Sign Linguistics And The Interfaces

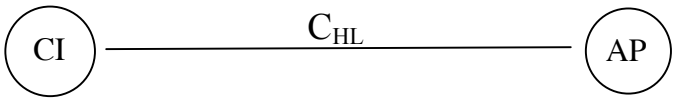
Diane Lillo-Martin

University of Connecticut

1. Introduction

Chomsky (1995) considers the interfaces to be the only conceptually necessary levels of linguistic structure. On one side, the conceptual-interpretive (CI), is some sort of representation of the 'message' we wish to convey. On the other side, the articulatory-phonetic (AP), is the medium by which that message is conveyed. The mechanism which maps CI to AP is the Human Language Computational system, C_{HL} (see 0).

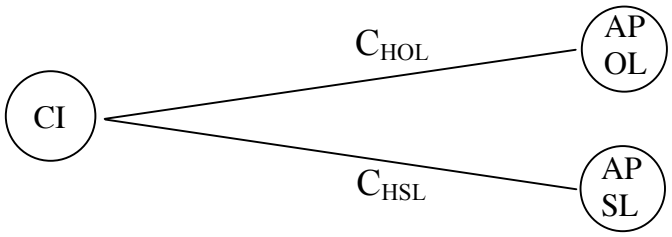
(1)



Languages differ from each other minimally in C_{HL} – only by the settings of a limited number of parameters, or, on some views, the strength of features driving elementary operations. In this way, the impressive similarities across languages can be captured.

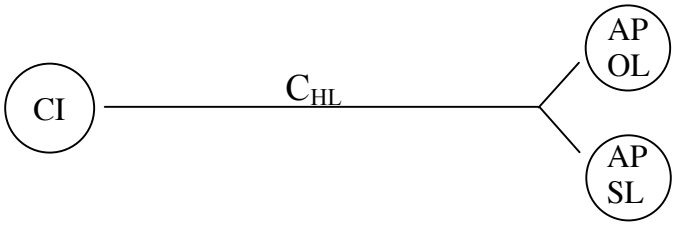
On the conceptual-interpretive side, it can be assumed that there would be no systematic difference between signed and spoken languages. Signers and speakers use language to convey the same range of meanings (with whatever language-particular differences may be allowed in the ways that meanings are derived). However, it is clear that on the articulatory-phonetic side, sign languages and spoken languages are distinct. The pressures contributed by the visual-manual modality versus the oral-aural modality result in many surface differences between signed and spoken languages (despite impressive similarities in the way that the two phonologies are structured, such as features, hierarchies, and rules). If the mapping between CI and AP interfaces is direct, then, it would seem that the structures of signed languages (SL) and spoken languages (oral languages, OL) could diverge radically, as illustrated in (2).

(2)



However, it has been found that sign languages and spoken languages share many features in their grammars (see Sandler & Lillo-Martin in press for an overview), indicating that the divergence due to the AP interface is much later, perhaps as illustrated in (3).

(3)



This discussion serves to highlight why the study of sign languages should be of interest to linguists more generally. If sign languages and spoken languages display similar properties, these can be described as true language universals. Properties that hold of sign languages and spoken languages are properties of language *qua* language, and should be the primary domain of interest for linguists. On the other hand, properties which spoken languages share in the absence of sign languages are somehow different. There may be an independent reason that sign languages block such a property – take sound patterning as one example – but even still, their absence in sign languages would disqualify such properties from membership in the category 'universals of language'. There are good reasons to study them, and they should be explained – but within the context of 'spoken language universals', and to do so it is crucial to know which properties are of which type.

Similarly, properties of sign languages not shared by spoken languages require explanation outside of the domain of linguistic universals. If sign languages display some properties that spoken languages do not, we want to know why there is such a difference. Presumably, there will be limits on such variation, and a theory of 'modality effects' will be able to explain these limits (Meier, Cormier, and Quinto-Pozos 2002). Linguists in general should know about such cases to avoid making claims that 'languages do not have X' when one class of languages in fact do.

2. Simultaneity

One area in which sign languages appear to have the potential for significant differences from spoken languages is the possibility to express multiple aspects of a message simultaneously. While the poor vocal organs are rather limited in their capacity for simultaneity, sign languages make use of two primary articulators (the hands), as well as movements of the head and body, and a range of possible expressions on the face

(collectively known as 'non-manual markers'). Indeed, this capacity for simultaneous articulation has drawn a good deal of attention, and various researchers have highlighted it as a major modality effect.

