Sign language phonology: Issues of iconicity and universality

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This chapter addresses two issues that concern sign language phonology. The first issue is how iconicity influences phonology in SLs. The second arises often in the minds of linguists working on verbal languages: To what extent are the levels of structure and the dimensions of variation the same in signed and verbal languages?

1. Introduction

To begin, let us compare two definitions of phonology; they are general definitions and written by researchers of sign languages (SLs). One definition takes phonology to be both the representations of forms without meaning, such as features, segments, and syllables, and the rules/constraints that govern their distribution: “Phonology is the level of grammar where primitive structural units without meaning are recursively combined to create an infinite number of meaningful utterances” (Brentari 1998: 2). A second definition focuses more on the distribution or prosodic role of phonology for all types of representations (both meaningful and meaningless), because all elements pass through the medium during their transmission, and prosodic structure plays this role in grammar: “Phonology is the level of linguistic structure that organizes the medium through which language is transmitted” (Sandler & Lillo-Martin 2006: 114). Until recently the work on SL phonology has focused on phonological units, such as features, syllables, and segments, but elements that have meaning, including those that involve iconicity, are also organized via the phonology.

The two main sections of this chapter deal with the structure and distribution of iconicity and the cues that mark various prosodic constituents.

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1 I thank organizers and participants of Verbal and Signed Languages for a stimulating discussion of these issues. All figures in this chapter are printed with permission.
These are followed by some concluding remarks that link this work to that of the rest of the volume.

2. Language modality, iconicity, and grammar

Iconicity has been an important area of study in SL research within a semiotic framework (Brennan 1990; Cuxac 2000; Cuxac & Sallandre, this volume; Pietrandrea & Russo, this volume), and in the study of figurative and metaphoric use of sign languages in narrative and SL literature (Meir 2004; see also Wilcox, this volume). These researchers have shown that at the level of word formation, as well as in metaphorical and creative use of a SL, the inherent iconic nature of signs cannot be ignored or fought against; instead, the grammar must work within the constraints of these inherent meanings as nonce forms are created. As Cuxac & Sallandre (this volume) state, iconicity and grammar are not mutually exclusively principles, but they must work together in SL grammars.

In Section 2, the following proposal is put forth: While the importance of iconicity as a source of raw material (i.e., phonetic properties) for new forms in SLs cannot be ignored and thus must be dealt with within the system of representations, the distribution of these elements is abstract and arbitrary (i.e., phonological/grammatical), and a phonological analysis is the mechanism needed to account for this distribution. Three sets of evidence, all of which have an iconic source and an abstract distribution, will be used to support this claim: (i) the system of verb agreement in SLs (Meir 2002), (ii) orientation in classifier handshapes (henceforth ‘HSs’) (Benedicto & Brentari 2004; Brentari 2005), and (iii) the timing of the two hands in classifier constructions (henceforth ‘CCs’).

The evidence from verb agreement draws on previous work by Meir (2002) and others. The two types of evidence on from HS in CCs comes from recent work on a cross linguistic project studying these structures (Benedicto & Brentari 2004; Brentari 2005; Eccarius & Brentari in press). The constraints on iconicity in these cases come from phonology and syntax.

2.1. Verb Agreement

Meir (2002) argues that the main difference between verb agreement in verbal languages and SLs is that verb agreement in SLs seems to be thematically, rather than syntactically, determined. Agreement typically involves
the representation of phi features of the NP arguments, and functionally it is a part of the referential system of a language. Typically there is a closer relationship between agreement markers and structural positions in the syntax than between agreement and semantic roles, such as source, goal and theme; however, SL verb agreement agrees with its source and goal arguments. There are three types of verbs in Israeli SL and American SL (Padden 1988): those that do not manifest agreement (‘plain’ verbs), and those that do, which divide further into those known as ‘spatial’ verbs, which under Meir’s analysis only take source-goal agreement, and ‘agreement’ verbs, which take source-goal agreement, as well as object agreement. The combination of syntactic and semantic motivations for agreement in SLs was formalized as the “direction of transfer principle” (Brentari 1988), but the analysis of verb agreement as having an iconic source of verb agreement is from Meir (2002).

