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The Categorical Status of Body Part Prepositions  
in Valley Zapotec Languages

A thesis submitted in partial satisfaction of the  
requirements for the degree Master of Arts  
in Linguistics

by

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## TABLE OF CONTENTS

<i>Title Page</i>	<i>i</i>
<i>Signature Page</i>	<i>ii</i>
<i>Table of Contents</i>	<i>iii</i>
<i>Table of Tables</i>	<i>vi</i>
<i>Table of Figures</i>	<i>vii</i>
<i>List of Abbreviations</i>	<i>viii</i>
<i>Acknowledgements</i>	<i>ix</i>
<i>Abstract of the Thesis</i>	<i>x</i>
1. Introduction	1
1.1 The Languages	1
1.2 The Data Sources	2
1.2.1 Orthography	4
1.3 The Phenomenon	6
2. The Syntax of Body Part Prepositions	10
2.1 Possessed Body Parts	10
2.2 Body Part Prepositions	11
2.2.1 Other Prepositions	12
2.3 Evidence from Intransitive Verbs	14
2.4 Evidence from Categorial Selection	16
2.5 Evidence from Coordination	18
2.6 Semantically Infelicitous Body Part Constructions	18
2.6.1 Semantically Infelicitous Possessed Body Parts	18
2.6.2 Body Part Prepositions as a Synchronically Closed Class	20
2.6.3 Mismatch Between Location of Figure and Body Part of Ground	20
2.6.4 Irrelevance of Orientation of Ground	22
2.7 Explanation for Ambiguous Sentences	22
2.8 Directionals	25
2.9 Semantic Change and Syntactic Reanalysis	27

2.9.1	Basic Meaning	27
2.9.2	Metaphorical Extension	28
2.9.3	Projecting Space	29
2.9.4	Syntactic Reanalysis	30
3.	Valley Zapotec Colonial Documents	32
3.1	Examples of Body Part Nouns	35
3.1.1	<i>Lao</i> 'face'	35
3.1.2	<i>Rua</i> 'edge'	36
3.1.3	<i>Queque</i> 'head'	37
3.1.4	<i>Ni</i> 'foot'	37
3.1.5	<i>Cue</i> 'side'	38
3.2	Examples of Body Part Prepositions	39
3.2.1	<i>Lao</i> 'before, to, in, etc.'	39
3.2.2	<i>Lani</i> 'in'	41
3.2.3	<i>Rua</i> 'at the edge of'	43
3.2.4	<i>Xana</i> 'under'	43
3.3	Conclusion	43
4.	Child Acquisition of Body Part Terms in SLQZ	44
4.1	Participants	45
4.2	Experimental Design	45
4.2.1	Pre-test	48
4.2.2	Body Part Test	49
4.2.3	Body Part Locative Test	52
4.3	Results	56
4.3.1	Manuel	56
4.3.2	Lorena	56
4.3.3	Andrea	57
4.3.4	Vanesa	58
4.4	Discussion of Results	59

4.4.1 Dissociation between Acquisition of Body Parts and BP Locatives	60
4.4.2 Comparison with Cross-linguistic Acquisition of Prepositions	64
4.5 Conclusions	65
5. Conclusions	65
References	67

## TABLE OF TABLES

Table 1. Consonant Inventory of Valley Zapotec Languages in Orthography	4
Table 2. Vowel Inventory of Valley Zapotec Languages in Orthography	5
Table 3. Body Part Terms and Meanings	7
Table 4. Possessed Body Parts in Valley Zapotec Languages	11
Table 5. Body Part Terms Used in Locative Constructions	12
Table 6. Spanish Prepositions in SLQZ	13
Table 7. Native Non-Body Part Prepositions in SLQZ	13
Table 8. PP and NP Analysis of <i>ni'ih me'es</i>	16
Table 9. Body Part Terms and their Range of Meanings	29
Table 10. Colonial Valley Zapotec Documents	33
Table 11. Number of Body Part Terms in Colonial Valley Zapotec Documents	35
Table 12. Body Part Terms Tested	46
Table 13. Pre-test	49
Table 14. Body Part Test	51
Table 15. Body Part Preposition Test	55
Table 16. Results for Lorena 6;4	57
Table 17. Results for Andrea 2;3	58
Table 18. Results for Vanesa 1;6	59
Table 19. Comparison of Acquisition of Prepositions	60
Table 20. SLQZ Acquisition of Body Part Terms	61
Table 21. Production of Body Part Locatives in SMTZ	62
Table 22. Body Parts and Locatives used by SMTZ acquiring child 2;9	63
Table 23. Cross-Linguistics Order of Acquisition for Prepositions	64

## TABLE OF FIGURES

Figure 1. Map of Mexico	2
Figure 2. Tlacolula de Matamoros and the Surrounding Area	3
Figure 3. Snake on Upside-down Car	21
Figure 4. Baby Sitting Beside Leg of Table	21
Figure 5. Snake under Car	23
Figure 6. Snake under Upside-down Car	23
Figure 7. Body Part Nouns Extended to Parts of Tables	28
Figure 8. Sample Picture Pair for Body-Part Test: <i>Cu'an gue'ehcy bìunny?</i> (head)	46
Figure 9. Sample Picture Pair from Pre-Test: <i>Cu'an bèe'cw?</i> (dog)	49
Figure 10. Sample Picture Pair from Body Part Preposition Test: <i>Cu'an bèe'cw nih zùub ni'ih me'es?</i> 'Where is the dog that is under the table?	53
Figure 11. Sample Picture Pair from Body Part Preposition Test: <i>Cu'an pelo't nih nà'tga'ah dehts gyizhi'iily?</i> 'Where is the ball that is behind the chair?'	54



## LIST OF ABBREVIATIONS

-	morpheme boundary	LOC.VERB	locational verb
=	clitic boundary	MZ	Mitla Zapotec
√	grammatical, but not volunteered by speaker. Suggested by me and approved and repeated by speaker	N	noun
*	ungrammatical	NEU	neutral aspect
#	syntactically grammatical, but semantically infelicitous	NOM	nominalizer
<< >>	enclose hypothetical forms	NP	noun phrase
1p	first person plural	P	preposition
1s	first person singular	PERF	perfective aspect
3	third person	PL	plural marker
3inan.dst	third person inanimate distal	POSS	possessed
AT	non specific locative head	PP	prepositional phrase
BP	body part	PROG	progressive aspect
BPP	body part preposition	REL	relative pronoun
DEF	definite aspect	SJGZ	San Juan Guelavía Zapotec
DP	determiner phrase	SLQZ	San Lucas Quiaviní Zapotec
FOC	focus	SMTZ	San Marcos Tlapazola Zapotec
HAB	habitual aspect	TMZ	Tlacolula de Matamoros Zapotec
IRR	irrealis aspect	VZ	Valley Zapotec
loc	located		

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ABSTRACT OF THE THESIS

The Categorial Status of Body Part Prepositions  
in Valley Zapotec Languages

by

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This thesis examines the categorial status of body part prepositions in the Zapotec languages of the Tlacolula Valley, drawing data from several languages, primarily Tlacolula de Matamoros Zapotec and San Lucas Quiavini Zapotec. I argue that the body part terms used in locative expressions, though identical in form to the nouns for body parts, are not syntactically nouns. I present three main types of evidence that these body part terms have been reanalyzed and grammaticized as prepositions: syntactic and semantic evidence from modern Valley Zapotec language; data from colonial Valley Zapotec documents; and evidence from child language acquisition. I propose a possible series of semantic changes and syntactic reanalysis that could account for the development of body part prepositions in the Valley Zapotec languages.

# The Categorical Status of Body Part Prepositions in Valley Zapotec Languages

## 1. Introduction<sup>1</sup>

This thesis examines the categorical status of body part prepositions in the Zapotec languages of the Tlacolula Valley, drawing data from several languages, primarily Tlacolula de Matamoros Zapotec and San Lucas Quiavini Zapotec. I argue that the body part terms used in locative expressions, though identical in form to the nouns for body parts, are not syntactically nouns. I present four main types of evidence that these body part terms have been reanalyzed and grammaticized as prepositions: syntactic evidence, data from Colonial Valley Zapotec documents, evidence from child language acquisition, and a proposal of a possible series of semantic changes and syntactic reanalysis.

### 1.1 The Languages

Zapotec languages belong to the Otomanguean stock and are spoken in Oaxaca, Mexico, and by many immigrants in the greater Los Angeles area. This thesis presents data from several Valley Zapotec languages: Tlacolula de Matamoros Zapotec (TMZ), San Lucas Quiavini Zapotec (SLQZ), San Juan Guelavía Zapotec (SJGZ), and Mitla Zapotec (MZ). Oaxaca City (labeled Oaxaca) can be located near the southern extreme of Mexico in Figure 1. The Tlacolula Valley, approximately 30 km to the southeast of Oaxaca City, is presented in Figure 2.

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<sup>1</sup> Papers based on parts of this thesis will appear as Lillehaugen (to appear a and to appear b).

Figure 1. Map of Mexico (adapted from Virtual Mexico 2002)



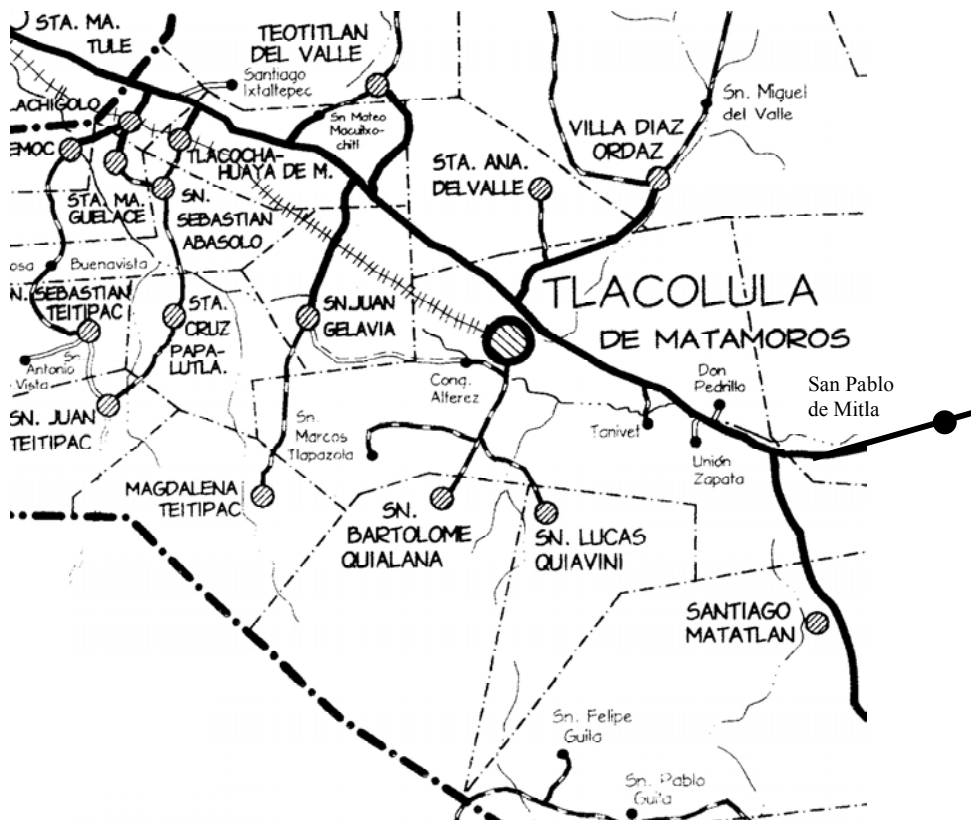
## 1.2 The Data Sources

I will be referring to the language group that contains TMZ, SLQZ, SJGZ, and MZ as Valley Zapotec (VZ). VZ contains the languages classified by the Ethnologue (Grimes et al. 1996) as San Juan Guelavía Zapotec (Western Tlacolula Zapotec, Guelavía Zapotec, code ZAB). Mitla Zapotec (Ethnologue's East Central Tlacolula Zapotec, East Valley Zapotec, code ZAW) is closely related to, but does not belong to, the VZ language group.

TMZ is a previously undocumented language. I began my fieldwork on this language in August 1999 and all of the data from TMZ comes from my unpublished field notes.

SLQZ has been described in a dictionary by Pamela Munro and Felipe Lopez (Munro, Lopez, et al. 1999), dissertations by Felicia Lee (1999) and Michael Galant (1998), and a thesis by Olivia Méndez [Martínez] (2000), as well as in several articles by Munro (e.g. Munro 1996, 2002). The SLQZ data in this paper come both from the dictionary and from Munro's and my unpublished field notes on this language.

**Figure 2. Tlacolula de Matamoros and the Surrounding Area** (adapted from García García et al. n.d.)



The New Testament has been translated into SJGZ by Ted Jones (Liga Bíblica 1995). He and his colleagues have written on its phonology (Jones and Knudson 1977) and pronoun system (Jones and Church 1985). Olivia Martínez is currently doing

extensive fieldwork on this language (Martínez, in progress). All of the SJGZ data in this thesis come from Martínez's, Munro's, and my unpublished field notes.

Morris and Carol Stubblefield have produced a dictionary (Stubblefield and Stubblefield 1991) and a collection of texts (1994) for Mitla Zapotec. All of the MZ data in this thesis come from these sources.

Although all of these Zapotec languages should be considered endangered since they are losing speakers faster than they are gaining them, TMZ seems the most critically endangered: there are most likely no more than several hundred speakers of TMZ, and to my knowledge, the youngest speakers are in their 50s.

### 1.2.1 Orthography

All of the VZ data will be presented in the orthography developed by Munro and Lopez, et al. (1999) for SLQZ. Table 1 summarizes the consonant inventory of these languages. *F* and *j* are in parenthesis because they are found only in loan words. The sounds in the shaded boxes are not found all VZ languages.

