apparently there is some division among French dialects regarding the status of sentences like 4b. Although in some dialects such questions can be only echo questions, in others they are reported as optional variants of the questions with moved wh-words.

3. Although many of the studies I am citing used earlier terminology such as "bounding nodes" rather than "barriers," S rather than IP, and S' rather than CP, I will translate these terms into the currently proposed notions for the sake of consistency. Occasionally, details (which are irrelevant for the present discussion) differ.
4. Current research indicates that the English/Italian subjacency difference may be more subtle. Some English speakers seem to accept the Italian value on this parameter, and some Italian speakers seem to have the English value. This indicates that the parameter perhaps describes different dialects rather than different languages. I will, however, continue to refer to these two settings as "English" and "Italian."
5. For some signers, examples like 12c are unacceptable. These signers produce multiclausal wh-questions using two sentences, as in example 10. This option is also available to signers who accept example 12c. Throughout the paper, I will be discussing the judgments of signers who accept 12c.
6.  $\alpha$  L-marks  $\beta$  iff  $\alpha$  is a lexical category that  $\theta$ -governs  $\beta$ .
7. Note that, although in Chomsky's (1986a) theory of barriers, adjunction to VP is available, this is not a way out of a subjacency violation in Lasnik and Saito's account.
8. Note that it has generally been assumed that ASL allows long-distance topicalization (for example, Padden 1983), as illustrated in (i). However, I claim that the sentences with apparent long-distance movement are actually best analyzed as left dislocation, with a resumptive pronoun (overt or null) in the place of the moved element; see (ii). See Lillo-Martin (1986a, b) for arguments that there is a null resumptive pronoun in sentences like (i), as well as an overt resumptive pronoun in (ii).

(i)  $\overline{\text{MOTHER}}_i$   $\text{PRONOUN}$   $\text{HOPE}$   $\text{SISTER}$   $\text{SUCCEED}$   $\text{PERSUADE}$ <sub>s</sub>  
 (pro)  $\text{TAKE-UP}$   $\text{EXERCISE CLASS}$ .  
 'Mother<sub>i</sub>, I hope my sister manages to persuade  
 (her)<sub>i</sub> to take an exercise class.' (Padden, 1983)

(ii)  $\overline{\text{MOTHER}}_i$   $\text{PRONOUN}$   $\text{HOPE}$   $\text{SISTER}$   $\text{SUCCEED}$   $\text{PERSUADE}$ <sub>s</sub>  
 \* $\text{(PRONOUN)}$   $\text{EAT}$   $\text{COOKIE}$ .  
 'Mother<sub>i</sub>, I hope my sister manages to persuade  
 her<sub>i</sub> to eat a cookie.'

9. It would probably be desirable to collapse the features for  $[\pm \text{WH}]$  and  $[\pm \text{TOP}]$ . In current work I am pursuing this possibility.

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