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Space in Language and Linguistics

Geographical, Interactional, and Cognitive Perspectives

Edited by
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John B. Haviland

Xi to vi: "Over that way, look!": (Meta)spatial representation in an emerging (Mayan?) sign language

1. Introduction: language, space, and meta-space

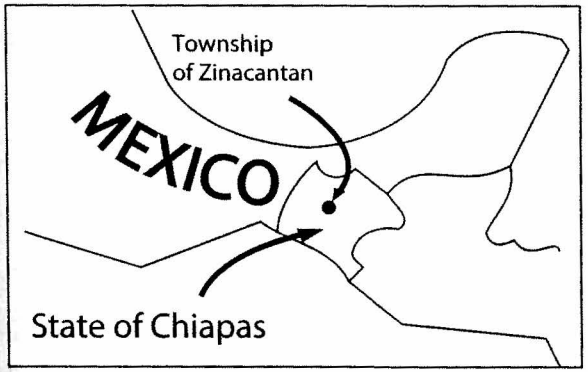
Those aspects of human experience most taken for granted, most widely shared, most seemingly universal and "natural" are for many anthropologists precisely those most in need of conceptual and comparative scrutiny. For those interested in language such scrutiny often begins with the linguistic resources speakers use for talking about apparently shared aspects of human experience: kinds of people and their interrelationships (represented, say, in kinship terminologies or in systems of linguistic gender), elements of the environment (found, for example, in ethnobotanical nomenclature or in color vocabularies), and certain quasi-mathematical aspects of assumed human perceptual experience (for example, numbers, or systems of quantification and classification).

Space has recently been a central focus of such comparative conceptual scrutiny.[1] Assuming neither a shared conceptualization of physical space, nor some experiential construal of its mathematical or topological properties, the point of departure here is instead the fact that particular languages provide interlocutors with resources for answering questions like "Where is X?" These linguistic resources include language particular devices to indicate such notions as size, distance, shape, position, arrangement, contact, containment, contiguity, alignment, motion, direction, and velocity. An important result is that languages provide interrelated but conceptually incommensurable "frames of reference" for representing spatial relationships and, correlatively, that speakers often give variable priority to different representational devices that reflect such frames of reference.

Mayan languages have been important in the typology of spatial language, partly because of the multiple and overlapping frames of reference typically employed by their speakers.[2] Typological interest in Mayan spatial conceptualization is very recent, however, when compared to the very long tradition of ethnographic inquiry into Mayan spatial practices – from the physical layout of house, cornfield, or church, to the cosmological significance of

[1] See, for example, Levinson 2003; Levinson & Wilkins 2006.

[2] See, among others, Haviland 1991, 1992, 1993, 200, 2005; de Leon 1992; Brown & Levinson 1993; Brown 1994, 2006; Bohnemeyer & Stolz 2006).



Map 1. The township of Zinacantán, in highland Chiapas, Mexico

spatial orientations, or from the day-by-day calibration of spatial information in interaction,[3] to the vast archeological and colonial record of elaborate socio-spatial organization in the Maya area.[4]

Work on linguistic representations of space in Tzotzil has focused on two striking features of communicative practice in the community of Zinacantán, in highland Chiapas, Mexico (see map 1). The first is the high degree of lexical elaboration in various spatial subsystems in the spoken language. The second is the co-speech gestures that give direct evidence about Tzotzil speakers' conceptualizations of space even in the absence of corresponding spoken forms. As background to the present chapter I shall, in the next section, briefly sketch results from these two investigations of Tzotzil spoken interaction.

Tzotzil, however, is not my principal concern in this chapter. If one's notion of space is linked in part to the language(s) one habitually speaks, as comparative work on spatial language and conceptualization suggests, then examining the linguistic resources available to different languages for describing space seems a useful initial step in characterizing human spatial conceptualization. Especially compelling in such an enterprise would be a "new" language – one with no apparent direct links to other languages, which evolves over the space of a single generation of initial language users. Even more interesting would be a language which makes direct use of space itself as a semiotic medium. Consider the case of sign languages: here the spatial

[3] See, for example, Vogt 1992, Gossen 1974a, 1974b, Hanks 1990.

[4] For example, W. A. Haviland 1966; Ashmore 1989; Ashmore & Willey 1981, Hanks 1988, 1992; Jones 1989; to cite only a few.

configurations of visible articulators (the hands, the head, the face, among other) are the primary vehicles for signaling communicative content. Talk about space, in such a language, is itself spatial, so that "spatial language" is necessarily meta-spatial – it uses space to describe space.

My recent research has involved just such a "new" language: a nascent sign-language – here called 'Z' – created in a single household of Zinacantec Indians from highland Chiapas. The three deaf members of this household have never met other deaf people or been exposed to any other sign language, and the tiny community of signers, both deaf and hearing, has limited contact with any spoken language other than Tzotzil. My primary purpose in this chapter is to show how spatial language works in this first generation sign language, and to compare the spatial frames of reference of spoken Tzotzil with the (necessarily meta-)spatial devices of Z. Are they the same or different? How much of the apparent underlying spatial repertoire of Z either resembles that of Tzotzil or instead represents something invented by the signers?

2. Space in spoken Tzotzil

In spoken Tzotzil, several linguistic subsystems contribute to spatial descriptions. A hypertrophied set of Tzotzil roots (traditionally called "positionals" in Mesoamerican linguistics) denoting shape, configuration, and anatomy facilitates – indeed, requires for felicitous speech – careful specification of the spatial character of different sorts of objects.[5] Much of the topological and geometric specification accomplished in other languages by adpositions or nominal cases (Talmy 1985, Svorou 1994) falls in Tzotzil to the complex anatomical and positional semantic portmanteaux of these positional roots. Tzotzil also elaborates "body part" expressions (Levinson 1994a) which enable descriptions of spatial position via an "intrinsic frame of reference" using as points of locative reference the anatomies of objects construed as virtual bodies. The exact "body-part" distinctions involved thus represent a partially grammaticalized spatial 'anatomy' which can be variously applied to different sorts of object. Tzotzil additionally has an elaborate set of grammaticalized auxiliary and directional verbs which permit precise inflection of virtually all predicates with respect to trajectories and motion.[6] Finally, the metaphor of an 'up/down' opposition, which literally refers to the vertical

[5] See Laughlin 1975, Haviland 1992, 1994, 1994b for Tzotzil, Brown 1994 for Tseltal.

[6] See Aissen 1984, Haviland 1981, 1993b, Zavala 1992.

axis, is conventionally extended to an East/West axis: where the sun rises is thought of as *ak'ol* or 'up', and where it sets as *olon* 'down'.[7] This opposition allows Tzotzil speakers to apply Levinson's "absolute frame of reference" which uses a coordinate system conceptually independent of local terrain and landmarks for locating objects and places in relation to one another.

These linguistic sub-systems are illustrated in a spontaneous dyadic interaction (videotaped in 1993 in the hamlet of Nabenchauk) in which Peter, a Zinacantec man in his eighties, describes to much a younger *compadre* the earliest settlement of their village as they stand in the older man's house compound. Questions of location are naturally prominent throughout this short conversation.

Consider first the use of Tzotzil body part words to describe locations. The complete meronymy for Tzotzil is complex[8], but a few "part words" exemplify the general principles. The word *pat* is used to denote a human 'back' or, for example, the posterior side of some object which has a distinct anterior *sat* 'face, eye', *ni`* 'nose', or *ti`* 'mouth.'[9] The corresponding posterior surface is a *pat*; the posterior end, if there is one, is a *chak* 'bottom.' *Pat* also denotes the outer surface of an object that is conceived as having a *yut* 'interior.'

Describing where his great grandmother settled after her husband cleared the virgin forest, Peter points toward the eastern edge of the valley where the village lies, saying

(1) Intrinsic use of *pat* 'back'

te	*nakal*	*yo`-bu*	*s-pat*	*s-na*	*chikin-p'ine*[10]
THERE	residing	WHERE	3E-back	3E-house	name

'She lived over in that area behind the house of the Chikin P'in family.'

[7] See Gossen 1974a for an account of some ramifications of this conceptual coincidence in the Tzotzil of neighboring Chamula. Cognate words apply to a parallel distinction in the Tseltal of nearby Tenejapa (Brown 2006, Brown & Levinson 1993) although there the dominant topography seems to have produced a different conventional association: since North is topographically downhill in most of Tenejapa, there *up* means 'South' and *down* 'North'. But see Polian & Bohnemeyer (forthcoming) for more details on Tseltal usage more widely.

[8] See Laughlin 1998c, Haviland 1992.

[9] What defines this anterior extremity is, as the glosses suggest, partly a matter of shape and configuration: a *sat* is usually a flat surface or point in a flat surface; a *ni`* is a projection; a *ti`* is a hole. See Levinson 1994 for related facts about Tseltal.

He conveys that his grandmother lived in an area that lies on the opposite side from the front (*ti`* or doorway) of the current Chikin P'in house. The intrinsic orientation of the reference object, the Chikin P'in house with its clearly identifiable parts, fixes the location of the great grandmother's former house.

Later Peter uses *pat* in a different way to describe the location of an old path that people from lowland villages originally used to make the journey up the mountain to the nearest market town.

(2) Relative use of *pat* 'back'

Xi la ch-jelav li be ta pat[11] vitze
THUS EVID ASP-pass ART path PREP back mountain
'The road used to pass on the far side of the mountain over there.'

Since a mountain, unlike a house, has no clear front side – no *sat* 'face' or *ti`* 'mouth' – the reference to "the mountain's back" must be calculated relative to the perspective of an observer (here the interlocutors), by a Tzotzil convention that parallels that of English.[12] Peter intends to say that the old path ran on the far side of the mountain *from where he stands.* The location is thus triangulated from (or projected onto) the mountain relative to the observers' viewpoint.

A still different use of a body part word to convey a spatial configuration occurs when Peter reminisces about the deer that once abounded in the forests surrounding the village in the early days before virgin forest was felled to accommodate settlement.

(3) Lexicalized body part projecting a spatial layout

te`tikil chije, te x-k'ate:t ta x-chak te`-tike
wild deer THERE ASP-lying_sideways PREP 3E-bottom tree-PLU
'Deer would be just be lying about sideways amongst the tree stumps.'

[10] Tzotzil is written in a Spanish based practical orthography. Abbreviations include 1E = 1st person ergative, 3E = 3rd person ergative, ASP = aspect, ART = article, CL = clitic, DIR = directional, EVID = evidential, PREP = preposition, PLU = plural,

[11] There is a further grammatical difference between examples (1) and (2), namely that *pat* is grammatically possessed in the former intrinsic use, but not in the latter relative use. See de Leon 1994 for further grammatical details.

[12] But it differs from that of Hausa (Hill 1982).

The expression *x-chak te`* 'lit., bottom of tree' is lexicalized to mean 'stump' (as well as its literal denotation: the cut end of a tree trunk – the end on which the trunk could, in principle, 'sit'), and it is partly here that Peter conveys the information that the deer are low-lying, on or close to the ground.

Example (3) also illustrates the second aspect of Tzotzil spatial language mentioned: how a spatial configuration can be partly encoded via the highly elaborated inventory of Tzotzil positional roots (e.g., Haviland 1994, 1994c). The verb *x-k'at-et* is based on the positional root *k'at* 'sideways, crosswise (predicated of a longish thing)' which combines information about the shape of the object described with a specific configuration or disposition in space: here that objects which are relatively longish in shape (the deer) are arranged so as to run perpendicular to the reference objects (the tree stumps in the forest). The image resulting from the positional information in the verb plus the body-part modification of the reference object is of deer lounging on the ground partially obscured behind the felled forest trees.

Other positional predicates in Peter's description of the forest are generally evocative of spatial scenes. He describes mushroom hunting, where

(4) Positional predicate

te lam-al li tajchuch
THERE spread_out ART lentinus_mushroom
'The mushrooms covered the ground.'

Or he describes the scene after the forest was chopped down to accommodate cornfields as

(5) *mo:l toje, tzel-ajtik*
large pine heaped_up-PLU
'Big pine trees all heaped up.'

In both cases, the positional roots give precise spatial indications: *lam* that the ground was an apparently unbroken blanket of mushrooms; *tzel* that the heap was composed of longish things in a jumble.

Two other lexical systems in spoken Tzotzil systematically encode spatial information. One is the system of motion verbs, which are grammaticalized across the verbal system as both auxiliary verbs and directional particles.[13] Peter illustrates the latter as he describes the original clearing of the moun-

[13] See Aissen 1994, Zavala 1992, Haviland 1993b, 1996.

tainsides in his village. Motioning toward one of the mountain ridges that ring the town he says:

(6) Directional particles

Tz-boj-ik muyel xi to vi noxtok une
ASP-chop-PL DIR:rising THUS CL EVID also CL
'They chopped the forest all up this way, too

Tz-boj-ik tal naka jvaskisetik la une
ASP+3E-chop-PL DIR:coming only Vazquez EVID CL
And they chopped down this way, only members of the Vazquez family, they say.'

The directional *muyel* in the first clause is derived from the intransitive root *muy* 'ascend' and allows Peter to add an upward trajectory to the action of chopping trees as he depicts how the early settlers worked their way up a mountain ridge. The directional in the second clause uses the root *tal* 'come' and it incorporates a deictic perspective into the scene: it was on the side of the mountain ridge *toward the observers* that the colonists continued felling the forest.

