

Semantics of Body Part Terms in Juchiteco Locative Descriptions*

Gabriela Pérez Báez

Department of Anthropology, Smithsonian Institution

This paper explores the system of body part terms used in locative descriptions in Juchitán Zapotec or Juchiteco. In particular, it examines their semantic properties as heads of Ground phrases to determine whether they encode spatial and locative relations or whether they remain as object-part denoting nominals. The analysis shows that structural and functional analogy allows body part terms to be extended to denote object parts as well as generalized object parts. Data suggests, however, that spatial and locative relations are not encoded in the semantic properties of body part terms in Juchiteco.

1. Introduction

This paper explores the system of body part (BP) terms used in locative descriptions in Juchitán Zapotec or Juchiteco (JCH).¹ In particular, it analyzes the role of BP terms as adnominal spatial relators (ASR), heuristically defined as elements which in combination with a Ground-denoting nominal form a Ground phrase in locative descriptions. I have chosen this terminology over alternative terms in keeping with the arguments I present which show that BP terms in JCH do not function as locatives.

I refer in this paper to the notion of Figure and Ground relations defined in Talmy 2000 as the relation between a “moving or conceptually movable entity” (Figure) and a “reference entity” (Ground) “that has a stationary setting relative to a reference frame, with respect to which the Figure’s path, site, or orientation is characterized”. As such a relation is expressed linguistically, the Ground-denoting nominal does not function as an argument of the verb but rather as an oblique licensed by an ASR. I will focus exclusively on BP-derived ASRs and examine their semantic properties as heads of Ground phrases to determine whether they encode spatial and locative relations or whether they remain as object-part denoting nominals. To this end, section 2 includes a grammatical sketch of Juchiteco as background for a discussion on locative predication in the language, with a focus on a description of the Basic Locative Construction (BLC). This is followed by a discussion of the semantic extension of BP terms to object parts in section 3. Based on ambiguities found in the data, section 4 argues that spatial and locative relations are not encoded in the semantic properties of BP terms.

* I am grateful to the Project for the Documentation of the Languages of Mesoamerica (PDLMA) for facilitating this research, and to the Department of Linguistics at the University at Buffalo – State University of New York, for providing complementary financial support. I am most thankful to Dr. Jürgen Bohnemeyer for his guidance and patience, and for comments received from Dr. Terrence Kaufman, Dr. Thomas Smith-Stark and Dr. David Fertig. Of course, any errors are my responsibility. My heartfelt thanks to Rosaura López Cartas, Rosalino Gallegos Luis, and Vicente Marcial Cerqueda for generously sharing their language with me.

¹ Abbreviations used in data glosses follow the Orthographic and Coding Conventions in Use in the PDLMA in its October 25, 2001 version. The following abbreviations are used in this paper: 1, first person; 2, second person; 3, third person; 3a, third person animal; 3i, third person inanimate; ASR, adnominal spatial relator; BLC, basic locative construction; BP, body part; cmp, completive aspect; dei, deictic; fut, future aspect; hab, habitual aspect; JCH, Juchiteco or Juchitán Zapotec; mdp, mediopassive; pcp, participle; pos, possessive; pot, potential aspect; prf, perfective aspect; prg, progressive; prn, pronoun; Sp, Spanish.

2. Grammatical sketch²

The term Zapotec has been used by both speakers and outsiders to Zapotec communities to refer to a language complex which comprises a number of closely related languages, each with a variety of dialects. Kaufman (p.c.) identifies the following 5 “virtual languages”: northern, central, southern, Papabuco, and western (Lachixío). Under this classification, the variety under investigation— Juchitán Zapotec or Juchiteco —is considered a variety of central Zapotec. The data presented was provided by speakers from La Ventosa belonging to the district of Juchitán de Zaragoza, and Santa María Xadani, a neighboring district, both in the Isthmus of Tehuantepec in Oaxaca, Mexico.

2.1 Orthographic conventions

Before moving on to an overview of the grammar of locative constructions, I shall introduce the orthographic conventions used in this paper. The JCH orthography used in this paper follows the conventions set in the Project for the Documentation of the Languages of Mesoamerica (PDLMA). Table (1) includes native consonantal phonemes as well as those incorporated into the phonological system of the language as a result of borrowing.

Table (1) *JCH consonantal phoneme inventory and their orthographic representation*

	Bilabial	Labio-dental	Alveolar	Palato-alveolar	Palatal	Velar	Glottal
Stops	p b		t d			k g	ʔ
Fricatives		f	s z	x zh			j
Affricates				ch dx			
Nasals	m		n nn		ny		
Laterals			l ll				
Rhotics			r rr				
Semivowels	w				y		

The JCH vowel inventory consists of five vowels represented as i, e, a, o and u. Vowels exhibit three modes of articulation, plain, glottalized or checked, and rearticulated. Vowels are accompanied by a low, rising or high tone, with the first being the most frequent, and the last the least frequent.³ There are some restrictions as to the interaction between the phonation type of the vowel and tone, which will not be explored here.

² This section is based on my own elicitation work, and also incorporates field notes and manuscripts by Terrence Kaufman as well as numerous discussions with him.

³ The orthographic representation of vowels and tone is as follows: V, plain vowel; Vʔ, glottalized (checked) vowel; VV, rearticulated vowel with intervening glottal stop or squeeze; CV, low tone (most common and thus unmarked); CV*, rising tone; CV!, high tone; CV^, high tone resulting from tone sandhi. A tone sandhi rule that occurs frequently in JCH is as follows: CV* # CV = CV CV^ and CV*+ CV = CV-CV^. Orthographically, the vowel that bears the rising tone continues to be represented as V* while the vowel bearing the transferred high tone is marked V^.

Semantics of Body Part Terms in Juchiteco Locative Descriptions

The basic syllable structure in JCH is CV. While there are monosyllabic nouns and verbs, the canonical phonological word is considered to be of the form CVCV in which the penultimate syllable is stressed.⁴

2.2 Typological properties

The canonical constituent order in Juchiteco is VSO as seen below:

(1) bi-dii Fa!n ti+ geta Ma-rya!
cmp.give.3 John a tortilla Mary
'John gave Mary a tortilla'

(2) r.adxi Fa!n dxita
hab.suck.3 John bone
'John sucks the bone'

With regards to noun phrases, in JCH as in all other Zapotec languages, a modifying adjective follows a noun.

