An investigation of the spatial semantics of Chiapas Zoque, a Mixe-Zoquean language of southern Mexico

A thesis submitted to the University of Manchester for the degree of Doctor of Philosophy in the Faculty of Humanities

2017

Luke McDermott

School of Arts, Languages and Cultures

Contents

6

8

Word count: 71,242

Abbreviations

1	first person
2	second person
3	third person
A	Set A prefix
ABS	absolutive
ANAP	anaphor
ANTIP	antipassive
APPL	applicative
APPROX	approximative
ASSOC	associative
ASSUMP	assumptive
AUX	auxiliary
B	Set B prefix
CAUS	causative
CONTR	counter factual
CP	completive aspect
DEP.I/II/III	dependent suffix 1/2/3
DER	derivational
DET	determiner
DIST	distal
ERG	ergative
EXC	exclusive
EXIST	existential
F	female
FUT	future
GEN	genitive
HESIT	hesitation
ICP	incompletive
IMP	imperative
INC	inclusive
INDEF	indefinite
INSTR	instrumental

LOC	locative
M	male
N	nominaliser
NF	Non-finite
PERF	perfective
PL	plural
PRED	predicator
PROG	progressive auxiliary
PRX	proximal
PST	past
Q	question marker
REL	relativser
REPOR	reportative
REP	repetitative
SIM	similaritive
TSUB	temporal subordinative

Abstract

In this thesis, I investigate the linguistic resources and strategies used to describe spatial concepts such as location orientation and motion in the variety of Chiapas Zoque (CZ; Mixe-Zoquean) spoken in the southern Mexican town of Ocotepec, Chiapas. This investigation is the first of its kind for a Mixe-Zoquean language and represents a significant increase in the descriptive analysis of Chiapas Zoque, which can reasonably be described as an under-documented language. One of three principle focuses of this investigation is the semantics of motion roots in CZ. To this end it was found that change of location relative to a reference location/object is encoded exclusively within a paradigm of 12 verbal roots all of which have punctual, change of state-like semantics. Furthermore, two of these roots are identified as encoding what Levinson and Wilkins (2006) have termed a *change of locative relation*, as a result of which they do not entail the motion of their absolutive argument. The second key theme of my investigation is the use and conceptual structure of the linguistic frames of reference (FoRs) used by speakers of CZ in Ocotepec. A notable feature in this area of investigation is the difficulty of categorising the slope-based FoR used in Ocotepec according to the system of classification proposed by the MesoSpace project (see O'Meara and Pérez Báez (2011) for an overview). Specifically, its conceptual structure suggests that the absolute and geomorphic FoRs represent two ends of a conceptual continuum. Finally, I have provided a first detailed discussion of the phenomenon of extrinsic FoRs that can not feature in locative statements in which a Ground is linguistically encoded and must therefore appear in *Groundless locative statements* when being used to locate a Figure. I argue that these represent an alternative strategy for expressing descriptions of location featuring extrinsic FoRs. I also propose that a class of locative statement that has previously been classified as examples of the direct (egocentric, intrinsic) FoR are in fact Groundless instances of the relative (egocentric, extrinsic) FoR.

13

Declaration

I declare that no portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

Copyright

i The author of this thesis (including any appendices and/or schedules to this thesis) owns certain copyright or related rights in it (the "Copyright") and s/he has given The University of Manchester certain rights to use such Copyright, including for administrative purposes.

ii Copies of this thesis, either in full or in extracts and whether in hard or electronic copy, may be made only in accordance with the Copyright, Designs and Patents Act 1988 (as amended) and regulations issued under it or, where appropriate, in accordance with licensing agreements which the University has from time to time. This page must form part of any such copies made.

iii The ownership of certain Copyright, patents, designs, trade marks and other intellectual property (the "Intellectual Property") and any reproductions of copyright works in the thesis, for example graphs and tables ("Reproductions"), which may be described in this thesis, may not be owned by the author and may be owned by third parties. Such Intellectual Property and Reproductions cannot and must not be made available for use without the prior written permission of the owner(s) of the relevant Intellectual Property and/or Reproductions.

iv Further information on the conditions under which disclosure, publication and commercialisation of this thesis, the Copyright and any Intellectual Property and/or Reproductions described in it may take place is available in the University IP Policy (see http://documents.manchester.ac.uk/DocuInfo.aspx?DocID=487), in any relevant Thesis restriction declarations deposited in the University Library, The University Library's regulations (see http://www.manchester.ac.uk/library/aboutus/regulations) and in The University's policy on Presentation of Theses.

Acknowledgements

Part I

Chiapas Zoque: the language and its speakers

1 Introduction

1.1 Research context

Spatial cognition is central to the wider cognitive abilities of humans, with spatial representations, usually in the form of spatial metaphors, being found in many different areas of human cognition, including, for example, our understanding of time (see, for example, Boroditsky (2000), Brown (2012) and Levinson and Majid (2013)) and our numerical reasoning (the concept of the number line, for example). If we follow the likes of Jackendoff (1983), therefore, in assuming that the manner in which spatial concepts are expressed linguistically reflects the manner in which they are encoded in the mind, the study of spatial language can be identified as holding great potential for the study of the human cognition. This potential for insight into human cognition has provided spatial language with a prominent place in the study of the relationship between language and cognition.

A development in the study of spatial language that has occurred in the last couple of decades has been the attempts to determine a *semantic typology* of space through the use of standardised stimuli sets, such as the Man and Tree (Levinson et al., 1992) or the Topological Relations Picture Series (Bowerman and Pederson, 1992*b*), across large and diverse samples of languages; an approach pioneered by the Language and Cognition Department at the Max Planck Institute for Psycholinguistics in Nijmegen, The Netherlands. This approach to studying spatial language has lead to a great increase in the number and diversity of languages for which accounts of spatial language exist and, as a direct result, has lead to a greatly increased understanding in the potential for variation

in the spatial domain of language. Three areas in which this crosslinguistic variation has been particularly evident have been the division of the topological conceptual space between linguistic spatial relators (for example, Bowerman and Pederson (1992a) and Levinson and Meira (2003)), the inventory of linguistic frames of reference (FoRs) used by speakers of different languages (for example, Pederson et al. (1998) and O'Meara and Pérez Báez (2011)) and the manner in which motion is conceptualized linguistically (for example, Bohnemeyer et al. (2007))[1].

Alongside the documentation of crosslinguistic diversity in spatial semantics has been the collection of evidence that suggests it is correlated with differences in non-linguistic spatial cognition between linguistic groups. This has been particularly true of the preferences shown by speakers of different languages for the linguistic FoRs used in spatial descriptions and the cognitive FoRs used in memorising spatial arrays (see Levinson et al. (2002) and O'Meara and Pérez Báez (2011)). These observations have been used as the evidential basis for so-called neo-Whorfian theories in which language, as a shared cultural tool, is not only reflective of the workings of the human mind, but has the potential to influence it (see Levinson et al. (2002) and Levinson and Wilkins (2006)). Such a revival of Whorf's ideas regarding the relationship between language and cognition, even in the considerably more nuanced form proposed by Levinson et al, are of course controversial and, as would be expected, have been disputed strongly, perhaps most notably in Li and Gleitman (2002) and Li et al. (2011).

In summary, spatial language is presently a central focus for investigations into the relationship between language and cognition. Much of the important discoveries made in this domain over the last few years - including the aforementioned observation of Whorfian effects and the construction of a number of semantic typologies relating to

---

[1]A spatial frame of reference is a co-ordinate system that divides space into angularly restricted regions and can be used as a basis for defining the spatial properties of an entity or the relations between multiple entities. A linguistic frame of reference is a frame of reference that is referenced when describing the spatial properties of an entity. A detailed discussion of linguistic frames of reference is provided in Section 7.

motion - have resulted directly from crosslinguistic comparisons. Given the ongoing debates regarding the proposed neo-Whorfian hypotheses and the nascent nature of a number of the sematic typologies proposed, a key aspect of the continued investigation of the relationship between spatial language and cognition is the increase in the number, and diversity, of languages for which detailed descriptions of spatial semantics exist. It is within this context that this thesis is presented.

1.2 Aims

The broad aim of this thesis is to provide a first description of the linguistic strategies used to express notions of location, orientation and motion in CZ. This description will have a number of different facets. I initially describe the constructions used to encode information about these three spatial domains and present analyses of the semantics of the formal elements that appear therein. The second part of the thesis focuses on those spatial descriptions that make reference to a linguistic FoR. In this part I describe inventory of linguistic FoRs that CZ speakers living in Ocotepec use - including their conceptual nature and the linguistic strategies for their expression - and the contexts in which they use them. The thesis concludes with a first detailed discussion of the phenomenon of the obligatory use of *Groundless locative statements* (locative statements in which the Ground is not linguistically encoded) when using particular FoRs to specify location[2].

This thesis aims to make a number of specific contributions to the wider literature related to spatial language described above. In the main these contributions come in the form of adding a first Zoquean perspective (and some times a first Mixe-Zoquean perspective too) on an aspect of spatial language that has been the focus of crosslinguistic investigation. For example, the account of the use of linguistic FoRs in CZ is the first for a Zoquean language and allows for interesting comparisions to be made with the now

---

[2]In this thesis, the term Ground always refers to an entity relative to which a location is specified. More details are given in Section 3.1.

substantial list of languages surveyed in this regard, particularly the well-known system of reference used in neighbouring Tseltal (Mayan, Mexico).

A second area in which the description provided in this thesis significantly enhances the potential for crosslinguistic comparison is in relation to the semantics of motion descriptions. The detailed description of CZ provided is the first for a Mixe-Zoquean language in this area and complements those already available for other Mesoamerican languages such as Tseltal, Yukatek Maya (Mayan, Mexico) and Lowland Chontal (Tequistlatecan, Mexico). Of particular interest in this area of study are the obvious similarities between these genetically unrelated languages with regards to their fundamental conceptualisation of motion events, the lexicalisation patterns exhibited for manner and path by motion predicates and the reliance on similar paradigms of motion predicates to encode change of location relative to a single Ground.

Perhaps the most notable contribution to the wider literature of this thesis is its description and analysis of *Groundless locative statements*. Although the obligatory use of Groundless locative statements when using particular FoRs to specify locations has previously been noted in the literature, there has not been any discussion regarding its significance in the use of projective descriptions of location[3].

1.3 The language and its speakers

The language that is the focus of this thesis is typically referred to as Chiapas Zoque (henceforth CZ) in the literature (see, for example, Faarlund 2012) and is spoken in the northwest of the southern Mexican state of Chiapas. It is a member of the Mixe-Zoque language family, which is spoken exclusively in the southern states of Mexico and is divided into two main branches, the Mixean branch and the Zoquean branch, of which CZ is a member. The Zoquean branch is further divided between the Gulf

---

[3]A projective description of location is one in which the Figure - the object being located - is described as being located within an *angularly restricted* spatial region. Such descriptions necessarily involve reference to linguistic FoRs. A detailed discussion of projective spatial descriptions is provided in Part IV of this thesis.
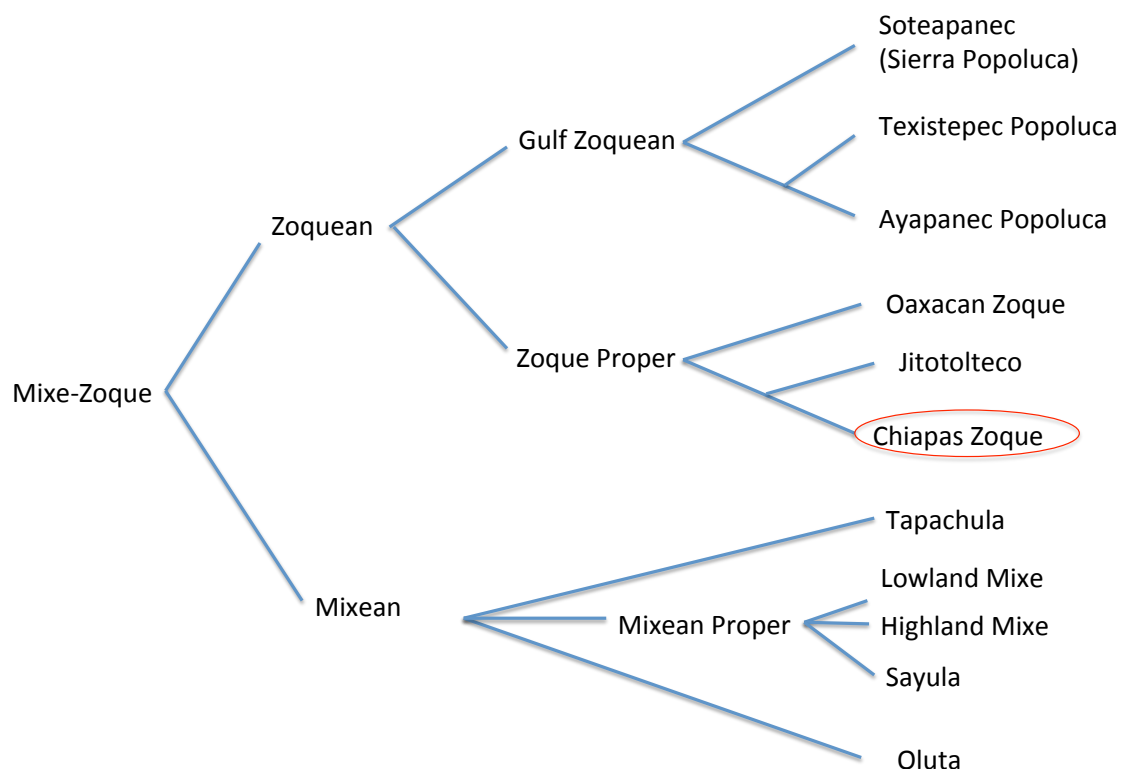
Figure 1: The most up-to-date classification of the Mixe-Zoque language family (Zavala, 2011)

Zoquean languages - predominantly spoken in the states of Veracruz and Tobasco - and the Zoque languages proper, which are those varieties predominantly spoken in Chiapas and Oaxaca[4]. In addition to CZ, the Zoque languages proper include the two Oaxacan varieties of Zoque and the recently recognised language of Jitotolteco (Zavala, 2011), which is spoken in the central part of Chiapas[5]. The most up-to-date classification of the Mixe-Zoque language family is shown in Figure 1.

It is generally agreed that CZ itself can be divided into four mutually intelligible dialects, themselves consisting of a number of sub-varieties associated with different mu-

---

[4]There are a small number of communities where CZ is spoken in the neighbouring state of Tobasco.

[5]See Johnson (2000) and Jiménez Jiménez (2014) for descriptions of one of these, San Miguel Chimalapa Zoque.

nicipalities. The dialectal regions with which these main dialects are associated (shown in the map in Figure 2) differ greatly in their current sociolinguistic context. For example, the varieties of the southern dialectal region - particularly those surrounding the state capital, Tuxtla Gutierrez - are generally taken to be extinct (Faarlund, 2012, p2). In contrast, in the northeastern dialectal region there are a number of communities in which CZ is the dominant language. The two remaining dialectal regions - the central and northern regions - fall between these two extremes in that there are still speakers of each associated dialect, but there are few (if any) communities where CZ remains the community language. In the case of the northern variety this diminished sociolinguistic status is in part due to the volcanic eruption that occurred in that area of the state in 1982; as will become evident from some of the examples provided below, this event was significant for all of the communities of the Zoque region.

The data on which this thesis is based were collected in the town of Ocotepec, which, as can be seen from the map in Figure 2 (where it is labelled **c**), is located in the northeastern dialectal region. According to the 2010 Mexican census (INEGI, 2010), over 99% of the population of Ocotepec (11,878) spoke CZ at that time. As this number suggests, CZ is the dominant language in Ocotepec, being used in the majority of social contexts (Ramírez Muñoz, 2016) and, in theory at least, in the early years of education too [6]. There are signs, however, that the community is in the early stages of the language shift to Mexican Spanish that is already advanced in the majority of traditionally CZ speaking towns. The most obvious example of this nascent shift is the number of parents who can be observed to communicate with their children principally through Mexican Spanish, the result of which is that presently many children learn CZ exclusively through their interactions with their grandparents. Further research is required to determine the effect of this apparent trend on the status of CZ in Ocotepec.

---

[6]Although early years bilingual education is a policy of the Mexican government in areas with high concentrations of indigenous languages speakers, some residents of Ocotepec expressed scepticism as to how much teaching was actually performed through the medium of CZ.
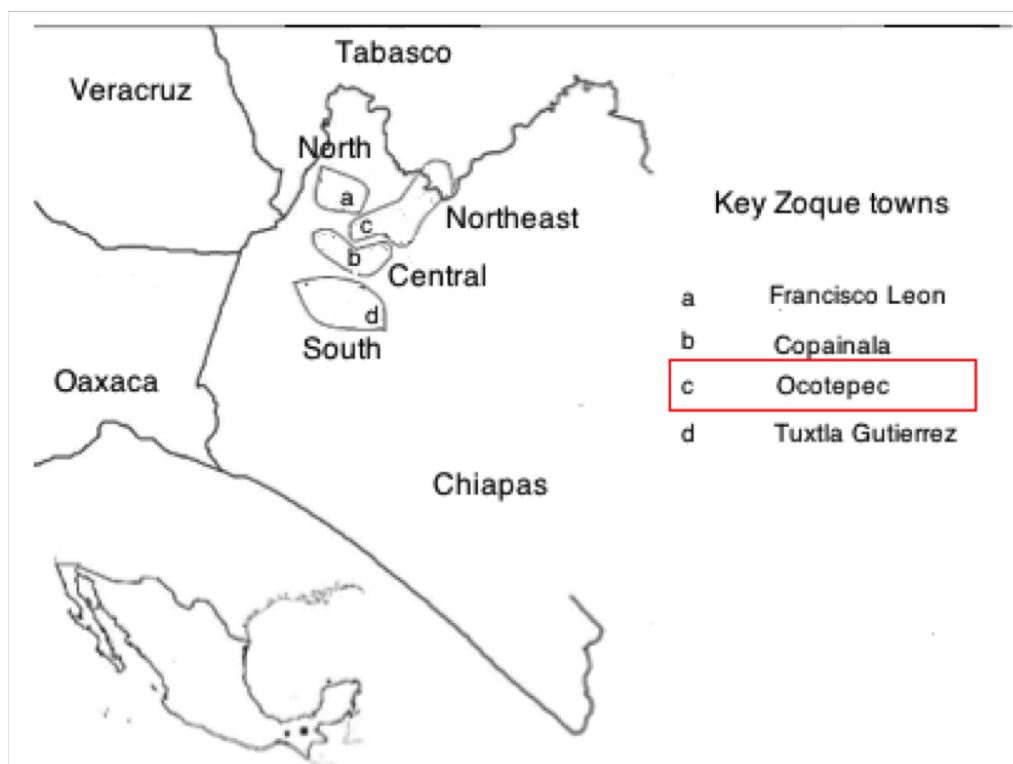
Figure 2: A map showing the locations of the main towns in each of the four dialectal regions of Chiapas Zoque (Adapted from Zavala 2011)

1.4 Relevant previous research

1.4.1 Previous research on Chiapas Zoque

A first modern grammar of CZ was published relative recently by Faarlund (2012). This short grammar - also primarily based on data collected in Ocotepec gives a broad overview of the main characteristics of the language, including its phonology, morphology, syntax and information structure [7]. The analyses presented in Faarlund's grammar have formed the principal basis for those presented in this thesis.

More recently still, two master's dissertations have been published that focus on more specific aspects of the CZ spoken in Ocotepec. In one of these, Ramírez Muñoz (2016) analyses complementary structures in the languages, whereas De la Cruz Morales (2016) has analysed serial verb constructions in the language. In addition to their primary focus, both of these dissertations contribute to the understanding of the grammar of CZ more generally; where these works have been the basis for an analysis rather than Faarlund (2012) it will be explicitly stated. In the context of this thesis the work of De la Cruz Morales (2016) is of particularly relevance due to its discussion of the function of motion roots in serial verb constructions (see Section 5.4).

A final piece of modern research concerning CZ is the analysis by Zavala (2015) of a colonial period dictionary of the CZ spoken in the central town of Tecpatan. Despite it focusing on a different variety of CZ and a time period almost 300 years in the past, much of the morphological analysis presented in this dictionary has proven relevant to the present research. Zavala has also conducted research into the modern variety of CZ spoken in Tecpatan, for example his analysis of external possession in Zavala (2013).

The only other major investigation into the grammar of CZ is the collection of papers published by Wonderly (1951a,b,c,d, 1952a,b) on the variety of CZ spoken in the central town of Copainala; taken together these papers amount to the phonological and

---

[7]This work was, to a lesser extent, also based on texts - many published by the state government - and data collected in the nearby town of Tapalapa.

morphological sections of a descriptive grammar. Although it is possible to gain some insight into the structure of CZ through studying these papers, the vast majority of their content has been superseded by the grammar of Faarlund. Other available material concerning CZ includes a number of CZ-Spanish dictionaries and word lists of the central (most notably Harrison and Harrison (1981)) and northern (most notably Engel and Engel (1984)) varieties published by the Summer Institute of Linguistics, some of which include brief grammatical sketches. Moreover there have also been postgraduate theses published on the phonology of the CZ spoken in Chapultenango (Herrera Zendejas, 1995) and the verbal morphology of the northern variety spoken in Rayon (Vilavicencion Zarza, 1990).

1.4.2 Other Zoquean languages

In the production of this thesis considerable insight was gained into the structure of CZ through considering research into the other languages in the Zoquean branch of the Mixe-Zoque language family. Three sources of information were of particular use: the extremely detailed grammars of Sierra Popoluca (also referred to as Soteapanec; de Jong Boudreault (2009)) and San Miguel Chimalapa Zoque, (one of the two varieties of Oaxacan Zoque; Johnson (2000)) and the master's dissertation by Jiménez Jiménez (2014) also concerning a variety of Oaxacan Zoque. The research into the recently recognised language of Jitotolteco by Zavala (2011) was also insightful.

1.4.3 Spatial language in Mixe-Zoquean languages

As yet there has not been any research focused specifically on the linguistic resources and strategies used to express spatial concepts such as location, orientation and motion in Zoquean languages. There has, however, been some prior discussion of topics that will be discussed in more detail in this thesis. For example, De la Cruz Morales (2016) has discussed the semantics of motion roots in serial verb constructions and the combinatorics

of locative postpositions and relational spatial nouns, both of which will be discussed in detail in this thesis. The locative postpositions of CZ are also discussed briefly in (Faarlund, 2012, p35) and Wonderly (1951c). Similar, general, discussions for the San Miguel Chimalapa Zoque and Sierra Popoluca are to be found in Johnson (2000) and de Jong Boudreault (2009) respectively.

Within the Mixean branch, Romero-Méndez (2011) has conducted research specifically aimed at spatial language. As this research has been conducted as part of the MesoSpace programme (Bohnemeyer and Pérez Báez, 2008), its focus has been the inventory of linguistic FoRs used by speakers of the language and the role played by part-naming morphemes (*meronyms* in the terminology of MesoSpace) in spatial descriptions. In addition, Zavala (2005) has also analysed the formal nature and semantics of motion roots in serial verb constructions for Oluteco; this treatment mirrors that conducted for CZ by De la Cruz Morales (2016).

1.5 Data

The data on which this thesis is based were collected during 4 trips to the town of Ocotepec between July 2013 and February 2016. During this time I spent a total of 18 weeks in Ocotepec divided into trips of 2, 4, 8 and 4 weeks in length. The data I recorded (using audio and, to a lesser extent, video) are of a varied nature, ranging in their spontaneity from observed (and recorded) natural conversation between native speakers to grammaticality judgements and translations. A summary of the amount of data for each of the types of 'communicative event' defined by Himmelmann (1998) is presented in Table 1.

1.5.1 Consultants

While in Ocotepec I worked with a total of 25 consultants for periods of time varying between one hour and tens of hours. 10 of these consultants were female (aged between

Communicative event type	Examples	Approximate number of hours
Observed communicative events	Natural conversations narratives	10
Elicitations	Word lists, paradigms, acceptability judgements	33
Staged communication events	Non-linguistic prompts (videos, pictures etc)	50

Table 1: Approximate amounts of data - in terms of hours of recording - for each of the three types of communicative event defined by Himmelmann (1998).

18 and 58) and 15 male (aged between 19 and 60). All consultants were native speakers of CZ and spoke CZ in their homes. Most consultants also spoke Mexican Spanish natively (through schooling or having lived in large cities for a period early in their life), though some of the older consultants, particularly women, spoke Spanish non-natively and in some cases had quite limited abilities in the language; no consultant declared speaking any language other than CZ and Mexican Spanish despite some having lived and worked in Tseltal speaking areas in the past. In terms of educational background and Spanish literacy there was considerable variation across consultants ranging from the illiterate (mainly older consultants), who had either never been to school or left at an early age, to those who had graduated from teacher training college and therefore had a high degree of literacy. Some of this latter group also had some literacy in CZ, though they typically still had some difficulty reading the orthography for CZ used in government produced materials[8]. A summary of the personal details of the consultants who provided the examples presented in this thesis are provided in Table 2.

1.5.2 Methods of data collection

The largest single type of data amongst my collection is that of spatial descriptions elicited through the use of non-verbal stimuli. The non-verbal stimuli in question in-

---

[8]These assessments of literacy were based on observations made by the author in addition to information provided by the consultants themselves.

Code	Gender	Age	Spanish	Literacy
AG	F	22	Native	Full
AT	F	28	Native	Full
B	M	27	Native	Full
BE	M	40	Native	Full
BR	F	48	Fluent	None
C	M	36	Fluent	Some
CM	F	58	Fluent	None
EU	M	57	Fluent	Full
F	M	50	Native	Full
JC	M	21	Native	Some
JL	M	19	Native	None
LG	F	18	Native	Full
MA	F	28	Native	Full
MC	F	40s	Native	Full
ME	F	19	Native	Full
MJ	F	21	Native	Full
P	M	52	Fluent	Some
PA	M	25	Native	None
R	M	20	Native	Full
RO	M	60	Fluent	Some
RU	M	40s	Native	Some

Table 2: Selected personal details of those consultants quoted in this thesis.

cluded both still images and videos. In many cases these were standardised sets of stimuli developed by different research groups with the intention of investigating a specific aspect of spatial language crosslinguistically. A list of the stimuli sets used, the aspect/aspects of spatial language at which they are targeted and the number of elicitations sessions in which they were used is provided in Table 3.

In all cases, the primary interaction consultants had with each set of standardised stimuli followed the experimental procedure recommended by their creators. In many cases - such as for the Topological Relations Picture Series or the Trajectoire video stimuli - this experimental procedure required the consultant to respond to a question directly from the researcher relating to the stimulus they had just seen. In others - such as A Hunting Story (Vuillermet and Desnoyers, 2013) and the Frog Story (Mayer,

Stimulus	Code	Nature	Procedure	Number of consultants
Ball and chair (Bohnemeyer, 2008)	B&C	photographs	referential communication task	5 x 2 (∼4hrs)
Man and Tree (Levinson et al., 1992)	M&T	photographs	referential communication task	1 x 2 (∼0.5hr)
Topological Relation Picture Series (Bowerman and Pederson, 1992*b*)	TRPS	line drawings	question-response	3 (∼ 2hrs)
Picture Series for Positional Verbs (Ameka et al., 1999)	PSPV	photographs	question-response	3 (∼ 2hrs)
Trajectoire (Ishibashi et al., 2006)	TRAJ	video clips	question-response	5 (∼ 2.5hrs)
Motion verb stimulus (Levinson, 2001)	MVS	video clips	question-response	5 (∼ 2.5hrs)
Frog Story (Mayer, 1969)	FS	line drawings	story retelling	11 (∼ 2.5hrs)
A Hunting Story (Vuillermet and Desnoyers, 2013)	AHS	line drawings	story retelling	4 (∼ 1hr)

Table 3: Standardised stimuli used in this study. The values in parentheses following the number of consultants who participated in a particular task indicates the number of hours of recordings collected in conducting that particular task.

1969)) - consultants were required to "read" a picture book before retelling it in their own words.

A third experimental procedure used - most notably with the Ball and Chair (B&C) stimuli (Bohnemeyer, 2008) - was that of the *referential communication task*, a paradigm pioneered by Clark and Wilkes-Gibbs (1986) and expanded more recently upon by the Language and Cognition Group at The Max Plank Institute for Psycholinguistics in Nijmegen (Levinson et al., 1992). The general details of this type of task are that two consultants sit side-by-side, facing the same direction, but are prevented from being in visual contact with each other by the presence of some sort of screen between them. One consultant performs the role of 'director' and must describe a particular stimulus so that the second consultant, the 'matcher', can either identify the same stimulus from
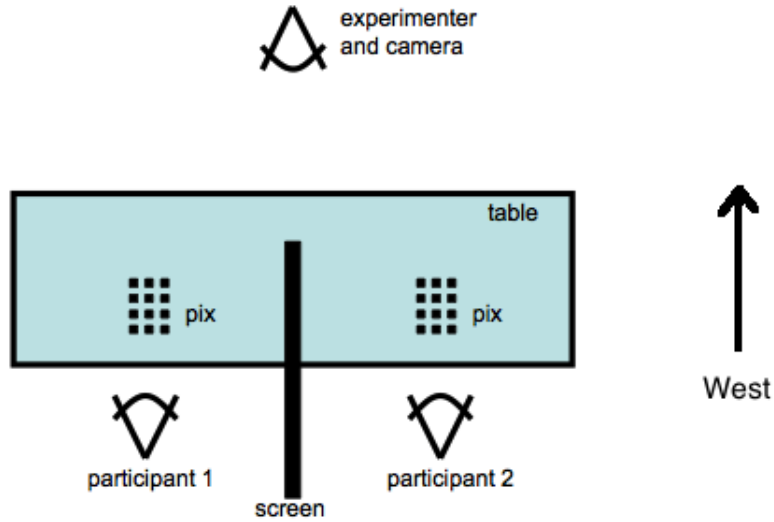
Figure 3: A schematic representation of the experimental used during runs of the B&C referential communication task in Ocotepec (modified from Bohnemeyer and Pérez Báez (2008) and originally based on the paradigms of Clark and Wilkes-Gibbs (1986) and Levinson et al. (1992)). A very similar set up was used for all other referential communication tasks.

a set of stimuli placed in front of them (as in the case of the B&C task) or recreate the stimulus described by the director using appropriate props. A schematic diagram of the experimental set-up used during runs of the B&C task is shown in Figure 3; roughly the same set-up was used for all other referential communication tasks performed in Ocotepec, the difference being purely the manner in which stimuli were presented or reproduced/identified.

In addition to those standardised stimuli listed in Table 3, elicitation of spatial descriptions of different types was also conducted with non-verbal stimuli created by the author. There were three sets of these author-created stimuli that were of particular importance. Most central to the research presented here were the two sets of short video clips created to investigate the lexical semantics of the CZ change of location roots: the Telicity Clips (TC) and the Entailment of Motion Clips (EMC). As described in detail in Section 6, both of these sets of stimuli were used as the basis for question-response

elicitations with individual consultants.

The other two principal sets of author-created stimuli were those used in the Maze Game (MG) and the Ordering Objects task (OO), both of which were run as referential communication tasks. In the Maze Game, one consultant - the director - was shown a video of a toy figure moving through a grid of white squares (the maze). The aim of the task was for the second consultant - the matcher - to recreate this route using a toy figure and a grid of squares placed in front of them[9]. In the Ordering Objects task, the matcher had to recreate spatial arrays - using appropriate props - based on the descriptions of photographs given by the director.

Stimulus	Code	Nature	Procedure	Number of consultants
The Maze Game	MG	video clips	referential communication task	3 x 2 (~3hrs)
Telicity Clips	TC	video clips	question-response	10 (~8hrs)
Entailment of Motion Clips	EMC	video clips	question-response	10 (~8hrs)
Ordering Objects	OO	photographs	referential communication task	3 x 2 (~1.5hrs)

Table 4: A list of the principal author-created stimuli used in this study. The values in parentheses following the number of consultants who participated in a particular task indicates the number of hours of recordings collected in conducting that particular task.

In all but a few cases, the experimental procedures or questions from the researcher were directed towards the consultants in Mexican Spanish. This was due to the researcher's productive ability in CZ being almost completely limited to the spatial domain and the his inability to find a consultant willing to perform the role of research assistant. One notable exception to the use of Mexican Spanish by the researcher was during elicitations related to the semantics of change-of-location verbs in CZ. During these elicitations, described in detail in Section 6, the researcher used CZ in two ways: to present consultants with alternative descriptions of elicitation stimuli and to present consultants with a verbal paradigm that had been formulated with the help of two native speaker consultants.

---

[9]The design of this task is a variation on one previously designed by Pederson and Senft (1996).

1.6 Presentation of examples and conventions used

All of the examples of CZ given in this thesis are presented over three lines. The first of these lines gives a phonemic transcription of the CZ utterance in IPA with morpheme boundaries indicated using hyphens '-' for affixes and equals signs '=' for clitics[10]. I have also used a plus sign '+' to indicate stems of different types formed from more than one root when I have not glossed the roots individually.

Other punctuation is also used to give an idea of intonation in this line: A short pause in the middle of an utterance is indicated by a comma. A longer pause in the middle of an utterance is indicated by ellipses. Moreover, ellipses at the beginning or end of an example indicate a linguistic context that has been omitted. These utterances have been omitted based on my judgement that they do not contribute further to the understanding of the utterances presented.

Loans from Spanish are presented in two ways. If, as is often the case, the pronunciation of the word has been altered to match the phonology of CZ then it is transcribed in the same way as other CZ words. If, however, a loan is pronounced in the same manner as it would be within a Mexican Spanish utterance it has been transcribed using standard Spanish orthography and rendered in italics. In Tables 5 and 6 are shown the CZ consonant and vowel phoneme inventory respectively.

The second line contains the glossing of the morphemes identified in line 1. When a single morpheme encodes more than one grammatical category the associated glosses are separated by a dot (.). A dot is also used to separate the parts of lexeme glosses that involve multiple English words.

In the third line is given, in single quotation marks and italicised, an English trans-

---

[10]I have chosen to exclusively use the IPA for transcriptions as I do not believe that an additional line of transcription featuring the state-authorised CZ orthography would increase the accessibility of this work to speakers of the language. This is in part due to the extremely limited extent of literacy in CZ amongst even those speakers with considerable formal education, but also the fact that without modification this orthography does not allow for accurate transcription (see the alterations made by De la Cruz Morales (2016) and Ramírez Muñoz (2016) in their recent dissertations).

	Bilabial	Alveolar	Palatal	Velar	Glottal
Stops	p	t			ʔ
Africatives		ts			
Fricatives		s			h
Nasals	m	n		ŋ	
Tap		ɾ			
Approximant	w		j		
Lateral		l			

Table 5: The inventory of consonant phonemes in CZ (Ramírez Muñoz, 2016).

	Front	Central	Back
High	i	ɘ	u
Low	e	a	o

Table 6: The inventory of vowel phonemes in CZ (Ramírez Muñoz, 2016).

lation of the utterance. This sometimes also features a more literal translation, which is enclosed in parentheses and is preceded by "*lit:*". Following the translation a reference to the source of the example is given, again in parentheses. The letters that occur before the comma in these references indicate the consultant who produced that particular utterance; the abbreviations associated with the consultants quoted in this thesis are listed in Table 2.

The letters following the comma in the parentheses following examples reference either the stimuli being described or alternatively provide an indication regarding the communicative context in which the utterance was given. The abbreviations used are shown in Table 7.

Stimulus	Code
Elicitation	E
Staged communicative events	SC
Observed communicative events	OCE

Table 7: A list of the communicative contexts referenced in this thesis (Himmelmann, 1998).

1.7 Structure

This thesis has the following structure. In the following section (Section 2) I describe aspects of the general grammatical structure of CZ that are pertinent to the analysis and understanding of spatial descriptions in CZ. In some cases these topics have either not been discussed before or my analysis disagrees with that presented previously. When this is the case it is explicitly stated, otherwise the analyses presented are founded on those presented by Faarlund (2012), De la Cruz Morales (2016) and Ramírez Muñoz (2016).

Part II of the thesis concerns the structure and semantics of descriptions of all three spatial domains. In Section 3, I provide an overview of descriptions of each domain. These overviews will include descriptions of the typical constructions used in such descriptions and their key typological features. In Section 4, I describe the formal nature of the spatial adjuncts that are a core component of all spatial descriptions in CZ. This description include a detailed discussion of the semantics of the formal elements that feature in these adjuncts, including postpositional clitics and relational spatial nouns. In Section 6, I analyse the semantics of those verbal roots that are used to express all changes of location relative to a Ground in CZ; I refer to these roots as *change-of-location* roots. This section also includes a discussion of the use of change of location roots in serial verb constructions.

The final part of this thesis (Part IV) is concerned with *projective spatial descriptions*, which are spatial descriptions in which a spatial property of an entity is specified through reference to a projective geometry[11]. The referencing of a projective geometry linguistically entails the use of a linguistic FoR. In Sections 8-10, therefore, I present accounts of all those linguistic FoRs used by speakers of CZ. These accounts include

---

[11]In descriptions of motion and orientation this means that the spatial properties of the Figure - the entity whose spatial properties are being defined - are defined through reference to a direction. In descriptions of location this means that the Figure is located in an angularly restricted spatial region. More details regarding projective geometries are provided in Section 7.2.2.

descriptions of the means of expressing each FoR, the manner in which each frame is used and any bearing they have on the typology of linguistic FoRs. Finally, in Section 11 I present my account of the use of Groundless locative statements in CZ. This account describes why some CZ FoRs can only appear in this type of construction when specifying a location, describes the patterns of use of such statements and considers their role in the evolution of linguistic FoRs.

2   Salient grammatical features

2.1   Introduction

In this section I present a selection of features of the grammatical structure of CZ that are necessary for the analyses of spatial language presented in this thesis. In addition to a brief description of the general typological characteristics of the morphology and word order of the language, these include descriptions of the core argument marking and alignment, the form of serial verb constructions in the language, the TAM system and, finally, the strategies used to express adnominal possession. Unless otherwise stated, the analyses presented here are based upon those presented in Faarlund (2012).

2.2   Morphology and word order

As with many of the Mixe-Zoque languages, CZ is polysynthetic and agglutinative. These properties are clearly demonstrated by the CZ verb, which can be composed of a wide variety of affixes and clitics in addition to a stem, which itself can contain multiple verbal roots, incorporated nouns and lexical affixes. Examples of the types of information that can be encoded within a CZ verb are person and number of core arguments, aspect and mood[12], evidentiality, valence changing and other derivational processes and adverbial information. An example of one of these highly information rich verbs is shown in (1)[13].

