

Different strokes

Gesture phrases and gesture units in a family homesign from Chiapas, Mexico*

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Kendon's foundational proposals about the phrasing of gesture are applied to the emerging syntax of the multimodal utterances in "Z," a first-generation sign language emerging among three deaf siblings and their hearing-age mates in an indigenous Mexican community. I build on the composition and dynamics of Kendon's "gesture units" to formalize a productive phrase-structure grammar for Z, and to highlight areas where the linguistic needs of signers apparently elaborate on this grammar and both extend and regiment it to produce phrasal and clausal units. Questions about "strokes," different sorts of juncture, and interactive constraints on conversational signing elucidate possible links between gesture and sign and potentially shed light on the nature and origins of language itself.

Introduction

It is a pleasure and a privilege to be able to contribute to this collection to honor Adam Kendon and to acknowledge intellectual debts that so many of us have to his long trajectory of research. I first met Adam at ANU in the late 1970s and early 80s. He was an intimidating senior colleague in the Anthropology Department at RSPacS, brought there as I understood it by the even more intimidating Derek

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Freeman, to work on what seemed to me – then a young and extremely naïve linguistic anthropologist with few credentials other than having done fieldwork on Tzotzil, a relatively exotic Mayan language – arcane and unfamiliar “non-verbal” (as people then put it) aspects of interaction. Kendon’s erudition, empirical care, and thoroughness put – and ~~still puts~~ – over-hasty modern slackers like me to shame, and his remarkable eye, then as now, was an inspiration, although it took me many years to realize how much I had absorbed, sitting with awe and envy in his lab and watching him put his hand-cranked 16mm film projector through its paces. The same is true of what, looking back, I now know that I gleaned from Adam in those heady days in Canberra, not only from academic seminars but also from ethnographic film evenings, shared meals (where the virtues of Mudgee wines and other Australian delicacies were discussed, although not by me), and tales of fieldwork in Aboriginal Australia and New Guinea. I wish I had been paying more attention!

In this chapter I revisit what is for me one of Kendon’s central contributions as a formalist, that is, as a student of gestural form and structure, no doubt linked to that hand-cranked film projector whose analytical possibilities have been made more accessible since then by digital video editing programs and laptop computers. In particular, I will take up Kendon’s foundational proposals about the structure of “gesture phrases” which have served me especially well as I have moved from studying spoken language, gesture, and interaction, to research on an emerging sign language, despite, in the latter case at least, my quite breathtaking ignorance. What I present here is largely a methodological exercise, a reflection on techniques and their underlying epistemology in a departure from familiar ground to serendipitously presented new empirical domains. (Something like this, I imagine, may have occurred when Kendon himself encountered his deaf Enga signer in the highlands of New Guinea, or immersed himself in the conversations of elderly Warlpiri women who had abjured speech.)

The gesture phrase

Kendon’s analysis of the physical dynamics of a “gesture” reaches its fullest published expression in Chapter 7 of his foundational 2004 book *Gesture: Visible Acton as Utterance*, although he has elaborated it slightly in lectures since that book appeared. In preparation for a suggested formalization (first presented in Haviland [2011], from which I borrow liberally in what follows), let me recapitulate the general outlines of his proposals. They are already present in a preliminary form in Kendon (1972), one of his earliest works on gesture, where he took up the general relationship of speech to bodily movement. Kendon was particularly

concerned there with questions of synchrony and apparent shared or complementary contributions to an utterance from talk and from different physical articulators, specifically the speaker's body and trunk, head, and forelimbs. Arraying the acoustic dynamics of spoken phrases against movements of these articulators, Kendon observed that the latter also seem to be organized into ballistically structured phrases.

In many instances, it appears to be best to say that the movement that distinguishes each phrase is a movement to a position that is distinctive for the phrase. Where this is so, we find that this position is reached at the center of the phrase, that is, at the point in the phrase where the most prominent syllable occurs [Hockett 1958]. This position may be held, or there may be a comparatively slow change that follows, or the movement that is to lead to the next distinctive position may be begun. Kendon (1972: 200)

Kendon goes on to note that, in the case of the forelimbs, the movement to the distinctive position (which he later comes to call the "stroke") frequently involves adopting a specific hand configuration – perhaps, he speculates, from a limited repertoire of such configurations. Moreover, it often coincides neatly in form with the content of the speech (he later describes this coincidence as "semantic coherence" – see Kendon [2004a: 115]) and, indeed, it seems to be performed with some temporal precision so as to coincide with the relevant speech. These phenomena are clearest, given the limited nature of the material Kendon describes in this early paper (a "London pub scene," filmed by Birdwhistell), in a few "pointing gestures" that the speaker makes coincident with apparent personal references in his speech.

In Kendon's developed terminology, a "gesture unit" is "the entire *excursion*, from when the articulators begin to depart from a position of relaxation until the moment when they finally return to one" (Kendon 2004a: 111). Within a single gesture unit Kendon distinguishes one or more phases – which he calls "gesture phrases" – each of which minimally includes a "stroke," the "phase of the movement excursion closest to its apex" when "the hand or hands tend to assume postures or *hand shapes* that ... are better defined than elsewhere in the excursion" (*ibid.*). The stroke is also the phase of movement "when the 'expression' of the gesture... is accomplished" and which, according to Kendon, most observers notionally associate with "gestures." Additionally, a stroke may involve as well a "post-stroke hold" (a term he takes from Kita 1993) when "the articulator is sustained in the position at which it arrived at the end of the stroke." Strokes are often, although not always, also associated with a preceding preparatory movement, as the articulator moves to its characteristic position and assumes its distinctive form – for example, a hand shape. The preparation and the following stroke-hold-complex are considered to form a single "gesture phrase." The excursion is then completed by a final "recovery" or retraction of the articulator back to rest. The

recovery thus partially brackets the overall “gesture unit,” but it is not considered part of a “gesture phrase” (Kendon 2004a: 112).

Kendon’s detailed analysis of the phases of complex gesture units immediately suggests a simple phrase-structure grammar like that in (1), where U represents a “gesture unit,” G a “gesture phrase” (or, informally, a “gesture”), P a preparatory movement, S a “stroke,” H a “post-stroke hold,” N what Kendon (2004a: 124) calls the “nucleus” of a gesture phrase (consisting of stroke and possible hold), and R a “recovery” or return to rest position. The superscript plus sign, +, is the “Kleene plus” – like * without the empty string.

- (1) Tentative PS “grammar” for gesture units
- a. $U \rightarrow G^+ R$
 - b. $G \rightarrow P N^+$
 - c. $N \rightarrow S (H)$

There are some uncertainties in even this simple formulation. For example, although Kendon’s description suggests that all gesture units begin with a preparatory movement P and end with a recovery R, it seems at least conceivable that some gesture strokes might be performed right where the hand already is – at rest – and that after the stroke is completed the hand remains where it was. This would allow one to parenthesize the R in rule (1a) and the P in rule (1b). Another complication is how to deal with Kendon’s subsequent observations in private conversation, not included in his published formulation from 2004, that gestural strokes can sometimes be repeated – reduplicated, as it were – right in place, without further preparation or subsequent recovery. This might suggest that a Kleene plus should be added to S in rule (1c). Such a rule would not be quite right, of course, since the intention is that the potentially repeated stroke be a copy of itself – not a different stroke but a repeat of the same one. (It is an empirical matter what formal relationships might possibly obtain between these repetitions; for example, after an initial “full” stroke a subsequent version might be, in some sense, “reduced.”) As an approximation (and not a very accurate one) of this constraint I have added a subscript to S to show that not just ANY stroke can be “reduplicated” under this rule, but only some kind of copy. This would give the alternate PS grammar in (2).

- (2) Alternate PS-grammar for gesture units
- a’. $U \rightarrow G^+ (R)$
 - b’. $G \rightarrow (P) N^+$
 - c’. $N \rightarrow S_i^+ (H)$

Further empirical studies of complex gesture units would be required to resolve doubts about how to choose between these alternate formalizations, and I return to some of them below.

The crucial parsing issue defined by such a grammar (which defines the formal “phonological” realization of a gesture unit) is the nature of the transitions from one gestural stroke to another: a gesture unit containing just one gesture phrase will bracket the gesture nucleus with one preparatory movement and a final recovery or return to rest position (${}_{U[G[P\ N] R]}$). A gesture unit with multiple gesture phrases will involve a transition from one gesture phrase to the next with no intervening return to rest position (${}_{U[G \dots G R]}$). The grammar also contemplates a closer binding between gesture nuclei in which one stroke (together with its possible subsequent hold) moves directly to another stroke with no intervening preparatory movement (e.g., ${}_{U[G[P\ N \dots N] R]}$). If one allowed the modified rule (2c'), a still closer binding together of strokes would be possible, as in ${}_{U[G[P\ N[S \dots S] R]}$. Dividing a gestural stream into units thus implies a judgment about recovery to “rest” position to distinguish the major units, and then judgments about the location of individual strokes and the junctures between them (including delicate questions of timing) to locate internal subdivisions in complex gesture units.

Despite his use of the plural “articulators” in the definition of “gesture unit” cited above, in this formulation Kendon does not elaborate the contribution to utterances of different possible articulators, which of course have different ballistic properties. Kendon does note in the 1972 paper that the head has a single basic “rest” position and that little preparation is needed for most of its “gestures.” However, even his carefully transcribed later gestural examples (for example, Example 3 in Kendon 2004a, Chapter 7, 120ff.) consider only co-articulations of forelimbs and the head, with minimal attention to the latter. The dynamics of gestural motion, captured in Kendon’s gesture units, are not well developed for theorizing the possible mutual interactions and different sorts of synchronization among multiple distinct visible articulators (e.g. the face, the trunk, or other limbs), another matter to which I return below.

As I mentioned, Kendon’s careful proposal about how to parse movements into gesture units, phrases, strokes, etc. seems in part to have been inspired by the desire to track synchrony and coordination between speech and speaker’s motions. Discovering robust links between speech and speakers’ gestures, both in semiotic terms or “semantic coherence” and temporal coincidence between gestural strokes and “tonic syllables,” was presumably part of the origin of the notion of a coordinated multimodal “process of utterance” (Kendon 1980a).

Kendon's early sign language research

Proposals about how to parse visible aspects of utterances reappear in Kendon's early empirical contributions to sign language studies, based on fieldwork in the New Guinea highlands and the Australian central desert. This was work which Kendon was actively conducting when I first came to know him at ANU, although it was not until many years later, when my own research quite serendipitously took a parallel turn, that I began to come to an adequate appreciation of it.

Consider Kendon's description of the dynamics of a deaf Enga signer's phrases, and compare it with his analysis of "gesture units" just sketched.

When the signer is not signing, his forelimbs are held in some convenient resting or baseline position, usually a position which it takes little or no muscular effort to sustain. A sign can be recognized as having begun, once the limb [or limbs] to be involved begin to move away from their baseline position towards the articulation location. Once this position is reached, the articulator will very shortly move away. If it moves all the way back to the baseline position, the sign manifested is usually seen as isolated – a one-sign utterance is perceived. Where several signs occur together in sequence to make up a sign-phrase, the articulator either moves directly from one articulation location to another or it may withdraw a little from the articulation location before moving on again to the next one. Whether or not such 'partial recovery' phases intervene between successive signs may be one of the ways in which subgroupings of signs within an utterance may be achieved....

(Kendon 1980b, Part 1, 9–10)

Kendon implicitly suggests that the ballistics of gesture may be at least an initial guide to the parsing of sign.

Later in his treatment of Enga sign, he explicitly applies his proposals to distinguishing different kinds of signed phrases and phrasal junctures, with multiple possible articulators.

...[T]he articulating body part moves away from a position in which it can be sustained for long periods to a position (in the case of limbs) or to a configuration (in the case of the face) from which it then departs again. Complete utterances or phrases are thus recognized as being bounded by periods when the articulator is in its rest position. Sign utterances, then, are clearly recognizable from the fact that while they are in progress the articulators involved are sustained in spaces, locations, or configurations they are not sustained in when the signer is at rest.

(Part III, 264)

Kendon measures sign duration and rate, in the manner of Friedman (1976) in his small corpus of Enga signing. He also contrasts the dynamics of forelimb excursions (which tend to be "quite restricted in their duration") with head movements – both in terms of inherent dynamics, and in how they are "glossed" (or not) as signs – that

is, as some sort of empirical measure of their perceived deliberate communicative intent. Finally, he adopts directly from Stokoe (1960) and from independent but contemporary analysis by Monty West (1960) a phonological model of sign formation, using as interdependent but distinct dimensions locus, hand configuration, orientation, and movement pattern. Kendon wants to add to this list an explicit classification of visual iconicities – something of a taboo subject in sign language research at the time.