On the other hand, some of the early claims of simultaneity have been tempered by later work. For example, early in the days of sign phonology, signs were seen as simultaneous bundles of information including handshape, location, and movement (Stokoe, Casterline, & Croneberg 1965; Klima & Bellugi 1979). Later researchers brought out the need to consider the sequential structure of signs, as evidenced by morpho-phonological processes including assimilation in compounds, affixation, derivationally related nouns and verbs, and even metathesis (Liddell 1984, Sandler 1989, etc.). At the same time, oral language phonologists were incorporating simultaneity in the primarily sequential analyses of spoken words, by using theoretical mechanisms such as autosegmental tiers and feature geometry to capture suprasegmentals and templatic morphology.

In the end, what appeared to be a major difference between signed and spoken languages has come to be seen as not such a major difference – and it was not just that the evaluation of signed languages changed, but our understanding of both signed and spoken languages changed.

I believe a similar shift is in progress now in a related area. A certain degree of simultaneity is present not only in individual signs, but also in the combination of manual signs with non-manual markers. The proper analysis of these non-manual markers is a matter of some debate. On some proposals, the possibility of simultaneously occurring non-manual markers makes sign languages rather different from spoken languages. On some proposals, non-manual markers provide "direct overt evidence of hierarchical relationships" (Neidle et al. 1998) – an explicit indication of abstract syntactic structure unlike anything available in the spoken modality. The alternative supported here is that (some) non-manual markers are (analogous to) intonational melodies, and not so different from spoken languages after all. But this alternative view does not require a shift in understanding of sign languages only. It also provides additional reasons for siding with those who would pay more attention to the role of intonation in spoken languages, even within formal syntax. That is, on this view, spoken languages also have a degree of simultaneity, highlighting the importance of accounting for the grammar of intonation.

3. Prosody or syntax?

The importance of non-manual markers in SL grammar has been noted since the first linguistic analyses of these languages. There are several types of non-manual markers. One category involves the shifting of body position from one side to another. I will not be discussing this type of non-manual here. Instead, I will focus on the movement of the head, and especially facial expressions. In fact, even within facial expressions there are (at least) two categories of non-manuals. Certain markers are known as adverbials – they are produced with predicates and provide adverbial-type information. An example is

illustrated in Figure 1, and this marker contributes the meaning ‘close (in time or space) to a sentence such as (4).

(4) HAPPEN YESTERDAY NIGHT
‘Did it happen just last night?’
(Liddell 1980)

Figure 1. ‘close’ (in time or space) non-manual marker

I will not discuss this type of example further here either. The types of non-manual markers I want to discuss are those known as ‘syntactic’ markers because they provide syntactic information, marking, for example, yes/no questions, WH-questions, topic phrases, and negation. An example of a WH-question with its non-manual marking is given in (5) and Figure 2. An example of a topic non-manual marking is given in (6) and Figure 3. The most standard notation system for non-manual markings is a line above the glosses with an abbreviation for one of the markers. The extent of the line indicates the extent of the non-manual marker.

(5) JOHN BUY WHAT
‘What did John buy?’

JOHN BUY WHAT

Figure 2. WH-question non-manual marking

(6) t
DOG CHASE CAT
'As for the dog, (it) chased the cat.'
Liddell (1980)

t
DOG CHASE CAT

Figure 3. Topic non-manual marking (on DOG) [reprinted from Liddell 1980]

Early researchers affirmed the linguistic status of non-manual markers by comparing them with affective facial expressions. While signers use both affective and linguistic facial expressions, they can be distinguished in several ways. One of the most notable is the sharp, distinct onset and offset of linguistic markers, in comparison with the more gradual and variable affective markers (Baker-Shenk 1983), as illustrated in (7).

Linguistic vs. affective non-manual markers (after Baker-Shenk 1983)

(7) 

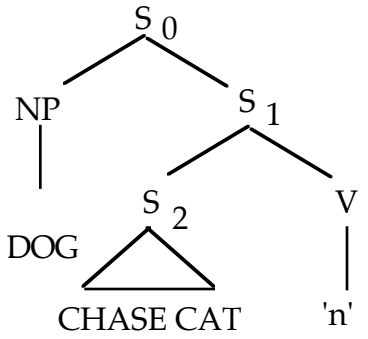
An additional observation was that linguistic non-manual markers may be the unique signal for some particular kind of structure, such as yes/no questions. Thus, the relatively early and common classification of such non-manual markers has been that they are part of the syntax.

Although they have been considered 'part of the syntax', it has not been clear how to represent such markers syntactically. Liddell (1980) made a specific proposal for the negative headshake. (Although he also provided arguments for the linguistic relevance of other non-manual markers, he did not represent them structurally.) He noted that the negative headshake extends over a sentence, but that if a topic is in the sentence-initial position, it will have the topic marker but not a negative marker, as shown in (8).

