

Directional Precision in Zinacantec Deictic Gestures:

cognitive preconditions of talk about space

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1. Spatial “frames of reference” in Zinacantec Tzotzil

Recent work on spatial language (see Levinson 2003) distinguishes conceptually different “frames of reference” for calculating position, trajectory, and location. In the canonical case, a certain entity (usually called the Figure) is to be located with respect to some other reference object (or Ground--Talmy 1985 imports these terms from gestalt psychology to apply them to linguistic descriptions of motion events), by specifying a “search domain” in relation to the Ground in which the Figure can be found. When the Figure is spatially displaced from the Ground, defining the search domain requires specifying both distance (how far the Figure is from the ground) and angle: in which direction to look.

Levinson (1996) distinguishes three major “frames of reference” that natural languages use for specifying such an angle. Two are familiar and reasonably well-described. The simplest is an “intrinsic” frame in which the built-in geometry of the Ground provides distinguishable angles from which to project a search domain. For example, the Ground may have a (partly conventionalized) anatomy, with certain parts labeled front or back, head or tail, and so forth. Thus, in Tzotzil (a Mayan language spoken in Chiapas, Mexico) one can locate an object by saying

(1)¹

te tz-jip ta y-ok tem
 THERE INC+3E-throw PREP 3E-foot bed
He throws it there by the foot of the bed.

Here the “anatomy” of the bed includes a named “foot” section, thus identifying an area around the bed where the object is to be found.

The “relative” frame requires that an angle be projected from the Ground but relative to the perspective of some viewer, whose “intrinsic” parts and orientation are mapped in one way or another onto the Figure/Ground relationship. Such a frame of reference is especially useful when the Ground has itself no relevant anatomy. Thus, although for Tzotzil speakers, a mountain has a clear head (its summit) and foot (its

¹ Examples are drawn from recorded conversations and narratives. I employ a practical orthography for Tzotzil in which letters and digraphs have their Spanish pronunciations, in which ' follows a glottalized or ejective consonant, and ` represents IPA /ʔ/.

base), it has neither “sides” nor “front/back” from which horizontal angles can be projected. It is the perspective of some observer, typically the speaker, whose “front” or “back” can be projected onto the mountain.

(2)

te nakal ta pat vitz
THERE resides PREP back mountain
He lives there behind the mountain.

Convention will also be involved here: for Tzotzil speakers this expression means that the person lives on the FAR side of the mountain with respect to the relevant perspective, e.g., on the opposite side of the mountain from where the speaker finds himself. Other speech traditions calculate an angle expressed in the same terms differently, for example by placing the residence of the person referred to BETWEEN the mountain and the observer (Hill 1982).

Levinson’s third frame of reference he calls “absolute” (or “environmental” or “geocentric”) because it instead uses Ground- and Frame-independent “antecedently fixed bearings” that can be given by reference to a larger, sometimes global environment. Perhaps the best described examples of languages which prefer this sort of frame of reference to the others are from Australia and involve the use of expressions like “upriver/downriver” (Dixon 1972) or global “cardinal directions” like North/South/East/West (Haviland 1979, 1989, 1998). Although Tzotzil does not have a well-developed terminological system encoding such “absolute” directions, it uses a simple opposition between *ak’ol* ‘above’ and *olon* ‘below’ to encode—at least in the community of Zinacantán I know best—the opposition East-West, also captured by explicit reference to the rising and setting sun.

(3)

oy parajel ta y-ak’ol ech’el muk’ta be
EXIST village PREP 3E_above DIR(away) big road
There is a village to the East of (lit., above) the highway on the other side.

(4) (from Laughlin 1976, Dream 151²)

laj tal xi ta lok’eb k’ak’al ti mixa une
finish DIR(coming) THUS PREP rising sun ART mass CL
The Mass finished there to the East.

As can be seen from the examples, Tzotzil uses all three of Levinson’s frames of reference, though it probably makes most frequent use of the “intrinsic” frame by exploiting elaborated conceptual anatomies for objects and a hypertrophied lexicon of “positional” roots whose semantics depend on these anatomies (Haviland 1992).

² Laughlin did not publish the Tzotzil versions of these Zinacantec dreams, and I am indebted to him for sharing some of the Tzotzil texts.

Different languages (and communities of speakers even within a single language) combine the different frames of reference in different ways, and each frame of reference seems to imply different sorts of conceptual calculations about objects and their spatial relations. In particular, to use an “absolute” frame of reference based on cardinal directions, it seems that for at least certain spatial tasks a speaker must keep track of cardinal directions or some similar “global” coordinates, and her interlocutors must equally be able to apply those coordinates in understanding spatial description. One evidence for such directional tracking comes from behavior other than speech (see, for example, Levinson 1997): performance on memory tasks, for example, and crucially for the present paper, gesture—both accompanying speech and independent from it. In other work (Haviland 2000), I have used the oriented gestures of Zinacantec Tzotzil speakers to argue that, despite the relative lexical poverty of the cardinal direction system in the language, Zinacantecs do in fact continually monitor cardinal directions in some spatial tasks and descriptions. Their “absolute” frame of reference is thus exhibited in their gestures more prominently than in verbal descriptions of location or motion, since the spoken language has relatively undeveloped resources for describing such directions. In this paper I will explore further the nature of the cognitive processes involved, or, more exactly, of the precision of orientational awareness. Here, too, my evidence comes from gesture.

2. Gesture and location

In an early study of the “absolute” frame of reference in the Pama-Nyungan language Guugu Yimithirr (Haviland 1986, 1993), spoken in northeastern Australia, I compared two serendipitously collected filmed narratives, separated by a couple of years, in which the same Guugu Yimithirr man tells a story about a shipwreck when he was a young man. Careful comparison of pointing and other oriented gestures in the two performances reveals a remarkably exact coincidence between the verbal expressions of orientation, the actual known geography of the area where the events took place, and the orientations of locations and vectors in pointing and representational gestures accompanying speech. Given the ubiquitous and insistent use of cardinal direction terms in all Guugu Yimithirr discourse, such a coincidence is perhaps not unexpected, simply because to manage the elaborate morphology of cardinal direction terms, speakers of the language cannot avoid keeping track of directions.

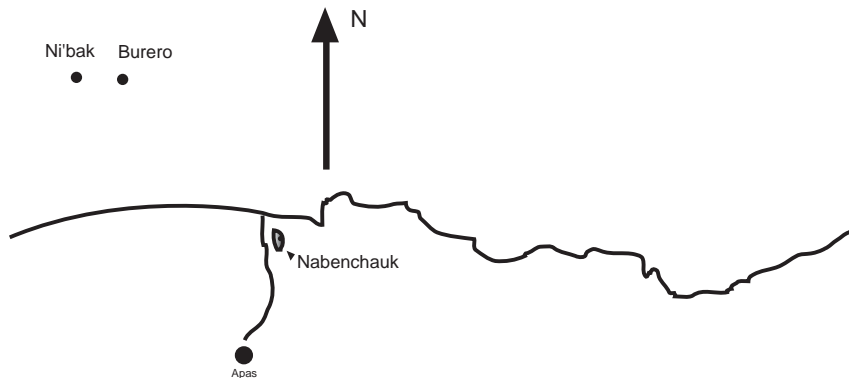
In a subsequent study, using films of two occasions on which a Zinacantec Tzotzil speaker described how to get from his home village in the highlands of Chiapas, Mexico (see map 1) to the distant resort city of Cancún, I argued that although the narrator used almost no Tzotzil expressions specifically mentioning direction or orientation, nonetheless his gestures were oriented in much the same way as those of the Guugu Yimithirr speaker to coincide precisely with the actual geography he was describing. That is, if one calculated the exact compass directions involved in gestures illustrating different segments of the route, they corresponded segment by segment with the compass directions of the trajectories involved. Further details can be found in Haviland 2000. In

fact, attention to the orientation of gestures in many different sorts of Zinacantec discourse suggested that Tzotzil speakers were equally attuned to cardinal directions in communicating a wide variety of spatial situations as were speakers of Australian languages, although Tzotzil almost entirely omitted verbal reference to such directions.