---

[12]I follow the analysis of Ramírez Muñoz (2016) that CZ does not mark tense morphologically.

[13]The translation and glosses of this example were translated from the original Spanish by the author.

(1) ø-witəŋ-toj-ʔaŋ+kət-pa=ʔtsi=ke=naʔak
3B-eye-pain-excessively-ICP=1ABS=well=CONTR
'Well, my eyes were hurting me a lot' (De la Cruz Morales, 2016, p18)

The order of constituents in a clause is, to a significant degree, "free". For example, as can be seen from (2)-(4), NP/DPs expressing core arguments can appear before or after the associated verb.

(2) [teʔ tuwi]$_{DP(ABS)}$ j-mak-nitsək-jah-u [teʔ weʔni=ʔis]$_{DP(ERG)}$
DET dog 3A-follow-begin-3PL-CP DET wasp=3ERG
'The wasps began to follow the dog' (AT, FSp15)

(3) j-mak-nitsək-jah-u [teʔ tuwi]$_{DP(ABS)}$ [weʔni=ʔis=taʔm]$_{DP(ERG)}$
3A-follow-begin-PL-CP DET dog wasps=3ERG=PL
'Wasps began to follow the dog' (R, FSp15)

(4) [teʔ tuwi=ʔis]$_{DP(ABS)}$ j-woh-naʔts-u [teʔ weʔni=taʔm]$_{DP(ERG)}$
DET dog=3ERG 3A-shout-scare-CP DET wasp=PL
'The dog scared the wasps by barking (lit: shouting)' (AG, FSp11)

CZ does, however, exhibit a number of traits that are characteristic of OV languages, for example, the existence of postpositions (such as *ʔomo* in (5)), the strong tendency for possessee to follow possessor in possessive constructions (as in (6)) and the marking of aspect and mood through suffixes (as in both the aforementioned examples), amongst others.

(5) teʔ pən ø-poʔks-u muʔŋ=**ʔomo**
DET man 3B-sit-CP grass=LOC3
'The man is sat on the grass (lit: in grass)' (AT, TRAJ)

(6) teʔ tuwi=ʔis j-tsək-məʔn-u [teʔ weʔni=ʔis]$_{POSSESSOR}$
DET dog=3ERG 3A-do-descend-CP DET wasp=3GEN
[j-noʔsa=taʔm]$_{POSSESSEE}$
3A-nest=PL
'The dog brought the wasps' nest down (lit: made it descend)' (R, FSp12)

Person	Set A	Set B
1	*n-*	*ø-*
2	*m-*	*nj-*
3	*j-*	*ø-*

Table 8: Set A and B prefixes used to mark core arguments on verbs. Set A prefixes are also used to mark possessed nominals, with the particular prefix used agreeing for number with the possessor.

Finally, CZ should be categorised as a double-marking language with grammatical role being marked on both head and dependent. Two contexts in which this is evident are the marking of case on nominals and within possessive constructions. Both of these are discussed more below.

2.3 Core argument marking and alignment

At least one of the core arguments of a verb is obligatorily marked on the verb itself, using a prefix from one of the two sets of prefixes known as, using the standard terminology of Mesoamericanists, Set A or Set B; these sets of prefixes are shown in Table 8. For syntactically independent verbs - that is, those not preceded by an auxiliary or some other formal elements (discussed below) - Set A prefixes are associated with the agent argument of transitive verbs (as in the first clause of (8)) and Set B with the subjects of intransitive (as in (7)) and objects of transitive verbs (as in (8)), reflecting the default ergative-absolutive alignment of CZ[14].

(7)   ø-poj-jah-u   teʔ pən=taʔm ø-maŋ-jah-u   kunjəʔmə
       3B-run-3PL-CP DET man=PL   3B-go-EXCPL-CP Coapilla
       'The people fled (lit:ran), they went to Coapilla' (RO, OCE)

[14]The root *təhkəj* 'enter' in (8) is in fact a verbal stem *tək-ʔəj* 'house-V'. In order to simply the presentation of the analysis of motion roots presented in Part **??** of this thesis, however, I will refer to it as a verbal root throughout.

(8) n-kaʔe=ʔis   j-nep-kiʔm-u   teʔ *pelota*   waʔa
     M-youth=3GEN 3A-kick-ascend-CP DET ball=3ABS in.order.that
     j-təhkəj-u   teʔ tiʔjək=ʔomo
     3A-enter-DEP.III DET thing=LOC3
     'The young boy kicked the ball so that it went into the thing (goal)' (LG, E)

Which argument is actually marked on a verb is determined by a person hierarchy
in which second person arguments are ranked highest, followed by the first person and,
finally, the third person $(2 > 1 > 3)$[15]. The pattern of argument marking for syntactically
independent transitive verbs is summarised in Table 9.

Object Agent	1	2	3
1		*m-* (2ERG)	*n-* (1ERG)
2	*m-* (2ERG)	-	*-m* (2ERG)
3	*ø-* (1ABS)	*nj-* 2ABS	-

Table 9: The pattern of argument marking exhibited by syntactically independent transitive verbs

As described in Section 2.5, however, in some contexts of syntactic dependency, the
third person Set A suffix is associated with the subject of both transitive *and* intransitive
verbs (see the second clause of (8), for example). This reflects a nominative-accusative
alignment of arguments in these contexts.

CZ verbal morphology also requires that if any of the core arguments of a verb are
plural this needs to be marked morphologically on the verb. If the plural argument
excludes the listener - i.e. if it is a third person or first person exclusive argument - it
is represented in the verbal complex by the suffix *-jah* 'EXCPL'. If, on the other hand,
the plural argument includes the second person - 2nd person and first person inclusive
arguments - it is represented by *-tam* 'INCPL' [16].

---

[15]As pointed out by both Ramírez Muñoz (2016) and (Faarlund, 2012, p110), an alternative analysis
of the pattern of argument marking is that the prefix *m-* is a "local person" marker in addition to the
2nd person marker. This pattern is seen in other Mixe-Zoque languages (see Zavala (2000), for example).

[16]The glosses used for these morphemes are those used by De la Cruz Morales (2016) and Ramírez
Muñoz (2016) rather than Faarlund (2012).

Case	1st person	2nd person
Absolutive	ʔəhsti	mihtsi
Ergative	ʔəht	miht
Genitive	ʔəh	mih
Oblique	ʔəhts	mihts

Table 10: Personal pronouns in CZ.

The first-person core arguments are also sometimes marked on the verb through the clitics *ʔt* '1ERG' and *ʔtsi* '1ABS'. Examples of the use of both of these clitics can be seen in (9).

(9) a. **n-nəm-haj-u=ʔt**   "*bueno* hutə=ʔam=te=ke   j-neʔ
         1A-SAY-APPL-CP=1ERG "good   where=PERF=PRED=well 3A-ANAP
         j-tək=pə?"
         3A-house=REL"
         'I said to her "ok, well, where does he live?"'

     b. **n-nəm-haj-u=ʔtsi** "j-neʔ   j-tək   hiŋə=te   kəʔmə *san*
         1A-say-APPL-CP=1ABS "3A-ANAP 3A-house DIST.LOC=PRED below *San*
         martin"
         Martin"
         'She said to me "his house is there in the downhill part of town (lit:below),
         San Martin"' (ME, OCE)

Finally, grammatical role is marked on nominals in the form of case. For 1st and 2nd person there are four distinct pronoun forms indicating case; these are shown in Table 10. For third person arguments - either pronouns or NP/DPs - the ergative and genitive cases are both marked with the clitic *ʔis* '3ERG/3GEN'. Absolutive and oblique case are zero marked on 3 person arguments and have not been represented in transcriptions.

2.4   Serial verb constructions

Serial verb constructions (SVCs) are a characteristic feature of Mixe-Zoque languages (Zavala, 2000; Johnson, 2000; de Jong Boudreault, 2009; Jiménez Jiménez, 2014). As de-

scribed in detail by De la Cruz Morales (2016), in CZ SVCs take the form of verbs whos stems are formed from the combination of multiple verbal roots without any morphological marking of subordination or dependence. In (10), for example the predicate is formed from the two verbal roots *nep* 'kick' and *tsiʔ* 'give', both of which can independently perform the role of verbal stem.

(10)   teʔ pən=ʔis   **j-nep-tsi-u**   teʔ *pelota* teʔ s-kaʔe
DET man=3ERG 3A-kick-give-CP DET ball   DET F-youth
'*The man kicked the ball to the girl (lit: gave the ball by kicking)*' (AT, TRAJ)

From (10) it can be seen that SVCs in CZ only take one set of person and aspect/mood affixes: *j-* '3A' and *-u* 'CP' in this case. Another defining property of SVCs in CZ is that the states of affairs encoded by all constituent roots are modified simultaneously by temporal adverbials, as evidenced by the interpretation of (11) and the ungrammaticality of (12).

(11)   teʔ pən=ʔis   **j-tuj-kaʔ-u**   təʔək   teʔ tsiʔ
DET man=3ERG 3A-shoot-die-CP yesterday DET opossum
'*The man shot (and killed) the opossum yesterday*'(De la Cruz Morales, 2016, p181)

(12)   *teʔ tsiʔ   təʔək   **j-tuj-kaʔ-u**   jəti   teʔ pən=ʔis
DET opossum yesterday 3A-shoot-die-CP today DET man=3ERG
Intended: '*The opossum that the man shot yesterday, died today*' (De la Cruz Morales, 2016, p181)

SVCs featuring one of a paradigm of motion roots (listed in Table 20) are of central importance to the description of spatial notions in CZ. In such descriptions the function of the motion roots is typically to describe the direction of orientation or motion of an object. For example, in (13) the function of the deictic motion root *min* 'come' is to indicate that the front of the chair is directed towards the speaker.

(13) teʔ poʔks-tək jəʔmə ø-ken-min-u
      DET sit-INSTR here 3B-look-come-CP
      'The chair is directed towards here' (C, B&C 2-1)

In Section 5.4 is discussed a proposal by De la Cruz Morales (2016) that, as has been suggested for other Mixe-Zoque languages (and is a well-known feature in other Mesoamerican languages), when appearing in SVCs this paradigm of motion roots constitutes a *grammaticalised* set of directionals. In the same section, I present my own analysis, which argues that the directional-like functions of this set of motion roots is entirely consistent with their independent semantics and the semantics of CZ SVCs.

2.5 TAM system

As mentioned above, there is some disagreement between Ramírez Muñoz (2016) and Faarlund (2012) regarding the nature of the TAM system in CZ. Where both parties agree is that only aspect or mood is obligatorily marked on the verb. A syntactically independent verb can be marked for one of four aspects/moods through the suffixes shown in Table 11: the completive (which can be identified with the perfective) and the incompletive (the imperfective) aspects and the imperative and the hortative moods.

(14) nike=naʔak   səhŋ **j-tsək-jah-pa**
      many=CONTR party 3A-do-3PL-ICP
      'They used to do lots of parties' (F, OCE)

(15) həsika teʔ **ø-pəŋ-u**   *volcan*
      then   DET 3B-erupt-CP volcano
      'Then the volcano erupted' (AU, OCE)

(16) teʔji   **pək-ə** teʔ *pelota*, jak-məʔn-ə   metsa *cuadra*
      MED;LOC2 get-IMP DET ball,   CAUS-descend-IMP two   block
      'Then get the ball, move it down (lit:make it descend) two blocks' (AT, MG)

The form of aspect and mood marking exhibited by dependent verbs is considerably

Aspect/mood	Suffix for independent verb
Completive	*-u*
Incompletive	*-pa*
Imperative	*-ə/-a*
Hortative	*-ʔi*

Table 11: The suffixes used to mark aspects and moods on independent verbs in CZ. Which of the imperative suffixes is used is determined by vowel harmony: if the preceding vowel is high or [-ə], -ə is used; if it is low, -a is used.

Suffix 'gloss'	Auxiliaries	Alignment in 3rd person
-a/-ə 'DEP.I'	Modal verbs	ERG-ABS
	Negation (completive)	ERG-ABS
	Connectors like *jempe* 'although'	NOM-ACC
-e/-i 'DEP.II'	motion verbs	ERG-ABS
	Negation (incompletive)	NOM-ACC
-u 'DEP.III'	Negation (imperative)	ERG-ABS
	Negation (hortative)	ERG-ABS
	Progressive	NOM-ACC
	The subordinator *waʔa*	NOM-ACC

Table 12: The suffixes used to mark aspects and moods on *dependent* verbs in CZ. Where there are two potential suffixes, vowel harmony again determines which is used.

more complex. There are three different suffixes used to mark aspect and mood on dependent forms of verbs. These suffixes cut across both the aspect/mood being marked and the type of auxiliary the verb follows. This complex picture has lead to Ramírez Muñoz (2016) and Faarlund (2012) having different analyses of the underlying semantics of these three groupings and, as a result, the use of quite different terminology. Both sets of terminology have advantages and disadvantages, so I will adopt a neutral position and use generic terms for each of these three endings. These are shown in Table 12, along with the auxiliaries in conjunction with which they are used and the pattern of alignment exhibited by the third person form of the verb on which they appear; the first and second person forms are always ergative-absolutive.

Other aspects, moods and tenses are encoded either periphrastically - like the progressive aspect (see (17)) and future tense (see (18)) - or through clause level clitics - as

in the case of the counterfactual mood (as in (19))[17].

(17) **nə** **j-məʔn-u**   tsaʔ, j-tsiʔ-u *cuenta* ke *volcan*=te **nə**
       PROG 3A-descend-DEP.III stone, 3A-give-CP account that volcano=PRED PROG
       j-pəhk-u=pə
       3A-erupt-DEP.III=REL
       '*Stones were descending (lit: are descending), we realised the volcano was erupting* (AU, OCE)

(18) jəti ʔəht   maka   m-tsam-haj-keʔt-i   ʔeja=pə
       now 1PRO.ERG AUX:FUT 2A-say-APPL-REP-DEP.II other=REL
       '*Now I'm going to tell you another one*' (JL, B&C)

(19) *es*   *como que* teʔ ø-poʔks-pa=ʔtsi=naʔak ʔəhtsi teʔ poʔks-tək=kəhsi
       3.BE as   that DET 1B-sit-ICP=1ABS=CONTR 1ABS DET sit-INSTR=LOC4
       '*It's as if I were sitting on the chair*' (JL, B&C 3-10)

2.5.1 The resultative

As described, the details of the TAM system of CZ still require further investigation. One such detail that has not been discussed in previous accounts, but which is of central importance to this thesis, is the use of the completive aspect marker to derive stative predicates from dynamic verbal roots; in other words, the use of the completive aspect marker to form predicates with resultative semantics.

The use of the completive marker in this manner has been mentioned briefly by Faarlund (2012) in the context of discussing the fact that existential/locative predicates in CZ typically, as in (20), take the form of the existential/locative root *ʔit* in the completive aspect. The durative semantics of combinations of the existential/locative root and the completive aspect lead Faarlund (2012, p89) to speculate that such verbs were originally perfective in nature.

(20) jəʔki   ø-ʔit-u=naʔak   tsaʔma, jəʔki   ha
       PRX;LOC2 3B-EXIST-CP=CONTR mountain, PRX;LOC2 NEG.CP

---

[17]Faarlund (2012) analyses the morpheme =*naʔak* 'CONTR' as a past tense marker.

ø-ʔit-ɘ=naʔak   tuk
3B-EXIST=CONTR road
'Here, there was scrub, there weren't any houses here' (F, OCE)

The completive aspect marker can in fact be used productively to form resultative stative predicates from dynamic verbal roots. Evidence for this function of the completive marker comes from its ubiquitous use to form dispositional locative predicates from dynamic roots, such as *poʔks* 'sit' in (21) and *woj* 'wind' (22)[18].

(21) a. hutɘ=ʔam   ø-ʔit-u   teʔ tuwi?
          where=PERF 3B-EXIST-CP DET dog
          'Where is the dog?' (Researcher)

      b. teʔ tuwi ø-poʔks-u j-ʔaŋtɘŋ=kɘʔmɘ
          DET dog 3B-sit-CP 3A-door=LOC5
          'The dog is sat by his door (CM, TRPS 5)

(22) teʔ tsaj ø-woj-u=ma   tsaʔ=kɘhsi
      DET rope 3B-wind-CP=STILL rock=LOC4
      'The rope is still wound around (lit: against) the rock' (R, E)

2.6 Adnominal possession

Adnominal possession is a key topic for the discussion of spatial descriptions in CZ due to it being the canonical context in which relational spatial nouns - a key linguistic resource used in spatial descriptions - appear. An adnominal possessive construction minimally comprises an NP denoting the possessee marked with a Set A prefix (Table (23)) that agrees for person with the possessor. An example of such a construction has already in fact been given in (21) above, but another is provided in (23). In both of these cases, 'the dog' (*teʔ tuwi*) is the possessor and therefore each possessee (*ʔaŋtɘŋ* 'door' in (21-b) and *ʔɘŋ-kuj* 'bed' in (23)) are marked with the third person Set A affix *j-*.

---

[18]Following Bohnemeyer and Brown (2007), I define a dispositional locative predicate as a predicate of a locative description which provides information regarding the disposition of the Figure.

(23)   teʔ tuwi **j-ʔəŋ-kuj=ʔomo**   ø-poʔks-u
       DET dog 3A-sleep-INSTR=LOC3 3B-sit-CP
       'The dog is sat in his bed' (BE, TRPS 5)

To this minimal structure can be added two further elements. Most commonly, an adnominal possessive construction also features either an NP marked for the genitive case (using the clitic *ʔis* '3GEN') or the genitive form of a pronoun. In the case of the first and second person pronouns these are their unmarked forms, whereas third person pronouns are, like NPs, marked with *ʔis* '3GEN'. Genitive forms of both NPs and pronouns are exemplified in (24).

(24)   ø-ʔuʔts-witu-pa=ʔtsi   teʔji   **ʔəh**   **n-tsən=ʔis**
       1B-fold-return-ICP=1ABS MED;LOC2 1PRO.GEN 1A-uncle=3GEN
       j-ʔaŋkə=ʔomo
       3A-surrounding.region=LOC3
       'I then turn at the area outside my uncle's house (lit: my uncle's outside area)'
       (AG, E)

A final element that commonly appears in adnominal possessive phrases is the morpheme *neʔ*, which appears to be a reduced form of the emphatic pronoun *neʔkə* 'self' (as in (25)) (Faarlund, 2012, p57). This anaphoric element is marked with the Set A prefix that agrees for person with the element to which it refers.

(25)   n-winaŋ=ʔomo nə   j-ken-u   n-neʔkə ø-ʔit-taʔm-u=pə=te
       1A-front=LOC3 PROG 3B-look-DEP.III 1A-self 1B-EXIST-INCPL-CP-REL=1INC
       'It is facing (lit:looking) at my front, where we are selves are' (B, E)

As Faarlund (2012) observes, in many cases, such as that in (26), *neʔ* 'ANAP' appears to serve the function of emphasising the genitive form of an NP or pronoun, with which it is often cliticised, as indicated by phonological changes at the morpheme boundary.

(26)   teʔ *pelota* teʔ=kəhsi ø-ʔit-u   . . . teʔts-tək=ʔis=j-neʔ
       DET ball   3PRO=LOC5 3B-EXIST-CP . . . lean-INSTR=3GEN=3A-ANAP

45

j-kuhj=kəhsi
3A-tree=LOC5
‘The ball is against it . . . against the sticks of the backrest (lit: the thing to lean
against’

Frequently, however, *neʔ* appears without the NP or pronoun that denotes the posssessor.
The precise function of this morpheme in this context - which is always omittable -
requires further research. However, it appears to be the case that it emphasises the
possessed nature of the possessee. An example of this use, taken from a rendition of the
Frog Story, is shown in (27).

(27)   teʔji   maŋ-u   j-meʔts-e   kuhj=ʔis   j-sutu=ʔomo=taʔm
       MED;LOC2 AUX:go-CP 3A-search-DEP.II tree=3GEN 3A-hole=LOC3=PL
       j-neʔ   **nahk**
       3A-ANAP frog
       ‘Then he went to look for his frog in the tree’s holes’

Part II

Spatial descriptions in Chiapas Zoque

3   Overview of spatial descriptions in CZ

All spatial descriptions can be classified as belonging to one of three spatial domains,
those of location, orientation and motion. In this section, I will provide an overview of
descriptions of all three of these spatial domains in CZ. To begin with, this overview will
outline those properties of spatial descriptions in CZ that are common to all three of these
spatial domains. It will then consider the general properties of *typical* descriptions of
location, orientation and motion in CZ, where relevant, placing these within the wider
typology of spatial descriptions found in the literature. A brief description of those
alternative constructions used by speakers to describe the spatial properties of objects

will also be provided.

3.1 Terminology

In this section and all those to follow I will repeatedly make reference to a small number of conceptual entities that are central to the definition of the descriptions of the different spatial domains. I will define these terms below through reference to the examples shown in (28)-(30).

(28)   The cup is behind the saucer

(29)   The dog ran out from inside the house, past where the gate is, to behind the car

(30)   The statue faced towards where the castle is

The starting point of all spatial descriptions is the entity whose spatial properties are being described. Following Talmy (1983), this entity is generally referred to as the *Figure* of the description. In the descriptions (28)-(30) the Figures are 'the cup', 'the dog' and 'the statue' respectively.

In his account of spatial descriptions, Talmy (1983) describes how the spatial properties of the Figure are defined through reference to sets of reference objects, which he refers to as *grounds*. As will be discussed below, in CZ it is more accurate to say that the spatial properties of Figures are defined through reference to *locations* rather than objects. In this thesis I use Talmy's term *Ground* exclusively to refer to an entity relative to which a location is defined, which is usually, as in (28), an object (*'the saucer'*).

In my analysis of descriptions of motion in CZ, I refer to three distinct types of reference location: A reference location defining the starting point of a Figure's motion (such as 'inside the house' in (29)) will be referred to as the *Source* of the description. A reference location defining the end point of a Figure's motion (such as 'behind the

47

car' in (29)) will be referred to as the *Goal*. Finally, a reference location indicating an intermediate point in the motion of the Figure (for example, 'where the gate is' in (29)) will be described as a *Via*[19]. The path roles performed by these different types of reference location will be referred to using the same terms but in small caps. For example, the path role performed by the Goal of a description is GOAL.

A reference location used to orientate a Figure (such as 'where the castle is' in (30)) will be referred to as the *Cue*. Again, the associated path role will be this label written in small caps, i.e., CUE.

3.2 The core components of spatial descriptions in CZ

A typical spatial description in CZ consists of three core components. The Figure of the description is stated within an NP or DP, the nominal element of which is in the absolute case (*teʔ tsuʔ-hon* 'night-bird (the owl)' in (31)). This NP/DP is typically accompanied by both an intransitive verb (the existential/locative verb *ø-ʔit-u* in (31)) and a spatial adjunct (*kuhj=ʔomo* 'tree=LOC3 (in a tree)' in (31)).

(31)   [kuhj=ʔomo]$_{SpAdj}$ [ø-ʔit-u]$_{pred}$ [teʔ tsuʔ-hon]$_{FigP}$
       tree=LOC3   3B-EXIST-CP DET night-bird
       'The owl is in the tree' (CON, TRPS 67)

As will be discussed in Section 4, the semantics of all spatial adjuncts in CZ spcify a location. There is no morphological marking of semantic roles, therefore spatial adjuncts are uniform across the three spatial domains. The interpretation of the spatial adjunct specified in a spatial description and its relation to the spatial properties of the Figure is predominantly determined by the semantics of the predicate of the description.

As an example of the dependence of the interpretation of spatial adjuncts on the predicate of the description in which they appear, compare the descriptions in (32)-(34),

---

[19]The specifics of this path role in the context of CZ are discussed in more detail in Section 5.2.

in each of which the location denoted by the spatial adjunct *nas=ʔomo* 'ground=LOC3' performs a different role. In (33) the existential/locative predicate means that the adjunct is interpreted as stating the location of the Figure, i.e. 'on the ground'.

(32) j-win   nas=ʔomo   nə   j-ken-u
      3A-front ground=LOC3 PROG 3A-look-DEP.III
      'Its (the chair's) front is facing the ground' (R, B&C 1-6)

In (32), in contrast, the presence of a predicate formed from the orientational verbal root *ken* 'look', means that the location denoted by spatial adjunct defines the direction in which the Figure is orientated, making the the 'ground' the Cue of the description.

(33) nas=ʔomo   ø-ʔit-u   *pelota*
      ground=LOC3 3B-EXIST-CP ball
      'The ball is on the ground' (C, PSPV7)

Finally, in (34) the semantics of the verbal root *nuʔk* 'arrive' (discussed in Section 6), means that *nas=ʔomo* 'ground=LOC3' denotes the location that is the end point of the child's motion, making the 'ground' the Goal of the motion.

(34) teʔ ʔune ø-piti-məʔn-u   teʔ kuhj=kəhsi teʔ=mə   ø-nuʔk-u
      DET child 3B-roll-descend-CP DET tree=LOC4, MED=LOC1 3B-arrive-CP
      nas=ʔomo
      ground=LOC3
      'The child fell (lit: descended, rolling) from the tree, it arrived there, on the ground' (AT, FSp14)

3.3 Descriptions of location

3.3.1 Definition

Throughout this thesis, a description of location is defined to be a description that specifies a search region for a Figure relative to a Ground. This conceptual structure is represented schematically in Figure 4.

Location: ``The ball is to the person's right.''
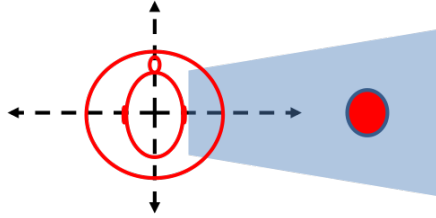
Figure 4: A schematic representation of the conceptual structure of the description of location 'The ball is to the person's right'. This shows a search region for the Figure (the ball) being projected off the Ground (the person), who is viewed from above.

As will be noted repeatedly in the course of this thesis, the above definition does not require that all of the defining conceptual entities are expressed linguistically. This is in part due to the possibility of retrieving these entities from the context of the description, but, as will be described in detail in Section 11, descriptions of location in which there is no linguistically encoded Ground are *unavoidable* in CZ when using certain types of description of location.

3.3.2 The basic locative construction in CZ

In their efforts to compare descriptions of location cross-liguistically, Levinson and Wilkins (2006, p15-17) introduced the notion of the *basic locative construction* (BLC). The BLC of a language is defined as "the predominant construction that occurs in response to a Where-question" (Levinson and Wilkins, 2006, p15) and can be considered the least pragmatically marked, or basic, locative construction in the language.

Two aspects of the BLC have been the topic of cross-linguistic comparison: the number of different predicates that they feature and the range of spatial relations that it can be used to describe[20]. In regard to the first of these properties, CZ is situated alongside

---

[20]See Ameka and Levinson (2007) for an overview and the associated articles for details

those languages for which the basic response to a Where-question is a description of location predicated by a locative verb; in the case of CZ this verb is formed from the existential/locative root ʔit. An example of a CZ BLC is shown in (35).

(35)   teʔ tsima ø-ʔit-u   kot-ʔoj-tək=kəhsi
         DET cup   3B-EXIST-CP put-ANTIP-INSTR=LOC4
         'The cup is on the table (lit: thing for putting things on)' (CON, TRPS 1)

The second property of the BLC that has been compared cross-linguistically is its extension to different types of spatial relation. In this regard also, there has been a considerable amount of variation described, from those languages in which the BLC is always available when locating a Figure regardless of the nature of the Figure or its spatial relation, such as English, to those languages in which the BLC is restricted to a subset of spatial relations (see Kutscher and Schultze-Berndt (2007) for a description of German, for example). As described in McDermott (2014), CZ falls into the latter category, it not being acceptable to describe 'negative space' or encirclement using a BLC.

The above judgements regarding the CZ BLC are based both on data elicited using the TRPS and PSPV non-verbal stimuli (the nature of which is described in detail in ?) and data originating from observed communicative events, such as narratives.

3.3.3 Alternative constructions

In addition to the BLC, there are two alternative locative constructions that occur frequently in my data and which are used occasionally to respond to Where-questions. The more common of these two alternative constructions is the use of what Bohnemeyer and Brown (2007) refer to as *dispositional predicates*, which in the context of descriptions of location are those predicates that provide information regarding the disposition of the Figure. An example of the use of such a dispositional predicate in CZ, in response to a

Where question, is provided in (36).

(36)　teʔ　tuwi ø-poʔks-u j-ʔəʔŋ-kuj=ʔomo
　　　　DET dog　3B-sit-CP　3A-lie-INSTR=LOC3
　　　　'The dog is sat in its bed' (CM, TRPS 47)

The use of a so-called *dispositional predicate* to predicate a description of location is never the least pragmatically marked response in CZ however, and it is for this reason that it is distinguished typologically from languages, such as Dutch (van Standen et al., 2006), in which different types of Figure are associated with a different one of a small set of dispositional predicates and those languages, such as Tseltal (Bohnemeyer and Brown, 2007) or German (Kutscher and Schultze-Berndt, 2007), in which a large number (≥ 9) of dispositional predicates can be used in a non-pragmatically marked manner depending on the disposition of the Figure and the nature of the Figure/Ground.

The second commonly occuring alternative locative construction in CZ is that in which the predicator clitic *te*, is added to a spatial adjunct already marked with the relativiser clitic *pə*, to locate the Figure in the location denoted by the spatial adjunct. In (37), for example this strategy of verbless predication is used to locate a rope (*tsahj*) in a basket (*waka=ʔomo*).

(37)　teʔ　tsahj waka=ʔomo=pə=te
　　　　DET rope　basket=LOC3=REL=PRED
　　　　'The rope is in a basket' (C, PSPV 27)

For completeness I also mention that there is a single use of a lexical verbal affix in a locational predicate in my data. This is the affix *ni-* 'related to the front/body', which, as will be discussed in subsequent sections, also appears in motion and orientational predicates in my data.

(38)　ni-ʔit-ʔəj-u=ʔuŋ　　　　　　teʔ tsan=ʔis　　muha=pə
　　　　front-EXIST-V-CP=REPOR DET snake=3GEN big=REL

52

'*On its outer surface (lit: its intrinsic front) was a large snake*' (PA, N)

3.3.4 Interrogatives

The indefinite spatial adverb *hutə* 'where' can be used to enquire about the location of an object by placing it directly in front of a locational predicate; the phrase stating the Figure whose location is being queried can be located either before or after this combination of constituents, depending on the information structure of the sentence (Ramírez Muñoz, 2016, p116). Although according to Ramírez Muñoz (2016) it can be used in an unmarked form (see (39)), in my own data *hutə* 'where' always appears marked with either the perfective marker *ʔam* (as in (40)) or the approximative morpheme *kaŋ* (as in (41)), when being used to enquire about location.

(39)   hutə ø-ʔit-u   teʔ n-pekanju?
           where 3B-EXIST-CP DET M-sculpture?
           '*Where is the sculpture?*' (Ramírez Muñoz, 2016, p205)

(40)   hutə=ʔam   ø-ʔit-u   teʔ weʔk-e
           where=PERF 3B-EXIST-CP DET fence-N
           '*Where is the fence?*' (MA, TRPS 15)

(41)   hutə=kaŋ   ø-ʔit-u   teʔ *pelota*
           where=APPROX 3B-EXIST-CP DET ball
           '*Whereabouts/in which direction is the ball?*' (R, B&C)

As will be discussed in Section 4.7, the core semantics of the approximative clitic *kaŋ* is to expand the location denoted by the spatial adjunct to which it is attached. In some contexts this semantics is used to emphasise a *directional* interpretation of the spatial adjunct in question. The marking of *hutə* 'where' with *kaŋ* therefore indicates that either an approximative location is required (as indicated in the translation) or a directional response is expected.

It seems reasonable to assume that the ubiquitous marking of *hutə* 'where' with

the perfective clitic in interrogatives relating to location is related to the perfective-like nature of the locative predicates in CZ noted in Section 2.5.1.

3.4 Descriptions of motion

3.4.1 Introduction and definition

My discussion of the description of motion events in CZ will focus on those strategies used to describe events in which at least one object changes location. As such, the term 'description of motion' will be used to refer to those spatial descriptions that prototypically describe such events. I will not specifically discuss the description of what Schultze-Berndt (2006) refers to as "internal motion", which is motion performed by an entity without the entity as a whole changing location; examples of this type of motion include shivering or running on the spot.

3.4.2 Intransitive constructions

A typical description of motion contains the three core components of spatial descriptions in CZ introduced above, i.e., an NP/DP denoting the Figure of the description, an intransitive verb and a location denoting spatial adjunct. This prototypical structure is exemplified in (42).

(42) teʔ jomo ø-kiʔm-u   teʔ kiʔm-tək=kəhsi
      DET women 3B-ascend-CP DET ascend-INSTR=LOC4
      'The man ascended the stairs (lit: on the things used to go upwards)' (F, TRAJ)

The spatial adjuncts appearing in descriptions of motion are identical to those appearing in descriptions of location and orientation. Consequently, their form does not indicate the path role (SOURCE, GOAL and VIA) of the reference location they denote. This can be seen from comparing (43) and (44), in which the spatial adjunct *kohtsək=ʔis j-neʔ j-sutu=ʔomo* 'the cave (lit: the mountain's hole)' performs the role of GOAL and SOURCE

respectively.

(43) teʔ jomo nə j-təhkəj-u **teʔ kohtsək=ʔis j-neʔ**
DET women PROG 3A-enter-DEP.III DET mountain=3GEN 3A-ANAP
j-sutu=ʔomo
3A-hole=LOC3
'The women is entering the cave (lit: the mountain's hole)' (AT, TRAJ)

(44) teʔ jomo nə j-put-u **teʔ kohtsək=ʔis j-neʔ**
DET women PROG 3A-exit-DEP.III DET mountain=3GEN 3A-ANAP
j-sutu=ʔomo ...
3A-hole=LOC3 ...
'The women is exiting the cave (lit: the mountain's hole)' (AT, TRAJ)

The different path roles performed by the spatial adjuncts in (43) and (44) have been inferred from the semantics of the verbs with which they co-occur. This inference of path roles based on the semantics of motion verbs will be discussed further in Section 6.2.

3.4.3 Serial verb constructions

It is often the case that motion descriptions in CZ are predicated by serial verb constructions (SVCs) featuring two intransitive motion roots. Two of these multiple motion root-featuring SVCs are present in (45).

(45) nə **j-təp-məʔn-u** n-kaʔe, **ø-təp-təhkəj-u** nəʔ=ʔomo
PROG 3A-jump-descend-DEP.III M-youth, 3B-jump-enter-CP water=LOC3
'The young boy is jumping down, he jumped into the water' (C, TRAJ)

The two SVCs in (45) exemplify the typical semantics of those SVCs that predicate descriptions of motion, as one of the roots encodes a manner of motion (*təp* 'jump') while the other relates to the direction of the motion described (*məʔn* 'descend' in the first SVC and *təhkəj* 'enter' in the second). The frequent use of a paradigm of motion roots - including *məʔn* 'descend' and *təhkəj* 'enter' - in SVCs to indicate the direction of

55

motion has led to their analysis as grammaticalised *directional* elements that have been bleached of their motion semantics (De la Cruz Morales, 2016, p215). My own analysis, presented in Section 5.4, is that these 'directional' roots are semantically identical to their independent forms when appearing in SVCs.

Unlike what is reported for Mayan languages, such as Jakaltek Craig (1993), it isn't possible to combine more than two of these 'directional' roots into a single SVC in CZ or, indeed, other Mixe-Zoquean languages such as Oluteco (Mixean) (Zavala, 2000). An example of a description of motion that is ungrammatical due to its predicate featuring more than one motion root of this type is shown in (46).

(46)   *teʔ tsuʔ-hon ø-siti-**kiʔm-put**-u   teʔ tɘk=ʔomo
         DET night-bird 3B-fly-ascend-exit-CP DET house=LOC3
         Intended: *'The owl (lit: night bird) flew upwards and out of the house'*

It is important to note, however, that it is possible for 2 motion roots to be combined with additional roots of different types, as in (47).

(47)   teʔ huʔki **ø-siti-maŋ-nitsɘk-u**
         DET vulture 3B-fly-go-begin-CP
         'The vulture began to fly' (B, E)

3.4.4   Transitive constructions

Motion descriptions in CZ can also be predicated by transitive verbs. Two of these transitive motion verbs - exemplified in (48) and (49) - are formed, without derivation, from the verbal roots *kɘt* 'pass' and *hak* 'cross', which are more commonly used to form intransitive motion verbs. In both cases the Figure is the ergative argument of the verb and the absolutive argument is a reference object that performs the path role of VIA.

(48)   teʔ jomo=ʔis   j-hak-u   teʔ tuk …
         DET women=3ERG 3A-cross-CP DET road
         'The women crossed the road' (AT, TRAJ)

56

(49)   j-kət-u   teʔ jəhk=pə   mətsik
          3A-pass-CP DET black=REL toy
          'It passed the black toy' (MJ, E)

It is also possible - though rare in my data - to form transitive motion verbs from intransitive motion roots using lexical verbal affixes such as *ni-* 'related to the front' (shown in (50)) and *kəʔ-* 'related to the side' (shown in (51)).

(50)   tumə pən ø-put-u   j-neʔ   j-aknja=ʔomo, ø-kət-u   ø-ʔit-u=mə
          one   man 3B-exit-CP 3A-ANAP 3A-left=LOC3 3B-pass-CP 3B-EXIST-CP=LOC
          fuente i   j-ni-kət-jah-u   teʔ jomo
          bridge and 3A-front-pass-3PL-CP DET woman
          'A man exits from the left (of the screen), passes where a bridge is and then passes in front of the women' (ME, TRAJ)

(51)   teʔ huʔki j-kəʔ-məʔn-u   teʔ pən
          DET vulture 3A-side-descend-CP DET man
          'The vulture came down to the man's side' (PA, N)

Other transitive motion verbs are typically formed from transitive roots, such as *mak* 'follow' (as in (52)) or derived transitive stems, such as *toʔm-ʔəj* 'close-v' (as in (53)).

