

NOUNS, VERBS, AND CONSTITUENTS IN AN EMERGING ‘TZOTZIL’ SIGN LANGUAGE

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Zinacantec Family Homesign (ZFHS) is a new sign language developed in a single household in highland Chiapas, Mexico, where the deaf signers are surrounded by speakers of Tzotzil (Mayan). Such a new language challenges easy assignment of such foundational linguistic elements as ‘part-of-speech’ categories and concomitant analysis of clause structure, especially syntactic expression of verbs and their arguments.

1. Introduction

Judith Aissen, in “Topic and Focus in Mayan” (Aissen 1992), made one of her characteristic contributions simultaneously to syntactic theory, to linguistic typology, and to Mayan linguistics. Much less significantly—except to me—she also contributed to my own understanding of the mutually informing relationships between formal syntax and the facts of Tzotzil, a language (I had thought) I knew well. In this case, perhaps her first published excursion into one particular syntactic paradigm of the many she has used to good effect, she demonstrated how certain formal representations, here involving phrase structure and intonation, could elucidate facts of clause structure, its layering, and the resulting “positions” in linear order in several languages, including Tzotzil.

One advantage of working seriously with different theoretical paradigms for syntax, as Aissen has done throughout her career, is that it allows one to experiment with competing choices of taken-for-granted theoretical elements: linguistic primitives, grammatical relations, and axioms of analysis. That the basic concepts of a grammatical paradigm both define and are in turn defined by the resulting descriptive constructs illustrates both the troubling circularity (and seeming ethnocentrism) of linguistic theory and the potential strength of playing off alternate theoretical models against each other in the context of empirical observations about people’s language use. There is a similar advantage to Aissen’s varied choice of field languages and her career-long attention to the “exotic” languages of Mesoamerica as foils for linguistic theorizing. It thus seemed to me appropriate in honoring Judith’s retirement, and thanking her for a small part of what I have learned from her, to try to test some of these same choices of primitives, relations, axioms, and theories. How better to do so than to try to apply them to an entirely *new* language?

2. ZFHS

For the past couple of years I have been studying what I have called Zinacantec Family Homesign (ZFHS), a manual sign-language emerging in a single extended family of Zinacantec

Indians from Chiapas, Mexico, whose hearing members are Tzotzil speakers.¹ In 1976 a daughter, Jane, was born to my ritual kinsmen Mario and Rose, who already had three older living daughters. Jane never began to speak, although she was sent to school for part of a year, after which she remained at home, as in fact many other Zinacantec girls her age did. Six years later another brother, Frank, was born, and he, too, failed to begin to speak. Both children were labeled *uma?* ‘dumb’—a word which in Tzotzil has the same unfortunate polysemy as its English gloss—and raised more or less exclusively by their mother and older siblings. In 1986 another daughter, Terry, was born, and although she also remained silent until she was well over two years old, she suddenly began to speak Tzotzil, as though the silence of her two nearest siblings had until then left her unmotivated to talk. It was only at this point that medical diagnosis revealed to the family what perhaps should have been obvious: that both Jane and Frank were profoundly deaf. Finally, in 1988—when his older deaf sister was already twelve years old—a youngest sibling, Will, was born, also deaf (although for a short period a Chiapas doctor prescribed for him a hearing aid which he soon abandoned). What thus presumably began as a typical “homesign” system developed for mutual communication by Jane and the rest of her hearing family was over the span of a decade extended to a medium of communication for the three, and then, four siblings who used it as their only means of interaction, with each other and to a lesser extent with the other hearing members of the family. Added to this mix, five years later, was a niece—Rita—who, although hearing, grew up largely in the company of her signing aunts and uncles and thus became fluent in their emerging sign language.

I have known all of these children—now young adults—since they were born. Their unique linguistic circumstances have cried out for systematic investigation, despite the children’s reluctance to sign in public and their general abashedness about the stigma of their deafness. As it happens, Mario, the father, was also a major collaborator in my ongoing research on Tzotzil ritual language and co-speech gesture, as well as an old friend. When in 2008 the work on ABSL by my UCSD colleague Carol Padden and her associates (see for example Sandler, Meir, Padden, and Aronoff 2005; Meir, Padden, Aronoff, and Sandler 2007) inspired me to undertake research on ZFHS, Mario and his children readily agreed. By then Jane had her own (hearing) son, Victor, now a 3-year-old bilingual signer and Tzotzil speaker, who is the beginning (and perhaps also the end) of the second generation of this miniature ZFHS speech community.² (See the genealogical chart in Figure 1.)