Map 1: Mexico, and the state of Chiapas

Consider, for example, the use of gesture to invoke geographically anchored spaces in the following segments from different kinds of Tzotzil narrative, which also illustrate more of the verbal resources available for spatial description. In the first fragment, a Zinacantec named M—whom we shall meet again later in this paper—is asked where a specific town named Burrero is located.³ He answers first with a gesture and a simple deictic, *li`toe* ‘just here.’ Consider the rough representation in Map 2, which shows the village of Nabenchauk, where M was conversing, in the wider context of the local geography, which includes the other villages M mentions.



³ I am indebted to Lourdes de León for sharing her videotaped interaction with M.

Map 2: the villages of Nabenchauk, Burrero, and Ni`bak.

Based on how M was sitting and the angle from which he was being filmed, it is possible to assign a rough cardinal direction to his pointing gesture (roughly 310 degrees, calculated clockwise from due North at 0 [=360] degrees.). In Figure 1 we see M's pointing gesture and a representation of the vector it would project in the wider geographic space. Note that he sits at the bottom of a valley, from which vantage point he can see only the surrounding mountains and not the distant village of Burrero at which he points. Still, since it is possible to see Burrero directly from the top of the mountains ringing the valley, it is presumably not hard for M to know in which direction to point.

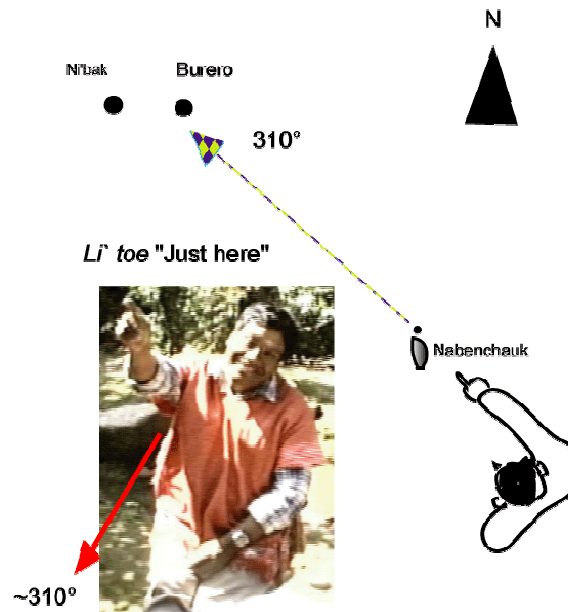


Figure 1: “Burrero is just here (pointing).”

However, M gives a slightly more detailed follow up to his locational description, which displays further knowledge of spatial relationships across the territory. He amplifies his description by saying

- (5)
 ta y-ak'ol talel Ni`bak.
 PREP 3E-above DIR(coming) Ixtapa
 (Burrero is) above Ixtapa, in this direction (i.e., toward here.)

He locates Burrero in relationship to two other places: first it is “above” (that is east of) the larger and better known town of Ixtapa (*Ni`bak*). He appends to the possessed form of “above” a directional element—“coming”—that adds a further deictic dimension to the description. It indicates that Burrero is between Ixtapa and the place where he and his interlocutor are; thus the trajectory from Ixtapa towards Burrero is both easterly and

“coming” towards where they sit. (M thus combines an “absolute” and a “relative” frame of reference in the same complex morphosyntactic construction.)

Figure 1 shows the accuracy of M’s characterization. Moreover, as we can see in Figure 2, as he pronounces each of the crucial words in his locative description M’s hand gestures correspond in an interesting way to his description. As he says “above” he gestures with a kind of beckoning gesture in his own direction (seemingly illustrating “coming”). As he says “coming” he flips his hand from west to east, seemingly illustrating “above/east.” Finally, as he names *Ni`bak/Ixtapa*, he points in the direction of that village (using a pen he is holding in his hand). Gesturally, he projects the relevant spatial relations involved in his verbal description, using true cardinal directions to anchor the projected relationships.

"above Ni`bak on this side"

y-ak'ol talel Ni`bak

POSS- above come-DIR

ya- k'ol



Ni`- bak



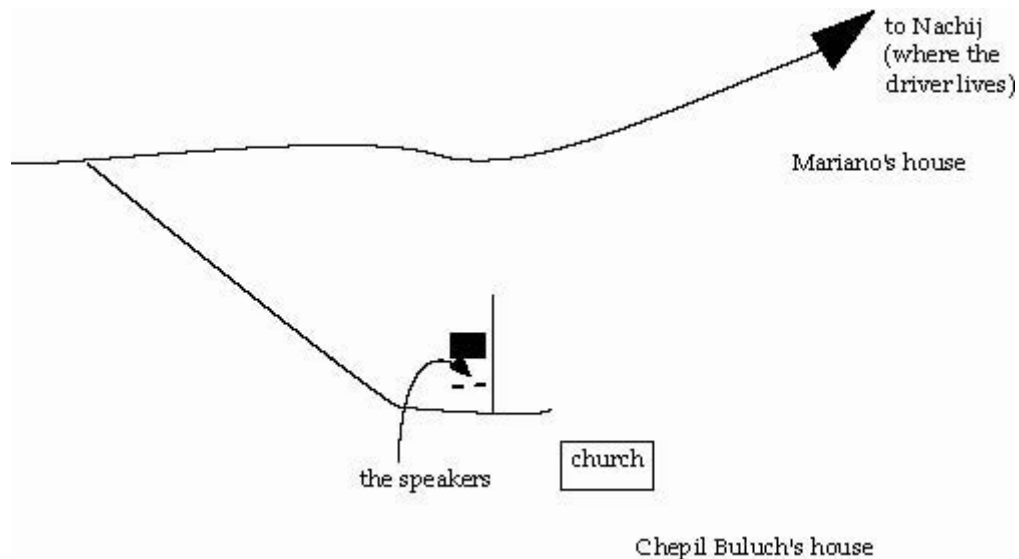
Fig. 2: above Ni`bak, on this side

3. Social geography

There are evidently, then, specific nearby places located and oriented on this speaker's mental map of the territory. However, geography is also saliently populated by social entities. In the next short sequence, a man is describing to his neighbor what he knows of a truck crash involving people from the area. The two conversants are seated in a fenced house patio, which effectively eliminates line-of-sight access to other parts of this and neighboring villages. Three people are referred to, in quick succession. In example 6, M asks X, the principal narrator who knows details of the crash, who the driver of the ill-fated truck was (line 1), and he goes on to venture a guess (line 2) that it was a certain man named "Pancho" from another hamlet called Nachij. X confirms the guess (line 3). (Gaze, gestures, and other movements are informally notated above the accompanying speech, aligned so as to show rough synchrony between the onset of movement and verbalization.)

(6)

- [M lifts head toward Nachij
 1 m: much'u spas manejar
Who was driving?
- [M's gaze turns to X
 [X's RH starts out to his R
 2 pero ja` li pancho ta na[chij
I suppose it was Pancho from Nachij.
- [RH up, index finger up
 3 x: ja` li pancho ta nachij une
Yes, it was Pancho from Nachij.



Haviland, p. 8

Map 3: Social geography in the conversation about the truck crash.

Consider how the interlocutors indicate specific social geography in this short interaction. There is virtually no locative talk here, except for the reference to the town of Nachij. Instead, more precise directions are communicated via gesture. The two men are seated facing north, as indicated on Map 3. (In the figures, X, the narrator is seated on the left—i.e., to the east—of M, his interlocutor.) Both name the nearby hamlet of Nachij, where the truck driver “Pancho” lives. They also indicate the absolute location of Nachij, in two different ways. M, just before he ventures his supposition that Pancho was the driver (i.e., between lines 1 & 2 on the transcript), lifts his head and gazes in the direction of Nachij “as the crow flies”—that is, he gazes briefly and tosses his head in the direction one would head to go to Nachij by the shortest normal route (see Figure 3).