(52)   teʔ tuwi=ʔis j-tək-məʔn-u   teʔ weʔni=ʔis j-noʔsa=taʔm,
          DET dog=3ERG 3A-do-descend-CP DET bee=3GEN 3A-nest=PL,
          j-**mak**-nitsək-jah-u=ʔuŋ   teʔ tuwi
          3A-follow-begin-PL-CP=REPOR DET dog
          'The dog caused the bee's nest to fall, they (the bees) began to follow him' (R, FSp15)

(53)   teʔ tuwi=ʔis nə   **j-toʔm-ʔəj**-u   teʔ j-neʔ   j-komi
          DET dog=3ERG PROG 3A-close-v-DEP.III DET 3A-ANAP 3A-owner
          'The dog is approaching its owner' (AT, E)

I will not be discussing this latter type of transitive motion verb in any further detail as they are not *basic* in a Levinsonian sense, i.e., they are not typically used when responding to requests for information relating to a motion event.

3.4.5 Verbs of transport and caused motion

Another class of verb that predicate descriptions of motion are those with the semantics of transport or caused motion. Both of these types of motion verb can be derived from intransitive motion roots in a productive way. Verbs of transport are formed through the addition of the associative prefix *nə-* (as in (54) and (55)), while verbs of caused motion are formed through the addition of the causative prefix *jak*, as in (56) and (57)[21].

(54)   **j-nə-put-jah-u**   teʔ kotsək=ʔomo   teʔ *pekanjo* tsaʔ=pə
        3A-ASSOC-exit-EXCPL-CP DET mountain=LOC3 DET statue   statue=REL
        'They moved the rock statue out of the mountain' (RO, N)

(55)   **j-nə-tsiŋ-hak-u**   j-neʔ   j-nahk
        3A-ASSOC-swim-cross-CP 3A-ANAP 3A-frog
        'He swam his frog across (the water)' (AT, FSp28)

(56)   n-kaʔe-ʔune **j-tohts-kiʔm-u**   teʔ məʔa=ʔis, jak-kiʔm-u   teʔ
        M-youth-child 3A-skewer-ascend-CP DET deer=3ERG, CAUS-ascend-CP DET
        j-kopak=kəhsi
        3A-head=LOC4
        'The deer skewered the child on top of it, it raised him on to its head' (R, FSp18)

(57)   **jak-wit-ə**   metsa teʔ *cuadra*
        CAUS-walk-IMP two   DET blocks
        'Move it (lit: make it walk) two blocks' (AT, MG)

There are of course also many lexical roots with semantics related to the forced/caused motion of a Figure, for example, *kot* 'put' or *təŋ* 'throw'. Again, these verbs are not basic, so will not be discussed in detail in this thesis.

3.4.6 Interrogatives

Information regarding the motion of an object is typically questioned using the same interrogative as for location: the indefinite place adverb *hutə* 'where' (as in (58)).

---

[21]Uniquely, *jak* doesn't take person prefixes. This is discussed in detail by De la Cruz Morales (2016).

(58) huto   ø-maŋ-ʔəj-keʔt-pa?
      where 3B-go-DER-REP-ICP
      Which way does it go again?' (ME, MG)

As in questions related to location, it is common for *huto* 'where' to be combined with the approximative morpheme *kaŋ* when appearing in questions related to motion. The functions of *kaŋ* 'APPROX' in this context are analogous to those described for questions related to location in Section 3.3.4. In most cases, *kaŋ* 'APPROX' emphasises that the location stated in the spatial adjunct (which, when combined with change of location (CoL) verbal roots - discussed in Section 5.2 - , perform a path role) is approximate. For example, in the question in (59), the matcher of a referential communicative task is attempting to clarify on which side of a square grid a toy figure exits.

(59) huto=kaŋ   ø-put-pa?   ø-ʔit-u=mə   mihtsi?
      where=APPROX 3B-exit-ICP 3B-EXIST-CP=LOC1 2PRO.ABS
      Where does he exit? Where you are?' (R, MG)

He therefore adds *kaŋ* 'APPROX' to the interrogative in order to emphasise that he is not expecting the director to tell him the precise location (i.e. which row and column). This is made still clearer by the matcher offering a potential response to the director for judgement ('where you are?'), that is also approximate in nature.

The approximative is also used in questions related to motion in order to *emphasise*[22] that information related to the *direction* of motion is being requested. This is again analogous to one of the functions of the approximative in questions related to location discussed in Section 3.3.4. This use of the approximative almost always occurs with verbs featuring the general change of location root[23] *maŋ* 'go', as in (60). It is also usually the case that *maŋ* 'go' is derived with the derivational morpheme *ʔəj*, which has a diverse set of meanings[24], but in motion verbs emphasises a directional reading.

---

[22]Its use is not obligatory, as can be seen from (58).

[23]The distinction between change of location and motion root is discussed in detail in Section 5.

[24]See Faarlund (2012, p74) for a discussion of the many functions of the verbal affix *ʔəj*, in CZ or see

(60) həsika hutə=**kaŋ**   ø-maŋ-ʔəj-pa?
      then   where=APPROX 3B-go-DER-ICP?
      'Then, in which direction (lit: whereabout) is it going?' (R, MG)

3.5   Descriptions of orientation

3.5.1   Definition

In this thesis I define a description of orientation as a spatial description that has the *primary* function of aligning a facet of the Figure with an *external* direction. A prototypical example of such a description from English is presented in (61).

(61)   The back of the house faced south

The definition above excludes the many types of description - spatial or otherwise - from which the orientation of an object can be inferred. For example, many descriptions of motion in which a direction of motion is stated (for example, the front of the car in (62) can be inferred to be facing 'west') or, as noted by Cauchard (2014), even topological descriptions of location, such as (63).

(62)   The car was speeding westwards

(63)   The girl has her back against the door

Of course the 'primary function' of an utterance is not something that is always easy to determine. It appears from the accounts of descriptions of orientation available in the literature (see the accounts in Levinson and Wilkins (2006), for example) that languages tend to use particular predicate, or at most, a small set of predicates, to describe the orientation of objects. CZ also has a clearly identifiable set of verbs that are used specifically for the purpose of orientating objects. I therefore restrict my discussion of

---

Johnson (2000) for a discussion of the function of its cognate in the Zoque of Santa Maria Chimalapa, Oaxaca.

descriptions of orientation to these unambiguous cases.

3.5.2 Typical descriptions

As can be seen from the representative example in (64), a typical description of orientation in CZ has the general form of a spatial description described in Section 3.2 and is predicated by a verb formed from the verbal root *ken* 'look'.

(64)   ø-ʔit-u   poʔks-tək ø-ten-u=pə   i   jəʔ=mə   **ø-ken-u**
       3B-EXIST-CP sit-INSTR 3B-stand-CP=REL and PRX=LOC1 3B-look-CP
       jəʔ=mə   ø-tsoʔt-pa=mə   hama
       PRX=LOC1 3B-come.up.celestial-ICP=LOC1 sun
       'There is a chair that is stood upright and here is is directed towards the east
       (lit: where the sun rises)' (P, B&C 3-4)

The default interpretation of a description such as that in (64), is that the intrinsic front of the Figure is aligned with the direction defined by the reference location denoted by the spatial adjunct. This default can be overridden if the Figure phrase explicitly states the facet of the Figure to be orientated. An example of such description is the first part of that in (65), in which the orientation stated applies to the intrinsic *back* of the chair. The orientation of the front is then stated in the second part of the description, in which no facet is explicitly stated.

(65)   …**j-ʔuka** jəʔ=mə   ø-ken-u   tiʔjək=mə *norte*
       …3A-back PRX=LOC1 3B-look-CP thing=LOC1 north
       j-nə.haj-jah-pa=mə   i   teʔ   ø-ken-u=pə=teʔ   *sur*
       3A-call-EXCPL-ICP=LOC1 and 3PRO 3B-look-CP=REL=PRED south
       ' …its (the chair's) back is directed towards north, as we say here, and it (the
       chair) is directed towards the south' (P, B&C 1-3)

The verbal root *ken* 'look' - and also the more marginal orientational root *ʔəʔm* 'look' - is often serialised with one of the CoL roots listed in Table 20 (Section 5.2), the function of which is to indicate the direction of orientation. For example, in (66), *ken* 'look' has

been serialised with the CoL root *min* 'come' to indicate that the Figure (the chair) is orientated *towards* the speaker.

(66)   ø-ten-u   tumə poʔks-tək ø-ken-min-pa=pə ʔəhtsi
           3B-stand-CP one   sit-INSTR 3B-look-come-ICP 1PRO.ABS
           ø-ʔit-u=mə=ʔtsi
           3B-EXIST-CP=LOC1=1ABS
           '*A chair is stood that is facing towards here, where I am*' (ME, B&C 2-4)

As shown by (66), these serialised orientational predicates are typically used *in addition to* a spatial adjunct. It is also possible, however, for the orientation of an object to be defined purely by the semantics of a SVC. This is exemplified in (67), in which the orientation of two dogs (sitting at the bottom of a hill in the town of Ocotepec) were described using SVCs without any co-occurring spatial adjuncts.

(67)   tumə nə   j-ken-kiʔm-u   *i*   tumə nə   j-ken-məʔn-u
           one   PROG 3A-look-ascend-DEP.III and one   PROG 3A-look-descend-DEP.III
           '*One is facing (lit:looking) uphill (lit:upwards) and one is facing downhill (lit:downwards)*'
           (AT, E)

The formal nature of the motion roots occurring in SVCs such as these, as well as the conceptual nature of such descriptions of orientation, are discussed further in Section 5.4.

3.5.3   Instrumental constructions

An alternative method of describing the orientation of a Figure is to use a construction in which the facet of the Figure being orientated appears marked with the instrumental case marker *piʔk*. This phrase can then be combined with an orientational predicate, as in (68), or a locational predicate, as in (69), to indicate that the named facet is orientated towards the stated reference location.

(68) teʔ poʔks-tək jəʔ=se **j-ʔuka=piʔk** nə j-ken-u jəʔki
DET sit-INSTR PRX=SIM 3A-back=INSTR PROG 3A-look-DEP.III PRX;LOC2,
ø-ʔit-u=mə neʔkə=taʔm
1B-EXIST-CP=LOC1 self=PL
'The chair, like this, is facing towards here, where we are, with its back' (B&C
2-5, B)

(69) həʔ, teʔ=se, **j-ʔuka=piʔk** ø-ʔit-u
yes, MED=SIM 3A-back=INSTR 3B-EXIST-CP
'Yes, like that, it has its back towards us (lit: it is located with its back)' (R,
B&C 1-6)

If no spatial adjunct is stated, as in (69), it is assumed that the named facet is
being orientated towards the speaker. This is the case for all of the examples of this
construction in my data with the exception of (68).

I have considered the primary function of descriptions like that in (69) to be ori-
entating rather than locating the Figure principally due to their closer resemblence to
typical descriptions of orientation, such as (64), than to typical descriptions of location.
This has been judged based on the fact that descriptions of location featuring an NP
denoting a facet of a Figure, rather than one denoting the Figure itself, are very unusual,
as are descriptions of location in which no location is explicitly stated.

3.5.4 Transitive constructions

A third, marginal, type of construction used to state the orientation of a Figure in
my data features a transitive orientational predicate, the object of which defines the
direction of orientation of its subject. As can be seen from the typical example of such
a description presented in (70), these transitive orientational predicates are formed by
combining the orientational root *ken* 'look' with the lexical afix related to the face or
front *ni*, and the suffix *-ʔəj*, which in this context is used to derive a transitive stem from
the intransitive root.

(70) ø-ʔit-u   j-neʔ   j-ʔaknja=ʔomo kuhj, teʔ   j-ni-ken-ʔəj-u   teʔ
3B-EXIST-CP 3A-ANAP 3A-left=LOC3   tree, 3PRO 3A-front-look-DER-CP DET
pən-tsəki   j-tsoŋ-u=pə=ʔis   kuhj-mətsik
person-figure 3A-hold-CP=REL=3ERG tree-toy
'There is a tree on its (the picture's) left. The figure of a person that is holding
a toy stick (lit:tree) is facing it' (EU, OO)

As with the instrumental constructions described in the previous section, there is
some ambiguity with regards to the nature of those descriptions predicated by the tran-
sitive orientational predicate in (70). This is evidenced from the fact that the transitive
orientational predicate is used in spatial descriptions whose primary function appears to
be locating, rather than orientating, the Figure. An example of one such description is
that in (71), in which a house is described as facing another house, but whose function,
I suggest, is actually to locate the houses opposite each other. This judgement is based
on the context in which the description was given - the consultant was asked to describe
what was on either side of the road at the point at which he was located - and the fact
that it is rare in my data that a landmark so closely located to the Figure is used when
describing an orientation on the scale of the village.

(71) n-tsəʔnaŋ=ʔomo ø-ʔit-u   tək   tiʔjək=pə kamotse=pə
1A-right=LOC3   3B-EXIST-CP house HESIT=REL purple=REL
j-ni-ken-ʔəj-u=pə=ʔis   tumə tək   ha   ø-ʔit-ə=pə=ʔis
3A-front-look-DER-CP=REL=3ERG one   house NEG 3B-EXIST-DEP.I=3GEN
j-neʔ   j-ʔaŋtəŋ
1A-ANAP 3A-door
'To my right is a house that is purple, it is facing a house that doesn't have a
door' (R, E)

3.5.5 Interrogatives

The orientation of an object can be requested in two ways, both of which are used with
roughly equal frequency in my data. The first of these, as in the other spatial domains,
is to replace the spatial adjunct of an orientational description with the indefinite spatial

adverb *hutǝ* 'where'. As with descriptions of motion, it is standard - see (72), for example - to combine this element with the approximative clitic *kaŋ*, which, as will be discussed in Section 4.7, usually has a directional interpretation when appearing in a description of orientation.

(72) hutǝ=kaŋ   ø-ken-maŋ-u *sulu* ø-ʔit-u=mǝ   j-tǝk   *o* teʔ
      where=APPROX 3B-look-go-CP Sulu 3B-EXIST-CP=LOC1 3A-house or DET
      ʔeja=mǝ
      other=LOC1
      'Where is it (the chair) directed towards? Sulu's house (lit: Sulu, his house) or the other way (lit: other location)' (JL, B&C 1-4)

The second distinct manner of requesting orientational information is to use the interogative element *huts* 'how', usually, though far from always, in combination with the perfective marker *ʔam*[25]. An example of the use of *huts* 'how' to request information about the orientation of an object is presented in (73).

(73) teʔ poʔks-tǝk huts=ʔam ø-ken-u?   teʔ=mǝ   ø-ken-maŋ-u
      DET sit-INSTR how=PERF 3B-look-CP? MED=LOC1 3B-look-go-CP?
      jǝʔ=mǝ   ø-ken-min-u
      PRX=LOC1 3B-look-come-CP?
      'How is the chair orientated (lit: how has it looked)? Is it directed there, away from us or here, towards us?' (C, B&C)

4 Spatial Adjuncts

4.1 Introduction

Spatial adjuncts in CZ can be divided into four categories:

1. A postpositional phrase headed by a locative clitic (as in (74))

2. A place-denoting adverbial clause (as in (75))

---

[25] Again, this appears to be due to be associated with the perfective-like semantics of the orientational predicate when it is in the completive aspect.

3. A spatial adverb (as in (76))

4. A toponym (as in (77))

(74) teʔ *pelota* teʔ **poʔks-tək=kəhsi** ø-ʔit-u
     DET ball   DET sit-INSTR=LOC4 3B-EXIST-CP
     'The ball is on top of the chair' (C, B&C 3-5)

(75) ʔune-mətsik ø-ʔit-u   teʔ **ø-ʔit-u=mə**   **teʔ tsima**
     child-toy   3B-EXIST-CP DET 3B-EXIST-CP=LOC1 DET cup
     ø-waŋkan-nej-u=pə
     3B-UPSIDE.DOWN-ASSUMP-CP=REL
     'The toy is where the upside-down glass is' (P, E)

(76) teʔ tuwi ø-poʔks-u **ʔaŋkomo**
     DET dog 3B-sit-CP outside
     'The dog is sat outside' (B, TRPS 5)

(77) ø-poj-jah-u.   teʔ pən=taʔm ø-maŋ-jah-u **kunjəʔmə**
     3B-run-EXCPL-CP. DET man=PL   3B-go-3PL-CP Coapilla
     'They fled. The people went to Coapilla' (RO, OCE)

In this section I will discuss the formal and semantic characteristics of spatial adjuncts in CZ. In particular, I will argue that contrary to previous analyses (Wichmann, 1995; Faarlund, 2012; De la Cruz Morales, 2016) the semantics of spatial adjuncts are purely locational in nature. That is, they only ever specify a location, with any semantic role (such as those associated with a path of motion) being assigned based on the semantics of the accompanying predicate and the context of the utterance. Put another way, I will argue that spatial adjuncts in CZ never denote a direction nor specify path roles such as SOURCE, GOAL or VIA. In the process of this argument it will be necessary to discuss those nominals that denote parts of objects and their associated spatial regions, so-called relational spatial nouns (RSNs).

In the following section I will introduce the nature of CZ RSNs and discuss their use in spatial descriptions. I will then discuss in Section 4.3 those postpositional phrases

that denote locations and particularly the semantics of the postpositions by which these are headed. In Sections 4.4, 4.5 and 4.6 I will discuss the use of place-denoting adverbial phrases, spatial adverbs and toponyms in CZ spatial descriptions. Finally, in Sections 4.7 and 4.8 I will discuss two more peripheral elements which appear in CZ spatial descriptions: the approximative morpheme *kaŋ* and the adverb/postposition, (=)*sjeʔŋomo* 'up to'[26].

4.2 Relational spatial nominals (RSNs)

4.2.1 Introduction

In many languages formal elements relating to parts of objects or their surrounding regions - so-called *meronyms* - are central to the description of spatial properties. In CZ these meronyms take the form of nominals, which are usually termed *relational spatial nominals* (RSNs) in the literature. Synchronically, these RSNs are a prominant feature of many PPs, allowing more precision in topological descriptions of location than would be possible using locative clitics alone and, as discussed in Part IV, playing a central part in the formation of projective spatial descriptions. From a diachronic perspective, PPs featuring RSNs are also the source of many of the locative clitics and spatial adverbs that can synchronically head spatial adjuncts in CZ.

4.2.2 Appearance in possessive constructions

Canonically, CZ RSNs appear in PPs as part of an adnominal possessive phrase that functions as the complement of a locative clitic. In (78), for example, the RSN *kuk* 'middle' is possessed by the Ground nominal, mesja 'table' and the whole possessive phrase is the complement of the locative clitic *mɘ* 'LOC1'.

---

[26]The parentheses around the equals sign indicates that sometimes this morpheme functions as a clitic and sometimes as an independent spatial adverb.

(78) teʔ pama ø-ʔit-u   teʔ **mesja=ʔis j-kuk=mǝ**
      DET cloth 3B-EXIST-CP DET table=3GEN 3A-middle-LOC1
      'The cloth is in the middle of the table (lit: at the table's middle)' (PSPV 14,

      AG)

In this context, the RSN is always marked with a Set A suffix that agrees with the possessor in number: in this case the third person Set A suffix *j-*. In some cases, such as (79), the possessive suffix is the only manifestation of an anaphoric Ground. If the Ground is explicitly stated then it appears as a nominal marked for the genitive case, which for third person arguments is always the clitic *ʔis* [27]. Despite the free consituent order of CZ in general, in adnominal possessive constructions the possessee almost invariably appears immediately following its possessor.

(79) ...**j-ʔukaŋ=kǝʔmǝ**   ø-ʔit-u   tumǝ *pelota*, nas=ʔomo
      ...3A-back.region=LOC5 3B-EXIST-CP one   ball,   ground=LOC3
      'On the ground, behind it (lit: behind its back region) is a ball' (R, B&C 3-11)

Those nominals that function as canonical RSNs in my data are listed in Table 13-15[28].

4.2.3   Direct attachment of RSNs

In addition to appearing in possessive constructions of the type described above, a small number of RSNs are also observed in my data combined directly with their possessor nominal. This is evidenced both by the absence of any possessive marking on the RSN and the presence of morphophonological changes - such as degemination, nasal assimi-

---

[27]One exception to this obligatory marking of possessors for the genitive case is *teʔ* when functioning as the third person pronoun, which regularly functions as a possessor in my data without being marked for the genitive case.

[28]It should be noted that the distinction between relational and non-relational nouns is not as clear cut as it might appear from this discussion. In my data there are a small number of nominals that denote parts of objects but for which I lack clear evidence of their relational status. As these terms are small in number and marginal I have decided to include only those RSNs that behave *canonically* in this and subsequent discussions.

Relational spatial nominal	Gloss
koso	foot/leg
kopak	head
ʔaknaka	mouth
tsek	stomach
nuni	backside
kinə	nose
win	tip/surface
kətə	underneath
wakaŋ	space between legs/haunches
hoh	inside
ʔakpoja	edge
kuk	middle
ʔaŋkin	corner
ʔaŋkə	surrounding region

Table 13: The list of relational spatial nouns found in my data that are exclusively assigned to their possessor in an orientation-independent manner.

Relational spatial nominal	Gloss	Conventional clitic
ʔuka(ŋ)	back (region)	*kəʔmə* 'LOC5'
tseʔŋa	side	*ʔomo* 'LOC3'
ʔaknja	left side	*ʔomo* 'LOC3'
tsəʔnaŋ	right side	*ʔomo* 'LOC3'
winaŋ	front	*ʔomo* 'LOC3'

Table 14: The list of relational spatial nouns in my data that can be assigned either in an orientation-independent manner or by imposing an external asymmetry based on the perspective of the speaker. Also listed are the locative clitics with which they conventionally combine.

lation and metathesis - at the boundary between possessor and RSN. Two examples of RSNs attaching directly to their possessor nominal are shown in (80) and (81).

(80) teʔ pən ø-ʔit-u **tək-kopak=ʔomo**
      DET man 3B-EXIST-CP house-head=LOC3
      'The man is on the roof of the house (lit: the house head)' (C, TRPS 34)

(81) teʔ tuwi **tək-tseʔŋna=ʔomo** ø-poʔks-u
      DET dog house-side=LOC3   3B-sit-CP
      'The dog is sat at the side of the house' (BE, TRPS 6)

Relational spatial nominal	Gloss	Conventional clitic
kəs	vertical top	ʔi/mə
kəʔ	vertical bottom	ʔi/mə

Table 15: The list of relational spatial nouns that are exclusively assigned based on an externally imposed asymmetry. Principally this asymmetry is based on the gravitational field of the earth, but can also be based on the direction of salient slopes in the vicinity of the possessor.

Although during interviews many consultants find it acceptable to directly attach all of the RSNs listed to their possessor nominals, in the case of almost all RSNs this is evidently not a productive strategy, as can be seen from the fact that their direct combination is extremely infrequent - or in most cases entirely absent - from the spontaneous language in my data set.

One exception to this picture of non-productivity is *kətə* 'underneath', which can be found combined with a variety of nominals, including Spanish loan words (as in (82)), throughout my data.

(82)   teʔ misju **mesja-kətə=kəʔmə**   ø-ʔit-u
        DET cat   table-underneath=LOC5 3B-EXIST-CP
        'The cat is under the table' (BE, TRPS 31)

Another RSN that is regularly observed to attach directly to nominals is *kopak* 'head'. The instances of such combinations in my data, however, feature just three nominals, *tək* 'house' (as in (80)), *kotsək* 'mountain' (as in (83)) and *kuhj* 'tree' (as in (230)). Furthermore, *kopak* 'head' does not feature alongside any of these nominals in PPs featuring possessive constructions. My hypothesis would be, therefore, that these three combinations are in fact examples of compound nouns rather than instances of a possessor-possessee relationship between noun and RSN.

(83)   **kotsək-kopak=ʔomo** ø-ʔit-u   tsit
        mountain-head=LOC3   3B-EXIST-CP pine.tree
        'The pine tree is on the top of the mountain' (R, TRPS 65)

(84) *iglesia*=ʔis   j-kopak=ʔomo sjeʔŋomo ø-ʔit-u   teʔ **kuhj-kopak**
      church=3GEN 3A-head=LOC3 up.to   3B-EXIST-CP DET tree-head
      'The top of the tree is up to the top of the church' (BE, TRPS 49)

Two apparent exceptions to the limited productivity of the direct attachment strategy
are the vertical RSNs *kəʔ* 'vertical bottom' and *kəs* 'vertical top', which are frequently
found directly attached to nominals (as in (85) and (86) respectively). It is important
to note when considering (85) that the pre-aspiration of the *s* in *kəs* 'vertical top' re-
sults from the regular morphophonological process whereby a consonant at a morpheme
boundary is pre-aspirated when followed by a morpheme beginning witha glottal stop
(Faarlund, 2012). The same pre-asipration occurs when *kəs* 'vertical top' is combined
with *ʔi* 'LOC2' in all contexts.

(85) teʔ pən=ʔis   j-kopak=**kəhs**i ø-ʔit-u   teʔ koʔkəʔji
      DET man=3GEN 3A-head=LOC4 3B-EXIST-CP DET hat
      'The hat is on the man's head' (M, TRPS 5)

(86) kot-ʔoj-tək=**kəʔ**mə   ø-ʔit-u   misu
      put-ANTIP-INSTR=LOC5 3B-EXIST-CP cat
      'A cat is under a table' (MC, TRPS 31)

It is notable, however, that the direct attachment strategy is used only when the
nominal-RSN combination functions as the complement of just one particular locative
clitic *ʔi* 'LOC2' in the case of *kəs* 'vertical top' and *mə* 'LOC1' for *kəʔ* 'vertical bottom'.
This is in contrast to the situation with the fully productive possessive-construction
strategy in which both RSNs can appear with either of these locative clitics (see (87)
and (88), for example).

(87) teʔ səʔŋ-kuj   ø-ʔit-u   teʔ toto-kot-tək=ʔis
      DET shine-INSTR 3B-EXIST-CP DET paper-put-INSTR=3GEN
      j-kəs=mə
      3A-vertical.top=LOC1
      ' The light (lit: thing for shining) is above the table (lit: in the thing for putting

paper on's above region)' (F, TRPS 15)

(88) teʔ=ʔis **j-kəʔ=ʔi=se,** j-winaŋ=ʔomo ø-ʔit-u teʔ
3PRO=3GEN 3A-vertical.bottom=LOC2=SIM 3A-front=LOC3 3B-EXIST-CP DET
pelota
ball
'Below it, in front of it (lit: in its below region, in its below region) is the ball'
(F, E)

It is also relevant that these cliticised RSN-LOC combinations have a number of additional functions compared to their possessed forms. As a result of these characteristics, I argue in Sections 4.3.4 and 4.3.5 that the RSN-LOC combinations *kəhsi* and *kəʔmə* have progressed along the well-attested grammaticalisation pathway between relational nouns and adpositions (Heine, 2003) and are synchronically analysable as independent locative clitics rather than instances of the direct attachment strategy for RSN use, i.e., *kəhsi* 'LOC4' and *kəʔmə* 'LOC5' rather than *kəs=ʔi* 'vertical.top=LOC2' and *kəʔ=mə* 'vertical.bottom=LOC1'.

4.2.4   Manner of assignment

A property of RSNs that will be relevant when discussing the use of frames of reference in CZ in Part IV is the manner in which different RSNs are assigned to their possessor, or, put more simply, the reason why a particular part of an object is labelled with a particular RSN. An example of a manner of assignment is the assignment of the English RSN *front*, to the facet of an object that is associated with the primary function of that object, for example, the screen of a television.

As described by Levinson and Wilkins (2006, p543) the precise manner in which any particular RSN is assigned can be extremely complex. For example, *front* is also assigned to the facet of buildings through which people enter, which although superficially similar to the 'function-based' assignment described above is not easily reconcilable when considered carefully. In the present context such precision is not required and so

72

I will therefore instead contrast two broad types of assignment. The first of these are assignments that are independent of the actual orientation of the possessor and so can therefore be considered to be based on, at least to some degree, *intrinsic* properties of the possessor; I will refer to this type of assignment as *orientation-independent*. Both of the assignments of *front* described above are classified as orientation-independent despite the differences in the precise details.

The contrasting type of assignment contains those that are dependent on the current orientation of the possessor. This dependence on orientation means that the RSNs in question must be assigned based on some externally imposed asymmetry. An example of an assignment based on an externally imposed asymmetry is that by which the part of an object closest to the speaker can be labelled as the *front* in English, as in (89), for example. In such an assignment it is the location, or alternatively the perspective, of the speaker that imposes the external asymmetry on the possessor of the RSN.

(89)   The sun is shining on the **front** of the rock

In Table 13, above, are listed all of those RSNs in my data that are assigned in an orientation-independent manner. As will be discussed in detail in Section 8.2, as a result of their orientation-independent assignment, those RSNs in Table 13 feature exclusively in spatial descriptions that can be categorised as either topological in nature or as instances of an intrinsic frame of reference. This means that they feature only in descriptions of location in which space is not divided into angularly restricted spatial regions at all or is divided up based on the intrinsic properties fo the Ground (in the case of descriptions of location) or the Figure (in the case of descriptions of motion).

In contrast, those RSNs listed in Table 14 can be assigned either in an orientation-independent manner or through reference to an externally imposed asymmetry, specifically one based on the perspective of the speaker. In this regard the terms in Table 14 behave similarly to their English equivalents. As will be discussed in Sections 8.2 and

8.4, the orientation-independent assignment of these RSNs is associated with instances of intrinsic frames of reference in the same manner as some of those in Table 13. In Section 8.3 it is described how it is through the assignment of those terms in Table 13 based on the perspective of the speaker that the so-called *relative* frame of reference is manifested.

Finally, the two RSNs listed in Table 15 are assigned exclusively based on externally imposed asymmetries. The primary asymmetry used to assign these two terms is imposed by the presence of the Earth: *kəs* 'vertical top' being assigned to the part of an object that is furthest away from the Earth's surface and *kəʔ* 'vertical bottom' to the part that is closest to it.

These terms can also be assigned using two further asymmetries. One of these is based on the direction of a salient slope at the location of the possessor. In this case *kəs* 'vertical top' is assigned to the part of the possessor that is closest to the top of the relevant slope and *kəʔ* 'vertical bottom' to the part that is furthest away. The second additional asymmetry is based on the location of the speaker in much the same way as described above for the RSNs in Table 14. In this case, *kəs* 'vertical top' is assigned to the part of the object that is furthest away from the speaker and *kəʔ* 'vertical bottom' to the part closest. These assignments will be discussed in detail in Sections 9.3 and 9.4 respectively.

4.2.5 Semantics of RSN-LOC combinations

The three groups of RSNs identified above also generally differ in the locative clitics with which they typically combine and the semantic transparency of the resulting PPs. Again with the exception of *kopak* 'head' and *kətə* 'underneath', those RSNs in Table 14 typically combine with a variety of locative clitics to form PPs that are semantically transparent. Examples of such PPs featuring the RSN *koso* 'leg/foot' are shown in (90)-(93).

(90) **j-koso=kəhsi** ø-ʔit-u neʔks-ʔoj-tək
3A-leg=LOC4 3B-EXIST-CP stick-ANTIP-INSTR
'The plaster (lit: thing that sticks) is on her leg' (TRPS 35, C)

(91) **j-koso=ʔomo** ø-ʔit-u *pelota*
3A-leg=LOC3 3B-EXIST-CP ball
'The ball is in between its legs' (B, B&C 1-12)

(92) **j-koso=kəʔmə** ø-ʔit-u, hohmo
3A-leg-LOC5 3B-EXIST-CP, inside
'It is by the legs, inside' (R, B&C 1-12)

(93) teʔ **j-koso=mə=kaŋ** ø-ʔit-u . . .
PRO.3 3A-leg=LOC1=APPROX 3B-EXIST-CP . . .
'It is sort of where the legs are' (R, B&C 1-5)

In contrast, *kopak* 'head' and *kətə* 'underneath' typically combine with just one locative clitic each: *ʔomo* 'LOC3' in the case of *kopak* 'head' and *kəʔmə* 'LOC5' for *kətə* 'underneath'. In both cases the resulting RSN-LOC combinations specify a location within a spatial region projected off the relevant part of the possessor, including those locations that are contiguous with the surface. Examples of the denotation of *kopak=ʔomo* 'head=LOC3' described above are given in (94) and (95) (both describing Figure 5) and that of *kətə=kəʔmə* 'underneath=LOC5' in (96) and (97) (describing Figure 6a and 6b respectively).

(94) **j-kopak=ʔomo** ø-ʔit-u *pelota* ʔəŋ-na ø-ʔit-u tumə
3A-head=LOC3 3B-EXIST-CP ball to.be.lying.down-STAT 3B-EXIST-CP one
poʔks-tək
sit-INSTR
'There is a chair lying down, by its head is a ball' (C, B&C 1-10)

(95) ø-ʔit-u teʔ *pelota* **j-kopak=ʔomo**
3B-EXIST-CP DET ball 3A-head=LOC3
'The ball is by its (the chair's) head' (AT, B&C 1-10)

75

Figure 5: B&C 1-10 (Bohnemeyer and Pérez Báez, 2008), described in (95).
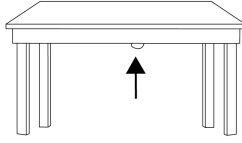
(a) TRPS 53

(b) B&C 2-7

Figure 6: Images described in (96) and (97) (Bohnemeyer and Pérez Báez, 2008; Bowerman and Pederson, 1992b).

(96)   teʔ was-tək   ø-ʔit-u   teʔ **mesja-kətə=kəʔmə**
        DET chew-INSTR 3B-EXIST-CP DET table-underneath=LOC5
        'The chewing gum (lit: thing for chewing) is underneath the table' (F, TRPS 53)

(97)   **j-kətə=kəʔmə**   ø-ʔit-u   tumə *pelota*
        3A-underneath=LOC5 3B-EXIST-CP one   ball
        'A ball is underneath it (lit: by its underneath is a ball)' (AT, B&C 2-7)

In the case of the combination of *kopak* 'head' and *ʔomo* 'LOC3', the projective semantics are entirely non-transparent from the inclusive semantics of *ʔomo* 'LOC3' described in Section 4.3.3[29]. On the other hand, those of *kətə=kəʔmə* 'underneath=LOC5' are partially consistent with the proximal sense of *kəʔmə* discussed in Section 4.3.5.

In a similar manner to *kopak* 'head' and *kətə* 'underneath', the RSNs listed in Table

---

[29]In the context of CZ postpositions, I use projective semantics to refer to the fact that a particular postposition denotes an angularly restricted spatial region and can therefore be used to form a projective description of location. These properties also entail reference to a linguistic FoR.

14 have one particular locative clitic with which they predominantly combine. With the exception of *ʔuka(ŋ)* 'back (region)' the RSN in question is *ʔomo* 'LOC3', yet the resulting PPs again have the type of projective denotation described for *kopak* 'head' and *kɘtɘ* 'underneath' rather than one related to the inclusive semantics of *ʔomo* 'LOC3'; the relationship between the semantics of *ʔomo* 'LOC3' and the semantics of these RSN-LOC combinations is considered in more detail in Section 4.3.3. Examples of these combinations can be seen in (98)-(101).

(98)   *pelota* ø-ʔit-keʔt-u   **j-tseʔŋna=ʔomo**
         ball   3B-EXIST-REP-CP 3A-side=LOC3
         'The ball is again to its side' (AT, B&C 2-4)

(99)   teʔ tsunu=ʔis=j-neʔ   **j-winaŋ=ʔomo**, teʔji   ø-kek-u   teʔ *pelota*
         DET bag=3GEN=3A-ANAP 3A-front=LOC3, MED;LOC2 3B-fall-CP DET ball
         'The ball fell there, in front of the bag' (AT, E)

(100)   **n-ʔaknja=ʔomo** ø-ʔit-u   tumɘ *pelota*
         1A-left=LOC3   3B-EXIST-CP one   ball
         'To my left is a ball' (B, B&C 2-1)

(101)   **j-tsɘʔnaŋ=ʔomo** ø-ʔit-u   teʔ n-kaʔe?
         3A-right=LOC3   3B-EXIST-CP DET M-youth?
         'Is the young boy to its right?' (JC, M&T)

Finally, as with those RSNs in Table 14, the two RSNs in Table 15 predominantly combine with locative clitics in a conventionalised manner to produce PPs with non-transparent, projective, semantics. For both *kɘs* 'vertical top' and *kɘʔ* 'vertical bottom' the conventionalised locative clitics in question are *mɘ* 'LOC1' and *ʔi* 'LOC2'. Both of these locative clitics can combine with both *kɘs* 'vertical top' and *kɘʔ* 'vertical bottom', with no apparent difference in semantics associated with the choice of locative clitic. Examples of such PPs are given in (102)-(105).

(102)   teʔ poʔks-tɘk=ʔis **j-kɘs=ʔi**,   poʔks-pa=pɘ=te,   teʔ=ʔis
         DET sit-INSTR=3ERG 3A-vertical.top=LOC, sit-ICP=REL=1INC, 3PRO=3ERG

j-kəs=ʔi   ø-ʔit-u   tumə *pelota*   nə j-siti-u=pə
3A-vertical.top-LOC 3B-EXIST-CP PROG J-SIDI=REL
'*Above the chair, above the seat, is a ball that's floating*' (LG, B&C 3-8)

(103)   teʔ səʔŋ-kuj   ø-ʔit-u   teʔ todo-kot-tək=ʔis
          DET shine-INSTR 3B-EXIST-CP DET paper-put-INSTR=3GEN
          j-kəs=mə
          3A-vertical.top=LOC1
          '*The light is above the table*' (FR, TRPS 13)

(104)   jəʔ *pelota* ø-ʔit-u   j-neʔ   **j-kəʔ=ʔi=se**,
          PRX ball   3B-EXIST-CP 3A-ANAP 3A-vertical.bottom=LOC2=SIM,
          ø-ʔit-u=mə   sulu=ʔis   j-tək
          3B-EXIST-CP=LOC1 *sulu*=3.GEN 3A-house
          '*This ball is sort of near the bottom of it (the chair), where Sulu's house is*'
          (JL, B&C 4-5)

(105)   jəʔ poʔks-tək=ʔis, j-neʔ   **j-kəʔ=mə=kaŋ**
          PRX sit-INSTR=3GEN 3A-ANAP 3A-vertical.bottom=LOC1=APPROX
          ø-ʔit-u   *pelota*, j-neʔ   j-tsəʔnaŋ=ʔomo
          3B-EXIST-CP ball,   3A-ANAP 3A-right=LOC3
          '*A ball is near the bottom of this chair (lit: roughly in its bottom region), to
          its right (lit: in its right region)*' (LG, E)

4.3 Postpositional phrases

All those postpositional phrases that function as spatial adjuncts in CZ specify a location

through reference to a Ground or part of a Ground. For example, in (106) the location

specified is defined as the region above the Ground (*kot.ʔoj.tək* 'table'), whereas in (107)

the location stated is that of the *kuk* 'middle' of the Ground (*kəʔkumə* 'ring').

