

**Wh-Questions in ASL:
A Case for Rightward Movement**

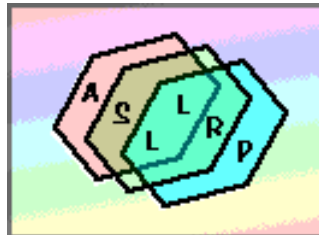
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*Report No. 6
American Sign Language
Linguistic Research Project*

© August 1998

WH-QUESTIONS IN ASL: A CASE FOR RIGHTWARD MOVEMENT

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Abstract

This report presents an analysis of wh-movement in American Sign Language in which moved wh-phrases occur in a rightward specifier of CP position. Evidence is based on straightforward word order facts and on the distribution of non-manual wh-marking, which displays the same patterns and systematicity as other non-manual syntactic markings. We had presented an analysis in terms of rightward wh-movement in prior work (see especially Neidle, Kegl, Bahan, Aarons, and MacLaughlin 1997). This analysis was criticized in Petronio and Lillo-Martin 1997. Here we show that their alternative interpretations of the data are incorrect and that their analysis cannot account for the facts of the language. In addition, this report presents a more detailed exposition of several aspects of our analysis than is available in our prior publications and presents new evidence in support of rightward wh-movement in ASL. Thus, we maintain that universal grammar must allow the option of rightward movement.

This report includes links to video examples corresponding to many of the grammatical constructions in this paper. In some cases, the video may not represent exactly the same lexical items as in the gloss, but it illustrates the same construction. Sometimes there are examples as signed by more than one native signer. In other cases, other slight variants of the construction discussed in the text are also provided on video.

<-- **Please read.** To view the video accompanying the text example, simply click on the video icon(s) to the right of the sentence. To close the video window, use the Escape key while the video window is active/selected (this is important to remember).



1. Introduction

Research on signed languages has revealed that, although interesting modality differences exist, signed languages are governed by essentially the same underlying principles as spoken languages. One way in which signed languages differ from spoken languages is that the visual modality allows for the overt expression of abstract syntactic features. Specifically, features such as +neg and +wh have non-manual expressions (on the face and upper body) that co-occur with manual signing and extend over precisely defined syntactic domains. Careful study of the distribution of such markings provides a unique kind of evidence about syntactic structure. For these reasons (among others), data from signed languages can be particularly illuminating with respect to the nature of language.

Specifically, data from American Sign Language (ASL) provide important evidence for evaluating controversial proposals concerning constraints on word order and the directionality of movement. For example, Kayne (1994) has suggested that all phrasal projections exhibit Specifier-Head-Complement order and that all syntactic movement is leftward. Neidle, Kegl, Bahan, Aarons, and MacLaughlin (henceforth NKBAM)¹ (1997) argue that wh-movement in ASL provides a counterexample to such claims.

Petronio and Lillo-Martin (henceforth P&L) 1997 offer an alternative account of ASL question constructions involving leftward wh-movement. While it would be interesting to explore possible analyses of ASL questions consistent with Kayne's proposed universal constraints,² it should be noted that P&L's (1997) account of wh-constructions in ASL is not compatible with Kayne's antisymmetry framework.

P&L (1997) suggest instead that there is some specific constraint such that [Spec, CP] (but not C) must precede IP universally. Despite P&L's statement that "this phenomenon remains unexplained,"³ the rest of their paper is devoted to showing how ASL can be made to fit this supposed universal. They thus assume that wh-movement is leftward in ASL and offer an account of right-peripheral wh-elements in terms of other mechanisms.

In contrast, we have argued that wh-movement in ASL is rightward. P&L critique our analysis, while neglecting important aspects of our argumentation. Here we address their counterproposals and, drawing on new data as well as data presented in earlier works, we demonstrate that the facts of wh-movement in ASL can only be accounted for under a rightward movement analysis.

¹ The research reported on here is part of the ongoing American Sign Language Linguistic Research Project, funded in part by the National Science Foundation, grants #SBR-9410562, SBR-9729010, SBR-9729065, and IIS-9528985. We are also grateful to the following people for comments, discussions, and assistance with various aspects of this work: Debra Aarons, Norma Bowers, Jimmy Challis Gore, Ken Hale, Marco Haverkort, Jack Hoza, Riny Huybregts, Jaklin Kornfilt, Marie Philip, Margaret Speas, Tarald Taraldsen, Höskuldur Thráinsson, and Patricia Trowbridge. Portions of this work were presented at Syracuse University, Harvard University, and the Tilburg Conference on Rightward Movement. We would like to thank the members of those audiences for comments and suggestions.

All research conducted within the context of the American Sign Language Research Project will be cited in this article by the authors' initials. Many of these works are available at our Web site, <http://www.bu.edu/asllrp>.

² We have argued elsewhere (NKBAM 1997, NKMBL forthcoming) against different approaches consistent with Kayne 1994, involving more complex combinations of leftward movement (such as leftward extraction of the wh-phrase followed by leftward movement of the clause left behind).

³ P&L (1997:18) state:

It is quite possible that no language uses rightward WH-movement (although WH-elements may occur on the right edge of a sentence through a different process). This phenomenon remains unexplained, yet its statistical strength is such as to lead an investigator to expect that WH-movement will be leftward in the next language studied.

P&L's article is, in part, a response to our proposal that wh-movement in ASL is rightward; however, they significantly misrepresent our work.⁴ For this reason, we begin in section 2 with an overview of our analysis of wh-movement in ASL. Section 3 summarizes P&L's alternative proposal in terms of leftward movement. Section 4 discusses differing predictions of the two proposals in relation to the data from ASL, and section 5 considers some more general issues related to the collection and reporting of ASL data.

2. The rightward movement analysis

Evidence that wh-movement is rightward in ASL comes from both basic word order facts and the distribution of non-manual wh-marking. So that the significance of the pattern of wh-marking will be clear, we first present, in section 2.1, essential background information about the distribution of non-manual syntactic markings in ASL. This report will show that, given the proper syntactic analysis of questions, the distribution of wh-marking can be explained in terms of precisely the same generalizations.

For simplicity of exposition, we initially restrict our attention, in section 2.2, to sentences that contain a single wh-phrase. Questions with more than one wh-phrase corresponding to the questioned argument are also common; these constructions are addressed in section 2.3. In section 2.4, we show that the rightward movement analysis correctly predicts extraction of wh-phrases from embedded clauses, as well.

2.1 Non-manual syntactic markings

Important syntactic information in ASL is often expressed through the use of non-manual markings, i.e., specific gestures of the face and upper body that co-occur with manual signing. Such markings have a strictly linguistic function, and are distinguishable from affective uses of facial expressions, as demonstrated by evidence from neurolinguistic research on language processing (Bellugi *et al.* 1989, Corina 1989) and impairment (Kegl and Poizner 1991, 1997; Poizner and Kegl 1992) and from differential acquisition of affective and linguistic facial expressions (Reilly, McIntire, and Bellugi 1990). Wh-questions in ASL involve a characteristic non-manual marking,⁵ whose distribution provides evidence for their syntactic structure.

⁴ It is, unfortunately, necessary to point out some inaccuracies in the ways in which our prior work is cited in P&L 1997. P&L often refer to several different publications collectively as "ABKN", as explained on p. 25:

Recent works (Aarons, Bahan, Kegl, & Neidle 1992; Aarons 1994; Neidle, Kegl, & Bahan 1994; and Neidle, Kegl, Bahan, Aarons, & MacLaughlin (sic) 1994) challenge this generalization. (Henceforth, when discussing claims that are common to all these works, we will use the acronym ABKN.)

(Note that the handouts for the two talks included in the above listing are available in pdf format at our World Wide Web site: <http://www.bu.edu/asllrp/talks.html>.)

P&L critique proposals attributed to "ABKN" despite the fact that the most comprehensive discussion of our analysis of rightward movement is NKBAM 1997, of which they had a pre-publication manuscript that they do cite explicitly, but selectively. However, this is cited, incorrectly, as a "talk" by "Neidle, Kegl, Bahan, Aarons, and MacLaughlin 1994. In reality, the 1994 talk, on which MacLaughlin was not a co-author, was much more limited in scope than the NKBAM article. Most significantly, many of the citations to the 1994 presentation concern our analysis of sentences containing multiple wh-phrases, despite the fact that the presentation only included discussion of sentences containing a single wh-phrase. P&L (1997:40) even provide a page reference that can only be to the pre-publication manuscript (when they quote a sentence of ours, which they attribute to Neidle, Kegl, Bahan, Aarons, and MacLaughlin (1994:11), about perseveration—a topic not mentioned in the 1994 presentation). In addition, as will become apparent, P&L also omit significant aspects of the argumentation presented throughout our works.




⁵ The "wh" marking is expressed by a cluster of expressions of the face and upper body, consisting most notably of furrowed eye brows and often including a slight, rapid side-to-side head shake.

In prior work, we have shown that non-manual syntactic markings are frequently associated with syntactic features postulated to occur in the heads of functional projections, such as those associated with negation, wh-questions, yes-no questions, and syntactic agreement. In general, the associated non-manual marking co-occurs with manual signing. The distribution of non-manual syntactic markings reflects relations that hold at s-structure (or Spell-Out). The markings optionally spread over the c-command domain of the node with which they are associated. Thus, the distribution of non-manual markings provides visible evidence of hierarchical relations.

Spread of a non-manual syntactic marking over its c-command domain⁶ is optional, unless it is required for purposes of providing manual material with which the non-manual marking can be articulated.⁷ In general, non-manual syntactic markings display maximal intensity at the node of origin, and the intensity of the marking diminishes as distance from that node increases.⁸ Careful examination of the intensity of such markings thus yields information about the location of the source of the marking. In what follows, we illustrate these generalizations briefly with examples involving negation and syntactic agreement.

2.1.1 Negation

Consider (1) and (2),⁹ which include the typical non-manual marking of negation, consisting most notably of a side-to-side head shake, frequently accompanied by a frown and sometimes furrowed brows, a wrinkled nose, and/or a raised upper lip (Baker and Cokely 1980a:145-146).¹⁰ When a manual sign of negation is present, the negative marking occurs concurrently with that sign and optionally spreads over the following VP. However, if no manual negative sign is present, then the negative marking spreads obligatorily over the c-command domain of Neg, as in (3).

- (1) JOHN $\overline{\text{neg}}$ [NOT]_{Neg} [BUY HOUSE]_{VP} 
 'John is *not* buying a house.'
- (2) JOHN $\overline{\text{neg}}$ [NOT]_{Neg} [BUY HOUSE]_{VP}  
 'John is not buying a house.'



⁶ The observation that c-command relations are relevant to the spread of non-manual negative marking is due to Liddell (1980). The general account here of the spread of non-manual grammatical markings over c-command domains follows the formulation in ABKN 1992. Lillo-Martin and Fischer (1992) and Petronio (1993) also make use of c-command to explain the distribution of non-manual marking, but their accounts differ significantly from what is presented here.

⁷ The basic idea that wh-marking spreads if spread is required to enable the marking to be co-articulated with manual material is also part of Lillo-Martin & Fischer's (1992) account of wh-questions, which recognized cases of both optional and obligatory spread although P&L (1997) no longer believe that there are any cases of optional spread.

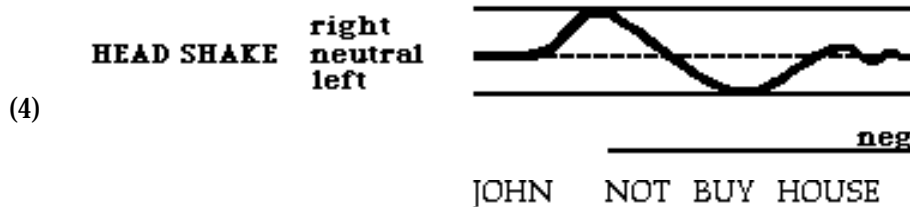
⁸ For further details concerning intensity of non-manual markings, see Bahan 1996. Note that these observations about intensity differ from descriptions by Baker-Shenk (1983). Variation in the intensity of non-manual markings has generally not been addressed in the literature on ASL syntax.

⁹ ASL examples are presented using a conventional gloss notation. Manual signing is represented by capitalized English glosses. Names in the examples presented here were fingerspelled (spelled out using the manual alphabet), although this is not explicitly noted. Non-manual syntactic markings are represented by a labeled line drawn over the manual signs with which they are co-articulated. This glossing system is inadequate in many respects. It hides a substantial amount of detail, with respect to both the manual articulation of signing and the non-manual components. For these reasons, it is extremely difficult to reconstruct a signed utterance solely from written glosses.

¹⁰ We are focusing here on VP-negation. In general, the non-manual marking does not spread beyond the negated constituent.

- (3) JOHN []_{Neg} [BUY HOUSE]_{VP} 
 'John is not buying a house.'