(8) t n
DOG CHASE CAT
'As for the dog, it didn't chase the cat.'
(Liddell 1980)

Liddell proposes the structure in (9) for (8). First, note that Liddell "tentatively analyze[s] the negative headshake as a higher verb which takes the clause as its subject" (Liddell 1980, p. 82). According to the structure in (9), the NP 'DOG' is Chomsky-adjoined to the clause containing the negative 'verb' and its 'subject'. Liddell says, "any element that is commanded by 'n' is subject to its negating force. Thus, where the subject has been topicalized, it is no longer commanded by 'n' and does not fall under the scope of the negation" (p. 83). In (9), S_2 is commanded by 'n,' and falls under the scope of negation (both in its interpretation and in the spreading of the non-manual marker). However, the NP DOG is not commanded by 'n', and is therefore outside of its scope.

(9)



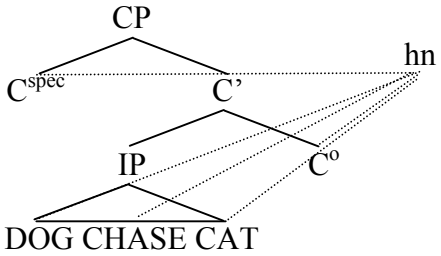
(Liddell 1980)

Liddell clearly proposed two things about the negative headshake. First, there is an element corresponding to it in the syntactic tree. Second, the domain of its spreading is determined by a structural notion, command. Both of these notions have been used in subsequent analyses of the negative and other non-manual markers.

Petronio (1993) builds on Liddell's proposal, but she makes explicit an 'analogy' between non-manual markers and intonation. She suggests that the non-manual markers 'q' (yes-no question), 'whq' (WH-question), 'neg' (negation) and 'hn' (assertion) are located on autosegmental tiers, linked to an element in a head position, spreading over the m-command domain of that head. An example is given in (10), with a structure in (11). In (11), the 'hn' is represented away from the tree, to indicate its placement on a separate autosegmental tier; the dotted lines represent the links between the spread 'hn' and each element it spreads over.

(10) hn
DOG CHASE CAT
'The dog did chase the cat.'
(Liddell 1980)

(11)



(Petronio 1993)

In at least some cases, Petronio makes an explicit claim that a syntactic feature is also present in the head of the functional category associated with a non-manual maker. For example, for WH-questions she proposes that the features [+WH] and [+Focus] must both be present for the 'whq' non-manual marker to be associated with C.

Neidle et al. (2000, p. 43-45) do not assume that non-manual markers are analogous to intonation. They do claim that they are (frequently) "associated with syntactic features residing in the heads of functional projections," and that a non-manual marker "may spread over the c-command domain of the node with which it is associated." They claim that "spread of such markings over phrasal domains provides evidence of particular hierarchical constituents. Moreover, the distribution, spread, intensity, and perseveration of such markings provide evidence about the location of abstract syntactic features." These assumptions about non-manual markings lead them to propose a particular hierarchical structure of functional categories which they claim is overtly attested by the timing of different non-manual markings, as illustrated in (12).

neg
head tilt$_i$
gaze$_j$

(12) JOHN$_i$ NOT [+agr$_i$]Agr$_S$ [+agr$_j$]Agr$_O$ VISIT$_j$ MARY$_j$
'John is *not* visiting Mary.'
(Neidle et al. 2000)

One assumption that all of these analyses share is that the non-manual markers under discussion are in an important sense *syntactic*. That is, they claim that an element present in the syntax is realized as a non-manual marker. They furthermore claim that the domain of spreading of the non-manual marker is determined by syntactic constituency. Petronio's account also makes explicit parallels between non-manual markers and intonation, using an analysis which brings intonational representations into syntax. Other authors have expanded on the parallels between non-manual marking and intonation in more detail.

For example, Sandler (1999) and Nespor and Sandler (1999) make the following points, discussing the so-called 'syntactic' facial expression non-manuals.

- Non-manual markers are like intonation in that they are *linguistic*. Both can be distinguished from affective markers which may use the same medium.

- Non-manual markers are like intonation in that they co-occur with and spread over segmental elements.

- Non-manual markers are like intonation in their spreading behavior. As we have seen, various proposals have been made to account for this spreading in terms of a syntactic domain (c- or m-command). But given the strong relationships between syntactic domains and Intonational Phrase domains, it might well be possible – perhaps even preferential – to account for spreading in prosodic terms.

- Non-manual markers (at least some) are like intonation in the types of meanings they express. These meanings are related to pragmatics and discourse, such as polarity question, content question, focus, etc.

- The meanings conveyed by non-manual markings are furthermore broad, and gain more specific interpretation through interaction with the meaning of the texts to which they are associated. As a clear example, sentences that are WH-questions syntactically may be accompanied by different facial expressions if their pragmatic intent is not that of a WH-question. Conversely, the typical WH facial expression may accompany strings that are not syntactically WH-questions, if the pragmatic intent is to ask a WH-question. The typical non-manual marker for WH-questions in Israeli Sign Language (ISL) is given in Figure 4. Like the ASL marker (in Figure 2 above), a distinctive component is the furrowed brows.