¹ This material is based upon work supported by the National Science Foundation under Grant No. 0935407, administered by the Center for Research on Language (CRL) at UCSD. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation. My principal debts are to the ZFHS signers themselves, acknowledged here by their pseudonyms: Jane, Frank, and Will, as well Terry, Rita, and Victor.

² Despite claims by Fox Tree (2009) that conventionalized emblematic hand gestures are widely shared in communities of speakers of Mayan languages in Guatemala and Chiapas and are also reported in the sign-languages of deaf communities in the region, this tiny group of ZFHS speakers has had no contact with any such outside communities, nor indeed with any other deaf people, except, perhaps, as mediated by commonalities in co-speech gesture in the region. ZFHS must therefore be considered to be essentially their own creation.

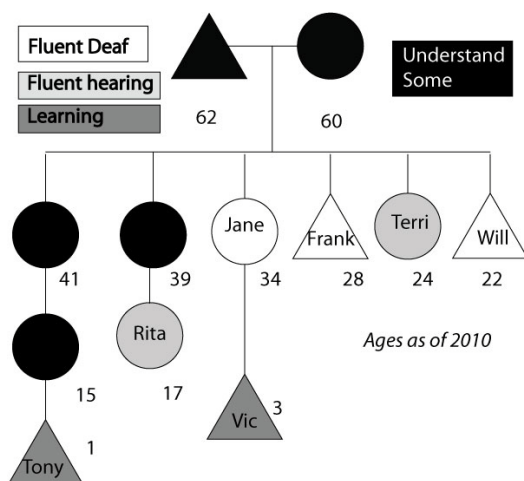


Fig. 1. Genealogy of the extended household where ZFHS is spoken.

3. The problem: constituency and argument structure

Largely because of my initial ignorance about sign-language, but partly as a result of a methodological decision to try to approach ZFHS as much as possible on its own terms, I have tried to focus on specific formal properties of ZFHS with as few preconceptions about manual linguistic modalities as I could manage. My initial thought, in trying to apply Aissen’s work on Tzotzil clause structure to ZFHS, was to compare linear constituent order in the two languages, both as a theoretical matter, and because if any spoken language can be imagined to have influenced ZFHS it is Tzotzil, since the hearing signers in the tiny ZFHS speech community are Tzotzil speakers. In this paper my concern is a much more basic question: can one even distinguish, on formal linguistic grounds, nominal from verbal constituents in ZFHS, and if so what consistent ordering of constituents can be observed?

Simple reflection (as well as a vast literature in sign language linguistics, summarized neatly in Napoli and Sutton-Spence 2010) shows that manual sign languages have a potential for non-linearity interestingly different from that of spoken language alone. Thus, although various sorts of gestural, prosodic, and rhythmic phenomena put the lie to them, standard representations of speech are largely linear, whatever further “underlying” hierarchical structure we may attribute to two dimensional strings of putative “segments.” In sign languages, where multiple simultaneous articulators may be involved—minimally, in ZFHS at least, the body itself, and its parts, especially the two hands and other limbs, as well as facial expression and gaze—representations (and more importantly the communicative resources from which they derive) necessarily involve higher orders of dimensionality. The question of the “linear order”—i.e., unfolding in time—of signed “constituents” is thus complicated from the start by the presence of multiple articulators and the ubiquity of simultaneous predication.

Nonetheless, discrete, apparently segmentable units do unfold sequentially in ZFHS, and insofar as grammatical properties can be ascribed to such segments it is possible to describe their raw linear ordering. In this brief, first consideration of the question of clause structure in ZFHS I will concentrate on methods, theoretical considerations, and inherent descriptive difficulties in my first attempts to identify and characterize “constituents” in this emerging sign language.

Trying to apply familiar axiomatic notions of syntax to a novel signed medium, with very little independent evidence available about structure (from glosses, bilinguals' interpretations, or an established tradition of analysis) can, I hope, illustrate foundational principles of linguistic analysis, especially when applied, as Aissen herself has done, to a previously un- or under-described language

4. The hammer and block example

As a first example of ZFHS and to illustrate some of the methods involved in my research thus far, consider the following short signed performance. In one elicitation task using a familiar pseudo-experimental paradigm, I asked one or two signers, the Describers, to watch a short video sequence—in this case drawn from recordings of everyday family events—and then to recount what they had seen to other signers, the Matchers. The Matchers, in turn, were presented with an array of video stills and asked to pick the one which corresponded to the clip described. If the Matchers failed, the Describers continued to elaborate their descriptions until a correct match was achieved. The method, though subject to various pitfalls, attempts to control referential “content” via the stimulus video, while at once exhibiting both production and comprehension strategies in the language under investigation. In (1), Jane describes a clip in which her infant son Victor is seen picking up from the ground a hammer and a block of wood and walking off with both objects in hand (see figure 2).