One final aspect of spatial language in spoken Zinacantec Tzotzil is the conventionalized association between the vertical axis – denoted by the relational nouns *ak'ol* 'above' and *olon* 'below' as well as by verbs of ascending (like *muy*) and descending – and the East/West axis. Considerable attention is paid to the exact path of the sun, and there are strong symbolic and religious associations with the East/West axis.[14] The East, where the sun rises, is 'high' and the west, where it sets, is 'low'. Despite local variations in terrain, it is geographically the case that the lowland cornfields that Zinacantecs frequent, historically, lie largely to the west of the township, and that access to them has been by paths that lead inexorably westward and down. What is called 'hot country' in Spanish is *olon osil* 'low country' in Tzotzil; people called *j'olonetik* 'lowlanders' are those from the township's westernmost settlements.[15] And the westernmost and at one time most distant place where Zinacantecs ever used to venture – Mexico City – is still called *olontik* 'the low place' by old timers.

[14] See Gossen 1974a.

[15] They are also called *jchobtiketik* 'cornfield people' because that is where corn grows best.

There is sometimes tension between applying the vertical axis to the actual slope of the landscape as opposed to the east/west axis independent of local inclination. In describing macro-space, however, by 'up' and 'down' Zinacantecs invariably mean the East/West axis. Peter thus describes the former walking path from his village into San Cristóbal, the closest market center. The path made its way up to a high point just east of the village and continued eastward, descending again into the large village of Nachij. Just before reaching Nachij[16] another path branched off to the north, just beyond the house of a well-known person whom his interlocutor mentions. Peter confirms that this is the place he means, placing it directly East of (although, in terms of the local terrain actually lower in elevation than) the point of reference.

(7) East/West

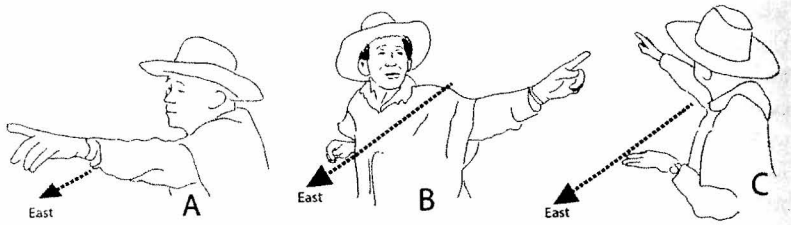
j-ak'ol s-na konkoron x-k-al-tik
3E-above 3E-house name ASP-1E-say-PLU
'East of the house of the guy we call Konkorón.'

3. Space and Zinacantec co-speech gesture

Although all of these spoken Tzotzil forms are frequently used in descriptions of spatial configurations, much of what we know about how Zinacantecs conceive of space comes not from their words but from their gestures. There is indirect but compelling evidence in gesture that space is inherently oriented by cardinal directions.

As he pronounced the phrases in all of the examples (1)-(7) above, Peter also produced gestures, in each case supplementing the spoken spatial information with visible representations. Thus, in talking about his great grandmother's house located (intrinsically) behind the Chikin P'in house, he points in the direction the house would have stood from his current vantage point (Fig. 1a). Placing the old path (relatively) behind the mountain, he also points in the direction he means (Fig. 1b) where the mountain itself blocks the old path on its far side. And as he reminisces about the deer lounging in the forest, he places them demonstratively on a different mountainside (Fig. 1c).

[16] Notably, Peter says *ta ba Nachij* 'above Nachij' using a "body-part" word *ba* 'top, forehead' that unambiguously refers to a high point on the vertical axis and is never used to mean "East."



Figs. 1a–c. Peter's line of sight pointing

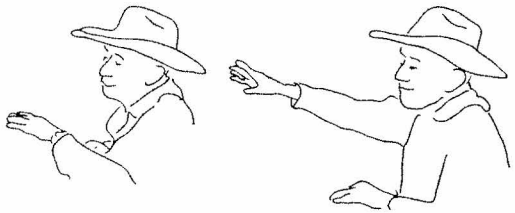
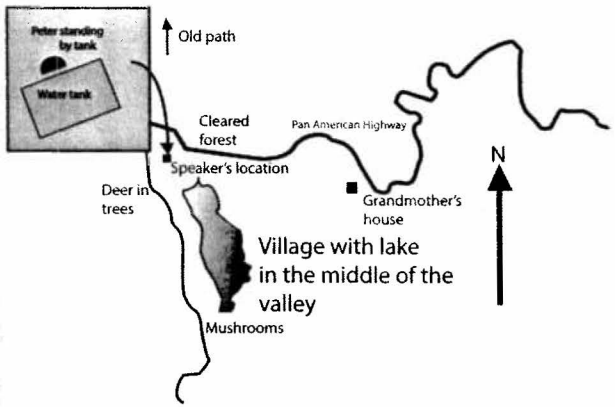


Fig. 2. Mushrooms covering the forest, trees stacked

Fig. 3. Chopping up one side of the ridge, and back down this way

More iconically he both sketches with his hand and describes with positional roots how the mushrooms carpeted the forest, and how the tree trunks were stacked. The direction of his sketching hand indexes the location involved (Fig. 2). He similarly combines an iconic representation of motion as he traces with his hands the trajectories he captures in words with directional verbs as he describes the felling of the forest, up one side of a mountain ridge and back down the other (Fig. 3).

In all of these performances – unsurprisingly, since he is recounting the history of the village where he and his interlocutor are standing – Peter's pointing gestures directly index visible landmarks. Although he is talking about past events, when the landscape was different, his gestures help his interlocutor to calibrate the past geography (the space Peter is talking about) with the immediate indexical surround (the space in which the current interaction occurs). Mapping the direction of his pointing gestures on a map of the village (Map 2) makes this calibration clear.



Map 2. The places Peter narrates in and around the village.[17]

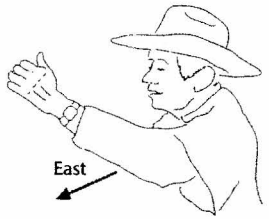
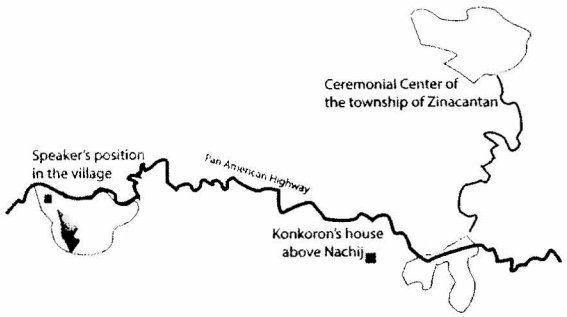


Fig. 4. East of Konkorón's house

When he goes on to speak about a more distant location – some 8 to 10 kilometers away, over the mountains to the East and well beyond visible range – Peter also points toward the exact place he describes, showing with a contoured hand how it is located relative to the house of the man his interlocutor mentions.

Once again, it is possible to check the directional accuracy of Peter's gesture by comparing its vector with a map of the area (Map 3), knowing roughly where the spot he mentions stands in relation to the nearby village of

[17] All maps were drawn on the basis of arial photographic coverage from the area in and around San Cristóbal de las Casas, Chiapas, Mexico, taken from Google Earth, the sources for which are copyrighted material belonging to Google, INEGI, Cnes/Spot image, and Digital Globe, all copyright 2011.



Map 3. Map of the wider area between Peter's village, Nachij, and Zinacantán

Nachij, directly on the old walking path into the town of San Cristóbal. Even at this distance, the direction of Peter's pointing gesture is surprisingly exact.

Zinacantec gestures can be spatially demonstrative in a different way. At another point in Peter's narrative he describes how people from the village (often Indians who had immigrated there from other Tzotzil communities in search of land and wives) were conscripted into the Mexican army and sent off to fight in distant places. One such man had given a vivid account of battle, and Peter describes how the man was taught to shoot either from a kneeling or prone position. He has recourse to two Tzotzil positional roots: *kej* 'kneeling' and *pat* 'lying on the belly with the front of the body raised.'

(8) Shooting in a kneeling or prone position

kej-ajtik la ch-ak' xi toe
kneel-PLU EVID ASP+3E-give thus CL
'They would shoot kneeling like this.'

mo`oje, patal tal ta lum
no prone DIR:coming PREP ground
'Otherwise they would lie down on the ground.'

However, he refines his postural description by acting out the positions via pantomime, showing how the soldiers were trained to kneel on just one knee (as opposed to the standard Zinacantec way of kneeling on both), and to support themselves on their arms when shooting from a prone position (Fig. 5).

More striking still is a conceptually more complex gestural specification of absolute direction that Zinacantecs frequently use. Here is a characteristic

Fig. 5. Shooting while kneeling or prone

example, which I unfortunately did not capture on film. Peter was once telling me how I should travel to reach his lowland cornfield, a day's journey from the village where we sat. He told me to take a truck to the city of Tuxtla, from there to take a 2nd class bus in the direction of a town in central Chiapas, and to ask the bus driver to let me off at a certain named place in the countryside. "When you get off the bus", he told me, "go that way" – pointing at a spot on the hills rimming the village where we sat, but more than 70 km as the crow flies from where I was heading. How was I to understand his instructions? Apparently what he expected was that I memorize the compass direction in which he had pointed and try to reproduce it when I found myself by the side of the road after the bus let me off.

To understand the complexity of such a pointing gesture, consider how another Zinacantec, Martin, who spent many years traveling between the village of Nabenchauk and the distant town of Cancún told me about the route he used to follow. I filmed his original description in 1991 while he sat in my yard in Nabenchauk, and again ten years later, from the quite different vantage point of the town of San Cristóbal, as part of a systematic study of co-speech gesture.[18] At that point he had not made the trip in nearly a decade. Given how he was oriented by the compass on both occasions, one can track with precision the directions of Martin's pointing gestures. A striking feature is the consistent orientation of his pointing gestures, which suggest a highly accurate point-by-point absolute recalibration of the compass directions he took at each major juncture of the trip.

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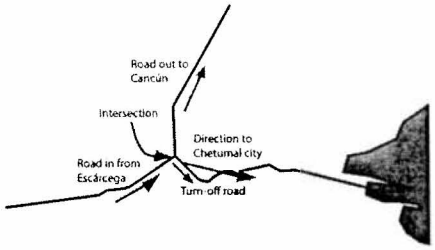
[18] See Haviland 2000d, 2005 for more detailed treatment of this route description and its gestures.



Map 4. Turn-off to Chetumal

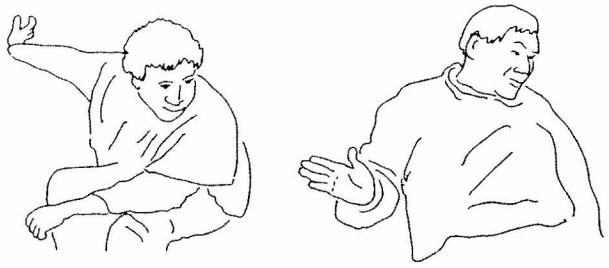


Fig. 6. "Chetumal is this way"

Here is one example. At the place on Martin's route where the road approaches the coastal city of Chetumal, the main highway bypasses the city, which lies to the east and slightly south of the intersection, and it there turns northeast toward Cancún. (See Map 4.)

In the 1991 film, Martin describes arriving at the Chetumal turn-off and silently indicates the trajectory of the turn-off road, branching away from the main highway. He then explicitly locates where the city of Chetumal is, flipping his right hand slightly back to the right as he says *xi ta xkom chetumal xi toe* ('Chetumal is over that way'). If we interpret this gesture in compass terms, it accurately places Chetumal slightly south of east, at about 100° on a 360° compass with North at 0°. In the 2001 narrative, with a brief turn of his hand off to the southeast, Martin also notes that Chetumal lies off the main trajectory of his route. The corresponding images from the two video recordings are shown in Fig. 6. Both gestures appear to place Chetumal in almost exactly the same compass direction from the turnoff.

Understood as 'absolute' reckonings of compass directions from the imagined road junction, his gestures reflect a consistent sense of orientation and direction which receives similar expression across the decade-long span (and his different body positions) between the two different narrations.

4. Narrated and narrating spaces

It is worth reflecting on the conceptual underpinnings these pointing gestures seem to imply. Because gesture about space itself uses space as its communicative medium – it is, in this sense, also "metaspatial" – it seems important to distinguish at least three conceptually different kinds of 'space' involved in the Tzotzil gestural practices we have been examining. Jakobson (1957:390), in his classic elaboration of the basic grammatical categories of the verb, distinguished "1. speech itself (^{s}), and its topic, the narrated matter (^{n}); 2. the event itself (E). and any of its participants (P), whether 'performer' or 'undergoer.'" He continues: "[c]onsequently four items are to be distinguished: a narrated event (E^{n}), a speech event (E^{s}), a participant of the narrated event (P^{n}), and a participant of the speech event (P^{s}), whether addresser or addressee."

Because events generally involve entities arranged in space, one could extend Jakobson's classification to include both a narrated space (S^{n}) and a narrating or speech-event space (S^{s}) within which the narration takes place. The former is the space in which narrated events putatively occur (and which thus may be at least selectively represented in the narration), and the latter is the space of the speech event itself, physically accessible to participants as they talk. As in the case of the other entities Jakobson distinguishes, these spaces are conceptually different: the narrated space is in a clear sense imagined and essentially partial, as it only acquires details as the narration and interlocutors' own knowledge progressively provide them. The narrating space, within which the speech event occurs, is largely presupposable from the immediate surround of the speech act participants, and partly brought into some kind of correspondence with the narrated space as elements of the narration highlight local places or entities to create such correspondence. For example, Peter locates his long deceased grandmother's house (part of the narrated space) relative to a contemporary local house known to his interlocutor (in the wider narrating space), to which he can point as shown in Fig. 4. Various mechanisms, including use in narration of immediately perceivable local landmarks, or coincidence of compass directions, can superimpose narrated space on local speech-event space or otherwise calibrate the two conceptually different spaces.

