

TOPOLOGICAL RELATIONS AND FRAMES OF REFERENCE IN MAYAN LANGUAGES: KAQCHIKEL, K'ICHE', TZ'UTUJIL AND Q'ANJOBAL *

CAROLA EMKOW
Friedrich-Schiller University, Jena

This paper deals with the perception and linguistic expression of topological relationships between spatial objects, and frames of reference that speakers of some Mayan languages of highland Guatemala, Kaqchikel, Tz'utujil, and Q'anjob'al employ. Kaqchikel and Tz'utujil both belong to the K'iche'an branch, Q'anjob'al is a member of the Q'anjob'alan branch. Spatial reference in Mayan and other Mesoamerican languages is characterized by the widespread absence or paucity of use of relative frames and the highly productive use of 'meronymic' terminologies for object parts and spatial regions based primarily on object geometry. Terms for parts of the human body are perhaps universally the prototypical meronyms. In many Mayan languages meronymies represent perhaps the most important resource for the expression of place functions (Jackendoff 1983).

It has been hypothesized that the pervasive use of geometric meronyms in the expression of spatial relations is a linguistic factor that biases the speakers of a language against the use of relative frames.

This paper will fill a gap and contribute to the discussion by adding three more. The paper will present data on topological relation markers in Kaqchikel, Tz'utujil, and Q'anjobal. The data is based on data collected during fieldwork.

Keywords: Mayan, FAMLi5, topological relations, frames or reference

1 Spatial orientation: topological relations and frames of reference

SPACE is a non-linguistic category and spatial cognition is at the heart of our thinking. It is indubitably hard-wired in our species. How else would we find our way around? Moreover, spatial cognition is likely necessary for the conceptualization of other domains such as TIME (Levinson 2003:1).

Spatial relations involve many aspects. They describe how objects are located in space in relation to a reference object or concept.

There are three significant terms typically used in the analysis of spatial relationships: the Figure, the Ground, and the Anchor. The Figure is the movable entity whose topological location or relationship is being described. The Ground is the primary object or concept that defines the reference point for the topological relationship. In addition to the topological relation which is perspective-neutral there is the perspective from which a spatial scene is viewed. Each spatial scene has an Anchor. The Anchor adds a point of view from which the scene is conceived.

The notion of frame of reference takes into account that a speaker can take several possible perspectives on the phenomenon that s/he is considering. These changes of perspective are particularly visible in the language of spatial reference. Three frames of reference are commonly distinguished: relative, intrinsic, and absolute. To illustrate the differences, consider three possible answers to the question, "Where is the frog" in the following reference pictures (Figure 1-3).

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The relative frame of reference is a viewer-centered system, describing the location of a Figure in relation to a Ground with the Anchor being the perspective of the viewer/speaker.

- (1) *The frog is to the right of the man.*

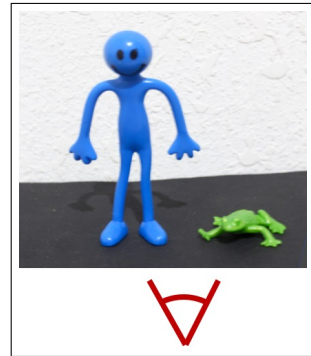
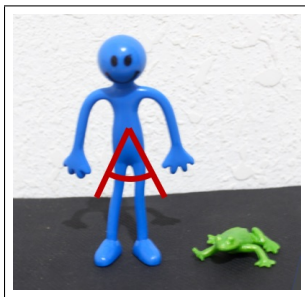


Figure 1: Relative frame of reference



The intrinsic frame of reference is an object-based system with the Anchor residing in the Ground. The spatial relationship of the Figure is described from the perspective of an inherent feature of the Anchor/Ground.

- (2) *The frog is to the man's left.*

Figure 2: Intrinsic frame of reference

The absolute frame of reference is an abstract object-based system wherein the Anchor is some fixed landmark or direction in the scene. The spatial relationship between the Figure and Ground is described referring to the Anchor.