(3) nexel7 ti+ man-te!l guchi lu ti+ mezha!7
lying.down a+ table.cloth yellow face a+ table
'a yellow table cloth is over a table'

(4) nuu* ti^+ benda wiini ndaani ti+ gisu wiini
exist a+ fish small stomach a+ pot small
'there is a small fish inside a little pot'

Possession in JCH may be expressed in a number of ways. Alienable possession is expressed through the use of the possessive pronoun *x.ti*7* as in (5) or by procliticization of the possessive marker *x+* onto the possessed noun as in (6).⁵ Inalienable possession involves body part terms, and certain kinship terms (and possibly a couple of other nouns such as *lidxi* 'house'). These nouns do not allow for procliticization of the possessive marker *x+*, as their semantics encompass the notion of an obligatory possessor.

(5) bi7ku x.ti*7 +be* bi7ku x.ti*7 Fa!n
dog pos.prn +3 dog pos.prn John
'his/her dog' 'John's dog'

(6) x.pikw.a!7 x.pi7ku +lu7 x.pi7ku (+be*)
pos.dog.1 pos.dog +2 pos.dog (+3)
'my dog' 'your dog' 'his/her dog'

⁴ Unstressed morphemes cliticize and are marked as follows: -, marks an affix in native words; it also marks material of a lexical item that precedes the stressed syllable, especially in Spanish loans; +, marks an extrametrical clitic; a period marks a clitic or an affix that incorporates into the CVCV phonological word.

⁵ The phonology of the possessive marker *x+* will not be discussed here. I will only mention for the sake of clarity that procliticization of *x+* affects the #C of the lexical root as in examples in (6).

- | | | | |
|-----|-------------------------------------|---|---|
| (7) | zhiiny.e!7
child.1
'my child' | zhiinyi (+be*)
child (+3)
'his/her child' | |
| (8) | ik.e!7
head.1
'my head' | ike +lu7
head +2
'your head' | ike (+be*)
head (+3)
'his/her head' |

As is the case in verb-initial head-marking languages such as JCH, the constituent order in possessive clauses is Possessed-Possessor. The possessor follows the possessed either as a pronoun or as an NP, although a 3rd person possessor is optional as indicated by the parenthesis around the 3rd person pronoun *+be** in examples throughout this section.

- (9) j.nyaa Fa!n
pos.corn.field John
John's corn field

- (10) lidxi Fa*na
house Jane
Jane's house

- (11) lu Uwi
eyeUwi
Uwi's eye

Most relevant to the topic at hand is the use of inalienably possessed nouns in adnominal possessive constructions. The same word order found in sentences such as (11) occurs in Ground phrases where the relationship between the BP term and the noun is the focus of a larger question –whether the BP term denotes a part of the Ground, parallel to the relationship between a BP and its possessor or a meronym to its related whole, or whether it encodes a spatial region projected from the part of the Ground or a locative relation between Figure and Ground. This will be the focus of the discussion in section 4.

2.3 Locative predication

This section provides an overview of locative constructions with the purpose of identifying the BLC in JCH. Data presented here was elicited with the Topological Relations Picture Book (BowPed) developed in the Max Planck Institute for Psycholinguistics by Melissa Bowerman and Eric Pederson. Illustrations in the BowPed show a highlighted Figure depicted in relation to a Ground, and is used to elicit locative constructions that respond to the question *where is the FIGURE?*. In a first attempt at analyzing the collected data, it was possible to identify instances of ASRs. Table (2) lists the BP-derived terms that emerged from the collected data and includes the frequency with which BP terms occur in the BowPed data. Glosses in Table (2) are restricted to the appropriate reference to body parts.⁶

⁶ Glosses are from the database of the PDLMA.

Semantics of Body Part Terms in Juchiteco Locative Descriptions

Table (2) *JCH Body Part Terms in BowPed-based Elicitation*⁷

JCH	English gloss	Freq.	JCH	English gloss	Freq.
ike	head	8	lu	face, eyes	30
lu=kwa	forehead	1	rwa	mouth	7
dyaga	ear	1	yanni	neck	1
la7dxi=do7	heart	1	x.pe*chu	chest (Sp loan)	1
ndaani	stomach, gut, belly, abdomen	18	ti7xi	flank	5
kwe7	side	18	deche	back	3
zha7(na)	buttocks, anus	1	na*7	hand, arm	1
bi-kwini na*7	finger	1	nyee	foot, leg	2
yanni nyee	ankle	1	ladi	skin, body	4

In addition to the BP terms listed in Table (2), the BowPed elicitation yielded other, non-BP-derived relators as listed in Table (3).

Table (3) *Other Relators in BowPed-based Elicitation*

JCH	English gloss	Freq.	JCH	English gloss	Freq.
ga-laa*	middle	3	ga-lawi!7	center	3
lade*	between, among	1	gaxa	near, near by	1
zha=gete!7	low, below, underneath	2	lu=gya*7	on top of, above, atop	2
ra+	where, at	2	a-tra!	behind (Spanish loan)	1
(g)u-rya!	edge (Spanish loan)	11	pu*nta	tip (Spanish loan)	1

The lexical and grammatical properties of these adnominal relators are varied and raise interesting questions. Yet, given that none of these relators are BP terms in and of themselves, they will be given no more attention in this paper other than in the exploration of their syntactic role in locative constructions in this section.

To begin the analysis of locative constructions, consider (12), an elliptical answer to the question *where is the FIGURE?*.

- (12) [Relator Noun.Phrase]_{Ground.Phrase}
 lu mezha!7
 face table
 ‘on the table’

(13) and (14) are full locative predicates used in locative descriptions. Note that some responses included sentences where the predicate is headed by the existential participle *nuu** used with predicate nominals that express not only existence but also possession and attribution. We will focus here on the use of *nuu** in locative constructions.

⁷ This paper makes no claims regarding the etymology of BP terms in JCH. It strictly engages in an analysis of the semantic properties of a selection of lexical items which refer synchronically to BPs.