In previous work (Haviland 1993a), I have appealed to a further "interactional space" (S^{i}) – related in some ways to what Kendon (1990:211) long ago called "o-space" – which is distinguished from the narrating or speech-event space (S^{s}) by its centrality not to the narrated events or to the speech-event surround in general but to the specific mutual interaction of the participants

in the speech event: it is the immediate shared space of the interaction and mutual attention, within which interlocutors usually gesture. (In the case of sign language, to which we shortly turn, it is also the space where signs are generally performed.) A distinguishing conceptual feature of S^i is that, just as the narrated space may be independent from the narrating space, the interactional space can also be independent or decoupled from the speech-event space. It is "free": a space created by and for the immediate interaction. When Peter half kneels to illustrate how the narrated protagonist fired his rifle (Fig. 5), he demonstrates the position in interactional space. However, his spatial use of interactional space is at least partly arbitrary in the sense that exactly *where* he kneels is irrelevant to the performance (and his interlocutors must understand this).

4.1 Z, an emerging language

Distinguishing different conceptual spaces in this way underlines how space is, first and foremost, a discursively constructed, linguistically structured category of interpersonal interaction. Whatever origins spatial understanding may have in the perceptual capacities and cognitive development of individual human beings, central and important features of a conceptualization of space, on this view, emerge from the way people talk about and otherwise represent spatial relations in their ordinary interactions. As I mentioned at the outset, such a perspective obviously lends special interest, in the comparative study of spatial conceptual systems, to a *new* language. If a community of speakers relies on its language to structure space, what happens when the linguistic resources for representing space are only beginning to emerge? How, in such a case, does spatial conceptualization come to express itself?

A first-generation sign language, Zinacantec Family Homesign ('Z'), emerging among five young adults in the township of Zinacantán, Chiapas, México allows a unique view of how spatial language grows out of interactive and social practices. The three deaf and two hearing members of this miniature language community have grown up with no interaction with other deaf people and limited contact with any language other than spoken Tzotzil, in a small and relatively isolated village of peasant Indians. Their communicative system uses a largely visual/manual modality and is the complex result of their interactions with each other, with Tzotzil speakers more widely, and their own processes of invention and innovation. Because of the extensive prior work on spatial representation in both spoken Tzotzil and also co-speech gesture, it is of special interest to see how a sign language emerging in this communicative context provides raw materials for creating linguistic

representations of space, and how those of this manual modality compare with parallel Tzotzil resources.

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, like many other Zinacantec girls her age. Six years later a 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 pejorative 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 that both Jane and Frank were profoundly deaf. Finally, in 1988 – when his older deaf sister was nearly thirteen years old – a youngest sibling, Will, was born, also deaf. 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 as well.

I have known all of these children – now young adults – since they were born. Their unique linguistic circumstances cried out for systematic investigation, despite the children's reluctance to sign in public and the general stigma of their deafness. Mario, the father, my old friend and *compadre,* was also a major collaborator in research on Tzotzil ritual language and co-speech gesture. When in 2008 the work on an emerging Bedouin sign language by my UCSD colleague Carol Padden and her associates[19] inspired me to undertake research on Z, Mario and his children readily agreed.[20] By then

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[19] See for example Sandler, Meir, Padden, and Aronoff 2005; Meir, Padden, Aronoff, and Sandler 2007.

[20] 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 Z signers themselves, acknowledged here by their pseudonyms: Jane, Frank, and Will, as well Terry, Rita, and Victor.

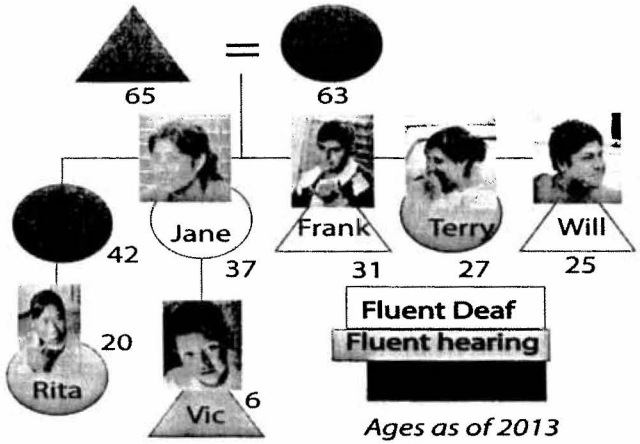


Fig. 7. Genealogy of the extended household where Z is spoken

Jane had her own hearing son, Victor, now a 5-year-old bilingual signer and Tzotzil speaker, who along with a younger cousin represent the beginning (and perhaps also the end) of the second generation of this miniature Z speech community. (See the genealogical chart in Fig. 7.)

Z represents a functionally effective means of communication for the signers in this family, allowing them to participate in apparently all the activities normally facilitated by spoken language in a Zinacantec household. Z signers issue and respond to commands, ask and answer questions about both facts and speculations, recount past events, participate in decisions, plan for the future, tell stories, argue, evaluate, joke, ridicule, criticize, and scold. Despite the very shallow history of their conjointly developed system of signs, despite the unusually high level of presupposable common ground that results from the intimately shared biographies of the tiny Z signing community, and despite the relative isolation in which the Z signers live compared to hearing Zinacantecs, they appear to have no more difficulty than other Tzotzil-speaking Zinacantecs in dealing with (and naming) things and people both familiar and unfamiliar, and generally in negotiating their lives, practical and social. Strikingly, for me as a linguistic anthropologist concerned with the presumed central role of language in cultural transmission, the Z signers seem wholly Zinacantec, in what they know, what they like, what motivates them, how they act, how they move, and how they interact. The central research questions in ongoing work address the structural properties of Z in the face of this evident functional efficacy.

Fig. 8. "at 4:30"

As mentioned, the issue for the present chapter, however, is smaller. How is space represented (and hence, at least as an initial approximation, construed) by the first generation of users of an extremely young language like Z? What resources for communicating about space have the Z signers adopted or invented?

4.2 Space in spontaneous Z conversation

I introduce the Z signers in the context of spontaneous conversation, to illustrate both the general character of the language and some of its spatial resources. Here are Memo and Frank, in a typically competitive interchange for young Zinacantec male siblings. They are talking about which of them will be asked to accompany their brother-in-law who makes periodic trips to a distant market town on the Chiapas Pacific coast to sell flowers, mostly for specific fiestas. These are among the few outings the boys make away from their home village, and they are prized occasions both to escape from quotidian routines and to earn money. The general tenor of the exchange is mutual insult: each brother boasts that he is more likely to be invited on the next trip because the other brother is "useless".

Consider Frank's first few utterances as he introduces the topic by mentioning that the brother-in-law had just left for the coast earlier that day. He says, "At 4:30 the truck set out and went (to the coast). Dad (will go) tomorrow, he didn't (go) now". Different parts of the utterance are illustrated in still frames from the video recording in the following figures In Fig. 8 Frank points to his left wrist (as if at a watch) to refer to the time of day, then displays the number 4 on his right hand, and adds the half hour by drawing his left finger across his right palm. He goes on to say that that was the hour when the truck was loaded and ready to set out (Fig. 9).

He signs that the truck went to the coast by performing a 'go' verb: he points with his right thumb (see Fig. 10) placing the final destination a long

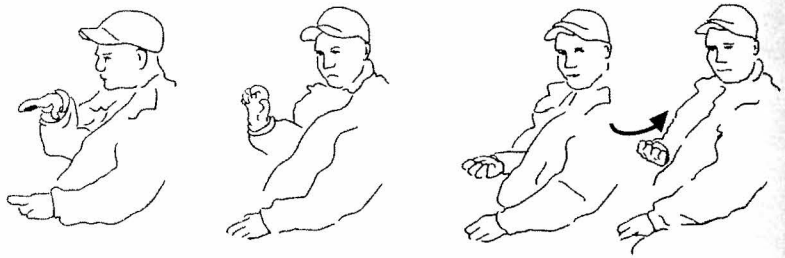


Fig. 9. "the truck was loaded and ready to go"

Fig. 10. "it went there"

way away (signaled by the height of the movement arc[21]) and slightly to the west of south (signaled by the compass direction of the pointing movement).

Frank goes on to add that their father (whose proper name in Z is illustrated in Fig. 11: a bent hand with the fingers together held in front of the belly – an iconic reference to the older man's prominent paunch) did not leave (using a conventionalized negative hand wave seen in Fig. 12), but would be going in the next couple of days (shown with the conventionalized "tomorrow or the day after" sign – rotating the right index finger in several circles oriented away from the body in Fig. 13).

At several other points in the conversation the boys make references to trips to the coastal town in question. The form of the signing anticipates a general finding about Z, already evident in the 'go' verb illustrated in Fig. 10: signs typically "absolutely" anchor locations in the narrating space. Thus, when Will mocks Frank for being left behind, Frank retorts that frequently Will himself is not invited on the flower selling trips; he illustrates the latter with another pointing gesture, somewhat awkward to perform from his

[21] Kendon 1980: 110 describes the same kind of usage in Enga sign. See Calbris 1990, Haviland 1993 for gestural uses of a similar convention to denote distance.

Fig. 11. "Dad"

Fig. 12. "He didn't go yet."

Fig. 13. "(He'll go) tomorrow."

seated position facing north-northeast: he traces a high backward arc to show the southern trajectory of the trips. (See Fig. 14.)

Will continues mocking, by saying to his brother, "Just wait, you'll see [see Fig. 15] – I WILL be going to the coast". Will also performs the motion verb with a dramatically exaggerated arc (Fig. 16), ending with a triumphant flourish and grin at his brother.

It is worth highlighting the (to many speakers of European languages) almost uncanny directional accuracy of these pointing gestures. In Map 5 I

Fig. 14. Frank, seated facing north, signs "go to the coast"

Fig. 15. "Just wait!" (Will on the left, Frank on the right)

superimpose on a map of Chiapas the rough directional vector of Frank's finger point and his and Will's later more demonstrative renditions of the same journey as they were performed from the signers' house in Zinacantán (see the inset on Map 5). Even with a very approximate reckoning of the direction indicated, both Frank and Will's pointing gestures seem to pick out the section of the Chiapas coast that includes the town of Huixtla, where in fact their brother-in-law does go to sell flowers.

In my understanding the vector that forms part of the sign for 'go' in Z does not depend on some arcane and mysterious directional acuity on the part of the Z signers, who have rarely traveled as far as the Chiapas coast in the course of their lives. Instead, one must consider such dead reckoning of

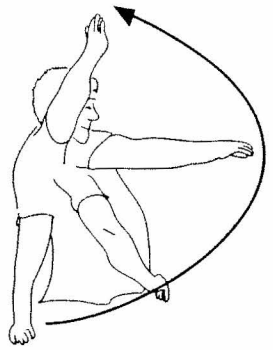
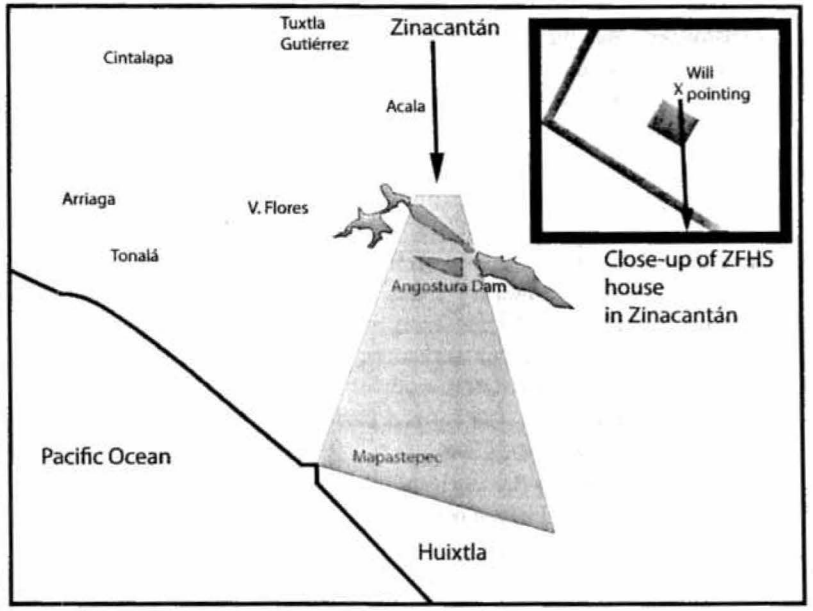


Fig. 16. Will: "I WILL go (a long way that way)."



Map 5. Map of Chiapas highlands and coast, Zinacantec household inset

location from a given origo, together with a set of visible devices to show relative distance and other aspects of intervening terrain, to be part of the wider convention in Zinacantec co-speech gesture to locate even distant places in terms of absolute compass directions from the current speech

origo, as illustrated above in Peter's gesture in Fig. 4 and the corresponding Map 5.[22] Such absolute locations (calculated relative to some speech event location) effectively serve as a proxy for Z place names.

5. Pseudo-experiments about space and place

As a novice student of sign languages, I have borrowed and invented tools for studying Z. I have relied on my previous knowledge of Tzotzil (which is, of course, my conduit to Z through the glosses and interpretations offered by the two hearing signers, Terry and Rita) and of Tzotzil gesture (which offers certain tools for describing Z sign form), trying to make only the most austere assumptions about how Z might work. Most of the Z signing I describe in this paper was elicited in semi-controlled tasks, in which one or two signers describe a photo or short video clip to other signers, who are in turn asked to select a matching photograph or video frame from an array. The descriptions and accompanying clarifying discussion (as well as subsequent critical commentary in Z) are filmed, transcribed, glossed into Tzotzil, and analyzed. Using such pseudo-experimental eliciting techniques has both advantages and defects, obvious in what follows.

