

13.1. ORGANIZATION OF SPACE

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1. INTRODUCTION: THE REPRESENTATION OF SPACE IN LANGUAGE

This chapter surveys the state of the art of research on the representation of space in Mayan languages. It is organized around the classification of spatial concepts depicted in Figure 1. This classification is treated here as an ‘etic grid’, a set of mutually (partially) independent properties applicable to the crosslinguistic and crosscultural exploration of the overarching conceptual domain on a trial-and-revise basis (cf. Moore et al 2015). It is valid for all languages that have been studied to date (so far as I know); but that does not mean that it is valid for all languages, nor that it is not biased toward better-studied languages.

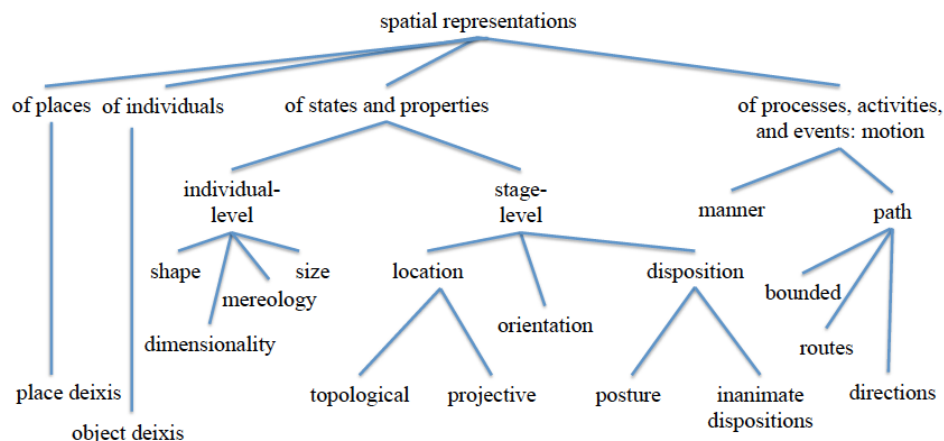


Figure 1. A classification of spatial concepts

This classification starts from an ontological distinction among four conceptual classes: places, individuals, states, and dynamic concepts, i.e., representations of processes, activities, and state changes. States are further subdivided into ‘individual-level’ and ‘stage-level’ states. According to the proposal by Carlson (1977), the former concern individuals *per se*, whereas the latter are properties of certain stages of their history. In other words, individual-level properties are inherent and essential, whereas stage-level properties are variable without the variation affecting the identity of the individual.

This chapter focuses on stage-level and dynamic properties of spatial representations. The stage-level spatial properties of an individual are its location, orientation, and what I will call its ‘disposition’, following Bohnemeyer & Brown (2007) and others. From the perspective of English and Spanish – and from that of many other languages – disposition is a wastebasket category, with only the postures of higher animals (along with their metaphoric extensions to other kinds of individuals) providing something of a coherent core. However, the Mayan languages treat postures on a par with a much larger category of properties, many of which apply primarily or exclusively to inanimate referents. At the same time, this larger dispositional category is set apart from other spatial properties (though not without areas of gradual transition).

Dispositional properties include the distribution and configuration of parts of the individual (e.g., ‘piled up’, ‘stacked’, ‘spread out’) and its force-dynamic (Talmy 2000 Vol. I: 409-470) affordances given its interactions with the environment (e.g., ‘contained’, ‘wedged in’, ‘stuck’).

Locative representations may be ‘topological’ (Piaget & Inhelder 1956), i.e., perspective-free, or may involve a ‘spatial frame of reference’ (e.g., Carlson-Radvansky & Irwin 1993; Levelt 1996; Levinson 1996). Reference frames are axis systems used to define regions and directions in space. Orientation descriptions are arguably by necessity frame-dependent as well (Bohnenmeyer 2003; Bohnemeyer & O’Meara 2012).

Representations of the motion of a given individual (the ‘figure’ in the terminology of Talmy 2000) have been argued to specify two kinds of information: the ‘path’ and ‘manner’ of the event (Talmy 2000 Vol. II: 21-146). Path information concerns properties of the trajectory of the event. Jackendoff (1983: 161-187) distinguishes three types of path concepts: ‘bounded path’ concepts specify the beginning and/or endpoint of the trajectory, ‘routes’ refer to places traversed in between, and ‘directions’ orient the trajectory. Like locations, bounded paths and routes may be represented in topological or frame-dependent terms, whereas directions, like orientations, are inherently frame-dependent. Manner is a complementary category to path in a way that is quite reminiscent of how dispositional information complements locative and orientation information in the stative domain (Belloro et al 2008). Manners are activities or processes of the figure that are cotemporaneous with the motion and may or may not be causing it. Some manners may also be conceptualized as trajectory shapes, taking the trajectory as an abstract object (e.g., ‘zigzag’, ‘spiral’, ‘caren’; cf. van der Zee 2000).

2. STAGE-LEVEL STATES

2.1. Location

2.1.1. Topological relations

Place functions (Jackendoff 1983: 161-170; ‘localizers’ in Kracht 2002) designate regions of space with respect to a reference entity or ‘ground’ in locative and motion descriptions.

Following Piaget & Inhelder 1956, ‘projective’ and ‘topological’ place functions may be distinguished. The former, but not the latter, return regions defined in some reference frame (see below). Frame-independent or non-perspectival place functions define regions in terms of properties such as inclusion in the ground, overlap with the ground, attachment to the ground, contact with the ground, proximity to the ground, and distance from the ground.

Among Mayan languages, the expression of topological place functions has been studied in Mam (England 1978), Tseltal (Bohnenmeyer & Brown 2007; Brown 1994), Tsotsil (de León 1992), Yokot’an (or Tabasco Chontal; Delgado Galvan 2013), and Yucatec (Bohnenmeyer & Brown 2007; Bohnemeyer & Stolz 2006; Goldap 1992; Lehmann 1992).