- (3) *The frog is to the east of the man.*



Figure 3: Relative frame of reference

2 Coding spatial scenes

SPACE is a non-linguistic category and any language has its means to code it. Spatial information is not restricted to one part of speech, but is typically distributed throughout the clause. It resides in verbs, nouns and different kind of morphemes.

All languages studied so far seem to have special morpho-syntactic ways to express spatial relations of objects. Yet the morpho-syntactic structures differ to a great extent. Prepositions and postpositions or case affixes are common strategies.

Mayan languages are typologically unusual in that they are generally sparse of prepositions, often they have only one or two prepositions. To provide specific topological information expressions of various lexical categories can come into service. Mayan languages use positionals to express topological information. Only a small number of the thirty Mayan have been investigated in sufficient detail regarding both the linguistic coding of spatial relationships and frames of reference. Topological relations have been studied in Mam (England 1978), Tseltal (Brown 1974, Bohnemeyer & Brown 2007), Tsotsil (de Leon 1992), Yokot'an (or Chont'al (Delgado Galván 2013), Yucatec (Goldap 1992, Lehmann 1992, Bohnemeyer & Brown 2007)

Frames of reference have been investigated in Mopán Maya (Danziger 1996, 1998, 2001, 2011), Tseltal (Brown & Levinson 1993, 2000, 2009; Levinson & Brown 1994; Polian & Bohnemeyer 2011), Tsotsil (de León 1991, 1994), Yucatec (Bohnmeyer & Stolz 2006; Bohnmeyer 2011, Le Guen 2011).

3 Topological relations in Kaqchikel, Tz'utujil and Q'anjob'al

To provide specific topological information expressions of various lexical categories can come into service. In basic locative constructions (BLC) prepositions and relational nouns play a major role in specifying a spatial relation between objects.

3.1 Prepositions

All three languages have two prepositions

Kaqchikel	Tz'utujil	Q'anjob'al
pa, chi	pa, chi	b'ay, tet

Table 1: Prepositions in Kaqchikel, Tz'utujil and Q'anjob'al

These prepositions have the general function of indicating a locative relationship between objects.

The preposition *pa* in Kaqchikel and Tz'utujil (*b'ay* in Q'anjob'al) has a broad range of meanings, all of which imply some sort of surroundedness as the following examples show:

(4) Kaqchikel

- | | |
|--|--|
| a. pa rachoch
pa rachoch
PREP POSS.3SG-house.POSS
'in the house' | d. pa chakäch
pa chakäch
PREP basket
'in the basket' |
| b. pa ch'akät
pa ch'akät
PREP chair
'on the chair' | e. pa taq che'
pa taq che'
PREP PL tree
'among trees' |
| c. pa ulew
pa ulew
PREP ground
'on the ground' or 'in the ground' | |

(5) Q'anjob'al

- | | |
|---|--|
| <p>a. b'ay txomb'al
b'ay txomb'al
PREP market
'in/at the market'</p> <p>b. b'ay yachinb'al
b'ay y-achinb'al
Prep Poss.3Sg-bathroom
'in his/her bathroom'</p> <p>c. b'ay watut
b'ay wa-tut
PREP POSS.1SG-house
'in my house'</p> | <p>d. b'ay tu'
b'ay tu'
PREP there
'there'</p> <p>e. b'ay junxa pak'an
b'ay junxa pak'an
PREP other side
'on the other side'</p> |
|---|--|

Thus, expressions like *pa jay* 'in the house', *pa chakäch* 'in the basket' the meaning refers to the most likely interpretation.

(6) Kaqchikel

K'o jun xajonik pa jay.
k'o jun xajonik pa jay
is one dance PREP house

'There will be some dancing in the house.'

(7) Q'anjob'al (Barreno & Mateo & Mejía 2005:132)

Ch'ach xew b'ay hana.
ch-ach xew b'ay ha-na
ICPL-2SG.ABS relax PREP POSS.2SG-house

'Relax in your house.'