Matching tasks with individual objects, sometimes distinguished only by color, size, or shape, proved trivial for Z signers. For example, when presented with a signed description of a single object marked from an array like those in Fig. 17, signers had no difficulty picking the corresponding item from a differently arranged array. The result suggests a well-developed conventional lexicon for Z, as well as resources for denoting size, shape, color, etc., and for creating nonce descriptions of novel objects.

To elicit spatial descriptions I asked Describers first to describe photographs of specific known local places as well as from unfamiliar sites so that Matchers could pick out the corresponding photos from an array. I then asked all parties involved to tell me where the place was if they knew. These tasks were carried out in different physical locations, sometimes in the signers' home in the village of Zinacantán, sometimes in my house in nearby San Cristóbal, both places whose locations and orientations are precisely known.

[22] From my earliest days in Zinacantán in the mid 1960s, when people ask me where I am from, they routinely request that I show by pointing on the horizon where my homeland lies, or where my current residence is.

Fig. 17. Arrays of objects

5.1 "Absolute" dead-reckoning

Given the apparent use of "absolute" dead-reckoning in S^s as a conventional part of naming known places, it should come as no surprise that when the Z signers want to refer to identifiable places, they do so by pointing in the 'correct' direction calculated from their current locations. For example, to describe a picture of the Chamula market from the vantage point of my house in San Cristóbal the signers pointed as in the following illustration (Fig. 18), where Frank, seated on the right, faces almost directly west. (The pointing gestures, though combined in one composite illustration, are all taken from different moments on the video.) Will, Frank, and Jane all appear to indicate a direction a bit north of west.

By contrast, while carrying out a similar task while seated in their house compound in the village of Zinacantán, Will and Terry indicated the location of the Chamula church as shown in Fig. 19.[23]

Drawing the rough vectors thus indicated from these two different vantage points onto a map of the region that includes the Z signers' house in Zinacantán, the researcher's house where the first experiments took place, and

[23] In the right hand panel shown in Fig. 19, Will is already retracting his hand from the apex of his pointing gesture. It is important to note that there is more to these locational signs than the vector of direction: different hand shapes are involved; the arc of the gesture indicates something about distance and visibility; gaze is sometimes engaged, often 'sighting' along the pointing limb; and, crucially, different movements of the hand often seem to suggest something about the intervening terrain. For example, Terry's gesture on the right frame of Fig. 19 involves a twirling toss of the hand clockwise (from her point of view) and forward, indicating that from where she sits the Chamula church lies on the other side of the high mountain ridge along the northern edge of the valley of Zinacantán. Detailed treatment of these formational details must await another occasion.

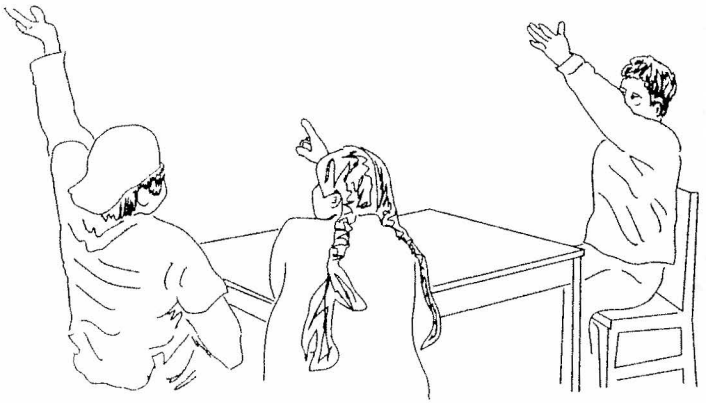


Fig. 18. The Z signers point to identify a picture of the Chamula market.

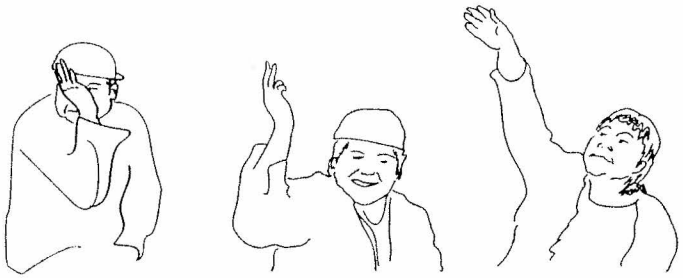
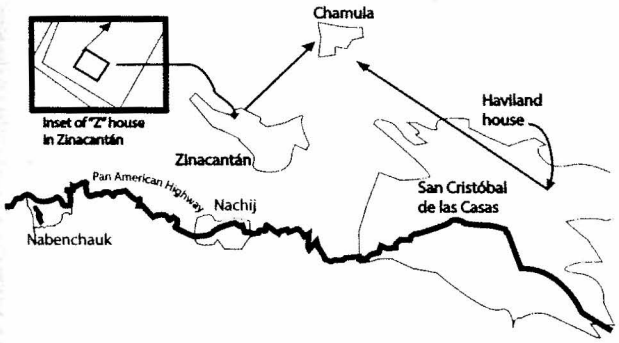


Fig. 19. Locating Chamula from Zinacantán

the center of Chamula (Map 6) shows that the locating gestures do in fact converge on the intended location.

Very similar directional convergence can be observed for other 'named' locations in the Z repertoire, including the signer's natal village of Nabenchauk or the lowland state capital of Tuxtla Gutierrez, both of which lie considerably farther from the immediate horizon. For example, I asked the signers to describe the picture shown in Fig. 20.

Jane, sitting in my house in San Cristóbal, describes it as a bucket containing a lemon grass plant (Fig. 21, left panel) which her mother (Fig. 21, right panel) brought from Nabenchauk (Fig. 22 right panel) to their house in Zinacantán (Fig. 22 left panel). The example illustrates clearly three quite different formational principles in Z conventionalized signs: the sign for 'lemon grass' – which also means 'coffee' or another hot drink – is an arbitrary (though iconic), established, and highly portable convention based pre-



Map 6. Map showing signer's locations their pointing directions, and Chamula

Fig. 20. A bucket holding a lemon grass plant outside Jane's house

sumably on both the image of steam rising from the cup and the beverage's strong smell. (It involves waving a flat '5' hand up and down in front of the nose.) The proper name for the signers' mother, 'Mom', is a somewhat uncomplimentary reference to her prominent belly. The "names" for the towns of Zinacantán and Nabenchauk are based on inferences from a pointed direction which must itself recalculated on every occasion of use from the current speech event origo. (See Map 7 which shows the rough vectors of Jane's pointing gestures in Fig. 22 from the vantage point of where she was seated.)

There seems little doubt that the gestural convention in Zinacantec Tzotzil of locating named locales on the horizon has been incorporated into Z as a formational component of locative signs: both place names for known places, and also locations attached to other sorts of entities. Successful use of such a convention requires both dead reckoning skills and strong inferential intuitions coupled with geographic awareness on the part of interlocutors.

Fig. 21. Jane signs "hot drink" and "Mom".

Fig. 22. Jane signs "Zinacantán" and "Nabenchauk" from Haviland house.

Map 7. Haviland house, signers' home village, and village of Nabenchauk

Maintaining such geographic awareness clearly requires reinforcement and depends on collaborative practices among signers and Tzotzil speakers alike. When the Z signers were unable to identify a pictured place they often indicated their perplexity by pointing in several different directions with an accompanying shrug: "I wonder where that is." During one of these quasi-experiments in the village of Zinacantán, the signers' father was also puzzling

Fig. 23. Agua Azul "on the road to Palenque"

Map 8. From Zinacantán to Agua Azul

over such a photograph. When I told him it depicted a place he knew by reputation – the famous waterfalls at Agua Azul – he remarked "That's on the road to Palenque" and in a seemingly automatic and unconscious way flipped his arm out in a rapid high arc in the correct direction (which, as it happened, lies just clockwise from the angle toward Chamula to the northeast, although Agua Azul is considerably farther away, s. Map 8).

Almost certainly related to this use of an absolute spatial frame of reference is a Z convention for talking about time. Frank and Will, who are familiar with watches, tend to name the hours with numbers shown on the fingers. Jane on the other hand often shows the hour with absolute gestures, pointing to an idealized position of the sun in the sky. For example, in a spontaneous conversation about her favorite afternoon soap operas, she once

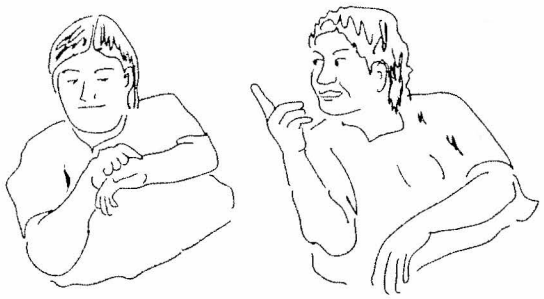


Fig. 24. Jane: Will we finish late?

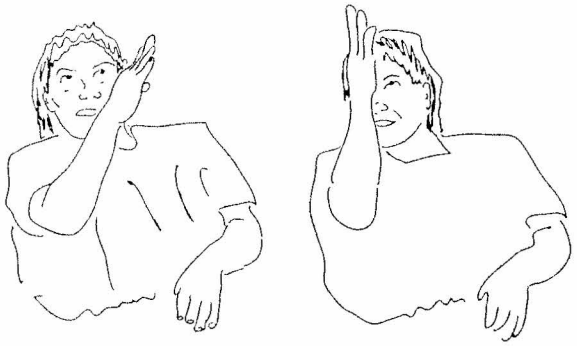


Fig. 25. Noon and one o'clock

asked her sister Terry what time she thought they might return home (after an eliciting session). She asked whether it would be late: first by pointing to her left wrist, and then pointing at the afternoon sky to the west (Fig. 24).

She went on to explain that the two television programs she was interested in started at noon and at 1pm, in both cases using a demonstrative pointing gesture at an idealized solar trajectory overhead (see Fig. 25).

Using the distinction between S^n and S^s introduced above, it is worth considering in which conceptual space these absolute dead-reckoning pointing gestures operate. Where or at what they are directed? When signers point at a visible landmark or local place, the gesture seems to draw on direction and location in the narrating or speech event space to supply a referent in the narrated event. Pointing at a more distant referent seems essentially similar: it relies on the location of things and places in the narrating space, widely construed, to supply narrated referents. Alternatively, such pointing relies on a convention that the narrated space, which is projected both from these

pointing gestures and from any other narrative elements which allow interlocutors to imagine narrated events, must be superimposed over narrating space. at least with respect to cardinal directions. Both spaces, that is, are identically oriented. (This is not, as far as I can tell, a convention of pointing in my own native English-speaking narrative tradition.) Indicating points along the trajectory of the sun to denote times of day suggests that the latter interpretation – a conventional oriented lamination of S^n on top of S^s – does better conceptual justice to the facts. Pointing to the place where the sun would be at noon – when it is not actually noon – seems to instruct an interlocutor to imagine another time when the sun would actually be where one is pointing in the here-and-now, a transposition that resembles Peter's superimposing his great grandmother's now long defunct house onto a location projected form the current Chikin P'in's house of the moment, in Fig. 1 above.

5.2 Intrinsic, relative, and absolute frames of reference mixed together

Dead reckoning can also be used by the Z signers to argue about location, and it is combined interestingly with other signs that rely on non-absolute frames of spatial reference. Consider the interaction that followed Frank's description of the church front pictured in Fig. 26. The church has a distinctive set of sculpted and painted arches above its door, which Frank sketches in the air as he begins his description (Fig. 27), adding that it is a church (Fig. 28), and he locates it in direct line of sight from where he sits. He is facing west as he signs, and the Guadalupe church he identifies is directly visible south-southwest from where he sits in my house.

Fig. 26. The church in the Cerrillo square

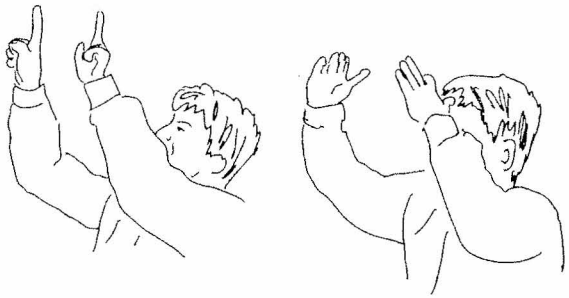


Fig. 27. Frank sketches the design of the church front.

Fig. 28. Frank signs 'church' (by crossing himself quickly).

In fact, Frank identifies the church several times as the church of Guadalupe, each time by pointing directly at the church, sometimes in a casual unmarked way, sometimes with just a gaze and head tilt (Fig. 29), and later – when he is challenged on his identification – in much more demonstrative ways (Fig. 30), which include facial inflection.

Frank's interlocutors, who are sitting across a table from him (and thus are oriented more or less facing East), recognize that he is describing a church front, but they (rightly) dispute his identification. They claim that the picture shows a different church almost directly west of them in the *plaza* of the neighborhood called Cerrillo (see Map 9). They signal their disagreement (using negative finger waves – see Fig. 31) and propose their alternate identification with a variety of pointing gestures (Fig.s 32 and 33). Frank ultimately concedes that they are right, in part by pointing at them (Fig. 34).

Strikingly, although all the signers here use absolute dead reckoning to indicate location (and as usual their pointing gestures are carefully calibrated from the origo of the speech event), a very different spatial frame of refer-

Fig. 29. Frank points casually at the Guadalupe church.