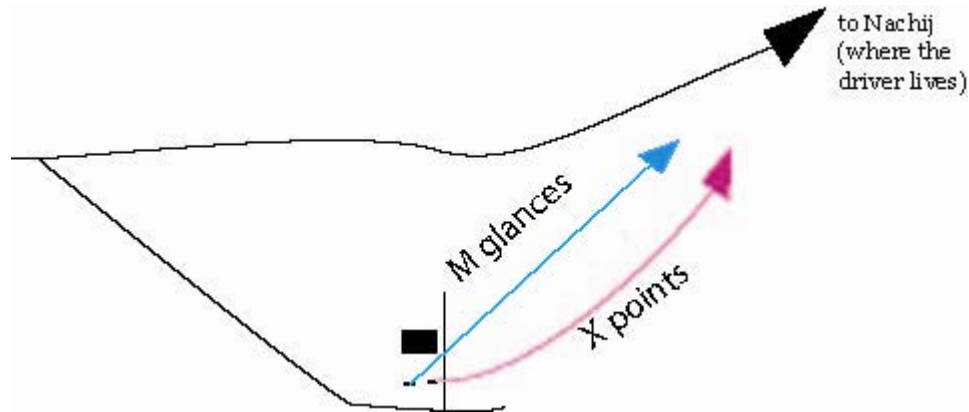


Fig 3 But was it Pancho?

X confirms M’s guess, very briefly pointing with the index finger of his right hand raised in the same direction, toward Nachij (Figure 4).



Fig 4: It- was Pancho



Map 4: the truckdriver

The named town of Nachij is thus explicitly located with respect to the place the men sit, via oriented pointing and gaze.

In example 7, X goes on to describe injuries suffered in the truck crash reported to him by a hamlet neighbor he identifies as “Maryan Palas.” M indicates confusion about the identity of the person named (see his question at line 3), and X adds further clarification at line 4.

(7)

- [X gaze up to his R
 1 x; ora li . ali maryan palas le' ta ak'ol
Now, uh, Maryan Palas there to the East
- [touches his nose with LH
 [M's gaze to X
 [L index finger still pointing to tip of nose
 2 ja' toj la: jel sni' li'e
He got really injured here on his nose.
- 3 m; much'u [maryan palas
Which Maryan Palas?
- . [X's RH starts out to his R
 [thumb pointing back over R shoulder
 [hands back to folded
 4 x; maryan palas lok'em jch'ulme'tik ta ak'ol
Maryan Palas the former ritual-officeholder to the East.

Again, gesture and gaze seemingly contribute to the socio-spatial identification of the protagonist. This time X gazes briefly up to the northeast in the direction of the house of the person he names (Figure 5).

Haviland, p. 10



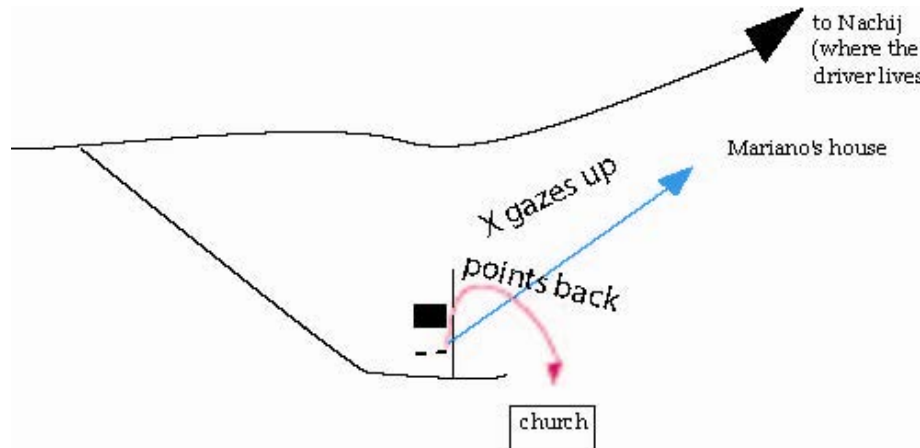
Fig. 5: It was Maryan Palas

When M questions the identification, X adds the further information that the man in question had held a certain ritual office. X appears to “locate” this characterization by pointing back with his thumb over his right shoulder (see Figure 6), evidently pointing at the village church where such ritual duties are performed (Map 5).



Fig. 6: The former ritual office holder.

X thus doubly anchors this second protagonist in space, both by virtue of where he lives and where he has done salient community work.



Map 5: the officeholder Maryan Palas

The orientation of his gaze and gesture reflects absolute directions in local geography, as shown in Map 5.

Finally, in fragment 8, in the face of his interlocutor's confusion X corrects his misidentification of the injured man and offers a new name and characterization.

(8)

- 1 m: i'i ja' me li ali mal-
No, I mean it was....uh...
- [X's gaze to M
 [L index finger farther back, wiggles
- 2 ali jil chepil buluch
It was Chepil Buluch
- [LH starts down to rest
- 3 chepil buluch le', lok'em jch'ulme'tike
Chepil Buluch, the foremr ritual-officeholder

Once again, X locates his new referent in space. Switching to his left hand, he points first to the new man's house (figure 7) and again to the church (figure 8) where this man also did ritual service.

Haviland, p. 12

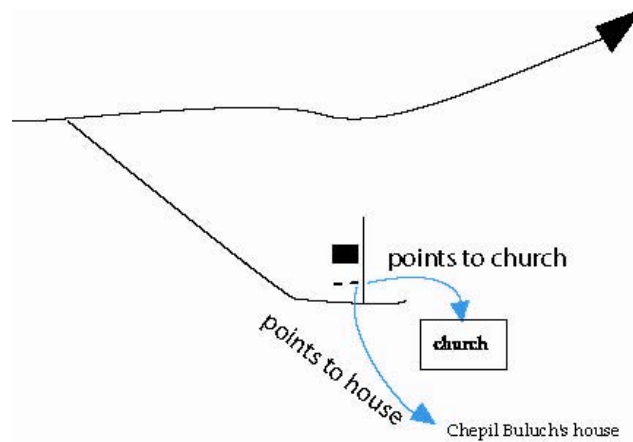


Fig. 7: No, it was Chepil Buluch



Fig. 8: The former officeholder.

These locations can be seen, in relation to X's position as he talk, on map 6).



Map 6: No, it was Chepil.

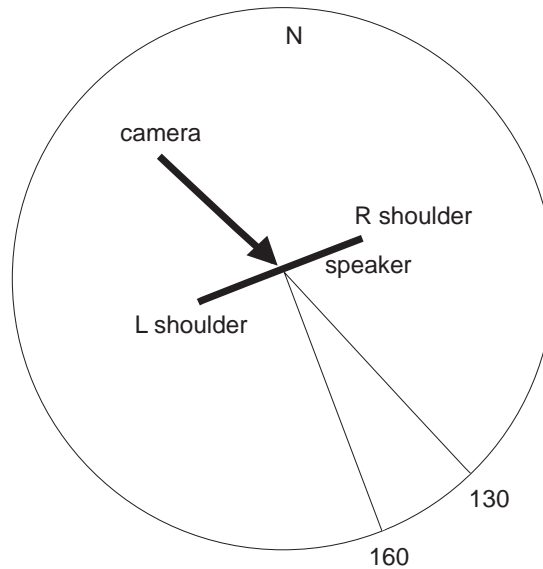
There is thus evidence to suggest that Tzotzil speakers, despite the lack of insistent verbal reinforcement for directional precision in speech, nonetheless maintain

orientation in their gestured (and thus, evidently, cognitive) representations of at least local geography. The question I want to address in the rest of this paper is exactly how detailed and exact these representations are, and how far they extend away from immediately available, commonly known local landmarks.

4. Route descriptions: local space

As part of a larger project to examine the relationships between speech, gesture, and gaze by using hi-tech video tools to facilitate exact calculation of motion vectors in gesture (see Bryll and Quek n.d.), I decided to look more closely at gestural evidence for an “absolute” frame of reference in Tzotzil spatial conceptualization. Let me describe the experiment, before discussing the results. To allow for computer-assisted calculation of directional vectors in gesture, a procedure was designed involving multiple digital video recordings of the same interaction, precisely calibrated. For the purposes of this work, in July 2001 I asked my Zinacantec compadre, M, to describe to me the route he used to take to travel to Cancún. This was the same man who had serendipitously described the identical route ten years previously, and although in the intervening years he had made the trip only once (by air—he said he had no idea what route the airplane had followed because he had been too frightened to look down at the earth below), he had no hesitation in performing the task for the five digital cameras arrayed around us. Because of the vagaries of natural light and color (as contrasted with videos filmed in a controlled laboratory), it never proved to be possible to use computer-assisted vector analysis on the resulting videotapes. However, since the different video cameras were carefully positioned and their directional orientations precisely measured, it has been possible to hand-code approximate directional vectors at salient points in M’s narrative.