Agreement verbs manifest the transfer of entities, either abstract or concrete (e.g., TEACH, GIVE, HELP, FAX, SAY-NO, etc.). The R (locational)-loci of SL verb agreement are regarded as visual manifestations, overt indices if you will, of the pronominal elements in question, rather than of grammatical categories, such as gender or number (cf. Meir 2002 and references cited therein). Meir argues that the path movement marks the spatial agreement of source and goal, and that the facing of the hand marks the object argument of the verb – typically the dative object. Crucially, Meir further argues that ‘DIR’, which is an abstract construct used in a transfer verb, is the iconic representation of the semantic notion ‘path’ used in theoretical frameworks, such as Jackendoff (1996: 320); DIR denotes spatial relations. It can appear as an independent verb or as an affix to other verbs. For Israeli Sign Language (ISL) and ASL agreement verbs, the source-goal agreement is expressed by the change in location; object agreement is expressed by the orientation of the fingertips, called ‘facing’.

[Images of sign language gestures for 'APOLOGIZE', 'SAY-YES', 'HELP', 'PAY']
(1) Distribution of phonological properties of agreement

a. ø path marker; ø orientation marker: e.g., APOLOGIZE (Figure 1)
b. ø path marker; + orientation marker: e.g., SAY-YES (Figure 2)
c. + path marker; ø orientation maker: e.g., HELP (Figure 3)
d. + path marker; + orientation marker: e.g., PAY (Figure 4)

This type of iconicity is rooted in the fact that referents in a signed discourse are tracked both syntactically and visuo-spatially; however, this iconicity is constrained. It is the phonology of the stem that accounts for the distribution of these agreement markers in the set of agreement verbs in ASL (Perlmutter 1994; Bahan 1996). In (1a) we see an example of the agreement verb, APOLOGIZE, that takes neither orientation nor source-goal properties, and signs in this set have been argued to have eye gaze agree with the object (Bahan 1996). The phonological factor relevant here is that all signs in this set have a distinct place of articulation that is on or near the body. In (1b) we see an example of an agreement verb that takes only the orientation marker of agreement, SAY-YES. The phonological factor relevant here is that the verb stems in this set have no path movement specified, but rather a different kind of movement, an *imitative* or *tracing* movement (Schick 1987; Brentari 1998). In (1c) we have an example of an agreement verb that takes only source-goal – HELP. The phonological factor relevant here is that all the verb stems in this set have a HS where the fingertips are either not visible or must be pointed up or down. In (1d) we see an example of the agreement verb PAY that takes both path movement and orientation properties of agreement.

This analysis shows that the iconic source-goal (path) and object (orientation) markers of agreement are distributed in an arbitrary, but systematic, way that can only be captured by a phonological analysis that includes an account of the relevant phonological features of handshape (HSs), movement and location, and how these features participate in the allomorphy of agreement morphology.

2.2. Orientation of handshape in Classifier Constructions (CCs)

The second case of an iconic source for a structure that is ultimately distributed arbitrarily involves the orientation of the hand in the HSs of CCs (CC-HSs). For our purposes here, CCs can be defined as complex predicates in which movement, HS and location are meaningful elements; we focus
here on HS. We will use Engberg-Pederson’s (1993) system, given in (2), which divides in CC-HSs s into 4 groups. Examples of each are given in Figures 5–8.