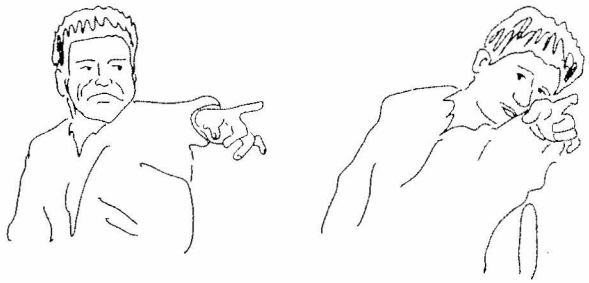
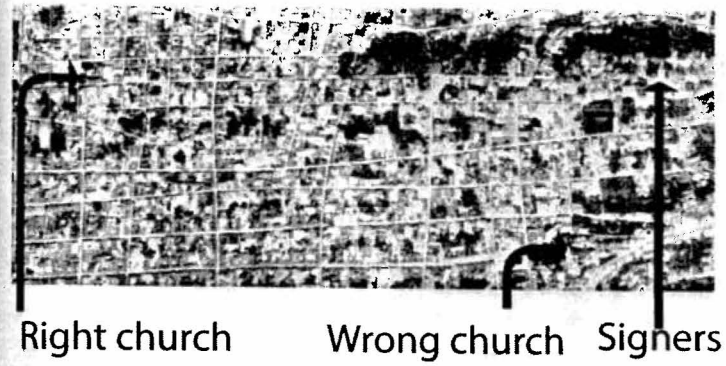


Fig. 30. Frank points at the Guadalupe church in more marked ways.



Map 9. Map of the location of the right and wrong churches

Fig. 31. Will and Jane contradict Frank with finger waves.

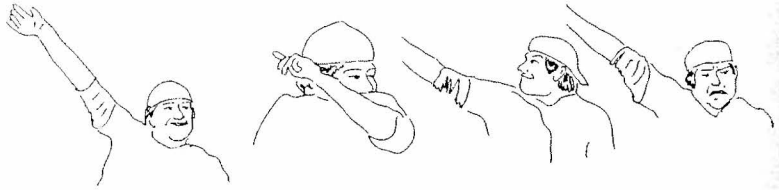


Fig. 32. Memo points to Cerrillo church.

Fig. 33. Terry points to Cerrillo church.

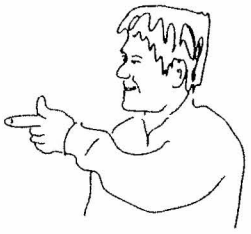


Fig. 34. Frank concedes that his interlocutors are right.

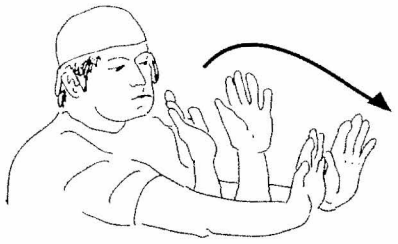


Fig. 35. Will asks if the church is seen from the front.

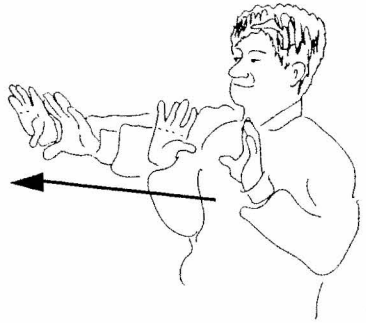


Fig. 36. Frank answers that the picture does show the church front.

ence is implied by another aspect of their description of the stimulus picture in Fig. 26. Just after Frank begins to sign, Will asks him whether the picture shows the church from the front. Frank replies that it does. Both Will's question and Frank's answer use a distinctive two-handed pushing gesture designed apparently to suggest the perspective of an observer looking at the front surface of an object (Figs. 35 and 36). It is clear that the two men, although using the same signs, have oriented them not absolutely but relative to their own perspectives as observers. Since they face each other, the two 'pushing' vectors are in fact performed in exactly opposite directions, as the illustrations show.

Even more striking is Will's use of a similar sign when he turns to Terry to repeat that the picture in question shows the front of the Cerrillo church. He signs that they are looking at the front of the church, but he is now turned toward Terry and his 'pushing' gesture now goes from him out toward her. He continues with an oriented finger point in the absolute direction of the church itself (Fig. 37).

In terms of Levinson's typology of frames of reference, the 'front' sign seems to rely on a "relative" spatial frame of reference, calculated deictically

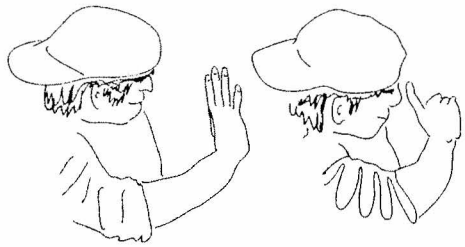


Fig. 37. Will tells Terry that the picture shows the front of the Cerrillo church.

from the perspective of an observer. There seems a clear affinity between this kind of unanchored or interactionally anchored sort of directional vector and the use of what I have called S^i, interactional space, illustrated above in Fig. 5, to which we shall turn again at the end of this chapter. The "free" or perspectivally anchored 'front' gesture is immediately followed by another pointing gesture which requires, for its interpretation, absolute reckoning of the location of the church in S^s.

Z signers' spatial representations in fact make extensive use of a relative frame of reference that requires projection from an observer's viewpoint. Although some of the spatial task I asked Z signers to perform were relatively easy for them, certain tasks repeatedly confounded their efforts to achieve a match, apparently because the tasks required certain conceptual transpositions at which the signers are not practiced and which Z provides few ready-made tools to facilitate. Fig. 38 shows a simplified version of the stimuli in one such case which, despite a deeply flawed design, revealed interesting aspects of Z spatial resources.

One must first imagine the spatial layout of the task, with the Describer sitting on the right to describe the picture with a thick border. The Matcher, seated on the left, must pick the corresponding picture. If it seems obvious to the reader that the left hand bottom picture on the left is the correct match ("the same picture"), consider a Describer, seated on the right and physically facing West, who uses an absolute frame of reference and describes his picture as (for example) "two animals facing East" or, alternatively who says "the animal directly facing me is on the south". Which of the Matcher's pictures would now be the correct match? The actual arrangement of signers for this particular description, shown in Fig. 39, further complicates matters because the Describer's slide was projected vertically on a computer screen, whereas the Matchers were presented with an array of printed photographs arranged horizontally on the table, requiring a further transposition of perspective.

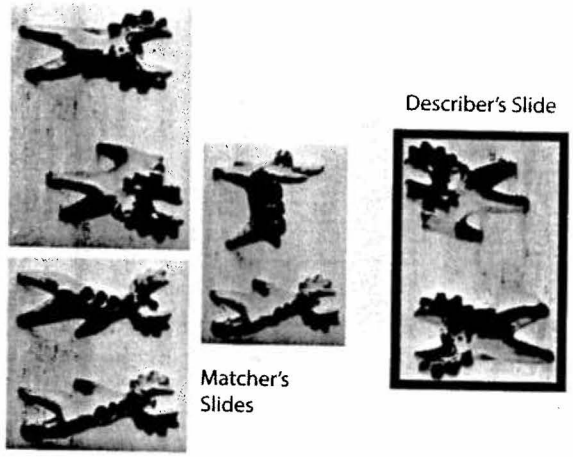


Fig. 38. Candleholder matching task

Fig. 39. Rita and Terry match, and Jane, holding Vic, describes.

The picture that Jane sees is reproduced the way it appears to her in Fig. 40. The two clay objects have already been identified by the signers as candle holders, in the shape of small animals.

The two matchers, confronted with an array of nine different photographs of the same two clay candle holders in distinct configurations, ask Jane to tell them how the animals are oriented. Jane first shows that the figures are oriented straight back from her perspective (i.e., as she sits, on an East-West line) by tracing a straight vector with her flat palm, forward and upwards (Fig. 41). She goes on to sign that both figurines are facing her (Fig. 42).

In order to add still more detail, Jane – who does not have access to the

Fig. 40. The stimulus picture as it appears to Jane.

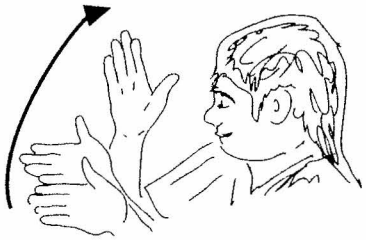


Fig. 41. Jane signs "that way, straight".

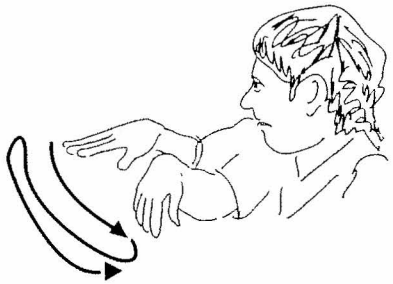


Fig. 42. "Both facing this way".

whole array of pictures Terry and Rita are looking at – elaborates a bit further. She notes that while the figurine on the left is facing straight toward her, the figurine on the right is angled slightly outward (Fig. 43), clearly the result of fairly close observation of the original stimulus picture in Fig. 40. Later the signers have recourse to drawing the vectors on the table top with their hands (Fig. 44).

Fig. 43. Jane shows that one figurine is angled slightly.

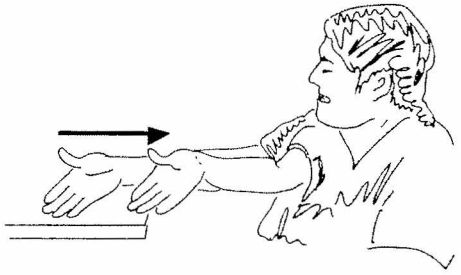


Fig. 44. Jane sketches the orientation of the figurines on the table top.

Fig. 45. The first (wrong) picture chosen by the Matchers.

How the matchers understood Jane's description can be inferred from their first (mistaken) choice of a 'matching' photograph, shown in Fig. 45.

On the basis of Jane's signs alone it does not seem possible to decide whether her description involves a relative frame of reference, in which she calculates direction relative to her own observer's perspective, or whether

Fig. 46. A sample configuration of farm animal toys

she is locating the pictured figurines in an absolute space in which they are facing not toward her but toward the East. (An intrinsic frame of reference is also implied, in the sense that the description appeals to how the figurines are facing which depends on their own intrinsic anatomies.) The Matchers' misconstrual of Jane's description is also ambiguous between an interpretation based on absolute directions (which would instruct them to look for a picture in which at least one of the figurines can be understood to face East), or an observer-relative frame of reference in which the matchers fail to re-center their perspective to that of the describer (who is facing in exactly the opposite direction).[24]

In another type of task, slightly less constrained than the previous one, the Describer was shown a photograph of an array of small plastic farm animals. The Matchers were given the actual toys themselves and were seated behind a screen so that the Describer could sign to them but not see their workspace. Their task was to follow the Describer's instructions in order to arrange the toys according to the model in the picture. Fig. 46 shows one such stimulus photo which Frank described to Jane, Will, and Terry, also in a face to face configuration. Frank is looking at the photograph, but his view of the actual of toy animals the Matchers must manipulate is obscured by a screen (Fig. 47).

In this task is the Matchers must construct a real array of toy animals, directly on the table in front of them, in S^s (and perhaps simultaneously in S^i). It seems clear that Frank's instructions are both intended and interpreted to involve absolutely oriented directions. He begins by specifying two animals:

[24] Since I persisted in treating only the 'same' photograph as the right answer, the Matchers in this case were very frustrated and resorted to guessing until I showed them the picture that Jane was describing, which allowed them to see how *my* frame of reference defined the task.

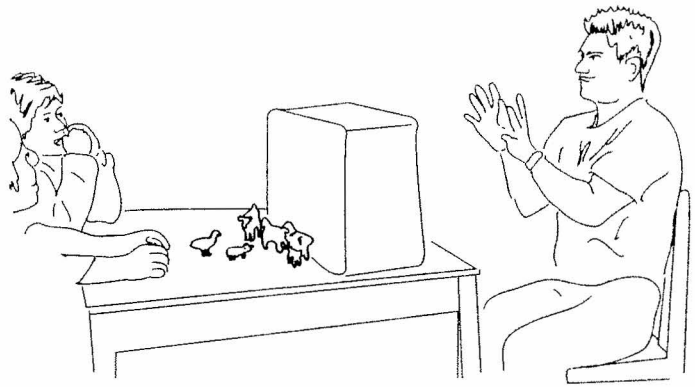


Fig. 47. Frank describing the turkey to the Matchers.

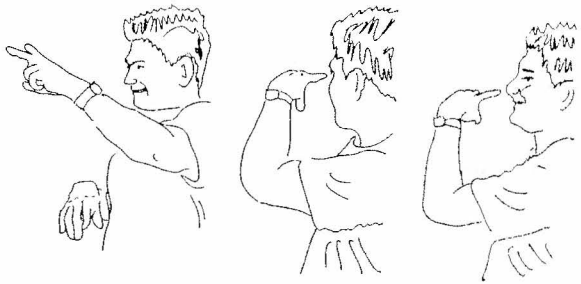


Fig. 48. Frank describes two animals, both facing northeast.

the bluish turkey and the large rooster with a red crest and a blue tail. He then describes how they are to be arranged on the table. Lifting two fingers, representing the two Figures, he turns back over his right shoulder and points both fingers in that direction, showing a northeast vector with his right hand (see Fig. 48).

In response to Will's question about which animal is on which side (Fig. 49), Frank places the turkey on the south (Fig. 50).

Frank then uses another striking devices to describe the spatial relationship between the turkey and the rooster. Asked specifically about the turkey's position, he first points in the same direction to show how the turkey ought to face. He then extends two fingers on his right hand, points them both back in the desired direction, and then indicates (by grabbing it with his other hand) that the southernmost finger corresponds to the turkey (see Fig. 51).