- (13) **Existential Figure.Phrase [Relator Noun.Phrase]_{Ground.Phrase}**
 nuu* ta*sa lu mezha!7
 exist cup face table
 ‘there’s a cup on the table’
- (14) **Positional Figure.Phrase [Relator Noun.Phrase]_{Ground.Phrase}**
 zu!=waa ta*sa lu mezha!7
 standing cup face table
 ‘A cup is standing on the table’

Constituent order variation allows for the Ground phrase or Figure phrase to be fronted:

- (15) **Positional Figure.Phrase [Relator Noun.Phrase]_{Ground.Phrase}**
 dxi!7ba bi!dxi*=gi^ ike yoo
 mounted spider head house
 ‘A spider is on the ceiling’
- (16) **[Relator Noun.Phrase]_{Ground.Phrase} Positional Figure.Phrase**
 ike yoo dxi!7ba bi!dxi*=gi^
 head house mounted spider
 ‘A spider is on the ceiling’
- (17) **Figure.Phrase Positional [Relator Noun.Phrase]_{Ground.Phrase}**
 bi!dxi*=gi^ dxi!7ba ike yoo
 spider mounted head house
 ‘A spider is on the ceiling’

Word order within the Ground phrase is fixed, as the relator precedes the Noun phrase in all cases as in (18) and (19).

- (18) ka* ma^nsani*ta lade* ba^-ndaga
 attached apple among leaves
 ‘the apples are among the leaves’
- (19) ka* ti^+ ba-ndaga yaa gu-rya! rra*ma
 attached a tree.leaf green end branch
 ‘A leaf is attached to the end of the branch’

We may thus state that the BLC used in response to *where?* questions is as follows:

- (20) **Predicate Figure.Phrase [Relator Noun.Phrase]_{Ground.Phrase}**

3. Semantic Extension to Animal and Object Parts

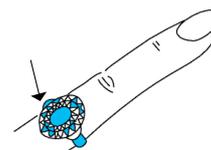
The following paragraphs are devoted to an overview of the semantic extension of BP terms in JCH spatial description. The data used for this analysis were collected through several elicitation efforts. An initial phase involved obtaining an inventory of human BP terms in

Semantics of Body Part Terms in Juchiteco Locative Descriptions

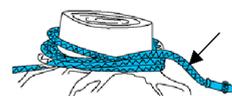
Juchiteco, using Chapter 12 of Bouquiaux and Thomas (ms.) as stimulus. This phase involved one native speaker of JCH and yielded over 300 BP terms. These data were crosschecked against the database of the PDLMA.⁸ A second phase of elicitation involved working with five native speakers of JCH utilizing the BowPed as stimulus, as well as subsequent and more specific elicitation work with two more speakers using stimuli I designed specifically for the task. The data obtained in this second round of elicitation showed that among the collected BP terms, only a small subset was found to be used in the expression of spatial relations. I will elaborate on this in the following paragraphs as it will be crucial in the discussion dealing with encoding of spatial relations.

The BP terms that emerged from the BowPed data were listed in Table (2) above. The fact that those 18 BP terms were elicited through the use of a tool intended to explore locative constructions does not mean that all 18 BP terms have extensions beyond their semantic properties as BP-denoting terms. Compare the token frequency of *lu* ‘face, eyes’ to that of a number of items which occurred only once in the data. An extensive range of stimulus scenes elicited *lu*, showing its extensive range of uses. In contrast, BP terms such as *dyaga* ‘ear’, *yanni* ‘neck’, *la7dxi=do7* ‘heart’, *x.pe*chu* ‘chest’, *na*7* ‘hand, arm’, *bi-kwini na*7* ‘finger’ and *yanni nyee* ‘ankle’ only surfaced in the data in cases where the Ground is the actual body part referred to as in (21), and only occasionally where the Ground is an object part as in (22).

- (21) nuu* ti^+ (g)a-ni!w bi-kwini na*7
exist a+ ring finger hand
‘there is a ring on the finger’



- (22) dopa* ma^nge*ra nyee x.ku
rolled.aroundhose foot tree.stump
‘the hose is rolled around the stump of the tree’



Overall, many BP terms in JCH are used to refer to animal body parts, and many also undergo semantic extension to denote object parts. In both cases, this paper considers the human body to be the source domain. Thus, Heine 1997 considers the human body to be basic. He particularly points out that while there are languages with zoomorphic models, as in Chalcatongo Mixtec (Brugman 1983 and Brugman and Macaulay 1986), these also have an anthropomorphic model. Further, Heine reports that no language has been described as using only a zoomorphic model supporting the view that conceptualization in the realm of spatial description is anthropocentric. Considering the human body as the model in JCH is also in line with MacLaury’s (1989) account of Ayoquesco Zapotec.⁹

⁸ The PDLMA database includes data collected by Terrence Kaufman, Marilyn Feke and myself from consultants Javier López Cartas, Rosalino Gallegos Luis and Rosaura López Cartas. It is supplemented by data from Pickett 1971, Jiménez Girón 1980, and Jiménez Jiménez and Marcial Cerqueda 1997.

⁹ MacLaury 1989 argues that the human body is “the model of all form” (1989:121) on the basis that (1) animal body part terms are never used to name parts of objects, (2) body parts terms are mapped onto animal bodies as if they were humans on all fours, and (3) when body part terms are applied to objects, the mapping follows the vertical canonical orientation of the human body. The research conducted on JCH so far does not allow for claiming with absolute certainty that in JCH no animal parts are ever used to refer to object parts. Data does support MacLaury’s second observation. In JCH, for example, the front extremities of animals are referred to as *na*7* ‘hand(s)’, while the hind ones are referred to as *nyee* ‘leg(s)’. In the case of animals or insects with more than 4 extremities, the two front

Semantic extension to denote object parts is done primarily on the basis of an analogical match between the physical features of the object as the target domain and the anatomical features of the human body as the source domain. Consider the example in Figure 1 below.