Figure 9 diagrams M’s rough orientation in the 1991 films, when he described how to get to Cancún from the vantage point of his home village of Nabenchauk. In fact, in 1991, M described the route twice, once for me in the morning, and again, later that same day for my colleague Lourdes de León. The comparisons below draw on videotapes of both versions.



1991 filming of Cancœn route, Nabenchauk

Figure 9.

On the basis of the narrated route description in 1991, I was able to calculate a very approximate rendering of the directions involved in the different stages of the trip, as shown in Figure 10, which can be compared to a standard Western map of the same territory in Figure 11.⁴ A principal aim in the present study was to understand not simply the overall course of different trajectories in M's descriptions of this route, but further to tease out his point-by-point or intersection-by-intersection tracking of (and memory for) directions all along the route between highland Chiapas and Cancún. It seems clear, from the maps, that M had a strong memory for the overall trajectories in the 1991 tellings.

⁴ Note that while the orientation of each segment can be calculated from M's gestures, there is of course no comparable way to work out the corresponding distances, which are thus represented on Figure 10 so as to coincide with the standard measurements.

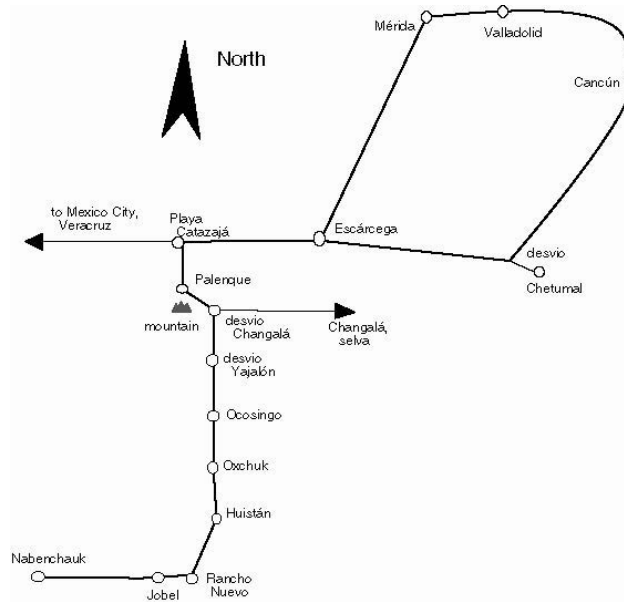


Figure 10: M's approximate "gestured" map of the route to Cancún, 1991 telling

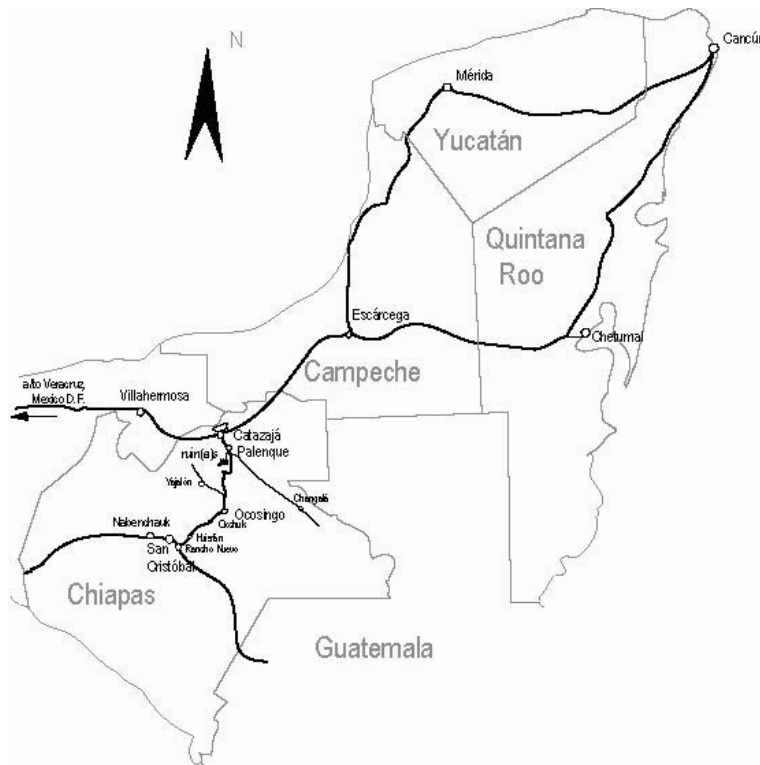
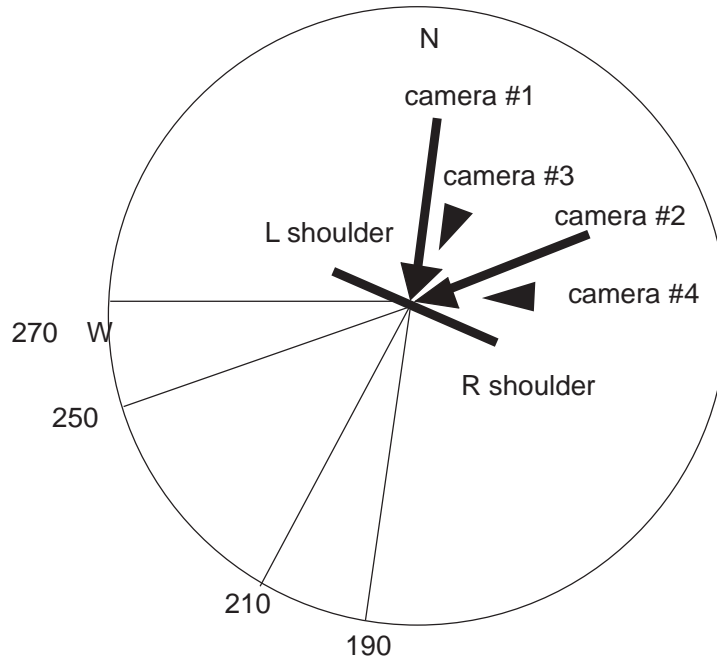


Figure 11: standard map of the route between Chiapas and Cancún.

In 2001, ten years later, armed with more elaborate digital recording equipment, I again asked my compadre M to describe the route from highland Chiapas to Cancún. On

this occasion we were seated not in M's home village of Nabenchauk, but rather in the nearby Mexican town of San Cristóbal de las Casas. Moreover, multiple cameras were arranged as shown in Figure 12.



2001 Cancun route description, SCLC
Figure 12.

Most of the video frames from the 2001 narrations that I use in this paper were extracted from camera #2, which, as the diagram shows, was facing just to the south of west. To illustrate how one can thus read directions from the video frame, here is how M gestured when—at the very end of the video recording session—I asked him explicitly to show me where he calculated the sun to rise. Figure **Error! Bookmark not defined.** shows the result.