Fig. 49. Will asks which side is which.

Fig. 50. Frank puts the turkey on the south.

Fig. 51. Frank locates the turkey relative to the rooster.

In this task, anchored in the shared and absolute orientation of local space, Frank's instructions resulted in an almost perfect match between the Matchers' toy configuration and how Frank himself wanted the figurines to be arranged. At the end of the task Frank was allowed to rearrange the toys as he wanted, and he made virtually no changes to what his interlocutors had proposed.

5.3 Left and right

Spoken Tzotzil I believe makes virtually no use of a left-right coordinate in describing either location or direction.[25] In the texts and transcribed conversations that many researchers have collected over the years I have found only one clear case in which Tzotzil speakers use a left/right expression to describe direction, and this in unique circumstances. In the diaries of two Zinacantecs taken on a visit to the United States by the preeminent Tzotzil lexicographer Robert Laughlin, on one occasion when the travelers are totally lost they describe coming to a crossroad, and for want of any other criterion, choosing the right fork.

> Then we went out again the next day. We didn't know which road to take. We came to two roads. We took the one that went to the right.[26] Then we saw that we had just come back to the place where we started (Laughlin 1980: 94).

Apparently only in describing such a totally disoriented state would Zinacantecs resort to using a left/right coordinate, perhaps to suggest its total arbitrariness.

Nonetheless, in trying to match photographs of places the Z signers clearly do seem to make reference to a deictically centered right-left distinction, although, as in the case of the clay candlestick holders mentioned above, there is also evidence that it is difficult for their interlocutors to adopt the speaker's point of view rather than sticking to their own. Here are two slightly different sorts of example, one involving an unrecognized place and the other a well-known and absolutely oriented locale. In describing the picture shown in Fig. 52, which shows a San Cristóbal street that leads to a church on a hill, both Frank and Jane mention the church. (See Jane signing 'church' in Fig. 53 and Frank signing that it is barely visible at the far end of the street in Fig. 54).

Both signers also point out that there are many cars on the street (using both hands as if turning a steering wheel – Fig. 55). To show that the cars are on the left side of the picture, but that they are all parked facing down the street (i.e., on the right hand side of the street coming down from the church) the signers resort to slightly different techniques.

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[25] Brown 2006: 270 writes of a closely related neighboring language that "[t]here is no relative system available in Tenejapan Tzeltal based on oppositions for which the projections from the body provide a coordinate system". We have already seen above (see example 2) that Tzotzil does employ a projected, deictically construed directional construction using the word *pat* 'back.'

[26] The Tzotzil says *ta batz'i jk'obtik* 'on our right hand.'

Fig. 52. Stimulus picture of street with Guadalupe church in background

Fig. 53. Jane signs 'church'.

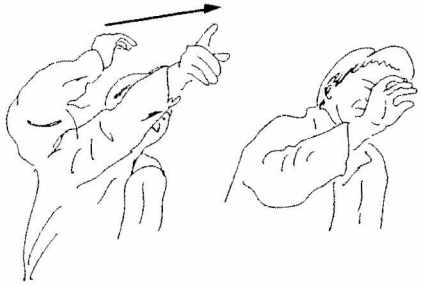


Fig. 54. Frank signs 'far that way' and 'small'.

Fig. 55. Jane and Frank both sign 'car.'

Fig. 56. Jane shows the left side of the road (three times).

Fig. 57. Jane signs "coming this way".

After signing the street itself with her right hand, Jane singles out its left hand side (from her point of view) by tracing a vector forward with a flat hand, palm inward, thumb perpendicular to the fingers – a movement that she repeats three times (Fig. 56), immediately after mentioning the cars.

She goes on to sign that the cars are facing toward her (Fig. 57).

In a more demonstrative way, Frank also mentions the cars, then signs the street itself (and both its edges, by using both hands to sketch the street's vector moving away from him), and then turns his body so that with his right

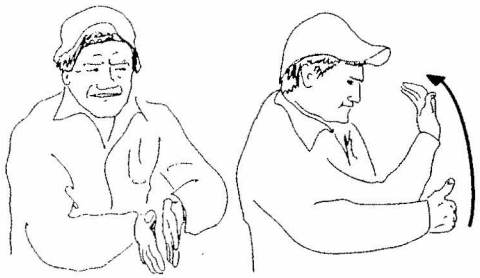


Fig. 58. Frank signs 'street' and then 'down the right side'.

hand he can mirror both the side of the street and the direction where the cars are parked (see Fig. 58).

It might be possible to think that the signs here still try to preserve the absolute cardinal directions of the scene itself, rather than a body-centric deictic projection. The photograph in Fig. 52 shows a street that travels west to east, with the church of Guadalupe far at the eastern end of it. Although in the end they could not identify which actual church was pictured, both Frank and Jane are surely aware of the convention that generally churches throughout Mexico are built with their main doors to the west and their altars to the East. However, from where they are actually seated in their house, their gestures run in exactly the opposite directions: they place the church slightly north of west, and the cars are portrayed as running in a direction that is actually east southeast.

Since we have already seen that the Z signers are scrupulous in placing known locations more or less exactly where they lie on the horizon, more striking still is the signers' description of the photograph in Fig. 59, which shows a simple flat-roofed house which both signers recognized as being just up the street from the vegetable stand their sister operates in the town of San Cristóbal. The shop is a place they visit frequently, and they have no trouble in dead-reckoning its location from where they sit in their house. Both Frank and Jane begin their descriptions by mentioning the vegetable stand (Fig. 60).

Jane continues by tracing a vector corresponding to the road on which both shop and house lie, moving right to left, and placing the target house on the left (Fig. 61).

Frank is again more forceful in his signing. Having first mentioned the vegetable stand, he "places" it out in front of his body to the right with a well-defined hand whose fingers are bunched and slightly bent. He then flattens the hand and moves it swiftly to the left (see Fig. 62), where he holds

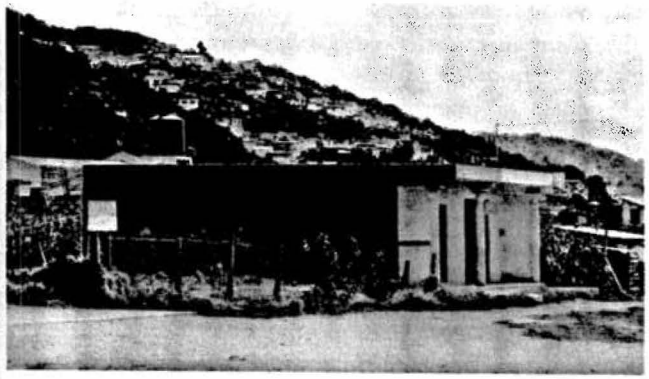


Fig. 59. Stimulus picture showing a house near the signers' sister's shop

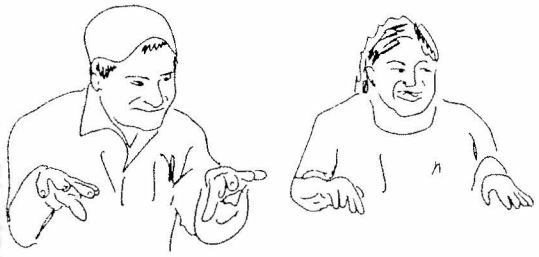


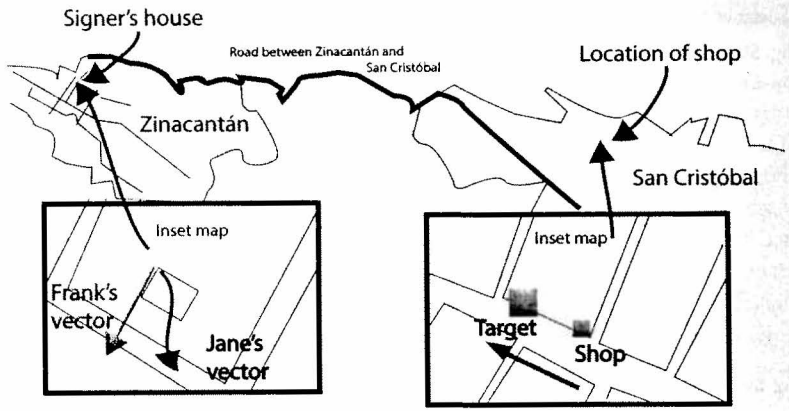
Fig. 60. Both Frank and Jane sign 'shop' (the vegetable stand).

Fig. 61. Jane signs 'up the street' and 'that side'.

it to signal that from the shop just mentioned the house in question (whose shape he goes on to describe) lies up the street to the left.

Once again, to discount the possibility that the signers are tracing the actual cardinal direction involved in going from shop to house, consider Map 10, where I have overlaid over a map of the region an inset of the house

Fig. 62. Frank signs 'from here to there'.



Map 10. Map showing orientation of shop and the signers' vectors

in the village where the signers sit (the directions in which they portray the vector from shop to house are shown with arrows), and also an inset of the configuration of shop and house on the ground. The map shows that whereas the target house is northwest of the shop, both signers portray the vector as roughly southwest, orthogonal to the geographic vector.

These examples allow us to conclude that for both known and unknown places, the Z signers are comfortable using a relative, observer centered, horizontal axis, for describing location and motion, in sharp contrast to speakers of Tzotzil who virtually never do so.

5.4 Transpositions and signing spaces

In this last described right-left type usage, the Z signers resemble most speakers of English, who tend to use projections from an observer viewpoint to describe horizontal angles in space, and whose interlocutors are practiced in transposing such perspectives to alternative viewpoints to interpret such descriptions (Haviland 1996). By contrast, speakers of Zinacantec Tzotzil appear to prefer, in co-speech gesture at least, to calculate horizontal angles absolutely – using cardinal directions. Although only a single horizontal axis, east-west, is lexicalized, evidence for this absolute frame-of-reference is abundant in the conventions of Zinacantec co-speech gesture. Furthermore, as examples like the description of the Chetumal turn-off (Fig. 6) show, Zinacantec interlocutors are presumably also practiced in transposing indicated cardinal directions onto imagined places, real or otherwise, other than the immediate location of the speech event – otherwise, Martin's gestures as he describes where Chetumal and Cancún lie from the Chetumal turn-off would be un-interpretable.

The different spaces I distinguished above, modeling them on Jakobson's distinction between narrated and narrating events, were originally postulated to clarify aspects of the speech and gesture of speakers of languages like Tzotzil or Guugu Yimithirr in Australia, who rigorously track places and movements in terms of cardinal directions. In these languages, all locations seem to come with directions attached, so that – as we saw in the first part of this chapter – one automatically projects the orientation of S^s onto S^n, according to language-specific conventions. There are other ways that directions can be projected onto S^n from S^s, notably by transposing the relative perspective of an observer in S^s onto that of some suitable vantage point in S^n, as speakers frequently do in English and as the Z signers appear to expect interlocutors to be able to do in the last few tasks described above.

One motivation in earlier work for positing an additional S^i, distinct from either the narrated or the narrating space, was to provide for the fact that interactants in both Tzotzil and Guugu Yimithirr sometimes perform gestures in ways *not* seemingly anchored by cardinal directions. For example, when a Tzotzil narrator like Peter demonstrated how a solider pointed his gun, as it happens, facing east in the direction of his interlocutor (Fig. 63), he seems not to have intended to indicate that the solider actually aimed east. Instead the direction of his gesture is arbitrary, or rather it responds to the interactive conditions of the conversation rather than to the spatial arrangement of things in some world, past or imagined. Spatial relations between entities in this theoretical interactive space S^i are thus imagined to be essentially arbitrary, emancipated from any sort of real space, and thus highly abstract. In this sense there is a scale of increasing abstraction from S^s which is constrained by the physical and concrete spatial surround of the speech event, to S^n which is selectively populated by those entities and the spatial relation-

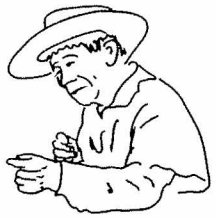


Fig. 63. Peter mimes how a solider aimed his rifle.

ships between them that a narrator chooses to depict (or an interlocutor chooses to imagine), to S^i wherein spatial relationships are absent or only serve as proxies for other kinds of relationships and which respond primarily to interactive needs.

A young language like Z whose conventionalized resources for communicating about space are presumably still developing poses an insistent question about the relationship between linguistic spatial practices and speakers' conceptual resources for thinking about space, including these postulated distinct conceptual spaces. In particular, the contrast between dead-reckoning of location but an alternation between an absolute and a relative right-left representation of narrated horizontal spatial relationships, that I have tried to demonstrate for Z, suggests a series of conventions still in-progress which rely in quite different ways on the theoretical conceptual spaces I have distinguished. Thus, for example, the fact that known locales are absolutely located on the horizon seems to imply that known places, even those that Fig. in narrated events, are always signed in S^s, in local space. To name a known location one does not *leave* the most concrete, local space of the speech event. Once spatial entities are conceptually implanted in S^n the relationships between them may be denoted with either an absolute or a relative frame of reference. The plastic toys are sketched in local space (perhaps diagrammatically) and one supposes that their absolute orientation is to be reproduced in the narrated space (i.e., the re-constructed array of the actual toys). On the other hand, the house near the sister's vegetable stand must be understood from the perspective of the speaker in S^s, but transposed to some vantage point in S^n with linguistic devices which can be interpreted in at least two different, and mutually incompatible ways. Deciding between the two frames of reference (as well as the requisite transpositions they imply) requires mental operations and conventions which Z seems not yet to facilitate, judging by the difficulty the signers have in resolving such ambiguities.