As indicated by the gradient shading of the lines showing the spread of the negative marking, the non-manual marking of negation is most intense over Neg. In particular, the maximal arc of the head turn occurs at that point in the sentence, and the angle of head turn diminishes gradually over the remainder of the c-command domain of Neg (i.e., the VP), as illustrated in the following diagram (based on Bahan 1996):¹¹



In the next section, we show that the same generalizations that describe the distribution of negative marking also characterize the distribution of non-manual markings associated with agreement.

¹¹ There is some anticipatory movement: the head is positioned so as to be able to begin its movement simultaneously with the manual signing of NOT. This is characteristic behavior for non-manual head movements, such as head shakes and nods in ASL. See Bahan 1996 and MacLaughlin 1997.


This anticipatory movement may be misinterpreted by Petronio (1993:60), who claims that negative marking necessarily extends over the subject (enabling Petronio to maintain her claim that non-manual markings such as affirmative head nod and negative head shake only occur over clausal domains). Thus, Petronio disputes the grammaticality of sentences like (1)-(3). The anticipatory effect can be confirmed, however, by insertion of additional lexical material before the negative sign. Thus, in sentences like (i) and (ii), it is clear that the (anticipatory) head movement begins just before NOT, rather than at the start of the sentence.

- (i) JOHN MAYBE  NOT BUY HOUSE 
 'John maybe isn't buying a house.'
- (ii) [IX_i STUDENT_i]  NOT FINISH HOMEWORK 
 'The student has not finished the homework.'

Our characterization of the domain over which negative marking may spread is consistent with other descriptions in the literature (see, e.g., Veinberg and Wilbur 1990 or McIntire, Reilly, and Anderson 1994).

One possible alternative analysis of the distribution of negative marking consistent with P&L's claim that it occurs over clausal domains would entail analyzing the subject (not bearing negative marking) as a pre-clausal topic. However, the examples presented here do not involve topics; furthermore, examples such as (i) clearly could not be explained in such a way.

Another case where their claim that non-manual marking occurs exclusively over clausal domains seems to get P&L into difficulty involves the affirmative head nod. Our informants do not accept this head nod over the indicated domains in many of P&L's examples (such as 40a, 88a, 94, 96, 100a, 101a), on the readings indicated in their English translations.


- (iii)  NANCY HATE ICE CREAM HATE [=P&L 40a]
 'Nancy HATES ice cream.' [P&L's translation]



On other readings, however, the head nod may appear over the whole sentence. For example, this may occur if an affirmative response is followed by an affirmative statement, analogous to the English, "Yes, Nancy hates ice cream." In such cases, there are multiple sources for the head nod, and its occurrence over the subject of the main clause is explained in terms of perseveration, as discussed in section 2.3.3.1. (Another such situation is in the context of a sarcastic statement, something comparable to: "Oh yeah. (Right.) Nancy hates ice cream. (Sure she does.)")

What is clear is that the head nod need not extend over the entire sentence. For example, Baker and Cokely 1980e contains evidence counter to P&L's claim in that regard. What is striking is that P&L actually cite this evidence (e.g., their example (33)), although P&L's gloss omits the head nod that occurs only over the final sign (see section 4.2).




2.1.2 Agreement




Bahan 1996 argues that there are non-manual markings optionally associated with subject and object agreement in the clause. These are instantiated, in transitive clauses, by head tilt and eye gaze toward the location in space associated with the subject or object.¹² See (5) and (6).

(5) $\overbrace{\text{JOHN}_i \text{ [Agr-S}_i \text{ [Agr-O}_j \text{ [}_i\text{SHOOT}_j \text{ FRANK}_j \text{]}_{VP}} \text{]}_{VP}}^{\text{head tilt}_i}$
 eye gaze_j 
 'John shoots Frank.'

(6) $\overbrace{\text{JOHN}_i \text{ [Agr-S}_i \text{ [Agr-O}_j \text{ [LOVE MARY}_j \text{]}_{VP}} \text{]}_{VP}}^{\text{head tilt}_i}$
 eye gaze_j  
 'John loves Mary.'

In intransitive constructions, subject agreement may be expressed by either or both of these devices, as shown in (7) and (8).

(7) $\overbrace{\text{JOHN}_i \text{ [Agr-S}_i \text{ [ARRIVE]}_{VP}}^{\text{head tilt}_i \text{ and/or eye gaze}_i}$   
 'John is arriving.'

(8) $\overbrace{\text{JOHN}_i \text{ [Agr-S}_i \text{ [BATHE]}_{VP}}^{\text{head tilt}_i \text{ and/or eye gaze}_i}$   
 'John is bathing.'

If the existence of agreement projections is assumed (Pollock 1989; Chomsky 1991, 1993),¹³ then these markings display a pattern of distribution similar to that of the non-manual marking of negation. In these sentences, unless spread occurs, there is no manual material with which the head tilt and eye gaze can be co-articulated.¹⁴ Thus, spread over the c-command domain of the Agr nodes is obligatory. Intensity of these markings decreases gradually as the VP is signed. The head and eyes may gradually return to neutral position.





Interestingly, the same non-manual markings of subject and object agreement occur within DP (see NMKB 1996, MacLaughlin 1997, and NBMLK in press). In possessive constructions, head tilt may express agreement with the possessor, while eye gaze expresses agreement with the main noun

¹² The head may tilt and the eyes may gaze toward the same points in space that are relevant to the manual agreement marking that occurs with verbs that exhibit such agreement morphologically (so-called "agreeing" verbs, following Padden's (1983, 1988) verb classification). However, it is significant that these non-manual expressions of agreement occur with verbs of all morphological types, including "plain" verbs (which do not mark agreement manually on the verb). Thus these findings provide confirmation of claims in ABKN 1992 and 1994 and Aarons 1994 that syntactic agreement is structurally present in clauses containing plain as well as agreeing verbs (counter to Lillo-Martin 1986, 1991). Moreover, the non-manual expression of syntactic agreement is sufficient to license null arguments (Bahan 1996, NBMLK in press, and BKLMN under review).

¹³ While Chomsky (1995:chapter 4) and Baker (1996) no longer maintain syntactic agreement projections, we have argued that the data from ASL support earlier analyses that postulate the existence of such projections.





¹⁴ This assumes that verbs do not raise to agreement heads overtly in ASL. See NKMBL forthcoming for arguments.

(the possessee). Non-possessive DP's exhibit the same non-manual markings as intransitive clauses: agreement may be expressed by one or both of the non-manual devices.

- (9) JOHN_i [POSS_i]Agr-S_i [_i]Agr-O_j [FRIEND_j]NP 
- 'John's friend'
- (10) IX_i Agr-S_i [MAN_i]NP   
- 'the man'

There is one significant difference between the marking of agreement in DP and in the clause. In DP constructions, there may be manual material in the agreement node, as is the case in (9) and (10). So, we would expect that the spread of these markings should be optional, rather than obligatory, in these cases. This prediction is correct, as shown by (11) and (12) (in conjunction with (9) and (10)).



- (11) JOHN_i [POSS_i]Agr-S_i [_i]Agr-O_j [FRIEND_j]NP 
- 'John's friend'
- (12) [IX_i]Agr-S_i [MAN_i]NP   
- 'the man'



In sum, the non-manual markings that we have examined all obey the same distributional generalizations. As will be seen in the next section, the same properties characterize the distribution of the non-manual marking found with wh-questions.

2.2 Wh-questions with a single wh-phrase



It is generally accepted among ASL researchers that wh-phrases in ASL may remain *in situ* or may move to [Spec, CP]. Astonishingly, there is controversy about whether the wh-phrase, when it moves, goes to the beginning or to the end of the clause. This controversy seems to be due, in part, to disagreements about the data. Many of the judgments of the sentences we present here are different from those reported in P&L 1997. Several issues concerning differences in reported grammaticality judgments are discussed in later sections of this report. Here we present our own findings.


2.2.1 Word order

Consider first a simple transitive clause in which the subject or object is questioned. Given the underlying SVO word order of ASL,¹⁵ the leftward movement analysis would predict that a wh-phrase questioning the object argument could occur sentence-initially, while a rightward movement analysis would predict that a wh-phrase corresponding to the subject argument could

¹⁵ A general consensus has emerged on this word order, with the notable exception of Bouchard and Dubuisson's (1995) suggestion that signed languages do not have any underlying hierarchical word order (see also Bouchard 1997). See, however, our reply to Bouchard and Dubuisson: KNMHB 1996.

occur sentence-finally.

- (13) * $\frac{\text{wh}}{\text{WHO JOHN HATE}}$
 ‘Who does John hate?’ [predicted to be grammatical by leftward wh-movement]


- (14) $\frac{\text{wh}}{\text{HATE JOHN WHO}}$  [predicted to be grammatical by rightward wh-movement]
 ‘Who hates John?’


Our informants consistently report that (13), signed exactly as glossed,¹⁶ is unacceptable, while (14) is completely natural. These findings are consistent with judgments reported by Petronio (1991) for native signers, although not with those reported in Lillo-Martin 1990 and Lillo-Martin and Fischer 1992; see discussion in section 4.1. Sentences like (13) and (14) provide evidence in favor of rightward movement, and appear to be incompatible with a leftward movement analysis.

A sentence-initial wh-phrase corresponding to the subject argument, such as (15), while grammatical, does not provide any relevant evidence for testing a leftward movement analysis, since the subject wh-phrase may be *in situ*.


- (15) $\frac{\text{wh}}{[\text{WHO HATE JOHN}]_{\text{IP}}}$  [subject *in situ*]
 ‘Who hates John?’

However, it is possible to distinguish *in situ* wh-objects from those that have moved rightward, as shown by Perlmutter (1991). *In situ* wh-objects precede IP-final adverbials, such as YESTERDAY, while rightward-moved wh-phrases occur sentence-finally.

- (16) $\frac{\text{wh}}{[\text{JOHN SEE WHO YESTERDAY}]_{\text{IP}}}$  [object *in situ*]
 ‘Who did John see yesterday?’

- (17) $\frac{\text{wh}}{[\text{JOHN SEE } t_i \text{ YESTERDAY}]_{\text{IP}} \text{ WHO}_i}$  [predicted by rightward wh-movement]
 ‘Who did John see yesterday?’

It is not the case that wh-phrases have the same distribution as ordinary noun phrases. As shown by (18) and (19) (contrasted with (17)), only noun phrases bearing the +wh feature can move rightward.

- (18) JOHN SEE MARY YESTERDAY 
 ‘John saw Mary yesterday.’

- (19) * JOHN SEE YESTERDAY MARY

Thus, we conclude that wh-phrases, when they move, move rightward to a clause-final [Spec, CP]


¹⁶ Variants of the sentence glossed in (13), which are grammatical, will be discussed later.


position.¹⁷ We adopt standard assumptions (Chomsky 1993, 1995; Rizzi 1996) that *wh*-questions involve feature checking of a +*wh* feature; *wh*-question constructions involve a +*wh* feature in C that must be checked by a phrase containing a matching feature.¹⁸ This is the motivation for *wh*-movement.

2.2.2 Non-manual *wh*-marking

The rightward *wh*-movement analysis is further supported by facts from the distribution of non-manual *wh*-marking. All of the above examples have involved *wh*-marking occurring over the entire question. While this is always possible, *wh*-marking may occur solely over the *wh*-phrase in a more limited set of cases: specifically, those cases where the *wh*-phrase has moved to the clause-final [Spec, CP] position. Thus, spread of *wh*-marking is optional when the *wh*-phrase has moved rightward. This optionality is explained in terms of the generalizations stated previously. The *wh*-phrase provides manual material with which the *wh*-marking associated with the +*wh* feature in C may be expressed. Spread is obligatory only when no such manual material is available (as is the case when the *wh*-phrase remains *in situ*).

The examples below illustrate the optionality of spread in sentences involving rightward *wh*-movement. Compare (15) with (20) and (17) with (21).

(20) t_i HATE JOHN $\overline{\text{WHO}}_i$ 
 ‘Who hates John?’

(21) JOHN SEE t_i YESTERDAY $\overline{\text{WHO}}_i$ 
 ‘Who did John see yesterday?’

In contrast, those sentences that can only be analyzed as involving the *wh*-phrase *in situ* require that the *wh*-marking spread over the entire question. This is shown by the ungrammaticality of (22) and (23) (as compared with the grammatical examples in (15) and (16)).

(22) * $\overline{\text{WHO}}$ HATE JOHN

(23) * JOHN SEE $\overline{\text{WHO}}$ YESTERDAY

We argue that the obligatory spread of *wh*-marking in sentences involving *in situ wh*-phrases is a consequence of the fact that there is no IP-external manual material with which the *wh*-marking in C can be co-articulated. Thus, the generalizations previously established for non-manual syntactic

¹⁷ The optionality of *wh*-movement in ASL is a problem for the minimalist approach, which predicts that overt movement occurs only when required. It is possible that there is, in fact, a semantic difference between the moved and *in situ* cases, and thus that *wh*-movement is not truly optional in ASL. This issue warrants further investigation, but preliminary results suggest that moved cases may involve a kind of presupposition that is not found with the *in situ* cases.