Figure 4. Typical WH-question facial expression (ISL)

However, in [+WH] contexts which do not require a response (such as true rhetorical questions), a different non-manual marker is used, as illustrated in (13) and Figure 5.

(13) WHY index1 GO MEETING neg-past WHY?!! excl./regret ISL
'Why didn't I go to that meeting??!!'
(Meir and Sandler 2004)

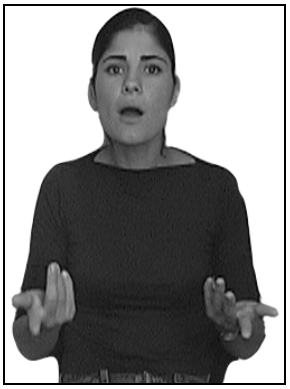


Figure 5. Facial expression in WH-question in non-interrogative context (ISL)

ASL exhibits the same property. For example, the so-called 'rhetorical questions,' which are felicitously analyzed as WH-cleft constructions (Wilbur 1996), do not employ the typical WH-question non-manual marker with furrowed brows.

In both ASL and ISL, WH-questions can be expressed with no overt manual WH-element, as long as the non-manual marking is that of a WH-question (Lillo-Martin & Fischer 1992). This is illustrated in (14).

(14) TIME YOU GO-OUT whq
'What time are you leaving?'
(Lillo-Martin & Fischer 1992)

Thus, in several ways, (certain) non-manual markings behave very much like intonation. We are then led to ask, if they are intonation, are they not syntax? The notion that non-manual markings are like intonation forces us to reconsider the claim that they are syntactic. On some analyses, prosody constitutes a separate component, interacting with syntax, phonology, and other components, but separate from them, with its own units and rules (Gussenhoven 1999). Do we automatically remove all parts of non-manual markings from the syntax if we accept the proposal that they are intonational?

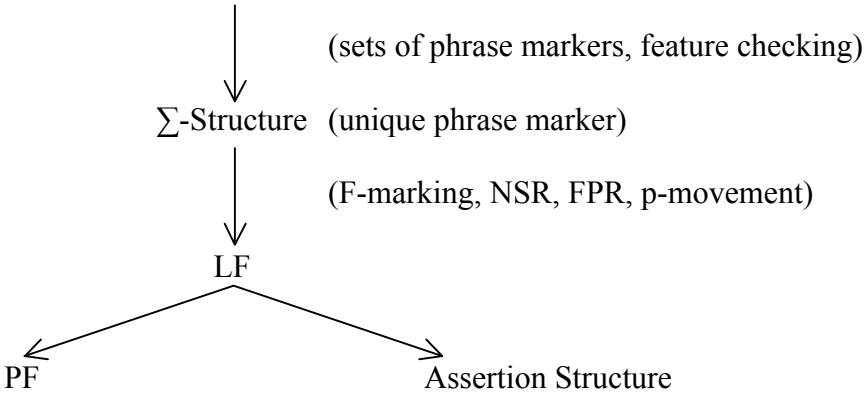
4. Viewpoints from spoken languages

It is helpful to begin by considering the position of prosody with respect to other parts of the grammar in spoken languages. As just mentioned, some linguists have proposed that a prosodic component links the interpretive and articulatory sides independent of syntax. This component would be sensitive to matters of discourse which affect prosody, but are outside of the syntax proper.

Other researchers focus on the phonological aspects of prosody, which do relate – but only imperfectly – to the syntactic structure. For example, in both Nespor and Vogel's (1986) and Selkirk's (1984) theories, prosodic structure starts with syntactic structure, but builds an independent representation. According to Nespor and Vogel, phonological phrases are projected from syntactic phrases according to an algorithm that starts with a phrasal head belonging to a major lexical category: Nouns, Verbs, or Adjectives. Once constructed, phonological phrases can be restructured or merged, especially if they are short. At the next higher level of prosodic structure, parentheticals, nonrestrictive relative clauses, topicalizations and other extrapositions, vocatives, expletives, and tag questions form Intonational Phrases in many languages. Thus, on this kind of view the distribution of prosodic elements follows according to rules which connect with the syntax, though no particular syntactic representation of such elements is required.

Still other researchers (e.g. Zubizaretta 1998) have explicitly argued for a representation in the syntax of (at least some) prosodic information, reasoning that a part of language which has both interpretive and articulatory aspects must be represented in the middle of these components. Zubizaretta argues for the architecture of the grammar given in (15). In this representation, certain prosodic processes (NSR, FPR) apply in the mapping between ∑-Structure and LF.