(2) Categories of HSs in CCs (Engberg-Pedersen 1993)

a. WHOLE ENTITY
   These HSs refer to whole objects (e.g. ‘1-HS:person’ (Figure 5))

b. HANDLING
   These HSs refer to how an object is handled or manipulated
   (e.g. ‘S-HS: grasp_gear_shift’ (Figure 6))

c. LIMB/BODY PART
   These HSs refer to the limbs/body parts of an agent
   (e.g. ‘V-HS:by_legs (Figure 7)’

d. SURFACE & EXTENSION
   These HSs refer to the physical properties of an object
   (e.g. ‘B-B-HS:flat_surface’(Figure 8))

Benedicto & Brentari (2004) and Brentari (2005) argued that, while all types of CC-HSs use HS morphologically in a general way, only CC-HSs of the handling and limb/body part type used orientation in a morphological way, while whole entity (2a) and surface and extension (2d) did not. This is shown in Figures 9-12, which illustrate the variation of the forms in Figures 5-8 that would be required to achieve the meaning ‘upside down’. While the handling classifier in ‘S-HS:grasp_gear_shift_from_below’ and the body part classifier in ‘(person) ‘V-HS:by_legs be located_upside_down’ are grammatical, the whole entity classifier in ‘1-HS_person_upside_down’ and the surface classifier in ‘BB-HS:flat_surface_upside_down’ are not grammatical (indicated with an “*”).

This analysis requires phonology because the representation of HS must allow for subclasses of HS features to function independently. It also requires syntax because the 4 types of CC-HSs are based primarily on their syntactic properties. Handling CC-HSs display transitive properties, while whole entity CC-HSs display properties of intransitives; body part CC-HSs display unergative properties, while whole entity CC-HSs display unaccusative ones (Benedicto & Brentari 2004).

2 In ASL we have found that the V-HS ‘by-legs’ can function as either a body or whole entity classifier.
It would be more iconic to have the orientation of the CC-HS express the orientation of the entity in question in all cases, but the grammar does not allow this. We therefore have evidence that iconicity is constrained by the grammar in the distribution meaningful use of orientation.

2.3. 2-handed timing in complex Classifier Constructions.

In this section a third case of grammatical constraints on iconicity is shown. Lexical items and CCs can be 1-handed or 2-handed. We focus on unbalanced, 2-handed, CC forms – ‘unbalanced’ means that they that have different HSs on each hand – and we see that the timing of the two hands depends on the phonological and syntactic complexity of H2.3 In 2-handed

3 These are the Type 3 forms of Battison (1978).
lexical items, the dominant hand is referred to as H1, and it is the one used for the more complex of the two HSs. The non-dominant hand is referred to as H2, and it is the hand used for the less complex of the two HSs. The terminology and classes of 2-handed forms was originally developed for lexical items (Battison 1978), but it has been expanded to CCs (Eccarius & Brentari in press).

Unbalanced forms can have either simultaneous or sequential timing. Simultaneous timing means that H1 and H2 form their respective HSs at the instant. Sequential timing means that H2 enters the signing space first as a ‘ground’ or static element in the discourse, and H1 is signed as a ‘figure’ or moving element (McIntire 1980). In looking at a corpus of 463 unbalanced CC forms in three SLs (American SL (ASL), Hong Kong SL (HKSL), and Swiss German SL (DSGS)), a pattern was discovered that predicts when the two hands in a 2-handed unbalanced CC will have sequential or simultaneous timing (Eccarius & Brentari in press). In general the pattern can be summed up as follows. Unbalanced signs have different HSs on H1 and H2, and this adds complexity to some degree, but taking this as given, the H2 structure must be as simple as possible in both phonology and syntax in order to have simultaneous timing. Table 1 shows the properties that are associated with simultaneous and sequential timing. Two of the properties are phonological; one is morphosyntactic. Examples of a simultaneously timed form are given in Figures 13–14, respectively. These properties will be described now in detail. In ASL, HKSL, and DSGS all unbalanced CCs with simultaneous timing have an unmarked H2-HS. Crosslinguistically, unmarked HSs are those in Figure 15, and they are described in Eccarius and Brentari (in press). These handshapes are ‘unmarked’ because of their frequency and their simple phonological representation; that is, these HSs have no branching ‘selected fingers’ structures (fingers used) or ‘joint’ structures (joints used). Any other HS is known as ‘marked.’