¹⁸ Question signs, such as WHERE, etc., are analyzed as containing a +*wh* feature in their lexical representation. Such words may, however, have other readings that do not involve a +*wh* feature, as in the construction described in section 2.5. In those cases, we assume a different lexical feature specification, not including the +*wh* feature. (There are also other situations in which signs that normally function as *wh*-signs may be used without the *wh*-feature (and associated *wh*-marking), such as when the sign WHO serves to name a baseball player (see Abbott and Costello 1945) or a musical group.)

markings provide an explanation for why *wh*-marking occurs obligatorily over the whole question in some cases, but may appear solely over the *wh*-phrase in others.

Furthermore, our analysis makes the correct predictions concerning the intensity of the *wh*-marking. We discuss here the case of moved *wh*-phrases and defer discussion of the issue of intensity of *wh*-marking in constructions with *in situ* *wh*-phrases until section 2.3.3. As predicted, the *wh*-marking is most intense at the end of the question, as shown in (24) (= (17)) below.

wh

(24) [JOHN SEE t_i YESTERDAY]_{IP} WHO_i 

‘Who did John see yesterday?’

The intensity characteristics of the *wh*-marking follow from our analysis, since we postulate the existence of a +*wh* feature in a head-final C position at the right edge of the clause (as well as a +*wh* feature associated with the moved *wh*-phrase in [Spec, CP]). The *wh*-marking diminishes in intensity as distance from the +*wh* feature(s) increases. Since the *wh*-marking spreads leftward, there is an effect of increasing intensity of the *wh*-marking as the IP is articulated, with maximum intensity over the final *wh*-phrase.

2.2.3 Summary

The evidence from word order shows that *wh*-movement in ASL is rightward. Furthermore, under a rightward movement analysis, the distribution and intensity characteristics of *wh*-marking follow from previously established generalizations about the distribution of non-manual syntactic marking in ASL.

2.3 *Wh*-questions with two *wh*-phrases corresponding to a single questioned argument





It is possible to find sentences that have more than one *wh*-phrase corresponding to a single questioned argument.¹⁹ There are several possible positions in which *wh*-phrases may appear. In this section, we first discuss *wh*-phrases that appear as part of a sentence-final tag, and then we discuss the occurrence of *wh*-phrases in topic position.

2.3.1 Final tags

A final *wh*-phrase may occur as part of a tag.²⁰ We have shown (ABKN 1992, 1995; Aarons 1994; and NKBAM 1997) that tags may include a modal or tense marker, a subject pronominal, or a question word. There is often a slight prosodic break before the tag.

¹⁹ ASL does not generally allow questioning of multiple distinct constituents. Thus, there is no (direct) ASL equivalent of the English ‘Who saw what?’ This kind of restriction against multiple *wh*-questions has been noted in other languages as well (e.g., Adams 1984, Calabrese 1984, and Rizzi 1982 for Italian and McCloskey 1979 for Irish). An apparent exception to this restriction in ASL involves *wh*-phrases that are strongly D-linked (in Pesetsky’s (1987) sense); these can occur in questions of the kind: ‘Which of these men read which of those books?’, although even in these cases, multiple *wh*-questions are somewhat marginal. Samek-Lodovici 1993 makes a similar observation for Italian.


²⁰ The tag construction, which is quite common in ASL, was first identified by Liddell (1977), who demonstrated that ASL sentences are frequently followed by an elliptical clause. He showed that, in affirmative clauses, there is a characteristic head nod associated with null verbal structure (in null copular constructions, gapping, verb phrase deletion, and similar constructions all involving null verbal material and an obligatory affirmative head nod). In negative clauses, a negative head shake is used instead of the affirmative head nod. This head movement within the tag, therefore, serves as a diagnostic for clausal structure. See Aarons 1994:129 for description of the realization of the combination of the *wh*-marking and the head movement associated with the tag.

- (25) JOHN_i WILL BUY CAR IX_i 
 'John will buy a car, he (will).'
- (26) JOHN WILL BUY CAR WILL 
 'John will buy a car, (he) will.'
- (27) WHO LIKE JOHN WHO  
 'Who likes John, who (does)?'

Many of P&L's examples supposedly illustrating a final "focus" position, however, would be analyzed on our account in terms of a tag,²¹ as will be discussed in section 4.2.

2.3.2 Initial topics

A different construction that also involves more than one wh-phrase corresponding to a single questioned element is illustrated in (28).²² Such constructions are quite common in ASL.

- (28) "WHAT" JOHN BUY "WHAT" 
 'What, what did John buy?'

We have argued that the initial wh-phrase is a base-generated topic,²³ and that the remainder of the sentence consists of a question CP. In such questions, the wh-phrase can either be *in situ* or moved rightward to [Spec, CP] (although there is a preference for the latter).

As Aarons 1994 has shown, ASL allows several distinct types of topics, differentiated by their non-manual markings, discourse functions, and syntactic properties. Specifically, there is an important distinction between moved topics (which bear non-manual marking labeled by Aarons as

²¹ P&L explicitly claim that they are excluding from consideration any constructions involving a prosodic break before the final wh-phrase (see, for example, P&L 1997:29, fn. 11). However, as with tag constructions in other languages, there need not be a noticeable prosodic break before a tag.

²² The sign glossed here as "WHAT" is a two-handed sign produced with open palms, facing upward, and is distinguished from another lexical item, usually glossed as WHAT (without quotes), which is articulated with the index finger of the dominant hand sweeping down the open non-dominant hand. These two signs have different distributions, as briefly discussed in NKBAM 1997.

²³ P&L suggest that our proposal involving wh-topics is crosslinguistically implausible. They cite claims in the literature (e.g., Epstein 1992) that wh-phrases may not be topicalized. Their discussion about wh-phrases not undergoing *movement* to topic position is, however, irrelevant, since we have clearly indicated (and argued) that wh-topics in ASL are necessarily *base-generated*.

P&L do note that wh-phrases have been attested in topic position in other languages, such as Chinese; they cite Xu and Langendoen (1985). Indeed, Xu and Langendoen (1985:16, fn. 20) state explicitly that "a WH-phrase can appear in TOP position in Chinese" and provide a sentence illustrating this. P&L (1997:23, fn. 6) claim that Xu and Langendoen's observation can somehow be dismissed because their example happens to involve "a 'whose' phrase, which is independently known to have some properties different from other WH-phrases (cf. Pesetsky 1987)" (despite the fact that Pesetsky (1987) does not directly discuss 'whose' phrases).

Wh-topics in Chinese, Japanese, and German are also discussed in Wu (1996), Miyagawa (1987), and Grohmann (1997 and 1998), respectively (as well as references contained in those works).

“topic marking 1” or “tm1”) and base-generated topics, of which there are several types. We argue here that wh-topics are of this kind. It should be noted, however, that wh-topics are not normally followed by a pause (unlike other base-generated topics).

In support of the proposal that the initial wh-phrase in such constructions occurs in topic position, we have offered a variety of types of evidence, which are not mentioned by P&L (1997), although they cite the sources in which those arguments appear (ABKN 1992, Aarons 1994, and especially NK BAM 1997 (cited by P&L as 1994)). This evidence is based on:

- the potentially different manifestation of non-manual wh-marking on left-peripheral wh-phrases (sharing certain characteristics of non-manual topic marking) and wh-marking on phrases in non-left-peripheral positions;
- the position of the left-peripheral wh-phrase with respect to other topics;
- the ungrammaticality of sentences containing a left-peripheral wh-phrase but no coreferential wh-phrase later in the sentence; and
- the distribution of different types of wh-phrases and the relation between the co-referential wh-phrases in a single sentence.

2.3.2.1 Non-manual marking of wh-topics

The non-manual marking associated with these initial wh-phrases combines characteristics of both wh and topic marking. However, an anatomical conflict arises, since non-manual wh-marking (which is present with wh-signs because the +wh feature is a lexical component of the signs themselves) normally involves furrowing of the brows, while topic marking normally involves raising of the brows. There are various ways in which this conflict may be resolved, as described in Aarons 1994.²⁴

Since the realization of topic marking with wh-topics is subtle and somewhat variable, this marking will not be explicitly notated in the glosses in this paper. Instead, we will continue to use ‘wh’, although the actual realization of the marking may differ slightly from typical wh-marking.

2.3.2.2 Distributional properties of wh-topics

The initial wh-phrase also exhibits certain distributional properties characteristic of topics. ASL allows a maximum of two topics (Kegl 1985, Aarons 1994), which we have argued are left-adjoined to CP. When there is an initial wh-phrase present, only one other topic may occur, as predicted by an analysis in which the wh-phrase is occupying a topic position.

Furthermore, wh-topics show the same distribution as other base-generated topics (which differ in their distribution from moved topics). As shown by Aarons, there is a restriction on the ordering and cooccurrence of topics. If a sentence contains a moved topic, the moved topic must occur in the

²⁴ Aarons (1994:124) states:

It is nonetheless possible for a wh-word to bear topic marking as well as wh-marking. This is achieved by a raising of the brow, at the same time as a narrowing of the eyes and the tilt of the head that is normally associated with wh-marking. This non-manual marking appears to be a combination of wh-marking and topic marking, and sometimes occurs over wh-words in topic position.

Alternatively, the following may occur, as described by Aarons (1994:150):

when wh-words appear in topic position, they retain their inherent wh-marking (slightly lowered brows), and can, additionally, be topic-marked, usually by a raised chin and a slight tensing of the muscles of the upper cheekbones.

Aarons (1994:150, fn. 2) reports that this distinctive non-manual marking found with left-peripheral wh-topics was first pointed out to her by Petronio (personal communication).

rightmost topic position of the sentence.²⁵ If there are two base-generated topics, however, there is flexibility in their relative ordering.²⁶ Thus, the following examples from NKBAM 1997 provide evidence that left-peripheral wh-phrases display the same distribution as base-generated topics.



(29) $\frac{\text{wh}}{\text{WHO}} \quad \frac{\text{tm2}}{\text{VEGETABLE}} \quad \frac{\text{wh}}{\text{PREFER POTATO WHO}}$
 'Who, as for vegetables, who prefers potatoes?'



(30) $\frac{\text{tm2}}{\text{VEGETABLE}} \quad \frac{\text{wh}}{\text{WHO PREFER POTATO WHO}}$
 'As for vegetables, who, who prefers potatoes?'



The first WHO could not be a moved topic, or else we would expect (29) to be ungrammatical.

2.3.2.3 Relation between the wh-topic and the wh-question

Just as with other topics, a wh-topic must be related to an element in the immediately following clause. In ASL, a wh-topic necessarily occurs in conjunction with a subsequent wh-phrase (contained within a wh-question). The wh-phrase within the wh-question refers back to the initial wh-topic. Further evidence that the initial wh-phrase is a topic comes from investigation of the discourse strategies for referring back to established topics. In general, topics contain more specific information than subsequent references to them. This is shown by the contrast between the following two examples, which illustrate that a pronominal can refer back to a full NP in topic position, while the reverse does not occur.

(31) $\frac{\text{tm2}}{\text{JOHN}_i \text{ IX}_i \text{ LIKE MARY}}$
 'As for John, he likes Mary.'



(32) * $\frac{\text{tm2}}{\text{IX}_i \text{ JOHN}_i \text{ LIKE MARY}}$

For related reasons, if JOHN occurs in topic position, the pronominal is preferred to a full NP for subsequent reference, since there is no need to repeat the same specific information already provided by the topic.

²⁵ The following examples from Aarons 1994 illustrate this:

(i) $\frac{\text{tm3}}{\text{JOHN}_j} \quad \frac{\text{tm1}}{\text{MARY}_i} \quad t_i \text{ LOVE IX}_j$
 'You know John, Mary loves him.'

(ii) * $\frac{\text{tm1}}{\text{MARY}_i} \quad \frac{\text{tm3}}{\text{JOHN}_j} \quad t_i \text{ LOVE IX}_j$


²⁶ As shown in Aarons 1994:

(i) $\frac{\text{tm2}}{\text{JOHN IX}_i} \quad \frac{\text{tm2}}{\text{MARY IX}_j} \quad \text{IX}_i \text{ LOVE IX}_j$
 'As for John, as for Mary, he loves her.'

(ii) $\frac{\text{tm2}}{\text{MARY IX}_j} \quad \frac{\text{tm2}}{\text{JOHN IX}_i} \quad \text{IX}_i \text{ LOVE IX}_j$
 'As for Mary, as for John, he loves her.'