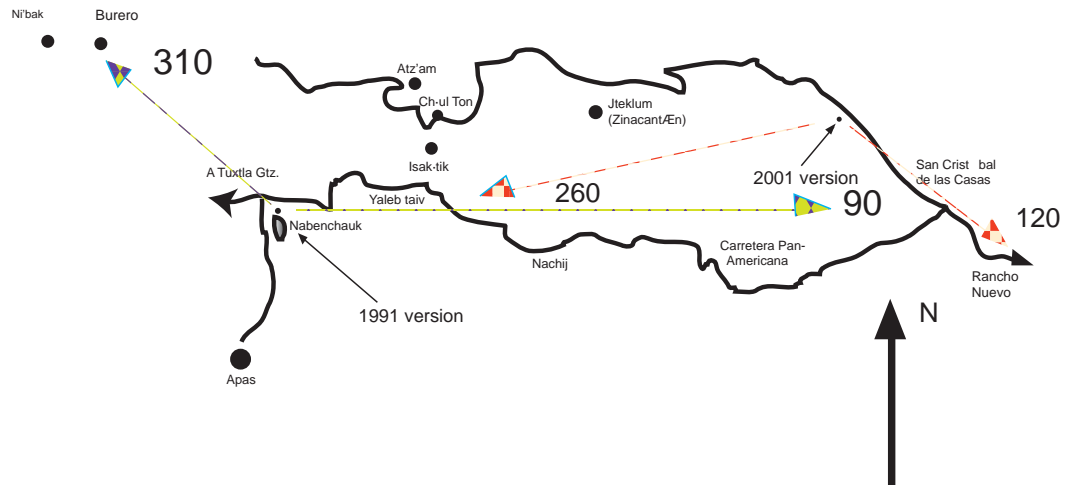


Fig. 13. Where the sun comes up (2001, camera #2).

Returning to the description of the route to Cancún, interestingly, M reported no memory of having performed a similar task a decade before, and, indeed, he first remarked that he couldn't really tell me about the route because he had not made the trip for many years and could no longer remember the names of all the intermediate points.⁵ Finally he recounted the route, and the striking consistency between his directed gestures on this occasion and those from a decade before is suggestive of the spatial representations he must maintain of his travels across southeastern Mexico.

Consider, first, Map 7 which shows the relative positions of the two places M sat as he described the route in 1991 (he was in the village of Nabenchauk at the left part of the map), and again in 2001 (on the outskirts of San Cristóbal, northwest of the city—towards the right of the map).

⁵ Traditional Zinacantec route descriptions concentrate on reciting named spots along the route, an indirect way of describing the amount of time required to walk from one place to another by associating specific times—the moment of dawn, or of taking a meal—with named locales.



Map 7: Two route descriptions, two locations.

Map 7 shows how M oriented himself to local geography on the two occasions. In 1991 he pointed in the direction both of Burrero (pronounced Bureró in Tzotzil)—in the gesture we considered earlier, shown on the Map with a blue arrow—and of San Cristóbal, shown with a green arrow. In 2001, sitting in San Cristóbal, he oriented himself with respect to his home village of Nabenchauk and of the place known as Rancho Nuevo, through which one must pass to begin the trip to Cancún. The trajectories in question are illustrated on the map with red arrows. How the angle of his pointing directions is calculated can be seen by comparing the camera positions shown in Figure 12 with still frames drawn from different cameras as he gestured toward Rancho Nuevo (see Figures 14 and 15), and later toward Nabenchauk (see Figures 16 and 17). What these pointing gestures seem to show is that M, just like the other Zinacantecs we have seen talking about social geography, is firmly anchored in the local area, precisely oriented with respect to nearby locales. Within this locally anchored space, M is able to point directly at named places.

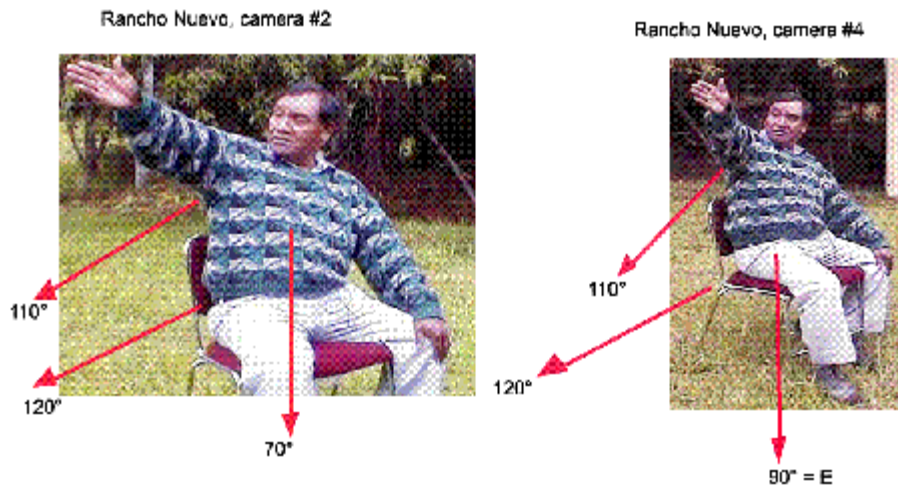


Fig. 14

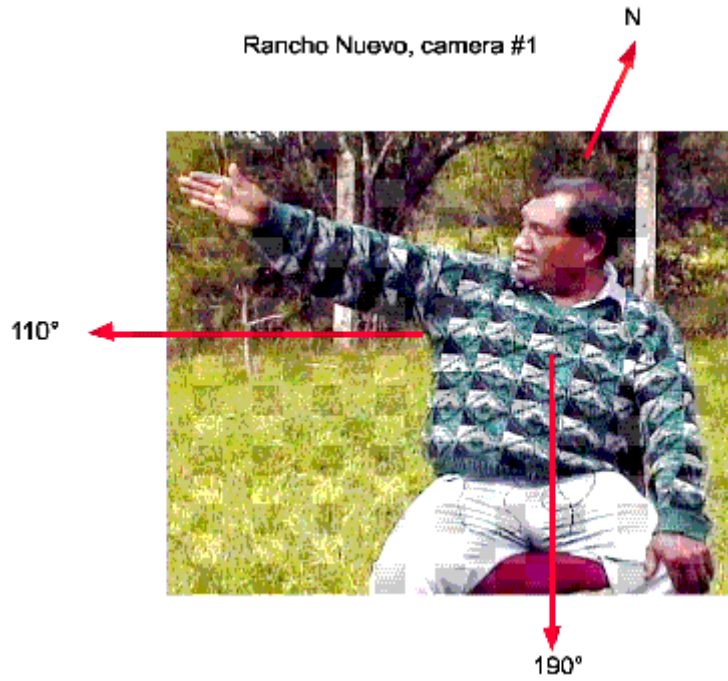


Fig. 15.



Fig. 16. Nabenchauk from here (camera #2)

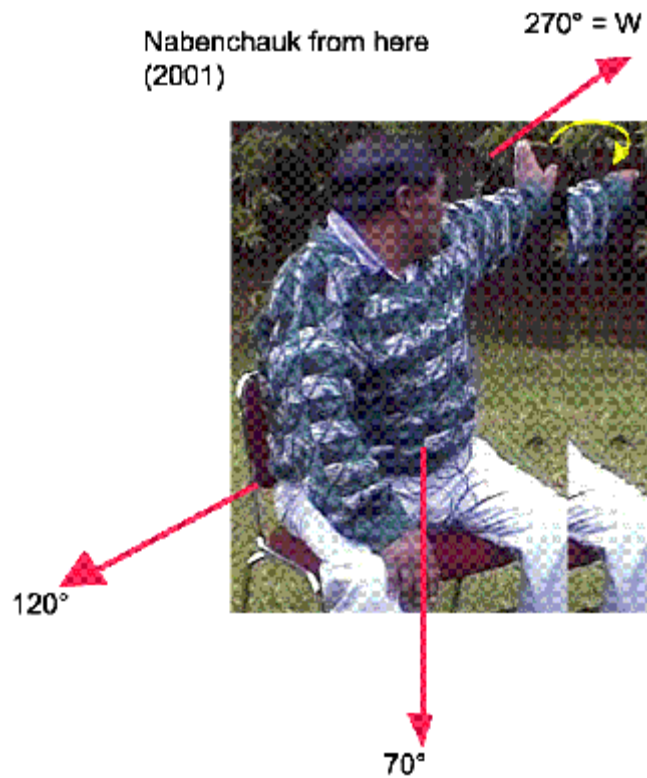


Fig 17. An alternate gesture from camera #2.

