1. Linguistic and conceptual gaps and linguistic relativity

The idea that linguistic categories, differing across languages, might reveal something about the nature of linguistic and conceptual categories, was of course widely entertained before the tide of rationalism gave us the working presumption that conceptual structure is universal, and that linguistic relativity is the province of particular languages. It is not surprising that the idea is now taken more seriously, if only because there is growing evidence that the linguistic categories are not the same as the conceptual categories. Recent work on the nature of conceptual categories and their relations to linguistic relativity has been reviewed by Langacker (1987) and by Fodor (1983).

2. Right and left in spatial conception and description

As far as is known, the tendency to right-handedness is universal among mankind. Judging from tool-use, even early hominids seem to have been predominantly right-handed. The asymmetry of this kind is not shared by the apes, or indeed other animals, and it may be supposed to be related to hemisphere lateralization. However, the actual genetic and environmental controls underlying this phenomenon are probably indirect, and in any case remain controversial.

The asymmetry of handedness is a slight physiological cue which makes it possible to identify one's own leading hand. On the distinction between the strong, skilled hand and the weaker, clumsy one may be hung a number of further distinctions. First, we may designate the hands differentially on the hemispheric basis, identifying the one that may or may not be the stronger as e.g. the right hand. Second, we may learn to distinguish left-handings or right-handings from each other, depending on which hand is used for particular activities or responses with only one designated hand (as in shaking hands, or making the sign of the cross). Often symbolically devalued or unequal activities may be restricted to the left hand. We may also learn to extend the notion of right and left to our bodies. Third, we may learn to identify other peoples' left and right hands. Fourth, and most importantly, we may project our bilateral asymmetry onto the outside world, so that not only do we have a left and a right side, but do so the structure of the space around us (as in the earlier quotation from Kant). This makes possible a range of distinctions: (a) we may think of things as passing in front of us from our left to our right side, (b) we may think of static arrays as organized from left to right (or vice versa), as with words on a page, (c) we may distinguish otherwise identical shapes that are inverted around the vertical axis (mirror-image objects or enantiomorphs), recognizing a d fence to be distinct from a b, or a left shoe from a right shoe. Fifth, we may go on to make the mental rotation required to think of left and right regions not only from an egocentric point of view but also from the perspective of our interlocutors. And so on.

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1 This is a short summary of some of the material and only some of the theoretical issues raised in greater detail in Levinson & Brown 1992; it was first presented at the Workshop on Space in American Linguistics, organized by the Cognitive Linguistics Research Group, Max Planck Institute for Psycholinguistics, Nijmegen, December 1991.

2 All KANT quotations are from the translation in Vos & Frederick (1991).
This is a complex conceptual and behavioural superstructure on a slender physiological basis (as Hertz (1969) pointed out over eighty years ago). How natural or inevitable is this assemblage? It is interesting to note that even animals lacking handedness can make some systematic left-right response differentiations. But few animals can distinguish enantiomorphs, and humans have to be trained (e.g. many children have lengthy problems with b vs. d). It takes Western children many years to learn the range of extensions of our terms left and right, as Piaget (1928) discovered: they are often not able to identify their own left/right hands till 5 or 6 years of age, they take another three years or so to be able to make the mental rotation to identify another’s left/right, and another two or three years to project abstract left/right regions into the visual field. Indeed the cross-cultural prevalence of much of this assemblage, Hertz argued, owes more to sociological and symbolic utility than to conceptual necessity.

In any discussion of left/right differentiation, it is essential to bear in mind the many kinds of analytical distinctions summarized in Table 1. Thus armed, we may proceed to discuss the various kinds of labelled distinctions and the conceptual gap associated with ‘left’ and ‘right’ in Tenejapa.

Table 1: Analytical distinctions in the study of Left/Right discrimination and response