(33) $\overline{\text{tm2}}$ * JOHN_i JOHN_i LIKE MARY

A similar contrast occurs with wh-phrases. ASL has not only specific phrases with the meanings ‘who,’ ‘what,’ ‘when,’ ‘where,’ and ‘why,’ but also a generic wh-phrase (glossed as “WHAT”). We find a similar distribution of “WHAT” with specific wh-question signs as we find for pronominals and their antecedents,²⁷ as illustrated in (34) and (35).²⁸

(34) $\overline{\text{wh}}$ WHO LOVE JOHN “WHAT” 
 ‘Who, who loves John?’

(35) * “WHAT” LOVE JOHN WHO $\overline{\text{wh}}$

The same considerations provide an explanation for the following paradigm:²⁹

(36) $\overline{\text{wh}}$ [JOHN BUY t_i YESTERDAY]_{IP} [WHICH COMPUTER]_i  


(37) $\overline{\text{wh}}$ [WHICH COMPUTER] [JOHN BUY t_i YESTERDAY]_{IP} WHICH_i 

(38) $\overline{\text{wh}}$ [WHICH COMPUTER] [JOHN BUY t_i YESTERDAY]_{IP} “WHAT”_i 

(39) ?* [WHICH COMPUTER] [JOHN BUY t_i YESTERDAY] [WHICH COMPUTER]_i $\overline{\text{wh}}$

There is no need to repeat the entire phrase WHICH COMPUTER in (39), just as there was no need to repeat JOHN in (33).³⁰

²⁷ While our informants prefer (34) to (i) below, this dispreference is not as strong as the contrast between examples involving JOHN and IX presented in (31) and (33). Sentences such as (i) have been reported in the literature as acceptable.

(i) ? $\overline{\text{wh}}$ WHO JOHN SEE WHO 
 ‘Who, who did John see?’

Our informants also show a preference for “WHAT” over WHO as the second wh-phrase in sentences like (29) and (30).

²⁸ The initial “WHAT” in (35) is distinct from a sign articulated similarly, meaning ‘well’, which can introduce questions.

²⁹ Example (36) was presented in Aarons 1994 as grammatical. P&L (1997:38) report this sentence to be ungrammatical “without a pause before WHICH COMPUTER” (although it is not clear what significance P&L attribute to the pause they report for this sentence, which is, in any event, not present in the sentence as signed by our informants).

³⁰ P&L (1997:34) claim that our analysis “cannot account for the ungrammaticality of sentences with full WH-phrases in the sentence-initial and sentence-final positions,” as in (39). As we have just shown, sentences such as (36) are grammatical, and the unnaturalness of sentences such as (39) follows straightforwardly from our account.



2.3.3 Distribution of non-manual wh-marking

Constructions involving wh-topics necessarily exhibit wh-marking over the entire utterance. This contrasts with wh-questions containing a single wh-phrase that has moved rightward, where the wh-marking may occur solely over the wh-phrase. In this section, we show that the distribution of wh-marking in these wh-topic constructions is predicted, given the multiple occurrences of the +wh feature, in conjunction with the general phenomenon of perseveration.

2.3.3.1 Perseveration and its motivation

As just stated, an initial wh-topic (inherently +wh) is necessarily followed by a well-formed wh-question (involving a wh-phrase *in situ* or moved rightward). Thus, in sentences containing wh-topics, there is also another wh-element later in the sentence. This has consequences for the realization of the non-manual wh-marking that follow from a more general phenomenon in the language, that of perseveration.

In ASL, if the same articulatory configuration will be used multiple times in a single sentence, it tends to remain in place between those articulations (if this is possible). This phenomenon occurs quite generally, in both the manual and non-manual channels. Kegl (1985:164-174) describes examples of manual perseveration involving classifier handshapes. One interesting example of manual perseveration relevant to the present discussion involves the perseveration of the non-dominant hand used for the sign “WHAT” in a sentence that contains two occurrences of that sign. This is illustrated in (40).³¹

	wh-----wh		
(40)	“WHAT” JOHN LIKE (“WHAT”	[dominant hand]	
	“WHAT”-----“WHAT”	[non-dominant hand]	
	‘What, what does John like?’		

In this sentence, the non-dominant hand retains the handshape of “WHAT” while the rest of the sentence is articulated with the dominant hand, finishing with the full two-handed articulation of “WHAT”.³² In fact, the final “WHAT” sign may be articulated solely by the perseverating non-dominant hand.


Since the final wh-sign can be produced solely by the non-dominant hand (and without a distinct onset), the presence of this final sign has generally gone unnoticed, with the notable exception of descriptions in Baker and Cokely 1980a,b,c,d.³³ NKB 1994 offered the first account of this phenomenon in terms of non-dominant handshape perseveration. This may provide an explanation for some of the discrepancies in the reported judgments on wh-questions that contain

³¹ The notation here is meant to highlight perseveration in the manual and non-manual channels. In the glossing of non-manual markings, the labels indicate the underlying source of the marking and the dashed line indicates perseveration of the marking between those sources. With respect to the non-manual wh-marking, the marking is maintained throughout. With respect to the manual channel, it is the non-dominant handshape that perseverates. There may or may not be a distinct onset for the second occurrence of the sign. In subsequent glosses, a single wh-marking will be indicated.

³² Similar effects are found with WHICH and Wh-MANY, which are also two-handed signs, as reported in NKB 1994 (see examples on the handout available at our Web site).

³³ Baker and Cokely (1980a,b) provide many examples of questions containing the “WHAT” sign. With one such example in Baker and Cokely 1980d:63, they explicitly point out: “Notice that the gesture “WHAT” is made with only one hand—the non-dominant hand.”

an initial wh-sign (not corresponding to an *in situ* subject). Our informants normally accept such sentences if, and only if, there is another wh-phrase in the sentence, either *in situ* or clause-finally:

- (41) $\overline{\text{wh}}$
 “WHAT” JOHN LIKE [dominant hand] 
 “WHAT”-----“WHAT” [non-dominant hand]
 ‘What, what does John like?’
- (42) * $\overline{\text{wh}}$
 “WHAT” JOHN LIKE [dominant hand]
 “WHAT” [non-dominant hand]

In particular, while some researchers have reported sentences like (42) to be grammatical, it is possible that the actual signed utterance corresponded to (41).³⁴ It is impossible to determine exactly what was signed since the relevant videotaped data have not been made accessible.³⁵

NKB (1994) also report perseveration in the non-manual channel, and further detail is provided in NKBAM 1997 (see also NKMBL forthcoming). Specifically, the non-manual wh-marking perseverates (that is, is maintained) between the multiple occurrences of the +wh feature in the sentence. This was illustrated, for example, in (40), where the non-manual wh-marking is maintained throughout the sentence.³⁶

Similar perseveration in the non-manual channel, involving head tilt and eye gaze in determiner phrases (MacLaughlin 1997, Bahan 1996), confirms that this phenomenon is general and systematic in the non-manual as well as the manual channel, rather than constituting an *ad hoc* account for the distribution of wh-marking, as suggested by P&L (1997:40).

³⁴ The final wh-sign may exhibit varying degrees of handshape assimilation (thus perhaps further obscuring the presence of this final wh-sign). For example, if the previous sign is CAR, the final “WHAT” sign may be articulated with the closed fist handshape from CAR.

It is also possible for the manual articulation of the wh-sign to be completely taken over by an intense non-manual realization of wh-marking that occurs in the same position where the manual wh-sign would otherwise have appeared, as in (i); the final manual sign must be held in such cases.


- (i) $\overline{\text{wh}}$ -----[intense wh-marking]
 “WHAT” JOHN LIKE-----
 ‘What is it that John likes?’

³⁵ P&L do present glosses of 13 example sentences that they say are taken from commercially available videotapes (see section 4.2). It is striking, however, that those sentences include no wh-questions. This is despite the fact that their primary source for those example sentences, Baker and Cokely 1980e, contains many wh-questions, and even, in the corresponding student text (Baker and Cokely 1980b:15), a description of the distribution of wh-phrases:

In general, ‘wh-word’ signs occur at the end of the question. However, they sometimes occur at both the beginning and the end. Thus, a Signer may ask:



$\overline{\text{wh-q}}$ ARRIVE WHEN or WHEN ARRIVE $\overline{\text{wh-q}}$ WHEN

³⁶ NKBAM further show that such perseveration can even mask topic marking in a sentence like (29), which may alternatively be realized as (i):

- (i) $\overline{\text{wh}}$
 WHO VEGETABLE t_i PREFER POTATO “WHAT”_i 
 ‘Who, as for vegetables, who prefers potatoes?’



2.3.3.2 Intensity



As shown in Bahan 1996, the maximal intensity of wh-marking correlates with the syntactic locations where the +wh feature occurs. When two such features are present, the maximal articulation is maintained between those two nodes. There are two cases where this happens. First, in the construction with an initial wh-topic, such as (43), our analysis entails the existence of a +wh feature both initially, as a feature of the +wh phrase occurring in topic position and finally, in C. (There is also a +wh feature associated with the wh-phrase *in situ* or in [Spec, CP].) As discussed in Bahan 1996, the articulation of wh-marking is maximally intense at these positions, and this intensity is maintained over the intervening material.³⁷

- wh-----wh-----wh

 (43) “WHAT” [[JOHN BUY t_i YESTERDAY]_{IP} [+wh]_C “WHAT”_i]_{CP} 
 ‘What, what did John buy yesterday?’

Thus, not only the distribution of non-manual wh-marking, but also the intensity of its realization, are explained by our account.

Second, we find a similar effect involving simple wh-questions with a wh-phrase *in situ*.

- wh-----wh

 (44) [[WHO LOVE JOHN]_{IP} [+wh]_C]_{CP} 
 ‘Who loves John?’

- wh-----wh

 (45) [[JOHN SEE WHO YESTERDAY]_{IP} [+wh]_C]_{CP} 
 ‘Who did John see yesterday?’



The spread of the non-manual wh-marking over the entire question is obligatory, since there is otherwise no manual material with which the +wh feature in C can be articulated. The maximally intense articulation begins with the first occurrence of the +wh feature (i.e., the *in situ* wh-sign) and perseverates through the rest of the sentence, until the position associated with the second +wh feature (C) is reached. Thus, the perseveration of the maximally intense wh-marking provides support for the dual representation of the +wh feature in these constructions.

In sum, the intensity of non-manual wh-marking in such constructions provides support for the syntactic analysis proposed here. That is, the pattern of wh-marking follows from the generalizations about perseveration only if the sentence is understood to contain a +wh feature in a post-IP position.



³⁷ Perseveration is manifested somewhat differently for the brow furrow and head shake components of the non-manual expression of wh-marking. This difference is more general and involves the articulatory characteristics of those two expressions. With respect to brow furrow, the lowered position is maintained at its maximum throughout the duration of the signing. However, since the head shake intrinsically involves movement (rather than maintenance of a position), it continues between the two occurrences of the +wh feature, but two separate peaks of intensity are nonetheless identifiable at the locations of the relevant features. This is true as well for the perseveration of head nod mentioned previously in [note 11](#).

2.4 Extraction from embedded clauses

The rightward movement account correctly predicts that *wh*-phrases extracted out of embedded clauses appear in the right-peripheral specifier of CP position of the main clause. This is illustrated by examples (46)-(48). As expected, non-manual *wh*-marking may occur solely over the final *wh*-phrase (as in (46)) or it may spread over entire clause (as in (48)), but it may not occur solely over the embedded clause (as in (47)).



(46) [[TEACHER EXPECT [[t_i PASS TEST]_{IP₂} t_i]_{CP₂}]_{IP₁} WHO_i]_{CP₁}  
 ‘Who does the teacher expect to pass the test?’



(47) * [[TEACHER EXPECT [[t_i PASS TEST]_{IP₂} t_i]_{CP₂}]_{IP₁} WHO_i]_{CP₁}

(48) [[TEACHER EXPECT [[t_i PASS TEST]_{IP₂} t_i]_{CP₂}]_{IP₁} WHO_i]_{CP₁}  
 ‘Who does the teacher expect to pass the test?’

2.5 Semi-questions and indirect questions

There are several verbs, such as *WONDER* and *CURIOUS*, which subcategorize for question complements.³⁸ Such verbs may occur with a complement clause that has the syntactic properties of a *wh*-question, including rightward *wh*-movement and *wh*-marking. The *wh*-marking may occur solely over the *wh*-phrase or may spread over the complement clause (but not over the entire sentence).

(49) JOHN WONDER POSS-1p MOTHER BUY “WHAT”  
 ‘John was wondering what my mother bought.’

(50) JOHN WONDER POSS-1p MOTHER BUY “WHAT”  
 ‘John was wondering what my mother bought.’

(51) * JOHN WONDER POSS-1p MOTHER BUY “WHAT”

Constructions of this kind have been referred to as “semi-questions” by Suñer (1993), who shows that semi-questions are syntactically distinct from “indirect questions” in English and Spanish. An example of an English “indirect question” is given in (52).

(52) John knows what you have.