5. Route descriptions: Playas de Catazajá

Now consider how M's gestures are oriented when he describes distant places along the route to Cancún. To anticipate, the evidence from these route descriptions, separated by a decade, suggests that M maintains a representation of the route sufficient to fuel an "absolute" or globally-based frame of reference which he *transposes*, point-by-

point, as he projects himself from where he actually is to an imagined point along the route. What remains constant in these projections is the set of absolute cardinal directions, which, as it were, anchor the projected distant place in the orientation of present local space. I shall consider three salient moments along M's narrated route to show how this works. (The reader may wish to consult again Map 6.) The first is the intersection of major highways that M describes to the north of Palenque, near a town called Playas de Catazajá. Details of the intersection can be seen in Map 8.



Map 8. Intersection near Playas de Catazajá.

In the first of his route descriptions from 1991, M has narrated the journey as far as the town of Palenque, site of famous Mayan ruins. He continues as shown on the following transcript fragments. (As before, gestures are notated above transcript lines, with numbers in the notations corresponding to movements of the hands and arms shown on the accompanying drawings.)



4

m0101

4

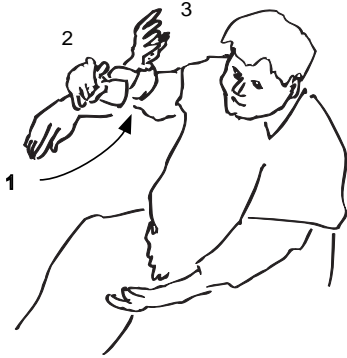
98 m;

ta- . ta jtamtik ech'el xi to e ta jnuptik xa li ali =

We.. we set out this way, we meet, uh-

In line 98, he extends his arm out northwards as he says *ta jtamtik ech'el* 'we set out away', and just as he says *ta jnuptik* 'we meet it' his hand drops slightly (as shown by the

4 on the drawing and above the word on the transcript line). He then initiates an apparent word search (with the hesitation marker *ali* 'uh'), which leads to a short gestural performance without words. Note that to interpret his gesture as “absolutely oriented” one must perform a conceptual transposition, as the point to which he is apparently “pointing” (and whose name he is apparently trying to produce) lies north not from where he sits—in his village recounting the route description—but from Palenque, the point he has already reached in his narrative.



m0103

hand dips downward slightly

| 1 (gaze to fingers)

2 3 (fingers splay slightly)

Apparently visualizing the intersection where the road leads north to Palenque and meets a larger East-West highway, he appears to indicate both with the shape of his hand and an East-West movement the T-junction and the trajectory of the highway.



m0104

| (down to)

4 5 (up again)

Catazajá Beach; a road comes to/from Mérida

Finally, in line 100 he pronounces the name of the place at the intersection in question—Playas de Catazajá—and he goes on to indicate that the road continues east if one will travel to Mérida (see the sweep of his flat hand at 4 & 5 here).



m0105

(up) 1 (down)

2 up

3 (then back to 2) and backhand out

101

ta mejiko chlik tal chava`i li jun karetera-

It starts in Mexico, you know, a highway-

Still using his right hand, M now reaches across his body, to show that this same highway he is describing originates in Mexico City, far to the west.



M0114

LH starts up, and head tilts down and to right

highest point of left hand up NW

Haviland, p. 24

			1	2	3
108	m;	tuk'	onox	chtale	ch`ech' ta verakrus ch`ech' ta =
		<i>It comes straight, passes Veracruz, passes</i>			
109		=viyaermosa			
		<i>Villahermosa</i>			

M now switches to his left hand and performs a broad sweeping motion, left to right (that is, west to east, as he sits), as he describes how the highway in question ,after leaving Mexico City, passes through Veracruz and then Villahermosa.



M0116...1-2.... (held high) ...

111	m;	chbat	onox	yech
		<i>It goes on that way</i>		

Finally, this section of the route description ends, as M remarks that after leaving Villahermosa, the highway continues in the same direction. His second sweeping gesture to his right suggests both that the trajectory continues eastward and that the highway goes on for a considerable distance. (Consulting map 6, one sees that essentially the same road continues all the way to Chetumal on the Caribbean coast.)

There are, for me, two striking feature of this short segment. First, although considerable information about directions and orientations seems to be conveyed in M's performance, virtually none of this directional information is encoded in his *words*. Instead, the gestures, coupled with M's current orientation in space, do the work. Moreover, as anticipated, the orientations associated with M's gestures—if, that is, we are to read them as consistently designed to convey information about cardinal directions—involve a **projection**: from the current space, with its attached cardinal directions, to a narrated space onto which the same orientations from the here and now must be superimposed. That is, M's narrative creates a projected or narrated *origo* from which cardinal directions are calculated from the spatial context of the narration itself.

What evidence might we have that it is any more than coincidence that the cardinal directions of M's narrating gestures correspond to what the map seems to tell us about the intersection at Playas de Catazajá? First, consider the second 1991 telling of the route to Cancún, filmed independently later on the same day by Lourdes de León. Once again, the extract begins at the point that M is describing how one departs from Palenque and arrives at Playas de Catazajá.



59

playa de katasaja

Playas de Catazajá

|RH up and pointing down in front

|RH just E, and gaze down to it

60

ja` taj- ta jtatik li desvio le`

So we get as far as the turn-off there

Using his left arm, M reaches out in front of his body and makes a slight gesture downwards and slightly to his right, indicating a trajectory just west of north (which corresponds to the direction one must travel from Palenque to the turn-off in question).

Haviland, p. 26



|RH moves up to W and back down and out E

|then back to point down in front

1---2---3

61 **jtatik xa li ali .**

We get as far as .. uh ..

|repeats same sweeping gesture as above

| then RH sweeps out and up E

62 **karretera chbat ta merida**

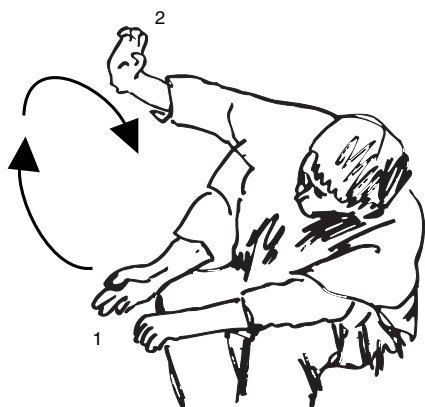
..as the highway that goes to Mérida

There follows a complex gesture in which M makes a repeated sweep back and forth with his right arm (see Fig. 18), as he again traces the path followed by the highway one encounters at the turn-off to Catzajá: it follows a west to east trajectory as one heads off towards Mérida.



Fig. 18: “the highway that goes to Mérida.”

M continues by showing how one would continue WNW to reach the next major town of Escárcega.



| back to rest, then lean forward on L knee

1-----2.....

| circles back to near head

64 **bweno . chibatik un .**

OK, then we go...

| and swoops down NE to point....held...

65 **eskarsega**

on to Escárcega.

Once again, in this second filming in 1991, M's gestures are apparently oriented so as to preserve the directions indicated, as transposed onto the narrated highway intersection.

More striking confirmation that M actually maintains a mental representation of this part of the route—a representation that comes complete with cardinal directions—can be found in his performance 10 years later when he again described the route to me, this time being filmed by several separate video cameras. The following screen shots were taken from Camera #4, which (as the reader will appreciate from consulting Fig. 12) once more) was facing directly to the west. M describes arriving to the intersection with a gesture that faces North (see the first panel of Figure 19). He then traces a perpendicular path, from west to east, as he says *ta jva`anbetik ech'el* 'lit., we stand it up,

going away' demonstrating with the trajectory of his arm⁶ how the road continues to the east.

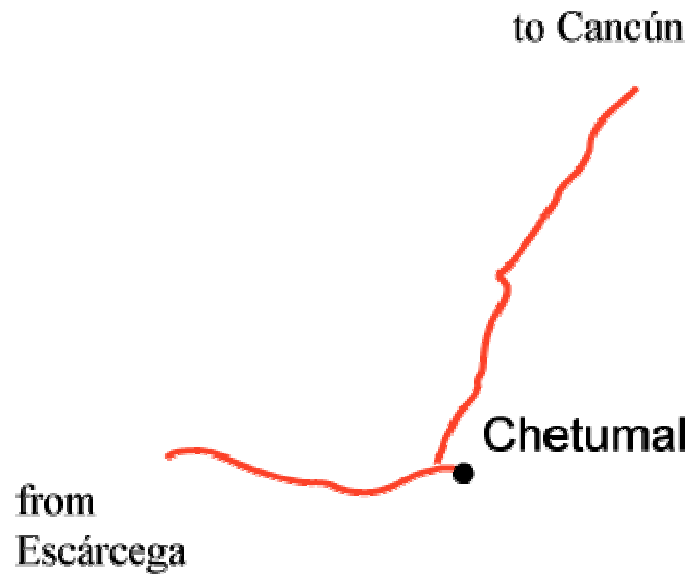


Fig. 19. The intersection at Playas de Catazajá, 2001, Camera #2.