Figure (1) BP-terms mapped onto a hammer

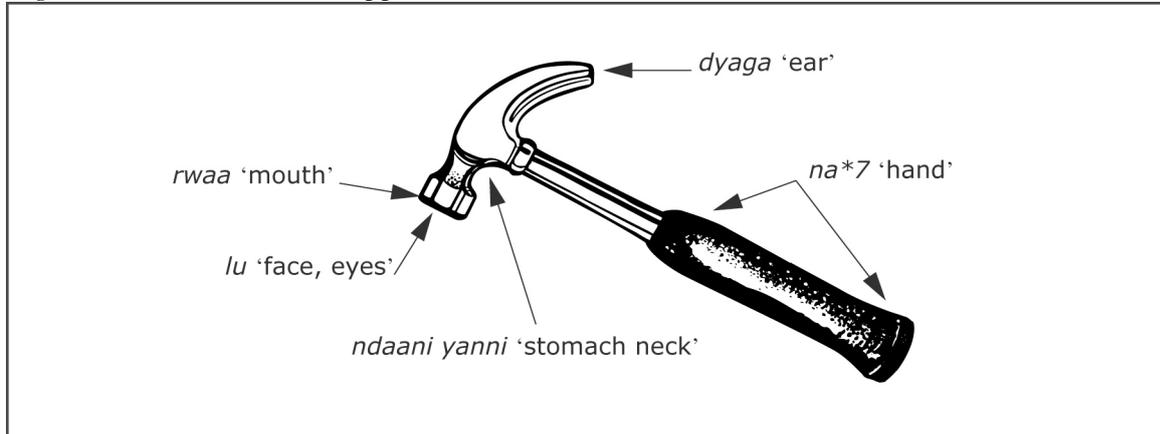
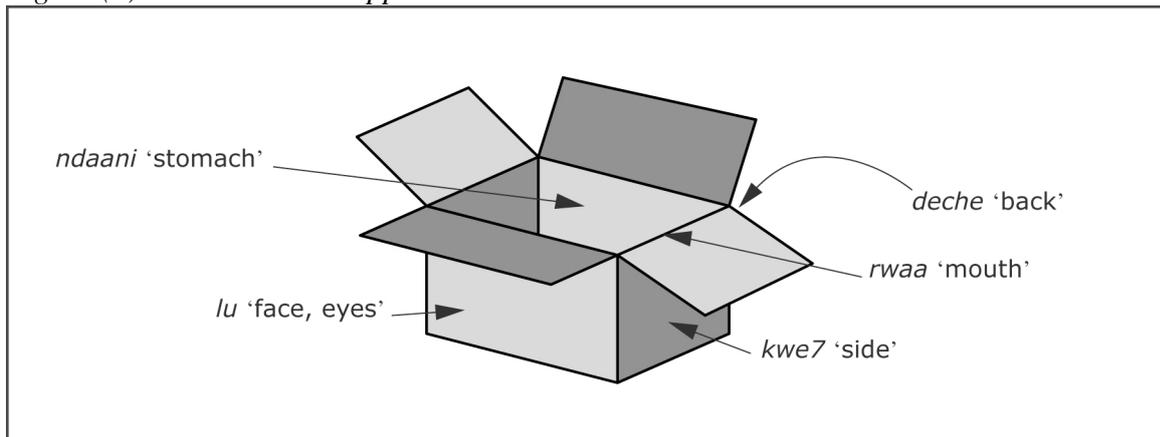


Figure (2) BP-terms mapped onto a cardboard box



The mapping between the source and target domains is primarily based on an analogy which may be spatial, functional or both (Gentner 1983). In the case of the hammer in Figure (1), it is in analogy to the face as interface that its blunt front is labelled *lu*. In Figure (2), it is in analogy to the stomach as container that *ndaani* 'stomach' is used to refer to the interior of a cardboard box. Likewise, the nature of the human mouth as a salient opening of the body allows for *rwa'a* 'mouth' to refer, for instance, in the case of a piggy bank, to both the anatomical mouth of the pig as well as the slot through which to insert money – a most salient and functional part of this object. This will be the extent to which this paper will expound on the semantic extensions of the terms in Table (2), as the goal of this study is rather to analyze the semantic properties of a selected set of BP terms in JCH used in locative and motion descriptions. Therefore the question of whether the semantic extension of BP terms attested in the data goes beyond denoting body parts will be limited to a core set of these terms.

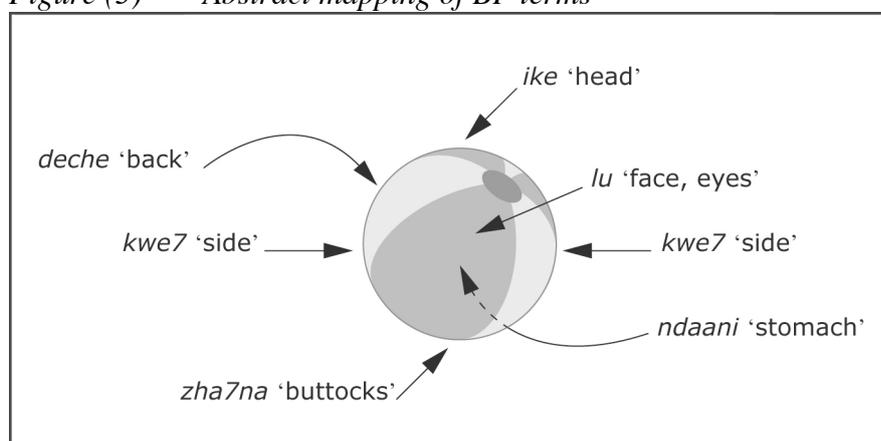
The mapping of a core set of BP terms is illustrated in Figure (3) below. This example raises an important question: how is the distribution of BP terms motivated? The BP terms in

ones will be referred to as *na*7* while all the other ones are called *nyee*. Section 3 of this paper discusses the third argument in light of JCH data.