Figure 2: Victor carries a block and hammer.

- (1) Jane describes block and hammer clip (20100318a)
- a. HEY!³ (RH up in quick wave at interlocutor, a standard pragmatic turn opener)
 - b. HEIGHT (LH up with horizontal palm face down, a size-shape specifier for height)
 - c. VICTOR (RH with flat palm oriented down, showing the short stature of Jane's son Victor, the two-sign combination serving as a virtual proper name for the little boy)
 - d. PICKS UP? GROUND? (RH reaches sharply down below the table, out of view, then RH up again)
 - e. HAMMER (RH fist hits raised LH fist 3 times, see Figure 3)

³ For ease of presentation, ZFHS is presented in the form of putative English glosses (in CAPS) for individual signs, each gloss followed by a brief prose description of the physical form of the sign itself, using ASL handshape abbreviations, supplemented from time to time by illustrative video stills. Other abbreviations include R=right, L=left, RH=right hand, LH=left hand, BH=both hands, M=Matcher.



Figure 3: Jane “hammers” her two fists

Based on the original video stimulus, a reasonable free gloss for this little performance (whether or not one would want to characterize it as a signed sentence or clause—a matter to which I return below) would be, “Listen, Victor picks up (from the ground) a hammer.” The apparent order of “constituents” in the main predication would thus be SVO (in marked contrast with Tzotzil’s robust VOS order), where both ‘Victor’ and ‘hammer’ are notional nominal arguments.

Nonetheless, when presented with a video of Jane’s utterance in isolation, her sister Terry, my bilingual signing-hearing consultant, glossed it as “Listen, Victor hammers something this way”—reading, that is, the two-handed pounding motion not as glossed above as ‘hammer (noun)’ but as ‘hammer (verb)’ (and apparently offering no gloss for the gesture in 1d). Has Terry misunderstood Jane? Has Jane mis-signed or perhaps misinterpreted the original stimulus video (in which a hammer, but no hammering, appears)? Does ZFHS, a very young language, provide no clear way to distinguish hammers from hammering? Is this even the right way to think about the signs in question? The thrust of this brief chapter is to consider how, if at all, ZFHS signals such a distinction between potentially ambiguous expression of cognate nouns and verbs.

Fortunately, the interactive context of the task yields further information beyond the signed performances themselves and their glosses by consultants. First, the fact that Matchers must demonstrate their understanding of Describers’ utterances by picking a matching still frame imposes a minimal standard of referential adequacy on signed descriptions, which either facilitate a successful match or do not. Moreover, the vaguely competitive nature of the experimental design means that signers are free—in fact eager—to criticize one another for what they consider sloppy, inaccurate, or otherwise deficient descriptions of the stimulus video clips. Thus, in the case of Jane’s performance in (1), the Matcher cannot find a good matching photograph and asks for clarification, evidence for at least some referential inadequacy in Jane’s first formulation. The Matcher asks whether she has understood correctly that the film is about Victor, and then she somewhat hesitantly picks an incorrect still frame in which Victor appears to be moving his hands rapidly. This error in turn prompts first Jane (example 2), and then her brother Will (example 3), to try further elaborations—in the latter case, a reformulation replete with metalinguistic critique in which he faults his older sister for signing incorrectly. Such reformulations allow us to exploit the familiar Labovian insight (Labov 1972) that people, in interactive repetition after apparent misunderstanding, tend to “standardize” or “correct” linguistic form in some ideologically motivated way, giving such repetitions special value as evidence for “grammaticality.”

Jane begins her second performance in (2) in a discourse context which allows her to elide the notional subject, Victor. Her interlocutor has immediately beforehand asked “Is it Victor (you’re describing)?” Jane nods and then launches into her reformulation.

(2) Jane tries again

- a. HEY! (LH with index finger pointed at M, with accompanying vocalization⁴)
- b. A HAMMER (gaze down to grasping RH, then R fist pounds L fist 3 times)
- c. HOLDS/CARRIES (BH down, gaze to hands, quick gaze up at M, both hands move L to R under table, held still briefly while gaze searches area)
- d. A HAMMER (while still searching with gaze, two quick pounds of R fist onto L fist, gaze returns to M)

A reasonable interpretation of this sequence would be “[Victor] has a hammer, [he] picks up a hammer (and something else),” although when glossing even this second sequence in isolation Terry rendered it as “my child pounds something,” again interpreting the pounding motion as a verb rather than a noun. Several details of the signing here give us clues about how Jane tries to convey that it is an object she is talking about rather than an action, and these details suggest how morphosyntax develops in a young sign language. In (2b) Jane starts with a quick glance at her right hand, which appears to be in a grasping configuration, before repeating her three-stroke fist pounding motion (see Figure 4). The glance and the grasping hand configuration conspire to produce something like a nominal specifier: thing-held-in-hand, suggesting that the following iconic pounding action should be taken as a nominal “characterizer” rather than as a verb. Furthermore, in (2d), while Jane still seems to be searching for a visually accessible resource to help her characterize the second object Victor picks up in the stimulus video (a small block of wood), she performs an apparently *reduced* form of the pounding gesture, with two very quick fist pounds (see Figure 5).