6. The Chetumal turn-off

Consider a different comparison. There is another point on M's route where a road branches, namely the spot near the entrance to the coastal city of Chetumal where the main highway bypasses the city, which lies to the east and south, and turns northeast heading to Cancún. (See Map 9.)

⁶ That the highway continues for a considerable distance is suggested by the upward sweep of the arm, a gestural convention also noted for French gesture (Calbris 1990) and encountered repeatedly below.



Map 9. Turn-off to Chetumal

In one of the 1991 films, from which an extract is shown below, M describes arriving at the Chetumal turn-off. Silently he indicates the trajectory of the turn-off road, branching away from the main highway.



| Body and head turn to E, hand extends out

| RH retracts again to pos. 1

He then explicitly locates where the city of Chetumal is, flipping his right hand slightly backwards, at line 89.

Haviland, p. 30



1

89

xi ta xkom chetumal xi toe

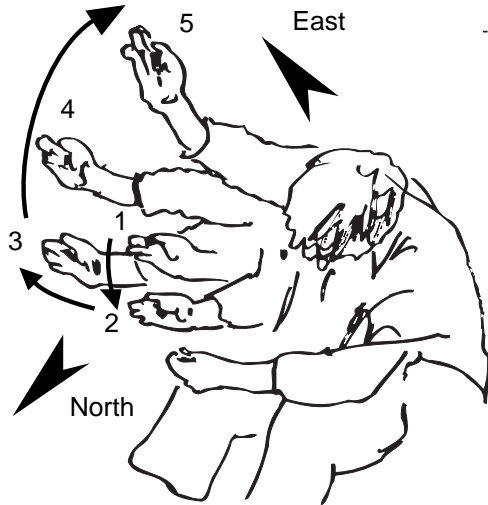
Chetumal is over that way.

In the 2001 narrative, M is less demonstrative about the Chetumal turnoff, simply noting, with a brief turn of his hand back to the southeast, that it lies off the main trajectory of his route. The comparable images from the two video recordings are shown in Figure 20.



Fig. 20. “Chetumal is this way”

By contrast, returning to the 1991 narration, after mentioning the location of Chetumal, M makes a sweep of his arm to show which direction Cancún lies from that point.



m0143

gaze to E and hand

| hand up

1 down

2 -----3... (rise)

4...(head dips) 5..

135

ora li jun be xi chbat xi to skwenta kankune chbat une

Now, the other road that goes to Cancún goes this way

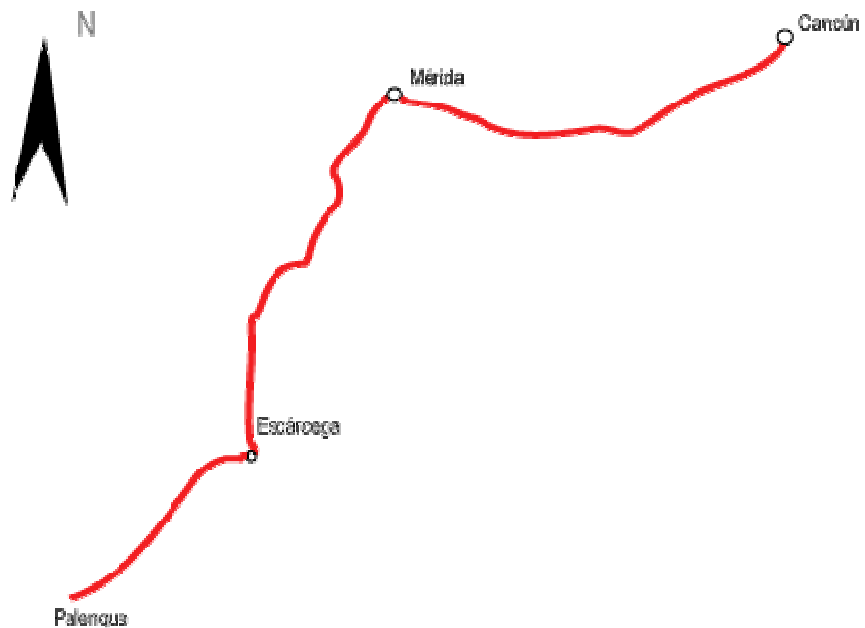
I have juxtaposed images from the two narrations, showing the contrasting direction M explicitly signals for Cancún, in Figure 21. Note that in the 2001 performance (where the direction of the gesture can be calculated by recalling Figures 12 and **Error! Bookmark not defined.**), M shows the direction from the Chetumal turn-off toward Cancún as east and north. In all of his narrations the gestured direction seems consistent, so that—whether exactly accurate or not by European cartographic standards—his gestures reflect a consistent sense of orientation and direction which receives similar expression across the decade-long span that separates the different tellings.



Fig. 21. Cancún that way

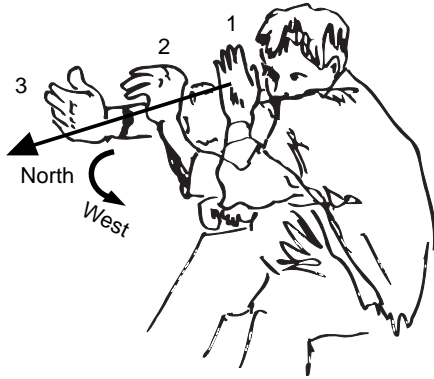
7. Cancún to Mérida

For a last example, consider M's quick description of how one returns home to Chiapas, following a different route: from Cancún to Mérida, and then back to Chiapas, via Escárcega and Palenque. (See Map 10.) Here I present a 1991 version of the first segment of this journey. Recall that in this telling, M is seated with his right side facing just north of east, shoulders roughly aligned east-west.



Map 10: From Cancún to Mérida and Chiapas

One important difference from the previous segments is that in describing this trajectory M explicitly mentions directions, in this case *olon* ‘down’ which in Zinacantec Tzotzil signifies west or the direction of the sunset, as he compares where Mérida lies in relation to Cancún. He accompanies his words with a rather striking sweep of the arm, fully extended in front of him, and moving east to west.



m0158

RH retracts and

LH up from knee

| to face

straightens up

| 1--2--3.....

148

mas xa olon ikom xi xa ikom xi toe

It lies down lower, it lies this way



Fig. 22. From Cancún to Mérida.

In the 2001 retelling, M again mentions the long trajectory from Cancún to Mérida. First he places Cancún to the southeast (Figure 23).



Fig. 23. “Cancún is this way.”

He then switches hands and traces a long sweeping arc, starting where he has located Cancún, and moving west-north-west to where he locates Mérida. His gesture, that is, suggest both the directional vector and the fact that it is a long (and, for a Chiapas highlander from the mountains, somewhat featureless) journey. (See Fig. 24.)



Fig. 24. "And Mérida is this way."

In the 1991 telling, M simply eliminates details from the rest of the return trip, characterizing it as a long haul on a bus from Mérida back to San Cristóbal. His gesture, another long curving sweep, shows that the trajectory is roughly north-to-south.



M0315. . . . hand vertical, palm E

| . . . 1 . . . ----- 2 ----- 3 ----- 4

205 m;

Merida un ctal xa ta Jobel un

From Mérida, it comes all the way to san Cristóbal.

In the 2001 version, by contrast, M mentions a couple of intermediate points along the way, but again, gesturally, the trajectory is characterized as north to south, with little flips of the fingers from the north back toward his present location..