³⁸ P&L claim that when verbs like *WONDER* and *CURIOUS* take embedded complements, the complements cannot bear *wh*-marking; instead, P&L claim that a head nod occurs over both the matrix and complement clause. The examples they offer (such as their (76) and (78)) illustrating this, however, are rejected by our informants as ungrammatical.

In English, the verb 'know' can occur with a +wh clause in which wh-movement occurs, although this clause is not understood to be a question. Not all languages allow wh-clauses in such contexts, however. For example, in French, a wh-clause cannot appear in such a position; rather, a nominal form (*ce* 'this' followed by a relative clause) is required.

(53) * Jean sait qu'avez-vous.
Lit.: John knows what have you.

(54) * Jean sait que vous avez.
Lit.: John knows what you have.

(55) Jean sait ce que vous avez.
Lit.: John knows this that you have.


ASL seems to be like French to the extent that wh-clauses are disallowed in complement position of a verb like KNOW.

(56) * JOHN KNOW MARY LOVE WHO wh

(57) * JOHN KNOW MARY LOVE WHO wh

(58) * JOHN KNOW WHO LOVE MARY wh

One way to express the same information is illustrated in (59).³⁹ However, this construction is extremely limited.⁴⁰

(59) JOHN KNOW WHO MARY LOVE hn 
'John knows who Mary loves.'

Several observations indicate that this construction does not involve a +wh clause. First, non-manual wh-marking is unacceptable. Second, a sign like WHO cannot remain *in situ*. Third, the wh-phrase cannot occur at the right-periphery of the clause. Thus, a statement such as the following is ungrammatical on the reading illustrated in (59) (regardless of non-manual markings, such as head nod or wh-marking):⁴¹

(60) * JOHN KNOW MARY LOVE WHO

³⁹ Note that the scope of the head nod in this example differs from claims made in P&L.

⁴⁰ It is possible that this is a construction borrowed from English.

⁴¹ With appropriate wh-marking, the sign order shown in (60) is grammatical only on the reading where it is a question meaning 'Who does John know Mary loves?'. It is not acceptable on the reading: 'John knows who Mary loves.' Examples like (60) were reported to be ungrammatical in Lillo-Martin 1990 and Petronio 1993. However, P&L's (1997) analysis predicts that such sentences should be grammatical, and P&L (1997:43) now report them to be grammatical (with "hn" over the entire sentence) for some consultants "in certain situations"--with no further elaboration. Thus P&L (1997:43) now claim that "WH-elements appear at the beginning of the embedded clause (or *in situ*)" in indirect questions.

The construction warrants further investigation, and we are not proposing an analysis for it here. What is clear, however, is that this construction is fundamentally different in structure from that of wh-questions.⁴² Therefore, this construction should not serve as the basis for determining the directionality of wh-movement in ASL.

2.6 Summary

In conclusion, examination of the simplest questions, involving a single wh-phrase, reveals that wh-movement can only result in the wh-phrase occurring to the right of IP. Sentences of this kind with left-peripheral wh-objects are ungrammatical to native signers, while sentences with right-peripheral wh-subjects are grammatical. In addition, our rightward movement analysis correctly predicts the distribution and intensity of non-manual wh-marking. When there is lexical wh-material to the right of IP, wh-marking may be borne solely by that wh-phrase. However, in the absence of such material, spread of wh-marking occurs obligatorily. Furthermore, wh-marking exhibits maximal intensity at the positions where +wh features are postulated to occur.

We have argued that constructions containing a left-peripheral wh-phrase involve a base-generated wh-topic followed by a complete question CP. The question CP in such constructions has the same structure as wh-questions containing a single wh-phrase: [[IP C] Spec]_{CP}.

Finally, we have shown that wh-phrases may be extracted from embedded clauses. As we predict, in such cases, the wh-phrase appears clause-finally.

3. P&L's alternative analysis for wh-questions

P&L (1997) claim that it is possible to account for wh-questions in ASL in terms of leftward, rather than rightward, wh-movement. The main characteristics of P&L's analysis are as follows:

- Specifier of CP is to the left of IP; wh-phrases optionally move leftward to [Spec, CP].
- C is to the right of IP. Right peripheral wh-elements are analyzed as occurring in this position.
- C may contain a focus feature, +F, as well as a base-generated lexical item (e.g. a wh-word,⁴³ modal, quantifier, or verb). This base-generated "double" must co-occur with an identical +F "twin" elsewhere in the sentence. It is suggested (p. 32) that "the twin functions as a focus operator, and as an operator, it undergoes LF raising to Spec-CP."⁴⁴

⁴² P&L (1997:42) recognize some differences between this construction and direct questions. In particular, they note that wh-marking and right-peripheral wh-signs do not occur in indirect questions. Under their analysis, the non-manual marking for wh-questions is not associated with the +wh feature alone, but only appears when the +wh feature co-occurs with the +F (focus) feature, which P&L stipulate that indirect questions lack.

⁴³ This differs from Lillo-Martin 1990:214, where right-peripheral wh-signs were not considered to be in C:

I believe that 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.

⁴⁴ Petronio and Lillo-Martin (1997:34) draw a distinction between wh and non-wh twins (erroneously referred to as "doubles" in the following quote):

One difference between the WH-doubles (sic) and the non-WH-doubles (sic) is that while the latter have only a [+F] feature, the former have both [+F, +WH]. We have observed independently that [+WH] elements can move to spec-CP either at the surface level or at LF. Hence, while non-WH-double (sic) operators do not move until LF, WH-doubles (sic) can move at the surface.

- ASL is postulated to contain a null wh-element which may constitute the matching “twin” for a wh-“double” in C. This makes available an account of certain constructions in which P&L claim that the “double” is the only overt wh-element in the sentence. Thus, the following structure would correspond to their analysis of (14):⁴⁵

$$(61) \quad \frac{[[e_i]_{\text{Spec,CP}} [[t_i \text{ HATE JOHN }]_{\text{IP}} [\text{WHO}_{j=i}]_{\text{C}}]_{\text{C}'}]_{\text{CP}}}{\text{“twin”} \quad \text{base-generated “double”}}$$

‘Who hates John?’

- Non-manual “whq” marking expresses the combination of features +WH and +F (in the C node of all direct questions). It obligatorily extends over the question CP. Thus, a clause that is +WH but not +F does not bear “whq” marking. P&L (1997:42) further “stipulate that indirect questions in ASL are not marked [+F].”

Data that are not accounted for by the above are handled by P&L in one of the following ways:

- Wh-phrases are subject to rightward movement, but this is claimed to be heavy NP-shift and not wh-movement.
- Instances where non-manual marking occurs solely over a right-peripheral wh-phrase are claimed to involve a sequence of two sentences: a statement (containing a non-overt non-wh element that will be questioned in the next sentence) followed by a separate question whose only overt realization is the wh-phrase itself.

Among the theoretical questions raised by this analysis that P&L do not address are the following:

- What is the theoretical status of “twins” and “doubles” as proposed by P&L?
- What is the nature of the movement process by which a lexical “twin” (“doubled” by the element in C) raises to [Spec, CP] (a phrasal position)?
- To what extent is this “focus via doubling” mechanism, involving twins, doubles, and other filters (such as the Final Double Filter discussed in section 4.2.3), peculiar to ASL? Is there any crosslinguistic support for such an analysis?

Although these are important issues, in the remainder of this report, we limit ourselves to considerations concerning the adequacy of their proposal for accounting for the facts of ASL.

Note, however, that this movement, whether at or prior to LF, involves not only wh-phrases, but also lexical heads, such as modals. Recognizing head movement of a modal to [Spec, CP] as a potential problem, Petronio and Lillo-Martin (1997:32, fn. 15) suggest that “an alternative analysis employing a null OP phrase is possible.”

⁴⁵ Given that they have the same analysis for right-peripheral wh-signs as for other elements they analyze as occurring in “focus” position, a similar account would be required for a sentence like the following:

$$(i) \quad [[\quad]_{\text{Spec,CP}} [[\text{JOHN WILL GO}]_{\text{IP}} [\text{WILL}]_{\text{C}}]_{\text{C}'}]_{\text{CP}} \quad \text{s-structure}$$

$$(ii) \quad [[\text{WILL}]_{\text{Spec,CP}} [[\text{JOHN } t_i \text{ GO}]_{\text{IP}} [\text{WILL}]_{\text{C}}]_{\text{C}'}]_{\text{CP}} \quad \text{LF}$$

‘John WILL go.’ [note: the translation follows P&L]

4. Deciding between the two analyses

In this section, we consider the predictions of the different analyses in relation to the ASL facts. We begin, in section 4.1, with an examination of simple sentences involving a single *wh*-phrase, by considering the cases predicted to be grammatical only by rightward movement (clause-final *wh*-subjects) and those predicted to be grammatical only by leftward movement (clause-initial *wh*-objects). We also consider the relevance of the distribution of non-manual *wh*-marking to the evaluation of the two proposals. Next, in section 4.2, we examine the predictions that the two analyses make concerning right-peripheral material. P&L's analysis relies crucially on their contention that only one lexical element can occur in clause-final position. We show that the ASL facts are incompatible with an analysis that imposes such a requirement. Finally, section 4.3 examines the occurrence of left-peripheral *wh*-phrases in relation to topics. We again show that P&L's analysis makes incorrect predictions concerning the cooccurrence of left-peripheral *wh*-phrases and (other) topics.

4.1 Sentences with a single *wh*-question sign

There are disagreements about the grammaticality of many examples relevant to the analysis of *wh*-constructions. We consider in this section the most basic and fundamental data critical to deciding between a leftward and a rightward movement analysis, and we discuss the nature of the disputes.

The most fundamentally different predictions of the rightward and leftward *wh*-movement analyses involve allowable positions for a *wh*-phrase questioning the subject or object. Object *wh*-phrases in initial position would constitute support for a leftward movement analysis. In contrast, subject *wh*-signs in final position would be evidence in favor of a rightward movement analysis.

4.1.1 *Wh*-objects in initial position

First consider examples like (13), repeated here as (62), predicted to be grammatical by P&L. Such sentences are reported to be ungrammatical by our informants, when signed exactly as glossed.

_____ *wh*
(62) * WHO JOHN HATE

Petronio (1991:212) reports that “signers who came from Deaf families where their parents used ASL” usually reported sentences with an initial *wh*-object to be ungrammatical, while “signers who came from hearing families (i.e. their parents did not use ASL)” sometimes concurred in their judgments with the native signers and sometimes did not.⁴⁶

Interestingly, Petronio (1993:99), while presenting no new relevant evidence, summarizes these findings as follows: “In previous work (Petronio 1991), I reported that some ASL signers accept *whOSV* in direct questions while others reject it.” No mention is made in Petronio 1993, however, of that fact that, according to Petronio 1991, *native* signers generally reject such sentences.

Although P&L discuss this construction (1997:50-51), they report “varying judgments” and make no explicit claim about the grammaticality of the critical sentences. They summarize their own previous reports on such sentences as follows: “Lillo-Martin 1990 and Lillo-Martin & Fischer 1992

⁴⁶ Petronio 1991 discusses in greatest detail grammaticality judgments on rhetorical questions, but clearly states (p. 214) that *wh*-questions are comparable with respect to word order and scope of non-manual marking:

The patterns found with the non-manual *whq* marker and the *wh*-terms in *wh*-questions are the same patterns found with the *rhq* marker and the *wh*-terms in the question segment of the *rhq* sentences.

report them as grammatical, and Petronio 1993 reports that they receive mixed judgments.” The misleading characterization in Petronio 1993 of the findings reported in Petronio 1991 is thus perpetuated in P&L 1997, since, yet again, no mention is made of the fact that the native signers tested by Petronio generally reject such sentences.


Thus, despite the misleading characterization in P&L 1997, sentence-initial wh-objects are generally rejected by native signers (according to Petronio 1991, as well as our own findings). This would appear to be a serious problem for the kind of leftward wh-movement analysis proposed in P&L 1997, but it is not the only one.

4.1.2 Wh-subjects in final position

In this section, we discuss the data relevant to evaluating the prediction of the rightward movement analysis that a subject wh-phrase may undergo wh-movement to a clause-final position. We consider first, in section 4.1.2.1, contradictory claims that have been made about the grammaticality of the simplest types of questions with clause-final wh-subjects. Next, since P&L propose a different structural analysis for constructions involving a clause-final wh-phrase without spread of non-manual wh-marking, we examine separately, in section 4.1.2.2, their proposal that such constructions necessarily involve more than one sentence, and we demonstrate that this claim is untenable. Thus, we argue that the grammaticality of sentences involving sentence-final wh-phrases (either with or without spread of wh-marking over the remainder of the question) is consistent with the predictions of the rightward wh-movement analysis (and only with such an analysis).


4.1.2.1 Examination of the data


Consider first the example presented earlier as (14), repeated here as (63), predicted to be grammatical by a rightward wh-movement analysis.