The prepositions *chi* in Kaqchikel and Tz'utujil are all semantically restricted. *Chi* in Kaqchikel and Tz'utujil exclusively precede relational nouns (see §3.2) whereas *pa* occurs with other nouns.

In Kaqchikel and Tz'utujil, the two general prepositions can be assumed to derive from the body part terms *pam* 'belly' and *chi* 'mouth'.

In Q'anjob'al the preposition *b'ay* seems to be the more general one, more or less corresponding to the use of *pa* in Kaqchikel and Tz'utujil. Differently from *pa* in these languages *b'ay* in Q'anjob'al may precede a relational noun.

(8) Q'anjob'al

- | | |
|--|--|
| <p>a. b'ay yich te' te'
b'ay y-ich te' te'
PREP POSS.3SG-under CLF tree
'under the tree'</p> | <p>b. b'ay sti ha
b'ay s-ti ha
PREP POSS.3SG-mouth river
'at the headwater of the river'</p> |
|--|--|

The preposition *tet* occurs less frequently and can be assumed to be the more restricted one. However, the two prepositions in Q'anjob'al also seem to be subject to regional varieties.

3.2 Relational nouns

Nouns in Mayan languages are classified by the way they react to possession. Body part terms belong to the group of nouns that, apart from their unpossessed form, have a possessed form. These possessed forms are relational nouns seen in relation to their possessor and obligatorily carry a possessive prefix.

ROOT	MEANING	UNPOSSESSED NOUN	POSSESSED NOUN, 3RD PERSON
-wi'	hair	wi'aj	ruwi'
-chi'	mouth	chi'aj	ruchi'
-ij	back	ijaj	rij
-pam	stomach	pamaj	rupam
-xikin	ear	xikinaj	ruxikin
-tz'am	nose	tz'amaj	rutz'am
-awäch	face	wachaj	ruwäch
-q'a'	arm	q'abaj	ruq'a'
-aqän	leg	aqanaj	raqän
-jolom	head	jolomaj	rujolom

Table 2: Kaqchikel body part terms

ROOT	MEANING	UNPOSSESSED NOUN	POSSESSED NOUN, 3RD PERSON
-wii'	hair	wi'aj	rwii'
-chii'	mouth	chi'aj	rchii'
-ij	back	ijaj	rij
-pam	stomach	pamaj	rpam
-xkin	ear	xkinaj	rxkin
-tz'am	nose	tz'amaj	rtz'am
-awäch	face	wachaj	rwäch
-q'a'	arm	q'abaj	rq'a'
-aqän	leg	aqanaj	raqän
-jolom	head	jalomaj	rjolom

Table 3: Tz'utujil body part terms

ROOT	MEANING	UNPOSSESSED NOUN	POSSESSED NOUN, 3RD PERSON
-xil	hair	xilej	sxil
-ti'	mouth	ti'ej	sti'
-ichin	back	ichinej	yichin
-yulk'ul	stomach	yulk'ulej	syulk'ul
-txikin	ear	txikinej	stxikin
-txam	nose	txamej	stxam
-sat	face	satej	ssataq
-q'ab	arm	q'ab'ej	sq'ab
-xub'	leg	xub'ej	sxub'
-xolom	head	jolomej	sxolom

Table 4: Q'anjob'al body part terms

Body part nouns in Kaqchikel, Tz'utujil and to some extent in Q'anjobal can refer, quite productively, not only to partitions of the body, human or animal, but also to spatial locations. Mayan languages are well-known for the extensive use of body part terminology when it comes to the expression of spatial relations. It has been debated whether the productive meaning extension of body-part terms is due to metaphorical extension of the human body as a source domain or part labelling based on the visually segmented outline of the subject entity. The following examples from Kaqchikel illustrate how body part terms are used as locative expressions.