<table>
<thead>
<tr>
<th>Distinction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mirror-image discrimination</td>
<td>Perception of enantiomorphs (e.g. seeing a 45° angle as distinct from its mirror-image)</td>
</tr>
<tr>
<td></td>
<td>Memory of those perceptions</td>
</tr>
<tr>
<td>Discrimination (e.g. of pairs) vs. Identification (e.g. of 1)</td>
<td></td>
</tr>
<tr>
<td>Labelling/coding of asymmetries: consistently (e.g. calling your left your ‘right’) correctly (calling your left hand your ‘left’)</td>
<td></td>
</tr>
<tr>
<td>Left/Right Response Differentiation</td>
<td>Stimulus types:</td>
</tr>
<tr>
<td></td>
<td>With systematic cues (e.g. turn left on red)</td>
</tr>
<tr>
<td></td>
<td>With iconic cues (arrows, T junction)</td>
</tr>
<tr>
<td></td>
<td>With arbitrary stimulus (e.g. salute when you see a Column)</td>
</tr>
<tr>
<td></td>
<td>With ‘left’/‘right’ linguistic labels as stimuli (see 3.2)</td>
</tr>
<tr>
<td></td>
<td>Response types:</td>
</tr>
<tr>
<td></td>
<td>Own body parts (e.g. raise left hand)</td>
</tr>
<tr>
<td></td>
<td>Motion (e.g. go to the left)</td>
</tr>
<tr>
<td></td>
<td>Location (e.g. push button to the left)</td>
</tr>
<tr>
<td></td>
<td>Linguistic label (say ‘left’) – see 3.2</td>
</tr>
</tbody>
</table>

3.1 Linguistic system of ‘left/right’ labels and its use

3.1. Body part labels

3.1.1 | ego’s parts (Piaget’s stage I)
3.1.2 | alter’s parts (Piaget’s stage II)
(a) in side-by-side position, |
(b) in ‘confrontation’ position, |
(c) in ‘single file’ position |
3.1.3 | object parts |
| (a) intrinsic (‘the left of the cow’s desk’), |
| (b) non-intrinsic (‘the left of the table’)? |

3.2 As labels for spatial regions

3.2.1 | regions on ego’s sides |
3.2.2 | regions on alter’s sides |
3.2.3 | regions projected from oriented objects (e.g. ‘to the left of the cow’) |

3.3 As deictic angles projected on the relationship between two objects (Piaget’s stage I)

(e.g. ‘the cat is to the left of the tree’ – where ego imposes a ‘left side’ on the tree)

3. Left and right in Tenejapa.

Tenejapa is a municipio in Chiapas Mexico, in which live perhaps 15,000 Mayan Indians who speak the language Tzeltal; they form a distinct ethnic unit, although there are many other ethnic groups that speak various varieties of the same language. Tenejapa

conceptions of space are currently under investigation, using a mixture of traditional ethnographic and linguistic techniques and informal experimentation (Brown 1991; Levinson 1991a; b; Brown & Levinson 1991).

Tenejapa has compound names for the left hand and the right hand, and also a term for hand/arm in general. But they do not generalize the distinction to spatial regions – there is no linguistic expression glossing as ‘to the left’ or ‘on the left hand’ or the like. And there is no elaborate system of value associations with the left and the right – indeed, none at all to our knowledge.

Here we lay out what we know about Tenejapa concepts of left and right in so far as they have such concepts. We should note that our research has focussed on the systems that effectively replace those concepts, so that we have failed to pay enough attention to exactly what there was as residue. But first some ethnographic background.

3.1 Ethnographic background

Until 1951, when the National Indian Institute arrived in the local town, the Indians of Tenejapa were isolated from the influences of metropolitan Mexico by an apartheid system that forbade them to be in town after dark, or to walk on the sidewalks in the day. Until such conditions, Tenejapa were illiterate, largely monolingual, and few ventured into town. Today, the situation is under rapid change, with roads under construction, electrification, influence of religious reformers, and effective schooling in Spanish. Tenejapa women, and also men over forty or so in the remoter areas, are still likely to be effectively monolingual, and to have grown up in a world constructed along traditional lines.

Traditional houses have a square floor plan, with one door (no windows) centrally placed. The door itself opens neither to the left nor the right, being split into two vertical half-doors, both opening inwards. (Modern houses are mostly rectangular but normally retain the split-doors located centrally in the longer side.) By virtue of the location of the fire, which might be a little off-centre, or of the bench for food preparation formed by lashing a board to stakes, there may be a side of the house clearly allocated to the household women, and another to the men and visitors. But there seems to be no pattern in the assignment: either area may be to the left or right of the entrance. In short, domestic architecture encourages a symmetry, or if needs be, an arbitrary allocation of space. Nor is orientation of any ritual significance – houses can face in any direction and, unlike in some other Highland Chiapas cultures, there are no obligatory directions for sleeping (e.g. in the opposite direction to that in which the dead are laid to rest). When people die, they were traditionally buried under the floor of the house in a vertical crouching position; now they tend to be laid out lengthwise but in any direction. In general, symmetry pervades material culture; for example, traditional vessels do not have one handle, but either none, two, or sometimes three equally placed around the top.