Figure 4: “holds a hammer”



Figure 5: reduced pounding gesture

Jane’s brother Will is the youngest of the deaf siblings, and his version of ZFHS represents the final development of the first generation of signers. (Will of course had the benefit of being born into a tiny speech community where his teenaged elder siblings had already had

⁴ Because several signers, including the Matcher here, have normal hearing, ZFHS routinely employs a series of partly interpretable vocalizations designed, apparently, for hearing addressees.

nearly a decade to elaborate their communicative resources.) During Jane’s second recounting of the video, Will breaks in to give his own elaborated description of the original stimulus video: “Victor picks up something—a hammer; [he] picks up two things and walks off carrying them.”

(3) Will re-describes the scene

- a. VICTOR (RH palm down flat showing child’s height)
- b. PICK UP (RH moves sharply downward, with palm out and open)
- c. OBJECT-GRASPED (RH moves up slightly, forms grasping hand with thumb and index fingers, gaze to his RH)
- d. A HAMMER (while moving gaze to Matcher, RH lifts in a loose fist and approaches bunched LH in a single hammering stroke, gaze to Matcher)
- e. PICKS UP [PLURAL OBJECT] (RH lifts again, gaze to ground, RH opens to open palm grasping hand, reaches down to ground, gaze to RH; RH closes to grasping hand, moves right, opens and closes again, and retracts upwards in grasping handshape)
- f. WALKS OFF (CARRYING THE OBJECTS) (body straightens up, gaze to matcher, RH still down to side with grasping fist, both feet lift in walking pantomime⁵)

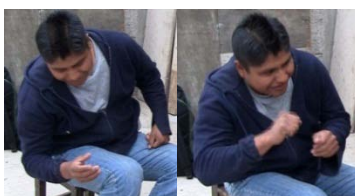


Figure 6: Will signs hammer object

The instructive contrast is at (3c-d) where Will gazes directly at his clearly classifying “held-object” hand—something I have called a ‘haptic specifier’—and follows with an extremely quick and abbreviated hammering motion (at which he does not gaze) to denote the hammer Victor picks up and carries (see figure 6). After Will’s description the Matcher immediately chooses the correct still frame. It is presumably because in her first attempt to describe the video in (1) Jane both omits a haptic classifier and fails to reduce the hammering motion that she was misunderstood.

By contrast, to illustrate how ZFHS represents ‘hammer’ (or less contentiously ‘pound’) as a verb, consider Jane’s description in (4) of another video clip in which Victor is shown actually pounding on the same block of wood with the same hammer.

(4) Jane signs “Victor hammers a block.”

- a. HEY! (RH rises, waves twice at M)
- b. VICTOR (RH 5-hand palm down, showing “height,” moves up slightly to show height of Victor, slight head nod, no hold)
- c. WEARING HOOD (BH, palms facing in, move up to sides of head and forward, no hold)

⁵ ZFHS, 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 p 653).

- d. BLOCK (BH move down in grasping configuration, gaze to hands, then BH move slightly outwards showing rectangular dimensions of the wood block, gaze to M, hold)
- e. POUND (BH move downwards, LH clasping right fist in preparation, then both arms brought up and down with BH clasped, in ‘hammering’ motion, twice)

Although there are both a noun ‘hammer’ and a cognate verb in English, it is not obvious from Jane’s performances that this is true in ZFHS. Thus, contrast the pounding motion she offers as part of signing the noun ‘hammer’ in Figures 3 or 5 (or Will’s in Figure 6)—in which one hand seems to play the part of the instrument itself (and the other the thing it pounds on) with how she performs the pounding verb in (4e), miming the action of the hammerer as shown in Figure 7.⁶ Note, too, that she makes no explicit mention of the hammer as an argument in (4), instead singling out the block of wood in (4d) as an apparent object, and only indirectly representing the hammer in the form of the hammering motion and the clasped hands around a presumed hammering instrument.



Figure 7. Jane signs ‘pounding’ or ‘hammering.’