**Table 1. Consonant Inventory of Valley Zapotec Languages in Orthography**

		bilabial	labio-dental	alveolar	alveo-palatal	palatal	retro-flex	velar	glottal
stop	fortis	p		t				c/qu	
	lenis	b		d				g/gu	
fricative	fortis		(f)	s	x		x:		(j)
	lenis			z	zh		zh:		
affricate	fortis			ts	ch		tx:		
	lenis			dz	dzh				
nasal	fortis	mm		nn				ng	
	lenis	m		n				nng	
lateral	fortis			ll					
	lenis			l					
trill				rr					
flap				r					
glide		w				y			

VZ languages have six vowels, as presented in Table 2.

**Table 2. Vowel Inventory of Valley Zapotec Languages in Orthography**

	front	back	
	unrounded	unrounded	rounded
high	i	ɛ̃	u
mid-high	e		o
low		a	

These vowels can have different tones: high, low, falling, and rising; and four different phonation types. For SLQZ, Munro and Lopez et al. (1999) describe thirty-three different combinations of vowel phonations<sup>2</sup> as they occur in a vowel complex in the key syllable of a word. The following symbols are used in the orthography in relation to phonation: ` above creaky vowels, *h* after breathy vowels, ' after checked vowels. When *ɛ̃* is creaky, it is marked with a circumflex: *ê*. Munro and Lopez et al. (1999) describe tone as predictable for any given phonation sequence.

For a detailed discussion of the phonemes and their allophones, please refer to Munro and Lopez, et al. (1999).

Zapotec languages are head initial languages and most sentences have the constituent order VSO, although the order SVO is also very common, especially for TMZ. Consistent with head initial typologies, possessed noun phrases precede their

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<sup>2</sup> Munro and Lopez, et al. (1999) state, “Our analysis of SLQZ tone and phonation is ongoing. We suspect that there may be several different rising and falling tone contours. Further, two aspects of the description of vowel phonation... are subject to revision depending on later discoveries.”



possessor (1a), and prepositions precede their objects (1b). (Explanations for abbreviations can be found in the forward material.)

- (1) a. **Ni'ih me'es** guù'ch.  
 foot table PERF.break  
 The leg of the table broke.
- b. Bèe'ecw ca-cabiecy **càaan gezhi'iilly**.  
 dog PROG-run around chair  
 'The dog is running around the chair.'

### 1.3 The Phenomenon

The use of body part (BP) terms in locative expressions is an areal feature of Meso American languages. (2-4) below are a few examples from TMZ where the same word is used to refer to a body part (in the examples labeled (a)) and in a locative construction (in the ones labeled (b)). (Where I have glossed BP terms in all capital letters, I mean to abstract away from the syntactic category in the gloss. For example *dehts* glossed as 'back' means the BP noun; glossed as 'behind' means the preposition; glossed as BACK means that for that particular gloss, I have not specified whether the word is syntactically a preposition or a noun.)

- (2) a. R-zabyùu'b **ni'=a'**. (TMZ)  
 HAB-hurts foot=1s  
 My foot hurts.
- b. Nàa're' n-u'=a' **ni'ih** me'es. (TMZ)  
 I NEU-be.loc=1s FOOT table  
 I am under the table.
- (3) a. R-ahc **làa'iny=a'**. (TMZ)  
 HAB-hurts stomach=1s  
 My stomach hurts.

- b. Nàa're' zòob=a' **làa'iny** co'ch. (TMZ)  
 I NEU.sit STOMACH car  
 I am sitting in the car.
- (4) a. R-ahcnah **lù<sup>3</sup>=a'** (TMZ)  
 HAB-hurts face=1s  
 My face hurts.
- b. Nàa're' zòob=a' **loh** me'es. (TMZ)  
 I NEU.sit=1s FACE table  
 I am sitting on the table.

All of the BP terms used in locative constructions such as these are presented in Table 3 below, along with their locative meanings, which have been simplified for this table. The locative meanings of the words differ not only from language to language, but in a few instances from speaker to speaker within the same language. For some SLQZ speakers, *cwe'eh* cannot be used as a human body part. For more discussion of this, see Section 2.1.

**Table 3. Body Parts Terms and Meanings**

TMZ	SLQZ	body part meaning	locative meaning
cwe'eh	cwe'eh (95)	'side'	'beside'
dehts	dehts (104)	'back'	'behind'
guë'ëhcy	gue'ehcy (123)	'head'	'on top of'
làa'iny	làa'iny (142)	'stomach'	'in'
lohoh	lohoh (156)	'face'	'on, in front of'
nnaàa'	nnaàa' (192)	'hand'	'on' (a branch)
ni'ih	ni'ih (181)	'foot'	'under, beneath'
ru'uh	ru'uh (303)	'mouth'	'at the edge of'
têë'ix	têë'ix (343)	'chest'	'beside'
zh:àa'	zh:àa' (383)	'bottom'	'behind, under'
zh:àa'cw	zh:àa'cw (383)	'upper arm'	'on' (a branch)
zh:àaa'n	zh:àaa'n (384)	'bottom'	'behind, under'

Numbers in parentheses following the TMZ and SLQZ words refer to page numbers in Munro, Lopez, et al. (1999).

<sup>3</sup> VZ languages exhibit complex phonological alternations in verb and noun paradigms, of which the change from *loh* to *lù=* is typical. I will not discuss these here.

Some linguists studying Zapotec languages have assumed that BP locatives are nouns and that the locative meaning is derived through metaphorical extension. In a paper which explains in great detail the metaphorical system employed in the use of body parts as locatives, MacLaury (1989) says of Ayoquesco Zapotec:<sup>4</sup>

[the] body-part locatives are not prepositions, because there is no justification for setting them apart from their primary classification as nouns. Unlike English prepositions, they are identical in form to the nouns applied to body organs, their use in syntax is optional, they only add specificity to other locative expressions, they do not complicate syntax, they do not denote direction, and they do not mark grammatical relations as do case markers (120).

It is important to note that MacLaury's comment is only a footnote in a paper which describes the system of metaphor. The focus of his paper is not to justify his assertion regarding the syntactic status of these words. Jensen de López (2002), who studies acquisition of San Marcos Tlapazola Zapotec, states:

Where English employs prepositions, Zapotec relies... on human body part nouns in referring to the spatial relationship between a trajectory and a landmark object. Zapotec body-part spatial terms are nouns or noun-derived items which are identical to the nouns used for referring to human body parts... The grammatical and semantic systems of the SMT Zapotec BP terms are grammatically and semantically very different from that of Indo-European prepositions (123).

However, the categorial status of the BP prepositions is not the focus of her paper, either. To my knowledge, there has been no work done directly on the categorial status of the BP terms as locatives in any Zapotec language.

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<sup>4</sup> Ayoquesco Zapotec is spoken in "Santa María Ayoquesco de Aldama, District of Zimatlán, Oaxaca, Mexico... in the southern extreme of the Valley of Oaxaca" (MacLaury 1989: 119).

Other linguists have commented on the semantic variation of these words in their dictionaries. Munro, Lopez, et al (1999) say of SLQZ that:

There are two classes of Zapotec prepositions. Many basic prepositional ideas are expressed with body part words...; the prepositional object is expressed either with a possessive pronominal agreement clitic or with an overt noun following the preposition. Such prepositions... are identified in the Dictionary as "prep." (24).

For MZ, Stubblefield and Stubblefield (1991) claim that:

Hay dos clases de preposiciones: las que en sí son preposiciones y los sustantivos usados adicionalmente como preposiciones... Algunos sustantivos que se refieren a las partes del cuerpo y que siempre se presentan con poseedor se usan con un significado más amplio como preposiciones, para expresar una relación de ubicación. *There are two classes of prepositions: those which are indeed prepositions, and nouns which can be used additionally as prepositions. Some nouns which refer to parts of the body and which always appear with a possessor are used with an extended meaning as prepositions, in order to express a locative relationship*<sup>5</sup> (244).

In this thesis I argue that VZ BP prepositions are not so different from English prepositions like *before*, *behind*, *beside*, and *inside*, which contain overt (though perhaps antiquated) body part words. The use of a preposition in any given sentence is not optional; the preposition can be the only morpheme in the sentence that specifies location. Classifying these terms as prepositions in the syntax of these languages provides for the simplest account of their syntactic distribution. I contend therefore, that although these words historically developed from the BP terms, synchronically they are syntactically distinct.

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<sup>5</sup> Thanks to Heriberto Avelino, Xochitl Flores, Olivia Martínez, and Pamela Munro for their help with the translation of the Spanish.

## **2. The Syntax of Body Part Prepositions**

### **2.1 Possessed Body Parts**

Body part nouns in VZ languages are inalienably possessed. They require a possessor, which is expressed with a bound pronominal clitic corresponding to the person and number of the possessor.

Table 4 below shows possessed forms for each of the BP words in question for VZ languages. Note that *cwe'eh* 'side' does not seem to be a body part word in SJGZ and for some speakers of SLQZ, evidenced by the fact that some speakers cannot say *cwi'a'* to mean 'my side', although this means 'beside me.' This ungrammaticality is marked with an asterisk before the ungrammatical form. All of the forms are first person possessed forms, except for the MZ words, which are presented in the table as unpossessed; I have included them in this table because the dictionary (Stubblefield and Stubblefield 1991) lists them as obligatorily possessed.

**Table 4. Possessed Body Parts in Valley Zapotec Languages**

	TMZ	SLQZ	SJGZ	MZ
'side'	cwe'eya'	*cwi'a' (95)	*cwèe'eya'	cüa' (16)
'back'	de'tsa'	de'tsa' (104)	detsa'	dejtz (18)
'head'	guë'ëcya'	gue'ecya' (123)	quiàa'	yejc (130)
'stomach'	làa'inya'	làa'inya' (142)	làa'inya'	--
'face'	lùa'	lùa' (156)	lua'	loj (40)
'foot'	ni'a'	ni'a' (181)	ni'a'	ni' (48)
'hand'	nnaàa'	nnaàa'	nnaàa'	nna (49)
'mouth'	ru'a'	ru'a' (303)	ru'a'	ro' (83)
'chest'	têë'ixa'	tèe'ixa'	tëë'xa'	tiejxh 'body' (119)
'bottom'	zh:aàa'	zh:aàa' (383)	zhààa'	xhajn (123)
'upper arm'	zh:àa'cwa'	zh:àa'cwa'	zh:ùucni'	xhajcw (123)
'bottom'	zh:àa'na'	zh:àa'na' (384)	zh:àa'na'	--
'nose'	zhi'a'	zhi'a'	zhi'a'	xi' (121)

The number following the Zapotec words refers to the page number in the corresponding dictionary. The SJGZ data was provided by Martínez (personal communication). "--" mark cells in which no cognate could be found.

Table 4 demonstrates that every body part word under consideration is undeniably a body part word in each language; *cwe'eh* 'side' is the only exception to this, and the fact that it can be used as a body part word in some VZ languages, but not others, is very interesting.

## 2.2 Body Part Prepositions

Just as Table 4 confirmed the status of the words as body parts, Table 5 seeks to confirm the use of these words in locative constructions. The term appears in bold if it is used in locative constructions in the given language, and appears in plain type if I have no evidence that it can be used in a locative construction in that language.

**Table 5. Body Part Terms Used in Locative Constructions**

	TMZ	SLQZ	SJGZ	MZ
'side'	<b>cwe'eh</b>	<b>cwe'eh</b> (95)	<b>cwe'eh</b>	<b>cüa' (16)</b>
'back'	<b>dehts</b>	<b>dehts</b> (104)	<b>dehts</b>	<b>dejtz (18)</b>
'head'	<b>guë'ëhcy</b>	<b>gue'ehcy</b> (123)	<b>quia</b>	<b>yejc (130)</b>
'stomach'	<b>làa'iny</b>	<b>làa'iny</b> (142)	<b>làa'iny</b>	--
'face'	<b>loh</b>	<b>loh</b> (156)	<b>lo</b>	<b>loj (40)</b>
'foot'	<b>ni'ih</b>	<b>ni'ih</b> (181)	<b>ni'i</b>	<b>ni' (48)</b>
'mouth'	<b>ru'uh</b>	<b>ru'uh</b> (303)	<b>ru'u</b>	<b>ro' (83)</b>
'bottom'	<b>zh:àa'</b>	<b>zh:àa'</b> (383)	<b>zh:àa'</b>	<b>xhajñ (123)</b>
'hand'	<b>nnaàa'</b>	<b>nnaàa'</b>	nnaàa'	<b>naa</b> (49)
'chest'	<b>tëë'ix</b>	<b>tèe'ix</b>	<b>tëë'sh</b>	tiejxh 'body' (119)
'upper arm'	<b>zh:àa'cw</b>	<b>zh:àa'cw</b>	zh:ùuc	xhajcw (123)
'bottom'	<b>zh:ààa'n</b>	<b>zh:ààa'n</b> (384)	<b>zh:àa'n</b>	--
'nose'	<b>zhi'i</b>	zhi'ih	zhi'i	xi' (121)

The number following the Zapotec words refers to the page number in the corresponding dictionary. The SJGZ data was provided by Martínez (p.c.). “--” mark cells in which no cognate could be found.

All of the body part terms above the dark line in Table 5 seem to be used in locative constructions in all four of the VZ languages being discussed here. Below the dark line, the languages vary as to whether they use a particular term in locative constructions. These terms seem to be emerging prepositions in VZ languages, and are not as fully established syntactically or semantically as the BP terms above the dark line: they are much more limited in their meanings. When referring to BP terms in locative expressions throughout the rest of this thesis I am referring to those terms above the line in Table 5, unless otherwise stated.

### 2.2.1 Other Prepositions

There are other prepositions in VZ languages. All of the languages considered here have some prepositions borrowed from Spanish and some native non-BP prepositions. Tables 6 and 7 below give examples of each type from SLQZ. These

tables are not intended to be an exhaustive list of the other types of prepositions, but rather representative examples.