Other aspects of daily life tend to show the same pattern of symmetrical design or arbitrary asymmetry. In traditional weaving patterns, symmetry is enforced by mirror-image reflection around a vertical line, and dress is in general symmetrical, bags being

\[ \text{some of these distinctions are drawn from Corballis & Biale 1976, passim.} \]

\[ \text{Z. Pho. Sprachwiss. Kommun.forsch. (ZPSK) 45 (1992) 6} \]
slung on the back by a tump-line over the forehead, or indifferently over left or right shoulder. Babies are slung on the back in a shawl tied over one shoulder, but which shoulder seems to be a matter of convenience. Body posture tends again to be neat and symmetrical (slouching or leaning not being typical), as indeed do gestures, generally not expansive, which are often double-handed. Men, though, in ritual or civil office may greet each other by touching limply their right hands.

In the ritual system, cardinal point orientation does not seem to play any important symbolic role as far as we know. Although major Christian churches are oriented East (the church in Tenejapa centre has been built by Spanish monks), individual household or community shrines may face in other directions. Since houses have no favoured orientation, and household shrines are placed inside opposite the door, it follows that the veneration. Ritual processions may go both clockwise and anticlockwise around a town or focical area, and although in major rituals the route is always followed, there is no particular reason to believe that there is any attention paid to clockwisiness.

Hertz (1909) suggested a universal symbolic association of 'right' and rectitude, strength and purity, as opposed to 'left' and turpitude, weakness and filth (see Nicholas Hammond 1973 for even stronger universal claims). But in Tenejapa there is no such Hertzian symbolic system of oppositions associated with right and left. The word for 'correct', 'real' is batz'il, for 'straight' is tojol, unrelated to wa'el 'right hand/arm' (unlike in neighbouring Zinacantecan: the word for 'bad' is chopol, for 'dirty' papas, unrelated to xin 'left', and so on. The body of officials we would call the President's 'right-hand men' are called yok sk'ab kawerol 'the president's legs and arms'. And so on.

3.2 Concepts of left and right

We come now to consider the perceptual, conceptual and linguistic aspects of left/right differentiation in Tenejapa. In Tenejapa Tzeltal there are words for left-hand and right-hand; Berlin et al. (1990) give the following entries:

1. On weaving and dress see Braunfels 1974.

2. It may be that a given woman always tends to do it on the same shoulder. Similarly, women pleat their skirts and wrap belts many times around themselves, but although a given woman always possibly correlates with handedness. Films we have taken of festivals indicate that male officeholders tend to wear their ceremonial white bag on the right hip and grasp their ceremonial staffs, unconsciously, in the right hand.

3. That is, Tzeltal — including ritual experts — do not articulate any rationale for the direction of the act: 'we always do it'. In fact there does seem to be a tendency for such circuits to go counterclockwise: Ross (1986) notes that in the fiesta for San Lazaro, a major festival in Tenejapa, the route followed by the procession through the town is always the same, a counterclockwise circuit. Before returning to the main plaza, a small counterclockwise circuit is also conducted inside the church before returning to the main square with the same route.

4. Tzeltal 'counter-clockwise' is our description of a route which they do not conceive of in these terms. And some ritual circuits differ: in a local festival we have watched a procession of the sacred image which started out counterclockwise, but then retraced its steps clockwise.

5. Like many languages, Tzeltal has a single term for upper limit (including hand) and another for lower limit (excluding foot). See Berlin et al. (1976) for the details of Tzeltal anatomical terminology.

6. Berlin et al. (1990) list a separate adjectival root sin '2' (distinct from the noun root sin '1') with negative connotations: sin '2 A root, a- 'stinking'; sinal, A, aj, 'stinking' (attributive form): xin 'bad, unlucky spirit'. The latter is often accompanied by the term 'cursed' in both speech and ritual. Berlin et al. (1990) list a separate adjectival root sin '2' (distinct from the noun root sin '1') with negative connotations: sin '2 A root, a- 'stinking'; sinal, A, aj, 'stinking' (attributive form): xin 'bad, unlucky spirit'. The latter is often accompanied by the term 'cursed' in both speech and ritual.

7. The use of the Tenejapa terms xin and wa'el may be elucidated by comparison to Plank's three stages for the acquisition of left and right in English (or destra and gauche in French), which are as follows. At first, prior to any proper acquisition of the concepts, there is only confusion. In the first stage of actual acquisition, there is correct naming of the child's own left- and right-hands and other body parts. In the second, the child learns to make the rotation required to name the body-parts of a confronting interlocutor. In the third stage, the relation between two inanimate objects can be specified by taking into account another relation, namely how the reference object lies with respect to ego's left and right (as in the orange is to the left of the bowl).