Semantics of Body Part Terms in Juchiteco Locative Descriptions

Figure (3) set themselves apart from other BP terms in that their mapping is based on an abstraction of the human body, and more specifically, of the relation among the relevant BPs. This paper considers the relevance both of the canonical orientation of the human body as a model for such analogical mapping, and of Frames of Reference (FoRs) –coordinate systems used in the identification of places with respect to a referential Ground. This section elaborates on the former. As for the latter, the research I have conducted to date has unveiled not only the importance of FoRs in the system of semantic extension of BP terms, but also an intricate division of labor between different types of FoRs. It is not the scope of this paper to elaborate on the use of FoRs in JCH locative descriptions (for a detailed analysis of FoRs in Juchiteco see Pérez Báez 2011). However, it is worth noting that the mapping of the core set of BP terms on Grounds that have no identifiable parts such as the ball in Figure (3) relies on the use of a relative FoR and is dependent on the orientation of the observer and its relation with the Ground.¹⁰

Figure (3) *Abstract mapping of BP terms*



In closing this overview of the semantic extension of BP terms, two observations can be made. First, BP terms may be productively used to name animal and object parts. The semantic extension of BP terms on the basis of both structural and functional analogies shows productivity in a broad sense. The hammer example in Figure (1) above, which is representative of a couple of hundred instances collected of the use of BP terms to name parts of tools and a variety of other miscellaneous objects, points to a system that is productive in the narrow sense, i.e., one in which speakers can spontaneously apply BP terms to a wide array of objects. And second, only a core set of BP terms that can be mapped following an abstract model of the human body can function as ASRs heading Ground phrases as in the case of *ndaani* 'stomach' in (23) and constitute a closed class in JCH. These BP terms are listed in Table (4) below and their semantic properties will be explored in detail in the following paragraphs.

¹⁰ Various FoRs classifications have been proposed in the literature such as in Levinson 1996 and 2003. More recently, work conducted by the Spatial Language and Cognition in Mesoamerica (MesoSpace) project (NSF Award No. BCS-0723694) has produced data that motivated an expanded classification using the concept of Anchor and Ground as the basis for a binary classification of six types of FoRs: intrinsic and direct when the Anchor is the Ground, and absolute, landmark, geomorphic and relative when the Anchor is an object other than the Ground. The term 'relative FoR' is used in this paper as per this classification. A detailed explanation of this six-way classification is in O'Meara & Pérez Báez 2011.

- (23) nuu* ti^+ mansa*na [ndaani ti+ bladu!7]_{GP}
 exist a+ apple stomach a+ dish
 ‘there is an apple inside a dish’

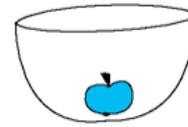
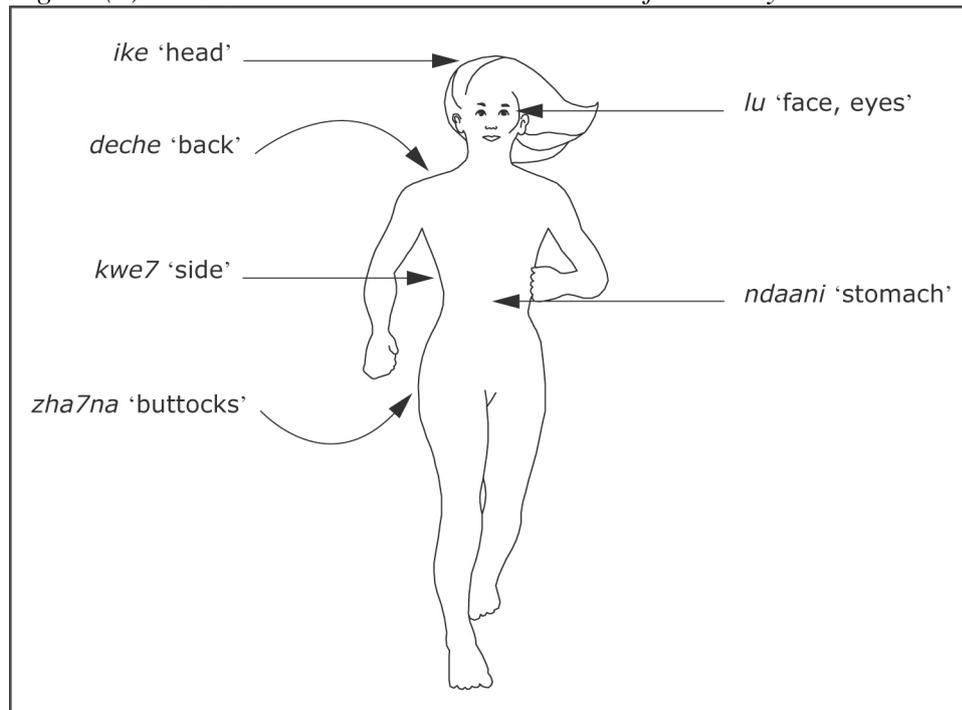


Table (4) BP-derived Adnominal Relators (as per BowPed data)

JCH	English gloss	JCH	English gloss
ike	head	lu	face, eyes
kwe7	side	ndaani	stomach, gut, belly, abdomen
zha7(na)	buttocks, annus	deche	Back

We now turn to a descriptive overview of the semantic extension of the so-defined closed class of BP terms. Figure (4) shows the six JCH BP terms listed in Table (6) above, as THING-denoting terms (Jackendoff 1983) in reference to the human anatomy.

Figure (4) JCH Adnominal Relators Derived from Body Part Terms



I refer here to the notion of directed axes as defined in Miller and Johnson-Laird 1976, Landau and Jackendoff 1993 and Jackendoff 1996. The mapping of the directed axes of the human body onto Ground objects allows the use of core BP terms in reference to object parts. The upper end along the principal generating axis, that is the vertical axis, defines *ike* ‘head’ and refers to the tip or upper end of an object. (24) to (26) show that *ike* is used independently of whether there is contact between Figure and Ground and therefore is also involved in the expression of relations described in English as ‘above, over, on top of’. Despite this, as we will see in 4.2, the BP term *ike* is THING-denoting only.

Semantics of Body Part Terms in Juchiteco Locative Descriptions

- (24) nuu* +ni* i^ke bu-te*ya +ka!
 exist +3i head bottle +dei
 ‘it (the cap) is on the tip of the bottle’

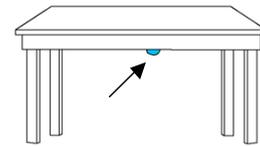


- (25) dxi!7ba za ike yoo
 raised.over cloud head house
 ‘the cloud is over the house’



The opposite end of the vertical axis defines *zha7na* or *zha7* ‘buttocks’. By semantic extension, *zha7(na)* corresponds to English ‘underside, bottom’ in denoting object parts. It also participates in the expression relations described in English as ‘under’ and ‘below’ as in (26) and (27).