Kendon adopts the same ballistic approach in describing the rough form of the signs of fluent Warlpiri signers at Yuendumu (Kendon 1984, 1988). Here is an elaborate description:

A manual sign can be analyzed as a phrase of movement in which the hand or hands are moved away from a rest position towards some region in space or towards some part of the body, and then away again. As the hand approaches this location, the hand itself comes to assume a distinctive organization, or *hand shape*. That is to say, the fingers of the hand come to be disposed in a particular fashion – curled together into a fist, held straight out, splayed wide apart, or any one of the five digits alone, or in combination with one or more others, may be extended. A very large number of different hand shapes are possible, of course, but a given sign language is found to make use of just a few – typically about forty. Sign languages differ in terms of which hand shapes they make use of.

In performing a sign, the hand not only comes to assume a particular shape as it approaches the apex of its excursion. It may also engage in a characteristic movement, which is distinct from the preparatory movement by which the hand is transported to the sign's location of articulation. For example, in Warlpiri, to sign *lawa* 'no', the hand is held with all five fingers extended and spread so that the palm of the hand is facing to the signer's left. The forearm is then rapidly pronated, 'flipping' the hand with a rotary movement to the right... It will be seen that, before this movement is performed, the hand must be moved forward into a suitable space in front of the signer. Such a preparatory phase of the movement phrase by which the sign is enacted is not part of what is distinctive for this sign and it is ignored in the systematic notation system that will be described later. The 'flipping' movement is distinctive, however. If the hand, again with the same shape and orientation, is moved into the same initial position and then is rotated back and forth on the forearm, rather than being 'flipped' to the right, this would be a way of doing a sign for *jarrampayi* 'large lizard, sp.' (1988:97–98)

Kendon again adopts another version of Stokoe's (1978) phonological approach which distinguishes various dimensions or "aspects" of sign formation:

These aspects are *what* acts, the *action* taken and *where* the action is done. These we shall here term *Sign Actor*, *Sign Action*, and *Sign Location*, respectively. (Kendon 1988: 100)

To these locutions he applies the same structural terms he had described for gesture units.

When considered as phrases of movement, manual signs comprise excursions of the forelimb or forelimbs from a position of rest to a spatial region that serves as the locus of articulation of the sign. The movement that transports the Sign Actor to the locus of articulation will be referred to as the *preparation*. The movement by which the Sign Actor is either moved back to rest position, or moved in the direction of the rest position is referred to as the *recovery*. In signed discourse, signs may succeed one another without any recovery movement or there may be a brief period of partial recovery before the next preparatory movement begins. When the Sign Actor has been moved to the Locus of Articulation it may then engage in a pattern of movement distinctive for the sign. It is this that is referred to as Sign Action. It is the equivalent of what we have elsewhere referred to as the *stroke* of the gestural excursion ... (Kendon 1988: 143)

From Kendon's early work, then, I extract a tentative warrant to apply my formalization of his proposals about parsing the gestural stream to the utterances of a family homesign system, partly to test the limits and consequences of such a formal approach. Note that one immediate advantage to the mini-grammar in (1) above is that it goes well beyond the sorts of parsing criteria sometimes applied to, say, the homesigns of single deaf children growing up in hearing families, viz:

We borrowed a criterion often used in studies of ASL: Relaxation of the hand after a gesture or series of gestures was taken to signal the end of a string, that is, to demarcate a sentence boundary. (Goldin-Meadow 2003: 67)

This cautious, minimalist approach is useful, but it seems to pre-judge the possibility that sign-language elaborations (particularly the notion of fixed hand configurations – and, indeed, the notion that forelimbs and hands will be the primary articulators of an emerging sign language) will necessarily be in place in a first-generation signing system; that a monovalent notion of “relaxation” will be sufficiently delicate; or that “sentence” is the relevant sort of unit to be sought. On the other hand, it seems eminently reasonable to suppose that the movement dynamics of speakers' gestures *will* be in place, and certainly available as primary raw material for an emerging visual communicative system like the one I am about to describe.

Zinacantec Family Homesign (ZFHS)

In 2008, inspired by my colleagues at UCSD who were studying emerging sign languages in different parts of the world (see, for example, Sandler et al. 2005), I began research on a project which had been nagging at my conscience. Of the several children of one of my ritual kinsmen in Zinacantán, Chiapas, Mexico – a man from whom I had learned much over several decades of research on language and social life in that Tzotzil speaking community – three were born profoundly deaf. A fourth hearing child as well as a niece, the daughter of an older sibling, had all grown up together in my *compadre’s* extended household. With no contact with other deaf people (of whom there were none in the village, anyway) and without the benefit of either schools or an established sign language, they had developed their own manual communication system, which they agreed to let me to study, although by that time all were young adults. Figure 1 shows a simplified genealogy of the family, including all the signers. A little reflection will make clear that Jane, the oldest of the signers, was the only deaf person in her household for the first 6 years of her life. She thus developed a prototypical homesign (Feldman et al. 1978; Goldin-Meadow 1993, 2003), together with her hearing caregivers. When her younger siblings began to arrive, however, they entered a communicative universe in which manual signs were already in use, and these signs became the normal means of communication for the five youngest members of the household. They also provided the raw material for the first language of young Vic, Jane’s son, born just before I myself began to study Zinacantec Family Homesign, hereafter dubbed simply Z.

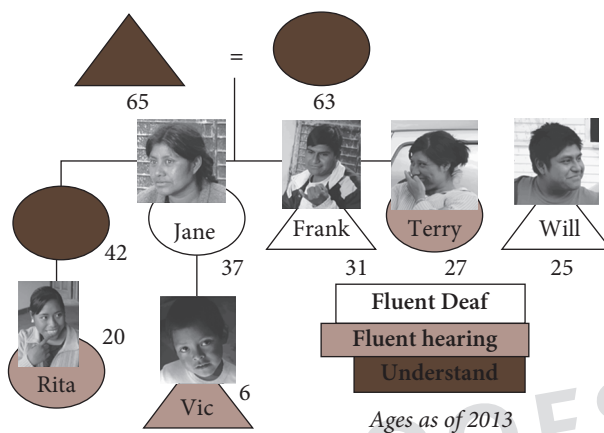


Figure 1. A mini genealogy of the Z signers

Although much of the material I have analyzed in the early stages of the research project derives from semi-elicited conversation about stimulus materials, to test how well a formalization of Kendon's "gesture phrase" model can be applied to Z I have primarily selected spontaneous, naturally occurring multi-party signing. Some comes from very simple interactions, particularly casual chat between signers who are attending a vegetable stall during the lulls between buying and selling. More complicated conversation between multiple signers, however, is especially relevant in evaluating different parsing models for Z. For the bulk of my examples I have selected the most hyperfluent, rapid, and complex Z signing I have managed to video-record, namely competitive male joking talk between the two brothers Frank and Will, who probably spend more of their time signing in conversation with each other than any of the other signers, hearing or deaf. Indeed, family members insist that the two have their own "secret" way of signing – using only the face, without the hands – which they use when they do not want to be, as it were, overheard. The overall conversation from which most of these examples are drawn is about which of the brothers is likely to be selected to accompany a hearing brother-in-law on a flower-selling expedition to the Chiapas coast, a prized opportunity for the deaf men who rarely leave their highland village at all, let alone have a chance to earn reasonable money.

Applying the formal phrase-structural model to the signing stream in such a case offers several clear advantages to the analyst. First it provides a formal (and thus non-notional) rationale for parsing the communicative stream into a hierarchical structure of formally comparable elements, thus removing some of a temptation all too common in studies of both sign language and gesture, namely, to assume in advance what should be most problematic in the analysis of any "exotic" communication system: the nature of systematic categories and the "glosses" that attach to them. Secondly, the more delicate parsing that allows different levels of "constituency" at least to be hypothesized – i.e. positing not just "sentence" boundaries but other sorts of phrasal juncture – and a tentative associated hierarchical organization provide a certain motivation for postulating utterance-internal structure. Third, keeping track of the different phases in the production of signed "phrases" allows us to study the temporal dynamics of unfolding signs, rather than simply to discard this information, in the manner of standard gloss-style transcripts, where signs are simply rendered as (usually single word) "abbreviations" in some unexamined meta-language. This in turn allows us to calibrate sign production, in real time, with other interactive temporal phenomena: turn-taking, delays and pauses, modulation of mutual attention, and so on – matters I return to at the end of this chapter.

Applying PS grammar to parsing Z

To begin to see how the little PS grammar can be applied to spontaneous Z signing, I will apply it to several “gesture unit”-like spans – that is, excursions of moving limbs bracketed at the start by a preparatory movement, and ending with a retraction or return to rest position – that occur in several episodes of Z conversation, especially Frank and Will’s conversation about traveling to sell flowers. I usually present examples in parts, arranged on a kind of timeline (where time is represented in video frames, the numbers shown below the illustrations – roughly 30 per second in my videos), with still pictures and drawings illustrating the phases of movement. Above these illustrations, when appropriate, I draw suggested phrase-structural trees, following the mini-grammars sketched previously. (Think of the results less as pseudo-syntactic trees and more as provisional prosodic parsings of the sign stream.) I also offer rough glosses for the Z signs.

The first question to ask is whether the parsing suggested by Kendon’s grammar for gestures seems to produce sensible results for Z signing in the first place. Note that even trying to apply the model based on the dynamics of motion requires some notional decisions. Consider, for example, the following utterance by Frank, who is signing while also eating a piece of roasted corn. He is going to say that only three people will be chosen to accompany the brother-in-law on his next flower-selling trip. He begins in a still position, with his hands resting in his lap. What follows could easily be described using Kendon’s proposals about gesture phrases: Frank’s right hand begins an excursion up from rest towards his mouth – a clear kind of preparatory movement (shown as P_1 in Figure 2), which culminates in his hand assuming a definite cupped shape (at S_1). Frank then spits a bit of corn debris into his hand, then moving the hand away from his mouth as he prepares (P_2) for a second defined movement: Frank throws the bit of corn into a bucket across the yard (S_2). His hand then begins to return to its rest position (R).

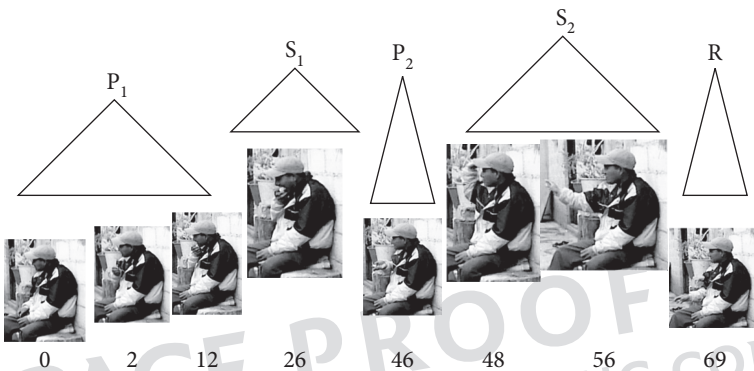


Figure 2. The dynamics of Frank's first movement

Whatever our analysis of this motion, it seems that we would want to exclude it from the system of Z signing, if only because, as the hearing signers say about this case, *mu xk'opoj* "he isn't talking" when he makes this motion; he is spitting into his hand. That is, the signers seem in most cases to make a clear distinction between motions which are "speech" and those which are not – something not strictly distinguished by the phrase structure model itself.

Frank actually arrests the retraction to rest by his right hand (Figure 2) in order to launch the next excursion of his right hand shown in Figure 3. His right hand moves up to shoulder height (P_1) and adopts a loose cupped form with a horizontally extended index finger which is rotated outward once in a circle (S_1 – a "stroke" which involves both the hand shape and a specific movement pattern). Frank then begins to open his hand and move it upward, beginning to separate the three last fingers (P_2), which he finally extends upward and out towards his interlocutor (S_2), holding the position (H) for more than a third of a second. Then his right hand also starts to return to a rest position (R), although simultaneously his left hand begins a new excursion upward. (The latter also turns out to be non-"speech" as he brings his remaining piece of corn up towards his mouth to see what's left to eat – see Figure 4.) His whole turn here – or at least the part of it represented in Figure 3 – is glossed by his fellow signers as, "Just three people will go tomorrow." Its structure, as sketched in Figure 3, fits well within the scheme Kendon suggested for parsing gesture, consisting of two interconnected gesture- or (as we will now presume to call them) sign-phrases bracketed into a single sign-unit, which takes about forty video frames or 1.3 seconds to perform.