5. Constituency in ZFHS

Using notional propositions (which involve, minimally, a predicate and the entities predicated about) one can assign global glosses to the signed performances in the examples given. In this sense one can note the linear order of occurrence of sign-vehicles which appear to correspond to verbs and their arguments, but trying to read anything corresponding to syntactic “word order” out of such facts is clearly problematic. Thus, in (1) the raw order of occurrence would give SVO order, whereas in (2) and (4) the result would be something like (S)OVO and SOV respectively.

Trying to describe true clause structure, and to distinguish full from elliptical clauses or those with appositions, is itself a complicated matter, since in a young language like ZFHS formal tests for syntactic constituency are problematic. Sandler et al (2005) describe a combination of semantic and prosodic criteria (largely having to do with nonmanual expression on the face) for delimiting constituents in ABSL. How appropriately to parse ZFHS utterances into constituents remains difficult without more confident glossing⁷ and more systematic study of prosodic processes than I have yet achieved. I have relied instead on motion-based parsing

⁶ On the basis of a contrast between ASL and ABSL, Carol Padden (p.c.) points out two different kinds of lexical strategies for signing the names for tools and other instruments, one which concentrates on the object itself (in some ways like Jane’s signing of hammer) and another which mimes the handling of the object by a tool user.

⁷ Remember that Terry, the native-speaking consultant mentioned above, at least initially disagreed with the interpretations I have presented of Jane’s utterances in both (1) and (2), an interesting issue in its own right but one beyond the scope of this paper.

methods derived from the study of co-speech gesture (Kendon 2004) to delimit clause-like constituents and their parts in ZFHS. In Kendon’s 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 2004:111). 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.” The stroke is also the phase of movement “when the ‘expression’ of the gesture . . . is accomplished.” Each stroke (which may involve as well a ‘post-stroke hold’ when “the articulator is sustained in the position at which it arrived at the end of the stroke”) may also be associated with a preceding preparatory movement and a final ‘recovery’ or retraction back to rest (Kendon 2004:112).

On the basis of Kendon’s detailed analysis of complex gesture units with multiple component gesture phrases, I have tried to formulate a simple phrase-structure grammar of the following form, where U represents a ‘gesture unit,’ G a ‘gesture phrase’ (or, informally, a “gesture”), N what Kendon calls the ‘nucleus’ of a gesture phrase, P a preparatory movement, S a ‘stroke,’ H a ‘post-stroke hold,’ and R a ‘recovery’ or return to rest position.

(5) Tentative PS “grammar” for gesture units

- a. $U \rightarrow G^+ R$ (where + is the “Kleene plus”—like * without the empty string)
- b. $G \rightarrow P N^+$
- c. $N \rightarrow S (H)$

The crucial parsing issue defined by such a grammar 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 (and possible subsequent hold) moves directly to another stroke with no intervening preparatory movement (e.g., $U[G[P N \dots N] R]$).⁸ Dividing a gestural stream up 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 and gaze) to locate internal subdivisions in complex gesture units.

Applying such a raw gestural parsing to ZFHS allows a series of useful distinctions. It first allows one to isolate full signed utterances, which are bracketed by rest position—tentatively equivalent to signed sentences. It then allows the analyst to individuate component phrases. A simplified “tree” for Jane’s signed utterance in (4), where still frames correspond to individual lettered lines, appears in Figure 8. The sequence is bracketed by the initial excursion of the hands before (4a) and their final return to rest after (4e). In between the hands are in

⁸ The nature of these nuclei, and how they are linked—whether, for example, reduplications of substantially the same stroke (and hold) are different from directly linked sequences of different strokes—is not yet clear from empirical studies, including analysis of complex gesture units shared with me by Adam Kendon (p.c.).

continual motion except for a brief hold at the end of the stroke at (4d). The dual pounding motions in (4e) with no intervening holds or preparatory strokes are also linked as two component nuclei of a single complex gesture phrase. If we are justified on grounds of the movement dynamics in calling this a single sentence, and if we consider as extra-clausal the pragmatic attention-getting initial sign, glossed “Hey!” above at (4a), it seems reasonable to record the constituent order for the central clause here as Subject⁹ Object Verb.