There remains one last matter to consider about spatial resources in Z, a matter of great theoretical interest which, unfortunately, I can introduce here

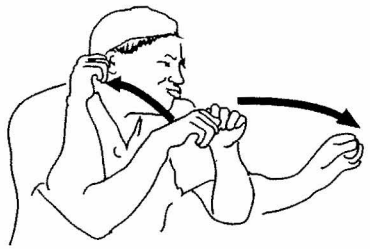


Fig. 64. The Z sign for 'chicken'

in only a preliminary way. This relates to the use of space as a grammatical device. There is evidence that even in a very young sign language like Z, the signers have begun to incorporate space into the grammar of the language in a way that recalls the spatial grammar of, among other things, verb inflection and agreement in established sign languages like ASL. Z thus provides evidence for the potential for S^i to serve directly as a morphological medium in the manual modality.

One device for turning space into grammar, prevalent in Z, we have so far met only laterally: the use of what I have been calling "haptic" classifiers to show the size, shape, and aspects of the manipulability of objects. We see hints of the phenomenon in the handshapes and configurations the signers use to indicate trajectories (of the road, for example in Fig.s 56 or 58), to show how human beings interact manually with named objects (e.g., cars in Fig. 55, or the vegetable stand in Fig. 60), to show their apparent size (e.g., the distant church in Fig. 54, or even the proper name for the signers' mother in the right panel of Fig. 21, which portrays her belly in an un-complimentary way) or their shape (the turkey's tail in Fig. 47 and the left panel of Fig. 50). The same principle is incorporated more directly into grammar, however, when the Z signers combine a common noun for an object with a haptic classifier that shows the size, shape, and manipulability of the object in question. The principle can be illustrated with a favorite example, the Z sign for 'chicken' which itself iconically incorporates the standard way of killing a chicken in Zinacantán: a sharp jerk with both hands to break the bird's neck. Fig. 64 shows Will performing this sign, which, in his rendition, also incorporates a characteristic way of holding the mouth by puckering the lips.

I have almost never seen this sign performed alone, however. Instead, Will normally precedes it with a haptic classifier to show the general class of object he is referring to. Thus, to describe a hen he starts with a handshape that indicates the size and characteristic way of holding such an animal

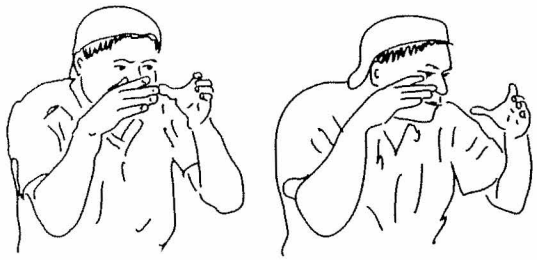


Fig. 65. Haptic classifier for a hen, and for a full-grown rooster sized animal

Fig. 66. A stimulus photo

(Fig. 65 left side), or to refer to a rooster he indicates a slightly larger bird (Fig. 67 right side) and only then performs the specific noun 'chicken'.

On the other hand, to describe a picture of two chicks (Fig. 66) he first signs a different haptic classifier, then the same neck-breaking chicken sign, immediately followed by the numeral two. The whole performance is illustrated in Fig. 67. It suggests both the conventionalized nature of the noun (since presumably, despite the iconicity, chicks are not so man-handled) and the abstract or grammatical character of the classifier as part of a larger noun-phrase-like construction. Haptic classifiers seem routinely to accompany nouns for commonly handled objects: domestic animals, clothing, tools, utensils, boxes, etc., and they are directly incorporated into the grammar. They rely on the immediately shared interactive bodily space of the signers to convey information that is incorporated into abstract, closed-class, functional elements resembling classifiers in other languages.

Probably the most well-known grammatical use of space in established sign languages like ASL is linked to argument structure and to the fact that for certain classes of verbs "verb agreement is marked using spatial positions" (Padden 1990:118), or more specifically "the form of the verb itself makes spatial reference to the subject, object, or both" (Liddell 1990:176). Here is a

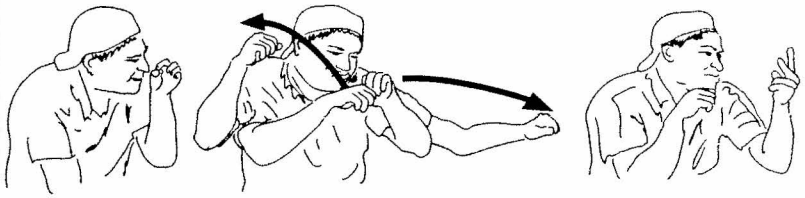


Fig. 67. 'Two chicks': CLASSIFIER: Tiny, chicken, two

Fig. 68. Frame from video of a woman giving a man a shirt[27]

rough illustration: the verb 'give' in ASL typically involves a specific hand configuration. A signer can sign "I give it to you" by moving the "give" hand from her own body towards that of the addressee, or "you give it to me" by moving it in the opposite direction. For third person arguments, the signer can "place" the giver in one arbitrary position in signing space, the "receiver" in another, and sign "She gives it to him" by moving the "give" hand from the giver's location to the receiver's – anaphorically indexing grammatical arguments via previously established spatial positions (i.e., signed "pronouns").

Meir et al. (2007) have shown that a young sign language like ABSL (developed over the last 70 years in a settled Bedouin village in Israel) does not code verb agreement with such a spatial device, although they note that the subject argument of a verb is typically implicit in the fact that a verbal action is performed in a way that iconically treats the signer's body as the virtual subject. This is, of course, in itself a grammatical use of space, in that the spatial orientation of the signed verb and its relationship to the signer's body provide essential grammatical information. It could be argued, nonetheless,

[27] The stimulus video here was part of a set originally produced by Carol Padden and her associates for their ABSL research.

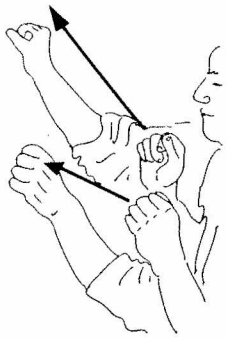


Fig. 69. Will signs "give [a shirt]".

to be less abstract than the ASL convention, which moves agreement (almost) entirely off the signer's body and into an arbitrarily structured S^i.

As my last examples will show, Z appears to share features of both ASL and ABSL, suggesting the range of possibilities space affords as a grammatical medium. The spatial affordances made available by the laminated conceptual spaces I have distinguished – S^s, S^n, and S^i – are indexed by "inflecting" a verbal sign directly, as well as through body orientation, and gaze. Consider first how the Z signers described a short video which shows a woman passing a shirt to a man (Fig. 68). Describing a small set of such videos was one of the tasks I asked the Z signers to do on the very first day after they agreed, in 2008, to participate in a study of their language. The way they initially represented this video in sign is indicative of the highly telegraphic, largely presupposing style with which they originally approached the tasks I set them. It also illustrates the sign they chose in this case for 'give' (or, less contentiously, for denoting the transfer of the shirt from one person to the other). Will's entire rendering of the video is initially contained in a single action, which he repeats twice. Using an apparently nonce haptic hand configuration that suggests the sort of transferred object involved, namely the shirt, he signs 'give' by moving the two grasping hands out away from his own body (Fig. 69). He makes no other apparent attempt to sign explicitly the man, the woman, or the shirt.

Frank, who has been asked to match Will's description against a series of possible still frames, picks one picture and describes it back to Will. He explicitly and opportunistically does sign 'shirt' (Fig. 70), and he continues with a mirror image of Will's sign for 'give' (Fig. 71). (The two brothers are sitting on opposite sides of a table.) As they negotiate about which picture Frank should choose, at one point both signers simultaneously sign the 'give' verb

Fig. 70. Frank signs 'shirt'.

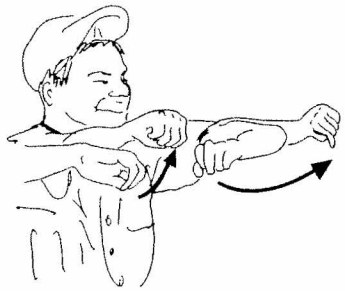


Fig. 71. Frank signs 'give'.

in exactly opposite directions, both using their own bodies as the origo from which the narrated protagonist "gives the shirt" (Fig. 72).

In this rendition the recipient is not marked, and the subject is virtually incorporated into the verb by virtue of the action's being performed from the perspective of the imagined agent.

Six months later, when the signers had figured out that both the tasks themselves and my expectations required a much higher level of explicitness in their renditions than they had volunteered that first day, they again described the same series of video vignettes. On this second occasion, both Frank and Jane, seated side-by-side, simultaneously described the video stimulus to the Matchers, and they took advantage of this arrangement to sign explicitly that it was a woman passing the shirt to a man. They used their own bodies as proxies for this gender distinction, an opportunistic device to which they frequently had recourse.

Frank started in a somewhat contradictory way. He began by pointing to himself, following with a finger wave to signal negation, and immediately

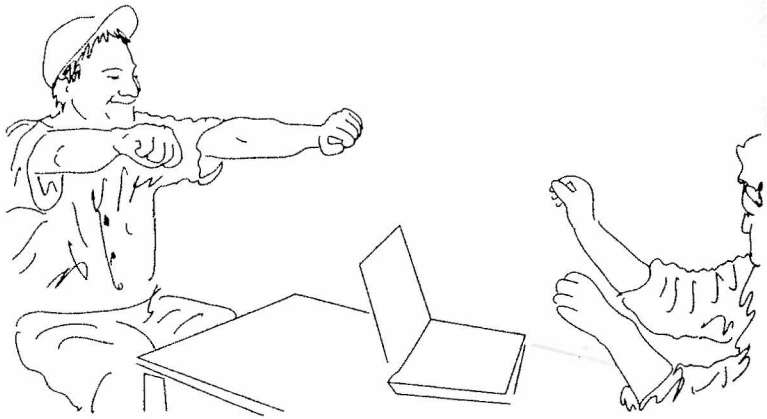


Fig. 72. Frank and Will simultaneous sign 'give' from opposite vantage points.

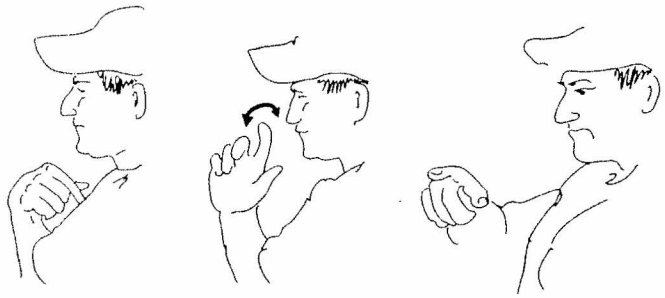


Fig. 73. "Not the man, but the woman".

thereafter pointing to Jane (Fig. 73), as if to say "not the man but the woman". With a subtle shift of his hand position, he then signaled the transfer of an object – not itself identified – from the woman to the man by drawing his hand from Jane's position back to his own chest (Fig. 74), a movement he repeated twice.

Using his own body as a proxy for the male recipient, and his sister's for the female giver, he was able to mark grammatical relations in an abstract signing space (that is, in S^i) overlaid on top of genders abstracted from S^s.

Jane used a variant device to sign "the woman gave the man a shirt". She performed a sign virtually identical to that used six months previously to show 'give' – using both hands in a gripping configuration that suggested that what they held was something like a shirt – and she moved them outward from her own body (as if following the "body as subject" convention). However, by demonstratively turning her body toward her brother (see Fig. 75) as she signed 'give', Jane was able to exploit their gender difference again to encode "the woman gave it to the man".

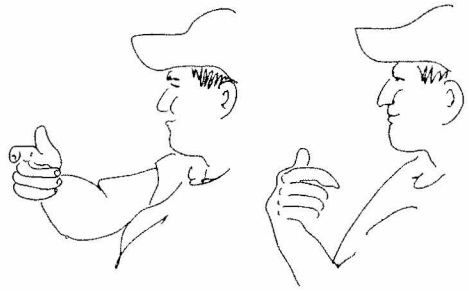


Fig. 74. Frank signs "The woman gave it to the man."

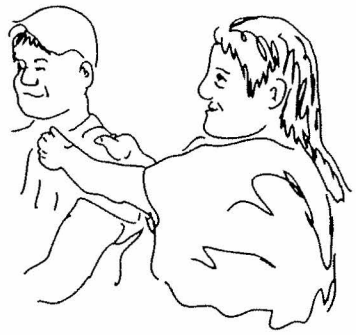


Fig. 75. Jane signs "The woman gave it to the man".

Exploiting features of the current local signing or "speech event" space S^s that are not themselves arbitrary (like the actual physical locations of co-present people, P^s – participants of the speech event, in Jakobson's formulation) but that can be used as at least partially arbitrary proxies for P^n – participants in the narrated event – seems to be one step in the direction of the spatially marked abstract verb agreement of languages like ASL. The Z signers made prolific use of such a device in describing stimulus videos meant to test the marking of presumed arguments in transitive clauses. So, for example, to sign another video clip in which a woman turns to look at a man, Frank signs "look" (twice), and again points first at Jane and then at himself (Fig. 76) to show who was looking at whom. One could liken such a signed construction to an uninflected verb combined with pronominal

Fig. 76. Frank signs "the woman looks at the man".

proxies opportunistically extracted from S^s (plus a principle of word order, in this case resembling the order VSO).[28]

As in Jane's performance in Fig. 75 above, shifting body orientation can also signal grammatical relations in way that combines a default iconic convention – that the signer's body stands in for a notional agent – with a different sort of spatialized inflection on a verbal predicate: a further step toward grammaticalization of abstract, arbitrary positions in S^i. In fact, Z signers seem to use body orientation in a variety of ways to signal grammatical relations, perhaps least surprisingly in the case of locative arguments. For example, in describing a video clip in which his young nephew was shown walking across a room to stand in front of a television set, Will first made the sign for 'TV', placing it slightly to his right, and then demonstratively turned his body before signing (with his feet) that the little boy walked (Fig. 77): "he walked to the TV set." Will's reorientation of the body (and the directional arc that he traces in the air afterwards – see Fig. 78 – interpreted by the hearing signers as "he went that way"[29]) seems to inflect the verb of motion and thus to serve the grammatical function of linking the television to the verb as a kind of allative argument.