(63) $\frac{\text{wh}}{\text{t}_i \text{ HATE JOHN WHO}_i}$ 
 ‘Who hates John?’

This sentence is reported to be grammatical by our informants.

Petronio (1991:212, 214) does not explicitly discuss the status of wh-questions involving the subject wh-phrase occurring clause-finally. However, she does report that the related structure as it occurs in rhetorical questions is grammatical, and she further reports that wh-questions and rhetorical questions exhibit the same patterns with respect to both the spread of the non-manual marking and the positioning of the wh-element (as mentioned in [note 46](#)). She offers the following examples as grammatical:

(64) $\frac{\text{rhq}}{\text{TAKE-UP EXPLAIN WHO, ANN}}$ [Petronio’s 1991:4a] 
 ‘It is Ann who will do the explaining.’

(65) $\frac{\text{rhq}}{\text{TAKE-UP EXPLAIN WHO, ANN}}$ [Petronio’s 1991:4b] 
 ‘It is Ann who will do the explaining.’

She would thus appear to be claiming that sentences such as (63) are also acceptable.

In fact, she reports that (64) and (65) are preferable to (66), the corresponding question with an *in situ* wh-phrase in subject position (the only word order, incidentally, that would be predicted to be grammatical under the assumption of leftward wh-movement). Petronio 1991 reports that (66) is actually ungrammatical for most native signers (although our informants find it grammatical).

_____ rhq

(66) (*) WHO TAKE-UP EXPLAIN, ANN [Petronio's 1991:4d]


Given Petronio's (1991) conclusion that wh-questions and the question portion of rhetorical questions are essentially identical in structure, Petronio would appear to be claiming that wh-subject phrases are, in fact, *preferred* in the right periphery of wh-questions.

Surprisingly—with no explicit mention of prior discrepancies—Petronio 1993:168 (fn. 11) reports that sentences such as (67) and (68) are “odd or ungrammatical” (as indicated by the “%”) for most signers.⁴⁷

_____ whq

(67) %LIKE JOHN WHO [Petronio's 1993:153, ex. 68] 

_____ whq

(68) %BUY CAR WHO [Petronio's 1993:153, ex. 69] 

P&L (1997:36) say of sentences like (68): “we find that when [they] are presented in isolation, judgments vary—some signers accept them, but others do not.” P&L use their observation that such sentences are considered more acceptable when presented in context than when presented in isolation to support their analysis of these constructions as involving a null wh-element (rather than a wh-trace) in subject position plus a “double” wh-word base-generated in a +F Complementizer.⁴⁸

Petronio and Lillo-Martin (1997:36-37) elaborate, with respect to sentence (68), as to the kind of context that improves acceptability for some signers:

A signer who will reject a sentence such as 61 when it is presented in isolation will often accept it when it is in the appropriate context, as in 64.

(64) Possible context: The speaker and addressee are discussing the addressee's car, which was just sold.

_____ whq

BUY CAR WHO
'Who bought the car?'

At the very least, from the example they give of the kind of context reportedly needed for acceptability (for some informants), this would not appear to be a case where some extraordinary context is required to allow interpretation of an otherwise marginal sentence.


⁴⁷ Sentence (68) is offered as grammatical in Lillo-Martin, Boster, Matsuoka, and Nohara 1996:13 (ex. 2b), and both (67) and (68) are grammatical for our informants.

⁴⁸ In section 5 we will return to examination of the way in which P&L adduce evidence in favor of their proposals from observations that certain sentences (otherwise problematic for their account) receive higher grammaticality ratings when presented in a natural context.

To summarize, then: P&L acknowledge that questions with sentence-final wh-subjects are acceptable in an appropriate context. To account for the acceptability of such sentences, P&L propose base generation of null wh-elements and of overt “double” wh-words. In contrast, according to a rightward movement analysis, the sentence-final wh-element is a wh-phrase that has undergone wh-movement to [Spec, CP].

4.1.2.2 Two sentence analysis

Because P&L require that wh-marking extend over the whole question, they have no explanation for the acceptability of sentences such as (69) in which a wh-phrase occurs sentence-finally with wh-marking that does not extend over the entire question.

(69) LOVE JOHN $\overline{\text{wh}}$ WHO 
 ‘Who loves John?’

P&L (1997:50) apparently dispute that cases like (69) can constitute a single sentence, instead suggesting that such constructions involve “multisentence discourses.” According to P&L 1997, (69) involves two independent sentences: a statement (containing a non-wh null subject argument) followed by a question (where the wh-phrase is the only overt element).⁴⁹ In support of this analysis, P&L (1997:50) offer only the following observation:

we find that judgments on these sentences are very dependent on context; without the appropriate context many consultants will usually judge them ungrammatical, while other consultants are able to construct an appropriate context that makes the sentence⁵⁰ grammatical. Our analysis predicts such a dependence on context, since the sentences employ null elements that are known to require identification in the context or discourse.

P&L offer no evidence to support the claim that (69) is anything but a single sentence. Furthermore, the suggestion that the signs in (69) that precede WHO constitute an independent sentence is problematic. Sentence (70) is uniformly reported to be ungrammatical, regardless of context.

(70) * e LOVE JOHN

In fact, this sentence, as glossed, is ungrammatical in any discourse context *except one in which the “question” WHO immediately follows*. Note that the following question must be WHO, in this case. No other wh-sign, such as WHY, for example, makes the preceding sentence grammatical.


(71) * LOVE JOHN $\overline{\text{wh}}$ WHY

The ungrammaticality of (70) is to be expected, since there is no way for the null pronominal that P&L posit to be properly licensed. Bahan 1996 shows that an overt manifestation of agreement

⁴⁹ A seemingly contradictory position is taken, however, in Petronio 1991, where a rhetorical question of this type (presented earlier as (64)) plus the answer to that question is analyzed as a single sentence.

⁵⁰ Although P&L appear to be discussing this construction as if they do, in fact, consider it to involve a single sentence, that is clearly not what they are claiming.

(either manual or non-manual) is required to license a null subject.⁵¹ Thus, there is a contrast in grammaticality between the following two sentences.

- (72) pro_i [I_{Agr-S_i} [I_{Agr-O_j} LOVE MOTHER_j]] 
 ‘(He/she) loves (his/her) mother.’
- (73) * pro LOVE MOTHER





The crucial point is that (69) is acceptable, with no overt marking of agreement (since there is no null pronoun in need of licensing), while (70) is not.⁵²

Thus, (70) lacks an essential grammatical argument—unless that argument is provided by the *wh*-phrase that we analyze to be in [Spec, CP]. It would appear, then, that the most relevant effect of “context” on the grammaticality judgment here is the effect of the occurrence of what P&L analyze to be the independent question, WHO, on the grammaticality of the preceding statement.

We conclude that P&L’s two sentence analysis for such constructions is untenable. We maintain that (69) is a single sentence and, moreover, one for which P&L have no account.

4.1.3 Optional vs. obligatory spread of *wh*-marking

The previous two sections have discussed sentences that differ minimally in the distribution of non-manual marking.

- (74) wh
 LOVE JOHNWHO  
 ‘Who loves John?’
- (75) wh
 LOVE JOHN WHO  
 ‘Who loves John?’

The rightward movement account analyzes these sentences uniformly as involving rightward *wh*-movement; they differ in whether the optional spread of the non-manual syntactic marking associated with the +*wh* feature over its c-command domain has occurred. As just discussed, P&L analyze these as involving significantly different structures. Although both contain null material, on their account, (75) is a single sentence while (74) is a sequence of two sentences.

Cases with apparent optional spread of *wh*-marking over the entire question are not limited to sentences containing final *wh*-phrases questioning *subject* arguments. As discussed in section 2.2.2, *wh*-objects that have moved rightward to [Spec, CP] (on our analysis) also exhibit optional spread of the *wh*-marking, as in (76).

⁵¹ Bahan 1996, BKLMN under review, and NKMBL forthcoming demonstrate that Lillo-Martin’s (1986, 1991) proposed analysis of the licensing of null subjects of “plain” verbs by Topic (as in Chinese) rather than by agreement, is incorrect.

⁵² This argument is also presented in KNMHB 1996, although it was evidently misunderstood by Bouchard (1997:148) in his reply. The crucial point is that (69), unlike (73), does not require non-manual expression of agreement for grammaticality.

(76) JOHN LOVE wh
 WHO
 ‘Who does John love?’



P&L would also need to analyze sentences like (76) as consisting of more than one sentence (although evidence comparable to that presented in 4.1.2.2 again strongly suggests otherwise). Examples like (76) were, in fact, presented in Lillo-Martin and Fischer 1992, where they were treated as (grammatical) single sentences. Under the assumption of leftward movement, Lillo-Martin and Fischer observed spread of *wh*-marking to be optional in cases like (76), which they analyzed as containing *in situ* objects, but obligatory for constructions in which they claimed leftward *wh*-movement had taken place or in sentences containing *in situ* subjects. This analysis cannot account for sentences like (74), involving a right-peripheral subject, nor for the contrast in grammaticality between (21) and (23), but such examples were not discussed by Lillo-Martin and Fischer.

In contrast, the analysis we have presented offers a straightforward account for the cases of optional vs. obligatory spread. As we have shown, our explanation of the distribution of non-manual *wh*-marking fits in with previously established generalizations about the distribution of non-manual syntactic markings (but only on the assumption of rightward *wh*-movement).

4.1.4 *Wh*-movement out of embedded clauses

The leftward and rightward movement analyses make different predictions about extraction of *wh*-phrases from embedded clauses. As shown in section 2.4, extraction from embedded clauses to a sentence-final position, as predicted by the rightward movement analysis, yields a grammatical result. This was demonstrated by examples (46)-(48). These same examples were also presented in ABKN 1992, Aarons 1994, NKB 1994, NKBA 1994, and NKBAM 1997, although no examples of this kind are addressed in P&L’s (1997:52-53) discussion of long-distance *wh*-movement.

In contrast, P&L’s analysis does not make the correct predictions. P&L (1997:52) state that the cases of leftward extraction predicted by their analysis to be grammatical

are rarely observed in natural conversation and judgments by consultants vary. Such sentences were reported to be ungrammatical in Lillo-Martin 1990⁵³ and ABKN; similar examples were found grammatical by Boster 1996 and received mixed judgments in Petronio 1993.

P&L (1997:52) point out that there are signers who accept such constructions only if there is a *wh*-sign on the *right* edge of the clause.⁵⁴

It is noteworthy that the examples whose grammaticality is characterized in this way are glossed without any notation indicating their questionable status. Consider P&L’s (1997:52) example (112a):

⁵³ Lillo-Martin 1990 had claimed that extraction out of embedded clauses is impossible in ASL (based in part on the lack of extracted *wh*-phrases at the left periphery of the matrix clause). Lillo-Martin 1990:216-218 offers an explanation for the impossibility of extraction in terms of an idiosyncratic parameterization of the notion of barrierhood. Lillo-Martin 1990 and 1992 explore the consequences for learnability and acquisition of the supposed impossibility of extraction from embedded clauses in ASL. (Note that P&L are now claiming that long-distance extraction *does* occur, and that it is leftward, even though the predicted examples are not attested.)

⁵⁴ P&L (1997:52) explain this in terms of the “stylistic preference for lexical material to be associated with a [+F +WH] C°.”

- _____ whq
- (77) WHO JOHN THINK MARY LIKE [as presented in P&L]
 ‘Who does John think Mary likes?’


This example is presented without an asterisk or even a question mark, although they admit that these sentences do not seem to be attested.⁵⁵ Our informants report that such examples are ungrammatical.

4.1.5 Summary

Consideration of the most basic predictions of the two analyses with respect to word order and the distribution of non-manual marking supports the existence of rightward wh-movement in ASL. The predictions of the rightward wh-movement analysis are upheld. While Petronio (1991, 1993), Lillo-Martin (1990), Lillo-Martin and Fischer (1992), and P&L (1997) offer conflicting reports on the grammaticality of some of the crucial sentences discussed in this section, our findings are generally consistent with those that Petronio 1991 reports for native signers.

4.2 Right-peripheral wh-material: in C or [Spec, CP]?

According to P&L, wh-material at the right edge of the clause (when not an *in situ* object), must be in a +F C⁰. Many of P&L’s examples supposedly providing independent motivation for this final “focus” position (allegedly housing a variety of types of elements) would be analyzed, on our account, in terms of a sentence-final tag (ABKN 1992, 1995; NMLBK 1998), as in (78).

- _____ neg neg
- (78) JOHN CAN’T GO, CAN’T 
 ‘John can’t go, (he) can’t.’

P&L cite several examples drawn from commercially available videotapes to illustrate the “focus” construction. In fact, however, P&L’s glosses do not accurately represent the data on those videotapes.