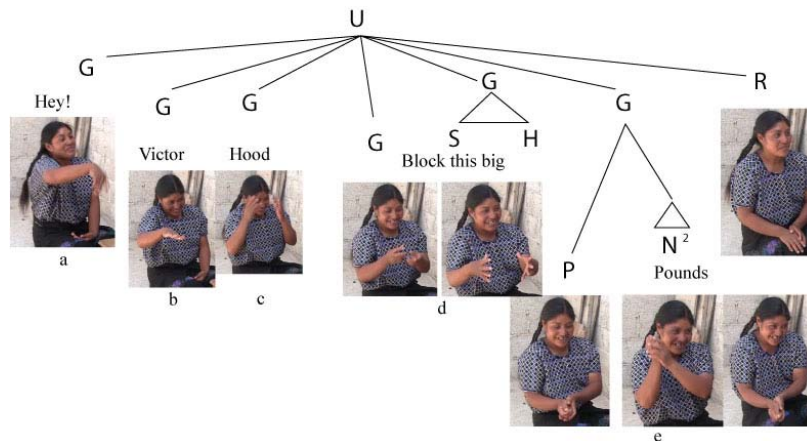


Figure 8: Jane signs, “Hey, hooded Victor hammers a rectangular block.”

By contrast, many descriptions of stimulus videos produced more than one “gesture unit,” potentially confounding any easy assignment of apparent constituents to linear “positions” within a “clause.” Here is a single example in which Jane describes a scene in which the author’s wife pours salt into a cooking pot. Her description involves two separate gesture units and distributes the notional arguments of the apparent verb between them. The sequence is illustrated in Figure 9, where each still frame corresponds to a line in (6).

(6) Jane describes EC pouring salt into pot (20100318a 18:42)

- a. SALT (from rest, gaze to M, RH index finger up to touch tongue)
- b. POUR (RH quickly turns palm up, cupped,
- c. INTO HAND (LH in grasping O hand “drops” something into RH from above twice, gaze to hands, up to M)
- d. MOVE (HOLDING) (gaze to RH, palm up slightly bent B hand, RH moves right and gaze follows it)
- e. DROP (gaze quickly to M, RH flips over palm downwards, slight downward bob of head)
- f. (RH hand retracts while gaze remains on M; LH has remained still at waist height)
- g. (0.7 seconds pause with gaze on M)
- h. HIM (LH index finger points up in direction of author, gaze follows, with vocalization, then gaze to M)

⁹ How to analyze the syntactic relationship between (4a) and (4b)—glossed VICTOR, HOOD, presumably to denote the little boy’s wearing of a hooded sweatshirt—is a matter I will not speculate about here.

- i. TALL (LH 5 hand sweeps up backhanded to high above head with palm out, vocalization)
- j. (LH retracts to lap, slight nod, gaze remains on M)

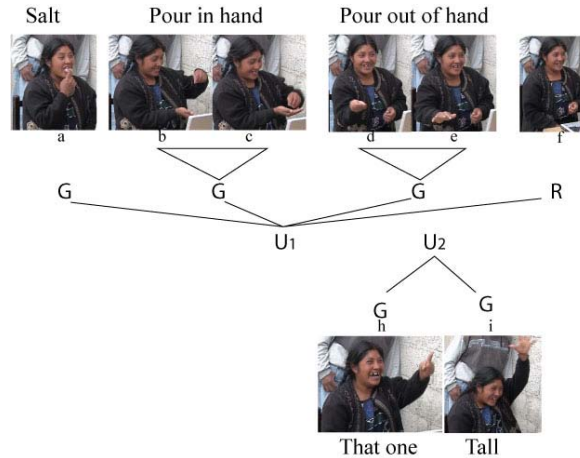


Figure 9. Jane describes EC pouring salt.

Although the raw sequence of signs that denote verbs or their notional arguments in this description is OVS, in fact Jane appears to have produced a concatenation of several distinct gesture units, the first of the form OV¹⁰ with no overt subject, and the second an apparent nominal phrase (“Him, tall”¹¹) almost as an afterthought to specify the subject of the previous phrase. We might thus notate the order of constituents in this short performance as OV, S, where separate clause-like units are separated by commas, to distinguish signed-phrases which correspond to gesture units from “lists” or concatenations of such phrases. To be sure, one may expect some overlap of arguments to characterize even the latter lists, just as the second gesture unit here resembles a right-dislocated or appositive “Subject” argument elided in the first gesture unit; but such structures seem different from the grammatically tighter linking of signs within “gesture units.”

¹⁰ There is clearly more internal structure to the sequence of two-handed signs in (6b-e) than is adequately captured by the shorthand notation V; notably there occurs an interesting figure/ground switch between the two hands, as well as a serial-verb-like structure in (6d-e). One of the striking findings of experimental work is how different two-handed co-speech gestures are from two-handed gestures in so-called “non-verbal gesture”—that is, in enforced pantomime where gesture is used to communicate in circumstances where speech is prohibited. Singleton, Goldin-Meadow, and McNeil (1995:300-301) report that “asymmetrical two-handed gestures are rare in gesticulation. Moreover the underlying function of an asymmetrical two-handed gesture in gesticulation appears to be related to differentiating the logical relationships of the thought structures that the gesture represents. In contrast, in nonverbal gesture, asymmetrical two-handed gestures are quite frequent and appear to have a more linguistic function—that of establishing and maintaining dual object reference.”