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4 In the earlier reporting of the simultaneous and sequential groups, blinking behavior was also reported. In the interest of space, we are leaving this property out of the discussion here.
Figure 13. Example of the stimulus item (a) and the obtained CC production from HKSL that is simultaneously timed (b). The gloss for this production is:
H1: Y-HS: person\textsubscript{wext} + MOVE AWAY-IN-ZIG-ZAG PATH\textsubscript{a}
H2: B-HS: 2-dimensional\_flat\_object\textsubscript{wext} \textsc{exist}\textsubscript{a}
“The person moved away from the rocket.”

Figure 14. Example of the stimulus item (a) and the obtained CC production from DSGS that is sequentially timed (b). The gloss for this production is:
H1: S-HS: grasp\_long\_thin\_object\textsubscript{wext} + HIT\textsubscript{a}
H2: F-HS: grasp\_delicate\_object\textsubscript{wext} + CONTACT\textsubscript{a}
“[someone] held the nail in place and then hit it with a hammer.”
Table 1. Phonological and syntactic properties associated with timing patterns in unbalanced CCs.

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<tr>
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<th>Simultaneous 70%</th>
<th>Sequential 22%</th>
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<tbody>
<tr>
<td>(i) phonological HS of H2</td>
<td>H2 unmarked</td>
<td>H2 marked</td>
</tr>
<tr>
<td>(ii) movement type of H2</td>
<td>existential/H1 copy (dependent)</td>
<td>extension/contact/active (independent)</td>
</tr>
<tr>
<td>(iii) morphosyntactic type of H2</td>
<td>H2 whole entity</td>
<td>H2 handling</td>
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a) unmarked joint specifications

![Extended](image1) ![Flexed](image2)

a) unmarked selected finger combinations

![Four fingers](image3) ![Index finger](image4) ![Thumb](image5)

Figure 15. Unmarked HSs in American SL, Hong Kong SL, and Swiss German SL.

Regarding movement, all unbalanced CCs that are simultaneously timed had either an H2 movement copied from H1 or no movement at all. When H2 has no movement it indicates an existential predicate with no specific location; these have been called ‘existence’ predicates by Wallin (1993). This contrasts with the movements found in the sequentially realized structures. In these forms, the movement was an independent movement from that on H1, typically a ‘contact’ movement, which is an existential predicate also, but one that indicates an entity’s specific location. Phonologically, a

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5 8% of the data falls outside of the purview of this analysis, because the face was used morphologically and therefore added a third articulator to the structure. We put these items aside for this analysis.
‘contact’ movement has a short downward movement towards a specific location in space. Contact movements add complexity to the structure, since in these cases the H2 has a distinct movement from H1. When H2 has no movement or copies movement from H1, it adds no complexity to the structure.

The H2-HSs in CCs that were simultaneously timed were whole entity classifiers, and those that were sequentially timed were handling classifiers. Benedicto & Brentari (2004) have argued that handling classifiers have two syntactic arguments, while whole entity classifiers have only one. These facts about syntactic structure reinforces the requirement that H2 be as simple as possible in CCs with simultaneous timing, because only if H2 represents a single syntactic argument can the structure be realized simultaneously. Given that H2 is representing an entity that is separate from that of H1 in unbalanced CCs, H2 must add some complexity to the syntax, but in order to be realized simultaneously, H2 must add as little complexity as possible. Even the same string of manual elements can be timed either simultaneously or sequentially, each obtaining slightly different meanings (cf. Padden 1988; Figure 16a–b). One might expect that the sequence of events represented on the two hands would determine this timing, but the same events can be expressed by different structures.

Figure 16a. Simultaneous articulation of H1 &H2 in a 2-handed CC in ASL.