8. However, our informants do not accept these terms designate the left (or correspondingly the right) side of the body. Their explications are somewhat complex. Although xin and wa'el are clearly nominals, they normally occur in collocation with just two body-part terms, -'am/hand' and -ak 'leg/foot' of either humans or animals (the front legs of quadrupeds are designated 'arms'). Now such body-part terms are inalienably possessed, requiring a possessive prefix, but in the collocation with xin or wa'el the possessor marker is prefixed to the latter, indicating that it's 'xin-k'ab ('your-left-hand') in the animal compound. Most people we asked did not accept the generalization of xin and wa'el to other body parts, but a few accepted the explanation to 'ear', 'eye', 'breast'. In sum, xin 'left arm/hand' and xin-ak 'left foot/leg' are complex body-part terms but Tenejapans deny that the body is split between left and right halves.

9. If one turns for comparison to the better-studied neighbouring language Tzotzil, one finds only one word for left-hand (Laughlin 1975):

nxal fit 'my left hand'

nxal fit 'my left hand'

10. Xam is perhaps most of origin, a corruption of xan in order to xin and hence to xin, the Indians making associations between staring at and the city-dwelling Ladinos. Certainly no Tenejapan informant offered us any association of this sort with 'left hand'. It should, however, be noted that recent missionary activity has drawn the attention of converts to biblical references to 'the right hand of God' and the weakness of the left hand.
Tenejapan usage of the terms *xin* and *we'el* is very infrequent; there are hardly any practical uses where the terms are essential, as we shall see. Nevertheless, Tenejapan has perhaps only a little more than the usual difficulty specifying which hand is their own left or right (*pagnít's* stage 1). They are not very hesitant, but perfectly able, to do the mental transfer required in assigning *left* and *right* to the hands of a facing interlocutor (stage 2). But they simply is no usage corresponding to *pagnít* stage 3. The reason is that the terms are not terms for regions; hence in the usage that *pagnít* labels stages 1 and 2, there is also no usage corresponding to *to the left*, whether this is ego-centric (*to your left*) or other-centric (*to your right*). The terms *xin* *k'ab* and *we'el* *kabel* are basically body-part expressions—they name human or animal parts. And although Tzeltal makes extensive use of body-part terms for spatial description, these also primarily denote abstract parts of things, rather than projected regions from named faces.

It follows of course that Tzeltal fails to make the Kamían cleavages of space along the three planes of the human body. Unlike in English or German, there is no entire system of orientation extended from ego's body. 12

**Kant** argued (1991 [1788]) that *left* and *right* are not dispensable notions. One might think that one could instead resort to maps or cardinal points or mirror-image objects like left vs. right shoes or concepts of clockwise vs. anticlockwise rotation. But in fact these devices and concepts in turn rely on, or are interdefinable with, *left* and *right*. Following Kant's reasoning, one might search for such other notions in Tenejapan, like clockwise/anticlockwise, or a sequence of cardinal points recal clockwise from say North. Equally, one might have distinctive labelled anantimorphy that appear as reflections as vertical axis, like /vs. /or vs. j/, which would serve the same purpose.

First then 'cardinal points': in Tenejapan Tzeltal there is a system of *uphill*/*downhill* orientation that is fundamental to the spatial system. We have described this in detail elsewhere (Brown & Levinson 1991). Suffice it to say here that this system is based on the overall inclination of the terrain of Tenejapan from high South to low North, so that although *uphill* (*tsō'ok* / *tsab* correspondingly), *downhill* is primary reference to the actual inclination of the land, which may or may not be tilted up to the South, the terms may be used on the flat to refer to cardinal orientations, or prototypical *uphill* direction. This system then replaces our use of left/right in many contexts: when there are two objects oriented such that one is to the South of the other, it can be referred to as the *uphill* object. Unlike *pagnít* stage 3 use of *left* and *right*, the position and orientation of the speaker is completely irrelevant to this usage. 13

Now curiously, this system of North/South alignment is not complemented by a similar differentiation of the orthogonal. There is a named orthogonal (*tsax*), but the term is indifferent as to whether it refers to East or West; what it really means is 'transverse to the incline'. So there is a three-way distinction: uphill (related to South), downhill (related to North), transverse (related to East/West). Significantly, then, it makes no difference whether one rotates clockwise or anticlockwise from *uphill*—either way, one comes first to *transverse* then to *downhill*. The system is also reflected in corresponding

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12 see León (this volume; and 1992) makes an analogous observation for Tzeltal, which she argues lacks the cleavage of space along the front/back axis of the body.