(106)   teʔ səʔŋ-kuj ø-ʔit-u   teʔ kot-ʔoj-tək=kəhsi
          DET light   3B-EXIST-CP DET put-ANTIP-INSTR=LOC4
          '*The light is above the table*' (CM, TRPS 13)

(107)   teʔ kəʔkumə=ʔis j-kuk=mə   ø-ʔit-u   təm
          DET ring=3GEN   3A-middle=LOC1 3B-EXIST-CP fruit
          '*The fruit is in the middle of the ring*' (RU, TRPS 19)

78

The location denoted by these postpositional phrases is, as in (106) and (107), typically transparent from the semantics of the locative clitic that heads the phrase and that of its complement; the five locative clitics that can head a PP in CZ are listed in Table 16, along with a summary of the spatial relations they encode[30].

When the location is specified through reference to the Ground as a whole, the complement of the locative clitic is an NP (DP): *teʔ kot.ʔoj.tək* 'the table' in (106). If the location is instead stated relative to a part of the Ground, it is overwhelmingly the case that the complement of the locative clitic is an adnominal possessive phrase in which an RSN is possessed by the Ground i(*kəʔkumə=ʔis j-kuk* 'ring's middle' in (107)).

Locative clitic	Gloss	Semantics
mə	LOC1	co-location
ʔi	LOC2	co-location
ʔomo	LOC3	inclusion (co-location/projection?)
kəhsi	LOC4	superposition, contact
kəʔmə	LOC5	subposition, BEHIND, proximity

Table 16: The list of locative clitics that may head a postpositional phrase in CZ alongside a description of their core semantic notions.

There are two cases in which the above characterisation of postpositional phrases in CZ does not hold. The most common of these is when a combination of nominal (either a noun or an RSN) and locative clitic together denote a spatial relation that is different to those encoded by the locative clitic alone. Two examples of this phenomenon can be seen in (108), as neither the combination *nas=ʔomo* 'ground=LOC3' nor *winaŋ=ʔomo* 'front=LOC3' have semantics that are transparently related to the notion of inclusion associated with the locative clitic *ʔomo* 'LOC3'.

(108) teʔ poʔks-tək=ʔis **j-winaŋ=ʔomo** ø-ʔit-u tumə *pelota*
       DET sit-INSTR=3GEN 3A-front=LOC3 3B-EXIST-CP one ball

---

[30]Following Levinson (2003), I use BEHIND as a loose meta-language to refer to the central, or prototypical, spatial relation of that English preposition rather than the full range of senses of the English preposition itself.

nas=ʔomo
ground=LOC3
'A ball is on the ground in front of (lit: at its front) the chair' (LG, B&C 3-3)

The second, more marginal, deviation is when an RSN is attached directly to the nominal denoting its possessor, as discussed in Section 4.2.3.

In Sections 4.3.1-4.3.5, I discuss the semantics of the locative clitics that can head a PP in CZ. Three of these clitics (*ʔomo* 'LOC3', *kəhsi* 'LOC4' and *kəʔmə* 'LOC5') have previously been analysed in the literature (De la Cruz Morales, 2016; Ramírez Muñoz, 2016), as the type of RSN-LOC combination that directly attaches to its complement discussed in Section 4.2.3. For these three clitics I therefore present evidence that they should in fact be analysed as independent postpositions, in addition to the detailed discussion of their semantics that is also provided for the remaining two postpositions I have identified. Finally, in Section 4.3.6 I will discuss those RSN-LOC combinations that are headed by *ʔomo* 'LOC3', but which have projective, rather than inclusive, semantics.

4.3.1 mə

The locative clitic *mə* 'LOC1' has been analysed as an independent spatial morpheme in all previous descriptions of CZ (Wonderly, 1951*c*; Wichmann, 1995; Faarlund, 2012; De la Cruz Morales, 2016). Although no detailed analyses have been presented, all accounts suggests that the semantics of *mə* 'LOC1' are broadly co-locational in nature. This notion of co-location appears to be refined slightly by De la Cruz Morales (2016), who glosses *mə* 'LOC1' as the "interior locative", possibly suggesting that there is some element of inclusion to its semantics; no evidence is presented to justify this analysis. Additionally, Faarlund (2012) proposes a "directional" meaning for *mə* 'LOC1' when in conjunction with motion predicates. It is not made clear the precise nature of this directional semantics, but in the example provided as evidence - reproduced in (109)[31]

---

[31]I have maintained Faarlund's glossing of *mə* as simply 'LOC' rather than using my own gloss of 'LOC1'.

- it appears to be allative (i.e. Goal marking) in nature.

(109)　nə　j-nuʔk-jah-kəʔt-u　　　　teʔ kupi=mə
　　　　PROG 3A-arrive-EXCPL-REP-DEP.III DET Ocotepec=LOC
　　　　'They were coming again to Ocotepec' (Faarlund, 2012, p33)

My analysis of the semantics of *mə* 'LOC1' is that its fundamental function is, in Jackendoff's (1983) terms, to convert an object or event into a location. This is most clearly seen in its use as the head of both PPs and place-denoting adverbial clauses (discussed in Section 4.4) in descriptions of orientation; examples of each of these uses are given in (110) and (111) respectively.

(110)　teʔ poʔks-tək ***pizaron=mə***　　ø-ken-maŋ-u
　　　　DET sit-INSTR whiteboard=LOC1 3B-look-go-CP
　　　　' The chair (lit:thing to sit on) is looking at where the whiteboard is' (JL, B&C 3-8)

(111)　ø-ʔit-u　　　 tumə poʔks-tək jəʔ=mə,　nə　　j-ken-maŋ-u
　　　　3B-EXIST-CP one　sit-INSTR PRX-LOC1, PROG 3A-look-go-CP
　　　　ø-ʔit-u=mə　　　 teʔ ***camera***
　　　　3B-EXIST-CP=LOC1 DET camera
　　　　'Here, there is a chair, it is looking towards where the camera is' (LG, B&C)

In locative descriptions, this notion has been extended so that Figures that are contiguous with - or at the least very close to - a Ground or part of a Ground can be described using a PP headed by *mə* 'LOC1'.These two scenarios are exemplified in (112) and (113) respectively.

(112)　(teʔ ***bandera***) ø-ʔit-u　　　tək=mə
　　　　(DET flag)　　3B-EXIST-CP house=LOC1
　　　　'The flag is at the house' (CM, TRPS 56)

(113)　teʔ tsunu=ʔis j-neʔ　　j-winaŋ=ʔomo, teʔji　　ø-kek-u　teʔ ***pelota***,
　　　　DET bag=3GEN 3A-ANAP 3A-FRONT=IN, MED;LOC2 3B-fall-CP DET ball,

pero j-neʔ **j-tsəʔnaŋ=mə**
but 3A-ANAP 3A-right=LOC3
'*The ball fell in front of the bag, but at its right side*' (AT, E)

In cases in which there is a salient distance between Figure and Ground, such as (114), descriptions preferentially consist of a PP headed by the locative clitic *kəʔmə* (discussed in Section 4.3.5).

(114)   jəti teʔ pən-tsəki   tsima=kəʔmə ø-ten-u
        now DET man-figure glass=LOC5   3B-stand-CP
        '*Now, the toy man is stood by the glass.*' (MJ, E)

With regards to the directional semantics suggested by Faarlund (2012), it is certainly the case that *mə* 'LOC1' can be used to head PPs that feature in descriptions of motion, as demonstrated by (115). In this example, just as that reproduced from Faarlund's analysis above, the Ground in this description plays the path role of GOAL. In (116) and (117), however, are examples of PPs headed by *mə* 'LOC1' featuring Grounds that play the path roles of SOURCE and VIA respectively.

(115)   teʔ *carro*-mətsik ø-tsuʔŋ-u   teʔ kuhj=kəʔmə i   ø-nuʔk-u   teʔ
        DET car-figure   3B-leave-CP DET tree=LOC5   and 3B-arrive-CP DET
        tək=mə
        house=LOC1
        '*The toy car left from near the tree and arrived at the house*' (B, E)

(116)   teʔ *pelota* nə   j-piti-tsuʔŋ-u   teʔ **caja=mə** ...
        DET ball   PROG 3A-roll-leave-DEP.III DET box=LOC1 ...
        '*The ball is leaving the box rolling ...*' (B, MVS)

(117)   *pelota* neʔ=ʔis   **j=ʔakpoja=mə** nə   j-kət-u
        ball   water=3GEN 3A-edge=LOC1   PROG 3A-pass-DEP.III
        '*A ball is passing the water's edge*' (JC, MVS)

This is inconsistent with Faarlund's claim that *mə* 'LOC1' has a directional interpretation, but consistent with my claim that it plays no role in the marking of path roles.

4.3.2 ʔi

As is the case with *mə* 'LOC1', the clitic *ʔi* 'LOC2' has been identified as an independent postposition in all previous descriptions of the language. Unlike *mə* 'LOC1', however, there have been significantly different analyses of its semantics. According to Faarlund (2012, p33), this morpheme has purely directional semantics equivalent to English 'to'. In contrast, De la Cruz Morales (2016) glosses *ʔi* 'LOC2' as an "exterior locative" in contrast to the "interior locative" gloss given to *mə* 'LOC1'; again, no explanation of, nor evidence for, this distinction is provided. Finally, Wichmann (1995) combines these two analyses, suggesting that *ʔi* 'LOC2' is both a general locative case like *mə* 'LOC1' - i.e. converts things and events into places - and an allative case marker.

A key element of my own analysis of the semantics of *ʔi* 'LOC2' not previously discussed in the literature is the fact that synchronically *ʔi* 'LOC2' as an independent locative clitic has very limited productivity. This can be seen from the fact that it appears as the head of a PP almost exclusively in combination with just two nominals, the vertical RSNs *kəs* 'vertical top' (as in (118)) and *kəʔ* 'vertical bottom' (as in (119)).

(118) teʔ poʔks-tək=ʔis **j-kəs=ʔi,**   poʔks-pa=pə=te,
       DET sit-INSTR=3ERG 3A-vertical.top=LOC2, sit-ICP=REL=1INC,
       teʔ=ʔis   **j-kəs=ʔi**   ø-ʔit-u   tumə *pelota* nə
       3PRO=3GEN 3A-vertical.top-LOC2 3B-EXIST-CP one   ball   PROG
       j-siti-u=pə
       3A-fly-DEP.III=REL
       'Above the chair, above the seat, is a ball that's floating' (LG, B&C 3-8)

(119) jəʔ *pelota* ø-ʔit-u   j-neʔ   **j-kəʔ=ʔi=se,**
       PRX ball   3B-EXIST-CP 3A-ANAP 3A-vertical.bottom=LOC2=SIM,
       ø-ʔit-u=mə   sulu=ʔis   j-tək
       3B-EXIST-CP=LOC1 *sulu*=3.GEN 3A-house
       'This ball is sort of near the bottom of it (the chair), where Sulu's house is'
       (JL, B&C 4-5)

In my data, when *ʔi* 'LOC2' heads a PP not featuring one of the vertical RSNs (i.e. *kəs*

'vertical top' or *kəʔ* 'vertical bottom') it always attaches to the nominal, *tək* 'house'. This attachment can take place both when *tək* 'house' appears as an independent noun, as in (120), or as part of a compound, as in (121). In interviews, consultants consistently rejected the use of *ʔi* 'LOC2' in combination with other nominals.

(120)   ø-məʔn-wə+tsək-keʔt-pa   tsajiʔka j-neʔ   **j-tək=ʔi**
        3B-descend-repeat-REP-ICP later   3A-ANAP 3A-house=LOC2
        'He descended home again' (PA, OCE)

(121)   . . . *i*   j-kobin-**tək=ʔi**   ø-ʔit-keʔt-u   tumə *pelota*
        . . . and 3A-relating.to.the.head-house=LOC2 3B-EXIST-REP-CP one   ball
        nas=ʔomo=dike
        ground=LOC3=also
        '. . . and where the head is (roughly: the head's house) there is a ball on the ground' (R, B&C 1-10)

Those examples presented as evidence of their analysis by De la Cruz Morales (2016) and Faarlund (2012) also exclusively feature the nominals stated above. Faarlund does, however, also list some additional nominals with which *ʔi* 'LOC2' can combine, for example, *kuk* 'middle'; all of those additional possibilities listed by Faarlund were rejected by my consultants.

The limited productivity of *ʔi* 'LOC2' as an independent locative clitic limits the extent to which its core semantics can be analysed. It is, however, possible to observe how PPs headed by *ʔi* 'LOC2' are used in my data and to formulate hypotheses regarding these semantics. Principal amongst these observations is that PPs headed by *ʔi* 'LOC2' and featuring the vertical RSNs seem to be, at least to a very large degree, synonymous with those PPs featuring the same RSNs but headed by *mə* 'LOC1'. Given the relatively small number of tokens in my data, this observation is primarily founded on the consistent judgement of consultants that the alternative forms of PPs featuring vertical RSNs are interchangeable. It is backed up, however, by descriptions such as (122), in which the two forms of PP featuring *kəs* 'vertical top' are used to describe the same spatial array.

(122) ø-ʔit-keʔt-u   ʔeja=pə   tumə poʔks-tək teʔ=ʔis
       3B-EXIST-REP-CP other=REL one sit-INSTR 3PRO=3GEN
       j-kəs=ʔi=se   ø-ʔit-u   *pelota* …poʔks-tək=ʔis
       3A-vertical.top=LOC2=SIM 3B-EXIST-CP ball   …sit-INSTR=3GEN
       j-kəs=mə=se
       3A-vertical.top=LOC1=SIM
       'There is also another chair, above it (lit:at its top) is a ball … above the chair'
       (F, B&C 3-8)

The question of the directional semantics of *ʔi* 'LOC2' is even more difficult to pass judgement on, as PPs headed by *ʔi* 'LOC2' appear so infrequently in descriptions of motion. It is notable, however, that the few examples that are available for analysis - both in my own data and in the examples presented by DLC and Faarlund - are remarkably similar in form, containing as they do the PP *tək=ʔi* 'house=LOC2' and with the Ground (the house) playing the path role of GOAL; examples of these descriptions are presented in (123) (repeated from above) and (124) (from Faarlund, 2012).

(123) ø-məʔn-wə.tsək-keʔt-pa   tsajiʔka j-neʔ   **j-tək=ʔi**
       3B-descend-repeat-REP-ICP later   3A-ANAP 3A-house=LOC2
       'He descended home again' (PA, OCE)

(124) ø-maŋ-jah-u=ʔuŋ=te   **j-tək=ʔi=taʔm**
       3B-go-3PL-CP=EV=FOC 3A-house=LOC2=PL
       'They went to their homes again' (Faarlund, 2012, P33)

The spontaneous uses of *tək=ʔi* 'house=LOC2' described above are of course consistent with Faarlund and Wichmann's analysis of *ʔi* 'LOC2' as a marker of the allative case. As I have stated in the introduction to this chapter, however, my analysis is that no locative clitic in CZ encodes path roles. My alternative analysis is therefore that the appearance of allative semantics of *ʔi* 'LOC2' that comes from the spontaneous uses of *tək=ʔi* 'house=LOC2' are in fact a result of the lack of productivity of *ʔi* 'LOC2'. Specifically, I hypothesise that the use of *tək=ʔi* 'house=LOC2' in descriptions of change of location in which a house is the Goal are, to some extent, fossilised, with all other

uses of that PP - and, indeed, other PPs headed by *ʔi* 'LOC2' featuring nouns - having ceased to be productive.

Evidence in favour of my analysis is the fact that PPs headed by *ʔi* 'LOC2' are, as in (125), synchronically used to specify Grounds that perform roles other than GOALS in descriptions of motion.

(125)   teʔ jomo   ø-tsuʔŋ-u   [**j-kəs=ʔi=se**]_{SOURCE}   . . .
         DET woman 3B-depart-CP 3A-vertical.top=LOC2=SIM . . .
         'The woman departed from its top . . . ' (ME, TRAJ)

4.3.3   ʔomo

In common with Faarlund (2012), but in contrast to De la Cruz Morales (2016), I have analysed the element *ʔomo* 'LOC3' as an independent locative clitic rather than the separable RSN-LOC combination, *hoh=mə* 'inside=LOC1' from which it has derived. The argument for this analysis has two aspects. Firstly, as can be seen by comparing (126) and (127) - in which the first line represents a phonetic transcription of the utterances - *ʔomo* 'LOC3' is phonologically distinct from the combination of *hoh* and *mə* 'LOC1' when the former is functioning as a canonical RSN (i.e. as part of a possessive construction); this difference in phonology can not be explained by any synchronic morphophonological processes[32].

(126)   teʔ ʔune təhkis kjobahk**omo** tenu
         teʔ ʔune tək=ʔis   j-kopak-**hoh=mə**   ø-ten-u
         DEF child house-3ERG 3A-head-inside=LOC1 3B-stand-CP
         'The child is stood on the roof of the house' (De la Cruz, 2016, p147)

(127)   teʔ ʔunemətʃik tsimaʔis hjohmo ʔihtu . . .
         teʔ ʔune-mətsik tsima=ʔis j-**hoh=mə**   ø-ʔit-u   . . .
         DEF child-play   cup-3GEN 3A-inside=LOC1 3B-EXIST-CP
         'The toy is inside the bag' (De la Cruz, 2016, p147)

---

[32]I have converted the author's original transcription - written using the local orthography - into IPA. The morpheme-level analysis of these examples are DLC's.

86

The second aspect of the argument is that the semantics of *hoh=mə* 'inside=LOC1' is strictly that of co-location within a 3D volume, as in the representative example in (127). The semantics of *Ɂomo* 'LOC3' on the other hand has extended to include the general notion of inclusion, including inclusion in a 2D region, as in (128) (used to describe the location of a stamp on a page), and temporal inclusion, as in (129).

(128)   teɁ **toto-haj-e=Ɂomo**   ø-Ɂit-u   tumə *estampa*
        DET paper-APPL-NOM=LOC3 3B-EXIST-CP one   stamp
        'The stamp is in the book' (CM, TRPS 3)

(129)   teɁji   ø-min-u=Ɂtsi   jəɁki   n-koso=piɁk *media*
        MED;LOC2 3B-come-CP=INSTR PRX;LOC1 1A-foot=INSTR half
        hora=Ɂomo
        hour=LOC3
        'Then I came here by foot in half an hour' (ME, OCE)

Furthermore, as has been introduced in Section 4.2.5 and will be discussed in more detail in Section 4.3.6, *Ɂomo* 'LOC3' can combine with a subset of CZ RSNs to produce PPs that denote spatial relations that are not obviously related to inclusion; two such combinations are exemplified in (130) and (131).

(130)   teɁ ɁoɁna ø-Ɂit-u   **kohtsək-kopak=Ɂomo**
        DET cloud 3B-EXIST-CP mountain-head=LOC3
        'The cloud is above the mountain peak' (TRPS 36, M)

(131)   **j-tseɁŋna=Ɂomo** ø-Ɂit-u   tumə *pelota* nə   j-siti-u=pə
        3A-side=LOC3   3B-EXIST-CP one   ball   PROG 3A-fly-DEP.III=REL
        'To its side is a ball that's floating' (B&C 2-4, MJ)

Another point on which my analysis of *Ɂomo* 'LOC3' is at odds with previous descriptions is in regard to the proposal by Faarlund (2012, p36) that it has ablative semantics (i.e. it functions as a marker of the SOURCE path role). Although it is certainly true that *Ɂomo* 'LOC3' features in PPs denoting locations that perform the SOURCE path role

- as in (132) - it just as frequently features in PPs denoting locations that play other path roles, such as GOAL in (133) and VIA in (134).

(132)   ø-put-u=ʔtsi   teʔ **tək=ʔomo**
          1B-exit-CP=1ABS DET house=LOC3
          'I exited the house' (R, OCE)

(133)   teʔji   teʔ n-kaʔe **nəʔ=ʔomo** ø-nuʔk-u   teʔ tuwi **teʔ=ʔomo**
          MED;LOC2 DET M-youth water=LOC3 3B-arrive-CP DET dog 3PRO=LOC3
          ø-nuʔk-keʔt-u
          3B-arrive-REPET-CP
          'then the young boy arrived in the water, the dog arrived in it too' (JC, FSp22)

(134)   *despues* ø-kət-u   teʔ **ʔaŋtəŋ=ʔomo**
          after   3B-pass-CP DET door=LOC3
          'After, it passes through the door' (P, E)

Based on my spontaneous data, therefore, there does not appear to be any basis on which to assign *ʔomo* 'LOC3' ablative semantics.

    In summary, my analysis is that *ʔomo* 'LOC3' is an independent locative clitic which primarily heads PPs denoting relationships of inclusion, though, in combination with a subset of the RSNs available to CZ speakers, the PPs it heads can denote non-inclusive spatial relations; these conventionalised combinations of *ʔomo* 'LOC3' and RSNs are discussed in Section 4.2.5. Finally, there is no evidence in my data to suggest that *ʔomo* 'LOC3' has a specifically ablative reading.

4.3.4 kəhsi

When a possessive construction featuring the RSN *kəs* 'vertical top' is the complement of the locative clitic *ʔi* 'LOC2', the resulting PP has the semantics of superposition or, very marginally, one of the related geomorphic notions discussed in Section 9.3. In the majority of the spontaneous uses of this morpheme in my data the Figure and Ground are non-contiguous; an example of one such use is presented in (135), which was used

(a) B&C 1-5   (b) B&C 1-1

Figure 7: Images described in (135) and (136) (Bohnemeyer and Pérez Báez, 2008).

to describe Figure 7a. As demonstrated by (136) (used to described Figure 7b), and supported by the judgement of consultants in interviews, this combination can also be used to describe contiguous superposition.

(135)   teʔ=ʔis   **j-kəs=ʔi**   ø-ʔit-u   tumə *pelota*
             3PRO=3GEN 3A-vertical.top=LOC2 3B-EXIST-CP one   ball
             'A ball is above it' (LG, B&C 1-5)

(136)   jəʔ poʔks-tək jəʔ=mə   ø-ken-maŋ-u n-tsəʔnaŋ=ʔomo *i*   teʔ=ʔis
             PRX sit-INSTR PRX-LOC1 3B-look-go-CP 1A-right=LOC3   and 3PRO=3GEN
             j-kəs=ʔi   ø-kot-kiʔm-u   tumə *pelota*
             3A-vertical.top=LOC2 3B-put-ascend-CP one   ball
             'This chair is directed to my right here and on top of it (lit: at its top) a ball has been put' (LG, B&C 1-1)

The clitic *kəhsi* 'LOC4' - which, as discussed in Section 4.2.3 is pronounced identically to the RSN-LOC combination *kəs=ʔi* 'vertical.top=LOC2'- is also used to denote the spatial relations of superposition, but with the opposite pattern of use of *kəs=ʔi* 'vertical.top=LOC2', i.e., in spontaneous descriptions it is predominantly used in cases of *contiguous* superposition, as in (137) (used to described Figure 8a) and marginally to describe instances of non-contiguous superposition, as in (138) (used to describe Figure 8b)

(a) B&C 1-1
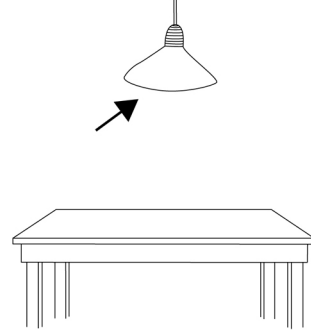
(b) TRPS 13

Figure 8: Images described in (137) and (138) (Bohnemeyer and Pérez Báez, 2008; Bowerman and Pederson, 1992*b*).

(137)   teʔ poʔks-tək=**kəhsi** ø-ʔit-u   teʔ *pelota*
        DET sit-INSTR=LOC4 3B-EXIST-CP DET ball
        'The ball is on top of the chair' (AG, B&C 1-1)

(138)   teʔ səʔŋ-kuj   ø-ʔit-u   teʔ kot-ʔoj-tək=**kəhsi**
        DET shine-INSTR 3B-EXIST-CP DET put-ANTIP-INSTR=LOC4
        'The light is above the table (lit:the thing for putting?)' (CM, TRPS 13)

Unlike the RSN-LOC combination *kəs=ʔi* 'vertical.top=LOC2', however, the clitic *kəhsi* 'LOC4' can denote a spatial relation of support that does not feature superposition. This is evident from the descriptions presented in (139) and (140), which were used to describe Figures 9a and 9b respectively.

(139)   teʔts-pa=pə=**kəhsi** ø-ʔit-u   j-neʔ   *j-pelota*
        lean-ICP=REL=LOC4 3B-EXIST-CP 3A-ANAP 3A-ball
        'Its ball is against the backrest' (R, B&C 1-4)

(140)   teʔ kiʔm-tək   ø-ʔit-u   noʔts-e=**kəhsi**
        DET ascend-INSTR 3B-EXIST-CP enclose-NOM=LOC4
        'The ladder is against the wall' (RU, TRPS 58)

Furthermore, the clitic *kəhsi* 'LOC4' can be used to describe temporal relations as in

(a) B&C 1-4
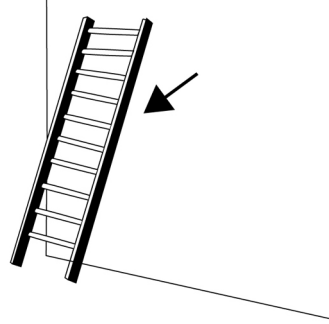
(b) TRPS 58

Figure 9: Images described in (139) and (140) (Bohnemeyer and Pérez Báez, 2008; Bowerman and Pederson, 1992*b*).

(141) and (142).

(141) teʔ tsuʔ=**kəhsi** haʔp.pəj-wətsək-u teʔ *volcan*
       DET night=LOC4 light.fire-begin-CP DET volcano
       'Around early morning volcano began to erupt again' (RO, OCE)

(142) teʔ pən ø-poj-pa   mosaj *hora*=**kəhsi**
       DET man 3B-run-ICP five   hour=LOC4
       'The man runs for five hours' (B, E)[33]

It is principally because of the additional senses that the RSN=LOC combination *kəs=ʔi* 'vertical.top=LOC2' has when directly combined with its complement compared to when it appears as part of a possessive construction that I have analysed the directly combined form *kəhsi* 'LOC4', as an independent locative clitic.

Finally, as with those locative clitics discussed so far, *kəhsi* 'LOC4' can head PPs that feature in descriptions of motion and in which a location with a path role is specified. As can be seen from the examples presented in (143)-(145), PPs headed by *kəhsi* 'LOC4' are not restricted to any path role in particular.

---

[33]This was a translation of the translation given by the consultant, though it isn't really in keeping with the usual uses of *kəhsi* in a temporal sense, which usually means 'after'.

(143)   teʔ   n-kaʔe   ø-təp-kiʔm-u   teʔ   [tsaʔ=**kəhsi**]_{GOAL}
DET M-youth 3B-jump-ascend-CP DET rock=LOC4
'The young boy jumped up on to the rock' (AT, TRAJ)

(144)   teʔ   ʔune   ø-təp-məʔn-u   teʔ   [tsaʔ=**kəhsi**]_{SOURCE}, ø-maŋ-u
DET child 3B-jump-descend-CP DET rock=LOC4,   3B-go-CP
j-poj-e
3A-run-DEP.II
'The child jumped down from on top of the rock' (P, TRAJ)

(145)   teʔ   ʔune nə   j-poj-kət-u   teʔ   [tsaʔ=**kəhsi**]_{VIA}
DET child PROG 3A-run-pass-DEP.III DET rock=LOC4
'The child is passing above the rock running' (AT, TRAJ)

4.3.5   kəʔmə

My analysis of *kəʔmə* 'LOC5' as an independent locative clitic is similar to that presented
for *kəhsi* 'LOC4' above. Like *kəhsi* 'LOC4', *kəʔmə* 'LOC5' is pronounced identically to an
RSN-LOC combination, in this case *kəʔ=mə* 'vertical bottom=LOC1'. Furthermore, as
with *kəhsi* 'LOC4', the basis for the identification of *kəʔmə* 'LOC5' as a locative clitic in
its own right as opposed to an instance of an RSN-LOC combination in which the RSN
is directly attached to its possessor was the identifiable difference in the semantics of
these two elements.

     An adnominal possessive construction featuring *kəʔ* 'vertical bottom' rarely functions
as the complement of the locative clitic *mə* 'LOC1' in my data. The limited number of
spontaneous uses that there are (all of which - including (146) - are examples of the notion
of subposition extended to geomorphic uses discussed in Section 9.3) coupled with the
judgements of my consultants lead to my analysis that *kəʔ=mə* 'vertical bottom=LOC1'
has the semantics of subposition, independent of contiguity.

(146)   teʔ   *cancha*=ʔis=j-neʔ   j-**kəʔ=mə**=kaŋ,   j-neʔ
DET field=3GEN=3A-ANAP 3A-vertical.bottom=LOC1=APPROX, 3A-ANAP
j-tsəʔnaŋ=ʔomo ø-ʔit-u   *telefono*
3A-right=LOC3   3B-EXIST-CP

'*At the bottom of the field, to its right is a telephone*' (ME, SC)

PPs headed by the locative clitic *kəʔmə* 'LOC5' occur frequently in my data and are observed to denote locations defined by a number of distinct spatial relations. Like the RSN-LOC combination from which it derives, one of these spatial relations is that of superposition. Unlike *kəʔ=mə* 'vertical.bottom=LOC1', however, *kəʔmə* 'LOC5' is preferentially used to describe contiguous subposition, as is the case in (148), which was used to describe Figure 11a. Occasionally, *kəʔmə* 'LOC5' is also used to describe instances of non-contiguous subposition, as in (147) (describing Figure 10), however, the preferred method of describing such non-contiguous subposition in my data was in fact the use of *kəʔmə* 'LOC5' in combination with the RSN *kətə* 'underneath', as in (149) (describing Figure 11b).

(147)   poʔks-tək=**kəʔmə** ø-ʔit-u   *pelota*
        sit-INSTR=LOC5   3B-EXIST-CP ball
        '*A ball is underneath the chair*' (MC, TRPS 16)

(148)   teʔ   *cuchara* ø-ʔit-u   ni.toʔk-kuj=**kəʔmə**
        DET spoon   3B-EXIST-CP cover-INSTR=LOC5
        '*The spoon is under the cover*' (TRPS 24, M)

(149)   teʔ   misu mesja=**kətə=kəʔmə**   ø-ʔit-u
        DET cat   table=underneath=LOC5 3B-EXIST-CP
        '*The cat is underneath the table*' (BE, TRPS 31)

In addition to subposition, *kəʔmə* 'LOC5' is also marginally used in descriptions of spatial arrays in which the Figure is behind the Ground, either from the perspective of the viewer (as in (150); describing Figure 12b) or based on the intrinsic properties of the Ground (as in (151); describing Figure 12a). Furthermore, the overwhelmingly preferred method of expressing the notion of 'behind without contact' is to combine *kəʔmə* 'LOC5' with the RSN *ʔukaŋ* 'back region', as in (152).
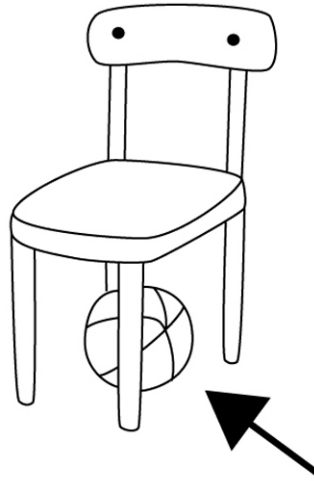
Figure 10: Image described in (147) (TRPS 16; Bowerman and Pederson, 1992*b*).
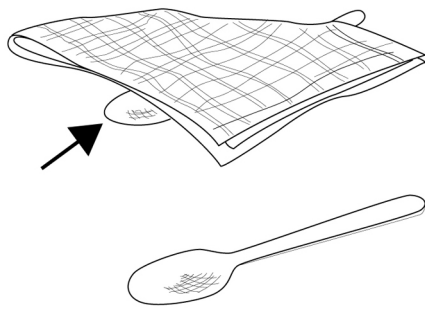
(a) TRPS 24
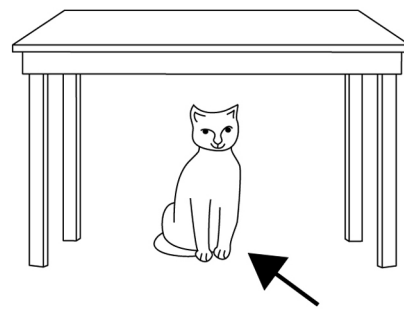
(b) TRPS 31

Figure 11: Images described in (148) and (149) (Bowerman and Pederson, 1992*b*).
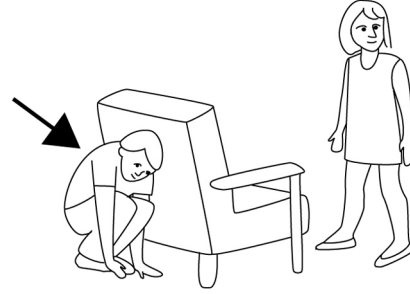
(a) FS, p23   (b) TRPS 64

Figure 12: Images described in (151) and (152)(Mayer, 1969; Bowerman and Pederson, 1992*b*).

(150)   teʔ n-kaʔe   poʔks-tək=**kəʔmə** ø-ʔit-u
         DET M-youth sit-INSTR=LOC5   3B-EXIST-CP
         'The young boy is behind the chair' (BE, TRPS 64)

(151)   ø-ʔit-u=ʔuŋ=naʔak   tumə kuhj ø-sutu-ʔəj-u=pə   teʔ=**kəʔmə**
         3B-EXIST-CP=REP=CONTR one   tree 3B-hole-V-CP=REL 3PRO=LOC5
         ø-ʔit-jah-u   metsa nahk
         3B-EXIST-3PL-CP two   frog
         'There was reportedly a hollow tree, behind which were two frogs' (FSp23, AT)

(152)   teʔ ʔune ø-ʔit-u   poʔks-tək=ʔis   **j-ʔukaŋ=kəʔmə**
         DET child 3B-EXIST-CP sit-INSTR=3GEN 3A-back.region=LOC5
         'The child is behind the chair' (MC, TRPS 64)

Most commonly in my data, however, *kəʔmə* 'LOC5' is used to describe the location of a Figure that can not be characterised as being either below or behind the Ground in any sense. Examples of two such uses are the descriptions presented in (153) and (154), which were given to describe Figures 13a and 13b respectively.

(a) B&C 1-11
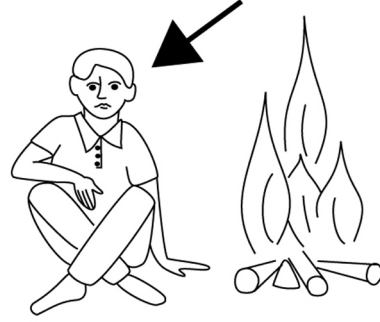
(b) TRPS 38

Figure 13: Images described in (153) and (154) (Bohnemeyer and Pérez Báez, 2008; Bowerman and Pederson, 1992*b*)

(153) teʔ n-kaʔe ø-ʔit-u   teʔ huhktək=**kəʔmə**
      DET M-youth 3B-EXIST-CP DET fire=LOC5
      'The young boy is by the fire' (TRPS 38, F)

(154) teʔ=**kəʔmə** ø-ʔit-keʔt-u teʔ *pelota*, j-neʔ **j-kopak=kəʔmə**
      3PRO=LOC5 3B-EXIST-CP DET ball 3A-ANAP 3A-head=LOC5
      j-kopak=kəhsi
      3A-head=LOC4
      'The ball is near it again, near its intrinsic top, against its intrinsic top' (B&C 1-11, R)

In these cases, it is my analysis that the spatial relation denoted by *kəʔmə* is that of a general proximity to a Ground, which may be faceted (as in (153)) or facetless (as in (154)). This sense is not shared by the RSN-LOC combination *kəʔ=mə* due to the RSN *kəʔ* synchronically denoting only the 'vertical bottom' of an object. Historically, however, *kəʔ* also denoted the side of an object (Zavala, 2015) and it seems reasonable to suggest that it is from this sense that *kəʔmə* 'LOC5' has developed its synchronic proximal sense[34].

Above I have demonstrated that the clitic *kəʔmə* 'LOC5' has two senses (proxim-

---

[34]*kəʔ* still refers to an arm/hand when possessed by a human.

ity and BEHIND) in addition to the sense of subposition that is shared with the RSN-LOC combination *kəʔ=mə* 'vertical.bottom=LOC1'. It is due to these additional senses that I have analysed *kəʔmə* 'LOC5' as a locative clitic independent of *kəʔ=mə* 'vertical.bottom=LOC1'.

Finally, as with the other locative clitics available to CZ speakers, *kəʔmə* 'LOC5' can head PPs appearing in descriptions of motion, but is not associated with any particular path role. This can be seen from the examples presented in (155) (GOAL and SOURCE roles exemplified) and (156) (VIA role exemplified).

(155) mesja=kəhsi nə   j-miʔks-u   *pelota.* [*caja*=kəʔmə]$_{SOURCE}$ nə
       table=LOC4 PROG 3A-move-DEP.III ball,   box=LOC5   PROG
       j-tsuʔŋ-u   [kuhj-kəʔmə]$_{GOAL}$ nə   j-min-u
       3A-leave-DEP.III tree=LOC5   PROG 3A-come-DEP.II
       'A ball is moving on a table. It is leaving from by a box and coming towards us to by a tree' (JC, MVS)

(156) teʔ jomo ø-poj-kət-u   teʔ [kuhj=kəʔmə]$_{VIA}$
       DET women 3B-run-pass-CP DET tree=LOC5
       'The woman ran past the tree' (AT, TRAJ)

4.3.6 Projective PPs headed by *ʔomo*

There are a small number of PPs headed by *ʔomo* 'LOC3' that are not transparently related to its semantics of inclusion. Two instances of such PPs, which are of marginal importance to wider discussions of spatial descriptions in CZ, are PPs featuring the RSN *kopak* 'head' (as in (157), describing Figure 14a) or the noun *nas* 'ground' (as in (158), describing Figure 14b).