- (26) gi!7di yaala* zha^7na mezha!7
 adhered chewing.gum buttocks table
 ‘the chewing gum is stuck under the table’



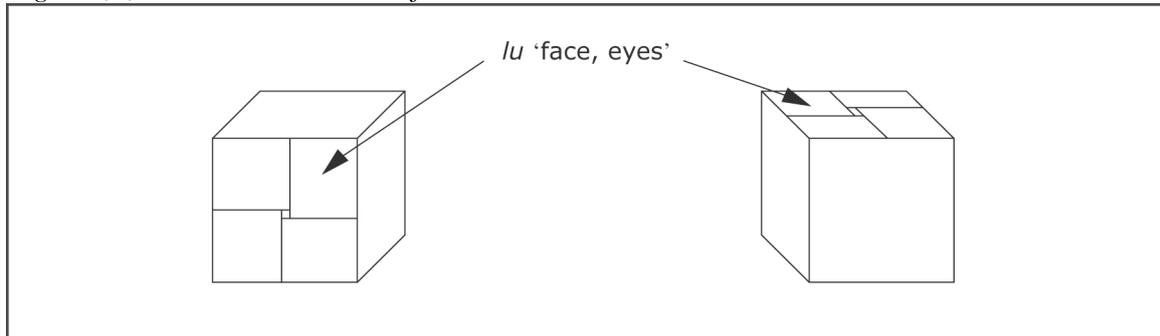
- (27) nuu* ti^+ bo*lla zha7na ti+ tabure*te
 exist a+ ball buttocks a+ chair
 ‘there's a ball under the chair’



The semantic extension of *lu* ‘face’ to refer to the ‘front’ or interfacing plane of an object is defined by the directed front-back axis. The opposite end of this axis defines *deche* ‘back’. The orthogonal side-to-side axis defines two body parts, one at each end and both named *kwe7* ‘side’. Special attention should be given to *ndaani* ‘stomach’, which is mapped onto a target domain on the basis of the relation between the BP and the body, and independently of the axial structure mapping. All of the core BP terms are underspecified for the CONTACT feature, and are used in constructions where neither spatial region nor locative relation are overtly expressed, as will be explained in section 4.1.

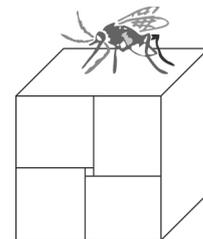
The mapping of human-to-object parts based on structural and functional analogy as explained earlier interacts with a system based on FoRs in making available to speakers more than one mapping option and thus more than one possible descriptive construction. In JCH, *lu* ‘face, eyes’ can denote the intrinsically most salient surface of a given object independently of orientation. This is illustrated in Figure (5) below where *lu* refers to the side with multiple flaps which allow for opening the box. The side denoted by *lu* is visually and physically more complex than the surrounding sides, and has a function that none of the other sides has (elicitation with this image assumed that the bottom of the box was sealed and without overlapping flaps).

Figure (5) Lu as salient surface



As mentioned earlier with regards to Figure (3), in the absence of identifiable Ground parts that may serve in locating a figure with respect to it, a relative FoR can be used. Such would be the case of mapping of the core set of BP terms onto a cube in a case parallel to that of the ball in Figure (3). Additionally, the vertical axis constitutes an absolute FoR and provides an alternative to the previous two models as illustrated in (28).¹¹

- (28) nexel7 +me* lu ka*ja
 lying.down +3a face box
 'it is on top of the box'



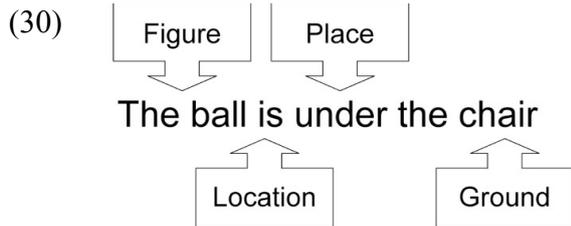
4. The encoding of locative and path relations

The following paragraphs explore whether the mapping from a THING function to a PLACE function and onto a LOCATIVE/PATH function as proposed in Jackendoff 1983 is expressed in the Ground phrases of JCH locative constructions. According to Jackendoff, a Ground nominal such as *table* can function as the object of a transitive preposition in spatial description as in *under the chair*. However, “The place referred to is distinct from the reference object” (Jackendoff 1983:161), as evidenced by the fact that the same reference object may be used to refer to a number of different places as in *over the chair*, *on the chair* and *inside the chair*. Jackendoff offers (29) as a notation for the mapping of THING function to PLACE function:

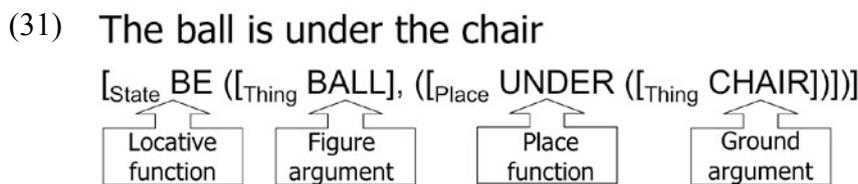
- (29) $[_{\text{Place}}x] \rightarrow [_{\text{Place}}\text{PLACE-FUNCTION} ([_{\text{Thing}}y])$ (1993:162)

Two conceptual prerequisites are present in locating a Figure with respect to the Ground. First, a place must be defined with respect to the Ground. Second, it must be expressed that the place is where the Figure is located. This is illustrated in (30) below.

¹¹ This interaction of mapping principles is the focus of research into the the role of FoRs in spatial description as well as the motivations behind speakers choice of mapping strategies in Pérez Báez 2011.



On the basis that the referential Ground for identifying a place is frequently an object, mapping of the PLACE function into a LOCATIVE function by a relator can be added to Jackendoff’s composition. Thus, in the sentence *the ball is under the chair* two separate conceptual functions are at play as in (31) where PLACE maps into the LOCATIVE function by a relator, and the LOCATIVE function in turn maps into a STATE by a locative predicate.



This sequence of function mapping mirrors the progression of semantic extension in (31) where I elaborate on the diachronic chain proposed in Heine 1997.