- (9) Kaqchikel *rupam* 'belly' → 'inside'
- | | |
|---|--|
| <p>a. <i>rupam ri ruq'a</i>
 <i>ru-pam ri ruq'a</i>
 POSS.3SG-inside DET POSS.3SG-hand
 'inside of hand' ('palm')</p> | <p>b. <i>rupam ri b'ojoy</i>
 <i>ru-pam ri b'ojo'y</i>
 POSS.3SG-inside DET pot
 'the inside of the pot'</p> |
|---|--|
- (10) Kaqchikel *ruwi'* 'hair' → 'top'
- | | |
|--|---|
| <p>a. <i>ruwi' ri juyu'</i>
 <i>ru-wi' ri juyu'</i>
 POSS.3SG-top DET mountain
 'top of the mountain'</p> <p>b. <i>ruwi' ri kotz'i'i</i>
 <i>ru-wi' ri kotz'i'i</i>
 POSS.3SG-top DET flower
 'the head of the flower'</p> | <p>c. <i>ruwi' ri saq'ul</i>
 <i>ru-wi' ri saq'ul</i>
 POSS.3SG-top DET banana
 'the top of the banana'</p> |
|--|---|
- (11) Kaqchikel *raqän* 'leg/foot' → 'bottom/foot'
- | | |
|---|---|
| <p>a. <i>raqän ri juyu'</i>
 <i>r-aqän ri juyu'</i>
 POSS.3SG-foot DET mountain
 'foot of the mountain'</p> | <p>b. <i>raqän ri oköx</i>
 <i>raqän ri oköx</i>
 leg DET mushroom
 'bottom part of the mushroom'</p> |
|---|---|
- (12) *ruchi'* 'mouth' → 'edge'

a. ruchi' ri wäy
ru-chi' ri wäy
POSS.3SG-edge DET tortilla
'the edge of the tortilla'

b. ruchi' ri ulew
ru-chi' ri ulew
POSS.3SG-edge DET ulew
'the border of one's territory'

c. kichi' ri taq b'ey
ki-chi' ri taq b'ey
POSS.3PL-edge DET road
'edges of the road'

(13) *ruxikin* 'ear' → 'side'

a. ruxikin ri q'aq'
ru-xikin ri q'aq'
POSS.3SG-side DET fire
'next to the fire.'

b. ruxikin ri b'ojoy
ru-xikin ri b'ojoy
POSS.3SG DET pot
'next to the pot'/at the side of the pot'

(14) *-tz'am* 'nose' → 'protuberance'

a. rutz'am ri juyu'
ru-tz'am ri juyu'
POSS.3SG-inside DET POSS.3SG-hand
'nose of the mountain' ('protuberent part')

b. rutz'am ri saq'ul
ru-tz'am ri saq'ul
POSS.3SG-nose DET banana
'the nose of the banana'

In Q'anjob'al the relational nouns are commonly used for spatial relations: *-tii* 'mouth' → *stii* 'at the side', *-sat* 'eye' → *ssataq* 'in front of'. Q'anjob'al *yul* derives from *yul k'ul* 'belly' and is used in the meaning of 'in'.

(15) Q'anjobal

a. yul ha'
yul ha'
inside river
'in(side) the river'

b. yul xij
yul xij
inside pot
'in(side) the pot'

c. yul sna
yul s-na
inside POSS.3SG-house
'in(side) his house'

d. yul xuk
yul xuk
inside box
'in(side) the box'

The assignment of meronyms has been viewed in the light of the speakers' analyses of an object with respect to its geometry. Although the geometry and shape of an object determine the assignment of body part terms to its inherent parts, cultural specifics are also crucial but mostly neglected in the discussion.