(157) j-**kopak=ʔomo** ø-ʔit-u   *pelota* ʔəŋ-na   ø-ʔit-u
       3A-head=LOC3 3B-EXIST-CP ball   to.be.lying.down-STAT 3B-EXIST-CP
       tumə poʔks-tək
       one   sit-INSTR
       'There is a chair lying down, by its head is a ball' (C, 1-10)

97

(a) B&C 1-10

(b) PSPV 42

Figure 14: The images described in (157) and (158) (Bohnemeyer and Pérez Báez, 2008; Ameka et al., 1999)

(158) teʔ *pisi* ø-ʔit-jah-u   **nas=ʔomo**
       DET yuka 3B-EXIST-3PL-CP ground=LOC3
       'The yuka are on the floor.' (F, PSPV 42)

These are conventionalised combinations with very general semantics, i.e., they denote a location at or near to the stated Ground/part of Ground. I hypothesise that these conventionalised combinations have come about due to the frequent co-occurrence of the two nominals in question with *ʔomo* 'LOC3', both denoting entities with which objects can naturally be located within.

Due to their central role in the manifestation of linguistic frames of reference in CZ (discussed in Part IV), those PPs headed by *ʔomo* 'LOC3' and featuring the RSNs of Table 14 (with the exception of *ʔuka(ŋ)*) are of greater importance to the description of space in CZ more generally. The combinations denote locations within a spatial region projected off the relevant facet of the possessor, as can be seen by the examples presented in (159) and (160) (used to describe Figures 15a and 15b respectively) and (161) (given by a consultant to describe her current location during a walk around Ocotepec).

(159) *pelota* ø-ʔit-keʔt-u   **j-tseʔŋna=ʔomo**
       ball   3B-EXIST-REP-CP 3A-side=LOC3
       'The ball is again to its side' (AT, B&C 2-4)

98

<center>(a) B&C 2-4   (b) B&C 3-3</center>

Figure 15: The images described in (159) and (160) (Bohnemeyer and Pérez Báez, 2008).

(160)   te? po?ks-tək=?is **j-winaŋ=?omo** te?ji   ø-?it-u   tumə *pelota*
        DET sit-INSTR=3GEN 3A-front=LOC3, MED;LOC2 3B-EXIST-CP one   ball
        'There, in front of the chair is a ball' (LG, B&C 3-3)

(161)   *la*   *iglesia* ø-tsə?j-pa   n-**?aknja=?omo** *i*   n-**tsə?naŋ=?omo**
        DET church 3B-remain-ICP 1A-left=LOC3   and 1A-right=LOC3
        ø-tsə?j-pa   *la*   *presedensia*
        3B-remain-ICP DET town.hall
        'The church is (lit:remains) to my left and the town hall is to my right' (AT, E)

My hypothesis for the origin of the projective semantics displayed by these RSN-LOC combinations is that it ultimately derives from the fact that some were originally compound terms containing the morpheme *?aŋ* 'region'. This morpheme, which originally referred to the mouth (as can still be seen in *?aŋ-naka* 'mouth (mouth-skin)'), synchronically appears in a number of different contexts with semantics related to spatial regions. Examples of these contexts are its presence in the RSN *?aŋkə* 'surrounding region'; its presence in the related spatial adverb *?aŋkomo* 'outside (in the region surrounding some object)'; or as part of the clitic *kaŋ*, which, as is discussed in Section 4.7, expands a location specified by a spatial adjunct into a broader region.

(162)   *Achente=?is*   j-**?aŋkə=?omo**,   nj-mə?n-pa
        Achente=3GEN 3A-surrounding.region=LOC3 2B-descend-ICP
        te?=kə?mə=kaŋ
        3PRO=LOC5=APPROX
        'Around about the area surrounding Achente's house you descend (lit: The area

surrounding Achente's house, you descend by it' (ME, E)

(163) te? jomo ø-put-u hohmo sutu=?omo ø-min-u j-pək-i te?
DET women 3B-exit-CP inside hole=LOC3 3B-come-CP 3-get-DEP.II DET
waka **?aŋkomo=pə**
basket outside=REL . . .
'The women exited from inside the cave and came towards us in order to get the basket outside' (ME, TRAJ)

(164) ø-?it-u=mə ?atʃə, te?=mə=**kaŋ** ø-tsə?j-pa te?
3B-EXIST-CP=LOC1 gentleman, MED=LOC1=APPROX 3B-remain-ICP DET
pelota
ball
'Where the gentleman is, the ball is around about there (lit: in a region surrouding that point)'

I hypothesise therefore that, at least historically, those terms ending in the consonant cluster *?aŋ* were interpreted as denoting spatial regions projected off the relevant facets, making their combination with *?omo* 'LOC3' entirely natural. At some point the association of *?omo* 'LOC3' with projective semantics when combined with RSNs related to the different surfaces of an object has been extended to those 'related' RSNs that do not end in *?aŋ* (i.e. *tse?ŋna* 'side' and *?aknja* 'left')[35].

It has not been possible to determine whether the projective semantics of these combinations is purely conventional or whether it can be associated in a compositional manner to the synchronic semantics of their constituent parts. There seem to be two likely scenarios in which the semantics are compositional:

- The semantics of *?omo* 'LOC3' remain purely inclusive and all the RSNs in question denote a spatial region projected from a facet of their possessor

- The RSNs in question denote only the facet of the possessor (and not a an associated region) and *?omo* 'LOC3' has acquired an additional, projective, sense.

---

[35]It is notable that taking into account the tendency for morpheme-final nasals to be denasalised in CZ (Faarlund, 2012, p13), the RSN *?aknja* 'left' appears to begin with *?aŋ*.

It seems reasonable to rule out the second based on the fact that there is no evidence that a projective sense of *ʔomo* 'LOC3' is productive with any other surface-denoting nominals. Indeed, a projective reading for the combinations that would seem likley candidates for such a reading of *ʔomo* 'LOC3' - such as *noʔte=ʔomo* 'wall=LOC3', for example, - were consistently rejected by consultants.

No clear evidence in favour of the first possibility has been found, but it remains a possibility. It is certainly the case that all those RSNs involved in such combinations can synchronically denote a facet of their possessor. Evidence for this comes from the fact that they can all appear in the same contexts as *ʔuka* 'back', such as in combination with the instrumental case in descriptions of orientation (compare, for example, (166) and (165)) or as the complement to *mə* 'LOC1' (see (167) and (168)); *ʔukaŋ* 'back region' can appear in neither of these contexts[36].

(165) teʔ poʔks-tək j-neʔ   **j-ʔuka=piʔk**   nə   j-ken-u
       DET sit-INSTR 3A-ANAP 3A-back=INSTR PROG 3A-look-DEP.III
       '*The chair is directed (towards us) with its back. (lit:looking at us with its back)*' (R, E)

(166) ø-ʔit-u   poʔks-tək tumə *este* j-**winaŋ=piʔk** nə
       3B-EXIST-CP sit-INSTR one   HESIT 3A-front=INSTR PROG
       j-ken-keʔt-u-pə
       3A-look-REP-DEP.III-REL
       '*There is a chair whose front is directed towards us. (lit:looking at us with its front)*' (R, E)

(167) jəʔ *pelota* kəʔji ø-ʔit-u   poʔks-tək=ʔis j-**ʔuka=mə**=k
       PRX ball   below 3B-EXIST-CP sit-INSTR=3GEN 3A-back=LOC1=APPROX
       '*This ball is below, near the chair's back*' (B&C 4-2, C)

(168) teʔ tsunu=ʔis j-neʔ   j-winaŋ=ʔomo, teʔji   ø-kek-u   teʔ *pelota*,
       DET bag=3GEN 3A-ANAP 3A-FRONT=IN, MED;LOC2 3B-fall-CP DET ball,
       pero j-neʔ   **j-tsəʔnaŋ=mə**
       but 3A-ANAP 3A-right.side=in
       '*The ball fell in front of the bag, but at its right side*' (AT, E)

---

[36]That *ʔuka* 'back region' unequivocally denotes a facet is clear from its co-existence with *ʔukaŋ*.

Figure 16: B&C 3-1 (Bohnemeyer and Pérez Báez, 2008), described in (169)

What remains unclear is whether these terms *also* denote the spatial region associated with these facets. Consultants' judgements on this question are variable, and there are some instances where a regional interpretation of the RSN appears to make more sense than one strictly related to the facet of the possessor. An example of one of these descriptions is that presented in (169) (describing Figure 16), in which the speaker appears to be specifying a location above the *region in front of* the chair rather than the front itself.

(169) ø-ʔit-u   nǝ   j-mǝʔŋ-u=pǝ   *pelota* . . .**j-winaŋ=kǝhsi** nǝ
       3B-EXIST-CP PROG 3A-bounce-DEP.III=REL ball   . . .3A-front=LOC4 PROG
       j-mǝʔŋ-u
       3A-bounce-DEP.III
       There is a ball that is bouncing . . . it is bouncing above its front(R, B&C 3-1)

4.4 Place-denoting adverbial phrases

A place-denoting adverbial clause is a dependent clause that denotes a location, such as that introduced by *where* in (170).

(170)   The girl went to **where she saw the cat**

As described by Faarlund (2012), there are two strategies for forming a place-denoting adverbial clause in CZ. The most common of these in my data is the attachment of the locative clitic *mə* 'LOC1' to the verb that heads the relevant clause. Examples of this form are presented in (171)-(173).

(171) teʔ *esquina*=kəhsi ø-ʔit-u=naʔak   tumə *cantina*
       DET corner=LOC4 3B-EXIST-CP=CONTR one   bar
       ø-ʔuʔts-witu-jah-u=mə=ʔtsi
       3B-turn-return-CP=LOC1=1ABS
       'On the corner where we turned there used to be a bar' (A, E)

(172) jəʔki   ø-ʔit-u   tumə poʔks-tək ø-ʔəŋ-u=pə   jəʔki   nə
       PRX;LOC1 3B-EXIST-CP one   sit-INSTR 3B-lie-CP=REL PRX;LOC1 PROG
       j-ken-min-u   **ø-ʔit-u=mə=ʔtsi**   ʔəhtsi
       3A-look-come-DEP.III 3B-EXIST-CP=LOC=1ABS 1PRO.ABS
       'Here there is a chair that is lying down, here it is looking towards me where I am' (MJ, B&C 2-6)

(173) jəʔki   **ø-poʔks-u=mə=ʔtsi** n-ʔaknja=ʔomo ø-ʔit-u   tsibu
       PRX;LOC1 3B-sit-CP=LOC1=1ABS 1A-left=LOC3   3B-EXIST-CP sheep
       'Here, where i'm sat, a sheep is to my left' (EU, OO)

It is not possible to form a place-denoting adverbial clause in this fashion with any other locative clitic. This restriction includes *ʔi* 'LOC2' despite it sharing the core co-locationary sense of *mə* 'LOC1'.

The second strategy for forming a place-denoting adverbial clause is to introduce it with the indeterminate place adverb *hutə* 'where' in a manner similar to that used in English (exemplified in (170)). Examples of this type of construction are shown in (174)-(176).

(174) *pelota* teʔ mesja=kəhsi ø-ʔit-u=pə   teʔ kuhj=kəʔmə nə
       ball   DET table=LOC4 3B-walk-CP=REL DET tree=LOC5   PROG
       j-tsuʔŋ-u   **hutə ø-ʔit-u=naʔak**   teʔji   nə
       3A-depart-DEP.III where 3B-EXIST-CP=CONTR MED;LOC2 PROG

j-nuʔk-wətsək-u
3A-arrive-repeat-DEP.III
'The ball that is on the table is departing from by the tree and is arriving again where it was' (JC, MVS)

(175)   teʔ=ʔis   j-mus-u   **hutə** ø-ʔit-u
           3PRO=3ERG 3A-know-CP where 3B-EXIST-CP
           'He found out where it was (lit: where it is)' (RO, E)

(176)   hiʔn   ø-mus-pa   **hutə** mus-pa m-paʔt-ə
           NEG.ICP 1B-know-ICP where can-ICP 2A-find-DEP.I
           'I don't know where you can find him' (AT, SC)

This form of place-denoting adverbial clause is preferred in cases of complementisation.

It is also regularly the case that speakers use a mixture of these two strategies, i.e. the place denoting adverbial clause is both introduced by *hutə* 'where' and the verb that acts as its head is marked with *mə* 'LOC1'. Examples of such formulations are shown in (177) and (178).

(177)   ø-ʔit-u   *cuarto* **hutə ø-ʔəŋ-pa=mə=ʔtsi**   ʔəhtsi
           3B-EXIST-CP room   where 3B-sleep-ICP=LOC1=1ABS
           'There is a room where I sleep' (C, E)

(178)   **hutə ø-ʔit-u=mə**   huhktək hiŋə ø-ʔit-u   kəpi
           where 3B-EXIST-CP=LOC fire   DIST 3B-EXIST-CP fire.wood
           'The firewood is where the fire is' (EU, E)

In fact, the use of *hutə* 'where' in combination with *mə* 'LOC1' to form a place-denoting adverbial clause is observed more frequently in my data set as a whole than the use of *hutə* 'where' alone.

4.4.1 Use in spatial descriptions

Amongst those spatial descriptions in my data that feature a place-denoting adverbial clause, the form featuring the locative clitic *mə* 'LOC1' dominates. Representative ex-

amples of spatial descriptions from all three spatial domains are shown in (179) to (181)

(179)　jəʔ　*pelota* ø-ʔit-u　　**ø-ʔit-u=mə**　　*sulu*=ʔis　j-tək
　　　　PRX ball　　3B-EXIST-CP 3B-EXIST-CP=LOC Sulu=3GEN 3A-house
　　　　'This ball is where Sulu's house is' (JL, B&C 2-5)

(180)　teʔ poʔks-tək **ø-ʔit-u=mə**　　mihtsi　nə　j-ken-u
　　　　DET sit-INSTR 3B-EXIST-CP=LOC1 2PRO.ABS PROG 3B-look-DEP.III
　　　　'The chair is directed towards (lit: looking at) where you are' (B, B&C 4-4)

(181)　ø-poj-pa　nə　j-kət-u　　　teʔ jomo **ø-ʔit-u=mə**　　teʔ kuhj
　　　　3B-run-ICP PROG 3A-pass-DEP.III DET woman 3B-EXIST-CP=LOC1 DET tree
　　　　'The woman is running past the tree (lit:passing the tree running' (C, TRAJ

　　　　40)

There are no instances in my all of my data of *hutə* 'where' alone being used to form a
place-denoting adverbial clause in a spatial description.

　　　Overwhelmingly, the most common predicate found in place-denoting adverbial clauses
in my data are ones formed from the existential root *ʔit*. In the same manner as PPs
headed by *mə* 'LOC1', these spatial adjuncts denote the location of an object. This se-
mantics is evidenced by the fact they appear to be interchangeable with PPs headed by
mə 'LOC1' in all contexts. An example of this interchangeability are the two descriptions
presented in (182) and (183), which were provided by the same consultant during the
B&C task, both times with the function of locating the ball in the respective images in
the direction of the house of a neighbour from the chair.

(182)　... ***sulu*=ʔis j-tək=mə**　　ø-tsəʔj-pa　　teʔ *pelota*
　　　　... Sulu=3GEN 3A-house=LOC1 3B-remain-ICP DET ball
　　　　' ... *the ball is towards (lit: at) Sulu's house*' (JL, B&C)

(183)　... **ø-ʔit-u=mə**　　　**sulu*=ʔis j-tək** hiŋə ø-tsəʔj-pa　　teʔ *pelota*
　　　　... 3B-EXIST-CP=LOC1 Sulu=3GEN 3A-house DIST 3B-remain-ICP DET ball

' . . . the ball is towards (lit: remains at) Sulu's house' (JL, B&C)

Given that they appear to be synonymous, it is not a surprise that the pattern of use of place-denoting clauses headed by *mə* 'LOC1' in my data is similar to that described for PPs headed by *mə* 'LOC1' described in Section 4.3.1. Specifically, the use of these adjuncts in descriptions is primarily as part of the type of landmark-based description exemplified in (183). When these spatial adjuncts are used in a non-landmark-based manner they are subjected to the same restriction of co-location that applies to PPs headed by *mə* 'LOC1'.

4.5   Spatial adverbs

Spatial adverbs in CZ are formal elements that may independently function as spatial adjuncts, but which are not postpositional phrases or place-denoting adverbial clauses. In many cases, these adverbs have transparently grammaticalised from the combination of a locative clitic and an element other than a noun, for example, a demonstrative (discussed in Section 4.5.1) or a non-possessed relational noun (discussed in 4.5.3). There are, however, a number of spatial adverbs in CZ whose origins are less clear; these are also presented in Section 4.5.3.

4.5.1   Deictic adverbs

There are 5 deictic adverbs in CZ (listed in Table 17), all of which are transparently combinations of one of the three demonstratives of the language (*jəʔ* 'PRX', *teʔ* 'NEUT' and *hikə* 'DIST') and one of the two locative cases of proto-MZ (*mə* 'LOC1' and *ʔi* 'LOC2') (Kaufman, 1995).

Although all of the terms of listed in Table 17 can independently perform the function of spatial adjunct, as demonstrated by examples (184) to (188), the semantics of the two adverbs formed using *ʔi* 'LOC2' appear to have shifted away from their original spatial

106

Deictic spatial adverb	Origin	Translation
jəʔmə	jəʔ=mə 'PRX=LOC1'	here
jəʔki	jəʔ=ʔi 'PRX=LOC2'	here
teʔmə	teʔ=mə 'MED=LOC1'	there
teʔji	teʔ=ʔi 'MED=LOC2'	there/then
hiŋə	hikə=mə 'DIST=LOC1'	there (in the distance)

Table 17: The list of CZ deictic spatial adverbs

notions to varying degrees.

(184) *pero* teʔ *pelota* ø-ʔit-u=mə=ʔtsi   ʔəhtsi, **jəʔ=mə**
       but DET ball   3B-EXIST-CP=LOC=1ABS 1PRO.ABS, PRX-LOC1
       ø-tsəʔj-pa
       3B-remain-ICP
       'But, the ball is here, where I am' (JL, B&C 2-8)

(185) wene ø-tsəʔj-jah-u=ma   **jəʔki**
       some 3B-remain-EXCPL-CP-PERF PRX;LOC1
       'Some had stayed here (in Ocotepec)'(RO, OCE)

(186) *i* **teʔji** ø-ʔit-jah-keʔt-u   *sobri*=ʔis j-tək=taʔm
       and MED;LOC2 3B-EXIST-EXCPL-REP-CP nun=3A   3A-house-PL
       'and there are also the nun's houses there' (AT, E)

(187) **teʔ=mə** ø-ken-maŋ-u te ʔ poʔks-tək
       MED=LOC1 3B-look-go-CP DET sit-INSTR
       'The chair is directed towards there' (C, B&C 2-5)

(188) teʔji   ø-nuʔk-pa=ʔtsi **hiŋə**
       MED;LOC2 1B-arrive-ICP=1ABS DIST.LOC
       'Then, I arrive there' (JC, E)

This is clearest in the case of *teʔji* 'MED;LOC2', which in my data is overwhelmingly used with the temporal function of dividing sequential events, as in (189).

(189) j-meʔts-u   *entero* tsaʔm=ʔomo, **teʔji**   ø-maŋ-u
       3A-search-CP whole countryside=in, MED;LOC2 3B-go-CP
       j-wej-meʔts-e   tumə sutu=ʔomo
       3A-shout-search-DEP.II one   hole=in

107

'He searched the whole countryside and then went and searched (by shouting) in a hole' (B, FS p10)

For the proximal adverb *jəʔki* 'PRX;LOC1', the shift is not so clear. It occurs in my data more frequently than *teʔji* 'MED;LOC2' as a complement to spatial predicates, though is primarily observed in conjuntion with non-spatial predicates, as in (190). In this context, it often has a function that could be glossed as 'here and now'.

(190)   **jəʔki** n-nə-ʔit-keʔt-u=ʔt   ʔeja=pə   *imagen*
        here   1A-ASSOC-EXIST-REP-CP=1ERG other=REL image
        'I have another image here' (JL, B&C)

In contrast, the three terms formed using *mə* 'LOC1' are key components of spatial descriptions of all kinds. Indeed, it is an interesting feature of thespatial descriptions in my data that a deictic spatial adverb is regularly used in conjunction with a non-deictic adjunct in spatial descriptions of all kinds, for example (191).

(191)   jəʔki   jak-min-ə   **jəʔ=mə=kaŋ**,   ø-ʔit-u=mə=ʔtsi
        PRX;LOC2 CAUS-come-IMP PRX=LOC1=APPROX, 3B-EXIST-CP=LOC1=1ABS
        ʔətsi
        1PRO.ABS
        'Here, you are going to move it here, where I am' (R, MG)

4.5.2   Anaphoric use of deictic adverbs

In many of the spatial descriptions in my data the spatial adjunct occuring within the same intonation unit as the predicate is one of the deictic adverbs discussed in the preceding section, particularly those formed from the locative clitic *mə* 'LOC1'. In most of these cases, however, this deictic adverb is referring to a location stated in an spatial adjunct immediately preceding or following this spatial description. An example of this type of description featuring a deictic adverb (*jəʔ=mə* 'PRX=LOC1' in this case) with a non-deictic spatial adjunct (*ø-ʔit-u=mə=ʔtsi ʔətsi* 'where I am') immediately following

is shown in (191). In (192) is exemplified the type of description in which a the non-deictic spatial adjunct (ø-ʔit-u=mə pizaron 'where the white board is') precedes the spatial description featuring the deictic adverb (teʔ=mə 'MED=LOC1' in this case).

(192) ø-ʔit-u=mə   pizaron,   **teʔ=mə**   ø-ken-maŋ-u j-teʔts-tək
       3B-EXIST-CP=LOC1 white.board, MED=LOC1 3B-look-go-CP 3A-lean-INSTR
       'Where the white board is, its backrest is directed away from us towards there'
       (JL, B&C 4-5)

Although not restricted to any particular variety of spatial adjunct, this type of anaphoric use occurs most frequently in my data when the non-deictic adverb in the description is a place-denoting adverbial clause (as in the two cases above). When a speaker wishes to use one of the approximative morphemes kaŋ or k, it appears that the use of this type of description is obligatory as these morphemes do not combine with such spatial adjuncts[37]

4.5.3 Non-deictic adverbs

Many of the non-deictic elements that meet my definition of a spatial adverb in CZ (listed in Table 18) are transparently grammaticalised combinations of an RSN and a locative clitic. In some cases these combinations, such as ʔaŋkomo 'outside' in (193), have undergone phonological erosion from their original form (j-ʔaŋkə=ʔomo 'in its surrounding region')

(193) teʔ tuwi ø-poʔks-u **ʔaŋkomo**
       DET dog 3B-sit   outside
       'The dog is sat outside' (BE, TRPS 6)

In other cases, however, there has been no such erosion. Instead, the grammaticalised nature of these elements is evidenced through a combination of their lack of possessor

---

[37]See Section 4.7 for more details of these approximative morphemes.

(evidence of decategorialisation) and their phonological and syntactic freedom. These properties, exemplified by *wihtkəhsi* (originally *j-win=kəhsi* 'against its outer surface') in (194),

(194)   hohmo ø-ʔit-u   *pelota o* **wihtkəhsi**?
        inside 3B-EXIST-CP ball   or against.the.outside.surface
        'Is the ball inside or against the outside?' (B, B&C)

Spatial adverbs	Original combination	Gloss
ʔaŋkomo	ʔaŋkə-ʔomo	outside
wihtkəshi	win-kəhsi	against the outside surface
hohmo	hoh-ʔomo	inside
kəhsi	kəs=ʔi	above
kəhsmə	kəs=mə	above
kəʔji	kəʔ=ʔi	below
kəʔmə	kəʔ=mə	below

Table 18: The full list of spatial adverbs that take the form of unpossessed RSN-postposition combinations.

There are also a number of spatial adverbs that are neither deictic in nature nor grammaticalised combinations of RSNs and locative clitics. The list of adverbs meeting this description found in my data is shown in Table 19.

Adverb	Origin	Gloss
toʔme		close
jaʔaj		far
tuʔmaŋ	tumə-ʔaŋ 'one-side/region' (Zavala, 2015)	on the other side
tuʔmaŋduʔmaŋ	tuʔmaŋ-tuʔmaŋ	side-by-side
ʔemə	ʔeja=mə 'different-LOC1'	somewhere else

Table 19: The list of those non-deictic spatial adverbs not derived from RSN-LOC combinations that appear in my data

Most of the adverbs in Table 19 are used in a manner in keeping with their English gloss. The term *tuʔmaŋ* 'on the other side', however, is an exception to this general rule in that it is often used as the principal spatial adjunct in spatial descriptions in a

manner that would not be expected in English of the phrase 'on the other side'. Two examples of such uses are shown in (195) and (196).

(195) *pelota* nǝ j-tsuʔŋ-u *arbol*=kǝʔmǝ nǝ j-witu-u
  ball PROG 3A-depart-DEP.III tree=LOC5 PROG 3A-return-DEP.III
  tuʔmaŋ=se
  other.side=SIM
  'A ball is departing from by a tree and is returning to the other side (of the tree)' (JC, 2015-01-16)

(196) ø-tǝhkǝj-pa=ʔtsi n-tǝk=ʔomo hiŋǝ, tuʔmaŋ=se, jǝʔmǝ
  1B-enter-ICP=1ABS 1A-house=in DIST.LOC other.side=SIM, HESIT
  kǝʔmǝ=kaŋ, ø-ʔit-u teʔ *cosina* ...
  below=APPROX 3B-EXIST-CP DET kitchen ...
  'I enter my house, there on the other side (of the house), below, is the kitchen ...' (LG, E)

The semantics of *tuʔmaŋ* are underspecified in a number of regards. In the first instance, the entity the 'other side' of which is referenced can be of a variety of forms, most commonly, an object, as in the two examples above, but also a spatial region, as in (197).

(197) *pelota* nǝ j-neʔm-poʔ-u ø-nuʔk-u
  ball PROG 3A-flash.like.lightening-COMP-DEP.III 3B-arrive-CP
  tuʔmaŋ=se
  other.side=SIM
  'A ball is disappearing (flashing like lightening) and arrived at the other side (of the screen)' (JC, MVS)

It is also the case that the location from which 'the other side' is calculated, is quite variable. In most cases in my data 'the other side' is calculated based on the location of the deictic centre, but there are also many examples, including (198), in which it is calculated from the position of some other salient object, often the Figure of a previous spatial description.

(198) a. jəʔ poʔks-tək=taʔm ø-tseʔŋ-nej-jah-u
           PRX sit-INSTR=EXCPL 3B-to.be.sideways-ASSUMP-EXCPL-CP
           'These chairs are sideways'

       b. tumə=ʔis=j-neʔ   j-tseʔŋna=ʔomo ø-ʔit-u   teʔ *pelota*
           one=3GEN=3A-ANAP 3A-side=LOC3   3B-EXIST-CP DET ball
           'To the side of one is the ball'

       c. teʔ ʔeja=pə=ʔis=j-neʔ   ø-ʔit-u   j-ʔaknja=ʔomo,
           DET other=REL=3GEN=3A-ANAP 3B-EXIST-CP 3A-left=LOC3
           tuʔmaŋ=se
           other.side=SIM
           'The other has the ball on its left, the other side'

4.6 Toponyms

As can be seen from the examples presented in (199)-(201), traditional toponyms in CZ
are transparently derived from PPs headed by one of the locative clitics described above
(usually *mə* 'LOC1') and as such constitute spatial adjuncts.

(199) jak-ʔoj-jah-u   teʔ *presu*=ʔomo, **poʔkjəʔmə**
       CAUS-arrive-EXCPL-CP DET prison=LOC3, Copainala
       'They made him go to (lit:arrive at) the prison, Copainala' (RO, OCE)

(200) teʔ pən ø-maŋ-u **koʔatəkmə**
       DET man 3B-go-CP Tuxtla.Gutierrez
       'The man went to Tuxtla Gutierrez' (B, E)

(201) ø-poj-jah-u   teʔ pən=taʔm ø-maŋ-jah-u **kunjəʔmə**
       3B-run-EXCPL-CP DET man=PL   3B-go-3PL-CP Coapilla
       'The people ran. They went to Coapilla.' (RO, OCE)

Occasionally, however, toponyms are not analysed as featuring a locative clitic and one
is therefore added; one example of such an occassion, featuring the toponym refering to
the town of Octepec itself, is presented in (202).

(202) teʔ wit-tək,   teʔ *carro* ø-min-pa=pə   jəʔki,   **kupi=mə**
       DET walk-INSTR DET truck 3B-come-ICP=REL PRX;LOC1, Ocotepec=LOC1
       'The truck that comes here to Ocotepec.' (B, OCE)

112

The ability of toponyms to independently form spatial adjuncts is usually extended to Spanish place names also (see (203)).

(203)   ø-maŋ-u=ʔuŋ   ***villahermosa***
        3B-go-CP=REPOR Villahermosa
        'He went to Villahermosa' (RO, OCE)

4.7   The morphemes k and *kaŋ*

4.7.1   Introduction

Two morphemes that are central to the expression of spatial notions in CZ, but which are not core consituents of spatial adjuncts - and in fact are always optional - are *k* and *kaŋ* 'APPROX'. I will argue that both of these clitics fundamentally denote a spatial region surrounding a location and are therefore synonymous. Notwithstanding this synonymity, the functions of these two morphemes do differ; I will therefore describe the different contexts in which each is typically used.

4.7.2   Form

Both of the morphemes *k* and *kaŋ* can be combined with spatial adjuncts ending in the phoneme clusters *mə* and *ʔomo*. This means that in addition to those PPs headed by the locative clitics *mə* 'LOC1' and *ʔomo* 'LOC3' (as in (204) and (205) respectively), *k* and *kaŋ* can be combined with PPs headed by *kəʔmə* (as in (206)), with place-denoting clauses (as in (207)) and any adverb or toponym that is transparently derived from adjuncts headed by those locative clitics (as in (208) and (209) respectively).

(204)   poʔks-tək ø-ken-u   *maestro clemente*=ʔis   j-tək=mə=**k**
        sit-INSTR 3B-look-CP teacher Clemente=3GEN 3A-house=LOC1=APPROX
        'A chair is directed towards Teacher Clemente's house' (P, B&C 3-10)

(205)   ø-ʔit-u   tumə poʔks-tək ø-ken-u   *maestro clemente*=ʔis
           3B-EXIST-CP one   sit-INSTR 3B-look-CP teacher Clemente=3GEN
           j-ʔaŋkə=ʔomo=**k**
           3A-surrounding.region=LOC3=APPROX
           ‘*A chair is directed towards the area surrounding Teacher Clemente's house*’
           (AU, B&C 2-10)

(206)   achente=ʔis   j-ʔaŋkə=ʔomo   nj-məʔn-pa
           Achente=3GEN 3A-surrounding.region=LOC3 2B-descend-ICP
           teʔ=kəʔmə=**kaŋ**
           3PRO=LOC5=APPROX
           ‘*By the region surrounding Achente's house you descend*’ (ME, E)

(207)   hama-tsoʔt-pa=mə=**k**   ø-ten-u   teʔ pən
           sun-come.up.celestial-ICP=LOC=APPROX 3B-stand-CP DET man
           ‘*The man is stood towards the east (from the tree)*’ (P, OO)

(208)   jəʔki jak-min-ə   jəʔ=mə=**kaŋ**   ø-ʔit-u=mə=ʔtsi   ʔəhtsi
           here CAUS-come-IMP PRX=LOC1=APPROX 3B-EXIST-CP=LOC=1ABS 1PRO
           ‘*Here, make it come towards here, where I am*’ (R, MG)

(209)   teʔ pən ø-ten-u=pə   jəʔ=mə   kunjəʔmə=**kaŋ**   ...
           DET man 3B-stand-CP=REL PRX=LOC1 Coapilla=APPROX
           ‘*The man that is stood towards Coapilla (from the tree)*’ (EU, OO)

In addition, *kaŋ*, but not *k*, are regularly combined with those spatial adverbs terminating in *ʔi* ‘LOC2’, that is, PPs headed by the locative clitics *ʔi* ‘LOC2’ and *kəhsi* ‘LOC4’ and related spatial adverbs such as *kəʔji* ‘below’ and *kəhsi* ‘above’. Examples of these uses are presented in (210) and (211).

(210)   teʔji ø-ʔit-u   tək=ʔis   j-kəs=ʔi=**kaŋ**
           there 3B-EXIST-CP house=3GEN 3A-vertical.top=LOC2=APPROX
           ‘*It is there on top of the house*’

(211)   tumə kəʔji=**kaŋ**=pə   tək
           one   below=APPROX=REL house
           ‘*A house that is below*’ (ME, E)

There is a single example of the use of *k* with a spatial adjunct ending in *ʔi* ‘LOC2’ in

114

my data - reproduced in (212) - but the use of this morpheme with spatial adjuncts of this type was generally not accepted by consultants.

(212) hiŋə   ø-maŋ-pa ø-tək.ʔəj-ə   kəhsi=**k**,   teʔ *espasio*=ʔomo
       DIST.LOC 3B-go-ICP 3B-enter-DEP.II above=APPROX DET gap=LOC3
       'It is going to enter upwards into the gap.' (C, MG)

4.7.3   Core semantics

The morphemes *k* and *kaŋ* have a number of different functions that I will argue are related to a single core sense. This core sense is most transparent in the use of these morphemes in the type of description of location - exemplified in (213) and (214) - in which *k(aŋ)* is combined with a PP featuring the Ground nominal of the description.

(213) jəʔ *pelota* ø-ʔit-u   kəʔji poʔks-tək=ʔis   j-ʔuka=mə=**k**
       PRX ball   3B-EXIST-CP below sit-INSTR=3GEN 3A-back=APPROX
       'This ball is below, near the chair's back' (C, E)

(214) tsibu, teʔ=ʔis   j-tseʔŋa=ʔomo ø-ʔit-u,   teʔ=ʔis
       sheep 3PRO=3GEN 3A-side=LOC3 3B-EXIST-CP 3PRO=3GEN
       j-tseʔŋna=ʔomo=**kaŋ**
       3A-side=LOC3=APPROX
       'It is to the side of the sheep, in the vicinity of the side of the sheep' (EU, OO)

In these descriptions, the function of *k(aŋ)* is to expand the location specified by the spatial adjunct to which it is attached into a broader region surrounding that location. This is most clearly demonstrated by considering the combination of *k(aŋ)* with those PPs headed by *mə* 'LOC1'. As noted in Section 4.3.1, the function of *mə* 'LOC1' is to convert an object or event into a location. As such, PPs headed by *mə* 'LOC1' are typically only found in locative statements describing spatial arrays in which the Figure is co-located - or at the least located close to - the Ground, or part of the Ground, denoted by its complement. However, as can be seen from descriptions such as (215) - used to describe the spatial array shown in Figure 17 -, when PPs headed by *mə*

115

Figure 17: B&C 3-4 (Bohnemeyer and Pérez Báez, 2008), described in (215)

'LOC1' are combined with *k(aŋ)* in descriptions of location near co-location of Figure and Ground is no longer necessary in order for the description to be felicitous. Instead, it is sufficient that the Figure be 'in the vicinity of' the Ground (the 'side' of the chair in (215))

(215)   teʔ poʔks-tək=ʔis=j-neʔ   j-tseʔŋna=mə=kaŋ   ø-ʔit-u   tumə
        DET sit-INSTR=3GEN-3A-ANAP 3A-side=LOC1=APPROX 3B-EXIST-CP one
        pelota j-ʔukaŋ=kəʔmə   nas=ʔomo
        ball   3A-back.region=LOC5 ground=LOC3
        'Behind the chair, on the ground, in the vicinity of its side is a ball' (LG, B&C
        3-4)

The use of *k(aŋ)* with the sense of 'in the vicinity of' is also found in descriptions of motion. For example, *k(aŋ)* was used in (216) to indicate that the point at which the descent described begins was not actually in the park, but in fact a block or so away. The park was, however, the most salient landmark in the vicinity of the point at which the descent begins.

(216)   ø-məʔn-pa=te   teʔ *parke*=mə=kaŋ
        1B-descend-ICP=1INC DET park=LOC1=APPROX
        'We descend in the vicinity of the park' (LG, E)

I propose that the denotation of a region surrounding the location specified by the spatial

adjunct to which it is attached is the core sense of *k(aŋ)*. This analysis is principally based on three factors. Firstly, such semantics are consistent with my overall framework for spatial descriptions in CZ, namely that - as detailed in this section - CZ spatial adjuncts fundamentally denote locations from which different spatial properties of a Figure can be derived depending upon both the semantics of the accompanying predicate and context. Secondly, as will be shown in the remainder of this section, all other functions attested for *k(aŋ)* are easily relatable to a core notion of a region surrounding a location; an equivalent inter-relation of senses is not possible starting from another direction.

Finally, the regional semantics of *k(aŋ)* are consistent with the semantics of other formal elements that transparently feature the morpheme *ʔaŋ*, such as, *ʔukaŋ* 'back region' and *ʔaŋkə* 'region around an object'[38].

4.7.4 Directional interpretations

A funtion of *k(aŋ)* that is clearly attested in my data is to emphasis a directional interpretation of the spatial adjunct to which it is attached (Faarlund, 2012). One context in which this function is common is in landmark-based descriptions. In these descriptions - exemplified in (217), (218) and (219) - *k(aŋ)* is combined either with a spatial adjunct denoting the location of the landmark that is the basis for the description (the house of 'Teacher Clemente' in (217) and where the sun sets - i.e. the east - in (218)) or, as in (219), a deictic adverb anaphorically referencing that location.

(217) ø-ʔit-u   tumə poʔks-tək ø-ken-u   *maestro clemente=ʔis*
       3B-EXIST-CP one   sit-INSTR 3B-look-CP teacher   Clemente=3GEN
       j-ʔaŋ=ʔomo=**k**
       3A-area.surrounding.house=LOC3=APPROX
       '*A chair is directed towards the area surrounding Teacher Clemente's house*'
       (Au, B&C 3-10)

---

[38]Also consistent with the semantics of its cognate in closely related Zoque of San Miguel de Chimalapa (Jiménez Jiménez, 2014, p203).

(218) hama-tsoʔt-pa=mə=**k**   ø-ten-u   teʔ pən
       sun-come.up.celestial-ICP=LOC=APPROX 3B-stand-CP DET man
       ‘The man is stood towards the east (from the tree) (lit: approximately where
       the sub goes down)’ (P, OO)

(219) ø-ʔit-u=mə   teʔ ʔatsə   teʔ=mə=**kaŋ**   ø-tsəʔj-pa   teʔ
       3B-EXIST-CP=LOC1 DET gentleman MED=LOC1=APPROX 3B-remain-ICP DET
       pelota
       ball
       ‘The ball is towards there, where the gentleman is’ (JL, B&C 4-4)

The interpretation of these landmark-based descriptions is that the Figure is located in
the direction of the stated landmark from a Ground that is unstated (a chair in (217)
and (219) and a figure of a tree in (218)) [39]. Given its fundamentally regional nature,
I propose that *k(aŋ)* achieves this interpretation by virtue of making unambiguous the
fact that the Figure is not *strictly* located at the location denoted by the spatial adjunct.
In contexts in which the Ground relative to which the Figure is being located is clear
from context, this leads to the directional intepretation described above. Again, it is
important to note that the role of *kaŋ* is one of *emphasising* this directional intepretation,
as it is possible to have landmark-based descriptions of location that do not feature *k(aŋ)*
(as in (220)).