A topologically unusual feature of the expression of topological place functions in Mayan languages is the general sparseness of prepositions in these languages (Kaufman 1990: 78). Many Mayan languages have only a single preposition, which occurs with adverbials and obliques nearly without semantic restrictions. An example is the preposition *ta* of Tseltal. Yucatec has a counterpart (and possible cognate), *ti*, and in addition a variety of relational nouns that appear to be in various stages of grammaticalization en route to prepositions. As far as spatial representations are concerned, these include *ich* ‘eye’, ‘face’, ‘fruit’, which occurs as the head of adverbials and obliques without possessive marking, expressing meanings of inclusion and containment.

Example (1) illustrates a ‘ground phrase’ (the phrase expressing the place function) headed by *ti’* (which in this case is reduced to *t-* or amalgamated in portmanteau with the cross-reference marker *u=* indexing the possessor). The complement is a possessed nominal meaning ‘its bone’, in this case referring to the antlers of a stag, who is the anaphorically represented possessor. The figure is a boy who climbed into the antlers mistaking them for a bush. This topological relation – inclusion in the spatial envelope of the antlers – is merely conveyed by stereotypical implicature, a generalized conversational implicature licensed by Grice’s second Quantity maxim (‘Do not make your contribution more informative than is required’; Atlas & Levinson 1981). A comparison with (2) makes this abundantly clear. In (2), a ground phrase headed by *ti’* is understood as referring to a support configuration. Clearly, this difference in interpretation is not reflected in the form of the ground phrase.

YUCATEC

- (1) *Ti’=yàan le=pàal t-u=bak’=o’.*
 PREP=EXIST(B3SG) DET=child **PREP-A3=bone=CFP**
 ‘There the boy was in [the deer’s] antlers.’
- (2) *Ti’=wa’l-un-wa’l-o’b te=lu’m=o’.*
 PREP=RED-DIS.PL-stand-B3PL **PREP:DET=ground=CFP**
 ‘There [the bottles] are standing one by one on the ground.’

To provide specific topological information, expressions of various lexical categories can be employed. Example (3) illustrates the relational noun *iknal*, which designates a region of space defined by proximity to a stationary ground whose horizontal extension in a plane that contains the figure is construed as negligible, not unlike English *at*:

YUCATEC

- (3) *Le=trisiikulo=o’, yàan hun-p’éel k’e’k’en y=iknal.*
 DEF=tricycle=CFP EXIST(B3SG) one-CL.IN pig A3=**at**
 ‘The tricycle, there’s a pig by it.’

As illustrated, *iknal* may head the ground phrase itself without support by *ti’*. (Note that the possessor of *iknal*, the nominal referring to the tricycle, is left-dislocated in (3).) The ground phrase is thus in this case a possessed nominal rather than a prepositional phrase.

Proximity may also be expressed using the stative predicate *nàats* ‘be near’,ⁱ which frequently co-occurs with *iknal*, as in (4):ⁱⁱ

YUCATEC

- (4) *Nàats’ t-inw=iknal=e’ yàan hun-tiul máak=i’.*
near(B3SG) PREP-A1SG=**at**=TOP EXIST(B3SG) one-CL.AN person=CFP
 ‘Near by me, there is a person.’

It has been hypothesized that Mayan languages use dispositional predicates to express topological information (Brown 1994; Grinevald 2006). This hypothesis is addressed in §2.1.3.

2.1.2. Projective relations and reference frames

Reference frames are systems of axes used to interpret linguistic and nonlinguistic representations of the location, motion, and orientation of entities. They are constituted by an origin and one or more (semi-)axes. In representations of location/motion, the origin is a reference point, most commonly a reference entity or ‘ground’. The axes are defined with respect to a contextual index, the ‘anchor’. Psychologists are accustomed to classifying frames on the basis of the identity of the anchor in terms of ‘egocentric’ vs. ‘allocentric’ frames. As it turns out, however, this classification does not capture the variation in frame use across languages: egocentric and allocentric frames are used in all languages, but certain subtypes are not. These subtypes differ by the operations involved in deriving the axes. Thus, all egocentric frames are anchored to the body of an observer,ⁱⁱⁱ but only ‘relative’ frames involve projection (geometrically, translation or reflection) of the observer’s body axes onto a distinct ground (as in ‘The ball is to the left of the chair’ uttered with respect to the configuration in Figure 2 below). In small-scale horizontal space, speakers of Dutch, English, and Japanese use relative frames and to some extent ‘intrinsic’ (object-centered) frames derived from the ground itself (as in ‘The ball is to the right of the chair’ uttered with respect to the configuration in Figure 2), but not ‘geocentric’ frames derived from the environment (e.g., ‘The ball is west/upriver of the chair’). In contrast, speakers of Tenejapan Tseltal and many other languages use intrinsic and geocentric frames, but not relative ones.

Among Mayan languages, there are published accounts of reference frame use in Mopan (Danziger 1996, 1999, 2001, 2011); Tseltal (Brown 2006; Brown & Levinson 1993, 2000, 2009; Levinson 1996, 2003; Levinson & Brown 1994; Polian & Bohnemeyer 2011); Tsotsil (de León 1991, 1994); and Yucatec (Bohnemeyer 2011; Bohnemeyer & Stolz 2006; Le Guen 2011). Relative frames play a marginal role in all of the languages except for Yucatec, and even there they do not dominate, not even in small-scale space.

Whether there is an overall preference for geocentric or intrinsic frames in small-scale space seems to be highly variable. Danziger reports Mopan speakers to use exclusively intrinsic frames in small-scale space. Brown and Levinson famously found Tseltal speakers in the hamlet of Majosik’, Chiapas, to prefer geocentric frames of the type that Levinson (1996) termed ‘absolute’. These are abstracted from a concrete, mountain-slope-based ‘up(hill)’/‘down(hill)’/‘across’-system (an example of what the members of the MesoSpace collective of researchers (see below) have called a ‘geomorphic’ system; cf. Bohnemeyer et al (2015), Polian & Bohnemeyer (2011), O’Meara & Pérez Báez (2011)). They are abstracted in the sense that a member of this speech community will theoretically use the same ‘up(hill)’, ‘down(hill)’, or ‘across’ term for labeling a given direction regardless of the location of the reference point or ground, much the same way cardinal direction terms are used in other languages. Tenejapa, for example, is uphill from Majosik’. But speakers from Majosik’ would continue to refer to this direction as *ajk’ol* ‘up(hill)’ even beyond Tenejapa and on the other side of the mountain, in places that might be construed as being downhill from Majosik’ in terms of the physical terrain. This contrasts with de León’s description of the use of slope-based reference frames in Zinacantán Tsotsil, which attests to only the concrete, geomorphic use.