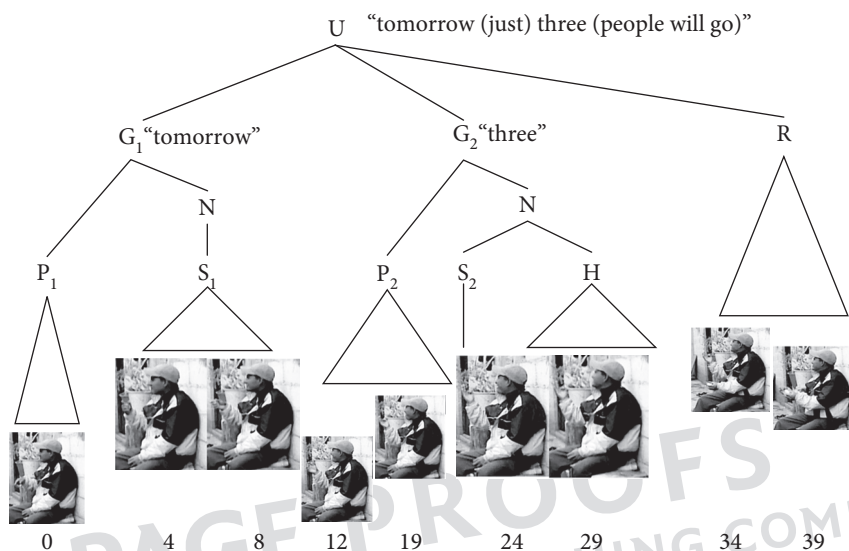


Figure 3. Frank's second movement, glossed

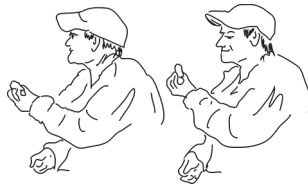


Figure 4. Frank goes on to examine his piece of corn

Problems in the definitions

Strokes

These simple examples immediately raise further definitional questions – and not just about what counts as “speech,” but about the adequacy of this PS-grammar as a whole for a visible communication system like Z. There is often doubt, as Kendon himself noted for gesture phrases, about where a preparatory movement ends and a stroke begins. If a stroke involves a determinate hand shape, then that hand shape often begins to organize itself at some point during preparation (and begins to decay while returning to rest); if the stroke involves a determinate location, then it moves towards that location, during preparation; if it involves orientation (as, for example, in a pointing gesture or a change of gaze), then it gradually achieves that orientation over the course of preparation.

More problematic, perhaps, is the fact that “strokes” themselves come in quite different dynamic flavors. One very simple typology might involve three contrasting possibilities. If a stroke is defined by a distinctive hand shape then performing the stroke is simply displaying the requisite hand shape. Or a stroke may involve a distinctive hand shape performed in a specific location (or with a particular orientation). Finally, the stroke may require a hand shape, a location, and a specific movement pattern – from one location to another, or in a characteristic orientation. These three possibilities themselves have quite different dynamic realizations.

Here is another example from Frank’s conversation with Will, which also displays what I venture to call an instance of characteristically Mayan semantics. In Figure 5, which illustrates the first couple of phrases of a much longer sign-unit, Frank is telling Will what has happened earlier that morning when their brother-in-law set out for the Chiapas coast with a truckload of flowers. He says that the fully loaded truck left the village at 4:30 am.

In phrase G_1 , Frank’s right hand comes up from rest, and he taps the back of his left wrist with an outstretched right index finger – a characteristic hand shape moved to a specific location, and an iconically transparent reference to a

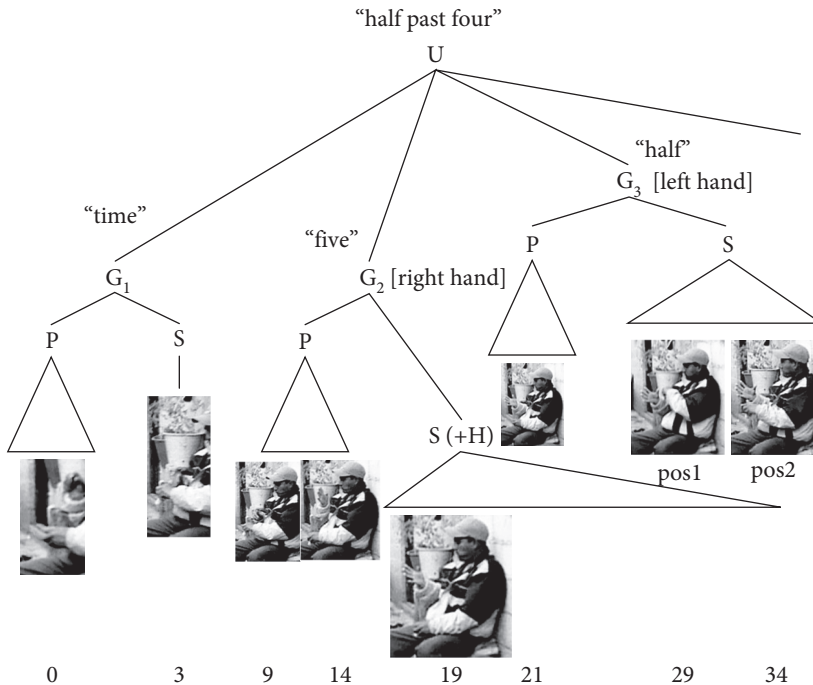


Figure 5. “At four thirty”

wristwatch as a way to sign “clock time.” In phrase G_2 , his right hand moves up to a neutral position in the “signing space” in front of his body and he displays a well-formed spread “5-hand” – meaning, not surprisingly, “five.” Frank then holds his right hand in place and, in fact, uses it as the backdrop or “ground” against which the “figure” of the next sign is performed. In G_3 , Frank raises his left hand, extends his index finger, and strokes it horizontally across the palm of his static right hand – that is, he moves it in a line from “pos(ition) 1” to “pos(ition) 2,” as shown in the figure. Thus, each stroke in this sequence has a different dynamic: the first involving movement to a point, the second merely the display of a hand configuration, and the last a complex configuration of hand shape and movement that, performed over the previous sign (which is held in place), modulates or “modifies” it. The sequence also clearly invokes chained syntagmatic relations: the reference to clock time in G_1 activates the reading “o’ clock” for “five” in G_2 ; and in typical Mayan fashion, the overlaid “cut in half” stroke of G_3 gives the desired meaning “4:30” just as, in spoken Tzotzil, *o’lol yo’obal* (lit. “half of the 5th”) means “four and a half.”

Before looking in more detail at issues of co-articulation raised by the last example, let me consider another complication about the dynamics of strokes

already mentioned in the elaboration of PS-rule (2)c'. As mentioned, Kendon has noted that strokes can sometimes be repeated (perhaps "reduplicated") as part of what would presumably be a single gestural nucleus. Different Z examples suggest that such an apparent morphological device can have a variety of effects. For example, a sign similar if not identical to that glossed as "tomorrow" at G₁ in Figure 3 can be repeated numerous times, unsurprisingly to suggest "several days later" or "a long time from now." In Figure 6, for example, Frank starts to make the sign, but he hesitates very briefly (and does a "thinking face," at S₁), and then repeats the circled finger twice (at S₂ and S₃), in preparation for performing a subsequent sign (with the head tilted to the side, cheek rested on the two flat hands, eyes closed) that means "dead" or "cemetery" (Figure 7). He holds the position for 12 frames, before re-opening his eyes and meeting the gaze of his interlocutor. Frank means to say "at the next All Saints festival" – almost exactly two months away from the date of the conversation – when he, too, expects to go on a flower-selling trip.

As a brief aside, to which I will return in the final section below, note that Frank's hesitation at S₁ in Figure 6 presents a further slight complication to Kendon's parsing proposals: it is unclear that Frank has actually completed a "stroke" when he halts his movement and pauses, evidently thinking about exactly what he is going to say. There is, however, no formal provision in the mini-grammar at (1) for a "hold" at this stage of the unfolding movement phrase.

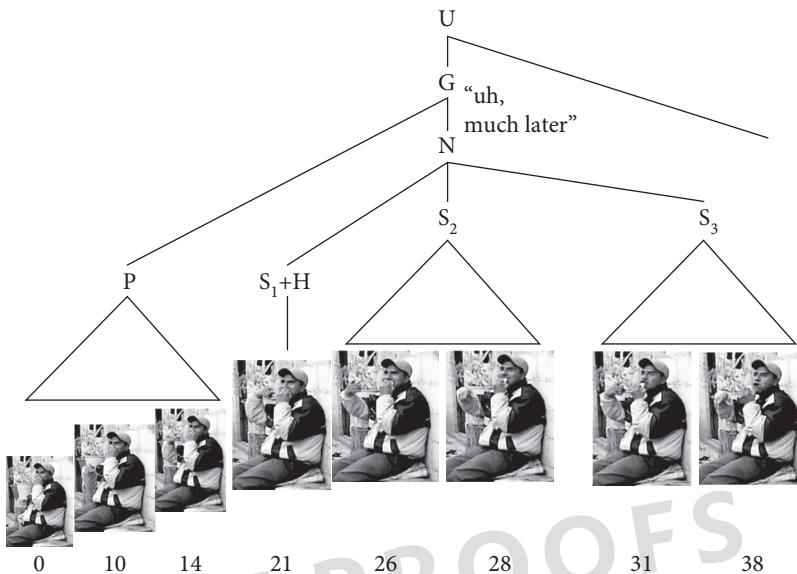


Figure 6. Frank signs "in a couple of months..."

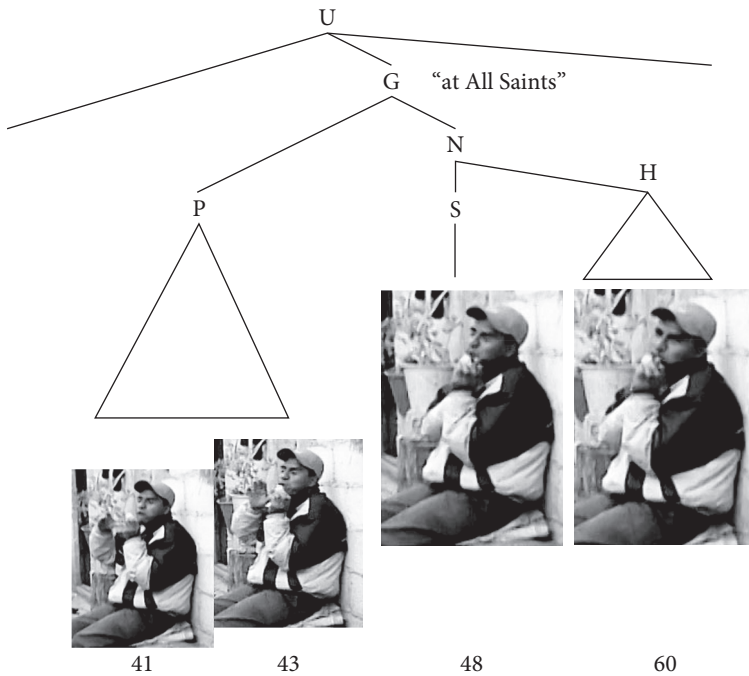


Figure 7. “At All Saints Day”

A sign involving repetitive motion that is indeterminate between “reduplication” and being an integral part of the sign itself seems a slightly different phenomenon. Towards the end of the long utterance about that morning’s early departure of the flower truck, Frank comments that it will be some days before the flower sellers return from the coastal town where they have gone. He performs two repetitions of the inward movement of a vertical cupped hand that means “come” (the first G phrase in Figure 8), before extending his hand, palm forward, back over his right shoulder in the direction from which the truck will return. In the case of the “come” sign a single inward movement sometimes suffices, and there are no clear interactive motivations – of the sort I propose at the end of this chapter – for the repetition, unless they have to do with what reduplication can mean in other languages: intensification or its opposite, repetitiveness, even plurality (as is potentially the case here, where Frank is possibly referring to the return of all the people in the flower-selling party).

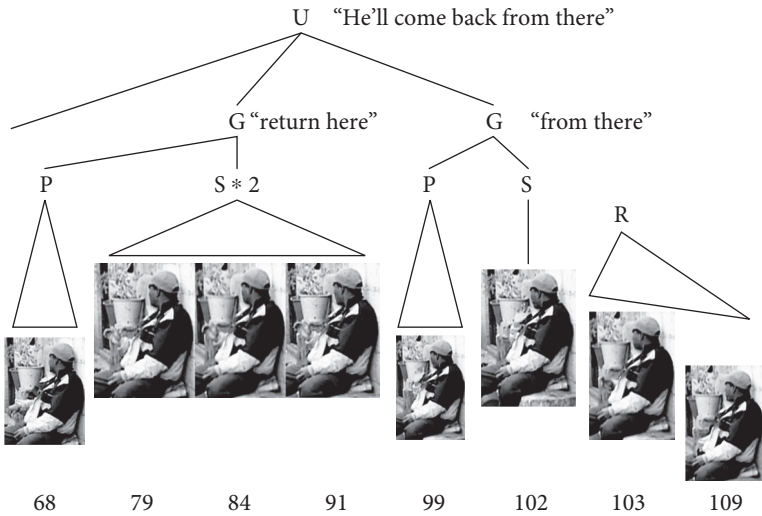


Figure 8. Frank says “(he/they) will come from there”

This sort of reduplicative effect is somewhat clearer, at least considered as a possible morphological device, in Figure 9, where Frank is talking about his plan to work very hard (he is a skilled builder) in order to earn enough money to marry and start a ritual career. The sign he uses for “work” involves a kind of pounding motion with his right fist, and his multiple strokes are glossed as “work hard” or “work a lot.” These examples reveal a layer of structure below the level of the primitive elements of Kendon’s parsing scheme, surrounding the internal dynamic of the stroke itself.