¹¹ Interestingly, this combination of signs—a pointing gesture to the author, who was co-present, plus the apparently redundant gesture for tall (since for a Zinacantec the author is excessively tall)—does *not* refer to the author, but rather to his wife—who is also tall by Zinacantec standards. The (neo)Gricean processes of inference that drive such an interpretation are interesting but beyond the scope of this paper.

Seen from this point of view, Jane’s original descriptions of Victor carrying block and hammer above seem to evidence the constituent orders SVO in example (1), and OV, O in example (2), since the hands seem to be temporarily suspended at the end of (2c). Will’s reformulation in (3) is more problematic from the point of view of constituency because, although the raw order of denoted elements seems to be SOV, the signing seems to exemplify a structure not contemplated by the PS-grammar in (5), namely, one with a kind of insertion sequence at (3c-d). Thus, as illustrated in Figure 6 above, Will signs what I have interpreted as the nominal ‘hammer’ by combining a grasping handshape with a rapid, stylized hammering motion. To introduce this notional argument of the following verbs ‘pick up’ and ‘carry’ he apparently interrupts the complex verbal sign itself midstream, starting it with the first part of the verb—an open hand “about to grasp” starting downwards—and then abandoning the sign to insert the ‘hammer’ sequence—a clasping hand specifier plus the single hammering motion, illustrated in Figure 6. At that he point he apparently *recycles* the interrupted verbal sequence (see Figure 10, where the small letters correspond to lines in (3) above). The movement pattern here suggests a signed analogue of speaker self-repair, a frequent feature of conversational talk¹² (and for that reason alone, I would suggest, further evidence for the linguistic organization of ZFHS). Such a gestural organization, however, complicates any assignment of constituent order; we may perhaps notate the utterance as S-O-V (where the dashes indicate the inserted repair sequence) and recognize that Will seems to find it appropriate to mention the notional object (or one of them) explicitly before finishing the verb itself.

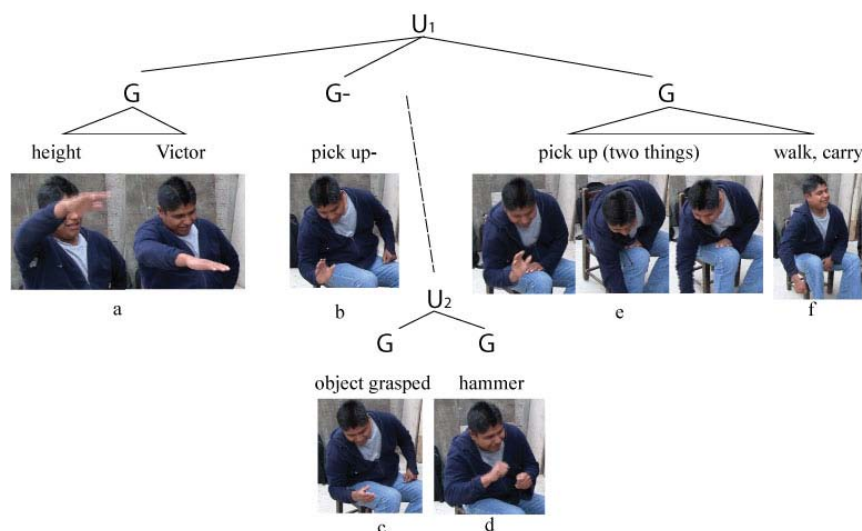


Figure 10: Will interrupts and restarts ‘pick up’ verb.

As an aside, note that Will’s reformulation of his sister’s failed description of the original video sequence departs in another way from the mini-grammar in (5), and this departure is also reminiscent of conversational speech. Will’s turn, like many we have seen in ZFHS, begins with

¹² Although rarely described in co-speech gesture (see, for example, McNeill and Duncan 2000; Chen, Harper and Quek, 2002; Seyfeddinipur 2006) and thus not directly considered in Kendon’s (2004) description of the gesture unit. On repair, see the classic formulation in Sacks, Schegloff and Jefferson (1974).

a conventionalized pragmatic turn-opener: a stylized waving or pointing hand 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.' Normally, the sign, which I usually gloss into English as HEY!, is followed without pause or retraction by the rest of the utterance; it therefore serves as an initial gesture phrase (G) in a longer gesture unit (U). Will begins his utterance in (3) with just such a HEY! sign; but Jane is simultaneously finishing her second description of the video stimulus. Will must thus wait until he actually has his interlocutor's attention before launching into his own description, and he does so not by retracting his waving hand to a rest position but instead by raising it high in the air (Figure 11), partly in preparation for the following "height" sign which forms part of the proper name for Victor, the subject of Will's first clause, and partly as a turn place-holder (not unlike the protracted *uh* of English or *este* of Spanish). The movement is thus held, but 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, exactly, but rather to the interactive engagement of the interlocutors.