Polian & Bohnemeyer (2011) studied the use of reference frames in three other Tseltal communities (Ch’ajkoma, Mesbilja’, and Tenejapa (Lum in Tseltal)), using methods similar to those of Brown and Levinson. They found a rather different picture. Speakers in all three communities preferred intrinsic frames for locative descriptions and frames based on local

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Comment [1]: A couple of additional examples such as the one that directly precedes this would help understand the frames more rapidly, i.e. examples for intrinsic, geocentric, and relative frames.

landmarks for orientation descriptions. An example of a landmark-based description is (5). It locates a ball (the figure) with respect to a chair (the ground), using the local cemetery as anchor:

TSELTAL

- (5) *Jich p'ekel bel ta stojol mukinal i pelota-i.*
 thus lying DIR PREP toward cemetery the ball-CL
 'The ball is placed toward the cemetery [with respect to the chair].'

Descriptions based on the 'up(hill)'/ 'down(hill)' system and descriptions employing sunset/sunrise-based terms played a large secondary role in Ch'ajkoma and Mesbilja', but were largely absent in Tenejapa. Polian and Bohnermeyer explain this striking inter-community variation with differences in the local terrain: the mountain slope offers a much more salient and unambiguous anchor in Majosik' than in the other three communities.

Yucatec differs from the other three Mayan languages in which frame use has been studied to date in that it shows a considerably greater incidence of relative frames. Three independent studies (Bohnermeyer 2011; Bohnermeyer & Stolz 2006; Le Guen 2011) have coincided in this finding. By hypothesis, the long history of more intensive contact with Spanish may be the crucial factor explaining this distribution. Bohnermeyer (2011) observes that there seem to be no restrictions on the use of all major frame types in small-scale space in this language. Consider (6), a description of the image reproduced in Figure 2, which combines an intrinsic (INT), a relative (REL), and an absolute (ABS) description:

YUCATEC

- (6) *T-u=tséel_{INT}, te=x-ts'iik_{REL}, te-estée-le=chik'in_{ABS}=o'*,
 PREP-A3=side PREP:DEF=F-left PREP:DEF-HESIT-DEF=west=CFP
hun-p'éel b'òola yàan=i', ch'uy-k'ah-a'n (...).
 one-CL.IN ball EXIST(B3SG)=CFP hang-ACAUS-RES(B3SG)
 'On the (chair's) side, on the left in the, uh, the west, there is a ball, it is suspended (...).'



Figure 2. Ball & Chair 2.2

The one restriction on frame use that all three studies have reported is a gender pattern: the cardinal direction terms are used almost exclusively by male speakers. Bohnermeyer (2011)

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suggests that this distribution may be accounted for in terms of occupational differences. Cardinal directions are primarily employed in male-dominated arenas of language use, such as horticulture, the construction of houses, and certain religious practices. Support for the role of topography and language contact as factors shaping practices of reference frame use comes from a recent multi-population study (Bohnenmeyer et al 2015).

2.1.3. Locative predication

Locative predication semantically involves a relation between an entity – the theme/figure – and a place (a region of space), such that it is asserted that, or questioned whether (etc.), the region of space immediately occupied by the figure and delimited by its spatial envelope is included in this place. This place may, but need not, be determined with respect to a second entity. The examples in (7) illustrate some of the options: the place may be denoted by a toponym (7a), specified deictically/indexically (7b), defined in terms of some state of affairs involving it (7c), or described with respect to a referential ground (7d).^{iv}

- (7) The book is...
- a. ...in Buffalo
 - b. ...over there
 - c. ...wherever you put it
 - d. ...on the table

Let us call the expression of the place at which the figure is located the **ground phrase** and the nominal that describes the ground object - if there is one - the **ground descriptor**. If the ground phrase is headed by an adposition or relational noun, it dominates the ground descriptor, which is the complement of the adposition or the possessor of the relational noun. But if the ‘place function’ (the conceptual function that maps the ground entity into the place; cf. §2.3, 2.1) is expressed by a case marker, as in Finnish, ground phrase and ground descriptor are constituted by the same string.

Syntactically, a locative predication involves an expression referring to the figure and a locative predicate. The latter in turn consists minimally of the ground phrase and a head. Typological research has found there to be systematic variation across languages both in the range of expressions that head locative predicates – and the conditions under which they are possible or preferred as locative predicators – and in the make-up of the ground phrase.

The typology of ‘basic locative predications’ (Ameka & Levinson 2007) has two orthogonal dimensions: (i) the type of head that speakers of a given language or linguistic variety prefer to describe what crosslinguistic research suggests is the *prototype* of locative predications: an easily movable inanimate figure located in non-attached fashion with respect to a larger and less mobile ground; and (ii) the semantic extension of the ‘basic locative predication’ (BLC) of a given language so defined.

One hallmark of the ‘grammar of space’ of Mayan languages is the common occurrence of dispositional predicates (cf. §2.3) as heads of locative predicates. Consider for illustration again the Tselal example (5), repeated in (8):

TSELTAL

- (8) *Jich p'ek-el bel ta stojol mukinal i pelota-i.*
 thus lie-DIS(B3) DIR PREP toward cemetery the ball-CL
 ‘The ball is placed (lit. ‘is lying’) toward the cemetery [with respect to the chair].’

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Comment [3]: what does this etc. mean? It's not at all clear what other possible members of this list might be.