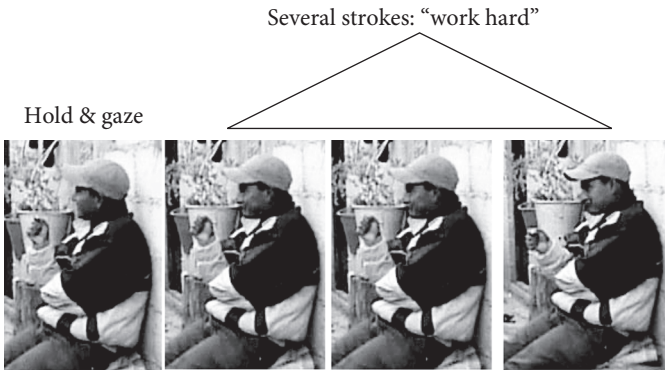


Figure 9. “I’ll work hard”

Co-articulation

As one moves to higher levels of structure in the PS-trees created by the mini-grammars postulated in (1) and (2), at least two more phenomena appear to complicate the formalism – co-articulation and different types of juncture. Let me introduce these issues briefly before concluding with notes about a still higher level of structure involving links between co-participants' turns.

Problems with how to represent co-articulation in Kendon's gesture-phrasal scheme stem from two sources. First, Kendon himself in his published work gives only sketchy information about how the phenomenon should be treated, limiting himself in Kendon (2004a) to only a couple of examples, and presenting instances involving only the forelimbs (usually taken as a kind of single composite articulator) and the head.¹ This may be a result of the fact that in many speech communities, speakers' gestures are relatively simple, involving few parts of the body, and, indeed, only a few distinct hand shapes (Kendon 2004b). Second, the formalism as presented in (1) and (2) has really no adequate device for dealing with co-articulation at all, unless it be simply adding an additional set of PS-trees for each articulator as it springs into action and subsides to rest, and relying on a mechanical expedient (such as a shared timeline) to link the contemporaneous actions thus represented. No notion, that is, of mutual synchrony, or even mutual interdependence is part of the theoretical apparatus. Such synchrony as appears thus seems merely a coincidence in timing.²

It is clear from even the few examples of Z signing we have met, however, that the interrelationships between different articulators must receive some principled treatment. In Figure 5, for example, we saw how a phrase with the right hand – an outstretched “5-hand” – becomes the stage on which a subsequent phrase with the left-hand – the “half” stroke – is played. The two are clearly interdependent, both in their unfolding physical dynamic and in their composite meaning. The fact that they overlap temporally is thus not coincidence but design.

1. The synchrony that Kendon was principally concerned with, in developing his suggestions about parsing the gestural stream, involved the coordination of motion and speech. In a parallel way, matters are complicated further in Z by the fact that, since just three of the signers are deaf, the full repertoire of signing makes considerable use of vocalizations, especially in utterances addressed to hearing signers. Treatment of these vocalizations and their place in Z signing must await another occasion.

2. The same comment applies to Kendon's remarks about the temporal coincidence of different parts of gesture phrases and tone units in speech, although he uses the empirical fact of such coincidence to motivate speculation about the mechanisms of utterance – a phenomenon that rises to the level of a central theoretical plank in, for example, McNeill's (1992, 2005) program of gesture studies.

This phenomenon – one sign with its own set of articulators providing a ground to the figure of another sign with different articulators – seems different in kind from another, probably simpler and more common sort of co-articulatory overlap. For example, the multiply articulated “All Saints” sign in Figure 7 requires a structured conjoint performance by the two hands, the tilting head which rests on them, and, finally, the closed eyes. Here a single signed ensemble combines all of these articulators at once (although each has a slightly different dynamic of “excursion” to produce the composite whole). For a very young sign language like Z, such conjoint signs seem to be especially common, the product of an apparently productive strategy of enactment in which characteristic patterns of motion and action are adopted as the iconic basis for conventionalized signs. Such patterns of action can, in Z at least, recruit quite a large range of body parts to a signed enactment: the hands, head, and face – including the eyes, eyebrows, mouth, and tongue – but also the shoulders, the entire trunk, the legs and feet.³ (In Z signs the feet are surprisingly prominent, although I assume that because of constraints on visibility and attention, their actions are often inferred rather than directly observed.) Each of these articulators has a different spatial range in which it can move, a slightly different set of ballistic properties (if “ballistic” is even the right word for relatively fixed body parts like the head or eyes), as well as different possible “rest” positions on which the bracketing of a gesture-unit is ultimately based, in Kendon’s formulation. Partly as a result of these differences, and probably also because of the deliberate packaging of different elements of iconic enactments (for example, only closing the eyes after the tilted head has been rested on both hands, as in the “dead” pantomime that figures in the sign for All Saints Day), the synchrony of the different movement of co-articulators is complex: the preparatory phase of one, for example, may coincide with the retraction of another, so that any simple parsing of the timeline will be complicated by these mutual articulatory interactions.

I can illustrate some of these issues with Jane’s signing, taken from a very simple interactive context in which she is helping her hearing sister and niece at their vegetable stand in the Mexican town near their home village. As the oldest signer, Jane’s signing is in some ways simpler than that of her siblings, and it gives hints about how the sign system of Z may have developed. Some of the issues about co-articulation I have just mentioned are clearly illustrated in even the following short utterances spontaneously produced by Jane in a brief episode of casual chat between the sisters as they sit waiting for customers to appear. The

3. Z, a very young sign language with exuberant use of pantomime, thus does not seem to accord with Napoli and Sutton-Spence’s remark (about ASL and BSL) “that the use of the feet is highly marked in sign languages and would only be accepted in language play or other exceptional situations” (2010: 653).

illustrations that follow also give more detail about the internal structure of the phases of movement that constitute Jane's sign-phrases.

Jane's first sign-unit is complex. It is bracketed by rest positions, and it contains four distinct sign-phrases. Of these, two are articulated with her hands, and two with her mouth. The overall structure is shown in Figure 10.

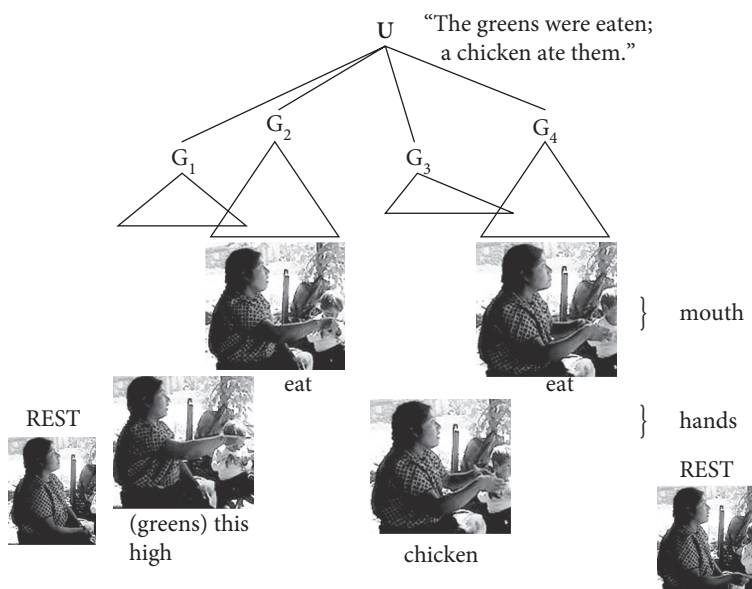


Figure 10. Jane signs “The greens were already this high when they were eaten by a chicken”

In Figures 11 and 12 the temporal unfolding of G_1 is shown in more detail. Jane performs the sign with her right hand; she shows the height of an inanimate object, probably a plant, which is inferred to mean edible greens (perhaps because that is what the girls have just been selling at their vegetable stand). Jane lifts her hand and extends the right index finger. Gazing at her hand she brings it up to what seems a definite intended height in front of her (Figure 11). At that point she gazes at her interlocutor, while holding the hand in position, glancing back down at it and then again at her interlocutor (Figure 12). The hand movement is thus itself parsed by the moving gaze, as Jane uses her eyes both to check her interlocutor's attention and, one supposes, simultaneously to redirect it.

While still holding her right hand forward with an extended index finger, Jane also makes a series of opening and closing movements with her mouth (Figure 13). As she does so her index finger begins to relax, and by the time she opens and closes her mouth for a third time, the left hand has come up and both hands begin to move together – a simultaneous recovery of one hand and preparatory movement of the other.

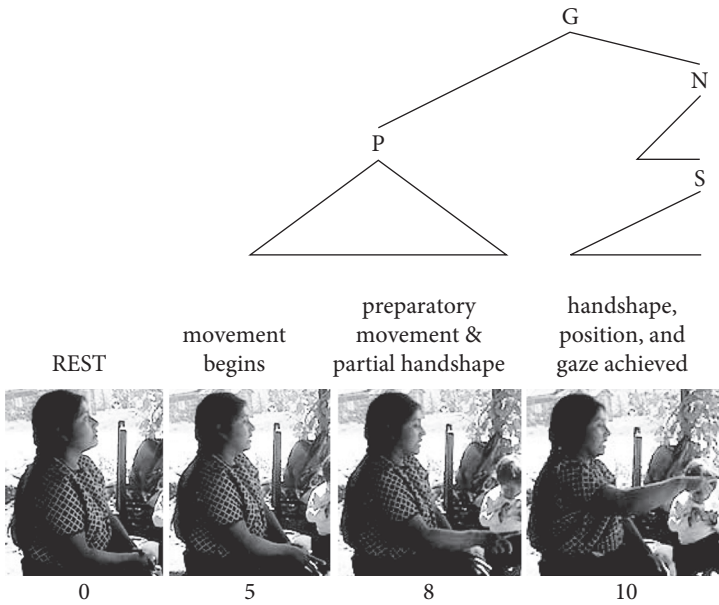


Figure 11. Jane lifts her hand to sign “greens”...

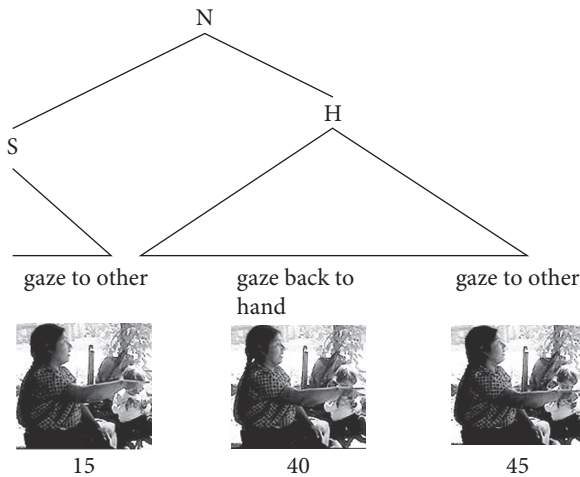


Figure 12. ...and checks her interlocutor’s attention

Jane’s hands at this point come together to form what is, in Z, a characteristic specifier for nominal expressions denoting small domestic animals. She forms the fingers of the hands into a loose ring, of about the right size and shape for holding what she intends to refer to: a chicken – the culprit responsible for the demise of

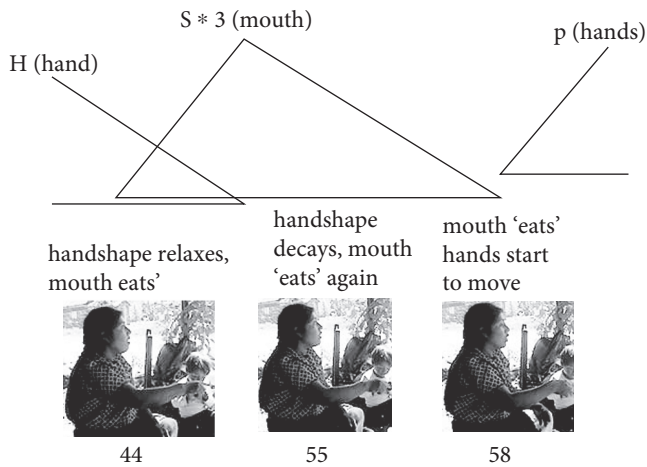


Figure 13. Jane signs “eat” with her mouth as both hands transition in and out of signs the greens in question (Figure 14). Once again she holds this hand configuration, engaging her interlocutor’s gaze. And once again she mouths an eating motion, twice, before relaxing hands, mouth, and face back to rest.