One of the examples they cite for which videotape is publicly available—their example (25) (listed as (30) in their appendix), from Unit 27 (cited as Unit 25 in their appendix) of Baker and Cokely (1980d)—provides evidence against their account. This example, in which the final sign is supposed to be in C, is glossed by P&L (1997:30) as follows:⁵⁶

- _____ cond
- (79) ... KNOW PROBLEM SITUATION, CANNOT J-U-R-Y CANNOT
 ‘... If [you] are aware of the problem, the situation, then [you] CANNOT be on the jury.’

⁵⁵ The same practice is followed with other examples, cf. P&L’s (1997:50) (108a):


- _____ whq
- (i) WHAT JOHN BUY [as presented in P&L 1997]
 ‘What did John buy?’

This practice of not marking examples in any way to reflect their less than fully acceptable status (particularly when these sentences are predicted to be grammatical by their analysis) contrasts with the notation of Petronio 1991, where sentences that are not grammatical (for native signers) are marked with “(*)”, as is evident for examples comparable to (i):

- _____ rhq
- (ii) (*) WHAT JOHN BUY BOOK [Petronio’s 1991:212, ex. 5d, as presented there]

⁵⁶ We thank Dennis Cokely for allowing us to make available the digitized video corresponding to these examples.


While P&L do not transcribe the non-manual marking for negation (although it is notated in Baker and Cokely's own gloss (1980d:149)), the intensity of this marking provides support for our analysis of a separate (clausal) tag constituent containing the second occurrence of the modal. There are two separate peaks of intensity, one in the main clause, and one in the tag.

(80) [CAN'T J-U-R-Y] [CAN'T] 
 '(you) can't be on the jury, (you) can't'

Other examples that P&L cite, upon closer examination, are invalid as support for their proposal because of inaccuracies in their representations of the data. Consider their example (33) (listed as (38) in their appendix, from Baker and Cokely 1980c Unit 17), which they gloss as follows:

(81) SEEM #ALL PEOPLE DEAF SEEM [as glossed in P&L 1997]
 'It seems that all the people [on the program] are deaf.'

This example, ostensibly with no prosodic break before the final SEEM (claimed to be in C), is glossed quite differently by Baker and Cokely (1980c:134):

(82) SEEM #ALL-arc PEOPLE DEAF, SEEM+ [as glossed in Baker and Cokely 1980c]
nodding 

According to Baker and Cokely, the comma indicates a syntactic break (the + symbol indicates that the sign is repeated). Moreover, the head nod over SEEM+ (omitted by P&L) is incompatible with P&L's analysis, as P&L simultaneously claim that head nods occur only over clausal domains and that this whole utterance contains only one clause. In Petronio (1993:133, ex. 13), that identical videotaped example is glossed:











(83) hn
 SEEM #ALL PEOPLE DEAF SEEM [as glossed in Petronio 1993]

In neither case was there any discussion of the fact that Petronio and Lillo-Martin's representations of the videotaped sentence differed from the gloss contained in Baker and Cokely, much less any justification for such differences. Such data reporting casts serious doubt on their representations of data generally and on the validity of analyses based on those representations.

Thus, the motivation for P&L's focus position is questionable. However, under the assumption that such a position exists, P&L's account explicitly predicts that only heads, but not phrases, could appear there. They also predict that only one member of their set of focusable elements may occur post-clausally. This section presents data that falsify both of these predictions, data that are thus incompatible with P&L's claim of a single clause-final C° focus position to accommodate all cases of right-peripheral wh-material as well as modals, negation, quantifiers, verbs, and so on.

4.2.1 Wh-phrases sentence-finally

The following data demonstrate that phrasal material can occur to the right of IP in wh-questions.

- (84) $\frac{\text{wh}}{[[\text{WHO POSS MOTHER}] \text{ DIE }]_{\text{IP}}}$ 
- (85) $\frac{\text{wh}}{[\text{t}_i \text{ DIE }]_{\text{IP}} [\text{WHO POSS MOTHER}]_i}$  
- (86) $\frac{\text{wh}}{[\text{t}_i \text{ DIE }]_{\text{IP}} [\text{WHO POSS MOTHER}]_i}$  
 ‘Whose mother died?’
- (87) $\frac{\text{wh}}{[[\text{WHO POSS CAR}] \text{ BREAK-DOWN }]_{\text{IP}}}$ 
- (88) $\frac{\text{wh}}{[\text{t}_i \text{ BREAK-DOWN }]_{\text{IP}} [\text{WHO POSS CAR}]_i}$  
- (89) $\frac{\text{wh}}{[\text{t}_i \text{ BREAK-DOWN }]_{\text{IP}} [\text{WHO POSS CAR}]_i}$  
 ‘Whose car broke down?’

Such data are consistent with the proposal that *wh-phrases* undergo *wh-movement* to a rightward [Spec, CP] position. On the other hand, these constructions cannot be accounted for under the assumption that the only available node to the right of IP is C, a position in which only a head constituent, but not a phrase, could appear.⁵⁷



In fact, P&L attempt to use the ungrammaticality of similar examples to support their proposal. However, they choose the incorrect form of the possessive phrase (without the possessive marker), which is the only source of ungrammaticality in the examples they provide (see MacLaughlin 1997 for further discussion of the possessive construction in ASL).


- (90) $\frac{\text{whq}}{* \text{ BREAK-DOWN WHO CAR}}$ [P&L’s 1997: example 66]
- (91) $\frac{\text{whq}}{* \text{ DIE WHO MOTHER}}$ [P&L’s 1997: example 65]

⁵⁷ Given P&L’s multisentence approach to subject wh-phrases that occur post-IP without spread of non-manual wh-marking (see section 4.1.2), they would presumably analyze the construction illustrated in (86) and (89) as involving two sentences, with a meaning something like: “Somebody died. Whose mother?” or “Something broke down. Whose car?”

NKBAM 1997 also presented examples of *wh*-phrases containing WHICH that similarly demonstrate the occurrence of post-IP *wh*-phrases. P&L suggest that, while the WHICH-phrases have, indeed, moved rightward, they have moved as the result of heavy NP-shift rather than *wh*-movement. It is difficult to see how heavy NP-shift could account for the distribution of non-manual *wh*-marking in examples like (88) and (89), nor for the contrasts in grammaticality between (88)/(89) and (92) or between (93)/(94) and (95).⁵⁸

(92) * [t_i BREAK-DOWN]_{IP} [JOHN POSS CAR]_i


(93) _____ wh
 [JOHN BUY t_i YESTERDAY]_{IP} [WHICH COMPUTER]_i  
 ‘Which computer did John buy yesterday?’

(94) _____ wh
 [JOHN BUY t_i YESTERDAY]_{IP} [WHICH COMPUTER]_i 
 ‘Which computer did John buy yesterday?’

(95) * [JOHN BUY t_i YESTERDAY]_{IP} [NEW COMPUTER]_i

4.2.2 Cooccurrence of modal and *wh*-phrase

As was shown in Aarons 1994 and NKBAM 1997, it is possible for a question to contain both a modal or tense marker and a *wh*-phrase in post-IP position, contrary to P&L’s predictions, although P&L have not addressed this evidence. This was demonstrated by examples such as (96):⁵⁹

(96) _____ wh
 JOHN EAT WILL “WHAT” 
 ‘What will John eat?’

4.2.3 Other restrictions on the relationship between “twins” and “doubles”

Finally, Petronio and Lillo-Martin need to ensure that, in a *wh*-question, the base-generated double (which could otherwise be, by their analysis, a modal, for example) is restricted to a *wh*-element. For restrictions on the double construction, the reader of Petronio and Lillo-Martin 1997 is referred to Petronio 1993, which proposes the following LF filter (Petronio 1993:148-149):

(97) Final Double Filter

*[] if is an X⁰ in a [+F] C⁰, and does not agree with the constituent in C^{Spec}.

There would have to be other restrictions on what can be a “double” in a given sentence, not so easily remedied by LF filters. One problem for this analysis, pointed out in Petronio (1993:160-161), is that while a main verb can appear in this final C position, according to Petronio (and Lillo-Martin),

⁵⁸ While (95) may be acceptable if there is heavy stress on NEW, no particular stress is required for the grammaticality of (93)/(94).

⁵⁹ While the relative word order of the modal and the VP in such examples is marked (resulting, on our analysis, from fronting of the aspect phrase, since a post-VP modal necessarily precedes a negative sign, if one is present; see discussion in Aarons 1994), such constructions cannot be accounted for at all by the structure proposed in P&L 1997.

it can only do so if the main clause does not have a modal. Another fact not addressed by Petronio (and Lillo-Martin) is the ungrammaticality of constructions like (98), irrespective of the distribution of non-manual negative marking.

(98) * JOHN WILL NOT GO WILL

Thus, their analysis overgenerates and would require further stipulations.

4.2.4 Summary

We have shown that *wh*-phrases may occur to the right of IP, and that postulation of a C node to house a variety of kinds of base-generated lexical items cannot account for the range of ASL data discussed in this section.

4.3 Positioning of the left-peripheral *wh*-phrase

P&L, who (like us) analyze topics as adjoined to CP, predict that topics necessarily occur to the left of a left-peripheral *wh*-phrase (in [Spec, CP], on P&L's account). Thus, P&L's analysis predicts that the *wh*-phrase should necessarily follow a topic, if there is one. However, as shown in [section 2.3.2](#), a left-peripheral *wh*-phrase may either precede or follow a(nother) topic. This is correctly predicted by our analysis, as left-peripheral *wh*-phrases are themselves base-generated topics that may occur in either of the two available topic positions.

4.4 Further advantages of the rightward-movement analysis

NKBAM 1997 shows that the rightward movement account of *wh*-questions in ASL extends naturally to yes-no questions, which exhibit a different non-manual marking but are otherwise quite similar in structure to *wh*-questions. In yes-no questions, the spread of the non-manual marking over the entire question is optional in the presence of manual material external to IP (a yes-no question sign, QMwg, that we have analyzed as occurring in C), and otherwise obligatory. In either event, the intensity of the non-manual yes-no marking is greatest in the clause-final position.

HNMKB 1997 argues that the rightward movement analysis for information-seeking *wh*-questions also accounts for rhetorical *wh*-questions (questions to which the signer provides an answer, as a device for introducing new information). While there is a distinctive non-manual marking associated with rhetorical questions, the question portion of such question-answer sequences has the same syntactic structure as information-seeking questions (despite claims to the contrary in the literature, although we agree with the basic observation of Petronio 1991 in this respect).

4.5 Summary

We have demonstrated that the data from native signers are consistent only with a rightward *wh*-movement analysis. In sentences containing a single *wh*-phrase, that phrase may be moved to a clause-final [Spec, CP] position, but not to a left-peripheral position. This also holds for *wh*-phrases extracted from within an embedded clause; such phrases may move to the right periphery of the matrix clause, but may not precede the matrix clause.

The distribution and intensity characteristics of *wh*-marking follow from generalizations about the distribution of non-manual syntactic marking in ASL, given the rightward movement analysis we have proposed. We have argued that the maximal intensity of *wh*-marking occurs in the positions in which the +*wh* feature is postulated to occur, and that intensity diminishes as distance

from the source increases. When manual material is available in the rightward [Spec, CP] position, the spread of wh-marking over the rest of the CP is optional; otherwise, spread is obligatory.

We have offered counterevidence to the differing proposals offered by P&L. First, we argued against their claim that right-peripheral wh-material cannot be phrasal. We provided examples involving phrases (such as WHO POSS CAR and WHICH COMPUTER) that can appear clause-finally. Moreover, we argued that heavy NP-shift is not a viable explanation for their clause-final occurrence. Thus, P&L's postulation of a single C node intended to house "focus" elements (including wh-signs) cannot account for the occurrence of such wh-phrases sentence-finally, nor can it be reconciled with the cooccurrence of wh-elements with other "focus" items, such as modals.⁶⁰

We have also shown that P&L's account of the distribution of non-manual wh-marking (associated with the combination of +WH and +F features) is incorrect. Specifically, P&L claim that non-manual wh-marking necessarily spreads over the entire question CP. To maintain this claim, they are forced to analyze examples in which non-manual wh-marking occurs solely over the final wh-phrase as multisentence discourses. We have shown this proposal to be untenable; one major problem is that the null non-wh element within the elliptical statement that they posit cannot be properly licensed.

P&L's analysis makes incorrect predictions for the relative ordering of topics (adjoined to CP) and left-peripheral wh-phrases (analyzed by them to occur in [Spec, CP]). In fact, left-peripheral wh-phrases may precede or follow (other) base-generated topics. Our analysis of left-peripheral wh-phrases as base-generated topics correctly predicts the allowed word orders.

In sum, we have shown that P&L's accounts for sentence-final and sentence-initial wh-elements are inconsistent with the facts. In contrast, the rightward wh-movement analysis makes correct predictions about the word order possibilities and the distribution and intensity of non-manual wh-marking.