JB: Every type of speech act involves a unique type of illocutionary act, the object of which may be the same locutionary act or proposition. Aside from asserting that the book is on the table or questioning whether it is there, the speaker may promise that it will be there, express surprise or disgust at its being there, request/demand its being there, apologize for its being there, use its being there as an object of an artistic expression, and so forth. I could add a footnote to this effect, but I feel as though that would be a bit out of place here.

The head of the locative predicate, glossed here as ‘lying’, uniquely describes the configuration between an object that lacks a dominant axis – in this case, a ball – and an implicit ground that supports it. Another example is the Yucatec description in (2), repeated in (9):

YUCATEC

- (9) *Ti'=wa'l-un-wa'l-o'b* *te=lu'm=o'*
 PREP=RED-DIS.PL-stand-B3PL PREP:DEF=ground=CFP
 ‘There [the bottles] are standing one by one on the ground’

This utterance describes a group of bottles on the ground. The root *wa'l* denotes a ‘standing’ disposition, meaning in this case that the figure has a dominant longest axis and is supported on one end of this axis. The use of posture verbs with meanings such as ‘sit’, ‘stand’, and ‘lie’ in locative descriptions is familiar from languages around the world, including from some European languages, such as Dutch and German. Dispositions include postures, but are not confined to them. They can be characterized in first approximation as any stage-level spatial property of an entity other than its location. The common presence of dispositionals in linguistic descriptions of location (and motion; cf. §3.1) in Mayan languages confounds Landau & Jackendoff’s (1993) generalization that such representations are more sensitive to the properties of the ground than to those of the figure.

Bohnmeyer & Brown (2007) show that both Tzeltal and Yucatec use the following range of predicators to form equivalents of English locative predications: (i) a function word that heads locative, existential, and possessive predications without imposing any selection restrictions on the theme/figure other than requiring it to be an individual; (ii) a stative predicate form of a dispositional root; (iii) a stative resultative predicate form of a verb root; (iv) a possessive predication; (v) a dynamic verb form. However, for the crosslinguistically prototypical locative scenes – a smaller, easily movable figure located in non-attached fashion with respect to larger, more stationary, and inanimate ground (Wilkins 1999; Levinson & Wilkins 2006a) – Tzeltal speakers prefer a stative dispositional predicate, whereas Yucatec speakers prefer the “generic” locative/existential/possessive predicator (*yàan*, illustrated in (11), and also several examples above). The contrast is exemplified by (10) and (11), elicited as descriptions of the same stimulus – the first picture of the Topological Relations Picture Series (Bowerman & Pederson 1992; ms.) – by a Tzeltal (10) and Yucatec (11) speaker, respectively:

TSELTAL

- (10) *Pach-al* *ta* *ba* *mexa te* *ala* *baso*,
 placed.upright.bowlshaped.container-DIS(B3) PREP top table DEF DIM cup
 ‘The cup is upright on the table.’ (Brown 2006: 245)

YUCATEC

- (11) *Le=lùuch=o'*, *ti'* *yàan* *y=óok'ol* *le=mesa=o'*.
 DEF=cup=CFP there EXIST(B3) A3=on DEF=table=CFP
 ‘The cup, it’s there on the table.’

Thus, the two languages use the same resources for the expression of locative predication, but have different pragmatic preferences in terms of which construction is the default for which

function. In terms of the typology of ‘basic locative predications’ proposed by Ameka & Levinson (2007), based on Wilkins (1998, 1999) (cf. Levinson & Wilkins 2006a, b), Tseltal is a Type-III language. Its speakers prefer to select one of a large number of lexical dispositional predicators to head locative predicates. In contrast, Yucatec is a Type-I language, which by default uses a uniform locative predicator. In such a language, dispositional information enters the locative predication only when the figure’s disposition is pragmatically at issue. Situated in between these two types are languages such as Dutch whose default locative predicators are a small set of posture verbs, which are chosen on the basis of geometrical properties of the figure and thus have a classificatory function.

What are we to make of the typological difference between Tseltal and Yucatec? Brown 1994 and Grinevald 2006 (drawing partly on Jakaltek data) hypothesize that there is a tradeoff between the information encoded in the head of the locative predicate and in the head of the ground phrase, which is a generic preposition in Tseltal. However, Bohnemeyer & Brown 2007 cast doubt on this conjecture, showing that the generic preposition is reinforced by a meronym in Tseltal even more frequently than in Yucatec. Bohnemeyer & Brown consider a number of plausible alternative explanations. Assuming that the Type-III strategy is the conservative one among Mayan languages – which of course cannot be taken for granted – Yucatec may have shifted to Type I due to its history of more intense contact with Spanish, which is likewise a Type-I language. Not mutually exclusive with this hypothesis is an account under which the shift from Type III to Type I is part of a larger pattern of typological change.

Delgado Galvan (2013) applies the design of Bohnemeyer & Brown (2007) to Yokot’an (Chontal de Tabasco) and finds that this language, like Yucatec, instantiates Ameka & Levinson’s Type I. However, the dispositional system seems to be richer than in Yucatec, more like the Tseltal one, and dispositionals appear to be used more frequently in discourse. Delgado Galvan argues that meronyms are used more frequently in locative predications involving the “generic” locative predicators than in dispositional predications, which she suggests supports the complementarity hypothesis. However, it is not clear that the frequency difference in her data is significant.

2.2. Orientation

Strategies for orientating entities have been studied in Tseltal (Brown 2006; Polian & Bohnemeyer 2011) and Yucatec (Bohnemeyer 2011; Bohnemeyer & O’Meara 2011; Bohnemeyer & Stolz 2006). The truth conditions of orientation descriptions can be captured in the framework developed in Bohnemeyer (2012) and Bohnemeyer & O’Meara (2011) in terms of an alignment of a suitable axis of the figure with an axis of a reference frame, and thus ultimately with an axis of the anchor from which the frame is derived. In Tseltal and Yucatec, the default axis of an object for the purpose of orienting it is the front axis. In (12), the front of a chair is selected explicitly by saying that the seat of the chair is ‘turned west’:

YUCATEC

- (12) (...) *le=pàarte tu’x* *k-u=kutal* *máak=o’*,
 DEF=part where(B3SG) IMPF-A3=sit:INCH.INC person=CFP
chik’in *súut-ul* (...)
 west(B3SG) turn\ACAUS-INC(B3SG)
 ‘(...) the part where one sits, it’s **turned west** (...)’