The gloss (cf. Padden, 1988: 217) is:
H1: TABLE MONKEY V-HS: small_animal_{tel}+ JUMP_{tel}
H2: TABLE MONKEY B-HS: 2-dimensional flat_object_{tel}+ EXIST_{tel}
“The monkey jumped onto the table.”
I have argued that SL grammar constrains iconicity in these three previous subsections. In the case of agreement verbs, the movement and HS of the stem can predict whether the orientation marker for objects, the locative marker for source-goal relations, or both, will appear. In CC-HSs, it is the morphosyntactic category of classifier type that determines if orientation will be used morphologically or phonologically. And in unbalanced 2-handed CCs, there are phonological and morphosyntactic properties that can predict if such a form will have sequential or simultaneous timing. Moreover, in the case of unbalanced forms, a diachronic relationship has been established directly lexical items and CCs. Using the sign corpus in Stokoe et al. (1965), only H2 forms with simultaneous timing and their cluster of associated properties will appear in the lexicon of frozen forms of ASL, showing that diachronic change proceeds in this direction.

To sum up, what I have shown in this section is that the grammar of SLs constrains the distribution of the phonetic, iconic substance by using phonological and syntactic grammatical mechanisms. I have shown that iconicity and principles such as frequency of use are not sufficient to predict grammaticization and stabilization of form, but rather phonological and syntactic principles must be employed as well.
3. Evidence for phonological and prosodic constituents

Specific questions are often raised about phonological alternation and constituency in sign languages. These issues concern the extent to which the levels of structure and the dimensions of variation is the same in signed and verbal languages, and they will be addressed in this section. I will provide examples of word-level alternations, parentheticals, as well as evidence of the autonomy of (P)rosodic constituency from (M)orphological constituency. Research on prosodic constituency in SLs is a recent development, since the problem of determining the primitive units of signs have occupied the attention of phonologists working on SLs for many decades. In this section, ‘sign’ will mean lexeme or stem, and the larger units will be referred to by their traditional names of phonological phrase and intonational phrase.

3.1. Allophonic/allomorphic variation

SLs express the equivalent of word-internal variations, and one example of this is the option of signing a 2-handed sign as a 1-handed form in ASL, known as Weak Drop (Battison 1974; Padden & Perlmutter 1987; Brentari 1998). There are three different types of 2-handed signs (Battison 1978): Type 1, where the HSs and movements on the two hands are the same; Type 2, where the HSs are the same, but one hand is stationary; and Type 3, where the HSs are different and H2 is either stationary or copies the movement on H1. Determining the signs that allow Weak Drop requires a phonological analysis, because not all 2-handed signs allow a 1-handed variant, and those that do are not all of one type. Examples of each type, with and without Weak Drop, are given in Figures 17–19.

The analysis requires that we look at the features of the signs in question. Type 1 signs that allow Weak Drop must not have a movement that has an alternating movement – i.e., a ‘to-and-fro’ movement between the two hands. Moreover, in Type 1 and 2 signs, in order for a 1-handed sign variant to be grammatical, the orientation of the hands with respect to each other must not be ‘symmetrical’. This means that when the two hands have analogous parts facing each other (i.e., symmetrical), as you see in WITH in Figure 17 (a Type 1 sign) and ABSTRACT in Figure 18 (a Type 2 sign), a 1-handed variant is not allowed. In Type 3 signs that allow Weak Drop, the HS on H2 must be an open B-HS (such as the H2 in READ, Figure 19 (left)), and the place of articulation on H2 must be the palm. Finally, in all
three types of signs, continuous contact between the two hands, such as is seen in LOCAL (Figure 19 (right)) will prohibit the application of Weak Drop.

By observing the process of Weak Drop and the analysis needed to account for it, we see that even though a general notion of complexity might capture the spirit of the process, but in order to achieve a complete and accurate analysis, the different types of 2-handed signs and the features involved in these signs must be taken into account in a formal way.

*Figure 17.* Type 1 sign QUIET, which allows Weak Drop (left), and WITH, which does not (right).

*Figure 18.* Type 2 sign REMEMBER, which allows Weak Drop (left), and ABSTRACT, which does not (right).

*Figure 19.* Type 3 sign READ, which allows Weak Drop (left), and LOCAL, which does not (right).
3.2. Parenthetical expressions

Brentari & Crossley (2002) analyzed an ASL lecture given by a native signer, and found that there are parenthetical expressions that are disassociated from the main text, and these are set off by eye blinks and body leans. Figure 20 shows that the placement of blinks and body leans indicate the beginning and end of the parenthetical expression.