(15) Architecture of the grammar (Zubizaretta 1998)



An architecture like that in (15) apparently violates the Inclusiveness Principle (Chomsky 1995), as it allows for the introduction of linguistic elements (in this case, stress) during the derivation. Zubizaretta concludes that this is necessary because "there is a part of the sound-meaning pairing in a sentence that cannot be reduced to the atomic sound-meaning pairings defined by the lexical items in the sentence." She proposes an alternative Inclusiveness Principles to accommodate this.

In order to avoid violation of the (Chomskian) Inclusiveness Principle, information about the elements which would eventually be realized as stress – and intonation – would need to be present in the numeration. Cheng & Rooryck (2000) propose just such a thing in their analysis of rising intonation in French. They argue that

an underspecified question particle [Q:] is associated with both rising intonation and a strongly presupposed context. This question particle is involved in the licensing of both non-inverted yes/no questions and WH-*in situ*. According to Cheng & Rooryck, both types of questions display the two properties associated with this particle, as illustrated in (16).

(16) a. Jean a acheté un livre? French
'Jean has bought a book?'

b. Jean a acheté quoi?
Jean has bought what
'What has Jean bought?'
(Cheng and Rooryck 2000)

This brings us to an important point. Rather than debating whether or not there is a representation of intonational markers in the syntax based on theoretical preference alone, we can look for independent empirical evidence of its necessity. That is, if a purely prosodic element has effects within the syntax, then surely there must be a way to represent this element syntactically. On the other hand, if a purely syntactic account would make the wrong predictions, an analysis which puts the prosodic element in its own component would be preferred.

On some analyses, focus is one such example. In some languages, such as Hungarian (illustrated in (17)), an element that is focused moves to a particular syntactic position and has a particular semantic effect (scope) – in addition to appearing in certain discourse contexts (new information) and having a particular phonological effect (prominence). While it is possible to consider the syntactic, semantic, prosodic, and discourse effects as separate phenomena, on a model of the grammar in which syntax is the connection between semantics and phonology, there must be some feature in the syntax to account for all of these effects.

(17) a. szereti János Marit
loves John Mary-acc
'John loves Mary.'
b. János szereti Marit
'It is John who loves Mary.
c. Marit szereti János
'It is Mary whom John loves.'
(Kiss 1981)

The necessity of a syntactic representation of prosodic elements is not uniform, however. For example, polarity (yes-no) questions can be asked in many languages by the use of intonation alone, without any apparent syntactic marker. However, the status of intonation-marked polarity questions is different across languages. In Russian – but not in English – such questions license polarity elements, as shown in the contrast between (18) and (19) (Lillo-Martin 1999).

(18) on byl kogda-nibud' v Moskve? Russian
he was when-ever in Moscow
'Was he ever in Moscow?' (lit: 'He was ever in Moscow?')

(19) a. You've been to Moscow?
b. * You have (/you've) ever been to Moscow?
c. √ Have you ever been to Moscow?

I take it that the examples in (18) and (19) tell us something very important about the nature of prosodic elements vis-à-vis the syntax. In Russian examples like (18), there is something present in the syntactic representation – perhaps a [Q] feature – which has the result that the sentence is interpreted as a question, spoken with rising intonation, and has whatever quality is needed for polarity item licensing. On the other hand, the English example in (19)a is interpreted as a question (although its use is somewhat restricted) and has rising intonation, but syntactically it lacks whatever is needed to license a polarity item. We cannot simply conclude about rising intonation or intonation more generally that it is represented in the syntax or not. Similarly, we should not conclude a priori that non-manual markers (or any particular non-manual marker) is or is not part of the syntax.

The lesson is to examine each prosodic element for its syntactic consequences in order to determine its place in the grammar. This lesson must now be applied to prosodic elements in sign languages.

5. Syntactic Evidence

I start by discussing the non-manual marker used with (direct) WH-questions. A number of researchers have assumed that this non-manual marker is the reflex of something syntactic. They have further assumed (or claimed) that non-manual markers provide direct evidence of syntactic structure, without providing independent evidence of the correctness of such structures. If the distribution of a non-manual marker like the 'whq' is determined by prosodic characteristics, it is not surprising that it would in large part mirror syntactic structure. However, non-isomorphism between syntax and prosody is sometimes found, and might also be expected in this case.

For example, recall that Nespor & Vogel stated that parentheticals, nonrestrictive relative clauses, topicalizations and other extrapositions, vocatives, expletives, and tag questions form Intonational Phrases in many languages. Then, it might be possible for such elements to 'interrupt' the flow of a non-manual 'whq' marker in ASL. In fact, in many if not most of these cases the structure would presumably be similarly interrupted, so the syntax and the prosody might again be synchronized. Furthermore, such interruptions are highly disfavored in ASL, with these kinds of phrases typically placed at the sentence edges. However, it seems that *if* such interruptions are allowed (manually), the predicted disruption of the non-manual marking is found, as illustrated in (20).