(220) kama+njeʔŋ=kəhs=ʔi jəʔki   ø-ʔit-u   tumə *pelota*
       hill=vertical.top=LOC2 PRX;LOC2 3B-EXIST-CP one   ball
       ‘The ball here is towards the top of the hill’ (AU, B&C 4-11)

The morpheme *k(aŋ)* can also be used with a function related to direction in descrip-
tions of orientation; however, the nature of this directionality differs slightly from that
described for landmark-based descriptions of location. Descriptions of orientation are,
by definition, directional in nature. Unlike in descriptions of location, therefore, the spa-
tial adjuncts occuring in descriptions of orientation are always interpreted as indicating

---

[39]This type of *Groundless* description is discussed in more detail in Section 11.

a direction. The function of *k(aŋ)* in descriptions of orientation such as that presented in (221) is, therefore, to emphasise the *approximate* nature of the direction indicated by the spatial adjunct to which *k(aŋ)* is attached.

(221) teʔ j-ʔuka teʔ ni.teʔts.ʔəj.pa.pə.te jəʔ=mə=**kaŋ** nə
DET 3A-back DET back.rest PRX=LOC1=APPROX PROG
j-ken-u, neʔkə ø-ʔit-u=mə=pə=te
3A-look-DEP.III, self 3B-EXIST-CP=LOC=REL=PRED
'*Its back, its backrest, is directed approximately towards here, where we are*' (B, B&C 2-12)

This function of making the direction indicated by the spatial adjunct to which *k(aŋ)* is attached less precise is consistent with its proposed regional core semantics.

There are also instances in which *k(aŋ)* is used to emphasise a directional reading of a spatial adjunct in a description of motion. An example of such a directional interpretation as part of a motion description is the description presented in (222), which was given in response to a question regarding the direction in which a ball in a video being watched by the consultant was travelling.

(222) jəʔ=mə n-ʔaknja=ʔomo=k
here 1A-left=LOC3=APPROX
'*Here, to my left*'

In Section 6, I will argue that motion events in CZ are encoded in terms of change of state-like changes of location relative to the location stated in the spatial adjunct. It is therefore not a surprise that *k(aŋ)* is used in descriptions of motion in much the same way as in descriptions of location. This also means that the relationship of these functions to the core regional semantics of these morphemes is the same as for descriptions of location.

119

4.7.5 Proposed ablative function

In certain contexts k (but not $kaŋ$) is observed - for example in (223) and (224) - to combine with spatial adjuncts denoting the Source of a motion event. This use is consistent with the function of emphasising an ablative reading of a spatial adjunct proposed by Faarlund (2012) and the glossing of k as the Spanish preposition, 'de' by Zavala (2015). It is, however, apparently at odds with the directional use of k described so far.

(223)   jəti nə   j-kiʔm-put-u   teʔ nəʔ=mə=**k**   teʔ jomo
        now PROG 3A-ascend-exit-DEP.II DET water=LOC1=APPROX DET woman
        'Now, the woman is climbing away from the lake (lit:water)' (AT, TRAJ)

(224)   teʔ *carro*-mətsik ø-put-u   teʔ kuhj=kəʔmə=**k** ...
        DET car-toy   3B-exit-CP DET tree=LOC5=? ...
        'The toy car left (lit:exited) from by the tree' (B, TC)

As we have seen, however, k 'APPROX' can also have a *directional* function that is in opposition to these ablative semantics. This apparent contradiction is resolved by noting that when k 'APPROX' has a directional function it appears in a clause predicated by one of those verbs that I will argue in Section 6 assign a GOAL role to co-occuring reference locations. In contrast, when k has an 'ablative' function it always appears with a verb that assigns a SOURCE role; in fact, in my data, and in the example presented by Faarlund (2012) (reproduced in (225)), k 'APPROX' only has this function when co-occuring with the motion verb *put* 'exit'. In this context, both of these functions are consistent with each other and with k 'APPROX' having core semantics that specify a 'surrounding region'.

(225)   teʔ tuka jama=piʔk ø-put-keʔt-u=ʔuŋ   teʔ j-tək=ʔomo=**k**
        DET three day=INSTR 3B-exit-REP-CP=EV DET 3A-house=LOC-ABL
        'On the third day he left his house' (Faarlund, 2012, p35)

4.8 sjeʔŋomo

The semantics of the morpheme *sjeʔŋomo* encodes the notion of an action or state continuing up to a particular point. This point can be a location in space (as in (226)), a moment in time (as in (227)), or - more abstractly - a point in a conversation etc (as in (228)).

(226)   tsuhon=ʔis j-tsək-naʔts-u n-kaʔe   ø-poj-u   tsaʔ=kəʔmə sjeʔŋomo
        owl=3ERG 3A-do-fear-CP M-youth 3B-run-CP stone=LOC5
        'The owl scared the boy and he ran up to by the rock' (JC, FSp16)

(227)   teʔ pən ø-min-u   teʔ mahkaj *minuto* sjeʔŋomo=di
        DET man 3B-come-CP DET ten   minute up.to=no.more
        'The man only came for 10 minutes (lit: The man had come up until to ten minutes, no more)' (B, E)

(228)   nj-nək.təj-u   teʔ   sjeʔŋomo
        2B-understand-CP 3PRO up.to
        'Did you understand up to there (lit: up to it)?' (JL, B&C 1-1)

sjeʔŋomo does not fit neatly into any of the formal categories described so far. In the majority of the examples of its use in my data it directly follows an independent spatial adjunct. In these instances it appears to be functioning as an independent postposition (though not cliticised like other postpositions), but taking the location denoted by the spatial adjunct as its semantic argument. An example of this type of construction is (226), above.

There are also examples in my data, however, of *sjeʔŋomo* appearing to take an NP/DP as its complement. In such cases - exemplified in (228) - it is the location (spatial, temporal or metaphorical) of the entity denoted by the NP/DP that is the semantic argument of *sjeʔŋomo*.

Finally, on a single occasion in my data, shown in (229), *sjeʔŋomo* took an NP/DP in the genitive case as its complement. This indicates that the speaker analysed *sjeʔŋomo*

as the combination of a relational noun, presumably *seʔŋ*, and the locative clitic *ʔomo* 'LOC3', from which the morpheme clearly derived. The denotation of this form was the same as those above, with *sjeʔŋomo* taking the location of the possessor as its argument.

(229)   ø-meʔts-jah-u   teʔ poʔks-tək=ʔis   sjeʔŋomo
           3B-search-EXCPL-CP DET sit-INSTR=3GEN up.to
           'They searched up to the chair' (JC, FSp5)

Based on interviews with consultants, the relational noun *seʔŋ* is not synchronically productive.

4.8.1   Uses in spatial descriptions

In my data, *sjeʔŋomo* 'up.to' has been observed performing two functions in spatial descriptions. One of these, exemplified in (230) and (231), is to describe the extension of a spatial extended Figure (in this case a tree and a village respectively).

(230)   *iglesia*=ʔis   j-kopak=ʔomo ø-ʔit-u   teʔ kuhj-kopak
           church=3GEN 3A-head=LOC3 3B-EXIST-CP DET tree-head
           'The canopy of the tree (lit: its head) is up to the roof of the church (lit: its head)' (BE, TRPS 49)

(231)   kupkuj *era*=naʔak ø-ʔit-u=mə   jəʔ sjeʔŋomo *iglesia san juan*
           village was=CONTR 3B-EXIST-CP=LOC PRX up.to   church San Juan
           'This village extended up to where the Church of San Juan is' (AU, OCE)

The second function is, in combination with a manner of motion verb (discussed in Section 5.2), to describe the extent of a motion event. An example of this type of description can be seen in (232).

(232)   teʔ ʔune ø-poj-u   tsaʔ=kəʔmə sjeʔŋomo
           DET child 3B-run-CP rock=LOC5 up.to
           'The child ran up to by the rock' (AT, FSp17)

In this context *sjeʔŋomo* 'up.to' effectively functions as a marker of the Goal of a motion event. This method of describing changes of location relative to stated locations is very rarely used, however. Instead it is overwhelmingly the case that these feature one of the 12 change of location verbs listed in Table 20 and discussed in detail in Sections 5 and 6.

Part III

Descriptions of motion

5 Lexicalisation of manner and path

5.1 Introduction

One of the most influential cross-linguistic comparisons of motion descriptions in the literature is Talmy's typology of lexicalisation patterns (Talmy, 1985). Talmy's original analysis divided the world's languages into *satellite-framed* and *verb-framed* languages, depending on whether the path element of a motion description is *characteristically* encoded in its predicate (verb-framed languages, for example, the Romance languages) or in 'satellite' elements such as, prototypically, adpositions (satellite-framed languages, for example, the Germanic languages).

This initial analysis has now been the subject of numerous refinements and criticisms (see Filipovic and Ibarretxe-Anuñano (2015) for a recent overview of these). For example, based on the work of Slobin (2004), a third category of lexicalisation pattern was introduced to the typology, that of *equipollent* languages (such as Caac (Cauchard, 2014)), in which path notions are freely expressed in both verbs and satellites. Other issues include the difficulty of identifying the 'characteristic' mode of expression for path for a given language and the lack of a principled manner of distinguishing verbs and

satellites, particularly in non-European languages[40].

Notwithstanding these issues it is still standard practice to use Talmy's typology as a starting point for discussions of the lexicalisation of manner and path. I will therefore take the same approach in this discussion.

5.2 Change-of-location verb roots

As we have seen in Section 4, spatial adjuncts in CZ are uniform across all three spatial domains. In descriptions of motion, therefore, they do not show any morphological marking of the path role played by the location they denote. This fact can be seen from the identical form of the spatial adjuncts in (233) and (234) (repeated from (43) and (44)), despite the fact that in (233) the denoted location is the Goal of the motion event, but the Source in (234).

(233) teʔ jomo nə j-təhkəj-u   **teʔ kohtsək=ʔis   j-neʔ**
       DET women PROG 3A-enter-DEP.III DET mountain=3GEN 3A-ANAP
       j-sutu=ʔomo
       3A-hole=LOC3
       'The women is entering the cave (lit: the mountain's hole)' (AT, TRAJ)

(234) teʔ jomo nə j-put-u   **teʔ kohtsək=ʔis   j-neʔ**
       DET women PROG 3A-enter-DEP.III DET mountain=3GEN 3A-ANAP
       j-sutu=ʔomo . . .
       3A-hole=LOC3 . . .
       'The women is exiting the cave (lit: the mountain's hole)' (AT, TRAJ)

Rather than being morphologically marked, path roles are assigned to locations in CZ by the semantics of a subset of motion roots. In (233), for example, 'the cave' is assigned the role of goal because it co-occurs with a verb featuring the root *təhkəj* 'enter', the semantics of which *typically* (though not always) assigns a GOAL path role. In contrast, in (234), 'the cave' is assigned the path role of SOURCE, as that is the role

---

[40]See Levinson and Wilkins (2006, p527) for a discussion of these issues

typically assigned by the root *put* 'exit'.

In total there are 12 CZ roots that assign path roles to the locations denoted by spatial adjuncts[41]. These are listed in Table 20 along with the path roles that they *typically* assign. As will be discussed in more detail in Section 6, motion is encoded in these 12 roots as punctual, change-of-state-like *change-of-location* events. For this reason I will refer to them as the *change-of-location* (CoL) roots for the remainder of this thesis.

Verb	Gloss	Default path role assigned
maŋ	go	direction/GOAL
min	come	GOAL
kiʔm	ascend	GOAL
məʔn	descend	GOAL
kət	pass	VIA
hahk	cross	VIA
witu	return	GOAL
put	exit	SOURCE
təhkəj	enter	GOAL
nuʔk	arrive	GOAL
tsuʔŋ	depart	SOURCE
ʔoj	arrive (but no longer be at the location)	GOAL

Table 20: Here are listed the complete set of CZ CoL verbs along with the default semantic roles of their accompanying spatial adjuncts.

The remaining, non-CoL, motion roots in CZ generally encode motion in a particular *manner*. Examples of such manner of motion roots are *wit* 'walk/move in a manner protoypical of the Figure' or *poj* 'run'. As these roots can not assign path roles, the spatial adjuncts with which they co-occur are - in keeping with the interpretation of spatial adjuncts alongside other types of dynamic predicate - interpreted as denoting the location of the *entire* motion event. This can be illustrated by comparing the two descriptions in (235) and (236), both of which feature the spatial adjunct *mesja=kəhsi*

---

[41]A thirteenth, *wanak* 'ascend' is evidenced in De la Cruz Morales (2016), but not in my own data. Due to its absence from my data and its apparent synonymity with *kiʔm* 'ascend' I have omitted this root from my list of CoL roots. It's inclusion would not change any aspect of the forthcoming discussion.

'table=LOC4'.

(235)   *mesja=kəhsi* nə   j-miʔks-u   *pelota*
              table=LOC4 PROG 3A-move-DEP.II ball
              'A ball is moving on a table' (JC, CG5)

(236)   teʔ pama ø-məʔn-u   *mesja=kəhsi*
              DET cloth 3B-descend-CP table=LOC4
              'The cloth descended from the table' (AT, PSPV 49)

In (236) the presence of the CoL root *məʔn* 'descend' in the predicate means that 'the cloth' is interpreted as descending *from* 'the table'. In contrast, the lack of a CoL root in the predicate of (235) leads to the interpretation that the motion of 'the ball' occurs entirely on 'the table' and that there is no CoL *relative to* 'the table'.

For completeness it is necessary to mention that some manners of motions are expressed through formally distinct verbal stems, comprising a reduplicated root and the *assumptive* morpheme *nej*. Typically, the manners of motion expressed using such reduplication are very semantically specific and often, themselves, involve repetition. For example, the stem *təp-təp-nej* 'jump-jump-ASSUMP' is used in (237) to describe the skittish hopping movements of a small bird.

(237)   teʔ *paloma* nə   j-təp-təp-nej-u
              DET dove   PROG 3A-jump-jump-ASSUMP-DEP.II
              'The dove is jumping along in a skittish manner' (AT, E)

5.3   Combining manner and path

As described above, in CZ there is a strict distinction between those verbal roots that assign path roles (and therefore can encode CoL relative to a stated location) and those that encode manners of motion[42]. This does not, however, preclude descriptions of motion in which the manner of CoL relative to a stated location is described. Indeed,

---

[42]There is no grammatical reflex of this semantic distinction.

as will now be described, there are a number of different strategies for combining these two components of motion descriptions into a single clause.

The most common strategy for combining these two components of a description of motion is the combination of a CoL root and a manner of motion root into a single SVC. For example, in (238) the manner of motion root *piti* 'roll' is combined with the CoL root *kət* 'pass' to form a verbal stem with semantics that in English could be translated as 'roll past' or 'pass rolling'.

(238)　*pelota* nə　j-piti-kət-u　　ʔakapoja=ʔomo
　　　　ball　PROG 3A-roll-pass-DEP.II edge=LOC3
　　　　'*A ball is rolling past an edge (of a body of water?)*' (JC, MVS)

The second strategy for combining manner and path in the same clause is, as exemplified in (239), to state the CoL using a finite verb - marked for aspect and person in the usual way - in combination with a non-finite manner of motion verb. This non-finite verb functions as a secondary predicate describing an action that occurs/occured in the time frame indicated by the principal predicate (Schultze-Berndt and Himmelmann, 2004).

(239)　*pelota* piti-pa ø-kət-u　　kuhj=ʔis　j-tseʔŋna=ʔomo
　　　　ball　roll-NF 3B-pass-CP tree=3GEN 3A-side=LOC3
　　　　'*A ball rolled past (lit: passed, rolling) the side of a tree*'(C, E)

The non-finite nature of this secondary predicate is indicated by the complete absence of person prefixes and its marking with the suffix -*pa* regardless of the aspect of the principal predicate of the clause (Ramírez Muñoz, 2016).

Finally, path and manner can also be expressed within a single sentence using the temporal subordinator clitic *ʔk*. As described by Faarlund (2012, p169), this clitic is used to indicate that the action denoted by the predicate to which it is attached occured at the same time as the action denoted by the predicate of the main clause of the sentence. In descriptions of motion, it is typically the case that the main clause of the sentence

is predicated by a verb formed from a CoL root (*kɘt* 'pass' in (240)), while a manner predicate (*ø-poj-u* '3B-run-CP') is combined with *ʔk* 'TSUB'.

(240)   te ʔ jomo   te ʔ kuhj=kɘʔmɘ ø-poj-u=ʔk   ø-tsuʔŋ-u   . . .
               DET women DET tree=LOC5   3B-run-CP=TSUB 3B-depart-CP . . .
               'The women departed from the tree running'

5.4   The semantics of change-of-location roots in SVCs

5.4.1 Introduction

Craig (1993, p27) defines a *directional* as a linguistic unit whose function is "not to specify the movement in space of a Figure at the time of an event but rather to trace a trajectory viewed from a particular perspective". De la Cruz Morales (2016) has proposed that when appearing in SVCs of the type discussed in the previous section the CZ CoL roots listed in Table 20 constitute a grammaticalised paradigm of *directionals* of the type common in Mayan languages such as Jakelteko (Craig, 1993), Tseltal (Brown, 2006) and Tsotsil (Haviland, 1994). Similar proposals have also been made for a number of other Mixe-Zoque languages, such as Oluteco (Mixean, Mexico; Zavala, 2005)[43].

Although I agree with De la Cruz Morales (2016) that a principal function of CoL roots in SVCs is to provide directional information (or detail a "trajectory" in Craig's terms), my analysis is that in most contexts in which CZ CoL roots feature in SVCs their contribution to the semantics of the predicate does not meet Craig's definition of a directional. In particular, it is my analysis that in *all* contexts CoL roots appearing in SVCs retain their independent CoL semantics and therefore, to some extent, entail the motion of a Figure; as will be described below, the nature of this motion varies considerably.

Although a detailed analysis of this question is beyond the scope of this thesis, in the

---

[43]A similar set of motion roots have also been identified as performing a directional role in Sierra Popoluca (Zoquean, Mexico) by de Jong Boudreault (2009, p690), but their status as a grammaticalised paradigm is not discussed.

immediately following sections I will provide a summary of my analysis of the semantics of CoL roots appearing in SVCs.

5.4.2 Outline of argument

The main aspect of my argument against the CZ CoL roots constituting a grammaticalised paradigm of directionals when appearing in SVCs is that in most contexts they retain their independent CoL semantics. I have identified three separate contexts in which CoL roots appear in SVCs that need to be considered in order to assess this claim:

1. In combination with manner of motion, e.g. (241)

2. In combination with dispositional or caused motion roots to describe static spatial arrays, e.g. (243)

3. In combination with verbs of locution and perception, e.g. (242)

(241) teʔ ŋ-kaʔe nə j-poj-put-u   teʔ nəʔ=ʔomo
       DET M-youth PRG 3A-run-exit-DEP.III DET water=in
       'The young boy is running out of the water' (P, TRAJ)

(242) jəʔ poʔks-tək=ʔis=j-neʔ   kəʔji ø-ken-məʔn-u   teʔ j-neʔ
       PRX sit-INSTR=3GEN=3A-ANAP below 3B-look-descend-CP DET 3A-ANAP
       j-kopak
       3A-head
       'The top of the chair (lit:object for sitting) is pointing downhill (lit: downwards)' (LG, B&C 1-9)

(243) teʔ j-kopak=ʔomo ø-poʔks-kiʔm-u teʔ ŋ-kaʔe
       DET 3A-head=LOC 3B-sit-ascend-CP DET M-youth
       'The young boy is seated on its (the deer's) head' (MJ, FSp19)

In the remainder of this section I will analyse the semantics of CoL roots in each of these contexts, before summarising in Section 5.4.6.

5.4.3 Combinations of change of location and manner of motion roots

That CoL roots appearing in SVCs alongside manner of motion roots retain their CoL semantics is a direct result of the fact that - as argued in Section 5.2 - they alone encode a change of location relative to a Ground/reference location. As a result of this, if CoL roots appearing in SVCs alongside motion roots did not retain their CoL semantics the resulting predicate would not encode CoL. As can be seen from the fact that the reference location denoted by the spatial adjunct in (241) is not the location of the entire CoL event, this is not the case. In this context, therefore, the principal function of CoL roots is to encode CoL relative to the reference location denoted by the spatial adjunct co-occuring with the SVC rather than provide information regarding the trajectory of the Theme of the description.

5.4.4 Change-of-location roots in stative predicates

The situation when SVCs containing CoL roots are used to describe static spatial arrays (as in (244) - describing Figure 18 - and (245)) appears at first glance to be quite different from that of CoL roots combined with manner of motion roots. The absence of motion from the state of affairs described by the predicate raises a significant question about whether the semantics of this type of SVC can be reconciled with the CoL roots retaining their CoL semantics.

(244)   teʔ tsahj ø-həʔm-kiʔm-u   teʔ kuhj=kəhsi
            DET rope 3B-hang-ascend-CP DET tree=on
            'The rope is hung up in the tree' (FR, PSPV 33)

(245)   teʔ pən ø-ten-kiʔm-u   teʔ tək-kopak=ʔomo
            DET man 3B-stand-ascend-CP DET house-head=LOC
            'The man is standing on the roof of the house' (B, E)

My analysis of predicates of the type in (244) and (245) is that they are akin to *resultative statives* described for Yukatec Maya and Tseltal by Bohnemeyer and Brown

Figure 18: PSPV 33 (Ameka et al., 1999), described in (244)

(2007). These are predicates that describe a state of a Figure resulting from the event described in the verbal stem. If the CoL roots appearing in stative predicates such as (244) and (245) do indeed retain their CoL semantics, as I claim, this means that the state of the Figure encoded by this type of predicate has resulted from a prior CoL event, i.e., the predicates in (245) and (244) encode states that have resulted from changes of direction in the vertical direction.

The principal basis for this analysis is the judgement of consultants that, in combination with a dispositional root, a CoL root describes a motion event that was central to the Figure obtaining the location described. This judgement is entirely consistent with all spontaneous uses of such predicates in my data. For example, the description in (245), the CoL root *kiʔm* 'ascend' indicates that the 'man' ascended on to the 'roof of the house', before assuming a standing position. Similarly, the rope shown in Figure 18, and described in (244), is assumed to have had to ascend into its present location; this ascent is also encoded in the CoL root *kiʔm* 'ascend'[44].

---

[44]It should be noted that these CoL events are often assumed based on the location of the Figure and

An example of the type of typical directional usage that this analysis precludes is exemplified in the Tseltal description of location in (246). In this, the directional associated with the downwards direction *koel* 'downwards' is used to describe the direction in which the 'rope' is hanging.

(246)   TSE jo'kol-ø   tal   **koel**   laso
         hanging-3A coming **downwards** rope
         '*The rope is hanging downwards*' (Brown, 2006, p263)

Consultants consistently rejected an equivalent CZ description in which the CoL root *məʔn* 'descend' was used to describe the disposition of a rope and not a CoL event that preceded the present state. For example, the description in (247) was rejected as a description for the spatial array in Figure 18 (cf (244)).

(247)   *teʔ tsahj ø-həʔm-məʔn-u   teʔ kuhj=kəhsi
         DET rope 3B-hang-descend-CP DET tree=LOC4
         Intended: '*The rope is hanging downwards from the tree*'

5.4.5 Change-of-location roots with verbs of perception and locution

Of the three uses for CoL roots in SVCs listed at the start of this section, that featuring verbs of perception and locution is the most prototypically directional. This assessment is based on the fact that, unlike the two previous uses, no *factive* CoL can be associated with the state of affairs described by such SVCs. This means that the appearance of CoL roots in descriptions such as (248), (249) and (250) serves the semantic function of providing information regarding trajectory but *without* any entailed factive motion.

(248)   teʔ ʔune nə j-wet-təhkəj-u   teʔ kuhj=ʔis   j-sutu=ʔomo
         DET child PRG 3A-shout-enter-DEP.III DET tree=3GEN 3A-hole=LOC3
         '*The child is shouting into the hole in the tree*' (AG, FSp10)

so could perhaps be classified as fictive motion. This possibility requires further investigation.

(249) teʔ ʔune ø-ken-təhkəj-u   teʔ j-sutu=ʔomo
      DET child 3B-look-enter-CP DET 3A-hole=LOC3
      'The child looked into the hole (in the tree)' (AT, FSp10)

(250) teʔ tsiʔ   teʔji   nə j-ʔəʔm-put-u   teʔ sutu=ʔomo
      DET opossum PRX;LOC2 PRG 3A-look-exit-DEP.II DET hole=in
      'Then the opossum looked out of its hole' (AG, FSp11)

The fact that the states of affairs described by SVCs containing a root of perception/locution and a CoL root do not contain any CoL is, however, reconcilable with my claim that CoL roots in SVCs retain their CoL semantics. The key to this is to recognise that although they do not feature any factive CoL they are consistent with the presence of some *fictive CoL*. Indeed, in his typology of fictive motion Talmy (2000) gives verbs of location and perception as one of the examples of his proposed 'emanation-type' of fictive motion: a type of fictive motion in which an object (potentially fictive itself) undergoes fictive motion along a specified trajectory. Two English equivalents of this type of fictive motion are given in (251) and (252).

(251)   The boy was looking towards the sea

(252)   The boy shouted down to his mother

It is important to point out, however, that the complete absence of factive CoL from the state of affairs described by combinations of CoL roots with roots of perception and locution means that their desemanticization *in this context* can not be categorically ruled out. Given the clear distinction between the uses of CoL-containing SVCs discussed in this section from those discussed in the other two, it does at least seem possible that they constitute a unique context in which CoL roots behave as directionals; it could also be the case that such combinations represent the primary stages of development of a paradigm of directionals. Given the arguments I have made in the preceding subsections, however, the simplest explanation for the use of CoL roots in combination with roots of perception

and locution remains fictive motion.

5.4.6 Summary

To summarise, although I agree with De la Cruz Morales (2016) that in some contexts the primary function of the CoL roots appearing in SVCs can be said to be to provide information regarding the trajectory of a Theme, I do not agree that these roots constitute a paradigm of grammaticalised directions bleached of their CoL semantics. The principal piece of evidence in my argument is that it is *essential* that CoL roots retain their CoL semantics when appearing alongside manner of motion roots - one of the contexts used by De la Cruz Morales (2016) to exemplify the directional nature of CZ CoL roots - in order for the SVCs in which they appear to encode change of location relative to a stated reference location.

In the remaining two contexts used by De la Cruz Morales (2016) to exemplify the directional nature of CZ CoL roots (their appearance in stative predicates and their combination with roots of perception and locution) the function of these roots is undoubtedly more 'directional-like'. It is not hard, however, to see how these directional-like functions can be explained while maintaining the CoL semantics of the CZ CoL roots. In the case of those CoL roots appearing in stative predicates this explanation requires the observation that the CoL roots in such predicates exclusively provide information related to the *position* of the Figure of the description and not its orientation, as is common in other languages that make use of directionals. In the case of the combination of CoL roots with verbs of perception and locution - the most directional-like context - it is necessary to appeal to Talmy's notion of *fictive motion*.

5.5 Summary and discussion

Above I have described how in CZ change of location relative to a stated location is encoded *exclusively* in the paradigm of 12 roots shown in Table 20. A reflex of this fact

is that these 12 roots are the only formal elements that can assign a path role to a location denoted by a spatial adjunct. The many other motion roots in the language typically detail the *manner* of motion performed by the Figure. Spatial adjuncts co-occuring with verbs formed from manner of motion roots alone are interpreted as denoting the location of the *entire* motion event and not a location relative to which CoL occurs. It is possible, using serial verb constructions, to combine both types of motion root into a single verbal stem, with the co-occuring spatial adjunct being assigned the path role associated with the CoL root.

The encoding of path notions exclusively within a paradigm of verbal roots is prototypical of Talmy's verb-framed languages, as is the strict distinction between these roots and those that encode manner of motion. Therefore, purely in terms of the formal nature of those elements in which path is encoded, CZ is a clear case of a verb-framed language. This type of strictly verb-framed nature is attested for many of the other Mesoamerican languages for which descriptions exist. Indeed, it is striking from these descriptions that not only is the generally verb-framed nature shared, but that the size and semantics of the paradigm of verbs encoding path are strikingly similar[45]. Such similarlity across a number of different language families in a single linguistic area suggests that this lexicalisation of motion, including the specific paradigm of path verbs, may constitute an areal feature.

In the literature, however, the terms verb-framed and satellite-framed have become shorthand for a wider set of characteristics related to the description of motion events. For verb-framed languages these are largely aligned with the characteristics of the Romance languages, which are often taken to be the prototypical verb-framed languages. One such characteristic of a prototypical verb-framed language is that it encodes manner of motion in a constituent *subordinate to* the path-denoting verb. In Spanish, for

---

[45]See for example the descriptions - of different levels of detail - of Lowland Chontal (Tequistlatecan; O'Connor, 2007, Tseltal (Mayan; Brown, 2006, Tsotsil (Mayan; Haviland, 1994), Oluteco (Mixean; Zavala, 2005) and Jakaltek (Mayan; Craig, 1993).

example, manner of motion is typically encoded using the non-finite, gerund form of a verb (*corriendo* 'running' in (253)).

(253) el hombre sali-ó   de la casa **corriendo**
       the man   exit-3SG:PST from the house running
       'The man ran from the house (lit: exited the house running)'

The potential to serialise verbal roots in CZ means that manner and path can be expressed within the same clause by formal elements of the same status. The equal status of manner and path elements in CZ SVCs distinguishes CZ from prototypical verb-framed languages and brings it more in line with those equipollently-framed languages proposed by Slobin (2004)[46] .

Ameka and Essegby (2013) have suggested that languages in which motion events are typically described using SVCs share a number of characteristics - including being equipollently-framed - that warrant them being grouped together into a new *serialising-language* category. Although there are certainly a significant number of characteristics shared by languages that typically describe motion events using SVCs, my description of CZ demonstrates that there are also important distinctions to be made. For example, Ameka and Essegby (2013) state that although serialising languages are restricted to stating one Ground per "motion verb" (presumably, this also refers to verbal roots), they have the potential to state multiple Grounds per clause. As has been discussed, it is indeed the case that CZ CoL roots are associated with a maximum of one Ground. The fact that SVCs can contain a maximum of 1 CoL root in a directional-like role, however, means that the single-Ground restriction also applies to the whole clause.

In summary, it does appear that descriptions of motion in serialising languages share a sufficient number of characteristics to warrant their distinction from non-serialising

---

[46]It is interesting to note that the two alternative strategies for expressing manner and path in the same sentence are precisely very similar in nature to those found in prototypical verb-framed such as the Romance languages.

languages. The fact that CZ does not fit neatly into the basic characterisation of serialising languages given by Ameka and Essegby (2013), however, shows that this category itself probably needs further refinement.

6 The semantics of change-of-location verbs

6.1 Introduction

Two quite different accounts of the linguistic representation of motion events have previously been proposed in the literature. According to Dowty (1979), for example, an expression such as that in (254) should be considered in terms of changes of state, specifically, the transitions that the Figure (John) makes between three different states: (1) being at the post office and not being at the bank (2) being at neither the post office nor the bank (3) being at the bank and not at the post office.

(254)   John walked from the post office to the bank (Dowty, 1979, p142)

This perspective on the semantics of descriptions of motion was also advanced by Miller and Johnson-Laird (1976)

In contrast, Jackendoff (1983) argues that it is not in fact possible to decompose the semantic structure of descriptions of motion into a series of changes of state. Instead he proposes as a semantic primitive the semantic function, GO, which takes a path as its argument. The Figure of a description of motion is then considered to pass through *every point* along this path (Jackendoff, 1990, p44). This conceptualisation of motion as a moment-by-moment mapping between time and location along a path has been termed *translational motion* (henceforth T-Motion) in the literature (Krifka, 1998; Levinson and Wilkins, 2006) and is often the default manner of framing linguistic expressions of motion.

More recently, an expansion of the sample of languages for which the semantics of

motion descriptions has been analysed has lead to to a third strategy for encoding motion linguistically being identified. This strategy is generally termed the *change of locative relation* (CoLR) strategy (Levinson and Wilkins, 2006, p531) and involves motion being encoded as a change in the locative relation between a Figure and a Ground/reference location. For example, in Japanese, the motion verb analogous to English 'enter' is described by Kita (2006) as having change-of-state-like semantics, with the initial state being roughly, 'Figure is not within the Ground' and the final state being 'Figure is within the Ground'; the semantics of the Japanese equivalent to 'exit' reverses the order of two states. As we shall see in relation to CZ, the key difference between motion verbs with CoLR semantics and more standard CoL semantics is that CoLR verbs do not *entail* the motion of the Figure, although, as Bohnemeyer and Stoltz (2006) point out, this is very strongly implied.

In this section I will provide a detailed account of the semantics of CoL roots in CZ. Initially this will concern their assignment of path roles to the spatial adjuncts with which they co-occur, before moving on to consider their lexical aspect. Finally, I will consider to what extent CoL roots entail the motion of their subject (the Figure of the motion description) in CZ. Based on the evidence presented I conclude that CoL roots in CZ fundamentally have, in most contexts, CoLR semantics.

6.2 The relationship between change-of-location verbs and spatial adjuncts

6.2.1 The assignment of path semantic roles in CZ

As described in brief in Section 5.2, only a subset of motion roots, the so-called CoL roots, can assign path roles such as GOAL, SOURCE and VIA to a co-occuring reference location. For all CoL roots it is possible to identify a dominant path role, which is the default path role assigned to a co-occuring reference location. These dominant assignments are listed in Table 20.

The extent to which a particular CoL root can assign path roles other than its

138

dominant role varies considerably between roots. At one end of the scale are those roots that denote *undirected* CoL relative to 1D Grounds - i.e. *nuʔk* 'arrive' and *tsuʔŋ* 'depart' - and those roots that assign VIA Grounds - i.e., *kət* 'pass' and *hak* 'cross' - which always assign their default role. At the other end of the spectrum are those roots that encode directed motion in the vertical direction - i.e. *kiʔm* 'ascend' and (particularly) *məʔn* 'descend' - which assign SOURCE and GOAL roles with similar frequencies.

6.2.2 Change-of-location roots without spatial adjuncts

It is a notable feature of motion descriptions in CZ that CoL roots regularly appear without an accompanying spatial adjunct. In these cases the location relative to which a CoL occurs is usually that stated in a preceding CoL or locative clause. For example, in (255) we are able to infer from context that the location the women is described as having entered in the final clause is the cave mentioned in the penultimate clause.

(255)   teʔ jomo   ø-kiʔm-u   j-neʔ   j-tsəʔnaŋ=ʔomo, ø-kiʔm-u
       DET woman 3B-ascend-CP 3A-ANAP 3A-right=LOC3,   3B-ascend-CP
       kəhsi=se   ø-nuʔk-u   teʔ kohtsək=ʔis   j-sudu=ʔomo, **ø-təhkəj-u**
       above=SIM 3B-arrive-CP DET mountain=3GEN 3A-hole=LCOC3, 3B-enter-CP
       'The women ascended to her right, she ascended sort of upwards, she arrived at the cave, she entered (the cave)' (ME, TRAJ)

It is not always the case that CoL roots without an accompanying spatial adjunct take their reference location from surrounding linguistic context. When the root *min* 'come' appears without a spatial adjunct, as in (256), it is usually the case that the deictic centre is the location relative to which CoL has occured.

(256)   teʔ=ʔis   j-nə-**min**-u   muha-tam=pə *autobus* … **ø-min-u**
       3.PRO=3GEN 3A-ASSO-come=CP big-PL=REL   bus   … 3B-come-CP
       ti=tam=pə   *carro*
       something=PL=REL car
       'They brought large buses (here) … assorted cars came (here)' (P, Vol)

Unlike in Yucatec Maya (Bohnemeyer and Stoltz, 2006, p283), with which motion descriptions in CZ share many characteristics, there are no roots that exclusively obtain their reference locations from context.

6.2.3   The specification of a location of change of location

As has been described in Section 5.2, spatial adjuncts co-occuring with non-CoL verbs denote the location of the *entire* motion event (henceforth the *location of CoL*). For example, the description in (257) is interpreted as stating that the ball bounced at some point while it was on top of the hill. It doesn't allow us to determine any possible change of location of the ball relative to the top of the hill.

(257)   ø-mǝʔŋ-u   teʔ *pelota* teʔ *loma*=ʔis j-kopak=ʔomo …
        3B-bounce-CP DET ball   DET hill=3GEN 3A-head=LOC3 …
        'The ball bounced while on top of the hill (lit: on the hill's head)' (AT, TR5)

In contrast, the ball in (258) can unequivocally be said to have changed location relative to the inside of the house while bouncing due to the presence of the CoL root *put* 'exit' in the verbal complex.

(258)   teʔ *pelota* ø-mǝʔŋ-put-u   teʔ tǝk=ʔomo
        DET ball   3B-bounce-exit-CP DET house=LOC3
        'The ball bounced out of the house' (AT, 24-02-15)

The interpretation of a spatial adjunct as stating a location of CoL is also possible with a subset of CoL roots. In the case of two CoL roots, *kiʔm* 'ascend' and *mǝʔn* 'descend', this interpretation of a co-occuring spatial adjunct as stating the location of CoL is observed to occur spontaneously in all aspects, including the completive (as in (259), for example).

(259)   teʔ mǝʔn-ǝ=ʔomo=ʔtsi   ø-mǝʔn-jah-u   …
        DET descend-N=LOC3=1ABS 3B-descend-PL-CP …

140

'We descended the slope (lit: in the slope) ...' (R, 03-02-15)

For another root *maŋ* 'go', descriptions in which a location of CoL was stated alongside a verb in the completive aspect were accepted by some consultants and rejected by others. An example of one such description that was accepted is shown in (260), which describes the journey of a man along a road.

(260) teʔ pən ø-maŋ-u teʔ tuŋ=ʔomo
       DET man 3B-go-CP DET road=LOC3
       'The man went along the road (lit: changed location in the road)' (C, 03-02-16)

In the progressive aspect, however, *maŋ* 'go' was used *spontaneously* alongside a location of CoL. One of these spontaneous uses is presented in (261).