Figure 11. Will requests his interlocutor's attention, and holds his hand high waiting for it.

6. Nouns, verbs, and constituents in ZFHS

Early studies of homesigners by Susan Goldin-Meadow and her colleagues¹³ argued that deaf children raised in hearing families without exposure to a sign language exhibited in their spontaneously generated systems of manual communication constituent order regularities (for example, placing patients and intransitive actors before predicates), and that there was formal evidence to suggest a noun-verb distinction—without which, of course, even notional thematic roles could hardly be assigned to putative arguments. In her earliest studies of homesign (e.g., Goldin-Meadow & Feldman 1977, Feldman, Goldin-Meadow, & Gleitman 1978, Goldin-Meadow & Mylander 1983) Goldin-Meadow considered only pointing gestures to be “nominal,” assigning iconic or “characterizing” gestures to the category of predicates. Careful examination of formal patterns in emerging homesign morphology (Goldin-Meadow, Butcher, Mylander, & Dodge 1994) later led the same researchers to differentiate between verbs, which showed nascent patterns of agreement (through spatial “displacement”), and nouns, which displayed various kinds of “abbreviation” in form (simplification of motion patterns, reduction of two- to one-handed gestures) with respect to cognate verbal gestures.

With ZFHS verbal constituents, two notable kinds of apparent morphology can be observed that would allow us to distinguish them from nominal constituents: verbs agree with their arguments, using deictic, anaphoric, and classifier-like mechanisms; and they frequently appear to be serialized. Not illustrated in this paper is verb agreement signaled by displacing the

¹³ See especially summaries in Goldin-Meadow 1993, 2003

performance of a motion in the direction of a signaled subject, but we have seen typical ways in which other arguments can be ‘incorporated’ into mimed verbs: Jane’s handling handshape suggesting the instrument held in her hand in Figure 7; the transferring hands of Figure 9; or the alternately open and grasping hands for ‘picking up’ of multiple objects in Figure 10. The sequencing of verbs into linked chains—gesture phrases with multiple nuclei—has also been apparent in nearly every ZFHS example.

With ZFHS nouns, we have seen instances of the sort of “abbreviation” or reduction in the performance of putative nominal arguments (see again Figures 5 and 6) by contrast with fully pantomimed verbal counterparts. More obvious emergent morphology is the use of haptic specifiers—usually handshapes which show the size and shape of an object and give an indication of how it is manipulated, often accompanied by explicit signer gaze (which may itself represent a sort of inflection for definiteness)—preceding a characterizing expression, the whole corresponding to a nominal phrase. This is what we see for ‘hammer’ in Figures 4 and 6, and there are many other examples in the conventional lexicon of ZFHS. Furthermore, the ‘characterizing’ expression may itself be frozen, as in my favorite example, the sign for ‘chicken’ where one first shows the size of the bird and then demonstrates the jerking motion traditionally used to break its neck—even if, as shown in Figure 12, the chicken in question is only a chick and thus, presumably, not liable to imminent execution.



Classifier: TINY THING Neck breaking pantomime
Figure 12. Will signs ‘chick’

Thus, even the few examples presented here suggest a set of emerging morphosyntactic categories and possible clausal argument positions. If one restricts oneself only to *reformulated* or ‘corrected’ descriptions of video stimuli—on Labovian principles mentioned above—and assigns apparent arguments to presumed Subject or Object categories on the basis of the putative referential content of the stimuli themselves, in a small corpus of around 100 apparent single-gesture-unit ZFHS ‘clauses’ there does seem to be a tendency toward (S)OV order: 76% follow such a pattern (37% SV, 34% OV, 5% SOV), with non-conforming orders falling into three infrequent types (11% VO, 8% VS, and 5% SVO). In a young language like ZFHS one might suppose that nascent categories may be less than fully categorical, and that different partial patterns developing in the language may together conspire to produce categorical effects. Thus, for example, this word order *tendency* where nominal arguments precede verbs, supplemented by optional or occasional morphological marking on nouns and verbs, may produce an increasingly robust pattern of clause structure, especially in the speech of the youngest signer.

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