For instance, the inherent parts of the traditional grinding stone (*k'a'* in all three languages) are all body part terms. Interestingly, in Kaqchikel, the lower part of the stone is referred to as *ruwi'* 'top'. To someone not familiar with the culture this denotations appears to be almost counter-intuitive. For Kaqchikel speakers, this term makes perfect sense as this is the top part once the grinding job is finished and the stone leaned upright against a wall (Duerr 1988). Studying the reference to space



Figure 4: Grinding stone and metate

in Colonial Quiché (K'iche') demonstrates convincingly how “[t]he concept of ‘intrinsic’ (...) helps lead us to a better understanding of cosmological beliefs in Quiché culture.” (Duerr 1988: 1) illustrates his point by investigating the ‘face’ or ‘front side’ of objects with vertical or horizontal orientation (Duerr 1988: 14). He also mentions that the front of the house was usually the side facing the courtyard and not the one facing the street. Apart from body parts terms there are a number of other relational nouns specifically denoting spatial relations

Locational noun root (relational noun)	3rd person possessive	Meaning
-nik'ajal	runik'ajal	middle
-naqaj	runaqaj	proximity
-wa	ruwa	outside
-xe	ruxe	under (root)
-xokon	ruxokon	left
-iqiq'a'	riq'iq'qa'	right
-kojol	kikojol	between
-ikin	rikin	with

Table 5: Locational relational nouns in Kaqchikel

In Kaqchikel and Tz'utujil relational nouns are preceded by one of the two prepositions in a locative clause. In Q'anjobal they often occur without.

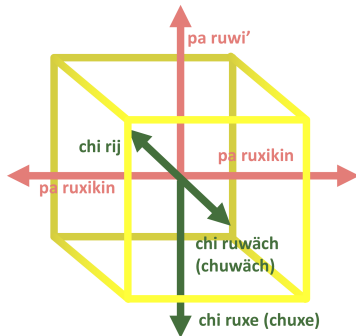


Figure 5: Kaqchikel

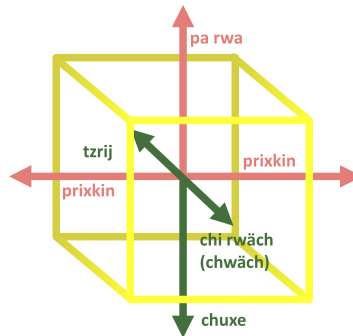


Figure 6: Tz'utujil

The use of the two prepositions *pa* and *chi* is a modern development. In Colonial Quiché (cf. Duerr 1988 and personal communication, Duerr and Sachse 2017) relational nouns exclusively combined with the preposition *chi*: *chuvi* ‘on top’, *chi rupam* ‘in’, *chi rih* ‘behind’, *chi qaxukut* ‘to our sides’.

Topological relations and frames of reference in Mayan languages:
Kaqchikel, K'iche', Tz'utujil and Q'anjobal*

Body part term (relational noun)	Meaning	Prepositional phrase	Meaning
-wi'	hair	pa ruwi' ri ch'tal	on top of the table
-ij	back	chi rij ri ch'atal	behind the table
-wäch	face	chi ruwäch ri ch'atal	in front of the table
-xikin	ear	chi ruxikin ri ch'atal	to the side of the table
-pam	stomach	chi rupam ri b'ojo'y	inside the pot
-k'ux	heart	chi ruk'ux ri tinamit	in the centre of the town
-tzam	nose	chi rutzam ri juyu'	at the nose of the mountain
-xe	root	chi ruxe/chuxe ri chat'al	under the table
-nikajal	middle	pa runikajal ri b'ey	in the middle of the road
-kojol	middle (among)	chi kikojol che'	among trees

Table 6: Kaqchikel relational nouns and prepositional phrases

Relational noun	Meaning	Locative phrase	Meaning
-tii'	mouth	sti' b'e	at the side of the road
-txikin	ear	stxikin te' mexha	at the edge/corner of the table
-sat	face	ssataq sna	in front of his/her house
-yul k'ul	belly	yul jun te kaxha	in the box
-ich	bottom	yich te' taj	at the bottom of the pine tree
-ib'an	on	yib'an te' mexha	on the table
-alan	under	yalan te' q'aja'	under the bridge
-intaq	behind	yintaq no txitx	behind the rabbit
-nan	middle	snan kawan anima	in the middle of two people
-xol	between	sxol	

Table 7: Q'anjob'al relational nouns and locative phrases

It should be noted that the relational noun *-kojol* 'between' is prefixed by the third person plural prefix *ki-* 'Poss.3PL' as the location of an object has two reference points.