**Table 6. Spanish Prepositions in SLQZ**

	meaning	Spanish origin
<b>a'xta'</b>	until (a time); from, since (a time); as far as, to (a place)	hasta
<b>cēhnn</b>	with	con
<b>co'nnr</b>	against	contra
<b>deh</b>	in the style of, like; (equipped) with; from	de
<b>dehsdeh</b>	to; since	desde
<b>pahr</b>	for; because of; as for; from	para
<b>pohr</b>	for; because of	por
<b>pu'ann</b>	on top of, on the highest point of	punta
<b>sihngg</b>	without	sin
<b>tráhsdeh</b>	in back of	tras de

data from Munro 1998, p.c., Munro, Lopez, et al. 1999

**Table 7. Native Non-Body Part Prepositions in SLQZ**

<b>càa'nta'</b>	along, by
<b>gagyèe'i</b>	around
<b>gahx:</b>	near, close to
<b>gayààa'</b>	along the edge of, around
<b>lài'</b>	through (a group); among; into the middle of
<b>x:tèe'n</b>	of, about, for

data from Munro 1998, p.c., Munro, Lopez, et al. 1999

The native prepositions, including the BP prepositions discussed in this paper and the prepositions in Table 7, take as their object either an overt nominal or a bound pronominal clitic. In this way they differ from the prepositions which have been borrowed from Spanish, like those in Table 6, which require either a free pronoun or an overt nominal as their object (Munro, Lopez, et al. 1999, 24).



### 2.3 Evidence from Intransitive Verbs

There is syntactic evidence that the BP terms used in locative expressions are not nouns. Here I will look at evidence from adjunction in intransitives and categorial selection for locational verbs. Finally, I will use arguments based on these constructions to provide a syntactic explanation for a certain set of ambiguous sentences.

First I will consider intransitive verbs, which by definition do not take complements (excluding cognate objects, e.g. 'I sneezed a loud sneeze'). As can be seen below, intransitive verbs require no complement (4a). Some types of phrases are allowed as adjuncts, such as *làa'iny yu'uh* (4b), but others are not, such as *yu'uh* in (4c). (I will be using \* to mark sentences which are syntactically ungrammatical.)

- (5) a. Ca-yu'ul=na'. (TMZ)  
      PROG-sing=3inan.dst<sup>6</sup>  
      'He is singing.'
- b. Ca-yu'ul=na'           làa'iny           yu'uh. (TMZ)  
      PROG-sing=3inan.dst STOMACH house  
      'He is singing in the house.'
- c. \*Ca-yu'ul=na'           yu'uh. (TMZ)  
      PROG-sing=3inan.dst house

The difference in grammaticality between (5b) and (5c) suggests that *làa'iny yu'uh* 'in the house' and *yu'uh* 'house' are not of the same syntactic category. *Làa'iny yu'uh* 'in the house' can function as an adjunct in the sentence while the noun phrase *yu'uh* 'house'

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<sup>6</sup> The third person inanimate distal pronoun can be used for humans under the right circumstances. Like all VZ languages, the pronominal system of TMZ is very complex, especially in the third person pronouns. My analysis of the pronominal system is ongoing.

cannot, even though it seems as though *yu'uh* 'house' could semantically function as a location for the singing.

Furthermore, example (5b) above clearly shows that it is not the case that body part expressions "only add specificity to other locative expressions" as MacLaury (1989) claims. There is no other locative expression in (5b) beside *làa'iny* 'in.' Consider the following intransitive sentences as well:

- (6) a. N-iga'ye'ihsy=na' cwe'eh yu'uh. (TMZ)  
NEU-sleep=3inan.dst SIDE house  
'He is sleeping beside the house.'
- b. N-iga'ye'ihsy=na' làa'iny yu'uh. (TMZ)  
NEU-sleep=3inan.dst STOMACH house  
'He is sleeping in the house.'
- c. N-iga'ye'ihsy=na' dehts yu'uh. (TMZ)  
NEU-sleep=3inan.dst BACK house  
'He is sleeping behind the house.'

Henceforth I will refer to the two objects involved in a locative relationship as the *figure* and the *ground*. The figure is the object that is located in relation to another object, which is referred to as the ground (Talmy 1985, Levinson 1996). In the sentence *the cat is on the table*, *cat* is the figure and *table* is the ground. There is a one-to-one correspondence between these terms and another pair of terms often used in the field: trajectory (figure) and landmark (ground).

In the examples (6a-c) above the only locative expressions are the BP expressions, and these are the only words that relate the figure and the ground to one another and result in the meaning differences of sentences (6a-c).

## 2.4 Evidence from Categorial Selection

Another piece of syntactic evidence that the BP locatives are prepositions comes from categorial selection (c-selection) of verbs. The ability of verbs to require the complement they select to be of a certain grammatical category is referred to as c-selection. A particular issue with BP prepositional phrases in VZ languages is that they are always phonetically ambiguous with potential possessed nouns, since the object of the preposition follows the preposition and the possessor of the body part follows it, as shown in Table 8.

**Table 8. PP and NP Analysis of *ni'ih me'es***

	<b>ni'ih</b>	<b>me'es</b>	
	under	table	'under the table'
PP:	P	NP	
	<b>ni'ih</b>	<b>me'es</b>	
	foot	table	'the table's foot'
NP:	NP	NP	
	possessed	possessor	

Consider (7a), below, where the verb *zìub* 'sit' c-selects a complement, which I've enclosed in brackets. What is the syntactic category of this phrase? An argument following MacLaury's (1989) assumptions about the status of BP locatives, one could claim that the entire phrase is a noun phrase, analyzed as 'the table's foot'.

However, if this category is nominal, then this verb ought to be able to c-select other NPs as complements, but as shown in (7b) this is not possible. Perhaps the verb has some way to specify that its complement must be a possessed noun. Although this seems unlikely, it is also easy to show that this type of selection also won't work, because then

other possessed nouns should also occur as complements, and as we can see in (7c), this is not possible.

- (7) a. Bèe'cw zùub [ni'ih me'es]. (SLQZ)  
 dog NEU.sit FOOT table  
 'The dog is sitting under the table.'
- b. \*Bèe'cw zùub [me'es]. (SLQZ)  
 dog NEU.sit table  
 intended: 'The dog is sitting by the table.'
- c. \*Bèe'cw zùub [x:-me'es=a']. (SLQZ)  
 dog NEU.sit POSS-table=1s  
 intended: 'The dog is sitting by my table.'
- d. \*Bèe'cw zùub [dyahg me'es]. (SLQZ)  
 dog NEU.sit ear table  
 intended: 'The dog is sitting by the table's ear.'
- e. Zuugwa'ah bèe'cw [cwe'eh me'es]. (SLQZ)  
 NEU.stand dog beside table  
 'The dog is standing beside the table.'
- f. Zuugwa'ah bèe'cw [trahsedeh me'es]. (SLQZ)  
 NEU.stand dog behind table  
 'The dog is standing behind the table.'

So how can the complements of these verbs be classified? It is not the case that these verbs select for nouns in general (see 7b) or for possessed nouns (7c). Instead, these verbs seem to select for phrases that begin with a body part word (7a, 7e), but it is not the case that the phrase can begin with *any* body part word (7d). Rather, these verbs select for a complement that begins with one of the body parts listed in Table 3. To specify that only a closed set of NPs can occur as complements would be stipulative and miss an obvious generalization: these words function differently from other body part words in the syntax; they form a syntactic category and they pattern syntactically (see

Section 2.5) and semantically (see Section 2.6) with other prepositions in the language and therefore should be classified as syntactic prepositions. Notice that non-BP PPs can also be complements of verbs like these, as exemplified in (7f). (These verbs can also take locative proforms, such as 'there', as complements, but these will not be discussed here.)

## 2.5 Evidence from Coordination

It is a syntactic characteristic that only like constituents can be coordinated. The fact that *làa'iny me'es* can be conjoined with *cààan gezhi'iilly* (as in 8), suggests that *làa'iny me'es* must be of the same syntactic category as *cààan gezhi'iilly* in constructions like these. *Cààan* 'around' is a non-BP preposition, like those presented in Table 7.

- (8) a. Bèe'ecw ca-cabiecy cààan gezhi'iilly. (TMZ)  
 dog PROG-run around chair  
 'The dog is running around the chair.'
- b. Bèe'ecw ca-cabiecy làa'iny me'es ne cààan gezhi'iilly.  
 dog PROG-run STOMACH table and around chair  
 'The dog is running under the table and around the chair.'

## 2.6 Semantically Infelicitous Body Part Constructions

This section presents arguments for an analysis of BP locatives as syntactic prepositions that appeal to the semantics of the BP terms when used in locative constructions.

### 2.61 Semantically Infelicitous Possessed Body Parts

Recall from Table 8 that all BP prepositional phrases are potentially ambiguous between two syntactic (and semantic) analyses when presented out of context, namely a possessed NP or a PP. If one were to argue that the BP terms used in locative

constructions are nouns, one would assume that there must be a referent for every NP that arises through the construction of BP term followed by a noun, and the locative meaning of this NP would be derived through metaphorical extension. If the phrase is a NP, then it should be a possible NP even when not used in a locative construction. However, as can be seen in (9) below, this is not the case. Although *ni'ih* is used in the locative expression in (9a), there is no such independent referent as *ni'ih ca'rr* 'the car's foot/feet' (9b), although syntactically *ca'rr* could be functioning as the possessor of the body part it follows. The problem with (9b) is not syntactic, rather semantic. Speakers rejected the possibility that the wheels or tires might be called *ni'ih ca'rr*; I was told that those are not 'the car's feet' (9b), but are called *ya'annt* 'tires' (9c). (I use # to mark sentences which, though syntactically well-formed, are semantically infelicitous.)

- (9) a. N-u'uh      bèe'elld ni'ih ca'rr. (SJGZ)  
 NEU-be.loc snake under car  
 'The snake is under the car.'
- b. # ni'ih ca'rr (SJGZ)  
 foot car  
 'the car's foot'
- c. ya'annt (SJGZ)  
 'tires'

If one were to analyze (9a) assuming that the BP preposition was a noun, the result would be similar to that presented below in (10), in which the verb includes a locational notion and takes a NP complement.

- (10) N-u'uh                      bèe'elld ni'ih ca'rr. (SJGZ)  
 NEU-be.loc.AT snake foot car  
 'The snake is located by the car's foot.' (= 'The snake is under the car.')

But the analysis in (10) suggests that, metaphorically at least, there is a foot of the car, which does not seem to be true.

### **2.6.2 Body Part Prepositions as a Synchronically Closed Class**

Not all possessed body parts can be used in locative constructions (see (7d) above), even if they can be used metaphorically to refer to a part of an object. For example, in SJGZ, *zh:ùu'c* 'arm' can be used to refer to the branch of the tree in a NP meaning 'the tree's arm.' However, this term cannot be used as a preposition in SJGZ. The prepositions comprise a closed class of words and other body parts cannot be used as prepositions, even playfully.

### **2.6.3 Mismatch Between Location of Figure and Body Part of Ground**

Even if the ground has a part that could be referred to with the BP term used in the locative construction, the figure does not have to be located at that position on the ground in order to use that term. In other words, it seems that the nominal and locative meanings do not necessarily coincide as would be expected if the locative uses were nouns with metaphorically extended meanings. For example, in (11a) below 'the head of the car' refers to the hood of the car in SJGZ. However, the figure (in this case, a snake) does not need to be located on *the hood* of the car (the car is the ground) in order to use *quiah* in a locative construction. Example (11b) shows the use of *quiah* in the case where the car is upside-down and a snake is on top of the upside-down car (Figure 3). In this example, we see that the locative expression *quiah* 'on' can refer to relationships between the snake and the car where the snake is not on the hood, even though the hood is the referent of the NP *quiah ca'rr* 'the head of the car'.

**Figure 3. Snake on Upside-down Car**



- (11) a. quiah ca'rr (SJGZ)  
head car  
'the car's head' (the hood of the car)
- b. N-u'uh bèe'elld quiah ca'rr (SJGZ)  
NEU-be.loc snake on car  
'The snake is on the car.' (which is upside down)

Example (12) below shows a further example from TMZ, which refers to the situation presented in Figure 4. In this particular scenario, a baby is seated beside a table leaning against one of the legs of the table, but is not under the table.

**Figure 4. Baby Sitting Beside Leg of a Table**



A leg of the table can be referred to as 'a foot of the table' (12a). Although *ni'ih me'es* does refer to the location where the baby is sitting in Figure 4, (12b), which uses



*ni'ih me'es* is ungrammatical when used to describe this relationship. This is because although as a noun *ni'ih* means 'foot', as a preposition it means 'under', and the baby is not under the table in this scenario, although she is sitting against the table's leg. Both sentences (12c) and (12d) could be used to describe this situation, and the preposition used in both of these sentences is *cwe'eh* 'beside,' either in (12c) as 'beside the table's leg' or in (12d) as 'beside the table.' (I used √ to mark sentences which I suggested to my consultant. He approved these sentences as grammatical and repeated them.)

- (12) a.    *ni'ih me'es* (TMZ)  
           foot table  
           'the leg of a table'
- b.    #*Mii'iny zòob ni'ih me'es.* (TMZ)  
           baby NEU.sit FOOT table  
           'The baby is sitting by the table's leg.'
- c.    *Mii'iny zòob cwe'eh ni' ih me'es.* (TMZ)  
           baby NEU.sit beside foot table  
           'The baby is sitting beside the leg of the table.'
- d.    √*Mii'iny zòob cwe'eh me'es.* (TMZ)  
           baby NEU.sit beside table  
           'The baby is sitting beside (the leg of) the table.'

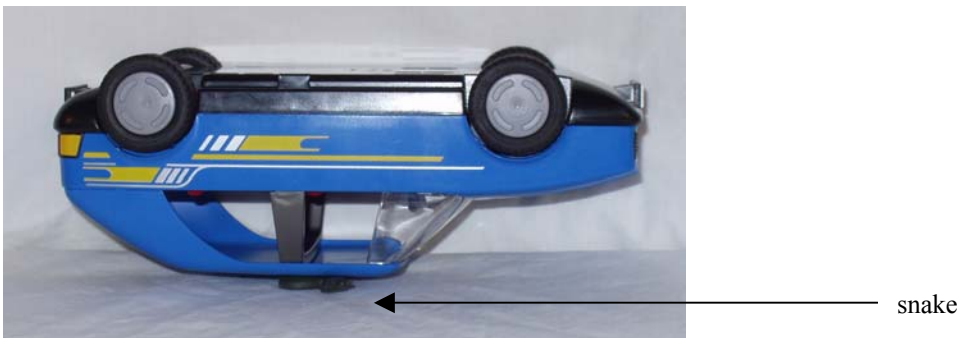
#### 2.6.4 Irrelevance of Orientation of Ground

Finally, the orientation of the ground seems entirely irrelevant for the choice of preposition. (13) describes both Figures 5 and 6. We can see that *ni'ih* can be used to mean 'under' regardless of the orientation of the car, which is in its canonical orientation in Figure 5 and is upside-down in Figure 6.