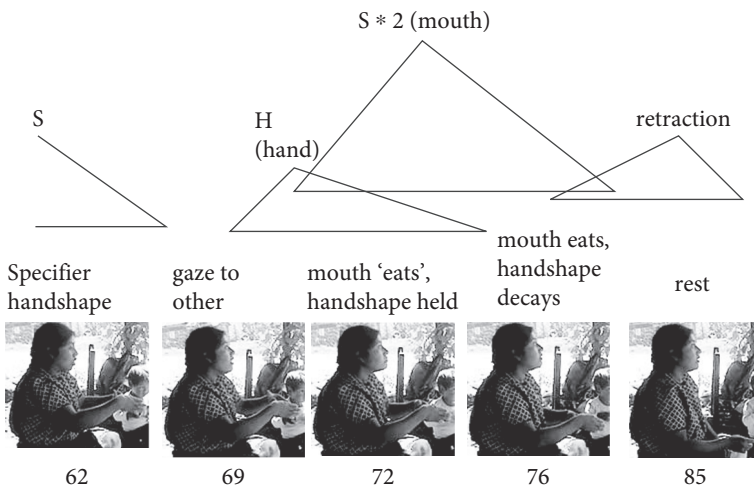


Figure 14. Jane signs “chicken, eats”

To repeat, in this overall sign-unit, there are two manual signs: one referring to the edible greens (and their height), the other to a chicken. Both are linked to “eating” signs made with the mouth (and note that the latter, too, involve the reduplicative mechanism – repeated opening and closing of the lips – described earlier),

although the linkage between the signs is not achieved by complete simultaneity. (See again Figure 10.) Both hand signs also involve holds, giving Jane sufficient time both to perform the associated sign with her mouth and also to check her interlocutor's attention via gaze. Then her hands return to a rest position, bringing the sign-unit to a close.

Jane goes on, after a very short pause, to elaborate with a second sign-unit – a pointing gesture back over her shoulder in an as-the-crow-flies direction (Figure 15) – that she is talking about events at home in the village (see Haviland forthcoming).

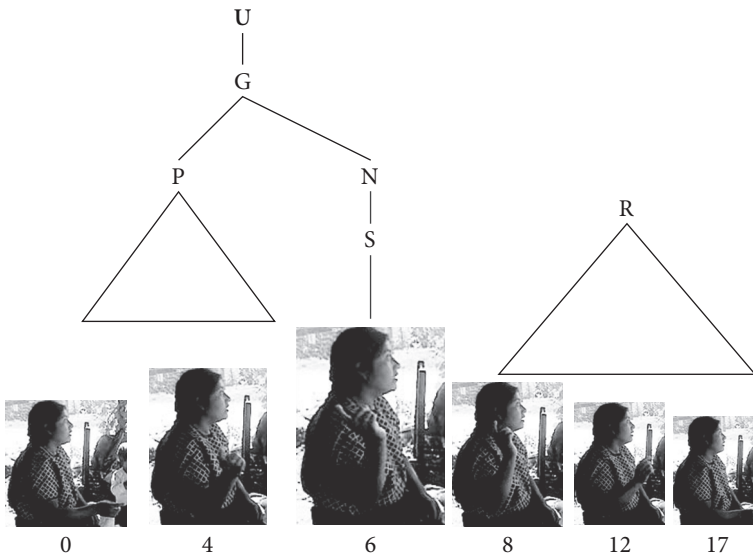


Figure 15. Jane points over her shoulder in the direction of home

Because Jane's interlocutor is not visible on the videotape of this part of the conversation, it is impossible to know whether and how she may have reacted to Jane's news. Jane does follow up, however, with three subsequent utterances, each its own sign-unit by Kendon's parsing principles. The first appears to repeat her "eat" verb with a different sort of enactment, which also involves co-articulation (or which, at the very least, involves the mouth as a significant sign-location). She brings her right hand, with bunched fingers, up to her mouth, repeating the motion twice (Figure 16).⁴

4. Although the syntax of Z clauses is beyond the scope of this chapter, note that the two relevant arguments of this putative verb "eat" have already been introduced in the previous utterance, although little in that earlier sign-unit indicated the relevant argument structure.

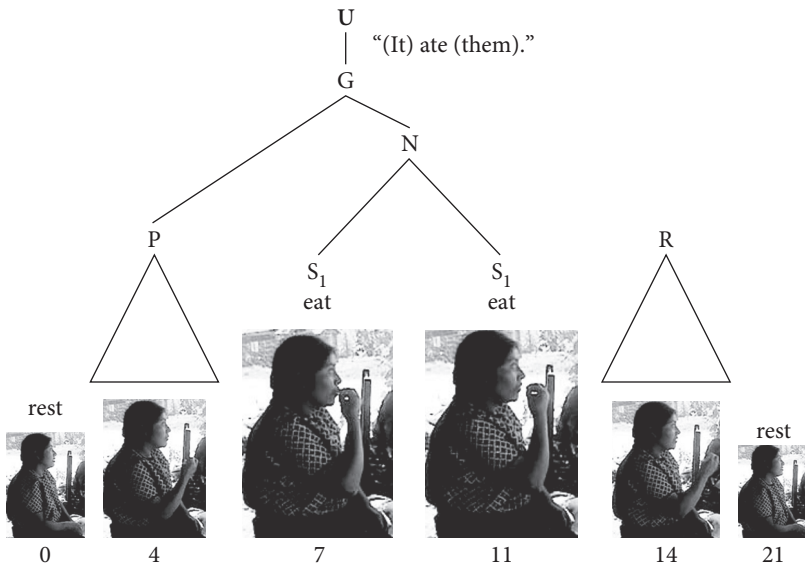


Figure 16. Jane signs “eat” with her hand

She goes on to repeat her characterization of the size of the greens – and note that she again gazes at her outstretched finger and then checks her interlocutor (Figure 17).

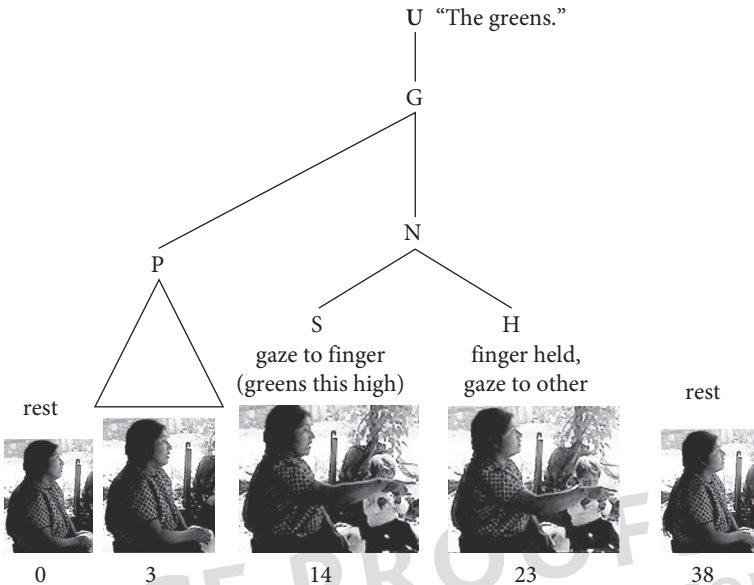


Figure 17. Jane signs “greens this high” again

She then turns to her other interlocutor (who is holding the video camera) and repeats to her that she is talking about events at home in the village. As she finishes this remark her hand retracts not to its original rest position but to her face, almost as though she is about to sign something further but then decides against doing so. She holds her hand in that position and turns her gaze away (Figure 18).

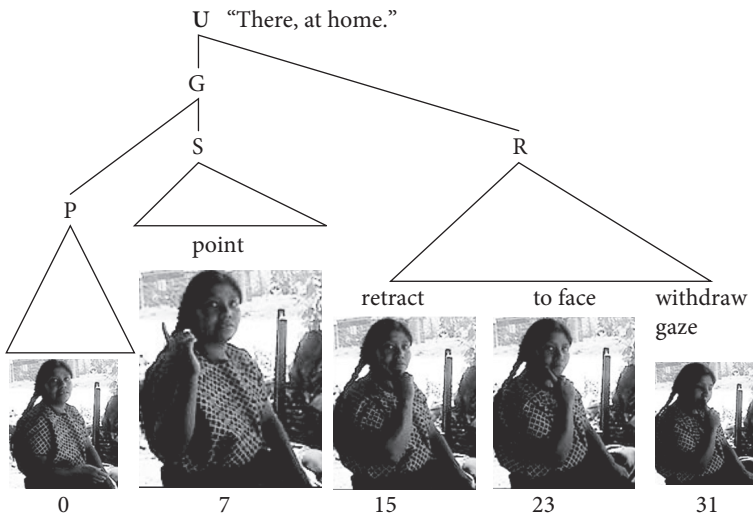


Figure 18. Jane signs "at home" and turns away

Junctures

This speculation about what Jane "might have intended to do" at the end of her last utterance – whether the final "return" movement of her signing hand to her face possibly suggests an intention to continue signing, which she ultimately abandons – introduces a penultimate issue about the internal construction of sign-units: the nature of possible internal "junctures" within units bracketed by "rest" position. It also leads indirectly to the final section below about interaction and turn-taking.

By definition, Kendon's parsing scheme divides the signing stream up into major units, comparable to his "gesture units," which correspond to "excursions" of the signing articulators from rest to rest. The presumption is that these major units have sufficient formal completeness to be treated as units of some basic sort; one could orient further studies to the "discursive" coherence between them. For example, Jane's whole little story about the edible greens and the chicken – including her apparent final clarification to a second interlocutor – could be represented as in Figure 19.

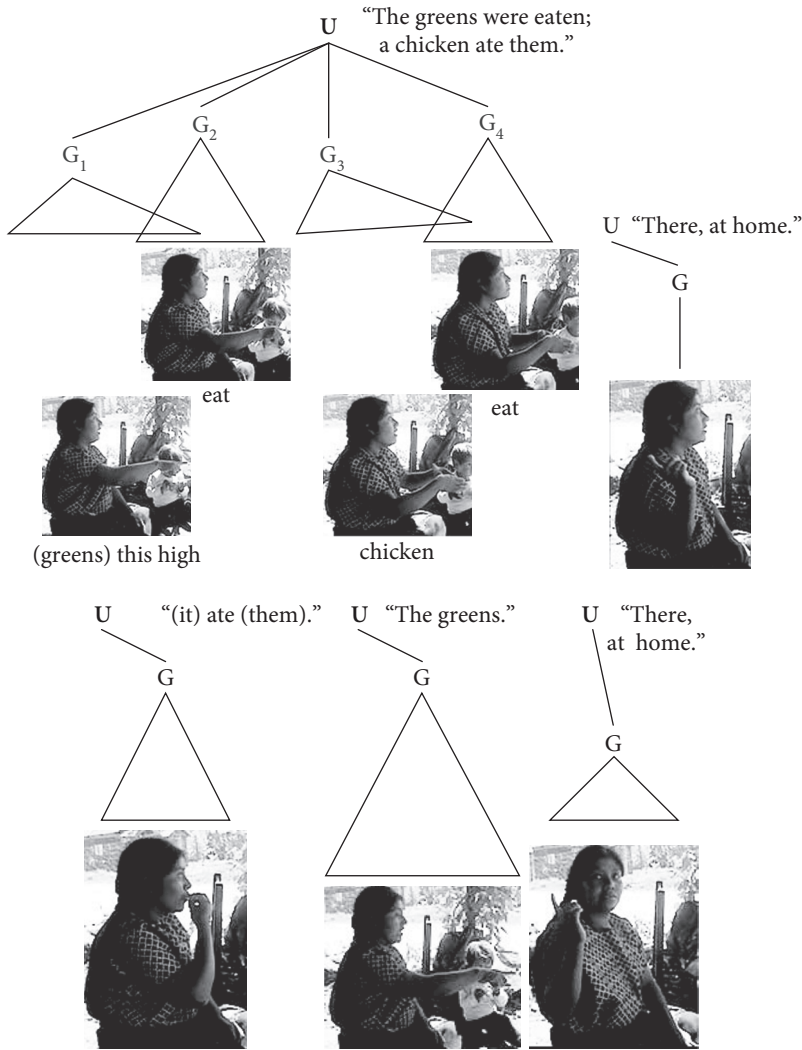


Figure 19. A representation of Jane’s full mini-narrative

I cited above Kendon’s suggestion, in connection with Enga sign language, that such phenomena as “partial recoveries” – where a sign articulator appears to begin to move towards rest position, but then starts a new excursion – may represent internal divisions within sign-units. In particular he suggests that different kinds of transitions or junctures – “how they are behaviorally marked” (1980, Part III, 265), I might add, both by signers and *interactively by their interlocutors* – suggest different hierarchical groupings of signs into phrases.