- (16) Ri ixok tz'uyül chi ki-kojol ka'i' achi'a'.
 ri ixok tz'uyül chi ki-kojol ka'i' achi'a
 DET woman sit.3SG PCL POSS.3PL-between two men
 'The woman sat between two men.'

The relational noun *-ikin* 'with' may also be used to express a local relationship. The noun differs from all other relational nouns in that it is not preceded by a preposition.

- (17) Rija' x-tz'uye' junan r-ikin ri xten.
 rija' x-tz'uye' junan r-ikin ri xten
 3SG CPL-sit.3SG one POSS.3SG-with DET girl
 'He sat down next to a girl.
 (Lit.: 'He sat with the girl.')

3.3 Locative clauses

Locative clauses may specify the location of an object by means of simple prepositions, noun phrases commonly involving relational nouns, positionals. All these means may interact.

3.3.1 Basic locative constructions

A basic locative construction is the construction that occurs in response to a question of the kind ‘where is the X’? In basic locative constructions prepositions and relational nouns code the position of an entity. In Tzutujil and Kaqchikel a basic locative construction usually contains the verb *k’o*, an existential and locative ‘be’. The constituent order differs depending on whether X is definite or indefinite. In Q’anjobal the verb ‘be (located)’ is often not expressed.

(18) Kaqchikel

- a. K’o jun wuj pa ruwi’ ri ch’atal.
 k’o jun wuj pa ru-wi’ ri ch’atal
 is one book PREP POSS.3SG-top DET table
 ‘There is a book on the table.’
- b. La wuj k’o pa ruwi’ la ch’atal.
 la wuj k’o pa ru-wi’ la ch’atal
 DET book is PREP POSS.3SG-top DET table.
 ‘The book is on the table.’

(19) Tz’utujil

- a. K’o jun siaf chuxe ch’k’at
 k’o jun siaf chi-ru-xe ch’k’at
 is one cat PREP-POSS.3SG-under chair
 ‘There is a cat under the chair.’
- b. Jun sq’u’ul k’o chpam jun kjon
 Jun sq’u’ul k’o chi-r-pam jun kjon
 DET banana is PREP-POSS.3SG-inside DET box
 ‘The banana is in the box.’

(20) Q’anjob’al

- a. Aiyatoj jun b’akal yib’an te’ mexha
 aiyatoj jun b’akal y-ib’an te’ mexha
 is one olote POSS.3SG-top CLF table
 ‘There is a corn trunk on the table.’
- b. No pejei ayekno yik’ul ch’en ka’.
 no pejei ayekno y-ik’ul ch’en ka’
 CLF frog is POSS.3SG-in CLF grinder.
 ‘The frog is on the grinder.’

3.3.2 Positionals

Positionals are CVC roots that never occur uninflected. They are a major inflectional class in all Mayan languages that may form adjectives, nouns, stative predicates, and verbs. Positionals indicate among other

things (like quality) locative position or posture. In many cases the specification regards the shape and position of the Figure as well as the Ground.

A positional by itself may be sufficient to provide information on the location of an object.

(21) Kaqchikel

a. Ximil la ti aq'
ximil la ti aq'
tied.3SG DET DIM pig
'The pig is tied.'

b. E ximil la taq aq'
E ximil la taq aq'
be.tied.3PL DET PL pig
'The pigs are tied.'

In many cases the positional verb provides the context and specifies the meaning. In the following example from Kaqchikel *tilik* 'be planted' implies that the sweet potato is in ground rather than on the ground as is implied by basic verb *k'o*.

(22) Kaqchikel

a. La camote k'o pa ulew.
La camote k'o pa ulew
DET sweet potato is PREP ground
'The sweet potato is on the ground.'

b. La camote tilik pa ulew.
La camote tilik pa ulew
DET sweet potato planted PREP ground
'The sweet potato is planted in the ground.'