(20) wh t2-bg wh
WHO, VEGETABLE, PREFER POTATO WHO
'Who, as for vegetables, who prefers potatoes?'
(Neidle et al. 2000)

In addition, we have already seen that there are cases illustrating a double dissociation between the WHQ non-manual marker and WH-question structures. One more piece of evidence for this dissociation is the behavior of the whq non-manual marker in indirect questions. If this marker were simply a reflex of the [+WH] feature found in both direct and indirect questions, it would invariably accompany the embedded clause in examples like (21). However, this is not the case. Indirect questions sometimes have a 'pondering' facial expression similar to the whq marker, but then it frequently accompanies the full sentence. In other cases (such as (21)b), the non-manual marker is clearly distinct from the whq.

(21) a. hs/ponder
I DON'T-KNOW WHAT HE BUY
'I don't know what he bought.'

b. hn
I KNOW HOW SWIM
'I know how to swim.'

c. ponder
I WONDER WHY JOHN FAIL
'I wonder why John failed?'
(Petronio and Lillo-Martin 1997)

Thus, both in terms of its spreading and its appearance, the whq non-manual marker behaves like an intonational element. There is no example that I am aware of showing the need for a syntactic feature representing the whq non-manual marker along the lines of the polarity licensing example cited earlier.

A complement to the brow furrow used with WH-questions might be the brow raise, which is used with a number of constructions, including topics, yes/no questions, relative clauses, and WH-clefts. Wilbur and Patschke (1999) argue that no single pragmatic function is associated with brow raise, and that its distribution can instead be described by a unified syntactic analysis: "The commonality among all the structures that have 'br' marking is that the 'br' shows up in A'-positions associated with [-wh] operator features. … Furthermore, the domain of 'br' spreading is the checking domain of the [-wh] feature".

Wilbur & Patschke's analysis does not identify any syntactic effect of the presence of the 'br', of the sort provided by the polarity item licensing example. Their argument against an intonational / pragmatic account is that a unified analysis would not be possible. However, note that the non-manual markers they discuss have various

different parts to them besides the 'br'. For example, head position, eyelid movements, and lip raises are relevant to some but not all of these markers. If 'br' is simply one component of different expressions (as, for example H* is one component of any number of intonational tunes), then it is not surprising that a unified pragmatic analysis is not available.

More problematic is that some of the syntactic analyses assumed in order to maintain the [-wh] operator analysis are not fully justified. For example, Wilbur & Patschke assume that the IP of a yes/no question moves to [Spec, CP] (so that the whole question will have 'br' marking). They assume that a P feature triggers preposing in examples with what they consider focused negatives and modals, but there is no evidence that preposing has occurred. The preposing is important to their analysis because it is the preposed part which is marked by 'br' (it is within the 'checking domain' of the '[-wh] operator').

While it may be that independent evidence of the necessity of some syntactic element which is realized as 'br' will be forthcoming, I conclude at this point that there is no compelling reason to posit a syntactic presence for this non-manual element either.

Let me turn now to the head shake which accompanies negatives. As illustrated earlier, this non-manual marker has been considered together with facial expressions in most of the literature. However, its status is much less clear. Like facial expressions, it co-occurs with and 'spreads' over manual signs, but it is different from facial expression in several ways. First, negation is not the type of meaning typically conveyed by intonation (Ladd 1996). Second, the domain over which the negative headshake spreads is apparently much more language-particular across sign languages, and does not correspond well with Intonational Phrases. Differences in the spread of the negative headshake between ASL, German Sign Language (DGS), and Catalan Sign Language (LSC) (illustrated in (22)-(24)) led Pfau (2002) to conclude that it is analogous to tone, which does mark negation in some languages. The status of the negative headshake in ASL and other sign languages is thus less clear.

ASL

(22) a. neg
JOHN BUY HOUSE
'John is not buying a house.'

b. neg
JOHN NOT BUY HOUSE
'John is not buying a house.'

c. neg
JOHN NOT BUY HOUSE
'John is *not* buying a house.'

(Neidle et al. 2000)

(23) a. MUTTER BLUME KAUF (NICHT) — DGS
hs hs
mother flower buy.neg (not)
'Mother does not buy a flower.'

b. * MUTTER BLUME KAUF (NICHT)
hs
mother flower buy.neg (not)
'Mother does not buy a flower.'

c. MUTTER BLUME KAUF
_ _ _ _ _ hs
(Pfau 2002; Pfau and Quer 2003))

(24) a. SANTI CARN MENJAR NO — LSC
hs
Santi meat eat not
'Santi doesn't eat meat.'

b. SANTI CARN MENJAR
hs
Santi meat eat.neg
'Santi doesn't eat meat.'

c. SANTI CARN MENJAR
_ _ _ _ hs
(Pfau and Quer 2003)

Finally, there is clearly a syntactic effect of a different prosodic element in sign languages, namely prosodic prominence. Prominent constituents tend to appear in the sentence-final position (Wilbur 1991, 1999, Wilbur and Zelaznik 1997) (although stressed elements may also appear in other positions, including in situ and – for contrastive focus – sentence-initial position; see Lillo-Martin and Quadros 2004). In ASL and LSB, prominent elements may appear twice – once in their sentence-internal position and once in the final position. Examples are given in (25) and (26).