5. Methodological considerations

As is evident from the discussion in earlier sections, fundamental disagreements about the data are at the heart of some of the controversies concerning wh-movement in ASL. In fact, there have been cases of conflicting judgments reported on the same sentence by the same researchers in different years. This section addresses methodological issues that have some bearing on differing claims that have made about the data.

There are special considerations associated with the collection, reporting, and interpretation of data presented in the ASL literature. We first address the sociolinguistic context for syntactic research on ASL. We discuss the elicitation of grammaticality judgments in this unusual sociolinguistic environment. Next, we discuss several difficulties involved in representing a signed language using an impoverished gloss notation. One problem to date has been the general unavailability of videotaped data for inspection by the scientific community. We believe that greater access to data is essential for progress in the field. Finally, we address an issue that relates specifically to the syntactic significance that P&L attribute to the role of contextual information in the elicitation process.

⁶⁰ As suggested earlier, we maintain that this is not only the incorrect analysis for clause-final wh-elements, but also for other material claimed by P&L to occur in this sentence-final C position, such as modals.

5.1 Sociolinguistic factors and data collection

It is, of course, essential to use native signers as linguistic consultants (as is the case when researching the syntax of any language). However, it is noteworthy that the community of signers using ASL as their primary language consists of only about 10% who acquired the language natively (from Deaf signing parents). This means that native signers make up only a small minority of Deaf signers. This has several interesting and important consequences relevant for linguistic research.⁶¹

5.1.1 Sociolinguistic context

ASL has not been widely recognized as a language by the general public or even by educators of the Deaf. As a consequence, most Deaf signers have been educated in environments where ASL is not the language of instruction. For most of this century deaf education in the United States has been dominated by those believing that Deaf children should only be instructed in the use of oral language. In fact, even when a signed form of communication is used in the classroom, it is usually a coded form of English (mapping individual English morphemes to signs, following English word order, resulting in something other than a natural language; for more information, see, e.g., Lane, Hoffmeister and Bahan 1996, Supalla 1991). ASL tends to be stigmatized and disallowed in the classroom.

In everyday interactions, native signers are accustomed to communicating with other signers who may use a range of non-native/non-standard forms. One consequence of such daily interactions and past educational experiences is that most Deaf adults have command of a spectrum of forms of communication, ranging from natural ASL (used in interactions with Deaf peers) to a kind of “contact” signing combining ASL signs with structures from English (Lucas and Valli 1989).

5.1.2 Eliciting judgments from native signers

Grammaticality judgment tasks are complicated by the fact that native signers are extremely tolerant of the wide range of non-native forms to which they are exposed on a daily basis. Thus, it is crucial that the informant evaluate the naturalness of a given sentence by actually signing it, rather than merely judging the acceptability of an observed utterance (especially when signed by a non-native signer or a hearing researcher).

Furthermore, when signers are asked about the acceptability of a particular sentence, it is important to frame the judgment in terms of naturalness within the context of interactions with Deaf peers. In other situations, such as interactions with teachers and/or hearing signers, native users of ASL might tend to use more English-like structures. Such structures may be internalized as prestige forms, which may be used in formal settings. The elicitation setting itself can be perceived as a kind of formal, education-related, interaction. Thus, a judgment given in such a setting may not reflect a true grammaticality judgment for ASL, but rather a situational acceptability judgment. For example, one informant indicated that a sentence like WHO JOHN MARRY could be used if the question were posed to a teacher or a hearing person;⁶² however, that signer would not sign this way to her Deaf mother.

⁶¹ For further discussion of the issues considered in this section, see, for example, Baker-Shenk 1983 (chapter 1), Aarons 1994 (chapter 1), MacLaughlin 1997 (chapter 2), Lane, Hoffmeister, and Bahan 1996, and NKMBL forthcoming.

⁶² However, even in such cases, there is nonetheless a particularly intense realization of non-manual wh-marking sentence-finally that occurs as the final manual sign is held, as discussed in [note 34](#) (see Baker-Shenk 1983, Aarons 1994, HNMKB 1997).

Finally, it is important to record on videotape the utterance—as signed by the informant—that corresponds to the particular grammaticality judgment. The researcher must then analyze the actual production, and not simply assume that it corresponds to the target utterance.

For these reasons, elicitation of grammaticality judgments must be carried out with great care. In our own work, all of our informants have been native signers. In addition, native signers have been involved in both elicitation and analysis of data. (As a Deaf native signer, Benjamin Bahan, a co-author of this paper, has not only contributed his own intuitions about his language, but has been able to probe other native signers in a way that hearing researchers could not.)

Given that the nature of dialectal and idiolectal variation in ASL syntax is not yet well understood, we have focused on intensive study of the systems of a few native signers. This methodology contrasts with the practice of pooling judgments from a variety of sources, in that it enables us to study the systematicity of individual grammars and to identify loci of variation. The pooling of data is particularly problematic when the judgments include those of native and non-native signers. In Petronio 1991, elicitation of judgments from both native and non-native signers is acknowledged (see, e.g., Petronio 1991:212, fn. 2). However, in Petronio 1993 and P&L 1997, those same judgments appear to have been pooled and simply reported as “mixed” (see discussion in [section 4.1.1](#))).

5.2 Representation and reporting of data

In addition to the issues just discussed, the fact that ASL is a visual language, with no written form, presents certain difficulties for the representation and reporting of data. The analysis and reporting of sign language data are complicated by the inadequacies of available written representations. The traditional glossing system omits tremendous amounts of detail, and it is virtually impossible to reconstruct an example based on a gloss alone. Given the fact that the linguistic significance of non-manual behaviors has not yet been fully analyzed, it is difficult to adequately represent the grammatically significant non-manual markings that occur in a given utterance.

Especially in light of the inadequacies of gloss notation, it is crucial that reported data be made available for inspection by the scientific community.⁶³ Such signed data must be presented by native signers (in order to ensure accurate representation of the reported data).⁶⁴ We have consistently displayed the video data we discuss, as signed by native signers, at conference presentations, and we have made our reported data available on videotape upon request. We have also begun to provide World Wide Web access to our video data in digitized form.⁶⁵

P&L (1997) acknowledge the inadequacy of glossing representation and the possibility that subtleties of the data may account for conflicting judgments reported in the literature. We hope that they will also make videotaped examples of data reported in P&L 1997 publicly available. (This

⁶³ For these reasons, we are developing SignStream™, a multimedia tool for the analysis of video-based linguistic data. See NMBLK 1997, MNL 1996, and <http://www.bu.edu/asllrp/SignStream> for more information. One goal of this project is to allow researchers to make data publicly available for viewing and analysis. As is evident from the discussion in section 4.2, even videotaped data may be inaccurately characterized. It is important that other researchers have access to the data so that they can evaluate claims made about those data.

⁶⁴ It is common practice for hearing researchers (often non-native signers) to sign example sentences themselves in the context of conference presentations, rather than presenting videotaped data. Given the complex interactions of the manual and non-manual components of a signed language, such representations make it impossible to evaluate the data.

⁶⁵ In addition to the digitized movies included with this report, digitized video corresponding to many of the examples here have been accessible from our Web site in conjunction with NMKB 1996 and NKBAM 1997.

would be particularly helpful since we have been unable to reproduce many the sentences that they claim are grammatical, including both wh and non-wh constructions.)

5.3 Use of context in elicitation

While there are considerations involved in collecting ASL data that relate specifically to sociolinguistic factors, there are other basic issues that are relevant to the elicitation of language data in general. For example, a sentence is considered to be acceptable if, in an appropriate discourse context, it might be uttered naturally by the speaker or signer. Thus, it is important for the elicitor to establish a context as part of the elicitation procedure. Particularly in discourse-sensitive languages, such as ASL, it is often difficult for subjects to offer judgments of sentences presented in isolation, as P&L (1997:46), in fact, point out:

Within sentences ASL productively uses topicalization to front constituents. Topicalization is so common that when a declarative sentence is presented in isolation, many people will reject the underlying SVO order.

Despite what P&L themselves note about the need to provide context in eliciting grammaticality judgments for even the simplest types of sentences, they nonetheless consider that evidence of specific types of syntactic structure can be adduced from the fact that a particular sentence's grammaticality rating seems to improve if appropriate contextual information is made available to the consultant. Specifically, they use contextual effects as evidence for the presence of syntactic null elements. For example, with respect to constructions containing sentence-final wh-subjects, such as their sentence (61) (shown as our example (68) above), P&L (1997:36) state:

Given the existence of a null WH-element in ASL, restricted to appropriate contexts, we can account for sentences like 61 under the leftward movement analysis, while also accounting for the variation in judgments. Our analysis is that 61 has the structure of a WH-double... and also has a covert WH-subject, as represented by the e in 62.

_____ whq
(62) e BUY CAR WHO

P&L claim that these examples exhibit variability in judgments attributable to some kind of context-dependency (see, however, the discussion in [section 4.1.2.1](#) of the type of context they report is required), and they furthermore construe this as evidence favoring their leftward wh-movement

analysis (requiring the postulation of null wh-elements)⁶⁶ over a rightward movement approach.


For constructions containing sentence-final objects occurring to the right of adverbials, P&L resort to the same structural account (involving a null WH-argument and a sentence-final

⁶⁶ They suggest that such null wh-elements (distinct from wh-traces) are independently motivated by the existence of "covert" wh-questions in ASL. As first observed by Baker-Shenk (1983), wh-questions do not always require an overt wh-sign, as illustrated in (i).

_____ wh
(i) NAME
'Name?'

We agree that such sentence fragments exist. Their usage is comparable the use of sentence fragments in other languages and (in our view) do not provide motivation for postulating a new type of null wh-element.

WH-double). Thus, they should expect variability in judgments for sentences like (99), as well.

(99) $\overline{\text{JOHN BUY e YESTERDAY "WHAT"}}$ 
'What did John buy yesterday?'

P&L (1997:37) present this sentence as a fully grammatical example, however, and make no mention of any variability in judgments.

Notably, there are other sentences for which they report “varying judgments” for which P&L do not postulate null syntactic elements (other than *wh*-traces). This is the case for sentences such as (62), with sentence-*initial wh*-objects, representing the simplest case predicted by a leftward movement analysis. They attribute this variability to “individual stylistic and idiolectal differences” (P&L 1997:50):

The literature reports differences in judgments reported for sentences that have a single, leftward, sentence-initial WH-object. To maintain a leftward analysis, we must account for the varying judgments for this type of sentence. In §7.1, we look at simple WH-questions with a single sentence-initial WH-object and account for the different judgments by attributing them to individual stylistic preferences that are in accord with the discourse-oriented strategies of ASL discussed above.

Thus, when the variability that they report is considered, no patterns emerge supporting any particular analysis over another. The inconsistency of P&L’s appeal to context, limited to those cases where they seem to think it supports their proposal, is unconvincing. This line of argumentation based on attributing specific syntactic significance to contextual effects on grammaticality judgments is seriously flawed. Essentially, P&L report variability for the majority of the constructions they discuss. Some of this variability is attributed to the presence of null *wh*-elements, while some of it is considered to be idiosyncratic; no principled basis for distinguishing between the two is provided.

5.4 Relevance to claims about *wh*-questions in ASL

It is perhaps somewhat surprising that the question of the directionality of *wh*-movement should have engendered such controversy in the field of ASL linguistics. One might have expected that this could be ascertained straightforwardly. In this section, we have discussed some of the complexities involved in the elicitation of grammaticality judgments that may have contributed to confusion about the data. Particularly in light of the difficulty of interpreting reported results, it is essential that videotaped data be made available for public inspection. Without access to such data for scientific scrutiny, claims made about the data cannot be evaluated. It is our hope that greater accessibility of video data may ultimately help to resolve outstanding disagreements about the data and analysis.

6. Conclusions

In this paper we have argued that *wh*-phrases, when they move, move to a right-peripheral [Spec, CP] position in ASL. Our analysis is based on evidence from word order and the pattern of distribution of the non-manual syntactic marking associated with the +*wh* feature. The “visibility” of syntactic features in signed languages provides an interesting kind of evidence for syntactic structure unavailable in spoken languages, shedding light on functional projections and the representation of abstract syntactic features. Under the assumption of rightward movement, the

pattern of distribution of wh-marking follows from a set of generalizations that apply to other non-manual syntactic markings in the language.

We have addressed criticisms of our analysis by P&L (1997). We have also pointed out several serious problems with P&L's leftward wh-movement analysis and have demonstrated that they cannot account for the ASL facts. Even the simplest constructions predicted by their analysis are not grammatical (for our informants). Moreover, the mechanisms that P&L invoke to account for right-peripheral wh-phrases are highly problematic in a number of respects. Among other phenomena for which P&L do not have a satisfactory account is the distribution of non-manual wh-marking.

We therefore maintain that universal grammar must allow for the possibility of rightward movement.

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