4 Frames of reference in Kaqchikel, Tzutujil, and Q'anjob'al

All three languages make use of the intrinsic frame of reference whenever possible, provided the object (Ground) that a Figure relates to does have intrinsic parts. The human body not only has intrinsic body parts but also an intrinsic left and right side. For the speakers of Kaqchikel, Tz'utujil and Q'anjob'al the location of the frog is to the boy's left or right. Even though all three languages have terms for left and right, these are often not favored and other suitable terms like 'to the side' are chosen. In Kaqchikel *rijqiq'a* the term 'right' is probably related to *q'ij'sun*.



Figure 7: Frog to the man's left



Figure 8: Frog to the man's right

(23) Kaqchikel

La xpeq k'o pa
 la xpeq k'o pa
 DET frog is PREP
 ruxokon la ti ala'.
 ru-xokon la ti ala'
 POSS.3SG-left DET DIM boy

'The frog is to the boy's left.'

(24) Tz'utujil

K'o xpaq prixkon
 k'o xpaq p-r-ixkon
 is frog PREP-POSS.3SG-left
 jun acha'
 jun acha'
 one boy

'The frog is to the boy's left.'

(25) Q'anjob'al

Ayek' no peqtza' b'ay
 ayek' no peqtza' b'ay
 is CLF frog PREP
 sk'exan naq winaq.
 sk'exan naq winaq
 POSS.3SG-left CLF man

'The frog is to the boy's left.'

(26) Kaqchikel

La xpeq k'o pa
 la xpeq k'o pa
 DET frog is PREP
 rijqiq'a' la ti ala'.
 r-ijqiq'a' la ti ala'
 POSS.3SG-right DET DIM boy

'The frog is to the boy's right.'

(27) Tz'utujil

K'o xpaq pa rejkinq'a
 k'o xpaq pa r-ejkinq'a
 is frog PREP POSS.3SG-right
 jun acha'.
 jun acha'.
 one boy

'The frog is to the boy's right.'

(28) Q'anjob'al

Ayek' no peqtza' b'ay
 ayek' no peqtza' b'ay
 is CLF frog PREP
 swatx' naq winaq
 s-watx' naq winaq
 POSS.3SG-right CLF man

'The frog is to the boy's right.'

Cars have intrinsic parts for which body part terms are used. The word denoting the front is most commonly the term for 'face' in the languages under discussion. For cars with a very protuberant front the term for nose may be used. The back of the car is invariably referred to as 'back'.



Figure 9: Pig at the back of the car



Figure 10: Pig at the front of the car

(29) Kaqchikel

La ti aq k'o chi
la ti aq k'o chi
DET DIM pig is PREP
rij la ch'i'ch.
rij la ch'i'ch
POSS.3SG-back Det car

'The pig is at the back of the car.'

(30) Tz'utujil

K'o jun a'aq
k'o jun a'aq
is one pig
tzrij ch'e'ch.
tz-r-ij ch'e'ch.
PREP-POSS.3SG-back car

'The pig is at the back of the car.'

(31) Q'anjob'al

Ayek' no txitam
ayek' no txitam
is CLF pig
yintaq ch'en carro
y-intaq ch'en carro
PREP-POSS.3SG-back CLF car

'The pig is at the back of the car.'

(32) Kaqchikel

La ti aq k'o
la ti aq k'o
DET DIM pig is
chuwäch la
chi ru-wäch la
PREP POSS.3SG-front DET
ch'i'ch.
ch'i'ch
car

'The pig is at the front of the car.'

(33) Tz'utujil

K'o jun a'aq
k'o jun a'aq
is one pig
chwäch ch'e'ch.
chi-ru-wäch ch'e'ch
PREP-POSS.3SG-front car

'The pig is at the front of the car.'