(32) body part > object part > generalized object part > spatial region > locative relation

Before discussing (32), it is useful to review Heine’s explanation of the development from source to target concept:

When a body-part noun like ‘back’ is recruited for the expression of the concept ‘back’, it is likely to refer first to the body-part region concerned before its use is extended to denote the back region of inanimate objects. A new stage is reached when the body-part term refers to the region immediately adjacent to that object, and, finally, the term denotes the space adjacent to, but detached from the object (1997:44).

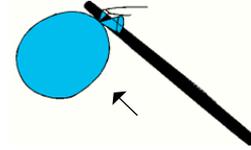
(32) is formulated exclusively for those instances where BP terms –the focus of this study– serve as the lexical sources for spatial relators. It introduces the notion of generalized object part, which for the purposes of this study, I will define as an instance where the analogical mapping involved in the use of BP terms as object parts is no longer required, as in the case of the ball in Figure 3. Instead, the BP term is applied on the basis of an FoR, since projections of spatial regions necessarily involve FoRs.

4.1 BP terms as THING-denoting terms

This section shows that neither spatial regions nor locative relations are encoded in BP terms used in spatial description. BP terms in JCH are considered to be primarily THING-denoting terms as they refer to parts of the body of a human or animal. This was discussed in section 3. First, BP terms used as ASRs may function as arguments of action verbs. Compare for illustration (33) where *ike* ‘head’ refers to the body part itself, and functions as a core argument of the verb *to hurt*, and (34) where it heads a Ground phrase.

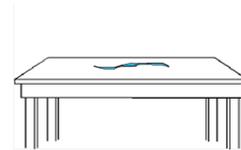
- (33) ka-yúuba ike!7
 prg-hurt head.1pos
 ‘my head hurts’

- (34) lii*bi beji*ga ike ti+ ba*ra
 tied balloon head a+ stick
 ‘the balloon is tied to a stick’

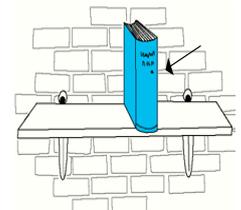


Also, a number of BP terms are extended by structural and functional analogy to refer to object parts. This was discussed in section 3 and is exemplified in (35) below where the BP term is also an argument of the verb *to break*. (36) is offered for comparison purposes.

- (35) Fa!n gu-ndaa* lu^ mezha!7
 John cmp-break face table
 ‘John broke the table top’

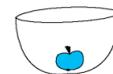


- (36) lu ti+ ta*bla nuu* ti^+ li*bru
 face a+ plank exist a+ book
 ‘there is a book on the shelf’



Second, Ground phrases headed by BP-derived ASRs do not distinguish between Locative or Path relations. (37) to (39) illustrate the use of one and the same ASR, *ndaani* ‘stomach’, in locative (37), goal (38), and source (39) functions, showing that JCH exhibits path/location-neutrality in Ground phrases.

- (37) Location:
 nuu* ti^+ mansa*na ndaani ti+ bladu!7
 exist a+ apple stomach a+ dish
 ‘there's an apple inside a bowl’



- (38) Goal:
 b.y.uu Ana ndaani yoo
 cmp.mdp.enter Ana stomach house
 ‘Ana went inside the house’

- (39) Source:
 zaa k.w.ee* +ka^7 +be* ba^7du +ka! nda^ani +be*
 allow prg.extract +pl +3 child dei stomach +3
 ‘let them extract the child out of her (by c-section)’

Third, the spatial region projected from the part of the ground selected by the ASR is not lexically specified either, but pragmatically construed. To recall Heine’s diachronic chain of

Semantics of Body Part Terms in Juchiteco Locative Descriptions

semantic extension in (32), I have shown that in addition to analogical mappings, speakers extend the use of the core set of BP terms to denote generalized object parts based on a mapping along generating axes and on FoRs. However, BP terms in JCH do not encode any of the later phases in Heine’s progression, notably spatial regions and locative or path relations. Examples (40) and (41) (from (25) repeated here for convenience), give initial evidence of this, as they show that the same spatial region is named differently depending on the morphology of the Ground. The Ground in (40), a lake, having no upper tip or end, cannot motivate the use of *ike* ‘head’ and renders it unacceptable, unlike in (41). Conversely, the use of *lu* ‘face’ in (41) in relation to a house would refer to its façade and would be unacceptable in a description of the image in question.

- (40) a. dxi!7ba za lu nisa
 raised.over cloud face water
 ‘the cloud is over the lake’
- b. *dxi!7ba za ike nisa
 raised.over cloud head water



- (41) dxi!7ba za ike yoo
 raised.over cloud head house
 ‘the cloud is over the house’

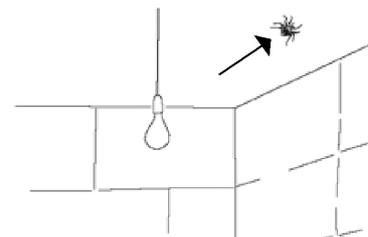


Further, one and the same BP term can be used to describe a variety of different locative relations. *ike* ‘head’ is used in both (42) where the Figure is on top of the Ground, and in (43) where the Figure is underneath the Ground. If BP terms in JCH did encode spatial regions, we would not expect the same BP to be used to refer to more than one Figure-Ground relation. In the case of (42) and (43), *ike* is not encoding a spatial relation but is simply THING-denoting and thus making reference to the Ground as the uppermost part of the house.

- (42) dxi!7ba +be* i^ke yoo
 mounted +3 head house
 ‘he is on top of the house’



- (43) bi!dxi*=gi^ dxi!7ba ike yoo
 spider mounted head house
 ‘the spider is on the ceiling’



It follows to search for the motivation for the apparent obligatoriness of BP terms in the BLC if it is not the encoding of locative relations. I propose that spatial relations are encoded,

not by specific lexical items, but rather by the PLACE slot in the Ground phrase which must be obligatorily filled. Further, there is no overt marking in the Ground phrase indicating whether mapping of the THING function to PLACE function has occurred. Therefore, ambiguities may occur in cases such as (42) and (43) above, and (44) below. While (44) was offered in response to the stimulus shown below, the sentence is ambiguous as to whether the belt is around the woman's abdomen or whether it is in her stomach as if she had swallowed it. These sentences can be explained as instances where no mapping of the THING function to the PLACE function has occurred and the BP term is strictly THING-denoting and therefore referring to a part of the Ground object.