13 There is another usage, described in Brown & Levinson 1991, which does take into account the orientation of the speaker; in this special and restricted use, *uphill* means 'further from speaker'. See discussion below.

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Z. Phon. Sprachwiss. Kommun.forsch. (ZPSK) 45 (1992) 6 motion verbs with a verb meaning 'to go up, ascend' *(mo)*, a verb meaning 'to go down, descend' *(ko)*, and another meaning 'to go across, to traverse' *(jelaw)*.

There is some evidence that speakers think of life as all uphill, i.e. the canonical situation is viewed as walking uphill. When wishing to talk of the facets of an object which lacks intrinsic facets of this sort, the 'flanks' *(zaqʷu)* may be assigned to the sides that lie on the transverse line, across the uphill/downhill axis. When the system gives rise to temporal metaphors, the future lies uphill. The ceremonial center of Tenejapan lies 'uphill' from much of the rest of the municipio. Most telling, there is a restricted special deictic use of the 'uphill', 'downhill' opposition, in which the term 'uphill' can be applied to one of two objects within my reach—in this case it refers to the one further away from me (i.e., 'higher' is arrived at later if one is walking uphill). If this supposition of canonical direction is correct, then there is a correspondence between the lack of a left/right differentiation by any descriptive use and the absence of any East-West orthogonal to the North-South line.

How could any peoples ignore the rising and setting of the sun, with all its natural symbolism? Of course the Tenejapanas don't. They refer to the relevant directions as the *coming out of the sun* *(tsō'ok b'īk k'atxi)* and the *spilling of the sun* *(m'āb b'īk k'atxi)*. Left is an independent axis, not thought of as orthogonal to 'uphill'/*downhill* (nor indeed would it be geometrically related, since the one system is tied to a fixed terrain, and the other to the movement of the sun across the horizon from mountains to solstice). Tenejapan use many other geographic landmarks as points of fixed reference in order to make up for the absence of left and right: they utilize the locations of other villages, mountains, named features like cliffs, etc., so that one can refer, e.g., to a particular branch of a tree as the one pointing out towards the Red Cliffs. The possibility of reference to East and West belongs to this system and not to the *uphill/downhill* system with its well-developed grammar of location and motion description.

What about anatimorphs, especially left-right reflections about a vertical axis? As already mentioned, the culture provides little in the way of paired objects of this sort, with the notable exception of shoes which are still only worn, especially by women, on special occasions, and have never been made locally. Our evidence, for what it is worth, suggests that the perception and conception of left-right asymmetries is in line with the linguistic resources of the language, i.e. such asymmetries are not salient, and are not easily described in systematic terms. We conducted a number of informal experiments and structured experiment sessions, described in detail elsewhere (León 1991b, Brown 1991). All in all, our informants performed on at least eleven tasks where left/right discriminations were at issue. (It should be noted however that many of these tasks were devised not for the purpose of elucidating Tzeltal concepts of left and right but for exploring the indigenous alternatives.) With that caveat in mind, the reader will find these tasks sketched in Table 2.

**Table 1**: A test of interactive 'space games' (see León 1991a; Brown 1991) played by Tzeltal speakers, one a Director who describes, one by one, a set of photographs so that the other, the Matcher, can distinguish the photo being described from the others in the set. Among these were pairs where, for example, (i) a model man was either to the left or right of another model man; or a dog was lying down either to the left or right of a standing one; (ii) a bag of corn was either to the left or the right of a pot; a cylindrical shape of corn dough was either to the left or right of a cube.

Under these conditions (where both images were visible and had to be contrastively

described in order to be identified by the Matcher), often identical descriptions were used for both enantiomorph pairs. For example:

1. (corn in net bag on left, corn in basket on right)
   x: ay jau ye te echeh te chojak
   EXIST again another ART sitting CONJ nethag
   there's another one with a net bag sitting
   sok jau ye te echeh
   CONJ sitting basket there DEIC
   and a basket sitting there.

2. (corn in net bag on right, corn in basket on left)
   x: ja' navi tse chiep tse chojak
   it is just TAG 3E-accompany-VN PREP sitting-VN ART nethag
   That's it, in its (nethag-like) sitting the nethag's accompaniment
   sok jun noh
   CONJ one basket
   (s) with one basket.