(34) Q'anjob'al

Ayek' no txitam ssataq
ayek' no txitam s-sataq
is CLF pig POSS.3SG-front
ch'en carro
ch'en carro
Clf car

'The pig is at the front of the car.'



Figure 11: Pig in front of the agave



Figure 12: Pig behind the agave

(35) Kaqchikel

La ti aq k'o
 la ti aq k'o
 DET DIM pig is
 chuwäch la
 chi ru-wäch la
 PREP-POSS.3SG-front DET
 ch'ut.
 ch'i'ch
 maguey

'The pig is in front of the agave.'

(36) Tz'utujil

K'o jun a'aq
 k'o jun a'aq
 is one pig
 chwäch sajkiy.
 chi-r-wäch ch'e'ch.
 PREP-POSS.3SG-front maguey

'The pig is in front of the agave.'

(37) Q'anjob'al

No txitam k'atan an sawil.
 no txitam k'atan an sawil
 CLF pig near CLF maguey

'The pig is near the agave.'

(38) Kaqchikel

La ti aq k'o chi
 la ti aq k'o chi
 DET DIM pig is PREP
 rij la ch'ut.
 r-ij la ch'i'ch
 POSS.3SG-back DET maguey

'The pig is behind of the agave.'

(39) Tz'utujil

K'o jun a'aq
 k'o jun a'aq
 is one pig
 tzrij sajkiy.
 tz-r-ij sajkiy.
 PREP-POSS.3SG-back agave

'The pig is behind the agave.'

(40) Q'anjob'al

No txitam k'atan an sawil.
 no txitam k'atan an sawil
 CLF pig near CLF maguey

'The pig is near the agave.'

5 Conclusions

Mayan languages are well known and somewhat celebrated for their being having few prepositions and employing other strategies (in particular relational nouns and positionals) to express spatial relationships.

Two attempts to explain the assignment of meronymics have been made. The assignment may be governed by a metaphorical mapping process (MacLaury), or by an algorithm that takes as input the visually segmented outline of the whole and labels parts on the basis of their shape and the axis of the entity they occur on (Levinson 1994).

It has been hypothesized that the pervasive use of geometric meronyms in the expression of spatial relations is a linguistic factor that biases the speakers of a language against the use of relative frames.

The investigation of Kaqchikel, Tz'utujil (both languages of K'iche'ean branch) and Q'anjob'al (of the Q'anjobalan branch) confirms that prepositions are scarce and that positionals and relational nouns play a crucial role in the expression of spatial relationships. In Kaqchikel and Tz'utujil many relational nouns denoting body parts come into service. In Q'anjob'al fewer body part nouns but other relational nouns are used. All three languages have relational nouns not related to a body part with the meaning 'middle' and 'between'

It has been hypothesized that the meronymic use of body part terms correlate with a "Mayan intrinsic world view". It is correct to say that speakers of the three languages under discussion describe a spatial scene from an object-centered view whenever possible. If the shape of the reference object (Ground) has intrinsic parts the speaker will refer to those in order to describe the location of an object. While it is common to specify the vertical Up-Down axis and the horizontal Front-Back axis, it is less common to specify the Left-right axis with the terms of 'left' and 'right'. Rather, speakers tend to say 'to the side'.

However, if the referential object cannot claim to have intrinsic parts, i.e., entities like trees for instance, speakers of Kaqchikel and Tz'utujil often take the speaker-centered (relative) perspective and assign the horizontal axis terms 'left' and 'right' or 'front' and 'back' (even though the object does not have an intrinsic front and back or left and right side). Alternatively they may just say an object is near another. Q'anjobal seems to differ from the K'ichean languages in that it does not allow the speaker to change perspective (from intrinsic to relative).

Abbreviations

1	1st person	DIM	diminutive
2	2nd person	ERG	ergative
3	3rd person	ICPL	incompletive aspect
ABS	absolute case	PL	plural
CLF	classifier	POSS	possessive case
CPL	completive aspect	PREP	preposition
DET	determiner	SG	singular

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