Within an extended sequence of signs, phrasal units may be recognized where *partial recoveries* occur between sign enactments. That is to say, if an articulator, having completed a sign at a given location, moves directly to the next location of realization, the two signs so juxtaposed are closely linked; they belong together in the same phrase. On the other hand, if an articulator, having completed a sign at a given location, moves part way towards a resting position before embarking upon a new excursion to the next location of realization, the articulator is regarded as having engaged in a *partial recovery*. Such partial recoveries may be devices whereby phrase boundaries are marked, for it is in conjunction with them that the signer may glance at the interlocutor who, at this point, is highly likely to offer a head nod.

(Kendon 1980a, Part III, 265)

As we have seen, a sign-unit in Z can range from a single phrase (with a preparatory movement and a single “stroke”) to a string of phrases, with different sorts of internal structure to the phrasal nuclei. Jane’s complex initial sign-unit, although formally containing four slightly overlapping individual sign-phrases with three different articulators (the right hand alone, both hands together, and the mouth), seems to exhibit a two-part structure, each part consisting of a motion of the forelimbs together with an apparently associated mouth movement.⁵ Partly this internal structure is suggested by the hold after each forelimb stroke, during which the co-articulated mouth movement is executed. This suggests that a “hold,” too, can potentially represent a juncture *within* a sign-unit.

Several other formal features of sign-movement seem to suggest different types of junctures. There are Kendon’s “partial recoveries,” in which an articulator appears to start to return to rest position, only to begin a new excursion before reaching it. There are “post-stroke holds” (Kita 1993) when a stroke is performed and then the articulator freezes in position for a perceptible lapse of time. There are other sorts of pauses in motion – both in preparatory movements (as we shall shortly see), and in recovery movements. There are also different kinds or degrees of “rest” position, as illustrated by Jane’s retraction of her hands to her face, whence, one imagines, they will eventually also move away. Conversely, a major point of the mini-grammar in (1) is to distinguish closer links between some sign elements than others: the close bond between a preparatory movement and its following nucleus, or between the elements within a gestural nucleus. In Z we have also identified other potential kinds of close binding: the repetition or reduplication of strokes (e.g. in Figure 9) is one example; another might be the close apparent connection between a specifier and a following characterizer (see Haviland 2011, 2013b) as in Figure 25 below.

5. Exactly how to interpret this structure with respect to the notional arguments defined – the greens, and the chicken – and the apparent predicate “eat” is an important linguistic matter beyond the scope of this chapter; but see Haviland (2011) and (2013b).

Complex multi-stroke units

Consider, for example, the long sign-unit bracketed by full rest position where Frank describes the departure of the flower truck. We have already come across several pieces of this long utterance, which starts with the sequence of signs (a total of three strokes) for “4:30 am” in Figure 5, and ends with the anticipation of the flower-selling party’s return in Figure 8 (a sequence of four strokes, some rather complex). In between these two end points Frank never fully returns to a rest position, and he performs another six strokes. These can, however, be grouped together by the separating junctures. Immediately following the “4:30 am” sequence with virtually no pause Frank produces the phrases shown in Figure 20.

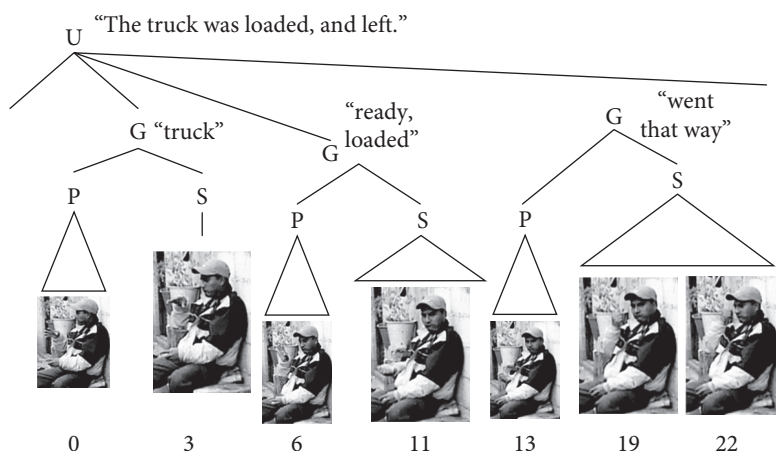


Figure 20. Frank signs, “the truck was loaded, and left”

His last sign uses the fist he has just produced in signing “loaded/ready”; he brings the fist up to point with his thumb over his right shoulder, which represents the cardinal direction in which the truck headed – the flower-selling destination on the Chiapas coast, figured as the crow flies from where Frank sits in his mountain village (Haviland 2013a).

What follows is what I interpret Kendon to mean by “partial recovery.” Frank starts to bring his right fist down, as though he intends to return his hand to the resting position. (See the R phase at the leftmost part of Figure 21.) As Frank’s hand reaches the middle of his trunk, however, the downward trajectory is arrested, and the hand adopts a kind of curved B-hand shape in front of Frank’s belly. This is the Z conventional sign-name for the signers’ father (who has a prominent paunch), thus “Dad.” The phrase continues with “tomorrow” and a conventionalized negative finger-wave.

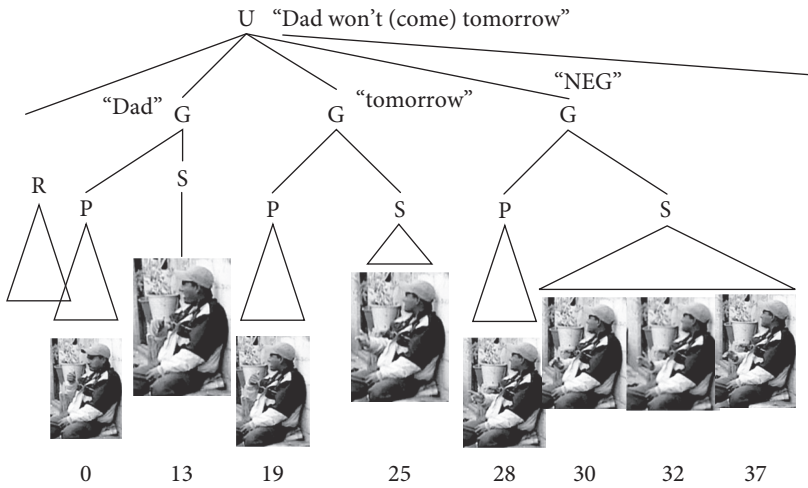


Figure 21. Frank continues, “Dad-tomorrow-NEG”

As he starts to move his hand from the end of the negative wave into the first part of the outward hand rotation sequence that means “day after tomorrow” shown at the start of Figure 22, there are several microscopic pauses or delays. The final leftward phase of Frank’s wagging finger is shown as ending at frame 37, and a full third of a second has elapsed before his hand has begun to adopt the horizontal extended index-finger hand shape of the “later/next day” sign.

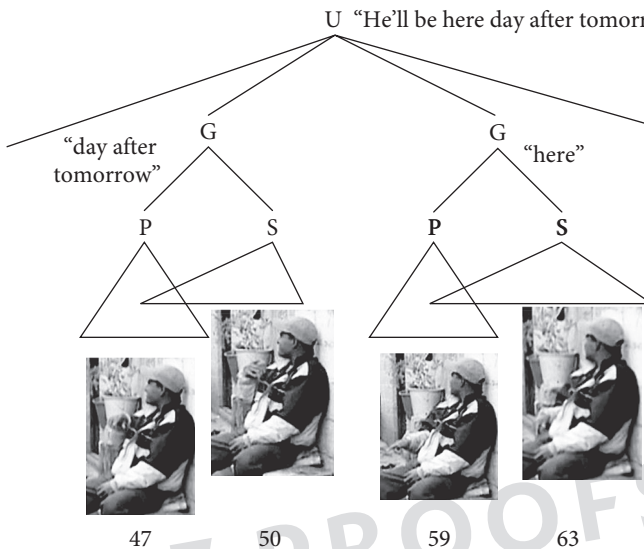


Figure 22. Frank signs, “Day after tomorrow (he’ll be) here”

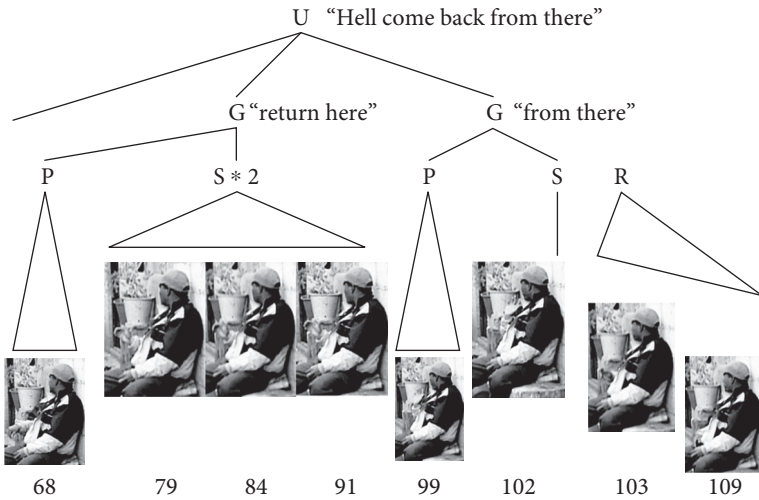


Figure 23. Frank signs “He’ll return here from there”

overlapping sub-trees at the P and S phases of this sign-phrase, partly to show that it is not exactly clear where this slow preparation ends and the defined stroke for “day after tomorrow” begins.) The downward pointing gesture “here” that ends this 2-stroke sequence moves directly into the final signs shown above in Figure 8.

The entire utterance, divided in sub-parts as defined by these unit-internal junctures, is represented in Figure 24. How, if at all, such formal facts might reflect a syntactic parsing of Z signing, or predicate and argument structure, is a matter of considerable interest; analysis of such phenomena is enabled precisely by applying the formal phrase-structural grammar to the Z material to isolate the equivalent of “prosodic phrases” and begin to construct a model of how to calibrate these with putative syntactic elements and categories.

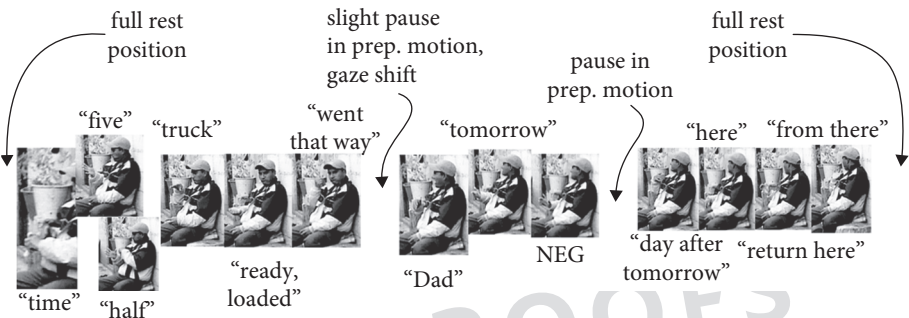


Figure 24. Frank’s whole sign-unit, parsed

Synchronization and interactive structure

Early in his gesture studies Kendon distinguished utterance parts, both in speech and in movement, which had what he called a “regulatory” function in organizing interaction. Some gesture sequences he characterized as “parentheticals” or “footnotes” (Kendon 1972: 193), and, as we have seen, he remarked that it was at “phrase boundaries” in Enga signing that “the signer may glance at the interlocutor who, at this point, is highly likely to offer a head nod” (1980a, Part III, 265).

As mentioned, much of the apparent motivation for Kendon’s early proposals about the dynamics of gesture phrases was to track the synchrony between phases of visible movement and the contours of the accompanying speech. Kendon notes that sometimes speech pauses after a particular word, and that during the pause the speaker completes certain gestural actions apparently linked to that word; and that conversely, sometimes there is a pause in speech before a particular word, that allows a manual action to catch up to the speech stream and produce a stroke corresponding to the delayed word. Of these pauses, Kendon observes that they do not appear to be lapses, for example, in a speaker’s production – not, for example, “word searches”:

They appear, rather, to be pauses introduced to permit a coordination between word and stroke that produces the semantic coherence [between word and stroke] we have noted. (Kendon 2004a: 119–120)

In the case of an emerging sign system like Z, of course, since speech is not part of the equation (although some vocalizations are), there is not a speech stream with which visible movement can be coordinated. This hardly means, however, that coordination between different phases of motion is not possible, and this becomes especially obvious when one imagines coordination not just between different sign articulators, but between interactants as well.