**Figure 5. Snake under Car**



**Figure 6. Snake under Upside-down Car**



- (13) N-u'uh      bèèe'ld ni'ih ca'rr. (SJGZ)  
NEU-be.loc snake under car  
'The snake is under the car.'  
*Can be used to describe both Figure 5 and Figure 6.*

The choice of preposition is dictated by the relationship between the figure and the ground and not by any potential geography or orientation of the ground. I believe this argues strongly against the analysis of these constructions as possessed NPs, since that analysis would not be able to account for semantic effects such as these.

## **2.7 Explanation for Ambiguous Sentences**

Recognizing that BP prepositions are syntactically distinct from BP nouns also provides explanatory power. Consider sentence (14) below, which is ambiguous between



If one were to analyze BP prepositions as synchronically nouns, one would have to say something additional in order to account for the meaning difference between these sentence, if one wished to derive the semantics from the syntactic structure. By recognizing the structural difference between these two types of sentences, the different semantics is easily accounted for.

## 2.8 Directionals

BP prepositions can be used in directional constructions as well, as exemplified in (17-19) below. In fact, all three verbs in the examples below c-select for PP complements.

- (17) a. Bèe'cw b-yèe'py loh me'es. (TMZ)  
 dog PERF-go.up on table  
 'The dog went up on the table.'
- b. \*Bèe'cw b-yèe'py me'es. (TMZ)  
 dog PERF-go.up table  
 'The dog went up the table.'
- (18) a. Bèe'cw b-tyi'ihš loh me'es. (TMZ)  
 dog PERF-jump on table  
 'The dog jumped onto the table.'
- b. \*Bèe'cw b-tyi'ihš me'es. (TMZ)  
 dog PERF-jump table  
 'The dog jumped onto the table.'
- (19) a. Bèe'cw b-ye'eht loh me'es. (TMZ)  
 dog PERF-get.off from table  
 'The dog got off the table.'
- b. \*Bèe'cw b-ye'eht me'es. (TMZ)  
 dog PERF-get.off table  
 'The dog got off the table.'

If the directional information is contained only in the verb, why would 17b, 18b, and 19b be ungrammatical? These verbs do not select for NP complements, which might be possible if the directional meaning were coded in the verb itself.

In fact, these BP prepositions seem to act much like non-BP prepositions in Zapotec, such as *caàa'n* 'around' in example (20) below. The verbs *cazah* 'is walking' (20a,b,c) and *cardinàall* 'is chasing' (20d,e,f) c-select for PPs. (20a) and (20d) satisfy this selectional restriction with a PP beginning with the preposition *caàa'n* 'around', while (20b) and (20e) satisfy this selectional restriction with PPs beginning with BP prepositions. (20c) and (20f) fail to meet the selectional restrictions of the verb by providing an NP complement *gyizhi'iilly* 'chair', despite the fact that 'chair' can be interpreted as a location for the events described in these sentences (i.e. the ground).

- (20) a. Bèe'ecw ca-zah        **caàa'n** gyizhi'iilly. (TMZ)  
          dog        PROG-walk around chair  
          'The dog is walking around the chair.'
- b. Bèe'ecw ca-zah        **ni'ih** gyizhi'iilly. (TMZ)  
          dog        PROG-walk under chair  
          'The dog walked under the chair.'
- c. \*Bèe'ecw ca-zah        gyizhi'iilly. (TMZ)  
          dog        PROG-walk chair
- d. Bèe'ecw ca-rdinàall    zhye'et **caàa'n** gyizhi'iilly. (TMZ)  
          dog        PROG-chase cat        around chair  
          'The dog is chasing the cat around the chair.'
- e. Bèe'ecw ca-rdinàall    zhye'et **làa'iny** gyizhi'iilly. (TMZ)  
          dog        PROG-chase cat        under chair  
          'The dog is chasing the cat under the chair.'
- f. \*Bèe'ecw ca-rdinàall    zhye'et gyizhi'iilly. (TMZ)  
          dog        PROG-chase cat        chair

Constructions using directional verbs show that BP prepositions function the same in the syntax as non-BP prepositions do. The directional verbs in (17-19) select for PP complements, which can be satisfied by either BP or non-BP PPs, but not, importantly, by NPs.

## **2.9 Semantic Change and Syntactic Reanalysis**

The meanings of the BP terms as both nouns and prepositions can be accounted for through a path of meaning extension through metaphor and syntactic reanalysis. These terms, though once purely lexical morphemes, referring to concrete objects, have developed into functional morphemes.

Adapting arguments from Hollenbach (1995), I categorize the meanings of the body part terms into three types: basic meaning, meanings derived from metaphorical extension, and meanings derived through "projecting space" extension; these are described below. Hollenbach (1995) uses these types of meaning change to account for all of the nominal and prepositional meanings of the body part terms in Mixtecan, another Otomanguan language family of Oaxaca. The types of changes she describes for Mixtec seem to be able to account for most of the locational meanings in VZ.

### **2.9.1 Basic Meaning**

The "basic meaning" of all the body part terms seems to be the human body part. This seems most basic for two reasons: all the other meanings seem explainable with the body part as the original source of the noun and speakers define these terms (when presented in isolation) as body parts. (However, it may be easier to define a noun out of context than it is to define a preposition, so perhaps the task of defining a word in

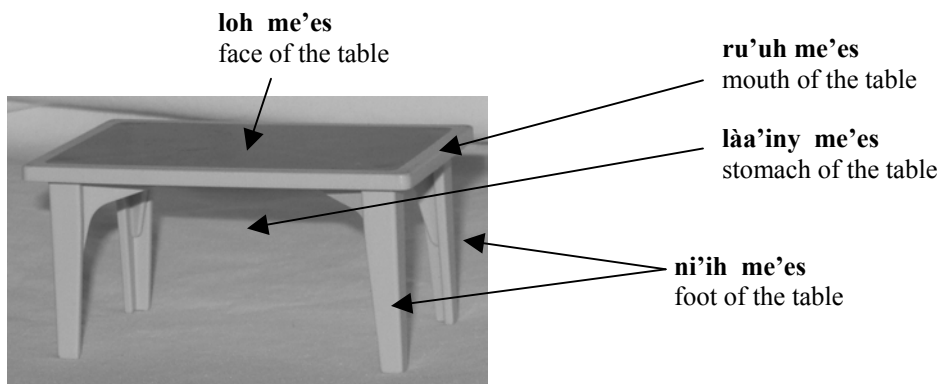
isolation lends itself to receiving the noun definition.) A similar phenomenon is attested by Hollenbach for Mixtecan.

For example, *lohoh* can mean many things including 'face', 'top (of something e.g. a table)', 'face (of a watch)', 'front (of a house)', and the prepositions 'on', 'in front of', 'to' and 'from'. When presented out of context *lohoh* is usually defined by speakers as '(a person's) face'. 'Face' seems to be the most basic meaning of this term, and all the other meanings can be explained using 'face' as a semantic base.

### 2.9.2 Metaphorical Extension

The other nominal meanings for the body part terms have resulted from metaphorical extension. The human body is projected onto inanimate objects, such that tables can have faces, mouths, stomachs, and feet (Figure 7); houses can have faces, backs, sides, heads, and mouths. This process explains the development of all the nominal meanings beyond the basic meaning.

**Figure 7. Body Part Nouns Extended to Parts of Tables**



### 2.9.3 Projecting Space

This extension can account for most of the prepositional meanings (see below for some problem cases). The process, along with syntactic reanalysis, can be used to explain the development of the body parts into grammatical prepositions. Projecting space extends the meaning of the terms from the part of the object to the area 'projected' by that part of the object. This seems to be a metonymic extension: "the use of a word for something associated with its original meaning" (Hollenbach 1995:171). For example, *lohoh* has a basic meaning of 'face'. Through a projecting space extension it could also come to mean the area of space in front of a face; and *lohoh* 'face' could undergo a metaphorical extension to mean 'top (of a table)'; this meaning could then undergo a projecting space extension such that *lohoh* could also refer to the area above the top of the table, i.e. the area projected from the top of the table.

Examples of all three types of meaning are given below in Table 9, which gives examples in English, Copala Trique (a Mixtecan language), and TMZ.

**Table 9. Body Part Terms and their Range of Meanings**

Meaning	English	Copala Trique <sup>7</sup>	TMZ
Basic Meaning	<b>My side</b> hurts.	<b>rian</b> <sup>32</sup> ne <sup>3h</sup> a <sup>32</sup> face baby DEC 'the baby's face'	Rahc <b>zh:ààa'n</b> a'. hurts buttocks=1s 'My bottom hurts.'
Metaphorical Extension	I painted the <b>side of the house</b> .	<b>rian</b> <sup>32</sup> we <sup>3?</sup> a <sup>32</sup> face house DEC 'the front surface of the house'	<b>zh:ààa'n</b> ca'rr buttocks car car's buttocks = 'trunk'
Projecting Space	The dog is <b>beside me</b> .  The lawnmower is <b>on the side of the house</b> .	<b>rian</b> <sup>32</sup> we <sup>3?</sup> a <sup>32</sup> face house DEC 'the area in front of the house'	Biinny nu'u <b>zh:ààa'n</b> ca'rr person NEU.be.loc buttocks car 'The person is under the car.'

<sup>7</sup> Data from Hollenbach 1995: 174-175. Tone marking is denoted with superscript numbers following the word; DEC stands for her "declarative."



#### 2.9.4 Syntactic Reanalysis

The meaning changes described above are not sufficient to account for the development of prepositions. However, these types of changes, especially the projecting space extension together with the metaphorical extension, produce a situation that lends itself to syntactic reanalysis, especially since VZ languages are head initial. This means that possessed-possessor phrases and preposition-complement phrases can be phonetically identical. Look again at Table 9; for all three languages, the same phrase can be found in both the metaphorical extension cell and the projecting space cell: *the side of the house* for English, *rian we* for Trique, and *zh:àà'n ca'rr* for TMZ. In all three languages, these phrases can be analyzed as possessed NPs in the metaphorical extension row. The syntactic reanalysis of a possessed NP seems especially likely given that it would be string identical to a PP.

If the BP PPs were originally possessed NPs, it also seems likely that the verb carried some locative information and c-selected for an NP complement. There are a few verbs in modern VZ languages that do this. For example SLQZ *zàa* 'to be from' and *rbèez* 'resides in', which both take NP complements (Munro, Lopez, et. al 1999) These verb cannot take PP complements, and a potentially ambiguous phrase such as *làa'iny Sann Lu'uc*, which out of context can either mean 'in San Lucas' or 'Saint Luke's stomach' will be interpreted as an NP when it is the complement of the verb *rbèez* even if the semantic context favors the PP, as in (21b) below.

- (21) a. Rbèez=a' Sann Lu'uc. (SLQZ)  
reside.in=1s San Lucas  
'I live in San Lucas.'

- b. Rbèez=a' làa'iny Sann Lu'uc. (SLQZ)  
 reside.in=1s stomach Saint Luke  
 'I live in Saint Luke's stomach.'  
 \*'I live in San Lucas.'

Given that verbs of this type exist in modern VZ languages, it seems plausible that a sentence like *Bèe'cw zòob ni'ih me'es* might originally have had the structure presented in (22). (I use << >> to enclose hypothetical sentences. These are forms that I am conjecturing may have existed at some previous stage of the language, but are not attested.)

(22) Stage 1.

- a. <<Bèe'ecw zòob me'es.>>  
 dog NEU.sit.AT table  
 'The dog is sitting by the table.'
- b. <<Bèe'ecw zòob ni'ih me'es.>>  
 dog NEU.sit.AT foot table.  
 'The dog is sitting by the foot of the table.'

However, with the syntactic reanalysis of the possessed nouns as prepositions, perhaps partially on analogy with non-BP prepositions such as *cààan* 'around', it seems likely that the locative information shifted from the verb to the newly available grammatical morpheme, and could then be analyzed as in (23), in which the BP locatives have been reanalyzed as prepositions, and the locative verbs c-select for PPs.

(23) Stage 2: Modern Language

- a. \*Bèe'ecw zòob me'es. (TMZ)  
 dog NEU.sit table  
 'The dog is sitting by the table.'

- b. Bè'ecw zòob        ni'ih me'es. (TMZ)  
dog        NEU.sit    under table.  
'The dog is sitting under the table.'

In Section 2 I have presented a variety of syntactic and semantic tests, showing repeatedly that BP and non-BP PPs pattern together in the syntax, while BP PPs do not function like NPs either syntactically or semantically. BP terms in locative expressions behave semantically as prepositions, referring to the relationship between the figure and the ground, and need not refer to a location on the ground. Furthermore, the path of syntactic and semantic change that would be necessary to develop this system can be accounted for using already existing and well established types of change such as metaphor and metonymic extension. Whatever the exact path of historical development, these changes must have happened very early, since the use of BP prepositions seems to be reconstructable for Proto-Zapotecan.

### **3.0 Valley Zapotec Colonial Documents**

Pamela Munro, Kevin Terraciano (History, UCLA), Lisa Sousa (History, Occidental College) and graduate students at UCLA including John Foreman, Christina Esposita, Olivia Martínez, and me, among others, have been involved in a long term project of translating and analyzing Zapotec language texts from the Spanish Colonial period in Mexico, ranging in date from 1565 to 1753. These documents were written in Zapotec by native speakers using Roman letters to approximate the complicated phonological system. The inaccuracy of this system and doubts about the meaning of these spellings make many types of phonological analysis nearly impossible, but does

allow for some types of morpho-syntactic analysis. In addition to the documents collected by Terraciano and Sousa, there is a dictionary and a grammar written by Fr. Juan de Cordova (1578a, 1578b). These tools have been invaluable in analyzing the Colonial documents, despite many problematic features of both the dictionary and the grammar.