(25) a. ANN CAN'T READ CAN'T — ASL
neg
'Ann CAN'T read.'

b. ANN WILL LEAVE WILL
q
'Will Ann go?'

c. WHO BUY C-A-R WHO
whq
'Who bought the car?'

d. JOHN NEVER EAT FISH NEVER
('John won't eat fish.')
(Petronio 1993; Wood 1999)

(26) a. IX<1> CAN GO PARTY CAN (hn) LSB

b. IX<1> LOSE BOOK LOSE (hn)

(Quadros 1999)

Various analyses have been proposed for the syntactic operations which result in sentence-final placement of prominent elements (Lillo-Martin & Quadros 2004, Nunes & Quadros 2004, Petronio 1993, Quadros 1999, Wilbur 1997). Whatever the analysis, it is clear that some kind of syntactic representation (e.g., a feature) triggers both the syntactic movement operation and the prosodic realization of prominence. In other words, ASL and LSB are like Hungarian in having a particular syntactic reflex (in addition to a prosodic one) for certain kinds of focus.

6. Conclusion

Researchers working on sign linguistics have often resisted the analogy between non-manual markers and intonation for fear that this would lessen the importance of such markers in sign language grammar. Instead, the similarities between sign language non-manual markers and spoken language intonation serve to highlight the importance of considering prosody in analyses of both types. Where prosody 'lives' in the grammar is another question, one that requires both theoretical and empirical justification. In some cases, a clear connection between prosodic and syntactic phenomena argue for some kind of representation visible to the syntax (see also the presentations at this meeting and other works by Büring, Kitagawa, Selkirk, and others for much more evidence in this regard).

The similarities between sign languages and spoken languages are strong enough to recognize that a common computational component serves them both. Even when it comes to parts of the languages which are quite close to the A-P interface, commonalities between languages in the two modalities require common explanation. This does not mean that there are no differences – true modality effects exist and have important ramifications for the structure of the grammar. But that is the topic of another paper.

Acknowledgments

This paper is based in large part on material presented in Sandler and Lillo-Martin (in press). I thank Wendy Sandler for convincing me to think about the implications of an intonation analysis of non-manual markers in sign languages, and for providing much information on the phonological view of intonation.

Figures of Isreali Sign Language are reprinted with permission from Wendy Sandler.

The material in this paper is based in part on work supported by the National Institutes of Health (NIH) under Grant #DC 00183. Any opinions, findings and

conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the NIH.

References

Baker-Shenk, Charlotte. 1983. *A Micro-Analysis of the Nonmanual Components of Questions in American Sign Language*. Ph.D. Dissertation, University of California.

Cheng, Lisa Lai-Shen, and Rooryck, Johan. 2000. Licensing *Wh*-in-Situ. *Syntax* 3:1-19.

Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.

Gussenhoven, Carlos. 1999. Discreteness and gradience in intonational contrasts. *Language & Speech* 42:283-306.

Kiss, K. E. 1981. Structural Relations in Hungarian, a 'Free' Word Order Language. *Linguistic Inquiry 12*, 185-213.

Klima, Edward and Bellugi, Ursula. 1979. The Signs of Language. Cambridge, MA: Harvard University Press.

Ladd, Robert. 1996. *Intonational Phonology*. Cambridge, UK: Cambridge University Press.

Liddell, Scott K. 1980. *American Sign Language Syntax*. The Hague: Mouton.

Liddell, Scott K. 1984. THINK and BELIEVE: Sequentiality in American Sign Language. *Language* 60:372-392.

Lillo-Martin, Diane. 1999. Syntactic Aspects of Intonation. Presented at the LSA Annual Meeting.

Lillo-Martin, Diane, and Fischer, Susan. 1992. Overt and Covert Wh-Questions in American Sign Language. Presented at the Fifth International Symposium on Sign Language Research; Salamanca, Spain.

Lillo-Martin, Diane and Quadros, Ronice Müller de. 2004. The Structure and Acquisition of Focus in American Sign Language and Brazilian Sign Language. Presented at TISLR VIII, Barcelona.

Meier, Richard, Cormier, Kearsy, and Quinto-Pozos, David, eds. 2002. *Modality and structure in signed language and spoken language*. Cambridge, UK: Cambridge University Press.