My final observation about space and grammar in Z links such indexical signs as pointing and bodily orientation to one further such visible device: gaze. Gaze has been argued in ASL to be yet another resource used to mark

[28] See Haviland 2011 for a preliminary discussion of Z word order patterns. The normal constituent order in spoken Tzotzil is a robust VOS.

[29] Just to dispel a different possibility that may have occurred to diligent readers, the actual cardinal direction of the narrated movement here *cannot* be what Will meant to signal; the actual location of the scene depicted in the video clip is well known to him, close by, and in fact lies directly behind where he is sitting, and not in the direction he indicates.

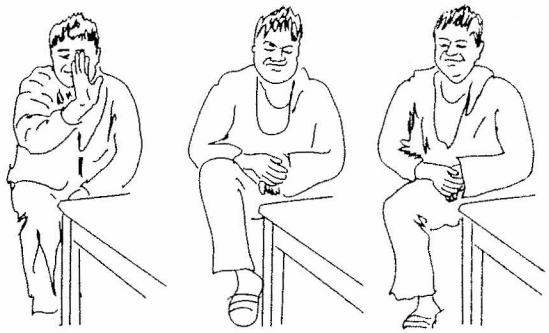


Fig. 77. Will signs "He walked to the TV".

Fig. 78. Will traces a directional arc.

agreement.[30] Z signers also recruit gaze, in sign, apparently to help signal arguments and distinguish what might be called participant frames; and they do so in ways that preserve distinctions we have already seen between different sorts of conceptual spaces.

Unsurprisingly, for example, to sign a verb like 'see' the direction of the gaze suggests what is being looked at. Will, talking about a peculiar old man, signs that he saw him yesterday, and the vector he draws from his eye to the object of his vision (Fig. 79) links S^n to the local geography of S^s in a way exactly parallel to dead-reckoning in naming places.

Just as one can direct gaze along a pointed vector in local space to indicate what one saw and where, however, one can also emancipate gaze from real space and direct it at an imagined or abstract interactive S^i, populated by discursively introduced entities. This appears to be what Frank does when he

[30] See Neidle et al. 2000; but compare Thompson et al. 2006.

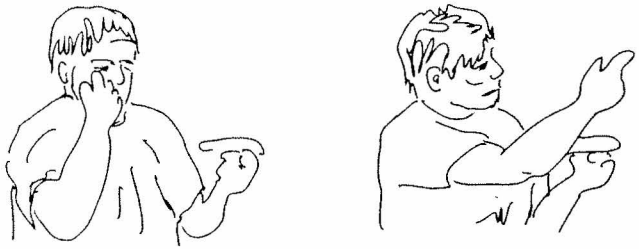


Fig. 79. Will signs, "I saw [the old man]."

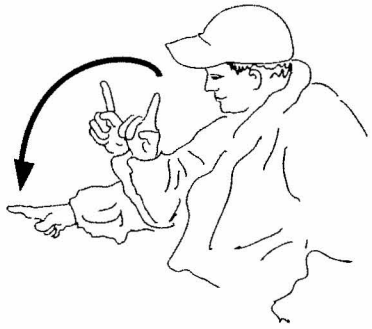


Fig. 80. Frank: "when I see those guys"

Fig. 81. Frank: "I'll punch them."

also sights along a pointed vector (Fig. 80) to sign the threat that when he catches sight of his sister's boyfriends, he plans to beat them up (Fig. 81).

In Fig. 80, Frank's gaze is directed along an arbitrary vector in S^i (and in fact is a kind of 'fake' gaze, looking at nothing at all in a neutral middle space – perhaps appropriate to the hypothetical situation he is evoking).

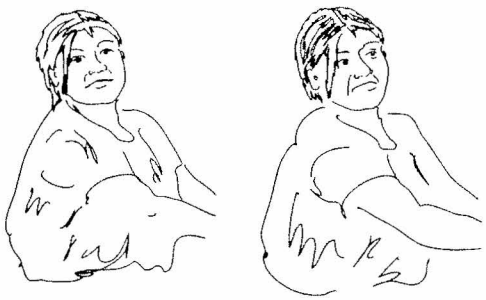


Fig. 82. Terry uses 'fake' gaze to ask "was the woman looking?" and then returns a real gaze to her interlocutor.

By the time he signs 'punch'[31] in Fig. 81 his gaze reverts to his interlocutor – that is, it returns to S^s, the site of the speech event. Note that Jane's gaze did something similar in Fig. 75 above, when she signed 'give' with her body oriented toward and apparently looking at or at least in the direction of her proxy recipient, but then returned her gaze to her interlocutors before actually retracting the 'giving' hands of her sign. The gaze shift, as it were, brackets off the narrated event ("I see the boyfriends" or "the woman gives the shirt") from the interactional mutual attention check between the interlocutors in the speech event.

The 'fake' gaze – apparently directed at some imaginary entity in the abstractly created interactional space – seems to represent a further exploitation of an interactively created or imagined S^i within which signed morphology can be abstractly spatialized. In checking that she has properly understood Frank's description of the video clip of a woman turning to look at a man, illustrated in Fig. 76 above, Terry also presents a 'blank gaze' as she mimes the verb 'look' – directing it first to her right as she asks Jane if it was the woman who was doing the looking (see Fig. 82), and then directing it to her left (and toward Will seated next to her – see Fig. 83) as she asks Frank (to whom she then shifts her gaze) "was she looking at a man?".[32]

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[31] And note that this sign, by analogy with the "body as subject" model described by Meir et al. 2007, seems to illustrate "body as *object*."

[32] Terry is a hearing signer, and there is a striking parallel between her signing and a standard discursive employment of voice in spoken Tzotzil. To clarify the argument structure of a transitive action, one can ask (with an antipassive) *mi chk'elvan li antze* 'Did the woman do the looking?'; or with a full transitive *mi isk'el vinik (li antze)* 'Did (the woman) look at the man?' See Aissen 1990, 1999, Haviland 1981, Ayres 1983, Davies & Sam-Colop 1990, Craig 1979.

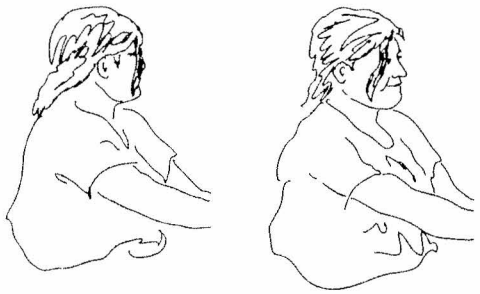

Fig. 83. Terry 'gazes' at a proxy protagonist, to ask "was she looking at a man?" and then looks back at her interlocutor.

Just as Z signers represent narrated spaces, S^n, whose geographies are sometimes known and sometimes not, by reference to local space, S^s, populated by presupposable entities with known locations, they also can use a much more abstract, interactively constructed space, S^i, with arbitrarily (or opportunistically) created virtual entities, whose locations then can be reprised in the form and direction of manual signs, as well as through posture and gaze. I have presented evidence that these spatial references are recruited, in at least a preliminary way, for grammatical purposes, in particular to mark argument structure in discourse in the emerging sign language.

6. Summary: Representing space with space

A very young sign language like Z affords special insights about how language construes space. Because it is a poorly documented language (albeit one in the making, and already endangered after a scant generation of existence), its structuring of space in linguistic terms has a compelling typological interest. Because it is young, its speakers can be expected still to be constructing formal resources for communicating about things important to them, including space, a domain they can scarcely avoid talking about. How they do so is thus of immediate diachronic interest. And because the medium is sign, Z necessarily uses space to represent space. It is metaspatial, by design, and thus allows a direct glimpse of the denotative and pragmatic potentials and requisites of space as both a medium and a referential target.

This chapter began with a quick review of Tzotzil, the spoken Mayan language that surrounds and overlaps with the tiny Z "language community", to illustrate typological distinctions that have been proposed for spatial language – most notably different frames of reference – and how spatial notions are realized in different Tzotzil form classes. One striking fact of Tzotzil spatial vocabulary is the elaboration and specificity of the lexical systems involved, especially a developed anatomical meronomy, hypertrophied positional roots, and grammaticalized verbs of motion. Perhaps more striking is the combination of somewhat meager lexical resources – the up/down distinction – with careful and quite precise directional gestures for specifying locations in terms of absolute cardinal directions, transposable between different perspectives or vantage points evident in the utterances of Zinacantec Tzotzil speakers. It is only in the combination of audible and visible features of utterances that the interaction between lexicalized space in speech and the visible manipulation of space in gesture to produce spatial reference are manifested.

Co-speech gesture immediately embeds the analyst in a further set of conceptual complications about space, for no matter how we might understand what space is or how it is structured in the abstract, gesturing which may be about space in various ways willy-nilly takes place *in* space. Elaborating on Jakobson's distinction between a narrated event E^n and a speech event E^s, I applied to gesture a parallel distinction between a narrated space S^n which interlocutors talk about, and a narrating or speech event space S^s where they are situated when they talk. I also found it useful provisionally to distinguish a further interactional space, S^i: a creation – a by-product – of the speech event and the positioning of interlocutors. S^i is, in an important sense, unanchored by the wider S^s, and it responds instead to interlocutors' interactional needs for conjoint attention. It is also where they sometimes gesture.

Distinguishing these different spaces involves interlocutors and analysts alike in the problem of how these different spaces are interrelated and coordinated. Thus, when my Zinacantec compadre points to a spot, he may intend his interlocutor to understand that he is pointing in an imagined narrated S^n; that he is pointing to a "real" place somewhere within narrating S^s, the space where he is speaking, construed either locally or more widely; or that he is pointing "arbitrarily" to a locus or entity created by the interaction, that is, in S^i. There may, moreover, be interactions between these different spaces, so that a narrated space may be laminated over the top of local space, allowing the absolute directions of one to be transposed onto the other, as in the description of places and directions along my compadre's route to Cancún. Likewise, the coordinating principle may be relative rather than absolute, if relative or projected relations are involved. Interactive space S^i may also be directionally anchored in some way, or it may be free from all orientation other than that imposed by its own conjured entities, whether arbitrarily placed in space or not. A central puzzle for interactants is, then, how to keep these spaces straight.

Having laid this groundwork, I introduced several striking features of Z spatial practice. First, the Zinacantec signers must keep careful track of the absolute locations of known places, so much so that the standard device for naming them seems conventionally to be pointing to them either line of sight or on the horizon, directly in S^s. This seems one clear example of the direct source in Zinacantec co-speech gesture for a central structural device in the emerging sign language. By contrast, despite the fact that in co-speech gesture Zinacantecs virtually never seem to calculate position or direction on the horizontal plane relative to a speaker's own body, the Z signers – perhaps because they do not (yet) have conventionalized lexemes for absolute directions (in much the same way that they lack conventional color names, for example) – do appear to apply body-centric relative signs for right and left in descriptions of spatial scenes, a device that clashes with an apparently poorly developed convention for altering perspective or point of view and thus leads to occasional miscommunication. In using such body-relative descriptive devices for spatial relations, the Z signers make extensive use of the directionally 'unanchored' interactive space S^i, thus building their linguistic devices around an interactively created and manipulated virtual metaspace.

The final sections of this chapter expand on the ways that S^i can serve as an abstract medium through or upon which spatial diagrams can be constructed to represent a variety of relations, only some of which are literally spatial. The well-known phenomenon labeled "spatial grammar" in developed sign languages allows different spatial devices to assume the functions of grammatical marking, notably argument structure, agreement and anaphora. Even a language like Z, emerging over barely thirty years in a single, tiny language community, can be shown to be using space itself to re-invent anew the abstract notions of grammar.

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Commentary: What difference does space make for interaction and interaction for space?

1. Introduction

The four papers in this section differ in terms of theoretical abstraction vs. empirical analysis, in their use of established vs. new concepts, and the type and relevance of the data they use to support their arguments.

2. Different types and relevance of data

Three of the papers represent empirical studies undertaken in various settings (Haviland, Mondada, Streeck). In contrast, the fourth paper (Hausendorf) offers a theoretical framework designed to integrate different notions of (interactional) space developed in Conversation Analysis (CA) and other closely related paradigms. While Hausendorf does not refer to empirical examples, Streeck's video-ethnographic analysis of the Plaza de la Trinidad in Cartagena de Indias (Colombia) is based on visual observation of the participants' bodily behavior, omitting spoken language altogether. Mondada and Haviland both use audiovisual data to analyze the relationship between language, visual bodily modalities, and space. Nonetheless, their data sets also differ significantly. Mondada draws on video-recordings of naturally occurring interactions in which participants speak French and approaches the data from a praxeological perspective, i.e. a reflexive elaboration of situated action and relevant spatial features. Haviland, in contrast, not only uses video-recordings of spontaneous face-to-face interaction between his participants, but also draws on semi-experimental data elicited in various set-ups in order to compare spatial and meta-spatial devices in a nascent sign language developed in a household of Zincantec Indians from Highland Chiapas (Mexico) to the spatial reference frames in the surrounding spoken language, i.e. Tzotzil.