Orientation can also be expressed by selecting an axis of the figure and treating it as a vector that is pointing toward a landmark. This is illustrated by the Tseltal example (13):

TSELTAL

- (13) *Li' ay tal y=elaw ta ba ay-otik=i.*
here EXIST(B3)DIR A3=face PREP where EXIST-B1PL=CFP
'It [the chair] is facing toward here where we are (lit. 'Its face is where we are).'
- (Polian & Bohnemeyer 2011: 878)

Bohnmeyer & O'Meara (2011) suggest that this strategy can be considered as implicitly likewise constituting a reference frame on the basis of the single (half) axis pointing toward the landmark. They also suggest, based on a comparison of data from Yucatec and Seri (isolate; Sonora), that orientation descriptions may be more likely to use geocentric frames compared to locative and motion descriptions. An earlier study pointing toward the same pattern is Terrill & Burenhult 2008.

2.3. Posture and disposition

Dispositional roots (usually called *positional* roots in the Mayan literature) are morphemes that lexicalize complex spatial configurations and may produce verb stems, stative predicate forms, classifiers, and other lexical categories with the appropriate derivational morphology.

Distinctions that enter the conceptualization of dispositions include support/suspension (e.g., 'sit', 'stand', 'lie', 'kneel', 'lean', 'hang', 'droop', 'dangle', 'be mounted on top of something'); blockage of motion (e.g., 'be stuck to something', 'be stuck between two things'); orientation in the gravitational field (e.g., 'lie face up', 'lie face down', 'lie on side', 'be tilted at an angle'); and configurations of parts of an object with respect to one another (e.g., 'be scattered', 'be spread out', 'be in a pile', 'be lined up in a row', 'be bulging', 'be bent', 'be twisted', 'be coiled up').

Mayan dispositionals combine a number of typologically remarkable traits:

- They constitute a lexical category of their own, the members of which produce stative predicates, inchoative intransitive verbs, causative transitive verbs, and numeral classifiers through various derivational operations, some (though not all) of which are unique to dispositional roots.
- They categorize properties that are for the most part not lexicalized at all in many other languages in a highly specific manner. Thus, 152 and 267 dispositional roots have been identified, respectively, in Yucatec and Tenejapa Tseltal (Bohnmeyer & Brown 2007; cf. also Sántiz Gómez (2010) for Oxchuc Tseltal). Tsotsil is said to have 273 (Laughlin 1975; Haviland 1994). Arcos Lopez (2009: 39-52) lists 140 numeral classifiers in Ch'ol, 132 of which are morphologically derived from dispositional roots. For some highland languages such as Q'anjob'al (Martin 1977; Mateo Toledo 2004) and K'ichee' and Motosintlek (Kaufman 1990), the number of dispositional roots has been estimated to be as high as 600-700.
- Lastly, they are frequently used in locative descriptions, in a function that has been compared to that of manner verbs in motion descriptions (Belloro et al 2008; Brown

2000). In some of the languages, they in fact represent the default choice for the heads of locative predicates (cf. §2.1.3).

Example (14), repeated from (12) above, illustrates two Yucatec dispositionals: the posture root *kul* ‘sit’ appears in an inchoative verb form. In contrast, the root *pek* appears in a special stative predicate form reserved to dispositionals. *Pek* is the default support root for inanimate objects that lack a unique dominant axis, but is also used with animate referents that are unconscious or (in the case of toddlers) sick.

YUCATEC

(14) (...) *te'l tu'x k-u=kutal máak=o', te=lu'm=o',*
 there where IMPF-A3=**sit:INCH.INC** person=CFP PREP:DEF=earth=CFP
hun-p'éel bôola pek-ekbal hach tu=tu'k'=o'.
 one-CL.IN ball **lie.as.if.dropped-DIS(B3SG)** reallyPREP:A3=corner=CFP
 ‘(...) there where one **sits**, on (lit. with respect to) the ground, a ball is **lying**, right at its corner.’

An apparent Tselal cognate of *pek* is *p'ek* in (5) above. Example (15) features *pek* as part of a causative verb stem:

YUCATEC

(15) (...) *eh, yan a=ch'a'-ik hun-p'éel chan=che' wolis*
 HESIT OBL A2=take-INC(B3SG) one-CL.IN DIM=wood round(B3SG)
*a=**pek-kunt-eh** (...).*
 A2= **lie.as.if.dropped-CAUS-SUBJ(B3SG)**
 ‘(...) uh, you have to take a little piece of wood that’s round, in order to **lay it down** (...).’

Brown (2000) draws attention to the use of dispositionals in Tselal motion event descriptions. This is discussed in the following section.

3. MOTION

3.1. Manner of motion

Manner of motion must be considered an understudied domain, both as concerns the conceptualizations involved and in terms of its linguistic representation, and both in Mayan languages and elsewhere.

Manners of motion are activities in the sense of Vendler’s (1957) classification. Activities play a typologically somewhat unusual role in the Mayan lexicon, since many of them are lexicalized as nouns in Mayan languages or as roots which have both nominal and verbal uses without either one requiring overt derivational morphology (so-called ‘action nouns’ (Kaufman 1990) or ‘verbo-nominals’ (Lois & Vapnarsky 2003)).