Although the research is ongoing, we have to date analyzed 15 documents. These documents are presented in Table 10 along with the abbreviations for the documents, which will be used in the following section. These fifteen documents come from seven different pueblos and cover 188 years from 1565 to 1753. We do not know how many languages these documents represented, even in Colonial times.

**Table 10. Colonial Valley Zapotec Documents**

<b>Document</b>	<b>Abbreviation</b>
1565 Zimatlán	Zi565
1610 San Sebastian Tectipaque	Te610
1616 San Sebastian Tectipaque	Te616
1618 San Sebastian Tectipaque	Te618
1626 San Sebastian Tectipaque	Te626
1643 Guaxolotitlan (Huizo)	Hu643
1675 Tlacoahuaya – a	Tl675a
1675 Tlacoahuaya – b	Tl675b
1686 Ocotlán	Oc686
1694 Tlacoahuaya	Tl694
1715 Ocotlán	Oc715
1719 Zaachila	Za719
1721 Coyotepec	Co721
1740 Ocotlán	Oc740
1753 Ocotlán	Oc753

These documents have proved to be a rich source of data for the use of body part terms both as nouns and as prepositions. I collected all the examples of body part terms from our analyzed texts and present and analyze them here.

Given the nature of the material, I can use the documents only to provide positive evidence. That is to say, just because we see no example of the use of a particular word in these fifteen documents does not mean the word was not being used at that time. Likewise, the absence of the use of a body part term used in a locational construction does not mean that it was not used that way at that time. And of course, we have no speakers who could judge potential sentences as ungrammatical. Nevertheless, the type of information that the positive data provides is interesting, and it adds another dimension to the discussion of the categorial status of the body part terms and possible paths of semantic and syntactic change.

Of the twelve different body part terms presented in Table 3, we see examples of seven of these in the Colonial documents. Additionally, we see a complex body part term that is used in sentences dealing with possession, *lachinaa* 'in the hand of.' These eight words are presented below in Table 11, which shows the total number of uses of each of these terms as prepositions and as nouns.

**Table 11. BP Terms as Prepositions and Nouns in Colonial VZ Documents**

<b>Body Part Term</b>	<b>Meaning</b>	<b>Tokens as Preposition</b>	<b>Tokens as Noun</b>
lao	'to'	110	1 'face'
lani	'in'	14	0
lachinaa	'in the hands of'	14	0
cwe	'beside'	4	0
xana	'under'	1	0
rua	'edge'	0	34
que	head	0	4
ni	'foot'	0	1

It is interesting to note that *lao*<sup>8</sup> occurs three times more often than any other body part term in these texts. As I will discuss below, it also seems to have the broadest range of meaning.

### **3.1 Examples of Body Part Nouns**

There are many examples of the body part terms presented in Table 11 used as BP nouns in the Colonial documents. Most of these examples are metaphorical uses of the BP nouns, which is not surprising, given the limited content of the documents, which are mostly wills. The definitions of the words in Cordova (1578a) confirm that these words were also used as body parts in the Colonial period.

#### **3.1.1 *Lao* 'face'**

Cordova defines *lao* as "cara o rostro de animal" 'face [of a person] or face of an animal' (Cordova 1578a, 72); however, all of the nominal uses we see in the documents seem to be metaphorical, such as (24) below where *lao* refers to the face of a house.

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<sup>8</sup> *Lao* also occurs in the documents spelled as *lo* and *loo*. For the purposes of this paper, I will treat these as the same word; however, it would be interesting to pursue the possibility of a lexical difference between these in the future.

- (24) Co721, page 2, lines 13-15  
 huanee tiopa yocho tobij n-ohuij **lao**=nij nesaa loolaha chela  
 and two house one NEU-look face=3 toward Oaxaca and  
 see-toobij n-ohuij **lao**=nij nesena late r-asi goobijcha  
 DEF-one NEU-look face=3 toward place HAB-go.into sun  
 'and two houses: one, its face looks toward Oaxaca and the other one, its face  
 looks toward the place where the sun goes in (west)'

### 3.1.2 *Rua* 'edge'

*Rua* 'mouth' is defined by Cordova as "boca generalmente" 'mouth, in general',  
 (Cordova 1578a, 56v), but all of the nominal uses of *rua* 'mouth' in the documents are  
 metaphorical extensions, as in (25) and (26) where *rua* is used to refer to the horizon—  
 the edge of the land.

- (25) Co721, page 2, lines 22-23  
 cheela n-aachagaa bysaa Bisente de mendossa  
 and NEU-mee s border.marker Vincente de Mendosa  
 nesena **ruaa** r-ijazij goobychar  
 toward edge HAB-go.into sun  
 'and [the lot of land] meets the border marker of Vincente de Mendosa  
 toward the edge the sun goes into (the west)'
- (26) Co721, page 3, lines 4-8  
 naa-chaga bijsaa layoo solar xtenij guetao sebastian  
 NEU-meet border.marker land solar of deceased Sebastian  
 bisente nesena **rua** r-ijlanee gobycha cheela...  
 Vicente toward edge HAB-emerge sun and  
 neesee **rua** r-iasij govijcha na-chaga vjsaa pedro gomes  
 toward edge HAB-go.into sun NEU-meets border.marker Pedro Gomez  
 '[The lot of land] meets the border marker of the solar of the late Sebastian  
 Vicente on the east and toward the west [it] meets the border marker of Pedro  
 Gomez.'

### 3.1.3 *Queque* 'head'

I found no instances of *queque* 'head' being used to refer to a human head in the documents, although Cordova does define it as "cabeça geralmente" 'head, in general' (Cordova 1578a, 63). The nominal uses in the documents seem to be metaphorical extensions from the body part, as in both (27) and (28), where 'head' is used to refer to the head of a town, perhaps a larger political organizational unit<sup>9</sup>. In (28) a shorter form, *que*, is used instead of *queque*. *Que* may be another form for 'head' or there may have been some haplology occurring in this case, because of the phonetic similarity of the following syllable.

(27) Hu643, lines 1-2  
ny lao queche santo donmi [go] xiteni **queque** queche Huizo  
here in town Santo Domingo of head town Huizo  
'Here in the town of Santo Domingo belonging to the head of the town of Huizo'

(28) Hu642, lines 5-6  
don Pedro de Rojas alcalde ordinario lao **que** queche Huizo  
don Pedro de Rojas alcalde ordinario in head town Huizo  
'Don Pedro de Rojas, alcalde ordinario of the head of the town Huizo'

### 3.1.4 *Ni* 'foot'

Cordova defines *ni* as "pie o mano de animal quadrupede" 'foot or forefoot of a four-legged animal' (Cordova 1578a, 314) and its appearance as a noun in the document is a metaphorical extension of the body part meaning, as in (24) below, where *ni* refers to the foot of the will.

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<sup>9</sup> Kevin Terraciano (p.c.) has suggested that the expression *que(que) queche* might be analyzed as 'the head town,' referring to the *cabecera*. He notes that Nahuatl and Mixtec developed similar terminology involving the words for head and town to refer to the new colonial designation of a *cabecera*. However, this would require a structure in which the modifier precedes the head, which is unusual for head initial languages.



- (29) Za719 page 3, lines 23-24  
 quijchij testamento=ni **ni**=ni huane ro-chiua testigos laa=ni  
 paper will=3 foot=3 and HAB-sign witnesses name=3  
 'The foot of his will and the witnesses sign their names.'

### 3.1.4 *Cue* 'side'

It is not entirely clear from the definition in Cordova if *cue* was used as a body part in the Colonial era; it is defined as “lado derecho or siniestro” ‘right or left side’ (Cordova 1578a, 238v), and it is not included in the list of body parts in the grammar (Cordova 1578b, 199-201). Given that there is variation among modern VZ languages and among speakers as to whether *cwe'eh* ‘side’ can be used as a body part, it will be interesting to continue to pursue its status in the Colonial documents as we continue this research. In the documents we see non-body part nominal uses of *cue*, as in (30) below where it is used to delimit a plot of land, referring to the east side, the west side, and the side toward Oaxaca City.

- (30) Oc715, lines 23-30  
 pi-chaga pisa **cue** ri-llani gobicha **cue**  
 PERF-join marker side HAB-rises sun side  
  
**cue** r-ina lolaa pi- chaga pisaa Mateo de la cruz  
 side HAB-look Oaxaca PERF-join marker Mateo de la Cruz  
  
 chela **cue** ri-ase gobicha pi-chaga pisa Migel Sanches  
 and side HAB-set sun PERF-join marker Migel Sanchez  
  
 '[The land] adjoined the marker on the side [where] the sun rises, [and on] the side [that] faces Oaxaca, it adjoined the marker of Mateo de la Cruz, and [on] the side the sun sets it adjoined the marker of Migel Sanchez'

### 3.2 Examples of Body Part Prepositions

As in the modern VZ languages, the body part words occur in locative expressions in the Colonial documents. I present the range of meanings each of the words seems to have in this section.

#### 3.2.1 *Lao* 'before, to, in, etc.'

*Lao* has a very broad range of meanings including 'before' (31-32), 'with' (33-34), 'in' (34-36), 'to' (37-38), 'from' (39), 'for' (40), 'on' (41). *Lao* is the preposition that has the broadest range of meanings, both in modern VZ languages and in the Colonial documents. (There are many non-spatial meanings on modern VZ *loh* which I have not addressed in this thesis.)

(31) Oc686, page 2, line 6

**lao**=tonoo<sup>10</sup>    justicia        aldes  
before=1p        justice        alcaldes  
'before us, the justice-alcaldes'

(32) Oc715, lines 11-12

**lao**        qui-ona        testigo chela chona    beni-gola        oficiales  
before    IRR-three    witness and three    person-old    official  
'before the three witnesses and three elder officials'

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<sup>10</sup> This particular pronoun seems anomalous because it looks like a first person plural free pronoun in many modern Valley Zapotec languages, yet we would not expect a free form to appear in this construction. Perhaps the bound form was simply different for this pueblo at this time.

In the same document we see the following construction, using the same form as a bound pronoun:

Oc686, page 2, line 7: firma                    **xiteni=tonoo**    lani    testamento niri  
signature        of=1p        on    will        this  
'our signatures on this will'

- (33) Co721, page 1, lines 10  
 r-oni=a xygaba-testamento xijteni=a **lao** qui-tobij guelaanayanij  
 HAB-do=1s account-testament of =1s with IRR-one understanding  
 whole  
 'I make my account and testament with total understanding'
- (34) Co721, page 1, line 12-14  
 n-aca=yaa Cristiano hua- roba=ya ni[sa] **lao** guela-  
 NEU-be=1s Christian NOM-get.spilled.on=1s water with NOM  
 gracia xtenij Bejuanaa=na Dios **loo** la Dios Bixoozee  
 grace of high.lord=1p God in name God father  
**loo** la Dios xijnij **loo** la Dios espiritu santo  
 in name God child in name God spirit holy  
 'I am a Christian baptized with the grace of our God. In the name of God the  
 Father in the name of God the Son, in the name of God the Holy Spirit.'
- (35) Co721, page 6, line 1-2  
 coo- napea Maria dela Cruz **laoo** testamento xtenij=nij  
 PERF-order Maria dela Cruz in will of=3  
 'Maria de la Cruz mandated in her will'
- (36) Oc740, lines 1-2  
 Annachij Biernes 14 ex-chij beo de otubre **loo** yssa de 1740  
 today Friday 14 poss-day month of October in year of 1740  
 'Today, on the fourteenth day of the month of October, in the year of 1740'
- (37) Co721, page 2, lines 7-8  
 tiopa tomnes r-oni=ja gona **lao** beecogoo Santa Jerusalem  
 two tomnes HAB-do=1s offering to altar Holy Jerusalem  
 'I make an offering of two reales to the altar of Holy Jerusalem.'
- (38) Co721, page 2, lines 9-10  
 toby=ga tomnes r-oni=ja gona **lao** too-tobi=ga beecoogo  
 one=each tomnes HAB-do=1s offering to one-one=each altar  
 'I make an offering of one real to each altar.'

- (39) Co721, page 5, lines 12-15  
 Laaca tomines nijxij nij n-aaca galee pesos guij-nabaa tio  
 same money this REL NEU-be twenty pesos IRR-ask uncle  
 xijteni=a **laoo** Pascual Peres guij-quij=nij **laoo** guela-guichija  
 of=1s from Pascual Peres IRR-pay=3 for NOM-sickness  
 xijteni=a=laa **laoo** guela-gooti xteni=a  
 of=1s=and for NOM-death of=1s

'This same money, which is twenty pesos, my uncle will demand from Pascual Peres. He (or it) will pay for [the expenses of ] my illness and for my death.'

- (40) Co721, page 5, line 16  
 xoonoo xaana tobaa ny n-oo **laoo** layoo  
 eight plant maguey REL NEU-be.LOC on land  
 'eight maguey plants that are on the land'

### 3.2.2. *Lani* 'in'

*Lani*, used locatively, most commonly appears in the Colonial documents

meaning 'in,' as seen in (41-44).

- (41) Co721, page 1, lines 22-23  
 ti-elilaachij guela-na-banij selij **lanij** guehuij quijebaa  
 HAB-believe.in NOM-NEU-live eternal in palace sky  
 'I believe in eternal life in the palace of the sky (heaven).'
- (42) Co721, page 2, lines 9-10  
 alanij toby=ga tomines r-oni=ja gona lao too-tobi=ga beecoogo  
 item one=each tomines HAB-do=1s offering to one-one=each altar  
 nij n-aso=nij **lani** yochotoo gueche  
 REL NEU-stand=3 in church town  
 'Also I make an offering of one real to each altar which is in the town church.'
- (43) Co721, page 5, lines 5-6  
 quij-raa looa xteni=ya de liensoo nij  
 IRR-all picture of=1s of linen REL  
 n-oo=nij **lanij** yocho-lijchi=ya  
 NEU-be.loc=3 in house-house=1s  
 'all my pictures on linen that are in my house'

- (44) Oc740, lines 5-6  
**lanni** quichii escriptura de benta  
 in paper bill of sale  
 'in the bill of sale'

Below in (45) *lanij* seems to be used meaning 'in (the possession of).' The Spanish translation of this section, *yten beinte pesos que me deve Pasqual pere*, 'and twenty pesos that Pascual Peres owes me', seems to preclude a meaning of 'twenty pesos are located in Pascual Peres,' although possible it could mean 'in Pasual Peres' house'.