Consider again the coordination between different speakers’ actions, as illustrated in Jane’s “edible greens” sequence shown starting in Figure 11 above. During the entire preparation, stroke, and hold sequence Jane employs her right hand, outstretched with extended index finger, at a specific height above the ground. Furthermore her gaze follows the finger as she extends it, then moves to her interlocutor, then back to the outstretched hand, and finally back to her interlocutor a second time before she continues with further signing. The temporal span of the movement, then, involves both the time required to get the hand into position and also the time required to check and signal attention interactively with her conversational partner – in fact, to do so twice. All of this happens before Jane starts to sign “eat” with her mouth. The overall dynamic suggests that

Jane's signing is timed so as to allow her gaze to survey both her hands and her interlocutor in the way she does.

I noted above, in connection with the utterance in Figure 6, that Frank appears to hold a preparatory movement before actually executing its stroke, a formal possibility not contemplated in the PS-grammar in (1). One has the impression, watching Frank – thinking ahead to All Saints Day when he will next have the opportunity to go flower selling – that he is hesitating as he thinks into the future, and thus pauses in his gestural execution. The movement pattern here suggests a signed analogue of speaker self-repair, a frequent feature of conversational talk.⁶

That this is not an isolated example can be illustrated with another apparent “hold” at precisely the same point in a sign-phrase. Here the pause seems to be motivated by conversational or interactional rather than (perhaps) “speech-planning” considerations (if it is even sensible to make such a distinction).

In Figure 25, Will is about to tell his interlocutor about something his young nephew Vic has done. Will's turn, like many by the Z signers, begins with a conventionalized pragmatic turn-opener at G₁: a stylized wave directed at the interlocutor, and routinely glossed into Tzotzil by consultants as *k'elavil* “look and see” or even *kaltik ava`i* “listen, let me tell you” (Haviland forthcoming). Normally, the sign, which I usually gloss into English as “HEY!,” is followed without pause or recovery by the rest of the utterance; it therefore serves as an initial sign-phrase in a longer sign-unit. However, his interlocutor's gaze is elsewhere when he begins, and Will must thus wait until he retrieves his interlocutor's attention before launching into his utterance, which will start with the name-sign for Victor. This name-sign concatenates a specifier for human beings (a palm down flat B-hand, at the stroke of G₂) with a deliberate move of the hand down to show the short stature of the little 4-year-old (G₃).⁷ Will does not retract his waving hand to a rest position but instead raises it high in the air (see the P phase for G₂ in Figure 25), and holds it there, partly in preparation for the following “height” sign which forms part of the proper name for Victor,

6. On repair, see the classic formulation in Sacks, Schegloff, and Jefferson (1974). Repair is rarely described in speaker's gestures (but see, for example, McNeill & Duncan 2000; Chen, Harper, & Quek 2002; Seyfeddinipur 2006) and does not seem to be directly contemplated in Kendon's (2004a) description of the gesture unit.

7. This tightly bound combination of specifier and characterizer is another example of the sort of close internal morphological structure that is probably not adequately captured by a sequence of independent G-phrases.

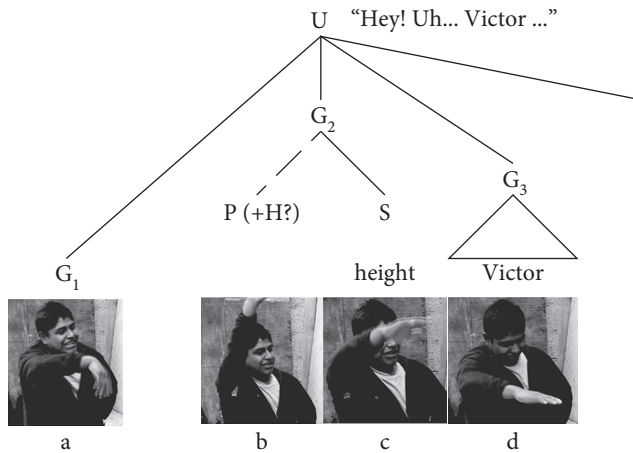


Figure 25. Will holds a preparatory movement, waiting for his interlocutor's gaze

and partly as a turn place-holder (not unlike the protracted *uh* of English, *este* of Spanish, or *ali* of Tzotzil) to signal that he is in the middle of a candidate turn. The movement is thus held, not at the end of a “stroke” but rather between strokes or, perhaps, at the end of a preparatory movement; and the length of this “hesitation” seems to respond not to grammar, but rather to the interactive engagement of Will’s interlocutor.

Thus, in much the same way that in Kendon’s original formulation, apparently independent movement phrases and sequences of sounds are synchronized, using different kinds of flexibility afforded by the production of each (thus delaying a word here or a movement there to bring about the desired coordination), the unfolding dynamic of sign-units seems to respond in part to the same sort of goal, writ large over the mutual interaction of different interlocutors. Synchrony is a prime interactive achievement, and excursions of signed articulators are engineered to make it possible. This is, once again, a result that Kendon anticipated quite early in his writings about gesture:

... positioning of the head, limb, or body can clearly serve as an advance warning of what is to come and may be part of the system of “floor-apportionment” signals which assist in regulating interchanges between interlocutors.

(Kendon 1967; 1972: 207)

It is therefore illuminating to look not only at the unfolding of a single signer’s phraseology, but so see how interlocutors mutually synchronize their actions so that they interdigitate and interact in the ways they intend.

Let us thus return, for our last examples, to Frank's conversation with Will about the flower-selling excursion. The conversation between the two brothers, as I remarked at the outset, is characteristic of a genre of competitive male joking speech – frequent between these two brothers – about getting ahead in life, having adventures, and become worldly Zinacantecs. The entire little discourse that Frank offers, summarized in Figure 24, is addressed to Will (as well as to their niece Rita, who is filming the interaction). Although it may not be obvious from what he says, Frank is actually a bit annoyed and jealous because he has not been invited to accompany the flower sellers on their trip that morning. Will, however, is not fooled, and as Frank finishes his long and complex utterance, Will makes a mocking comment, making fun of his brother's jealousy. I have translated the comment – which Will essentially performs just by pointing at Frank with an appropriate expression on his face – as “you're useless,” in turn a rough gloss of a variety of Tzotzil equivalents offered by the hearing signers (for example, *k'u yu`unot* “what's wrong with you?” or, literally, “what's the reason for the way you are?”). Figure 26 shows Will and Frank facing one another (somewhat indirectly), eating corn, as Will makes his disparaging remark.



Figure 26. Will mocks Frank

Will has allowed virtually all of Frank's long turn to unfold before venturing a comment. As I have tried to diagram in Figure 27, it is precisely at the moment that Frank finishes the stroke of his final sign (G_1) (and is gazing now at Will, presumably expecting some feedback) that Will obligingly begins to prepare his mocking gesture. He leans his body back, turns away with a derisive expression on his face, and begins to lift his arm – the latter preparatory movement coinciding now with Frank's retracting his signing hand to

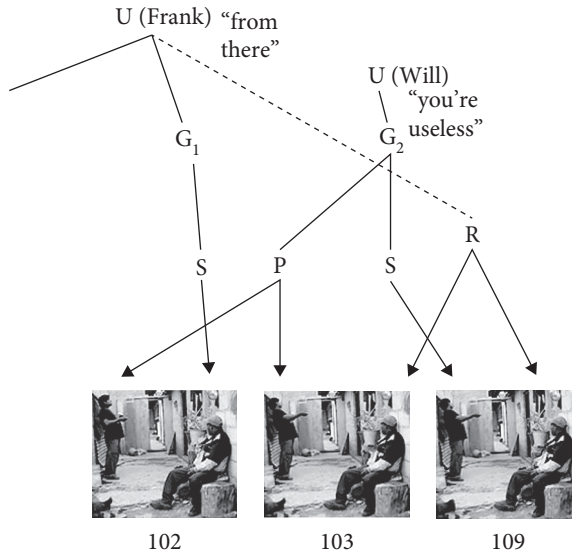


Figure 27. Will times his disparaging comment to occur exactly with the end of Frank's signing

a rest position. Finally, the main stroke of Will's "you're useless" sign at G₂ occurs almost exactly at the point that Frank's movements subside to rest. The dynamics of preparation and recovery – and the possibility of both extending and foreshortening the movements involved – allow interactants to achieve such tight synchrony of turns.

The timing and structure of an unfolding utterance in Z is, as I have already suggested in describing interactional "repair," in part dependent on an interlocutor's attention. Consider now the interaction surrounding Frank's hopeful boasting about how he will work hard, earn money, and find a wife with whom to serve in ritual office, of which we saw a part in the discussion about Figure 9. In the following examples I recapitulate both how Frank formulates his dream for the future and how Will receives it. Figure 28 shows the beginning of Frank's turn, during which, as it transpires, Will – who seems ostentatiously to be concentrating on his corn cob and not paying attention to his brother – is actually about to call Frank's whole prospective scenario into question. Frank talks about working hard, and then as he apparently prepares to start the next sign, he pauses – holding up his right index finger – and watches his interlocutor, noting his lack of eye contact.

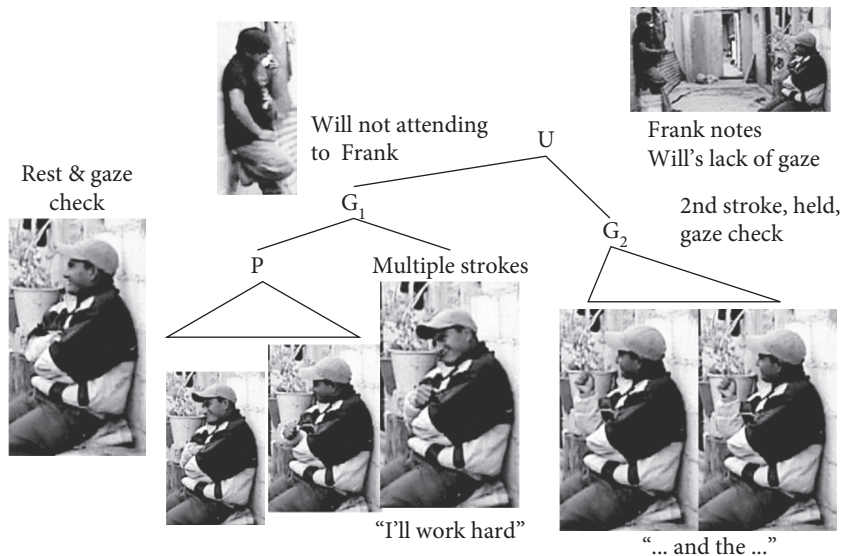


Figure 28. Franks starts signing but sees that his brother isn't watching

Interestingly, it appears that Will – although seemingly staring at his corn – has seen perfectly well what Frank was signing, as he goes on to reproduce in miniature Frank's "work hard" sign with his right fist precisely as Frank pauses in his signing and gazes at him (see the leftmost panels in Figure 29). At this

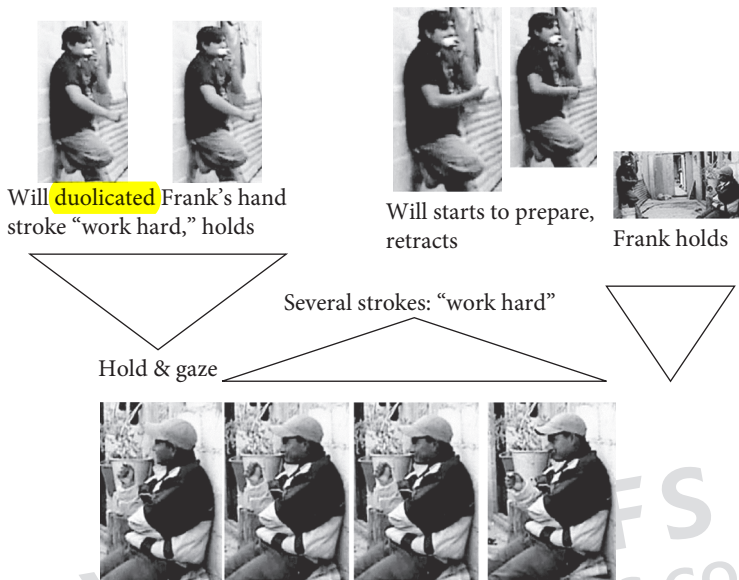


Figure 29. Will shows he is watching, and Frank recycles the first part of his turn