Talmy’s (2000: Vol. II) typology of ‘lexicalization patterns’ distinguishes a variety of approaches to combining manner and path information in motion event descriptions. ‘Verb-framed’ descriptions express path information in the main verb root, whereas ‘satellite-framed’ descriptions express it exclusively outside the main verb root (in adpositions, case markers, or ‘satellites’, i.e., co-predicative adverbs or particles), leaving the main verb root free to encode manner information provided the syntax of the language permits location change descriptions to be headed by manner verbs (Narasimhan 2003).⁹ Path-conflating and manner-conflating verbs

also form serial verb constructions in many languages, in which there is no unique main verb. This type of construction has been argued to instantiate neither the verb-framed nor the satellite-framed type, but a third option (Ameka & Essegbey 2001; Zlatev & Yangklang 2003). Individual languages instantiate any of these patterns to the exclusion of the others or mix multiple of them.

Of these three construction types identified by Talmy, some Mayan languages' motion event descriptions instantiate exclusively the verb-framed type, albeit with a number of twists to be commented on below. These languages (i) have a set of verb roots that lexicalize notions of location change and thus resemble path-conflating verbs with meanings such as 'enter'/'exit', 'come'/'go', and 'ascend'/'descend' (but see below); and they (ii) lack any expression of path functions outside these verb roots, thus rendering combinations of manner main verbs with satellites or oblique phrases expressing path impossible. This type of Mayan language is exemplified by Yucatec. Examples (16a) and (16b) illustrate two ways of combining manner and location change verbs in Yucatec sentences. In (16a), the main verb *em* 'descend' expresses location change. The manner verb *xíiknal* 'fly', 'flutter' appears in a gerund-like form, which for verbs of its class – verbo-nominals or action nouns – is morphologically unmarked. This gerund heads a projection that is embedded into the verb phrase as an adverbial modifier.

YUCATEC

- (16) a. *Le=ch'iich'=o' h-èem u=xíiknal te=che'=o'.*
 DEF=bird=CFP PRV-descend(B3SG) A3=fly PREP:DEF=wood=CFP
 'The bird, it **flew down** from the tree [lit. it descended from the tree flying].'
- b. *Le=ch'iich'=o' xíiknal-il h-úuch uy=èem-el*
 DEF=bird=CFP A3=fly-REL(B3SG) PRV-happen(B3SG) A3=descend(B3SG)
te=che'=o'.
 PREP:DEF=wood=CFP
 'The bird, it **FLEW down from** the tree [lit. in a flying manner is how it descended].'
- c. *Le=ch'iich'=o' tíun xíiknal y=óok'ol le=che'=o'.*
 DEF=bird=CFP PROG:A3 fly A3=on DEF=wood=CFP
 'The bird, it is/was **flying** above the tree.'

In contrast, in (16b), the manner verb appears in the syntactically higher position. However, this sentence has a cleft-like structure, instantiating a special manner focus construction (cf. Bohnemeyer 2002: 123-125), which in perfective aspect requires the support of the light verb *úuch* 'happen'. Since manner and path (or rather location change; see below) are not expressed in the same clause in (16b), this structure does not represent an exception to the generalization that the verb-framed type of description is without competition in Yucatec. And indeed, when a manner verb is combined with a ground phrase without the support of a location change verb, as in (16c), the ground phrase can only be understood as referring to the place at which the manner activity takes place, not to a place that marks the beginning or endpoint of a motion path or some space traversed in between (but not all of these).

It seems likely that all Mayan languages have constructions similar to the one illustrated in (16a). However, the following Tzeltal example has no parallels in Yucatec:

TSELTAL

- (17) *Ya x-ben jelaw-el mut ta ch'ajan tak'in.*

INC IMPF-walk(3A) cross-DIR bird PREP cord metal
'The bird **walks across** the electric wire.' (Brown 2006: 253)

As in (16b), the manner verb – in this case, *ben* 'walk' – is the highest up in the syntactic tree in (17). However, (17) is not a focus construction, and there is no reason to think that it is biclausal. The location change verb *jelaw* 'cross' appears in a special non-finite verb form, which is similar to the gerund form of the manner verb in (16a) (which with location change verbs is marked by a *-VI* suffix in Yucatec; cf. *èem-el* 'descend-ing' in (20) and *na'k-al* 'ascend-ing' in (21) below). This form of location change verbs is known as the **directional** form in Mayan linguistics. Thus, a location change verb projection is embedded as a modifier or copredicate in a verb phrase headed by a manner verb in (17). As Brown (2006: 251-253) observes, this instantiates satellite framing. Tsel'tal therefore exhibits a 'split system of conflation', as Talmy (2000 Vol. II: 64-65) puts it.

Whether or not Yucatec can be said to have directionals as well is somewhat unclear. This issue is discussed in §3.2. However, even if it does, these are not used in combination with manner main verbs. Thus, there are no satellite-framed motion descriptions and in this sense, no satellites in this language.

It is uncertain how widespread the Tsel'tal-style split system is in the Mayan language family. A plausible conjecture is that its presence in a given language correlates with the productivity of directionals in that language. Outside Tsel'tal, productive directional systems have been attested at least in the sister language Tsotsil (Aissen 1994; Haviland 1991), in Mam (England 1978), and in three Q'anjob'alán languages: Akatek (Zavala 1993, 1994), Jakaltek/Popti' (Grinevald in press), and Q'anjob'al (Mateo Toledo 2004). On the other hand, Yucatec is to my knowledge the only Mayan language for which the absence of a productive directional system has been explicitly stated.

Brown (2000) shows that motion descriptions in Tsel'tal often represent the figure's disposition (cf. §4.3) and suggests that disposition might play a role in how Tsel'tal speakers communicate motion information that pragmatically overlaps with that of manner in better-studied satellite-framing languages. Example (18) illustrates the use of dispositionals in Tsel'tal motion descriptions:

TSEL'TAL

(18) *Xoj-ol mo-el s-jol ta ala plastiko.*
inserted.tightly-DIS(B3) ascend-DIR A3-head PREP DIM plastic
'His [the dog's] head is inserted tightly upwards into the little plastic thing.' (Brown 2000: 69)

3.2. Path

As mentioned in the previous section, all Mayan languages have a set of location change verb roots, and in many – perhaps most – Mayan languages, these roots produce 'directional' forms, which can be embedded into a verb phrase seemingly functioning as Talmyan 'satellites'.