The sentence is in the context of the speaker telling the audience that her sister has misunderstood the date of the presentation and did not send a crucial videocassette that the speaker wanted to use.

*Figure 20.* The ASL sentence translated as ‘She misunderstood – I sent her [February] 20th [as the lecture’s date] – she thought the 28th.’ The middle intonational phrase functions as a parenthetical phrase and is marked by blinks at the left and right edges.
Note that after the sign MISUNDERSTOOD, there is a blink, then another blink after 1.2, after which the signer inclines her head and body to her right. Eye blinks and leans have been demonstrated to be an indicator of intonational phrases (Boyces Braem 1999; Wilbur 1994), and leads have been argued to be markers of intonational phrases as well as of contrast, more generally (Wilbur & Patschke 1998).

3.3. Markers of prosodic constituency

Brentari & Crossley (2002), Nespor & Sandler (1999) and Sandler & Lillo-Martin (2006) have proposed the following markers for the prosodic word (P-word), phonological phrase (P-phrase), and intonational phrase (I-phrase), and these properties will be discussed the next subsections. Phonological constituents are not isomorphic with their morphological counterparts, but they are related to them in important ways demonstrated for verbal languages in work such as Nespor & Vogel (1986), Selkirk (1984) and Truckenbrodt (1999). Cues of prosodic structure in SLs are listed in (3).

(3) Prosodic cues in SLs

a. Prosodic word:
   i. In 1-handed forms, assimilation of HS occurs across a cliticized pronoun (Liddell & Johnson 1989).
   ii. In 2-handed forms, coalescence of 2 M-words in 1 P-word occurs (Nespor & Sandler 1999).
   iii. In all forms, spreading of mouthing (borrowed lip patterns of borrowed spoken words) occurs across 2 M-words in a P-word (Boyces Braem 1999, 2001; Brentari & Crossley 2002).

b. Phonological phrase:
   i. In 2-handed forms, the spread of H2 occurs (Nespor & Sandler 1999).
   ii. In all forms, lengthening of the phrase-final syllable occurs (Brentari 1998).

c. Intonational Phrase:
   i. Eyeblinks occur at the right edge of I-Phrases (Wilbur 1994).
   ii. Changes in leans from left to right in the signing space occur at I-Phrase boundaries (Boyces Braem 1999).
   iii. Resetting of all nonmanual behaviors occurs at the edges of I-Phrases. (Nespor & Sandler 1999).
3.3.1. The prosodic word

Blanche-Benveniste (this volume) discusses mismatches between the M-word and the P-word domains; the same type of mismatch occurs in signed languages. Compounds and cliticized forms are good examples of this, since they contain two M-words, and one P-word. In Figure 21 from ISL (Nespor & Sandler 1999, Sandler & Lillo-Martin 2006), *HS assimilation* is demonstrated (3a.i). Notice that instead of the ‘index finger 1-HS’, which is used for the first person pronoun when it appears as an independent word, this cliticized form exhibits the same HS as the following word READ (the 2-finger, V-HS); this indicates that the two forms are one P-word. This type of assimilation occurs in compounds as well, and was first reported for ASL in Liddell & Johnson (1989). In the compound form in Figure 22 both of the input signs are stems. COLD is a 2-handed sign, and SHOULDER is a 1-handed form. In this form we see two markers indicating that these two M-words have become 1-P-word. We see the H1 of COLD remain in the signing space while the 1-handed SHOULDER is being articulated. This is not a case of H2-spread, since it is actually H1 that retains the HS of the previous sign. This operation is called *Coalescence*, and it was first reported for Israeli SL (Nespor & Sandler 1999 (3.aii)). Also in Figure 22, the non-manuals of the lower face remain the same across both M-words. This phenomenon of *Nonmanual Spread*, first discovered for Swiss German SL, is also a marker of a single P-word (Boyes Braem 1999; Brentari & Crossley 2002 (3.iii)).
3.3.2. The phonological phrase