- (45) Co721, page 5, line 8  
 alarij gaalee pesos nij n-oo **lanij** Pascual Peres  
 and twenty pesos REL NEU-be.loc in Pascual Peres  
 'along with twenty pesos that are in (the possession of) Pascual Peres'

Additionally, *lani* seems to be used to mean 'on' as in (46) below.

- (46) Oc686, page 2, line 7  
 firma xiteni=tonoo **lani** testamento niri  
 signature of=1p on will this  
 'our signatures on this will'

Finally, *lani* occurs in a complex expression *laane-yo*, which apparently literally means 'in the house,' but is used simply to mean 'in.' The use of this word in modern SLQZ is restricted to inside buildings: “*la'nyu'uh* ... inside, in... used only before certain nouns referring to buildings, such as *liihahz* 'house' and *scweel* 'school' ” (Munro, Lopez, et al. 1999). In the Colonial example below, it is used to express 'in the month of October'.

- (47) Hu643, line 2-4  
 Ana co-xopa gobicha r-izaa chiy **laane-yo** beo octubre  
 now PERF-six sun HAB-fall day in-house month October  
 in  
 'Today, the sixth day in the month of October'

### 3.2.3 *Rua* 'at the edge of'

The only locative meaning of *rua* that I have found in the documents is 'on the edge of', as in (48) and (49) below.

- (48) Tl675b, line 21  
tobi cuelayo na **rua** nesa xana yaga quichi  
one planted.field NEU.be on.the.edge.of road under tree thorn  
carob.tree?  
'one field [that] is on the edge of the road under the carob tree'

- (49) Oc740, lines 19-21  
**rua** nesa r-isa bene santiago  
on.the.edge.of road HAB-walk people Santiago  
'([land] that is) on the edge of the road that the people of Santiago walk on'

### 3.2.4 *Xana* 'under'

The only locational example of *xana* that I have seen in the Colonial documents means 'under', as in (50) below.

- (50) Tl675b, line 21  
tobi cuelayo na rua nesa **xana** yaga quichi  
one planted.field NEU.be at.the.edge.of road under tree thorn  
carob.tree?  
one field at the edge of the road under the carob tree

## 3.3 Conclusion

In this section I have presented evidence that some of the BP words were used as prepositions as early as the sixteenth century. During the Colonial period, we have evidence that *lao*, *lani*, *rua*, and *xana* were used in locative constructions. The use of *lao* is the most interesting for the question of the categorial status of these words, since it is used in locative constructions where a nominal interpretation ('face') would be semantically infelicitous. This word seems to have had a very broad dative-like meaning in the Colonial period. The modern cognate can also be used with dative meaning,

although seems to have more restrictions than the Colonial preposition. I plan to document the non-locative meanings of the preposition *loh* in future work.

#### **4.0 Child Acquisition of Body Part Terms in SLQZ**

This section examines the acquisition of BP locatives in San Lucas Quiavini Zapotec. I wanted to explore whether the fact that the BP locatives developed from and are homophonous with body parts affects their acquisition. Do the homophony and iconicity with body parts have a facilitating effect on the acquisition of BP locatives? Are children sensitive to the grammatical differences between the BP locatives and the BP nouns, such as those presented in Section 2?

This pilot study tested four SLQZ speaking children (ages 1;6, 2;3, 6;4, 7;11)<sup>11</sup> on their knowledge of the meanings of both the body parts and the BP locatives using a forced choice, picture identification task. The data suggest that the BP locatives are acquired as independent grammatical elements and their acquisition is not related to the acquisition of the corresponding body parts. Moreover, this dissociation between the acquisition of the BP locatives and the body parts supports the hypothesis that the locative terms are not synchronically metaphorical extensions of the nominal forms, as the locatives can be acquired without the BP nouns having been acquired. The results are consistent with an analysis of BP locatives as prepositions.

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<sup>11</sup> Ages are given in the following format: years;months. For example, 1;6 stands for one year, six months old.

#### **4.1 Participants**

Four children were tested: Vanesa 1;6, Andrea 2;3, Lorena 6;4, and Manuel 7;11.<sup>12</sup> At the time, Vanesa was learning SLQZ as her primary language and also had Spanish input. Andrea was learning both SLQZ and Spanish as her first languages. Lorena initially learned SLQZ as her only language, until age 3, when she began learning Spanish. At age 3;5 she began learning English. At the time I worked with her, she was English and Spanish dominant. Manuel learned only Spanish until age 1;5, when he began learning SLQZ. Like Lorena, he was dominant in English and Spanish. The relevant data for most of this paper is from the two youngest girls, Vanesa and Andrea.

This experiment was conducted in March 2001. Previous to this study, I had observed the children for another project, so they all knew me and were used to speaking Zapotec in front of me.

#### **4.2 Experimental Design**

In order to test the children's understanding of body parts and BP locatives, two forced-choice picture identification tasks were designed, testing the eight words listed in Table 12. Each word was tested twice in each task; 16 questions for body parts and 16 questions for BP locatives, for a total of 32 questions. The tests were run twice on the two younger girls, on separate occasions, but only once on the two older children.

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<sup>12</sup> The age range is so wide because I tested all the children that were present in the home of the two youngest girls.



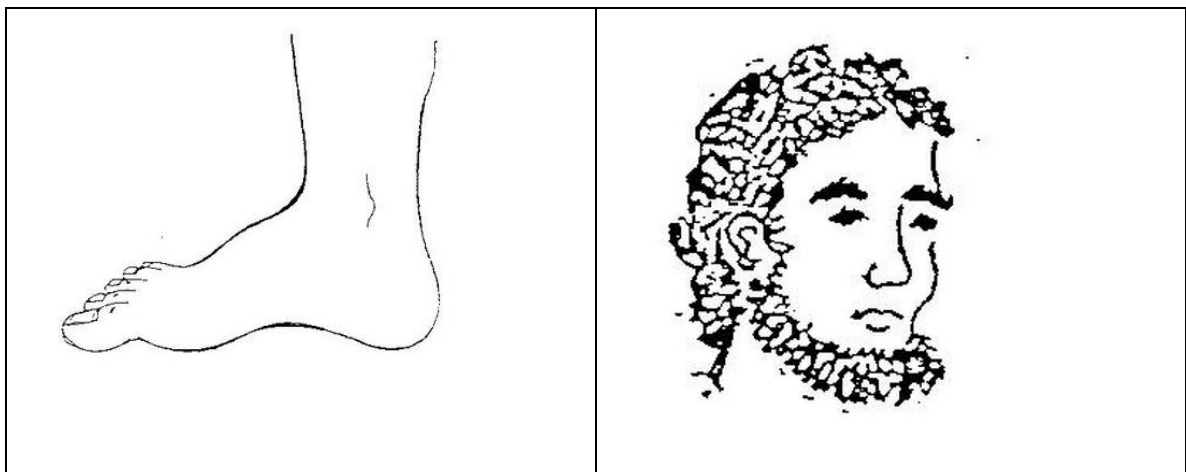
**Table 12. Body Part Terms Tested**

SLQZ	body part meaning	locative meaning
cwe'eh (95)	'side'	'beside'
dehts (104)	'back'	'behind'
gue'ehcy (123)	'head'	'on top of'
lää'iny (142)	'stomach'	'in'
lohoh (156)	'face'	'on, in front of'
ni'ih (181)	'foot'	'under, beneath'
ru'uh (303)	'mouth'	'at the edge of'
zh:àà'n (384)	'bottom'	'behind, under'

Numbers in parentheses following the words refer to page numbers in Munro and Lopez 1999.

Along with each question the child was shown two pictures (one that corresponded to the question being asked, and one that did not). For example, the child was shown a picture of a foot and a picture of a head, as in Figure 8 below, and was asked *Cu'an gue'ehcy bìunny?* 'Where is the person's head?' (The form of the question will be discussed in 4.2.2.) The picture on the right (a head) corresponds to the question, whereas the picture on the left (a foot) does not.

**Figure 8. Sample Picture Pair for Body Part Test: *Cu'an gue'ehcy bìunny?* (head)**



The children were tested in their home during two sessions in March 2001. The tests took place in a quiet room. I was present during the tests, as were Silvia Lopez, the child, and sometimes the child's mother. Lopez was a student at Santa Monica College at the time, and is Manuel and Vanesa's older sister and Lorena and Andrea's cousin. Lopez is a native speaker of SLQZ and has worked as a linguistic consultant with Munro and me.

None of the other children to be tested were present while another child was being tested. The child was asked if she (or he) wanted to play a game. Lopez explained the game by saying that the child would hear a question while looking at the book, and she was to pick the picture that answered the question and every time she answered she would get a sticker. The child was given a choice between two brightly colored construction paper shapes on which to keep her stickers.<sup>13</sup> When the child chose which shape she wanted, we began with a pre-test, which will be described in the following section, and then continued directly with the body part test. If the child was ever fussy or wanted a break, we took a break. After the body part test we asked the child if she wanted to play some more. If she said yes, we proceeded directly with the body part preposition test. If not, we let the child take a break while we tested another child.

The pictures used in the tests are all black and white line drawings. All but one of the pictures used in these tests were taken from the Curtiss-Yamada Comprehensive

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<sup>13</sup> Thanks to Susan Curtiss for this wonderful idea. The children really loved the bright shapes and enjoyed getting stickers.

Language Evaluation (CYCLE) (Curtiss and Yamada 1987).<sup>14</sup> Many pictures were slightly modified by cropping or cutting and pasting to make additional pictures. During the first testing session, I videotaped the children as they did the task. I did not videotape them during the second session, however, because I found it too hard to both videotape and participate in the task.

#### 4.2.1 Pre-test

A pre-test was conducted before the body part test. The pre-test served two functions. It introduced the child to the forced choice task. During this section, if the child was unresponsive after being asked the question, Lopez modeled how to choose a picture by pointing at the correct picture, and was rewarded with a sticker. This established the task of choosing and the preferential method of choosing: pointing. Furthermore, the pre-test was used to introduce some of the pictures that would be used later in the body part locative test. The pictures used in the pre-test were a dog, a chair, a table, and a car, all of which were used in the actual test. The child's success in the pre-test showed that she could recognize the pictures and understood the task. As in the test itself, all answers given by the child were rewarded with verbal praise and a sticker, regardless of whether the answer was correct or not.

The three pre-test pairs are listed below in Table 13. The correct answers are in bold. The words are presented as the pictures were presented, with the word on the left

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<sup>14</sup> The picture for *lâa'iny* 'stomach' was drawn for me by Melissa Tai and was drawn in the style of the CYCLE pictures.

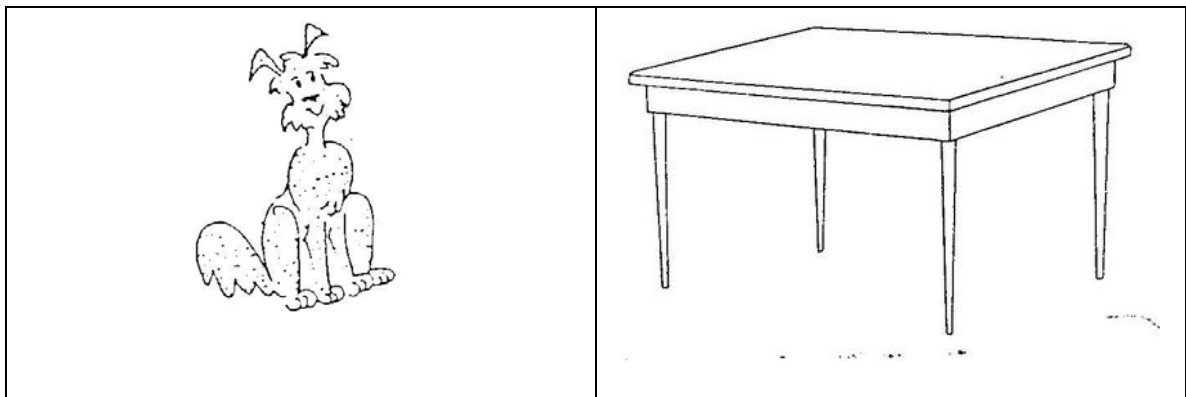
representing the picture on the left. The question on the right is what Lopez asked the child for that pair.

**Table 13. Pre-test**

	Left Picture	Right Picture	Question Asked
1	<b>bèe'cw</b> 'dog'	me'es 'table'	Cu'an bèe'cw? 'Where is the dog?'
2	<b>ca'rr</b> 'car'	gyizhi'iilly 'chair'	Cu'an ca'rr? 'Where is the car?'
3	ca'rr 'car'	<b>me'es</b> 'table'	Cu'an me'es? 'Where is the table?'

Figure 9 below shows the pictures used with the first question in the pre-test: *Cu'an bèe'cw?* 'Where is the dog?' The picture on the left (the dog) corresponds correctly to the question.

**Figure 9. Sample Picture Pair from Pre-test: *Cu'an bèe'cw?* (dog)**



#### 4.2.2 Body Part Test

Every body part was tested twice, once with the correct answer on the left and the other with correct answer on the right, to control for the children having a bias for one

side or another. Each body part was paired with a different distracter body part for the two trials.

The question asked of the children for each pair was *Cu'an \_\_\_\_\_ bìnunny?* 'Where is the person's \_\_\_\_?' In SLQZ it is generally unnatural to have unpossessed body parts in sentences, so rather than present the child with an awkward question such as *Cu'an ni'ih?* 'Where is the foot?', we decided to use the possessed noun construction.<sup>15</sup> All 16 pairs are presented in Table 14; the answers that correspond to the question are in bold.

The test was designed so that all of the body parts were tested once before any body part was tested a second time. This way, if a child got fussy half way through, she would have provided at least one response for each body part.