Despite these fundamentals, there are a number of typological properties that make the expression of path functions in Mayan less straightforward than it might appear as first. First of all, unlike in European languages, ground phrases are completely path-neutral. They merely designate the regions of space in which the beginning or endpoint of the motion event (or some place in between) is located. This is illustrated by the Yucatec examples in (19):

YUCATEC

- (19) a. *Le=kàaro=o'* *tí'=yàan* *ich le=kàaha=o'*.
 DEF=cart=CFP PRP=EXIST(B3SG) in DEF=box=CFP
 'The [toy] car, it is in the box.'
- b. *Le=kàaro=o'* *h-òok* *ich le=kàaha=o'*.
 DEF=cart=CFP PRV-enter(B3SG) in DEF=box=CFP
 'The [toy] car, it entered (lit. in) the box.'
- c. *Le=kàaro=o'* *h-hóok'* *ich le=kàaha=o'*.
 DEF=cart=CFP PRV-exit(B3SG) in DEF=box=CFP
 'The [toy] car, it exited (lit. in) the box.'

These examples feature the same ground phrase *ich le kàaha'o'* 'in the box' in the role of locative (19a), illative/goal (19b), and elative/source (19c). This behavior generalizes to all ground phrases and all path functions (Bohnmeyer 2007, 2010; Bohnmeyer et al 2007; Bohnmeyer & Stolz 2006). Complete absence of locative and path distinctions from the ground phrase has also been attested for Jakaltek (Grinevald 2006, in press) and Tseltal (Bohnmeyer et al 2007). Bohnmeyer et al 2007 consider this a more radical type of verb-framing, unattested in the languages examined in (Talmy 2000 Vol. II), all of which have ground phrases the form of which is at least somewhat sensitive to the path function.

Grinevald (2006, in press) hypothesizes that path-neutral ground phrases correlate with the occurrence of directionals. *Prima facie*, counterevidence against this hypothesis comes from Yucatec, which has exclusively path-neutral ground phrases, but arguably lacks directionals. If one considers, with Talmy (2000 Vol. II: 65-66), the satellite-like use of path verb forms to be the hallmark of a directional system, then Yucatec lacks directionals and therefore falsifies Grinevald's hypothesis. The following examples illustrate the construction that comes closest to directional constructions in Yucatec (compare with the Tseltal examples (17) and (18) above):

YUCATEC

- (20) *K-u=ka'=táal* *uy=èem-el=e'*.
 IMPF-A3=REP=come(INC) A3=descend-INC=CFP
 'It comes descending again (i.e., it descends towards the speaker or listener).'
- (21) *K-u=máan* *na'k-al* *y=óok'ol* *le=mehen* *búut'un=o'*
 IMPF-A3=pass(INC) ascend-INC A3=top DEF=small hill=CFP
 'It passes ascending over the small hill'

Both examples feature a dependent use of a location change verb – *èem* 'descend' in (20) and *na'k* 'ascend' in (21) – in a non-finite *-VI* form that appears to be a cognate of the suffix used to form directionals in Tseltal. However, in both instances, the main verb is a location change verb as well – *táal* 'come' in (20) and *máan* 'pass' in (21). Combinations of dependent location change verbs with manner verbs are unattested and speakers reject them during elicitation.

I have been referring to the Yucatec equivalents of what are commonly called 'path verbs' or 'verbs of inherently directed motion' (Levin 1993) as 'location change verbs'. This otherwise awkward terminological choice is conditioned by the evidence presented in Bohnmeyer (2010, 2013) to the effect that these verbs are semantically compatible with scenarios in which the

ground rather than the figure moves or in which a certain spatial configuration between figure or ground comes about or is dissolved as a result of the figure or the ground disappearing and subsequently reemerging at a different location (teleportation or “beaming”). This compatibility suggests that these verbs do not actually lexicalize the translational motion of the figure along a path defined with respect to the ground, but merely change of location of the figure vis-à-vis the ground.

Insensitivity to figure motion is not restricted to ‘enter’ and ‘exit’ in Yucatec. It can be shown for *òok* ‘enter’ and *hóok* ‘exit’, but also for *na’k* ‘ascend’, *èem* ‘descend’, *liik* ‘rise’, *lúub* ‘fall’, and *máan* ‘pass’, though not for *bin* ‘go’, *tàal* ‘come’, *luk* ‘leave’, *k’uch* ‘arrive’, and *u’l* ‘return (to deictic center)’. Together, these 12 roots constitute the set of location change verb roots in Yucatec; only clauses that contain one of these roots in the main verb position can be used to describe location change events in this language. The set differentiates in terms of the region of space selected with respect to the ground and in terms of whether the figure occupies this region in the beginning of the event, at the end of it, or in between. As an illustration of the lack of entailment of figure motion, consider Figure 3. It features the first and last frame of a short animated video clip in which a plank slides underneath a stationary ball. (The third object, a cylinder, is shown to facilitate identification of the ball as stationary.) This is one out of a series of 96 such animations created by Levinson (2001) for the crosslinguistic study of the semantics of motion event descriptions.

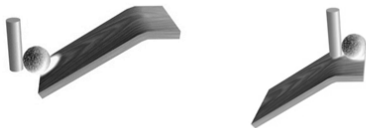


Figure 3. First and last frame of “FIGURE_GROUND 14” (Levinson 2001; ©Stephen C. Levinson; reproduced with permission)

When asked whether this clip can truthfully be described by saying that the ball went up the plank, as in (22), most Yucatec speakers will deny this, as would speakers of English. However, when asked to correct a description such as (22) so that it becomes acceptable as a description of the scenario in the clip, speakers will produce responses such as the one in (23):

YUCATEC

(22) *H-na’k* *le=chan* *kaniika* *y=óok’ol* *le=tàabla=o’*
 PRV-ascend(B3SG) DEF=DIM marble A3=on DEF=plank=CFP
 ‘The little marble, it **went up** the plank’

(23) *Le=chan* *tàabla=o’* *h=péek-nah-ih,*
 DEF=DIM plank=CFP PRV=move-CMP-B3SG

káa=h-na’k *le=chan* *kaniika*
 CON=PRV-ascend(B3SG) DEF=DIM marble

y=éetel che' te'l y=óokol=o'.
A3=with wood there A3=on=CFP

'The little plank, it moved, and the little marble and the tree **ascended** there on top.'