- (44) *nuu** +ti^ *sinin-do!rr* *ndaani* +be*
 exist +a belt stomach +3
 'She has a belt around her belly'
 OR
 'She has a belt in(side) her belly'



These ambiguities are eliminated when the Ground is an inanimate object and BP terms are used in reference to generalized object parts. In these cases, the analogical mapping between the source and the target domains ceases to be required.¹²

5. Conclusion

The corpus of spatial descriptions in JCH analyzed has provided an inventory of BP terms as well as evidence of the system of semantic extension in which they function as adnominal spatial relators. It has been shown that not all BP terms can be extended to denote anything other than a BP whether human or animal. Some denote object parts and only a core set of six BP terms are extended to denote generalized object parts. Data which is ambiguous as to the locative or path relations they describe suggest that spatial relations and locative relations are not encoded by specific lexical items. The analysis offered here has been limited to the semantics of BP terms for the sake of scope management, yet it has made it evident that the study of spatial descriptions in JCH must look beyond BP terms. Indeed, non-BP-derived ASRs remain to be studied in the same vain. Also, an adequate understanding of Figure-Ground relations demands directing attention to the role of FoRs in spatial description. Further, the contribution of elements outside the Ground phrase, namely positionals, should be researched as to understand the division of labor between the relevant elements in the BLC. It is my hope that this paper represents a first step, yet a decisive one, in engaging in in-depth research of space in JCH, and that by appearing alongside contributions by researchers specializing in Zapotec languages, this field of study will see a much deserved surge in interest and dedication.

¹² Elements outside the Ground phrase also play a role in disambiguation, namely the predicate. In (43), replacing *nuu** 'exist' with *zhi!7* 'tight' eliminates the ambiguity. This is mentioned only as a footnote in keeping with the scope of this paper.

References

- Bouquiaux, Luc and Jacqueline H. C. Thomas (eds.). [no date]. *Etnolingüística: Metodología y encuestas para el trabajo de campo*. Translated and adapted by Perla Petrich and Jesús García Ruiz. Peeters-SELAF. France. ms.
- Brugman, Claudia Marlea. 1981. The use of body-part terms as locatives in Chalcatongo Mixtec. *Survey of Californian and Other Indian languages* 4:235-90.
- Brugman, Claudia Marlea, & Monica Macaulay. 1986. Interacting semantic systems: Mixtec expressions of location. *Berkeley Linguistics Society* 12:315-27.
- Gentner, D. 1983. Structure-mapping: A theoretical framework for analogy. *Cognitive Science*, 7, 155-170. (Reprinted in A. Collins & E. E. Smith (Eds.), *Readings in cognitive science: A perspective from psychology and artificial intelligence*. Palo Alto, CA: Kaufmann).
- Heine, Bernd. 1997. *Cognitive Foundations of Grammar*. Oxford: Oxford University Press.
- Jackendoff, Ray S. 1996. The architecture of the linguistic-spatial interface. In *Language and space*. Ed. by Paul Bloom. Cambridge Massachusetts: MIT Press.
- 1983. *Semantics and cognition*. Cambridge, Massachusetts: MIT Press.
- Jiménez Girón, Eustaquio. 1980. *Guía Gráfico-Fonémico para la Escritura y Lectura del Zapoteco*. Juchitán: Editorial Victoria Yan.
- Landau, Barbara and Ray Jackendoff. 1993. "What" and "where" in spatial language and spatial cognition. In *Behavioral and brain sciences* 16, p. 217-265. New York: Cambridge University Press.
- Levinson, Steve. C. 1994. Vision, shape, and linguistic description: Tzeltal body-part terminology and object description. In S. C. Levinson & J. B. Haviland (eds.), *Space in Mayan languages*. Special issue of *Linguistics* 32 (4): 791-856.
- 1996. Frames of reference and Molyneux's Question: Crosslinguistic evidence. In: Bloom, P., Peterson, M. A., Nadel, L., Garrett, M. F. (Eds.), *Language and space*. MIT Press, Cambridge, MA, 109-169.
- Levinson, S. C., Meira, S., and The Language and Cognition Group, 2003. 'Natural concepts' in the spatial topological domain – adposition meanings in crosslinguistic perspective. *Language* 79, 485-516.
- MacLaury, Robert E. 1989. Zapotec body-part locatives: prototypes and metaphoric extensions. In *International Journal of American Linguistics*, vol. 55, no. 2, p. 119-154. Chicago, Illinois: The University of Chicago.
- Miller, George A. and Philip Nicholas Johnson-Laird. 1976. *Language and perception*. Cambridge, Massachusetts: Belknap Press of Harvard University Press.
- Jiménez Jiménez, Eneidino and Vicente Marcial Cerqueda. 1997. *Neza Diidxa': ni gacane* binnihuanisi gu'nda, gucaa ne gu'i' diidxaza** / *Vocabulario zapoteco: auxiliar del modelo pedagógico de diálogo cultural y alfabetización*. Centro de Investigación y Desarrollo, Binniza*, A.C. Juchitán, Oaxaca, México.\
- O'Meara, Carolyn and Gabriela Pérez Báez. 2011. Spatial frames of reference in Mesoamerican languages. In *Spatial frames of reference in languages of Mesoamerica*. Ed. by O'Meara, Carolyn and Gabriela Pérez Báez. *Language Sciences* 33, 837-852.
- Pérez Báez, Gabriela. 2011. Spatial frames of reference preferences in Juchitán Zapotec. In *Spatial frames of reference in languages of Mesoamerica*. Ed. by O'Meara, Carolyn and Gabriela Pérez Báez. *Language Sciences* 33, 943-960.
- Pickett, Velma B. and others. 1971. *Vocabulario zapoteco del istmo : castellano-zapoteco y zapoteco-castellano*. Instituto Lingüístico de Verano and Secretaría de Educación Pública.
- Talmy, Leonard. 2000. *Toward a cognitive semantics. Volume I*. Cambridge, Massachusetts; London, England. The MIT Press.

Gabriela Pérez Báez

Department of Anthropology
National Museum of Natural History, Smithsonian Institution
MRC 112
PO Box 37012
Washington, DC 20013-7012

perezbaezg@si.edu