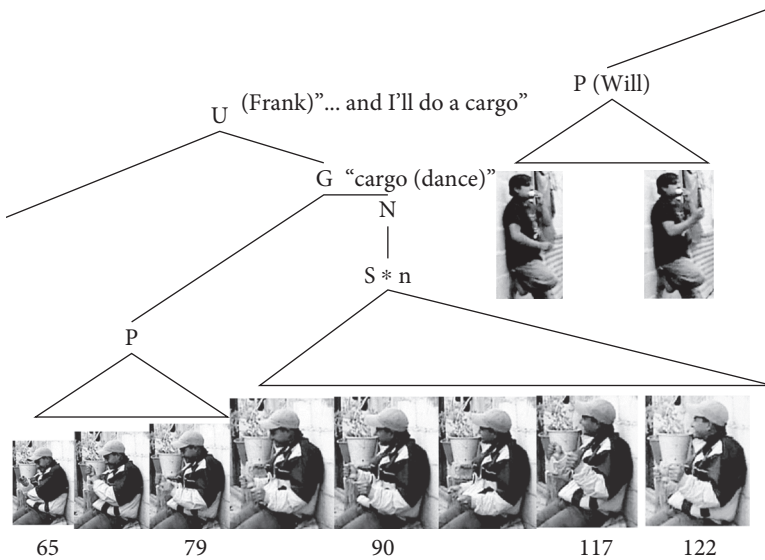


Figure 30. Frank brings up both hands and signs that he will perform ritual service

point, Frank recycles the whole “I am going to work hard” sequence – a repetitive series of strokes with his right fist. Will appears to be about to break in with a comment, which he then retracts as Frank holds his position at the end of his phrase. Note here a possible interactive motivation for multiple reduplications: not just to repeat a sign for some referential effect (marking plurality, for example), but as a timing device which allows Frank to maintain the floor, or to extend a phase of movement in order to achieve some other sort of coordination with his interlocutor.

Frank now continues, preparing both of his hands to pantomime the little dancing motion that denotes service in a position in the ritual hierarchy of the community. He is still in the midst of this multiple stroke dance when Will begins to prepare a retort, bringing up his own right fist – which he has been holding in place since first indicating to Frank that he was following the latter’s narrative – and beginning to extend his first two fingers (Figure 30).

What happens next is complicated, and it points to a further parsing deficiency in the PS-grammar in (1). Consider first Will’s contribution, shown in the top half of Figure 31. He forms a V-hand – the Z sign for “two” and also for “couple” or “marriage partner” – which he displays prominently to Frank, holding it up towards his brother, dropping the hand slightly, and then bringing it up sharply twice more. This appears to be a fairly standard sign-unit, structured in a normal if insistent way, that moves from rest to rest with several morphologically similar strokes in between.

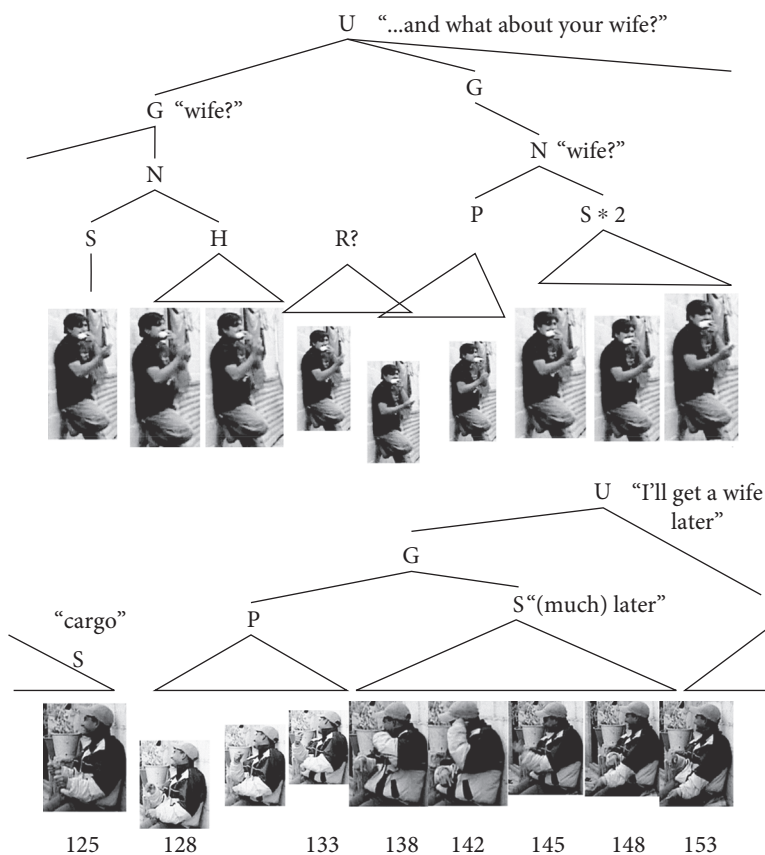


Figure 31. Will challenges Frank about his wife, and Frank says "That will come later"

After Will's first challenge – "and what about your wife?" (note that no man can do a ritual *cargo* position in Zinacantán without a wife or at least a woman who performs the ritual and culinary functions of an officeholder's consort) – Frank abandons his cargo-dancing sign and makes an elaborate, highly demonstrative series of outward spirals with both hands. This is an exaggerated form of the Z sign we have already met which means "later, tomorrow, next day, next month..." – hence, here, "a long time from now." That is, Frank assures his brother that, although it may not happen immediately, he is determined sooner or later to acquire a wife, which is what he goes on to say as his turn continues in Figure 32.

The challenge to the parsing scheme of PS-grammar (1) is hidden here in the interactive basis for breaking up Frank's sequence of G-phrases into larger U-units. The transition between the last part of his "ritual office" dancing stroke (at frame 125 in Figure 31), and the following "much later" stroke (which is already prepared and in play at frame 138, 0.4 seconds later) involves no return to rest.

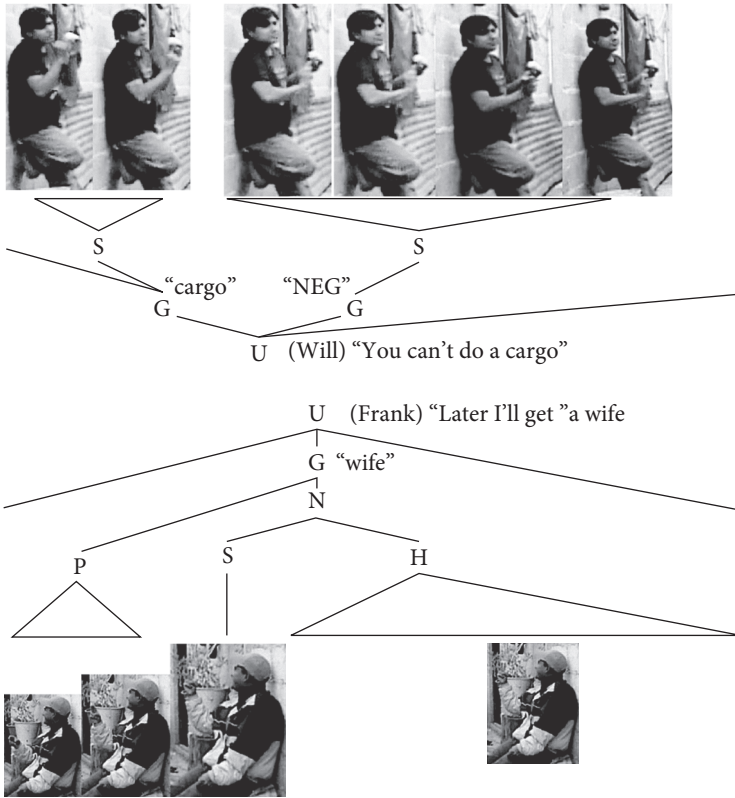


Figure 32. The brothers disagree about the future

Nonetheless, it seems clear that Frank has switched from whatever he was signing up to that point to an entirely new utterance, *as a direct response* to his interlocutor's turn. Thus, it is only the facts of the conversational sequence that justify my parsing Frank's utterance glossed "I'll get a wife later" as a separate U-unit in Figure 31. Such interactive facts provide an entirely new analytical dimension to how one must parse the sign stream, because the physical unfolding of the motion of his forelimbs does not justify such a juncture.

While Frank insists that he *will* manage to find a wife, Will has continued to dig at him. In the top half of Figure 32, he continues his turn in full overlap with Frank. Having challenged Frank about getting a wife, he repeats Frank's *cargo* "dancing" sign followed by an extended negative finger wave, followed again by the "cargo" sign (in the top half of Figure 33): "You can't do a cargo." He then starts to walk away from the conversation in a deliberately dismissive move, as Frank continues to claim that sooner or later he *will* be able to find a wife (Figure 33, bottom).

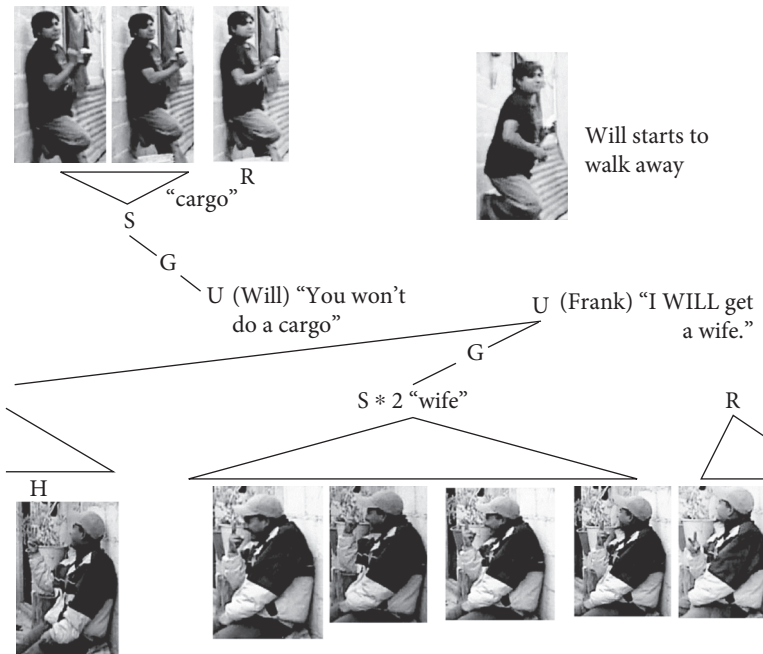


Figure 33. Will walks off, as Frank repeats his confidence about finding a wife

The competitive turn-taking structure of the conversation, as much as the internal dynamics of signed excursions of articulators, seems here to structure the overall interaction and to help the signers achieve their delicate mutual synchrony.

Summary and conclusions

In this study I began with formal mechanisms inspired by Kendon's early studies of the dynamics of speaker's gesture (as he prefers to call those visible aspects of utterance that accompany speech) and his pioneering work on spontaneously developed languages not meant to accompany speech, in both central Australia and highland New Guinea. Having formalized his proposals about how visible excursions of different parts of the body are organized, I tried applying a putative phrase structure grammar to the signed utterances of a small community of deaf Zinacantecs and their family members. The justification for such an epistemologically austere treatment of their young and autonomously developed sign system is that only by such means can appropriate analytical categories be allowed to emerge from the empirical materials. Such a "form first" approach, familiar from

the study of exotic (and ideally all) human languages, seems to afford considerable purchase on the structure of signed utterances in Z, although, of course, it is powerless to make a central initial distinction between signing and “non-speech” motions and actions.

Probing further the structural properties of Z utterances leads to several conundrums about how exactly to apply notions like “preparation,” “stroke,” and “hold,” and gives renewed importance to other issues that Kendon has raised throughout his career: the dimensions of a signed or gestured “phonology” (with such elements as hand shapes, “locations,” patterns of action and “enactments,” and so on); the mutual synchrony of different aspects of “the process of utterance”; and the notion of “semantic coherence,” across modalities and across different ethnographic contexts.

Z signing also poses other problems for linguistic analysis, exposed in a particularly clear way when one tries to apply such a formalization: how are the multiple articulators of a young visible communication system to be treated in an adequate way? What notions of constituency and hierarchy can be applied, and on what analytical basis? And finally, the issue that has occupied the last section of the chapter, how can the interactive features of signed conversation be incorporated into such a formalism? In all of these cases, I have intended to show that the mere attempt to apply Kendon’s principles of description to a novel set of empirical facts both illuminates the latter and reconfirms how much Kendon’s ground-breaking research has established basic tools that guide anthropological inquiry into the principles and bases of human communication.

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