The difference between these two descriptions is that (23) states explicitly that it was the plank that moved. As Bohnemeyer (2010) argues, this blocks a stereotype implicature (Atlas & Levinson 1981) triggered otherwise by (22) according to which it is the ball that moves, since translational motion of a figure is the stereotypical cause of location change of the figure in the experience of Yucatec speakers as much as in that of English speakers. Without this stereotype implicature being blocked or canceled, (22) seems to be considered misleading as a description of the event in Figure 3.

Why are some of the location change verbs compatible with non-figure-motion scenarios, whereas others are not? At least a partial possible explanation appears to be that the spatial region conceptualized as part of the source or target state of the event is defined with respect to a stationary ground in many or all cases in which non-figure-motion scenarios are excluded.

In combination with the path-neutrality of the ground phrase, the insensitivity of the location change verbs to figure motion suggests that Yucatec does not express translational motion at all, but instead represents motion purely in terms of change of location. Either the figure is specified to be located in a certain place at the source state of the event, and the target state negates this, or it is conversely the target state that is positively specified and the source state described as the absence of the target state. Levinson & Wilkins (2006b: 527-537) suggest that the picture sketched here for Yucatec may well extend to Tzeltal as well.^{vi}

Further important properties of the representation of motion in language that cannot receive adequate attention here due to space limitations are the expression of perlocative or 'route' path functions that characterize neither the beginning nor the end point of the path, but some point or segment in between; the expression of 'directional' path functions, which characterize the direction in or away from which the figure is headed at a given moment; the composition of complex path functions that refer to multiple grounds; and the metaphoric use of path functions in representations of non-motion state of affairs ('fictive motion'; Talmy 2000 Vol. I: 99-175). These are addressed for Yucatec in Bohnemeyer (2010; 2013). Bohnemeyer et al (2007) discuss path composition in a sample of languages that includes Tzeltal and Yucatec.

4. SUMMARY AND CONCLUSIONS

Let us review some of the typologically most noteworthy traits of the representation of space in Mayan languages – especially traits that confound previously proposed generalizations:

- There is widespread use of geocentric reference frames in small-scale space complementing the use of intrinsic frames, which typically involves meronyms. In contrast, the use of relative frames seems more restricted in most populations, but varies from language to language and also from speaker to speaker, with the frequency of use of Spanish as a second language being an important predictor of the frequency of use of relative frames (cf. §2.1.2).

- Mayan languages have very large sets of dispositional roots, which lexicalize stage-level spatial properties other than location. While dispositions include the postures of animate beings, many dispositionals select for inanimate referents. In many languages, dispositional roots represent a lexical category *sui generis* (cf. §2.3).
- Dispositionals are commonly used as heads of locative predicates and as constituents of motion descriptions (cf. §3.1), confounding the generalization proposed by Landau & Jackendoff (1993) according to which locative and motion descriptions convey more information about the ground than about the figure (cf. §2.1.3). In some – though not in all – Mayan languages, dispositionals are in fact the prototypical locative predicators.
- ‘Radical’ verb-framing (Bohnenmeyer et al 2007): The ‘ground phrases’ that reference places and direction vectors in locative and motion descriptions do not express locative and path functions at all (cf. §3.1).
- Verbs that lexicalize location change with respect to a ground seem to not entail or presuppose translational motion of the figure with respect to the ground. In this sense, path may not be verbally encoded at all in some Mayan languages (cf. §5.1).

It must be stressed that most of these properties have only been attested in a few Mayan languages so far – most commonly, in Tzeltal and/or Yucatec. Future research must clarify how widespread these properties are in the language family. It is my hope that the synopsis of the verbal representation of space in this chapter will contribute toward closing these gaps.

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ⁱ *Nàats* ' is a stative predicate rather than an adjective. That is to say, it does not occur as a pronominal modifier, the position of attributes in Yucatec. This distinction is discussed in Bohnemeyer (2002: Ch5). The same holds for its inverse *náach* 'be far away'.

ⁱⁱ In (4), the entire ground phrase is left-dislocated. The clause-final clitic particle =*i*' anaphorically represents the place denoted by the ground phrase.

ⁱⁱⁱ What defines the perspective of egocentric representations is the observer, which is prototypically the cognizer or speaker. The cognizer or speaker can assume the perspective of another person, such as that of the addressee in discourse; to what extent such representations should be treated as egocentric is controversial. Intrinsic descriptions with 3rd-person grounds (e.g., *The ball is on her left*) are not egocentric except perhaps in case they involve a generic observer, as in *When one enters, the reception is on one's left*.

^{iv} In Yucatec at least, there appears to be a fifth option: there are a number of nouns that appear to be inherently place-denoting (or to have place-denoting readings), but that refer to *kinds* of places, unlike toponyms. Examples include *ka'n* 'sky', *lu'm* 'earth', 'ground', and *k'áax* 'bush'. These nouns project ground phrases without the help of a preposition or meronym (part-whole term), a property they share with toponyms.

^v An important exception to this generalization are path specifications that do not entail location change. These may be compatible with manner verbs even in languages that are otherwise exclusively verb-framed (Aske 1989).

^{vi} However, the discussion of the relevant phenomena in Bohnemeyer & Stolz (2006) and Levinson & Wilkins (2006b) seems somewhat dated in several respects. For instance, both chapters maintain that location change as conceptualized in the relevant Mayan verb roots is instantaneous. A more accurate way of stating the underlying observation here is that these verbs do not presuppose the space-time isomorphism of translational motion.