In effect, informants simply failed to recognize the difference, or at least failed to realize its pertinence to the task. Where the objects to be related were animate in kind (model people or animals), two of our informants resorted to left-right descriptions from the point of view of the people or animals in the photos. So where a model man had at his (intrinsically) left hand a model women, the following description was used:

3. (corn jau ye in net bag, jau ye in basket)
   x: ay jau ye sok jau ye ante
   EXIST one-NC nan CONJ one-NC woman
   there's one man plus one woman.

   tek'el ta, ta s-wa'el k'ob te ante te winke
   standing PREP PREP 3E-right hand ART woman ART man
   the man is standing at the woman's right hand.

which distinguished it from the description of its enantiomorph:

4. (corn jau ye in net bag, jau ye in basket)
   EXIST one-NC nan CONJ one-NC woman
   There's one man plus one woman.

   tek'el ta, ta sin k'ob te winke,
   standing PREP PREP left hand ART man-CL
   the man is standing at her left hand.

In the case of some of the photographs, the two models were almost touching — so that taxin k'ob 'at the left hand/arm' implied contiguity. In some cases, the figures were at some remove — roughly the same distance as the breadth of the model figure itself. The taxin k'ob expression could still be used to refer to the separated figure. This might be held to indicate that 'left' and 'right' here do have regional extensions after all. We do not
believe this to be the correct interpretation. All body part terms in Tzeltal allow some latitude in contiguity, although the extent of this varies with each term; but no cases are we really dealing with *projective* as opposed to *topological*, notions, to use the Plagian

space, or divide the whole visual field. Instead they denote just body parts, and just like English *at* allow a certain latitude (often very small) of interpretation (cf. *John is waiting at the station* which is a correct description even if he is outside it).

Now this system of 'left/right' description from the point of view of animate entities could not be generalized to the inanimate objects in the photos, because that would require the sidelessness of projected objects in the visual field, giving us a true projective use of 'left/right' as in *the cat to the left of the tree*. Here the pairs were given identical or near-identical description and successful matching was a matter of chance. After one gesture we confronted the same sort of inanimates with two such paired photos of left-right inversions of inanimate objects and asked them what difference they could see. They claimed them to be identical, *pojol*, 'the same'. When pressed, they replied by finding tiny details of asymmetry either in the arrangement of the objects or the finish of the photo-

graph. In some way, in the context of this task at least (in contrast to Task 9, described below), the impossibility of left-right reflection was 'invisible' or irrelevant to the infor-
mants. The differentiation of paired animals or people in photographs were the only cases where left-right terms were used for identification.

Another type of task (Task 4) involved differentiation of two identical three-dimension-

al objects where these fell in a left-right relation in the visual field. A pair of identical bottles on a table, or a pair of benches on a patio, were never distinguished by reference to their left/right place in the visual field; instead they were located by reference to one of three strategies. Where they lay along the absolute *uphill*/"downhill" axis mentioned above, this was used to distinguish them (it’s the one ta ajik ol, uphillwards as for ex-

ample). Where the pair lay on the transverse to the uphill/downhill axis, even though the two sides of this transverse are labeled identically, *ta fech*, the two objects could be distin-
guished using deictic descriptions. Thirdly, where the objects lay near a labelled part of the

reference area, use was made of another aspect of Tzeltal spatial description, the seg-

mentation of objects into 'body-parts' (see Brown 1991); then one bench could be said to be at the 'ear' (i.e. cornea) or at the 'ipsa' (i.e. side edge) of the patio, or to be at its 'top' (bok) or 'bottom edge' (yejtol) – these terms being in turn related to the *uphill*/"down-

hill" dimension. All these systems break down if the objects are perfectly arranged on a
diagonal to the uphill/downhill line, at the middle of the table or patio (where no body

differentiation is possible), and the speaker is himself orthogonal to that diagonal so that the two objects are equidistant from him). In these circumstances, speakers were

at a loss – any left/right terms applicable to objects in the visual field would have rescued them, but none are available. Figures 1 to 4 present diagrammatic illustrations of these three possibilities and the fourth, unsolvable one.14

14 In fact the fourth is not in principle unsolvable by an ingenious Tzeltal-speaker: a geographic landmark can be used to provide an axis (speaker-landscape) in principle in any direction 360° around the speaker. (See the LxQ 1992 for the analogous system in Tzeltal.) That solution is actually used in this context is possibly due to the lack of salient landmarks in the rele-