(261) hiŋə nə j-kət-u n-kaʔe taksji=pə, tuʔŋ=ʔomo nə
       DIST.LOC PROG 3B-pass-DEP.II M-youth topless=REL road=LOC3 PROG
       j-maŋ-u
       3A-go-DEP.II
       'The topless young man is passing there, it is moving along the road (lit: changing location in the road)' (C, TRAJ)

A fourth CoL root that is spontaneously used alongside a location of CoL in my data is *min* 'come'. As with *maŋ* 'go' this spontaneous use is restricted to verbs in the progressive aspect, such as can be seen in (262), which describes a man exiting an area of overgrown vegetation before walking towards the camera through an area of brush.

(262) kuhj-tək=ʔomo nə j-put-u hikə pən teʔji nə j-min-u
       tree-house=LOC3 PROG 3A-exit-DEP.II DIST man then PROG 3A-come-DEP.II
       taʔn-ə=ʔomo
       to.grow.grass-N=LOC3
       'The man is coming out of the bushes (lit: the house of trees) then is coming towards here in the brush (lit:where grass grows)' (C, TRAJ)

Unlike *maŋ* 'go', however, no consultant accepted the location-of-CoL interpretation of

141

a spatial adjunct when combined with *min* 'come' in the completive aspect.

6.2.4 Discussion

As has been discussed in this and the previous sections, there are a number of related characteristics of CZ descriptions of motion that suggest that notions of path are treated differently in this language compared to languages such as English. To restate these facts briefly: Spatial adjuncts in CZ are uniform across the three spatial domains and do not show any morphological marking that indicates semantic role. Instead, the path role of a reference location is determined by the semantics of the accompanying predicate and, to a lesser extent, the pragmatics of the description. The fact that the semantics of CoL roots is principally responsible for the assignment of path roles means that each reference location in a CoL description necessarily appears alongside at least one CoL verb (i.e. a verb featuring a CoL root).

The above properties mean that descriptions such as that in (263), in which the start and end point of a motion event are stated within the same clause, are not possible in CZ. The nearest equivalent of such a description is (264), in which two clauses are used: one clause in which the SOURCE of the motion is stated and the other in which the GOAL of the motion is stated.

(263)   The ball went from by the small box to the box's side

(264)   teʔ *pelota* ø-tsuʔŋ-u   *kaha-ʔune*=kəʔmə *i*   ø-nuʔk-u   teʔ
         DET ball   3B-depart-CP box-child=LOC5   and 3B-arrive-CP DET
         kaha=ʔis   j-tseʔŋna=ʔomo
         box=3GEN 3A-side=LOC3
         'The ball departed from by the small box and arrived at the box's side' (AT,
         CG20)

The impossibility of encoding the full path of an object moving between two points using a single verb suggests strongly that the notion of path-traversal is not a funda-

mental part of the semantics of CZ CoL roots. Furthermore, the maximum association of each CoL root in a description with just one reference location is very suggestive of the type of change-of-state-like semantics that were the basis for Dowty et al's analysis of motion descriptions.

Interestingly, an almost identical restriction on the number of path roles stated in a single clause has been described in Yucatec Maya by Bohnemeyer and Stoltz (2006)[47]. Based on the descriptions of Yucatec Maya available, it appears that this similarity is ultimately related to the lack of formal elements that mark path roles in both languages. This type of segmentation of motion events constitutes one particular type in the typology of motion events presented by Bohnemeyer et al. (2007).

6.3   Durativity of change-of-location verbs

6.3.1   Introduction

An important source of evidence in relation to the fundamental conceptualisation of motion encoded with motion verbs is their lexical aspect. With regards to their durativity specifically, it would be expected that a predicate in which motion was encoded as T-motion would be durative in order to reflect the continuous mapping of time to the location of the Figure along the stated path. In contrast, the encoding of motion in terms of CoL would require that the relevant predicates were punctual, thereby reflecting their change-of-state-like semantics. In terms of Vendler's well-known categorisation of verbs (Vendler, 1957), predicates encoding T-motion would, depending on their telicity, fall into either the category of *activity* or *accomplishment*. Predicates encoding CoL would, on the other hand, be categorised as *achievements*.

In this section I will argue that all CoL roots in CZ are punctual, and therefore change-of-state-like, when combined with a reference location relative to which the Figure

---

[47]See Bohnemeyer (2003) for more details on this feature of Yucatec and how it relates to the encoding of motion more generally.

changes location. I will at the same time argue that when a CoL root occurs with a spatial adjunct specifying a location of CoL it is fundamentally durative in nature. Evidence for both of these claims will come from a number of different diagnostics motivated by those suggested for English by the likes of Dowty (1979) and Kearns (2003).

6.3.2 Diagnostics

A number of diagnostics for the durativity of verbs have been suggested in the literature with those suggested by Dowty (1979) and Kearns (2003) being amongst the most commonly referenced. As these diagnostics have principally been aimed at determining the lexical aspect of English verbs, their specifics are not applicable cross-linguistically. It is possible, however, to attempt to recreate their *general approaches*. One approach commonly used is to test the acceptability of verbs with formal elements that specify the duration of a process, it obviously being impossible to state the duration of an event that is conceptualised as punctual (i.e. instantaneous). In English these include, amongst others, temporal adverbials featuring the prepositions *for* (in the case of activities) or *in* (in the case of accomplishments).

A second approach commonly used in the literature is to test the acceptability of combinations of verbs with formal elements that encode the inceptive or terminative aspects. This approach is based on the observation that if an event is conceptualised as being punctual it does not have any internal structure such as a beginning and an end. In English, this test amounts to the acceptability of using a verb in conjunction with the verb 'begin' (the inceptive), 'stop' (terminative for achievements) or 'finish' (terminative for an accomplishment).

Although it would ideally be possible to use the above principles to identify formal elements that are strictly prohibited from co-occuring with verbs of a particular aspectual class, this is not always possible. One possible reason for this is simply that the language under investigation does not lexicalise the semantic distinctions necessary to formulate

144

such prohibited combinations. A common issue, for example, is that a language does not have formal elements that are strictly used for specifying the duration of events. Precisely this issue is discussed by Bohnemeyer (2007) in relation to Yucatec Maya and is also in fact the situation in CZ.

Another issue when attempting to formulate formal combinations that are strictly prohibited due to the lexical aspect of the verb is the phenomenon of what Kearns (2000) calls "repair readings". These are alternative interpretations given to verbs when in apparently prohibited formal combinations in order to endow them with the "correct" events structure and therefore make them felicitous. An example of such a repair reading is the possibility of interpreting a combination of a punctual verb and a *for*-adverbial in English as specifying the duration of the *state* resulting from that punctual event rather than the duration of an event encoded in the verb, as would normally be expected. An example of where such an interpretation could be applied is the sentence in (265), which can be interpreted as stating that the man was in a state where he knew who the women was for five minutes, before he forgot.

(265)   He recognised her for 5 minutes (and then forgot who she was)

As will be discussed in more detail in the following sections, repair readings of CoL verbs when combined with inceptive and terminative markers meant that it was not possible to use these to formulate strictly prohibited formal combinations reflective of the durative-punctual distinction.

The inability to formulate strictly prohibited formal combinations associated with the durative-punctual distinction meant that it was necessary to rely entirely on the *interpretion* of CoL verbs when combined with different formal elements when determining their durativity. In the following sections I will detail the specific formal elements used and the interpretations used as diagnostics. I will also present my analyses based on the interpretations provided by my consultants.

145

6.3.3 Change of location verbs with the inceptive and terminative aspect

In CZ the inceptive and terminative aspectual notions are expressed through SVCs containing the verbal stems *ni+tsək* 'begin' and *ʔaŋ+heh* 'stop' respectively[48]. As is the case with semantically equivalent descriptions in English, the combination of these roots with verbs that encode durative events are interpreted as specifying the beginning or end of a process that has a duration. Examples of the combination of these roots with durative verbs are shown in (266) and (267), the interpretations of which are that 'the man began to prepare his food at midday (and then continued with the process)' and that the man ran for a short period of time before stopping, respectively.

(266)   te? tuwi j-mak-ni+tsək-jah-u   te? we?ni=?is
          DET dog 3A-follow-begin-PL-CP DET bee=3ERG
          'The bees began to follow the dog' (AT, FS p15)

(267)   te? pən ø-poj-u   ?uʃaŋ=?omo   te?ji ø-poj-?aŋ+heh-u
          DET man 3B-run-CP short.time=LOC3 then 3B-run-stop-CP
          'The man ran for a short time and then stopped running' (F, E)

In contrast, when *ni+tsək* 'begin' and *ʔaŋ+heh* 'stop' were combined with verbs with punctual semantics the resulting predicates had one of two interpretations: If the event encoded by the root was repeatable, then the interpretation was generally that the predicate identified the beginning or end of a period in which the punctual event occured *repeatedly*. For example, the interpretation given to the sentence in (268) by the consultant who provided it was that the man was out hunting, had been finding animals all day, but then after some point didn't find any more.

(268)   te? pən=?is   j-pa?t-?aŋ+heh-u te? kobən
          DET man=3ERG 3A-find-stop-CP   DET animal
          'The man stopped finding animals' (B, E)

---

[48]In some cases just *heh* 'stop' is used to encode the terminative, but the basis for this requires further investigation. The use of *heh* 'stop' to indicate the terminative with CoL roots was consistently rejected by consultants.

If, on the other hand, the event encoded by the root was not repeatable then its combination with *ni+tsək* 'begin' was generally interpreted as specifying the start of a period *preceding* the event encoded by the punctual root but directly related to it. This was the case for the sentence in (269), which was typically described by consultants as indicating the start of an illness or other such infirmity that preceded the man's death.

(269)　teʔ　pən　ø-kaʔ-ni+tsək-u
　　　　DET man 3B-die-begin-CP
　　　　'The man began to die'

The combination of a root that encodes a non-repeatable event with *ʔaŋ+heh* 'stop', such as in (270), was consistently rejected by consultants.

(270)　*teʔ　pən　ø-kaʔ-ʔaŋ+heh-u
　　　　DET man 3B-die-stop-CP
　　　　'Intended: The man stopped dying'

When denoting CoL events, CoL predicates combined with either *ni+tsək* 'begin' or *ʔaŋ+heh* 'stop' were consistently interpreted in the manner associated with punctual verbs. Specifically, when CoL roots were combined with *ni+tsək* 'begin' or *ʔaŋ+heh* 'stop' the resulting predicates were given a *semelfactive* interpretation, that is, they were interpreted as referring to the beginning of a period in which the Figure changed location *multiple times*[49]. Precisely this type of interpretation was given to the motion description in (271).

(271)　təʔək,　teʔ　pən　ø-maŋ-u j-neʔ　j-tək=ʔi.　ø-maŋ-ni+tsək-u
　　　　yesterday DET person 3B-go-CP 3A-ANAP 3A-house=LOC2, 3B-go-begin-CP
　　　　tuhkaj ʔora=ʔomo
　　　　three　hour=LOC3
　　　　'Yesterday, the man went to his house (multiple times). He began to go at 3 o'clock'

---

[49]Due to the lack of obligatory plural marking in CZ, some consultants also offered the interpretation that multiple Figures underwent a single CoL, this, however, seemed to be at the margins of acceptability.

There were also some instances in which consultants interpreted the combination of a CoL root with the inceptive as relating to a *pre-stage* to a CoL event. For example, the description in (272) was interpreted by one consultant as describing the man beginning to make *preparations* before leaving the house, for example, putting on his shoes and coat.

(272)   teʔ pən ø-put-ni+tsək-u j-neʔ   j-tək=ʔomo
        DET man 3B-exit-begin-CP 3A-ANAP 3A-house=LOC3
        '*The man began to leave his house*'

6.3.4   Interpretation with duration-stating adverbials

Further evidence for the punctual semantics of the CoL roots comes from the interpretation of CoL predicates alongside those temporal adverbials that can be used to express the duration of events in CZ. One of these features a time period combined with the instrumental case marker *piʔk* and has the semantics that an event is completed at the end of the stated time period. As such, when combined with accomplishments, as in (273), this type of adverbial is interpreted as specifying the time taken to complete the process encoded by the predicate.

(273)   teʔ pən=ʔis   j-tsək-u j-neʔ   j-kuʔt-kuj   tumə ʔora=piʔk
        DET man=3ERG 3A-do-CP 3A-ANAP 3A-eat-INSTR one   hour=LOC3
        '*The man prepared his food in an hour*'

In contrast, when combined with achievements the interpretation is that the punctual event occurs at the end of a *pre-stage* which lasted for the duration specified. Again, a clear example of this interpretation can be obtained by combining the root *kaʔ* 'die' with a *piʔk*-adverbial, as in (274). The time period specified in this sentence was consistently interpreted by consultants as refering to a period in which the man was in a state of ill-health of injury prior to his death.

148

(274)   teʔ pən ø-kaʔ-u   tumə ʔora=piʔk
           DET man 3B-die-CP one   hour=INSTR
           'The man died after an hour'

Similarly, in the spontaneously provided sentence shown in (275), the time period stated in the temporal adverbial refers to the time spent *searching for* a boy who had run away from home.

(275)   *ocho dia,* tumə *semana*=ʔuŋ ø-wit-u   j-meʔts-pa   . . . *hasta ocho*
           eight day, one   week=REPOR 3B-walk-CP 3A-search.for-ICP . . . until eight
           dia=piʔk   j-paʔt-u=ʔuŋ
           day=INSTR 3A-find-CP=REPOR
           'He walked for 8 days, for one week they were searching for him . . . until after 8 days they found him' (RO, N)

When combined with a location relative to which CoL occurs, CoL predicates were again interpreted in the manner expected of punctual predicates. For example, one consultant described the interpretation of (276) in terms of a person walking along a road for an hour *and then* arriving at the tree. The same consultant then offered (277) as an alternative manner in which to describe the same event. This formulation features the standard strategy for expressing the duration of a CoL event: to combine a clause predicated by a CoL predicate with one predicated by a manner of motion predicate that co-occurs with a temporal adverbial.

(276)   teʔ pən ø-nuʔk-u   ø-ʔit-u=mə   teʔ kuhj tumə ʔora=piʔk
           DET man 3B-arrive-CP 3B-EXIST-CP=LOC1 DET tree one hour=INSTR
           'The man arrived at the tree after an hour'

(277)   teʔ pən nə   j-wit-u   tumə ʔora=ʔomo maŋ-pa j-nuʔk-i
           DET man PROG 3A-walk-DEP.II one hour=LOC3 go-ICP 3A-arrive-DEP.I
           kuhj=mə
           tree=LOC1
           'The man is walking for an hour and is going to arrive at the tree' (B)

149

A second strategy for stating the duration of an event is to use a bare time period, as in (278).

(278)　te**ʔ** pən ø-poj-u　　tumə **ʔ**ora
　　　　DET man 3B-run-CP one　hour
　　　　'The man ran for an hour'

When combined with punctual predicates, this time period is typically interpreted as specifying the duration of some state *resulting from* the encoded event. This interpretation was frequently given when such adverbials were combined with CoL predicates. For example, the time period in (279) was described by one consultant as referring to the time that the man spent outside of the house, giving the specific example of going to the shops for three hours.

(279)　te**ʔ** pən　　ø-put-u　　te**ʔ** tək=**ʔ**omo　　tukaj **ʔ**ora
　　　　DET person 3B-exit-CP DET house=LOC3 three hour
　　　　'The person left the house for three hours'

A third type of adverbial that is used to specify duration comprises a time period marked with the locative clitic *ʔomo* 'LOC3' as already exemplified in (277). When combined with a durative predicate that is also atelic, an *ʔomo*-adverbial is interpreted as stating the duration of the activity encoded in the VP (i.e. walking in (277) and playing in (280))

(280)　**ʔ**əhtsi ø-maŋ-pa=**ʔ**tsi ma**ʔ**tsə**ʔ**j-i te**ʔ**　*campo*=**ʔ**omo *cuarenta i　　cinco*
　　　　1PRO AUX=1ABS　　　play-DEP.I DET field=LOC3　forty　　and five
　　　　minuto=**ʔ**omo
　　　　minute=LOC3
　　　　'I am going to play (football) on the field for 45 minutes' (B, E)

When combined with telic predicates - durative or punctual - however, *ʔomo*-adverbials are interpreted as stating a time period *during which* the event encoded in the predicate

was completed. As will be described in the following section, the CoL roots were generally found to be telic in nature meaning that *ʔomo*-adverbials could not be used in the diagnosis of their durativity.

6.3.5 Combination with a location of change of location

The discussion of the durativity of CoL roots so far has exclusively concerned CoL predicates in descriptions of motion in which the Figure is described changing location relative to a reference location. As described in Section 6.2.3, however, three CoL roots, *kiʔm* 'ascend', *məʔn* 'descend' and *maŋ* 'go' can co-occur with an adjunct specifying the location where all of the CoL experienced by the Figure occurs (the location of CoL). When used in descriptions in which a location of CoL is specified, consultants consistently judged the combination of these three CoL roots with *ni+tsək* 'begin' or *ʔaŋ+heh* 'stop' to be acceptable *without* a semelfactive interpretation. For example, the description in (281) was consistently interpreted as stating that the Figure began an extended journey ascending a ladder. Similarly, the description in (282) - provided spontaneously as part of a narrative - was used to describe the progress of a group of people through a cave.

(281) teʔ pən ø-kiʔm-ni+tsək-u teʔ kiʔm-tək=kəhsi paŋhama
       DET man 3B-ascend-begin-CP DET ascend-INSTR=LOC4 midday
       'The person began to ascend the ladder at midday'

(282) ø-maŋ-ni+tsək-jah-u=ʔuŋ kotsək=ʔomo
       3B-go-begin-PL-CP=REPOR mountain=LOC3
       'They began to move through the cave (lit: began to change location in the cave)'
       (RO, N)

These examples show that when combined with a spatial adjunct stating a location of CoL the three CoL roots under discussion behave in a similar manner to durative manner-of-motion roots such as *poj* 'run'. It appears therefore that a location of CoL

adjunct can bring about a shift in the aspectual class of those three CoL roots with which they can combine.

6.4 Telicity

6.4.1 Introduction

The telicity of a verb relates to whether or not the event it encodes is represented as having an inherent endpoint. If it does then it is termed *telic*, if not, *atelic*. Being punctual, non-iterative change-of-state verbs are necessarily telic, the events then encode having their result state as a natural endpoint. For example, the event encoded in the English verb ' die' ends at the point when the relevant object becomes dead. In contrast, manner verbs, such as English 'run', are typically atelic as they can theoretically continue for an arbitrary period of time. It is important to note, however, that the telicity of a verb is sensitive to the form of its complement[50]. For example, the prototype of a atelic verb provided, 'run', becomes telic if accompanied by a complement that 'bounds' the event. In (283), for example, the stating of a distance that the person ran bounds the event of running and therefore provides a natural endpoint, making 'run' in this context telic.

(283)   The person ran a mile

Above I have argued that CoL verbs in CZ are punctual when combined with an adjunct stating a reference location relative to which a Figure changes location. This implies that they have the semantics of non-iterative changes of state. It would therefore be expected from Vendler's categorisation that they would also be telic. I have also argued, however, that when combined with spatial adjuncts that state a location of CoL the three CoL verbs that can be combined with such adjuncts (*maŋ* 'go', *kiʔm* 'ascend'

---

[50]This is also the case for the durativity of a verb, but complement-induced shifts between punctual and durative are not as common.

and *məʔn* 'descend') are durative. It is therefore possible for these verbs to be either telic or atelic in this context.

In the following sections I will present the methods that I used for testing the telicity of CZ CoL verbs and also present the evidence collected using these methods.

6.4.2 Diagnostics

In English the telicity of verbs is typically tested using the fact that the co-occurance of a verb with a egressive/terminative phasal verb is sensitive to its telicity. If a verb is telic it can combine freely with one of those phasal verbs that entail completion, such as 'finish' or 'complete'. If a verb is atelic, however, it can not co-occur with these completion-entailing verbs and is instead combined with verbs such as 'stop' and 'end', which do not entail completion, to indicate the end of the event they encode.

As can be seen in (284), the verbal root used to express the completion of an event in CZ, *ʔaŋ+heh* 'stop/complete', can also be used with atelic verbs such as *poj* 'run'. As a result it was not possible to find for CZ a direct test of telicity equivalent to that in English[51].

(284) teʔ pən ø-poj-tsuʔŋ-u   teʔji **ø-poj-ʔaŋ+heh-u**
       DET man 3B-run-depart-CP then 3B-run-stop-CP
       'The man departed running and then stopped running' (F, E)

As a result of the failure to identify telicity-sensitive co-occurances, alternative methods were used to test the telicity of CZ CoL verbs. These are described in the following two sections.

---

[51]This type of situation has previously been described for Yucatec Maya by Bohnemeyer (2004) and for Navajo by Smith (1996).

<div align="center">(a)   (b)</div>
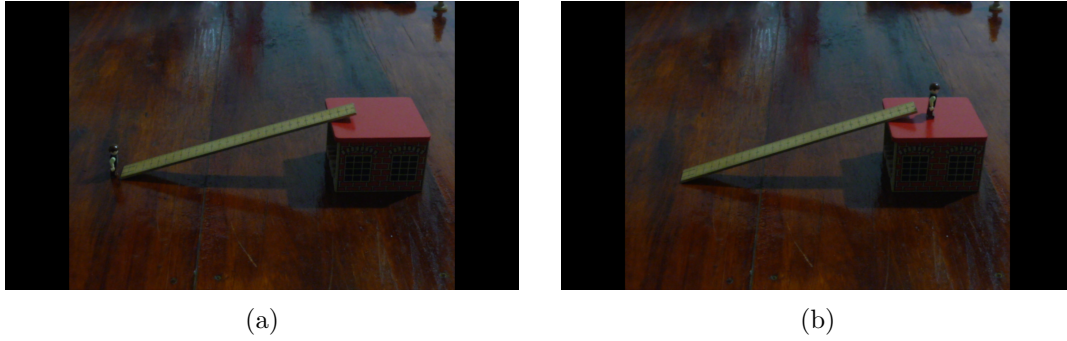
Figure 19: The first (a) and final (b) scenes of the first of the pair of video clips used to elicit evidence related to the telicity of the CZ CoL verb *kiʔm* 'ascend

6.4.3 Use of non-verbal stimuli

The first method used to test the telicity of CZ CoL verbs was elicitation using non-verbal stimuli, which I had designed specifically for the task. These stimuli consisted of short video clips showing the motion of a toy person or a toy car. The basic set of these stimuli consisted of pairs of videos depicting Figures moving in a manner typical of each of the CZ CoL verbs. In the first clip of each pair, a Figure was depicted moving in the relevant manner before ending its journey in the immediate vicinity of a stereotypical Ground (a toy house or a toy tree). In the second clip of each pair, the Figure was shown departing from precisely the same location and moving in precisely the same manner as in the first clip, but this time the Figure ended its journey half way between its departure point and the Ground. To illustrate the difference between these two clips the first and final scene of the clips used to test the telicity of the CoL verb *kiʔm* 'ascend' are shown in Figures 19 and 20 respectively.

During the elicitation based on these stimuli, a consultant was initially shown the first of one of the pairs of clips (the order of the pairs of clips was varied between consultants), i.e., the clip showing the Figure "arriving" at the Ground. The consultant was then asked (in Spanish) to describe in CZ what had happened in the video. If the consultant had provided a description featuring the intended CoL verb, they were then

<div align="center">154</div>
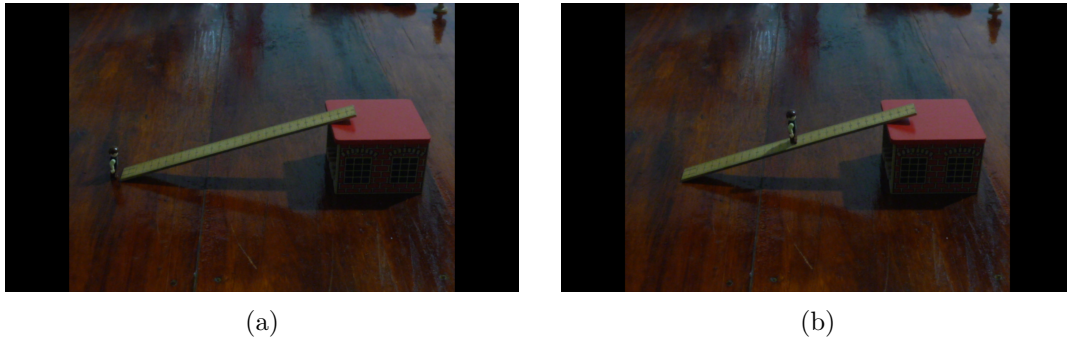
Figure 20: The first (a) and final (b) scenes of the second of the pair of video clips used to elicit evidence related to the telicity of the CZ CoL verb *kiʔm* 'ascend

shown the second clip of the pair and asked the same question. If the consultant did not use the intended CoL verb then they were asked to judge whether a description featuring that verb would be acceptable; in the small number of instances in which this occured the consultant accepted the proffered description.

Once a description for the first clip featuring the intended CoL verb had been agreed upon, the consultant was shown the second video clip related to that verb. They were again asked to describe what had happened in the video. If, as was usually the case, the consultant used a different description for the second clip than for the first, they were asked directly whether their first description (which was repeated back to them by the researcher) could also be used to describe the second video clip. The responses to this question were then used in my analysis of the telicity of the CZ CoL verbs.

6.4.4 Verbal paradigm

The second test of telicity used in my study centered on a series of descriptions of motion in which a man's change of location relative to a stated reference location is interrupted by persons unknown. One of these descriptions was constructed featuring each of the 12 CZ CoL verbs, with them all following the general structure of that constructed for the CoL verb *maŋ* 'go' shown in (285).

(285) a. təʔək   teʔ pən nə=naʔak   j-maŋ-u   ø-ʔit-u=mə   teʔ
           yesterday DET man PROG=CONTR 3A-go-DEP.II 3B-EXIST-CP=LOC DET
           kuhj
           tree
           'Yesterday, the man was going to where the tree is'

       b. həsika ʔihudi=pə=ʔis   j-weh-haj-u
           then   somebody=REL=3ERG 3A-call-APP-CP
           'Then, somebody called'

       c. teʔ pən ø-maŋ-u j-weh-haj-jah-u=mə
           DET man 3B-go-CP 3A-call-APPL-3PL-CP=LOC
           'The man went to where they had called him from'

       d. ha   j-widu-u=ʔam
            NEG 3A-return-CP=PERF
           'He hasn't returned'

In order to test the telicity of a particular CoL verb, the description in which it featured was read out in full to a consultant. Once the consultant had confirmed that they had understood the description they were then asked a yes/no question related to the journey in CZ. This question, exemplified for *maN* 'go' in (286), related to whether the man in the description could be considered to have completed the event encoded by the relevant CoL verb.

(286) ø-maŋ-u=sjə teʔ pən ø-ʔit-u=mə   teʔ kuhj
       3B-go-CP=Q DET man 3B-EXIST-CP=LOC3 DET tree
       'Did the man go to the tree?'

If the response to the question was 'yes' this was taken as evidence that the verb in question was atelic, as it showed that the event encoded by the verb was considered to have been completed during the journey described. In contrast, if the response to the question was 'no', this was taken as evidence that the event encoded was not considered to have been completed during the journey.

In addition to the 12 core descriptions, a further 4 descriptions were formulated in which the spatial adjunct featuring in the description of the man's initial motion

(that found in (285-a) above) denoted a location of CoL rather than a reference location relative to which the man would change location. Each of these 4 descriptions were predicated by one of the CoL verbs that had previously been attested being used alongside a location of CoL adjunct when in the progressive aspect. These 4 descriptions were used in precisely the same way by consultants as that described above for the 12 core descriptions.

6.4.5   Results and discussion

Evidence collected using both the non-verbal stimuli and the verbal paradigm showed that CoL verbs in CZ are telic if they co-occur with spatial adjuncts stating a reference location. If, on the other hand, the verb co-occurs with a spatial adjunct stating a location of CoL (as is possible for 4 CoL verbs) it is atelic. These conclusions are clearest from the near unanimity amongst 10 consultants in responding 'no' to the question in the verbal paradigm when the CoL verb was combined with reference location adjunct and 'yes' when combined with a location of CoL adjunct.

The evidence arising from the non-verbal stimuli was less clear, but still suggestive of the stated conclusions. In all cases consultants either spontaneously offered or accepted descriptions for the first clip of each pair in which the CoL verb was in the completive aspect and co-occured with a adjunct stating a reference location. When asked if the same description could be applied to the second clip in the pair, however, a clear majority said 'no' for each CoL verb. Consultants were willing to accept descriptions featuring location of LoCoL adjuncts for *both* clips in those pairs aimed at testing the telicity of the verbs *maŋ* 'go', *kiʔm* 'ascend' and *məʔn* 'descend'.

Based on discussions with consultants (after the elicitation had been conducted), part of the variation observed in responses to the non-verbal stimuli was due to consultants having different ideas of what 'arriving' at a particular location entailed. For some, the Figure coming close to the stated reference location was enough to consider it to

157

have arrived, whereas for others it was necessary for the Figure to be almost touching; the latter was the intended interpretation. It also appears to have been the case that interpretations from the same consultant regarding the arrival of a Figure varied between videos.

6.5 The entailment of Figure motion

6.5.1 Introduction

A third central issue regarding the semantics of CoL roots in CZ is whether or not they entail the motion of the Figure. This element of the investigation has been motivated by observations made for languages such as Yucatec Maya (Bohnemeyer and Stoltz, 2006) and Japanese (Kita, 2006) that suggest that, although the motion of a Figure is strongly implied by some descriptions of motion, it is not always *entailed*. The explanation provided for this lack of entailment is that a subset of motion verbs in the aforementioned languages encode a change in locative relationship between two (or more) objects rather than a change in the location of a Figure. It is therefore possible for the encoded change of locative relation to occur in ways that do not involve the motion of the Figure. For example, a change of locative relation between a Figure (in the sense of the absolute argument of the motion verb rather than necessarily the entity that moves) and a Ground (that specified by an adjunct) could be brought about by the motion of the Ground alone.

Given that the evidence presented so far suggests strongly that CoL verbs in CZ are change-of-state like, it is necessary to investigate whether their semantics encode a change in the location of a Figure (therefore entailing motion) or a change in the locative relation between a Figure and a reference location/Ground. In order to answer this question I investigated whether or not each CoL verb could be considered to entail motion. In Section 6.5.2 I describe the methodology used to answer this question and in Section 6.5.3 I present my conclusions.

158

<div align="center">(a)   (b)</div>
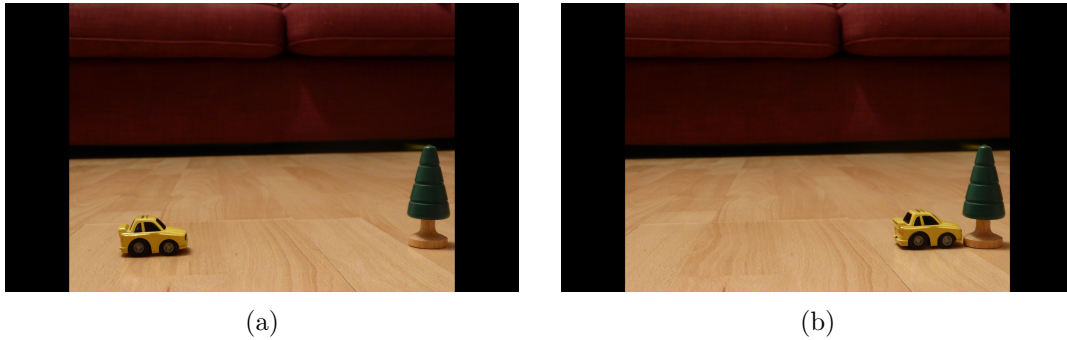
Figure 21: The first and final scene of the first clip of the pair of videos used to investigate the entailment of motion of the CZ CoL root *nuʔk* 'arrive'

6.5.2   Diagnostics

Evidence that motion of the Figure of a description of motion was entailed was principally sought through elicitation sessions using non-verbal stimuli. These non-verbal stimuli constituted pairs of short video clips depicting change-of-location events typical of each CZ CoL verb. The majority of these clips were created by the researcher, although those used to investigate the semantics of the boundary crossing roots *put* 'exit' and *təhkəj* 'enter' came from the MPI motion stimulus set (Levinson, 2001).

In the first clip of each pair, a stereotypical Figure (a toy man, car or ball) was shown either arriving at or leaving from a stereotypical Ground (a toy house, toy tree or wooden enclosure) in a manner associated with the CoL verb being investigated. For example, in the first clip of the pair used to investigate the verb *nuʔk* 'arrive' (the first and final scenes of which are shown in Figure 21), the toy car was shown departing from its initial position on one side of the screen, moving across the screen gradually, before arriving directly in front of the toy tree.

In the second clip of each pair the Figure and Ground had the same initial locations as in the first clip, but it was the stereotypical *Ground* that was subsequently depicted changing location until it arrived at the location of the Figure. This series of events is exemplified in Figure 22, which shows the first and final scenes of the second video clip

(a)　　　　　　　　　　　　　　　(b)

Figure 22: The first and final scene of the second video clip of the pair of videos used to investigate the entailment of motion of the CZ CoL verb *nuʔk* 'arrive'

associated with the CZ verb *nuʔk* 'arrive'.

These video clips were used in the following manner to elicit evidence of Figure motion entailment. The first step for each CoL verb was to show the consultant the first of the pair of clips relevant to that verb. After the consultant had watched the clip (sometimes more than once), they were asked, in Spanish, to describe what had happened in the video. If the consultant did not use the target verb in their description, a simple description of the video featuring that verb was offered up for judgement by the researcher; in all cases in which this step was necessary the researcher-offered description was readily accepted.

The consultant was subsequently shown the second clip of the relevant pair of videos and asked precisely the same question. If the consultant had reversed the Figure and Ground from their first description (i.e. the Figure of the first description was the Ground of the second), they were asked directly whether the description they gave (or accepted) for the first clip could also be used to describe the second clip.

An example of this type exchange is shown in (287)-(289). In (287) is shown the description of the first clip of the pair used to investigate the verb *nuʔk* 'arrive'.

(287)　　teʔ　*carro* ø-tsuʔŋ-u,　　**ø-nuʔk-u**　　teʔ　**ø-ʔit-u=mə**　　　**tsit**
　　　　DET car　　3B-depart-CP,　3B-arrive-CP DET 3B-EXIST-CP=LOC1 pine.tree
　　　　ø-ten-u=pə
　　　　3B-stand=CP=REL

> 'The car departed and arrived at where the pine tree that is stood up straight is' (MJ,)

In (288) is then shown the description of the second *nuʔk* 'arrive' clip spontaneously offered by the same consultant.

(288)   teʔ *carro* ha   j-miʔks-ə   *pero* teʔ kuhj ø-miʔks-u, **ø-nuʔk-u**
        DET car   NEG.CP 3A-move-DEP.I but   DET tree 3B-move-CP 3B-arrive-CP
        teʔ *carro*=ʔis j-kinə   ø-ʔit-u=mə   . . .
        DET car=3GEN 3A-nose 3B-EXIST-CP=LOC1 . . .
        ' *The car didn't move, but the tree moved, it arrived where the car's nose is*'
        (MJ, EMC)

Finally, in (289) is shown the description of the second *nuʔk* 'arrive' clip offered to the consultant. In this case the consultant accepted the description offered.

(289)   teʔ *carro* ø-nuʔk-u   ø-ʔit-u=mə   teʔ kuhj
        DET car   3B-arrive-CP 3B-EXIST-CP=LOC1 DET tree
        'The car arrived where the tree is' (LM, EMC)

6.5.3 Discussion

Based on the responses of consultants to the non-verbal stimuli described above, it was possible to unambiguosly identify the boundary crossing roots *put* 'exit' and *təhkəj* 'enter' as having semantics that do not entail the motion of the Figure. This was evident from the fact that all descriptions in which the choice of Figure and Ground did not match the motion observed in the video clip were unanimously accepted by consultants. Indeed, there was even a single spontaneous description provided - reproduced in (290) - in which the absolutive argument of the CoL verb (the argument normally associated with the Figure of the description) remained stationary in the video being described.

(290)   teʔ *rueda* ø-miʔks-u *i*   ø-put-u   teʔ *pelota*
        DET ring   3B-move-CP and 3B-exit-CP DET ball

'The ring moved and the ball exited' (MJ, MVS)

Descriptions in which the absolutive argument remained stationary were not universally accepted or rejected for any other verb. It was possible, however, to identify a group of verbs for which such descriptions were consistently rejected. This group contained the 'general' CoL verb *maŋ* 'go' and those verbs whose semantics have a directional component, i.e., the vertical roots *kiʔm* 'ascend' and *məʔn* 'descend' and the verb that encodes motion towards the deictic centre *min* 'come'.

In contrast, descriptions featuring the remaining CoL verbs were each accepted and rejected with similar frequencies. The only spontaneously provided example of a description in which the absolutive argument of the verb corresponded to the stationary entity, did, however, feature one of these roots, *hak* 'cross'. This description is reproduced in (291).

(291)   teʔ *carro-mətsik* ø-hak-u   teʔ *libro=kəhsi*
         DET car-toy   3B-cross-CP DET book=LOC4
         'The toy car crossed to the other side of the book' (F, EMC)

Given that the video to which this description was applied was one of the more unusual (it showed a book moving under its own volition underneath a toy car) it is possible that this description arose due to a misunderstanding as to what was being depicted. As a result I have not taken its use to necessarily indicate that *hak* 'cross' has CoLR semantics.

6.6 Summary

6.6.1 Lexical aspect

Based on the evidence presented in Sections 6.3 and 6.4, it is my analysis that CZ CoL verbs can be divided into two distinct groups with regard to their lexical aspect.

162

The largest of these two groups contains those verbs that only combine with adjuncts denoting a reference location and are therefore punctual and telic in all contexts. Motion in these verbs is therefore encoded as a case of a change of state, as originally proposed by the likes of Dowty (1979) and Miller and Johnson-Laird (1976).