The children were encouraged during the pre-test to select their answer by pointing, but I counted anything that looked like choosing as a response. Most often the two youngest girls chose by placing a sticker on the picture they were choosing. These stickers were removed before the book was used to test another child.

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<sup>15</sup> Thanks to Pamela Munro and Silvia Lopez for much discussion on this.

**Table 14. Body Part Test**

	Left Picture	Right Picture	Question Asked
1	<b>ni'ih</b> 'foot'	lohoh 'face'	Cu'an ni'ih bùunny? 'Where is the person's foot?'
2	<b>lohoh</b> 'face'	cwe'eh 'side'	Cu'an loh bùunny? 'Where is the person's face?'
3	dehts 'back'	<b>ru'uh</b> 'mouth'	Cu'an ru'uh bùunny? 'Where is the person's mouth?'
4	ni'ih 'foot'	<b>gue'ehcy</b> 'head'	Cu'an gue'ehcy bùunny? 'Where is the person's head?'
5	<b>làa'iny</b> 'stomach'	cwe'eh 'side'	Cu'an làa'iny bùunny? 'Where is the person's stomach?'
6	<b>zh:ààa'n</b> 'bottom'	lohoh 'face'	Cu'an zh:àa'n bùunny? 'Where is the person's bottom?'
7	ni'ih 'foot'	<b>dehts</b> 'back'	Cu'an dehts bunny? 'Where is the person's back?'
8	<b>cwe'eh</b> 'side'	lohoh 'face'	Cu'an cwe'eh bùunny? 'Where is the person's side?'
9	ni'ih 'foot'	<b>lohoh</b> 'face'	Cu'an loh bùunny? 'Where is the person's face?'
10	gue'ehcy 'head'	<b>làa'iny</b> 'stomach'	Cu'an làa'iny bùunny? 'Where is the person's stomach?'
11	ni'ih 'foot'	<b>cwe'eh</b> 'side'	Cu'an cwe'eh bùunny? 'Where is the person's side?'
12	cwe'eh 'side'	<b>ni'ih</b> 'foot'	Cu'an ni'ih bùunny? 'Where is the person's foot?'
13	<b>ru'uh</b> 'mouth'	làa'iny 'stomach'	Cu'an ru'uh bùunny? 'Where is the person's mouth?'
14	làa'iny 'stomach'	<b>zh:ààa'n</b> 'bottom'	Cu'an zh:ààa'n bùunny? 'Where is the person's bottom?'
15	<b>dehts</b> 'back'	lohoh 'face'	Cu'an dehts bùunny? 'Where is the person's back?'
16	<b>gue'ehcy</b> 'head'	zh:ààa'n 'bottom'	Cu'an gue'ehcy bùunny? 'Where is the person's head?'

### 4.2.3 Body Part Locative Test

As with the body parts, every BP locative was tested twice. Each time it was tested, it was tested opposite a different BP locative term and the matching picture occurred on different sides in each trial.

In addition, the type of locational verb used had to be controlled for. Unlike in English, there is no single VZ verb, like *is*, that can be used in any type of simple locative sentence, such as *The book is on the table*, or *The ball is beside the chair*. Instead, in SLQZ, there are a small number of locational verbs that can be used. The choice of locational verb seems to depend on features of the figure more than on features of the ground; e.g. one verb is used to describe a cup on a table, but a different verb has to be used to describe a ball on a table. In this test, five locational verbs were used, which are listed here with definitions from Munro and Lopez (1999): *bèe'b* 'is located on' [usually a raised surface]; *nàa'tga'ah* 'is lying down, is (located) in a lying position'; *nu'uh* 'exists (in a location)' [often has a habitual sense]; *zuu* 'is standing, is located (standing)'; *zùub* 'is sitting; is located, exists (sitting or projecting)'. In order to ensure that the only difference between the matching and non-matching pictures was the preposition, we chose pictures that could be described using the same locational verb, as verified by a native speaker.

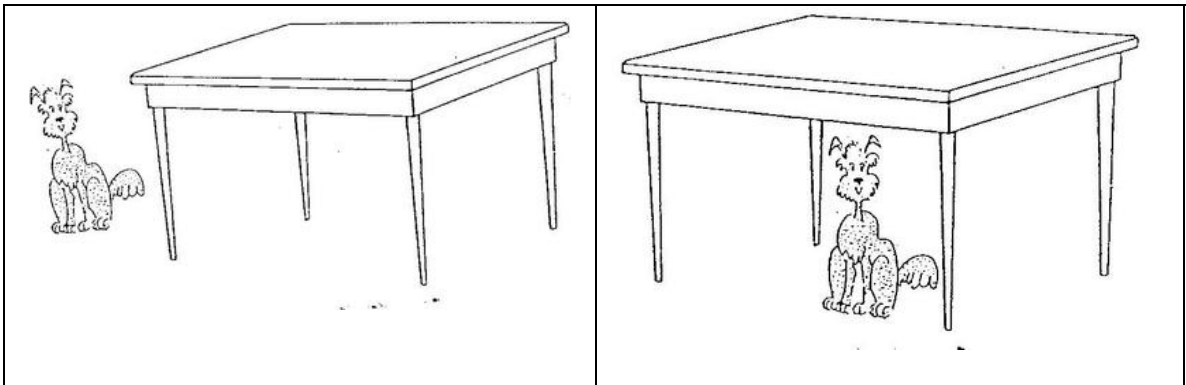
The question asked of the children for each pair was on the model: *Cu'an FIGURE nih LOC.VERB PREP GROUND?* 'Where is the FIGURE that is PREP GROUND?'; for example, *Cu'an bèe'cw nih zùub ni'ih me'es?* 'Where is the dog that is under the table?' and *Cu'an ta's nih zùub loh me'es?* 'Where is the cup that is on the table?' We wanted to choose a question that was syntactically relatively uncomplicated

while still natural. Upon consultation with Munro and Lopez, I decided that this question, though containing a relative clause, was the most natural way to ask the question. All other simpler structures were judged too awkward.

The following two figures are sample picture pairs from the body part preposition test. The corresponding question to Figure 10 is *Cu'an bèe'cw nih zùub ni'ih me'es?* 'Where is the dog that is under the table?' and the corresponding question to Figure 11 is *Cu'an pelo't nih nàa'tga'ah dehts gyizhi'iilly?* 'Where is the ball that is behind the chair?'

**Figure 10. Sample Picture Pair from Body Part Preposition Test:**

*Cu'an bèe'cw nih zùub ni'ih me'es?* 'Where is the dog that is under the table?'

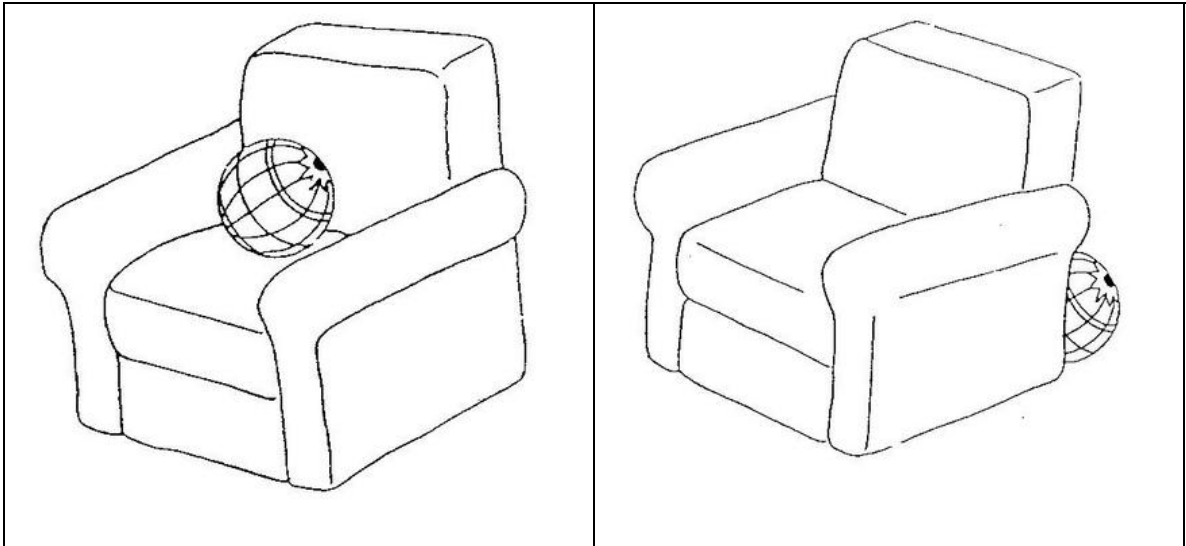


In Figure 10, the picture on the right corresponds to the correct answer to the question, and in Figure 11 it also happens to be the case that the picture on the right corresponds correctly to the question.



**Figure 11. Sample Picture Pair from Body Part Preposition Test:**

*Cu'an pelo't nih nà'tga'ah dehts gyizhi'iilly?* 'Where is the ball that is behind the chair?'



The entire test, consisting of 16 questions, is presented in Table 15, below. The same figure and ground are presented in each picture, varying only in the locative relationship to one another, as seen by comparing the example pairs in Figures 10 and 11 above.

**Table 15. Body Part Preposition Test**

	Locative Relation Expressed in the Left Picture	Locative Relation Expressed in the Right Picture	Question Asked
1	cwe'eh 'beside'	<b>ni'ih</b> 'under'	Cu'an bèo'cw nih zùub ni'ih me'es? 'Where is the dog that is under the table?'
2	<b>gue'ehcy</b> 'on top of'	lohoh 'on'	Cu'an pelo't nih bèo'b gue'ehcy gyizhi'iilly? 'Where is the ball that is on top of the chair?'
3	<b>lohoh</b> 'on'	cwe'eh 'beside'	Cu'an ta's nih zùub loh me'es? 'Where is the cup that is on the table?'
4	lohoh 'on'	<b>làa'iny</b> 'in'	Cu'an bèo'cw nih zùub làa'iny ca'rr? 'Where is the dog that is in the car?'
5	<b>cwe'eh</b> 'beside'	dehts 'behind'	Cu'an pelo't nih nàa'tga'ah cwe'eh gyizhi'iilly? 'Where is the ball that is beside the chair?'
6	ni'ih 'under'	<b>ru'uh</b> 'on the edge of'	Cu'an ta's nih zuu ru'uh me'es? 'Where is the cup that is on the edge of the table?'
7	gue'ehcy 'on'	<b>zh:àà'a'n</b> 'behind'	Cu'an bèo'cw nih nu'uh zh:àa'n ca'rr? 'Where is the dog that is behind the car?'
8	lohoh 'on'	<b>cwe'eh</b> 'beside'	Cu'an bèo'cw nih zùub cwe'eh me'es? 'Where is the dog that is beside the table?'
9	<b>dehts</b> 'behind'	lohoh 'on'	Cu'an bèo'cw nih nu'uh dehts gyizhi'iilly? 'Where is the dog that is behind the chair?'
10	cwe'eh 'beside'	<b>gue'ehcy</b> 'on top of'	Cu'an bèo'cw nih zùub gue'ehcy ca'rr? 'Where is the dog that is on top of the car?'
11	dehts 'behind'	<b>lohoh</b> 'in front of'	Cu'an mnii'iny nih zuu loh mnnààa'? 'Where is the boy that is in front of the woman?'
12	<b>ni'ih</b> 'under'	lohoh 'on'	Cu'an pelo't nih nàa'tga'ah ni'ih me'es? 'Where is the ball that is under the table?'
13	<b>zh:àà'a'n</b> 'behind'	làa'iny 'in'	Cu'an bèo'cw nih nu'uh zh:àa'n ca'rr? 'Where is the dog that is behind the car?'
14	<b>ru'uh</b> 'on the edge of'	cwe'eh 'beside'	Cu'an pelo't nih nàa'tga'ah ru'uh me'es? 'Where is the ball that is on the edge of the table?'
15	<b>làa'iny</b> 'in'	dehts 'behind'	Cu'an bèo'cw nih nu'uh làa'iny ca'rr? 'Where is the dog that is in the car?'
16	lohoh 'on'	<b>dehts</b> 'behind'	Cu'an pelo't nih nàa'tga'ah dehts gyizhi'iilly? 'Where is the ball that is behind the chair?'

### **4.3 Results**

I will discuss the results for each child in turn, beginning with the older children, Manuel and Lorena, and then the younger children, Andrea and Vanesa. A child was counted as knowing a certain word if they answered correctly for that word more often than they answered incorrectly. Analysis of the most pertinent results (Vanesa and Andrea) will come in Section 4.4. Because of the limited data, the results were not tested for statistical significance.<sup>16</sup>

#### **4.3.1 Manuel**

Manuel, who was nearly eight years old, scored almost perfectly on all the tests. He got 100% of the body part questions correct, and 93.75% of the body part preposition questions correct. He missed only two body part prepositions, one in each test. Clearly Manuel was an adult for the purpose of this study, having acquired all of the body parts and prepositions. He pointed to all of the pictures he chose with confidence and said that the game was really easy. His results will not be discussed any further since they do not bear on the developmental questions I am interested in.

#### **4.3.2 Lorena**

Lorena was less fluent in SLQZ than any of the other children tested. She spoke primarily English and Spanish, as mentioned earlier, but spoke only SLQZ until age 3. Her results are quite striking. She answered 100% of the body part questions correctly and 0% of the body part preposition questions correctly. These results are displayed in Table 16 below:

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<sup>16</sup> I hope to be able to replicate this study later with more participants.

**Table 16. Results for Lorena 6;4**

	Body Part			BP Locative		
	meaning	correct	incorrect	meaning	correct	incorrect
cwe'eh	'side'	2	0	'beside'	0	2
dehts	'back'	2	0	'behind'	0	2
gue'ehcy	'head'	2	0	'on top of'	0	2
lää'iny	'stomach'	2	0	'in'	0	2
lohoh	'face'	2	0	'on, in front of'	0	2
ni'ih	'foot'	2	0	'under, beneath'	0	2
ru'uh	'mouth'	2	0	'at the edge of'	0	2
zh:àà'a'n	'bottom'	2	0	'behind, under'	0	2

Why would she get all of the preposition questions wrong? Had she misunderstood the task? This seems unlikely since we went directly from the body part test to the preposition test. I asked her if the second book was harder, and she said no. Had she misunderstood the syntax of the relative clause in the locatives test? Perhaps her results are a reflection of her language loss.