Two other tasks cited in Table 2 deserve special mention. One, Task 3, involved one informant introducing another to put an artist’s ‘wooden man’ with flexible joints into cer-
tain positions – e.g. raising an arm or a leg, bending it to a certain angle, etc. What was striking here was that terms for ‘left’ and ‘right’ would have been extremely useful, and

for this task – naming body-parts – they are of course available. They were nevertheless

used just three times (note the similar result from Task 11). Instead, absolute directions in

terms of *uphill*/"downhill" (quasi-cardinal points), ‘towards the sunset’, ‘towards the big

banana tree’, etc. were used to distinguish the two hands or legs. For example, in <6> the

Director uses right and left to distinguish the two hands, but in <7>, <8> he uses alternatives:

<5> (woodman.doc: 1)
D: toj teč’el. x-bich-oj x’-kab
straight standing. ASP-stick-up-STAT 3E-arm
He is standing straight up. His arm is extended.
M: ta toyo?
PREP up-high
Vertically upwards?

<6> (woodman.doc: 2)
D: jm m. jich k’atal x-bich-oj bel ta ya Turuvut
No. thus asymmetry ASP-exceed-STAT DIR (go) PREP NAME
It has extended out acrossways away towards Turuvut mountain.
k’atal x-bich-oj bel ta ya Turuvut,
crossways ASP-exceed-STAT DIR (go) PREP NAME,
It is extended acrossways towards Turuvut.
k’atol y-ak’oj te j-ch’ik x’-kab
Dir (descending) 3E-give-STAT ART one-NCsticklike 3E-arm
(and one arm (ie, the other one) is placed downwards.

<7> (woodman.doc: 3)
D: x-bich-oj me te j-ch’ik x’-kab ta ajik el.
ASP-head-STAT PT ART one-NCsticklike 3E-arm PREP uphill
He has bent one arm uphillwards.
bejol rebuk, teb max.
bent s+bit a+bit just
A bit bent, just a bit.

<8> (woodman.doc: 5)
D: jich ma ba to mali k’al ay s-jol.
thus NEG very falling sun EXIST 3E-head
That’s it. His head isn’t very much towards the sunset.
From inspection of the dialogue, it seems that one reason for the avoidance of 'left/right' terms is an uncertainty that they will be correctly interpreted: when they were used by the Director, the Matcher tended to ask for confirmation in 'absolute' terms. This is reminiscent of the following anecdote published as a short note in "Science", 1931: there was an American boy who was noted to have an outstanding sense of absolute direction; investigation showed that the source of this unusual development was that his mother frequently confused left with right, and so had substituted cardinal points, as in "get me the brush on the north side of the dresser". Where one or more of the parties is unsure is the application of 'left' vs. 'right', it will pay to abandon it as a routine mode of reference. And this seems to be the case in Tenejapa.

This may also illuminate another task we would like to describe in more detail (Task 5). This involved a game of 'blindman's bluff' where a Director had to manoeuvre a blindedfder Finder by verbal instructions over a large flat expanse. Our 10-year-old son did this for us in English by the device of indicating rotation in terms of left/right ('turn a little to the left, a bit more' and so on). Our Tenejapan informants did not do this. Clearly rotation of the body is not usually so described. Instead they took the absolute, non-body-centered perspective, and directed the Finder to move 'uphill', 'downhill', 'traverse', even though the search area was dead flat and the Finder blindedfolded. For example:

\[\text{game5.doc}\]

\begin{verbatim}
  a: jich ya x-wal'k'o-xan xan teh-ak
  thus ICP ASP-turn-2A again DIM a-bit-CL
  'Just turn again a little bit more.'

  x: jich mene
  thus DEIC
  'Like that?'

  a: ben-an bel ti'in
  walk-IMP DIR (go) PT
  'Walk away, then'

  x: jm
  'OK'

  a: try max xe mene
  there just DEIC DEIC
  'Just there.'
\end{verbatim}

The assumption was that the developed absolute sense of direction in terms of canonical 'uphill' ('South') etc. would be sufficient to overcome the handicap of blindfolding. And so indeed it was.