There are two markers of a phonological phrase reported in the literature. \textit{H2-Spread} occurs when the H2 HS remains in the signing space while H1 continues to sign the remaining signs of the phrase. We see this in Figure 23 in the prepositional phrase \textit{FROM-C-O-D-A} (3.bi), where the 1-HS on H2 spreads to the fingerspelled form \textit{CODA} (child of Deaf adults). Notice that there is a change in the posture of the mouth between the signs \textit{FROM} and \textit{C-O-D-A}, so as discussed above, this cannot be judged to be a single prosodic word; if it were, there would be only one mouth posture. Brentari & Crossley (2002) found several different uses of H2 spread, so it was not necessarily the most reliable indicator of a P-phrase.

A more reliable indicator of a P-phrase was found to be \textit{Phrase-final Lengthening} of the final segment of the phrase (3.bii). In the sentence of Figure 23, the last segment of \textit{C-O-D-A} is lengthened (i.e., the fingerspelled letter ‘A’ in \textit{C-O-D-A}). This process was first thought to be a word-final process (Perlmutter 1992), but it was later found to be more accurately applied to the domain of the P-phrase (Brentari 1998). This rule can be formulated as: $\varnothing \rightarrow x_i / x_i \quad \underline{pp}$, where ‘x’ refers to a particular segment.

3.3.3. The intonational phrase

The three markers of an I-Phrase discussed in this section are all optional non-manual behaviors. Nespor and Sandler (1999) state that all non-manual behaviors are reset at the end of an I-Phrase, but let us focus on just two – eyeblinks and leans. Wilbur (1994) has argued that inhibited involuntary \textit{eyeblinks} are an I-Phrase boundary marker (3.ci). These are short blinks
that occur either just after or slightly overlapping with the final sign in an I-Phrase. We have seen these already in Figures 15 and 20. In Figure 15, a blink occurs after the first part of a 2-handed classifier construction, after H2 and just before H1 is realized. In Figure 20, we see the use of eye blinks to set off a parenthetical remark. Both of these examples are extensions of the canonical use of eyeblinks. A more typical example is shown in Figure 24, where the two I-Phrases are separated by an eye blink. The passage can be translated as ‘[English and ASL are different languages]_{IP} [WOW! It blows my mind.]_{IP}’ The second I-Phrase marker is the use of body leans in a direction that is off-center to indicate the domain of an I-Phrase, with changes in the direction of leans indicating a change in I-Phrase and a return to the midline/center at the end of the utterance (Boyes Braem 1999; Wilbur & Patschke 1998).

Figure 24. The use of an eye blink to mark the right edge of an I-Phrase, as seen between the two I-Phrases in the passage ‘[English and ASL are different languages]_{IP} [WOW! It blows my mind.]_{IP}’
In Figure 20, after the sign ‘20’ there is a blink, indicating the end of the parenthetical I-Phrase, but the next I-Phrase, ‘THOUGHT 28’, is signed with the body leaning to the signer’s right; the shift in the direction of lean also demonstrates the boundary between the two I-Phrases.

Section 3 of this chapter has shown that SLs have word-internal morphophonemic and phonological alternations. Moreover, prosodic constituency markers at the level of the P-word, P-Phrase, and I-Phrase demonstrate an autonomous level of prosodic structure in SLs like that of verbal languages.

4. Conclusions

Regarding the interaction between iconicity and arbitrariness, I concur with the findings of many of the papers in this volume: a large portion of the substantive, featural material of signs has an iconic base that cannot be ignored. I agree with Cuxac & Sallandre (this volume) that the arbitrary relationship between signified and signifier is not valid for SLs and that iconicity and arbitrariness do not have to be in opposition in a system. At the same time, this chapter has shown that it is also equally true that, whatever the source of the phonetic features in SLs, arbitrary formal structure is present and observable at every level of SL grammar.

The work discussed in this chapter shows that it is not the case that arbitrariness in SLs is limited to context, but instead permeates every level of the grammar – from alternations at the level of the word to organizational principles of prosodic structure.

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