Although Lorena's results are difficult to interpret, they certainly do not argue against the proposal that there is a categorial difference between the body part and locational uses of these terms. In fact, if body part terms used in locative constructions were metaphorical extensions of the noun, one might predict that Lorena would have been able to answer many questions correctly in the body part locative task, since she clearly had acquired all of the body part nouns.

### **4.3.3 Andrea**

Andrea was learning both SLQZ and Spanish as her first languages. She knew 7 of the 8 body parts tested: *cwe'eh* 'side' and *lää'iny* 'stomach' were identified correctly 4 out of 4 times; *gue'ehcy* 'head', *lohoh* 'face', *ni'ih* 'foot', and *zh:àà'a'n* 'bottom' 3 out of 4 times; and *ru'uh* 'mouth' was identified correctly 2 out of 3 times.

She seemed to know four of the prepositions: *lâa'iny* 'in' and *zh:ââa'n* 'behind' she answered correctly 4 out of 4 times; *lohoh* 'on, in front of' and *ni'ih* 'under' she answered correctly 3 out of 4 times. The compiled results are given in Table 17; the numbers in bold correspond to meanings that she seemed to have acquired.

**Table 17. Results for Andrea 2;3**

	Body Part			BP Locative		
	meaning	correct	incorrect	meaning	correct	incorrect
<i>cwe'eh</i>	<b>'side'</b>	<b>4</b>	<b>0</b>	'beside'	2	2
<i>dehts</i>	'back'	1	2	'behind'	1	3
<i>gue'ehcy</i>	<b>'head'</b>	<b>3</b>	<b>1</b>	'on top of'	2	2
<i>lâa'iny</i>	<b>'stomach'</b>	<b>4</b>	<b>0</b>	<b>'in'</b>	<b>4</b>	<b>0</b>
<i>lohoh</i>	<b>'face'</b>	<b>3</b>	<b>1</b>	<b>'on, in front of'</b>	<b>3</b>	<b>1</b>
<i>ni'ih</i>	<b>'foot'</b>	<b>3</b>	<b>1</b>	<b>'under, beneath'</b>	<b>3</b>	<b>1</b>
<i>ru'uh</i>	<b>'mouth'</b>	<b>2</b>	<b>1</b>	'at the edge of'	2	2
<i>zh:ââa'n</i>	<b>'bottom'</b>	<b>3</b>	<b>1</b>	<b>'behind, under'</b>	<b>4</b>	<b>0</b>

#### 4.3.4 Vanesa

Vanesa was the youngest of all the children tested. She seemed to know four of the eight body parts: *gue'ehcy* 'head' was identified correctly 4 out of 4 times; *dehts* 'back' and *lohoh* 'face' 3 out of 4 times. *Ni'ih* 'foot' was identified correctly only correctly 2 out of 4 times, but both times she answered correctly, she also pointed to her own foot before answering. Because of this, it is difficult to say that she did not know this word.

Vanesa seemed to know five of the prepositions tested: *cwe'eh* 'beside', *lohoh* 'on, in front of', *dehts* 'behind' was identified correctly 4 out of 4 times; *ni'ih* 'under' 3 out of 4 times; and she correctly identified *lâa'iny* 'in' 2 out of 3 trials. These results are summarized below.

**Table 18. Results for Vanesa 1;6**

	Body Part			BP Locative		
	meaning	correct	incorrect	meaning	correct	incorrect
cwe'eh	'side'	2	2	'beside'	4	0
dehts	'back'	3	1	'behind'	3	0
gue'ehcy	'head'	4	0	'on top of'	2	2
lää'iny	'stomach'	1	3	'in'	2	1
lohoh	'face'	3	1	'on, in front of'	4	0
ni'ih	'foot'	2	2	'under, beneath'	3	1
ru'uh	'mouth'	2	2	'at the edge of'	1	3
zh:àà'n	'bottom'	2	2	'behind, under'	2	2

#### 4.4 Discussion of Results

In this section I will be discussing the results for Vanesa and Andrea, but not those for Manuel or Lorena. Neither Manuel nor Lorena's data can be used to comment on the categorial status of BP locatives. Manuel's performance was nearly adult-like, and Lorena scored perfectly on the body parts, while missing every BP locative question. Although these results are certainly interesting, they are compatible both with a nominal and a prepositional categorization of BP locatives.

Vanesa and Andrea's data, however, do speak to the question of the categorial status of BP locatives. Vanesa and Andrea both seemed to have acquired the prepositions *lää'iny* 'in', *lohoh* 'on, in front of' and *ni'ih* 'under'. Both children also had acquired a word for 'behind': Vanesa *dehts* and Andrea *zh:àà'n*. Vanesa also demonstrated knowledge of *cwe'eh* 'beside'. Table 19 below summarizes the prepositions each girl had acquired.

**Table 19. Comparison of Acquisition of Prepositions**

<u>Vanesa 1;6</u>	<u>Andrea 2;3</u>	<u>Prepositions not acquired by either child</u>
'in'	'in'	'on top of'
'on'	'on'	'at the edge of'
'under'	'under'	
'in front of'	'in front of'	
'behind'	'behind'	
'beside'		

#### **4.4.1 Dissociation Between Acquisition of Body Parts and BP Locatives**

These data show a dissociation between the acquisition of the body parts and the corresponding BP locatives. That is to say, a child could acquire the body part and not have acquired the BP locative or vice versa: the child could have acquired the locative but not have acquired the corresponding body part term. Table 20 below summarizes the data for Vanesa and Andrea; the cells that show a dissociation between the acquisition of the body parts and BP locatives have been shaded gray.

Both of these children had acquired some BP locatives for which they had also acquired the corresponding body part (*lohoh* 'face' and *ni'ih* 'foot'). If the BP locative meanings are derived through metaphor, then the fact that the children showed adult comprehension for some pairs, might suggest that they have also acquired the metaphor “tools” they need.

The following BP terms were acquired without the corresponding preposition: *cwe'eh* 'side' (Andrea), *gue'ehcy* 'head' (Vanesa, Andrea), and *ru'uh* 'mouth' (Andrea). A convincing analysis of the BP locative terms as nouns with extended meanings would have to specifically address the challenges presented by this acquisition data.

**Table 20. SLQZ Acquisition of Body Part Terms**

	meaning	Vanesa (1;6)	Andrea (2;3)
cwe'eh	'side' (n)	No	Yes
	'beside' (prep)	Yes	No
dehts	'back' (n)	Yes	No
	'behind' (prep)	Yes	No
gue'ehcy	'head' (n)	Yes	Yes
	'on top of' (prep)	No	No
lâa'iny	'stomach' (n)	No	Yes
	'in' (prep)	Yes	Yes
lohoh	'face' (n)	Yes	Yes
	'on' (prep)	Yes	Yes
ni'ih	'foot' (n)	Yes	Yes
	'under' (prep)	Yes	Yes
ru'uh	'mouth' (n)	No	Yes
	'at the edge of' (prep)	No	No
zh:ââa'n	'bottom' (n)	No	Yes
	'under' (prep)	No	Yes

More revealing are the two examples of BP prepositions that were acquired before the corresponding BP nouns: *cwe'eh* 'side' and *lâa'iny* 'in' (Vanesa). Again, an analysis in which the body part and locative meaning are both nouns would have a difficult time accounting for this dissociation. If the locative meaning is based upon the body part nominal meaning, how could the child acquire the locative meaning without also having acquired the BP noun?

If, instead, the BP locatives are prepositions, as I argue, this dissociation is in fact expected. One would predict that the BP nouns would be acquired in the order that children acquire nouns, and that the BP prepositions would be acquired in the same order as children acquire prepositions. Section 4.4.2 below will address the question of cross-



linguistic order of acquisition of prepositions and how the SLQZ data correspond with the observed order of acquisition in other languages.

There are other data that further substantiate the dissociation between the BP nouns and prepositions in the acquisition of Valley Zapotec. In her dissertation, Jensen de López (2002) reports the results of both a language comprehension task involving approximately 40 children acquiring San Marcos Tlapazola Zapotec (SMTZ) and a longitudinal study of one child acquiring SMTZ (15 to 33 months). (San Marcos Tlapazola is very close to San Lucas Quiaviní and can be found in the map in Figure 2 to the southwest of Tlacolula.)

Although her experimental design and the analysis of her data are founded in a much different framework, some of her data are directly relevant and comparable to my results. In Tables 21 and 22 I have organized data that Jensen de López gathered in her longitudinal study of one boy acquiring SMTZ. Between the age of two and two-and-a-half years old, the child reportedly uses four of the BP terms in locative constructions; these are displayed in Table 21. He uses *láani* 'in', *quia* and *lo* 'on', and *dets* 'behind.'

**Table 21. Production of Body Part Locatives in SMTZ**

SMTZ BP term <sup>17</sup>	locational meaning	reported age of first use of term “employed as [a] spatial locative during the data period” (136)
<i>láani</i>	'in'	24 months and 12 days
<i>quia</i>	'on, on top of'	24 months and 12 days
<i>lo</i>	'on, in front of'	27 months and 23 days
<i>dets</i>	'behind'	30 months

<sup>17</sup> The SMTZ data are presented in Jensen de López’s orthography (Jensen de López 1999, 2002).

In an earlier paper, Jensen de López (1999) reported data from the same SMTZ acquiring child at age 2;9 years, which is three months later than the last data point in Table 21. By this time, the child is reported to use one additional BP term in locative constructions: *ruu* 'at the edge of.' In Table 22 I present Jensen de López's (1999) data, showing for each BP term whether the child used that term in either the nominal body part meaning or the locative meaning.

**Table 22. Body Parts and Locatives Produced by SMTZ Acquiring Child 2;9\***

SMTZ Body Part Term	Body Part Meaning	Used as Body Part	Used as Locative
<i>làani</i>	'stomach'	No	<b>Yes</b>
<i>lo</i>	'face'	<b>Yes</b>	<b>Yes</b>
<i>quia</i>	'head'	No	<b>Yes</b>
<i>ruu</i>	'mouth'	No	<b>Yes</b>
<i>dets</i>	'back'	No	<b>Yes</b>
<i>nii</i>	'foot'	<b>Yes</b>	No

\*Modified from Jensen de López's Table B (1999: 17).

As in my data on the acquisition of SLQZ, the SMTZ acquisition data also show a dissociation in the acquisition of BP nouns and prepositions. As can be seen in Table 22, the child has acquired the body part *nii* 'foot', but not the corresponding preposition 'under'. Furthermore, the child has acquired *làani* 'in', *quia* 'on', *ruu* 'at the edge of', and *dets* 'behind' without having acquired the corresponding BP nouns. These results are consistent with the data found in my pilot study and support the hypothesis that there is a categorial distinction between the BP nouns and locatives.

#### 4.4.2 Comparison with Cross-linguistic Acquisition of Prepositions

How does the acquisition of Zapotec prepositions compare with the acquisition of prepositions in other languages? Cross-linguistically, the first prepositions to be acquired are 'in' and 'on', then 'under' and 'beside', then 'in front of' and 'in back of' of things that have inherent fronts and backs, and finally 'in front of' and 'in back of' of things with no inherent fronts or backs. Data from several languages (Table 23 below) attest to this order (Johnston and Slobin 1979, Dromi 1979). (In this table, *back<sub>F</sub>* and *front<sub>F</sub>* refer to objects that have inherent fronts and backs as opposed to *front* and *back*, which refer to objects with no inherent front or back.)

**Table 23. Cross-Linguistic Order of Acquisition for Prepositions**

Language* → Order ↓	English	Turkish	Serbo-Croatian	Italian	Hebrew
1	in on	in on	on in	in on	in on
2	under beside	under beside	beside under	under beside	beside
3	in front <sub>F</sub> of in back <sub>F</sub> of	in front <sub>F</sub> of in back <sub>F</sub> of	in front <sub>F</sub> of in back <sub>F</sub> of	in front <sub>F</sub> of in back <sub>F</sub> of	behind
4	in back of in front of	in back of in front of	in back of in front of	in back of in front of	under

\*The data from English, Turkish, Serbo-Croatian, and Italian is from Johnston and Slobin (1979). The Hebrew data is from Dromi (1979).

The acquisition of BP prepositions in SLQZ is consistent with the cross-linguistic data. The hypothesis in this thesis predicts that the BP locatives in VZ languages would be acquired as other prepositions are cross-linguistically, and the SLQZ and SMTZ data seem to bear out this prediction, offering further support for their classification as prepositions.

#### **4.5 Conclusions**

There is no evidence from my data that the SLQZ learning children acquire prepositions in a different order than children acquiring other languages. Furthermore, there is no evidence that the fact that these prepositions are homophonous with body part words affects their acquisition at all. The fact that the youngest child, Vanesa 1;6, had acquired *làa'iny* 'in', but not *làa'iny* 'stomach' seems to be the strongest evidence in support of a grammatical dissociation between the words, and the other dissociations also offer support of a categorial difference between the BP nouns and locatives. Similar patterns of dissociation were also found in Jensen de López's data (1999 and 2002).

If the child acquires 'in' before 'stomach', then it does not make sense to argue that the child's use of 'in' is a metaphorical extension of 'stomach'. This, of course, has implications for adult grammar as well: if children acquire these lexical items separately and thus do not derive the location sense of the BP term from the BP noun, it seems unlikely that adults do.

#### **6.0 Conclusions**

In this thesis I argued that the BP terms used in locative expressions should be classified as prepositions. I presented syntactic evidence from modern VZ languages supporting this and data from Colonial VZ documents which are consistent with the prepositional analysis and show that this distinction has been around for at least 200 years. The data from child acquisition of Zapotec further supports the categorial

distinction between BP nouns and BP locatives through a dissociation between the acquisition of the body part and the corresponding locative expressions. The path of syntactic and semantic change that would be necessary to develop this system is not extraordinary, and can be accounted for using already existing and well established types of change.

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