Fig. 25 “Mérida to Escárcega”



Fig. 26. “Passing through Palenque”

8. Conclusions: cognition, space, & deixis

Clearly, considerably more evidence is required, from more Tzotzil speakers, and in different kinds of spatial tasks, to be able to make firm claims about a linguistic or cultural preference, in this community, for one or another of Levinson’s spatial “frames of reference.” In particular, ongoing work with younger Zinacantecs, with women, and with people with different kinds of travel experience (M was a truck owner who made frequent trips to Cancún to sell contraband) may reveal something about the acquisition, transmission, refinement, and maintenance of an apparent absolute frame of reference,

and its connection (or lack thereof) with explicit resources of spoken Tzotzil. Such research, in Zinacantán and elsewhere, may reveal whether the use of one or another frame of reference is tied to specific cultural practices, communicative traditions, or even physical environments. Does an absolute frame of reference fade into irrelevance in some circumstances, or become more salient in others? One supposes that there may be imbalances, functional differentiation, and varied communicative virtues to different frames of reference, and more work is required to untangle the details of their use, especially in a language community like the one described here where all are frequently employed.

There is little doubt, from the material presented here, that my compadre M—and from personal experience in Zinacantán I know that he is not alone among his countrymen—actively monitors cardinal directions as he moves through his life, both near and far from home. M’s gestural and terminological precision, and his consistency in narrative performance over a decade in which he has stopped visiting faraway Cancún, suggest that spaces, in his cognitive representations, come with directions attached. This is all the more remarkable since, by contrast with the Australians I have worked with who enjoy similar directional awareness and acuity, reference to directions in ordinary Tzotzil speech is scant. The east-west central axis, lexically labeled in terms of an up/down contrast and the movement of the sun, is clearly highly salient for M, and he monitors such directions carefully, although from the limited material examined here it is hard to be sure whether similar precision is maintained on the transverse axis.⁷

Exactly how “directions come attached” to spaces remains mysterious, although it seems likely that the spatial representations that give rise to gesture—whatever their nature—are involved. In particular, the analogue nature of directional gestures, contrasting with the necessarily more discrete digital calculus of verbal directionals,⁸ suggests that it is precisely through a kind of imagistic “dead reckoning”—of the sort involved when we *work out* how to point at something out of sight—that directional precision in gesture is achieved. Thus, it is in some sense no surprise that the “absolute frame of reference” surfaces in M’s gestures more than in his words. Precisely oriented gestures thus give a somewhat unexpected confirmation of the conclusion, argued by some students of gesture (for example, McNeill 1992), that verbal and gestural channels

⁷ The transverse axis, and, indeed, ‘north’ and ‘south’, have no standard terminological representation in Tzotzil, as far as I know, though it has been argued (see Gossen 1974) that in Chamulan Tzotzil, reference may be made, in a culturally conventionalized way, to right and left hands to refer to north and south. I know of no such convention in Zinacantán, where people speak indifferently of *ta katal* ‘sideways.’

⁸ Even in a language with hypertrophied directional morphology, such as Guugu Yimithirr—see Haviland 1998.—the range of directional discriminations possible is severely limited compared to that of an analogue pointing gesture.

Haviland, p. 38

in utterance are inextricably linked, but also inherently *complementary*. That theoretically distinguishable frames of reference should thus be non-trivially linked or merged in different communicative modalities—speech and gesture, for example—also provides further evidence for the conceptual and cognitive complexity of deictic practice (Hanks 2005).

Finally, consider the sorts of interactive practices required for such spatial representations and the performances in which they are incorporated to work at all. M's route descriptions demonstrate that some oriented gestures must be calculated in the "here and now," whereas others must be *transposed* and *projected* (see Bühler 1934, Hanks 1990, Haviland 1996). It is clear that complex processes of inference and interactive collaboration between interlocutors are required for such transpositions to succeed. It is also clear that, at least in the case of directional gestures of the sort considered here, a major part of the information intended to be communicated by an utterance is contained in gesture. Therefore, here at least gestures are by design communicative (see Kendon 1994), and they depend in just the way that other collaborative actions (Clark 1996) do on the active knowledge and participation of interactants.

References Cited

- Bryll, Robert and Francis Quek
n.d. Vector-Based Tracking of Conversational Gestures. VISLab Report:
VISLab-01-08 .:
- Bühler, Karl
[1934] 1982 Sprachtheorie: Die Darstellungsfunktion der Sprache. Jena: Fischer.
Reprinted 1982, Stuttgart: Gustav Fischer Verlag.
- Bühler, Karl
1934 Sprachtheorie. Jena: Fisher.
- Calbris, Genevieve
1990 The semiotics of French gesture. Bloomington: Indiana University Press.
- Clark, Herbert H.
1996 Using language. New York: Cambridge University Press.
- Dixon, R.M.W.
1972 The Dyirbal Language of North Queensland. Cambridge: Cambridge
University Press.
- Gossen, Gary H.
1974a Chamulas in the world of the sun: time and space in a Maya oral tradition.
Cambridge, Mass.: Harvard University Press.
- Hanks, William F.
1990 Referential Practice. Chicago: University of Chicago Press.

- Hanks, William F.
forthcoming(2005) . *Current Anthropology* :.
- Haviland, John B.
1979 Guugu Yimidhirr. *In Handbook of Australian Languages*. R.M.W. Dixon and Barry Blake, eds. Pp. 27-182. Canberra: Australian National University Press.
- Haviland, John B.
1986 Complex referential gestures. Ms. Center for Advanced Study in the Behavioral Sciences, Palo Alto, Ca..
- Haviland, John B.
1989 Complex referential gestures revisited: the 'iconicity' of pointing in Guugu Yimidhirr. Paper and videotape presented at the University of Chicago, Oct. 1989, and at the invited session, "The interactive organization of talk: analyses of video tape from five cultures," organized by Charles Goodwin and Adam Kendon, annual meetings of the American Anthropological Association, Washington D.C., Nov. 1989..
- Haviland, John B.
1992 Seated and settled: Tzotzil verbs of the body. *Zeitschrift für Phonetik, Sprachwissenschaft und Kommunikationsforschung* 45(6):543-561.
- Haviland, John B.
1993 Anchoring, iconicity, and orientation in Guugu Yimithirr pointing gestures. *Journal of Linguistic Anthropology* 3(1):3-45.
- Haviland, John B.
1996 Projections, transpositions, and relativity. *In Rethinking linguistic relativity*. J.J. Gumperz and S.C. Levinson, eds. Pp. 271-323. Cambridge Univ. Press.
- Haviland, John B.
1998 Guugu Yimithirr cardinal directions. *Ethos* 26(1):1-23.
- Haviland, John B.
2000 Warding off witches: voicing and dialogue in Zinacantec prayer.". *In Les rituels du dialogue, promenades ethnolinguistiques en terres amérindiennes*. Aurore Monod-Becquelin and Philippe Erikson, eds. Pp. 367-400. Nanterre: Société d'ethnologie.
- Hill, Clifford
1982 Up/down, front/back, left/right: a contrastive study of Hausa and English. *In Here and there: cross-linguistic studies on deixis and demonstration*. J. Weissenborn and W. Klein, eds. Pp. 13-42. Amsterdam: John Benjamins.
- Kendon, Adam
1994 Do gestures communicate?: a review. *Res. on Lang. and Soc. Interaction* 27(3):175-200.

Haviland, p. 40

Laughlin, Robert M.

1976 *Of wonders wild and new: Dreams from Zinacantan*. Washington, D.C.: Smithsonian.

Levinson, Stephen C.

1997 Language and cognition: the cognitive consequences of spatial description in Guugu Yimithirr. *Journal of Linguistic Anthropology* 7(1):98-131.

Levinson, Stephen C.

2003 *Space in Language and Cognition, Explorations in Cognitive Diversity*. Cambridge: Cambridge University Press.

McNeill, David

1992 *Hand and Mind: What gestures reveal about thought*. Chicago: University of Chicago Press.

Talmy, Leonard

1985 Lexicalization patterns: semantic structure in lexical forms. *In Language typology and syntactic description*. Timothy Shopen, ed. Pp. 57-149. London: Cambridge University Press.