In summary, Tenejapan makes no essential use of 'left' and 'right' terms in daily life. There are such terms, referring strictly to body-parts. But there is evidence that Tenejapan are slow and uncertain in their processing of these terms, further undermining their limited utility. If we refer back to Table 1, we may briefly indicate where we have positive evidence of the nature of Tenejapan left/right discrimination. Our informants gave us equivocal evidence about the perception of left/right reflection enantiomorphs (point 1.0 in Table 1): the very same informant could in some sense 'see' the difference (e.g. specifying a model man as to the left hand of a model women in a photo), and yet on another occasion fail to 'see' the difference (e.g. asserting that left/right reflections of inanimate objects in a pair of photos were identical). This behaviour is of course in line with the linguistic resources, which permit left/right terms only for animate entities. Confronted, informants were quite adamant that there was no difference between the left/right inversions of inanimate objects in photos, and this relativistic opinion was also reflected in the failure to give differential descriptions in Tasks 1 and 2. On this evidence alone one might infer that the linguistic gap actually determines a partial perceptual gap. Later tests however (Task 9) made it clear that when informants were asked to sort photos into identical pairs vs. mirror-image pairs without other distractions, they could certainly do this. Although denied a simple linguistic formulation of the systematic character of e.g. left-
inversions, they described the difference between mirror-image pairs as *jielu saibai*.
"they have exchanged themselves". 16

With regard to left/right response differentiation, Tenejapans of course (like virtually all vertebrates) can no doubt give consistent responses on one side or the other of the body. But it is possible that stimuli may not be conceded of as in the left/right half of the visual field, for example; they may immediately be 'coded' in terms of absolute directions. Where the stimuli are terms for left/right body parts, there is definition if unsystematic evidence that informants are slow and uncertain in their interpretation of these terms, and they also had difficulty in identifying photographs of a single hand as being the 'left' or 'right' hand of the person.

As for the linguistic system of labels itself (Table 1, point 3.0), the Tzeltal terms are restricted to those of type 3.1, not being used to label regions as in 3.2 (with the exception of some very limited topological stretching), and not being projectable on the relation between two inanimate entities as in 3.3. Tenejapans thus have available linguistic resources a bit like those attained by English children in Piaget's stage 1 and 2, except that these have no regional extensions from ego's or alter's location; but they lack the system that Piaget thought so significant in the development of Western children, where the terms become truly projective (Piaget's stage 3). We hasten to add that we use the Piaget classification merely as a typing of systems, without any attribution of retarded development; that would be an impossible charge, since Tenejapans master their absolute system of projective space probably as early as age 4 or 5, when European children cannot even systematically label their own left and right. 17 That is the beauty of a system divorced from left and right: an absolute system of directions has a conceptual elegance, with only one drawback, but a substantial one: the need for a developed sense of direction, and the constant demand for a mental ‘dead-reckoning’ conducted in the mental ‘background’. 18

4. Conclusions

Tenejapan Tzeltal exhibits a linguistic gap: there are no linguistic expressions that designate regions (as in English to my left) or describe the visual field (as in to the left of the tree) on the basis of a plane bisecting the body into a left and right side. There are expressions for left and right hands, but these are not generalized to form a division of space. There is a lot of evidence that this corresponds to a conceptual gap: this is simply not the way Tenejapans think about space. When tasks are devised in which concepts of left and right would provide a simple solution, other notions are employed, even when the

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16 These photographs with two objects portrayed in each photograph, but with a left/right reversal of the objects in the corresponding member of the pair. For these sorts of paired objects the description "they have exchanged themselves" is applicable, as the two objects in one photograph have 'exchanged' their positions in the other. The root *jal* here gives rise also to notions of counterpart, namesake, etc.

17 Here we illegitimately extrapolate from findings by LoUdEs De León (1991b) on the acquisition of spatial competence in Tzeltal children. Tenejapan children's absolute directional system needs to be checked. The youngest subjects in our tasks were about 9, and used the absolute system flawlessly.

18 For some remarks on the processing demands, see LEVinson 1991b: 20ff.
Figure 1: How to describe things in visual field without "left" & "right"

Figure 2: How to describe things in visual field without "left" & "right"
Figure 3: How to describe things in visual field without "left" & "right"

Figure 4: How to describe things in visual field without "left" & "right"
References

- KAUFMAN, T., MAPFI, L. (1990): Un Diccionario básico del Tematol de Tenejapa, Chiapas, Mexico, Procomit, A.C.
- and BEALE, L. L. (1976): The psychology of left and right, Hillsdale.
LEVINSON, S. C. (1990): ‘Figure and Ground in Mayan spatial description, Paper prepared for the conference ‘Referencing to space and time’, MPI Nijmegen.


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