Meir, Irit, and Sandler, Wendy. 2004. *Language in space: A window on Israeli Sign Language (Hebrew)*. Haifa: University of Haifa Press.

Neidle, Carol, Bahan, Benjamin, MacLaughlin, Dawn, Lee, Robert G., and Kegl, Judy. 1998. Realizations of Syntactic Agreement in American Sign Language: Similarities Between the Clause and the Noun Phrase. *Studia Linguistica* 52:191-226.

Neidle, Carol, Kegl, Judy, MacLaughlin, Dawn, Bahan, Benjamin, and Lee, Robert G. 2000. *The Syntax of American Sign Language: Functional Categories and Hierarchical Structure*. Cambridge, MA: MIT Press.

Nespor, Marina, and Vogel, Irene. 1986. *Prosodic Phonology*. Dordrecht: Foris.

Nespor, Marina, and Sandler, Wendy. 1999. Prosody in Israeli Sign Language. *Language and Speech* 42:143-176.

Nunes, Jairo, and Quadros, Ronice Müller de. 2004. Phonetic Realization of Multiple Copies in Brazilian Sign Language. Presented at TISLR VIII, Barcelona.

Petronio, Karen M. 1993. *Clause Structure in American Sign Language.* Ph.D. Dissertation, U. of Washington.

Petronio, Karen, and Lillo-Martin, Diane. 1997. Wh-Movement and the Position of Spec CP: Evidence from American Sign Language. *Language* 73:18-57.

Pfau, Roland. 2002. Applying Morphosyntactic and Phonological Readjustment Rules in Natural Language Negation. In *Modality and Structure in Signed and Spoken Languages*, eds. Richard Meier, Kearsy Cormier and David Quinto-Pozos. Cambridge University Press.

Pfau, Roland, and Quer, Josep. 2003. V-to-Neg raising and negative concord in three sign languages. Presented at the XXIX Incontro di Grammatica Generativa, Urbino, February 2003.

Quadros, Ronice Müller de. 1999. *Phrase Structure of Brazilian Sign Language.* Ph.D. Dissertation, Pontifícia Universidade Católica do Rio Grande do Sul.

Sandler, Wendy. 1989. *Phonological Representation of the Sign: Linearity and Nonlinearity in American Sign Language.* Dordrecht: Foris.

Sandler, Wendy. 1999. Prosody in Two Natural Language Modalities. *Language and Speech* 42:127-142.

Sandler, Wendy, and Lillo-Martin, Diane. In press. *Sign Language and Linguistic Universals.* Cambridge, UK: Cambridge University Press.

Selkirk, Elizabeth. 1984. *Phonology and Syntax: The Relation Between Sound and Structure*. Cambridge, MA: MIT Press.

Stokoe, William, Casterline, Dorothy and Croneberg, Carl. 1965. *A Dictionary of American Sign Language on Linguistic Principles.* Washington, DC: Gallaudet College Press.

Wilbur, Ronnie B. 1991. Intonation and Focus in American Sign Language. *ESCOL '90: Proceedings of the Seventh Eastern States Conference on Linguistics*.

Wilbur, Ronnie B. 1996. Evidence for the Function and Structure of Wh-Clefts in American Sign Language. In *International Review of Sign Linguistics*, eds. William H. Edmondson and Ronnie B. Wilbur, 209-256. Mahwah, NJ: Lawrence Erlbaum Associates.

Wilbur, Ronnie B. 1997. A Prosodic/Pragmatic Explanation for Word Order Variation in ASL with Typological Implications. In *Lexical and Syntactical Constructions and the Constructions of Meaning*, eds. Marjolijn Vespoor, Kee Dong Lee and Eve Sweetser, 89-104. Amsterdam, Philadelphia: Benjamins.

Wilbur, Ronnie B. 1999. Stress in ASL: Empirical evidence and linguistic issues. *Language and Speech* 42:229-250.

Wilbur, Ronnie B., and Patchke, Cynthia. 1999. Syntactic correlates of brow raise in ASL. *Sign Language & Linguistics* 2:3-30.

Wilbur, Ronnie B., and Zelaznik, H.N. 1997. Kinematic Correlates of Stress and Position in ASL. Chicago, IL: Presented at the LSA Annual Meeting.

Wood, Sandra K. 1999. *Semantic and syntactic aspects of negation in ASL.* M.A. thesis, Purdue University.

Zubizarreta, Maria Luisa. 1998. *Prosody, Focus, and Word Order*. Cambridge, MA: MIT Press.

Sign Linguistics and the Interfaces

University of Connecticut
Department of Linguistics
337 Mansfield Road, Unit 1145
Storrs, CT 06269-1145

lillo.martin@uconn.edu