The second group contains those verbs that are capable of combining with a location of CoL-denoting adjunct, i.e., *maŋ* 'go', *kiʔm* 'ascend' and *məʔn* 'descend'. When combined with an adjunct denoting a reference location these verbs behave in the same manner as those from group one, i.e., the are punctual and telic. When combined with one of the aforementioned location of CoL-denoting adjuncts, however, these verbs appear to be both durative and atelic. This ambiguous telicity is reminiscent of that exhibited by the so-called *degree achievement* class of verbs (Abusch, 1985; Bertinetto and Squartini, 1995; Dowty, 1979; Kennedy and Levin, 2008). These verbs - which include the English verbs, 'grow', 'darken' and 'cool' - encode gradual state change that does not have any inherent endpoint and so are atelic unless an endpoint is stated as a complement. Identifying the CZ CoL verbs as degree achievement verbs also allows their apparent durative nature when combined with location of CoL adjuncts to be identified as being semelfactive, i.e., the extended process evidenced by the responses of consultants is one over which *multiple*, punctual CoL events occur rather than a single extended one.

The CoL verbs in Yucatec Maya form a very similar paradigm to those found in CZ (Bohnemeyer and Stoltz, 2006). Furthermore, this paradigm can be divided into the same two telicity-based groups as already described for CZ, i.e. one group contains verbs that are always change-of-state like and the other verbs that exhibit variable telicity, which in the case of Yucatec Maya is conditioned by the presence, or absence, of a co-occuring spatial adjunct (Bohnemeyer, 2004, 2007). Just as in CZ, the group of verbs that exhibit variable telicity includes those verbs used to describe motion in the vertical direction, namely the equivalents of *kiʔm* 'ascend' and *məʔn* 'descend' and

163

another verb that is glossed as 'fall'(Bohnemeyer and Stoltz, 2006, p301).

As has been suggested in Section 5.5, the similarity in the composition of the paradigm of CoL verbs across a number of unrelated languages found in Mesamerica is potentially an areal feature of the Mesoamerican linguistic area. The similarity between the division of these paradigms into different semantic classes might therefore represent another aspect of this areal similarity. An alternative, more interesting, possibility, however, is that this pattern is related to the idea proposed by Levinson and Wilkins (2006, p533), that the semantics of a verb places it somewhere along a cline of the liklihood of it having punctual or durative semantics. All of those verbs that have shown some tendency towards durative behaviour (in the form of degree-acheivement semantics) in both CZ and Yucatec Maya encode *directed* motion, such as CoL in an upwards direction (as in * kiʔm* 'ascend'). I suggest, therefore, that if the semantics of a verb has a directional element, this makes it more 'manner-like' than those with purely CoL semantics (such as *put* 'exit', *kət* 'pass' etc in CZ), with the result that it is more likely to exhbit some durative properties.

Furthermore, it seems, based on this very small sample size, that there may be some tendency for vertical motion verbs to be more likely to have a durative nature than other types of directed motion. This is possibly the explanation for why the vertical motion roots *kiʔm* 'ascend' and *məʔn* 'descend' are spontaneously used in a durative-like manner in the completive aspect, whereas spontaneous uses of *maŋ* 'go' and *min* 'come' are restricted to the progressive aspect, an aspect more usually associated with durative semantics. Both of these tentative suggestions clearly require considerably more investigtion in a broader set of languages.

6.6.2 Conceptualisation of motion

In Section 6.5 it was argued that the CoL verbs of CZ are spread along a cline with regards to the extent that speakers consider them to entail motion of the "Figure"

164

(actually the absolute argument) argument of descriptions they predicate. At one end of this cline are the boundary-crossing verbs *put* 'exit' and *tɘhkɘj* 'enter', which all consultants agreed do not entail the motion of the Figure. This lack of entailment of Figure motion, in combination with the change-of-state like semantics for which I have argued above, shows that motion is in fact encoded in these two verbs as a *change of locative relation*. At the other end of the 'entailment of Figure motion' spectrum were *maŋ* 'go', *mɘʔn* 'descend', *kiʔm* 'ascend' and *min* 'come', all of which were judged by a majority of consultants to entail Figure motion. It is therefore possible to identify the semantics of these verbs within the typology suggested by Levinson and Wilkins (2006) as being *CoL* in nature.

For all other CoL verbs there was too much variation in consultant judgements regarding whether they entailed the motion of their subject argument or not to categorically identify them as CoL or CoLR. Further research is required to determine the basis for and the factors involed in this variation.

Part IV

Projective spatial descriptions

7 Frames of reference and projective descriptions

7.1 Introduction

The same spatial relations between objects can be conceptualised, and therefore described, in different ways. For example, it is possible to describe the spatial array shown in Figure 23 using the three conceptually distinct descriptions presented in (292)-(294) [52].

---

[52]These, of course, do not exhaust the possible descriptions of this spatial array.

Figure 23: An arbitrary example of a spatial array

(292)   The toy man is near to the tree

(293)   The tree is to the toy man's right hand side

(294)   The tree is to the left of the toy man

The first of these descriptions is an example of a *topological* description of location; such descriptions represent one of the two general strategies for describing location. The descriptions in (293) and (294) are examples of the other main strategy, that of *projective* descriptions of location. Notwithstanding their broad conceptual similarity, (293) and (294) are in fact also conceptually distinct, representing as they do the use of two different linguistic frames of reference (FoRs).

The now numerous and varied studies of spatial language available in the literature have shown there is considerable cross-linguistic semantic variation in both of the main strategies for describing spatial properties. In the topological domain, this variation is principally associated with the selection of topological notions encoded and the manner in which these different notions are distributed between different spatial relators (see Levinson and Meira (2003) and Bowerman and Choi (2001) for descriptions of this type

166

of variation for a broad range of languages). These differences in the semantics of topological spatial relators can be observed in closely related languages. For example, English distinguishes the notion of inclusion - as encoded in the preposition *in* - from notions of support and attachment - mainly encoded in *on*. Spanish, however, encodes both of these notions in the same preposition *en*. A detailed description of the organisation of topological concepts in CZ has been presented in McDermott (2014) and so will not be discussed in any detail in this thesis.

In contrast, in relation to the use of FoRs, the key point of semantic variation is the conceptual structure of those FoRs available to speakers of a particular language. Since Pederson et al. (1998) showed that there was considerable cross-linguistic variation in this aspect of spatial language, the inventories of FoRs available to speakers of different languages has been a topic of considerable interest in the linguistic literature, with a diverse group of languages now having been surveyed (see Levinson and Wilkins (2006) and O'Meara and Pérez Báez (2011) - and associated papers - for a good cross-section of available accounts). As it stands, however, there has been only a single detailed account of the FoR inventories of any Mixe-Zoque language and none at all of a Zoquean language. In the following sections, therefore, I will consider in detail the conceptual structure of the linguistic FoRs used by CZ speakers in Ocotepec.

It is also important to note that in the literature the principal focus of studies of FoR use has been their use in descriptions of orientation and, particularly, descriptions of location. In comparison to these two domains, descriptions of motion have been relatively neglected in this regard, perhaps in part due to a lack of a motion equivalent to the M&T (or B&C) standardised elicitation stimuli, but also due to a number of other areas of semantic variation in this domain (path, etc)[53]. This lack of consideration has sometimes led to the impression that FoR inventories - and usage patterns - in the motion domain can be extrapolated in a straight-forward manner from those in the other

---

[53]The detailed descriptions of a wide range of languages found in Levinson and Wilkins (2006) are a notable exception to this characterisation.

domains.

In the following three sections of this thesis (Sections 8, 9 and 10), I will present a detailed discussion of the FoR inventory available to CZ speakers. These discussions will include descriptions of the conceptual structure of each FoR, their formal means of expression and their patterns of use across the three spatial domains (location, orientation and motion). During these discussions I will highlight a number of aspects of the CZ FoR inventory that are of either theoretical or typological interest. Finally, in Section 11 I will describe the phenomenon of a subset of the CZ FoR inventory being unable to feature in a basic locative construction in which all defining conceptual entities are explicitly stated. I will then discuss the possible implications of this phenomenon for the development of linguistic FoRs.

7.2   Frames of reference in descriptions of space

7.2.1   Topological spatial relations and frames of reference

In their 1956 work Piaget and Inhelder observed that a child aquires the cognitive ability to use the spatial relations associated with different geometries (roughly, sets of mathematical rules for relating the locations of different entities) at different ages and in a predictable order. It was observed that the first spatial relations aquired by children were those associated with a *topological* geometry, which can be thought of as a geometry in which locations are related to each other without reference to *angle* or *distance*. Topological spatial relations therefore include those of separation, order, enclosure and proximity [54].

The next stage of development for the child is to develop the notions of angle associated with *projective* geometries, followed by that of metric distance, which, along with angle, define *Euclidean* geometries. These two types of spatial relations are often

---

[54]It is possible to define proximity in a mathematical manner without referencing metric distance. See Piaget and Inhelder (1956) for details.

conceptualised in terms of co-ordinate systems, which in the linguistics literature are referred to as frames of reference (FoRs). In contrast, topological relations can not be interpreted in terms of FoRs.

7.2.2 Projective and topological descriptions of location

In the literature, the analysis of FoRs in descriptions of location is usually restricted to their use in so-called *projective* descriptions of location. These are descriptions of location in which a Figure is located within an *angularly restricted* search region projected from a Ground, with which it is not contiguous. For example, the projective description in (295) locates the ball in a search region projected from the 'side' of the house.

(295)   The ball is to the side of the house

As the definition of an angularly restricted search region requires reference to an FoR, all projective descriptions of location necessarily involve an FoR.

FoRs can, however, also be referenced in those non-projective descriptions of location in which a Figure is located relative to a Ground using a topological spatial relation[55]. Typically, this occurs in descriptions of location in which a spatial relation of contiguity or co-location is stated between a Figure and a *facet* of a Ground. The FoR is then referenced in specifying which facet of the Ground features in this spatial relation. For example, in (296) it is necessary to invoke the cardinal co-ordinates in order to identify in which wall of the house the window is located.

(296)   The window is located in the west wall of the house

Similarly, in (297) a co-ordinate system derived from the location of the sea relative

---

[55]In the literature topological descriptions of location are often defined in reference to "contiguity or close proximity" (Levinson and Wilkins, 2006, p514); however, it is in fact possible, using the notion of proximity, for non-contiguous Figure-Ground spatial arrays to be described using topological notions.

to the church (an example of either a landmark or absolute FoR) is used to label the pertinent side of the church.

(297)   The cross is located on the seaward side of the church

It has even been noted by Levinson (2003, p72) that a single linguistic spatial relator (a formal element that specifies a spatial relation) can encode topological notions and refer to an FoR. An example of this type of dual-natured spatial relator is the English compound preposition *on top of*. This specifies a topological spatial relation of contiguity between a Figure and the part of the Ground that is (roughly at least) furthest from the Earth; this specification of the part of the Ground with which the Figure is contiguous can be conceptualised through reference to a co-ordinate system derived from the gravitation field of the earth[56] (an example of an geomorphic/absolute FoR).

7.2.3 FoRs in descriptions of orientation and motion

Based on the definition given Section 3.5.1, all descriptions of orientation require the specification of a direction. As such, all descriptions of orientation necessarily feature reference to an FoR. The focus of my analysis with regards to these descriptions is therefore very clear.

In descriptions of motion, FoRs usually have one of two functions. In the forthcoming discussions I will be considering only the use of FoRs to specify the direction of motion of a Figure. For example, in (298) the cardinal direction *west* describes the general direction of travel of the boat.

(298)   The boat is moving west

The second common use of FoRs in descriptions of motion is to specify a location that

---

[56]See Section 9 for a discussion of the possible alternative sources for this co-ordinate system.

performs a path role. For example, in (299) the cardinal co-ordinate system, in the form of *east*, is referenced in order to define the relation of the boat to the rock as it passes by.

(299)   The boat moved past the east side of the rock

Given that in this context the FoR is being used to specify a location, I would hypothesise that the use of FoRs in this manner would pattern with the use of FoRs in descriptions of location more generally. Unfortunately, I have not had sufficient time to test this hypothesis and have therefore decided to relegate this use of FoRs in descriptions of motion to a marginal role in the following discussion.

CZ doesn't distinguish formally between those spatial adjuncts that specify a direction of motion and those that specify a reference location that performs a path role, both of these being specified by location-denoting spatial adjuncts. In most situations it is therefore necessary to rely on the pragmatics of the description to determine whether a spatial adjunct is specifying a reference location or a direction.

7.3   Classification of frames of reference (FoRs)

7.3.1   Conceptual structure of FoRs

A linguistic FoR is defined by two conceptual entities, its *Anchor* and its *Origin*. The Anchor of an FoR is the entity from which the directions of its axes derive. For example, many languages - including CZ - make use of an 'uphill-downhill' system of spatial reference when giving spatial descriptions (see (300)[57] from the Mayan language, Tseltal, for example).

---

[57]This example includes an exact reproduction of the transcription, gloss and translation from Brown and Levinson (1993). I have omitted explicit labelling of the Figure and the Ground of the description from the original.

(300) te lapis ay   ta   ajk'ol yu-un   te limite
       the pencil EXIST PREP 'uphill' 3E-RELN the bottle
       'The pencil is uphill of the bottle' (Brown and Levinson, 1993, p55)

These descriptions can be conceptualised in terms of a *slope-based* FoR, the axes of which are derived from the directions of elevation change of a particular slope or, as in the case of Tseltal, the direction of overall elevation change in a region. The slope that defines the axes of a particular slope-based FoR is its Anchor.

A second entity frequently used as an Anchor of an FoR is the body of the speaker. An example of a spatial description in which this is the case is the English description of orientation shown in (301). In this the direction *left* is derived directly from the left-right asymmetry of the body of the speaker. The speaker can therefore be considered the Anchor of the FoR referenced in this description; the conceptual structure of this description is represented schematically in Figure 24.

(301)   The truck is facing to the right

As the name suggests, the Origin of an FoR is the entity that sits at its centre. This is the location from which the directions associated with an FoR are calculated and the location from which search regions are projected. This means that in descriptions of orientation and motion the Origin of the description can be identified as the Figure of the description, while in descriptions of location the Origin can be identified with the Ground. For example, in the English description of location in (302), 'the green box' (the Ground) can be identified as the Origin of the FoR, as it is from this location that the search region for the ball (the Figure) is projected; the conceptual structure of this description is shown schematically in Figure 25.

(302)   The ball is to the right of [the green box]$_{\text{Origin}}$

172

"The truck is facing to the right."

Figure = Origin

Anchor

Figure 24: A schematic representation of the conceptual structure of the description of location presented in (301). The scene is viewed from above and all defining conceptual entities (Figure, Anchor and Origin) are labelled.

Whereas, in the description of motion in (303), it is the truck (the Figure) that is the Origin of the description, as the direction 'right' - derived from the bodily asymmetry of the speaker - is calculated at its location; the conceptual structure of this description is represented schematically in Figure 26.

(303)   [The truck]$_{\text{Origin=Figure}}$ is moving to the right

It is standard practice in the literature to classify FoRs based on a number of properties related to their Anchor. These include the nature of the entity that functions as the Anchor, the relationship between the Anchor and Origin, the manner in which the axes of the FoR are derived from the Anchor and the extent to which the axes of an FoR have been *abstracted* from their original Anchor. Within these general properties there are a number of different distinctions that can be made. In the remainder of this section I will present those distinctions that are relevant to the classification system that I will use when discussing the FoR inventory of CZ. For the large part this overlaps with the

``The ball is to the right of the green box.''
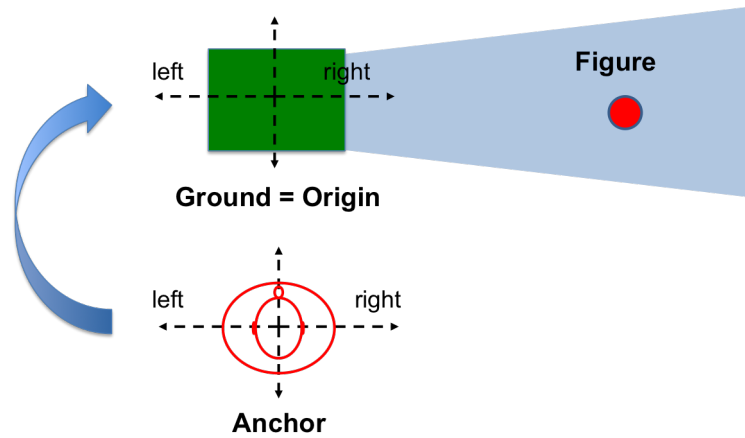
Figure 25: A schematic representation of the conceptual structure of the description of location presented in (302). The scene is viewed from above and all defining conceptual entities (Figure, Ground, Anchor and Origin) are labelled.

classification system used by the Mesospace project (described in O'Meara and Pérez Báez (2011)); where this is not the case it will be made clear.

7.3.2 Head-anchored versus angular-anchored FoRs

In Bohnemeyer and O'Meara (2012) the authors present a framework for conceptualising linguistic FoRs in terms of the mathematical concept of *vectors*. Unlike the notion of vectors used in Vector Space Semantics (see for example Zwarts and Winter (2000) and Bohnemeyer (2012)), however, the vectors used by Bohnemeyer and O'Meara (B&OM) in describing FoRs do not have any magnitude associated with them and might therefore better be thought of a as simply *directions*. For ease of comparison with the original paper, however, I have retained the original vectorial terminology.

According to Bohnemeyer and O'Meara (2012, p32) an FoR is defined by at least one vector. This vector defines one half axis of the FoR, with the other three half axes being inferred from its direction. For example, in a description such as that in (304),
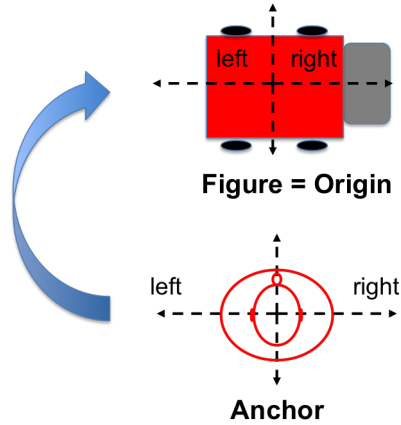
``The truck is moving to the right.''
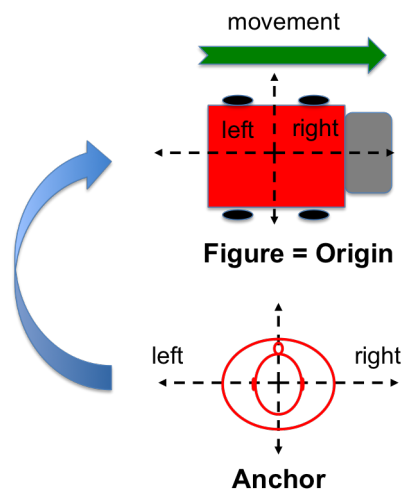
Figure 26: A schematic representation of the conceptual structure of the description of location presented in (303). The scene is viewed from above and all defining conceptual entities (Figure, Anchor and Origin) are labelled.

B&OM consider the vector running between the 'pier' and the 'church' to define a full co-ordinate system, or FoR. The FoR referenced in (304) is represented graphically in Figure 27.

(304)   The person is towards the pier from the church

As part of their framework Bohnemeyer and O'Meara (2012) identify two distinct
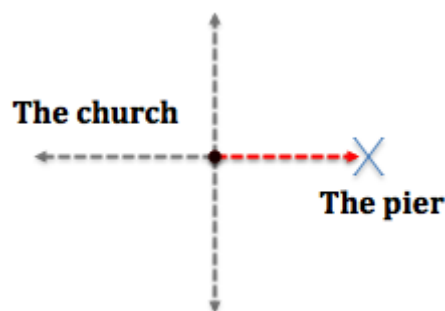
Figure 27: A schematic representation of the conceptual structure of the head-anchored description of location in (304)

The car ┅┅┅┅┅┅┅┅┅┅┅┅⟶ **The church**
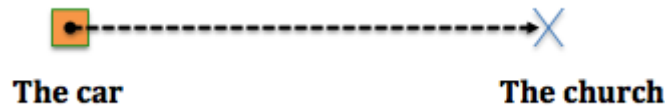
Figure 28: A schematic representation of the conceptual structure of the head-anchored description of orientation in (305)

strategies for defining an FoR-defning vector. One of these strategies, exemplified in (304), is to specify two locations/objects between which the vector runs. One of these locations/objects is necessarily the Origin of the FoR (the 'church' in (304)), while the other location/object - the *head* of the vector - is the *Anchor* (the 'pier' in (304)). The resulting vector and FoR are described by Bohnemeyer and O'Meara (2012) as being *head-anchored*. Another example of a spatial description referencing a head-anchored FoR is presented in (305), and its conceptual structure is schematised in Figure 28.

(305)   The car is facing the church

The second strategy for defining a vector described by B&OM is to state an angle relative to some other direction. Almost always this angle is zero, and therefore unstated, meaning that the vector is aligned with the defining direction. This type of vector and the FoR it defines are referred to by B&OM as *angular-anchored*. A prototypical example of an angular-anchored vector is that which defines the slope-based FoRs discussed above. In these the defining vector is aligned with the change of elevation of the slope that is the Anchor of the description. The conceptual structure of the English slope-based description in (306) is represented schematically in Figure 29.

(306)   The car is facing uphill

In my discussion of the FoRs used by CZ speakers I will refer to all of those FoRs that are head-anchored as *landmark-based* FoRs. FoRs that are angular-anchored will be divided

176
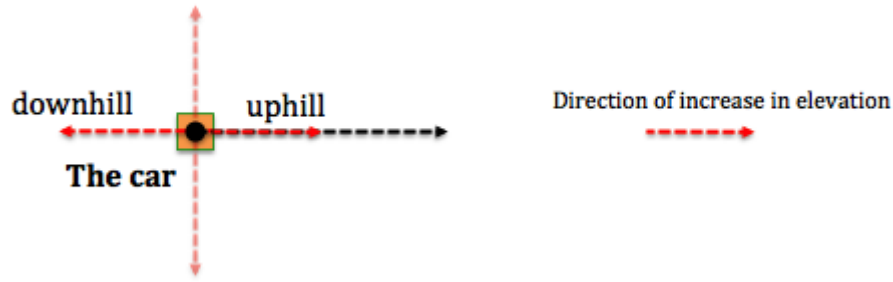
Figure 29: A schematic representation of the conceptual structure of the angular-anchored description of orientation in (306)

between a number of different categories of FoR, the bases of which are described in the sections immediately following this.

7.3.3 Intrinsic versus extrinsic

With regards to the relationship between Anchor and Origin of an FoR, the key opposition is between *intrinsic* and *extrinsic* FoRs. An intrinsic FoR is one for which the Anchor and Origin are the same entity, meaning that the axes of the FoR point in directions derived from intrinsic asymmetries of the entity that performs the function of the Origin. In an intrinsic description of location, therefore, the Figure is located in a search region defined through reference to an FoR whose axes are derived from the intrinsic asymmetries of the Ground. For example, in (307) - used to describe the spatial array in Figure 30 - the Figure (the person) is located in a search region defined through reference to axes whose direction are derived from the location and orientation of the 'front' facet of the house. Importantly, in this instance this facet has been assigned based on the orientation-independent, intrinsic properties of the house.

(307)   The person is in front of the house

In an intrinsic description of motion, in contrast, it is the Anchor and the *Figure* (rather than the Ground) that coincide. This type of description is exemplified in (308),

177
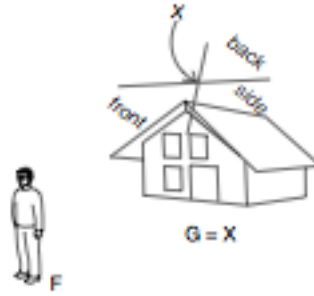
Figure 30: A diagram (copied from Levinson (2003, p40)) showing the spatial array described by (307)

in which the direction, *left* in which the Figure moves is defined based on her own bodily asymmetry.

(308)   **The player took a step to her left** before taking the penalty

As the definition of a description of orientation given in Section 3.5.1 requires the alignment of a facet of the Figure with an *external* direction, it is not possible to give a truly intrinsic description of orientation.

In the subsequent discussion of the CZ FoR inventory, I identify two intrinsic FoRs. As with the landmark-based FoRs mentioned in the previous section, the key distinction between these two types of intrinsic FoR is that in the case of one - the so-called *direct* FoR (discussed in Section 8.4) - is *egocentric*, meaning that its Anchor is the speaker. In contrast, the other intrinsic FoR - the so-called *object-centered* FoR (discussed in Section 8.2) - is *allocentric*, meaning that its Anchor is some entity *other than* the speaker. An example of the former being referenced in an English description of location is provided in (309), while the latter has already been exemplified in (307) above.

(309)   The ball is to my left hand side

Extrinsic FoRs on the other hand are defined in opposition to intrinsic FoRs and are

therefore those FoRs for which the Anchor and the Origin are distinct entities. Examples of extrinsic FoRs include the slope-based FoRs discussed above, the western cardinal co-ordinates (an example of an absolute FoR) and descriptions, such as that in (310), in which the body of the speaker is the Anchor of the description, but not the Origin.

(310)   The ball is to the left of the rock

As with the landmark-based and intrinsic FoRs discussed above, egocentric extrinsic FoRs - generally referred to as the *relative* FoR - are singled out for special attention; a number of examples of this type of FoR have already been given, including (310) above. It is also common practice to distinguish amongst allocentric extrinsic FoRs that are Anchored by environmental entities, such as slopes, rivers, wind directions etc. These frames can be referred to by a number of different names. The most general term used is *geocentric* as this indicates simply that they are anchored by an environmental entity. Depending on whether the FoR in question is considered to be *abstracted* from its Anchor or not (discussed more in Section 7.3.4) they can also be described as *geomorphic* (not abstracted) or *absolute* (abstracted).

7.3.4   Abstraction

In his 2003 monograph, Levinson uses three related properties - abstraction, fixedness and arbitrariness - to define a subset of allocentric FoRs as *absolute*. As Palmer (2015, p193) puts it, these three properties of absolute FoRs referenced by Levinson can be considered different "faces of the same notion", or at the very least as three interrelated notions. The property of abstraction refers to the claim that absolute FoRs are entirely 'free' of their Anchors, affected neither by their current orientation or location. The notion of fixedness refers to the fact that, in Bohnemeyer's words, absolute FoRs define "bearings that can be considered fixed relative to the totality of space" (Bohnemeyer, 2011, p893). Finally, the property of arbitrariness refers to the fact that once a set of

directions have been fixed, it doesn't matter from where they originally came, only that everyone in the speech community that uses them agrees about their orientation relative to the earth.

A number of these notions have been challenged in the literature, most notably by Palmer (2015). In particular, Palmer challenges the idea that any FoR can be truly arbitrary and abstract, claiming that all FoRs rely on the use of local environmental cues in order to maintain their orientation (Palmer, 2015, p191). He also takes issue with the definition of 'fixedness' used by both Levinson and Bohnemeyer, arguing that FoRs that Levinson and Bohnemeyer would not consider fixed (the radial mountain-sea FoRs common in the Pacific for example) in fact are "'fixed' within the conceptual frame work within which they operate"(Palmer, 2015, p221)[58].

Although I share some of Palmer's concerns regarding the generalisability of Levinson and Bohnemeyer's definitions of absolute FoRs, I do consider there to be justification for giving a subset of geocentric FoRs a special status. The property I will principally reference in this regard will be the extent to which an FoR can be used in isolation from its Anchor, which I consider to be a gradable, rather than a binary (as appears to be suggested by Levinson and Bohnemeyer) property. To take slope-based FoRs as an example, at the geomorphic end of the abstraction spectrum are those slope-based FoRs that can only be used to describe spatial arrays located on (or at least very near) the anchoring slope, as in English, for example. At the other, absolute, end of the spectrum, are those slope-based FoRs that, having been entirely abstracted from their Anchors, can in principle be used anywhere on Earth; the slope-based FoR used by the Tseltal speakers of Tenejapa falls into this latter category[59].

---

[58]See Palmer (2015) for a summary of such systems

[59]See the anecdote related to the use of the Tenejapan slope-based FoR in an unfamiliar urban environment in Levinson (2003, p4) for example.

8 The object-centered FoR and related FoRs

8.1 Introduction

In this section I will first discuss the expression and use of the object-centered FoR in CZ. I will subsequently discuss those egocentric FoRs - the direct and relative FoRs - that are expressed using a subset of the linguistic resources used to express the object-centered frame.

8.2 Object-centered FoR

8.2.1 Unambiguously object-centered descriptions of location

As described in Section 7.3.3, an object-centered FoR is one for which the Anchor and Origin coincide (i.e. it is intrinsic) and for which the Anchor is an entity other than the body of the speaker (i.e. it is allocentric). An example of an object-centered description of location in English is shown in (311).

(311)   **The person is in front of the house**, where the door is

As described in Section 4.3, CZ locative clitics (with the exception of the vertical locative clitics *kəhsi* 'LOC4' and *kəʔmə* 'LOC5') have topological semantics. As a result, the object-centered FoR is manifested in CZ through the *combination* of relational spatial nouns (RSNs) and these topological locative clitics.

The unambiguously object-centered descriptions of location in CZ are those whose spatial adjunct features one of the conventionalised RSN-LOC combinations discussed in Section 4.2.5. These include those conventionalised combinations featuring the RSNs from Table 14 (as in (312) and (313), describing Figure 31a and 31b respectively) plus the combinations *kopak=ʔomo* 'head=LOC3' (as in (314)[60], describing Figure 32a),

---

[60]The use of the perfective clitic *ʔam* in contexts such as this requires further investigation, although based on my data it appears to be related to the use of the clitic *ti* 'still' in the same clause.

kətə=kəʔmə 'underneath=LOC5' (as in (315), describing Figure 32b) and *wakaŋ=ʔomo* 'haunches=LOC3' (as in (316), also describing Figure 32b).

(312)   teʔ *pelota* **j-ʔukaŋ=kəʔmə**   ø-ʔit-u
               DET ball   3A-back.region=LOC5 3B-EXIST-CP
               'The ball is behind it' (B, B&C 4-1)

(313)   teʔ=ʔis   **j-winaŋ=ʔomo** ø-ʔit-u   tumə *pelota*
               3PRO=3GEN 3A-front=LOC3 3B-EXIST-CP one   ball
               'In front of it (lit: in its front) is a ball' (LG, B&C 3-12)

(314)   teʔ=se=ti   ø-məks-nej-keʔt-u=ʔam   *pero*
               NEUT=SIM=still 3B-to.be.upside.down-ASSUMP-REP-CP=PERF but
               j-kopak=ʔomo=se ø-ʔit-keʔt-u   *pelota*
               3A-head=LOC3=SIM 3B-EXIST-REP-CP ball
               'It (the chair) is still upside down, but the ball is sort of near its head again (the top part when in canonical orientation)' (C, B&C 1-11)

(315)   teʔ poʔks-tək j-waŋgaŋ-wə-jah-u   i   teʔ poʔks-tək=ʔis
               DET sit-INSTR 3A-to.be.upside.down-POS-3PL-CP and DET sit-INSTR=3GEN
               j-kətə=kəʔmə   ø-ʔit-u   teʔ *pelota*
               3A-underneath=LOC5 3B-EXIST-CP DET ball
               'They put the chair in an upside down position and the ball is by its underneath part' (AG, B&C 1-6)

(316)   jəʔki n-tsoʔŋ-keʔt-u=t   ʔeja=pə poʔks-tək ø-ʔit-u=pə   kəhsi
               here 1A-hold-REP-CP=1ERG other=REL sit-INSTR 3B-EXIST-CP=REL above
               pelota, teʔ **j-wakaŋ=ʔomo**, j-kuk=mə   ø-ʔit-u
               ball,   DET 3A-haunches=LOC3, 3A-middle=LOC1 3B-EXIST-CP
               'Here I hold another chair that there is a ball above, it is in the space between its legs, in its middle' (C, B&C 1-6)

An important point to note is that, of those descriptions of location featuring an RSN from Table 14, only those in which the RSN has been assigned to its possessor in an *orientation-independent* manner are classified as being object-centered. An example of this type of assignment is shown for a chair in Figure 33. Comparing the assignment of the apparent assignment of these terms in (312) and (313) with that in Figure 33

(a)   (b)

Figure 31: The images described in (312) and (313) (Bohnemeyer and Pérez Báez, 2008).

(a)   (b)

Figure 32: The images described in (314) and (316) (Bohnemeyer and Pérez Báez, 2008).

confirms that they are indeed object-centered in nature.

8.2.2 Object-centered descriptions of motion

The object-centered FoR is manifested in descriptions of motion through the use of those conventionalised RSN-LOC combinations featuring RSNs from Table 14 that are also used in descriptions of location. It is presumably also possible to use the other RSN-LOC combinations used in object-centered descriptions of location, however, contexts in which this would be felicitous are not common. As has been described in the introduction to this section, there are two ways in which it is possible to define the directions of the axes of an object-centered FoR, either based on the intrinsic asymmetries of the Figure or on an asymmetry induced by its motion. As in descriptions of location, in CZ these different strategies are reflected in the manner in which the RSN in the relevant RSN-LOC combination has been assigned to its possessor.
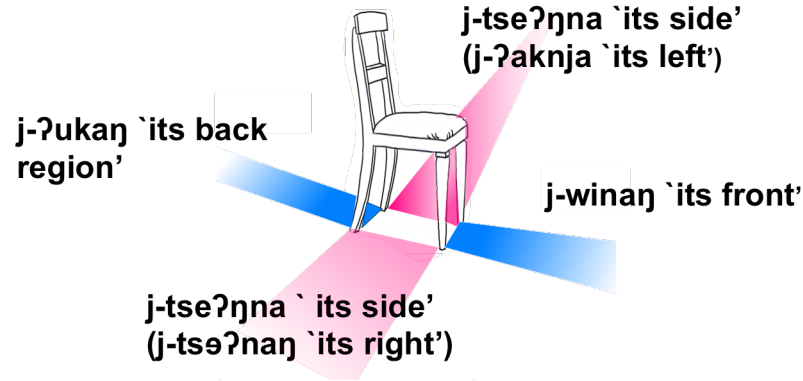
Figure 33: The orientation-independent assignment of those RSN in Table 14 used to instantiate the object-centered FoR exemplified for a chair.

(317)   te?ji ka   ø-ki?m-i   *dos cuadros*, **te?ji ?u?ts.witu-a**
        then FUT 3B-ascend-DEP.I two squares, then turn-IMP
        j-?aknja=?omo, te?ji ka   ø-ki?m-i
        3A-left=LOC3,   then FUT 3B-ascend-DEP.I
        'Then it will ascend two squares, then turn it to its left, then it will ascend'
        (AT, MG)

In (317), for example, the direction of travel of the Figure (a toy person travelling through a maze) is changed with reference to the *?aknja* 'left' of the Figure. This 'left' can unambiguously be said to have been assigned to the Figure on the basis of its own asymmetries as these were the reverse of those of the speaker.

8.2.3 Discussion: intermediate descriptions of location

I have referred to those descriptions of location described above as being unambiguously object-centered to contrast them with descriptions of location that have denotations of the sort expected of an object-centered description of location - i.e. the location of a Figure in a search region projected from a facet of an object - but whose semantics are fundamentally topological in nature. I refer to these object-centered-like descriptions of location as an *intermediate* description of location.

One example of these intermediate descriptions are those whose spatial adjunct is a

PP headed by the locative clitic *kəʔmə* 'LOC5' and containing an RSN from Table 13. The combinations of such RSNs and *kəʔmə* 'LOC5' are non-conventionalised, meaning that their semantics are compositional and, ultimately, *topological*, due to the semantics of *kəʔmə* 'LOC5' (described in Section 4.3.5). Examples of this type of description are given in (318) and (319).

(318) jəʔ *silla* ø-ʔəŋ-u=pə=teʔ   nas=kəhsi   *i*   teʔ **j-kopak=kəʔmə**
       PRX chair 3B-lie-CP=REL=PRED ground=LOC4 and DET 3A-head=LOC5
       ø-ʔit-u   *pelota*
       3B-EXIST-CP ball
       'This chair is lying on the ground and near the part that is its top when in a canonical orientation (lit: its head) is a ball' (AG, B&C 1-10)

(319) **j-koso=kəʔmə**   ø-tək-nej-u   teʔ *pelota*
       3A-foot/leg=LOC5 3B-to.be.thrown-ASSUMP-CP DET ball
       'The ball is in a position as if it had been thrown near its (the chair's) feet' (P, B&C 1-8)

The proximal sense of *kəʔmə* 'LOC5', however, means that such spatial adjuncts denote a location that is *near to* the facet of the Ground denoted by the accompanying RSN. As the notion of proximity is not angularly restricted (a point in any direction could be defined as 'near' to the named facet) it does not meet the theoretical definition of a projective description given in Section 7.2.2. It is important to note, however, that it seems from my data that such descriptions are only used when the facet denoted by the RSN is the *closest* facet to the Figure, meaning that the spatial region denoted is angularly restricted pragmatically.

A very similar situation exists with a second group of apparently topological descriptions of location. These are those descriptions that contain a PP headed by the postposition *mə* combined with *k(aŋ)*. As discussed in Section 4.7, the semantics of *kaŋ* denote a region around the location denoted by spatial adjunct to which it is attached and there is no evidence to suggest that this region is angularly restricted. When com-

bined with a PP headed by *mɘ* 'LOC1' and featuring an RSN, however, it appears that, as with those PPs headed by *kɘʔmɘ* 'LOC5' discussed above, the region denoted is effectively restricted. In a similar way, therefore, such descriptions can be considered as an intermediate point between purely topological and projective descriptions of location.

In principle, the compound clitic *=mɘ=k(aŋ)* '=LOC1=APPROX' can be combined with any RSN and therefore represents a productive strategy for forming object-centered-like descriptions of location. In practice, however, this strategy is used fairly infrequently with PPs containing RSNs and then almost exclusively with the RSN *ʔuka* 'back' (as in (320)).

(320)   teʔ *pelota* nɘ   j-pahk-mɘʔŋ-u,   j-ʔuka=mɘ=kaŋ
            DET ball   PROG 3A-hit-bounce-DEP.II, 3A-back=LOC1=APPROX
            ø-ʔit-keʔt-u
            3B-EXIST-REP-CP
            'The ball is bouncing, again behind it (the chair)' (C, B&C 3-2)

An example of this strategy being used with an RSN other than *ʔuka* 'back' is shown in (321).

(321)   teʔ   j-koso=mɘ=kaŋ   ø-ʔit-u,   teʔ j-koso   kɘhsi nɘ
            3PRO 3A-foot/leg=LOC1=APPROX 3B-EXIST-CP DET 3A-foot/leg above PROG
            j-ken-u
            3A-look-DEP.II
            'It is by its feet, its feet are directed upwards' (R, B&C 1-5)

In the quantitative analysis of the data collected using staged communicative tasks - presented immediately below - I have coded descriptions such as those described above as *intermediate* descriptions.
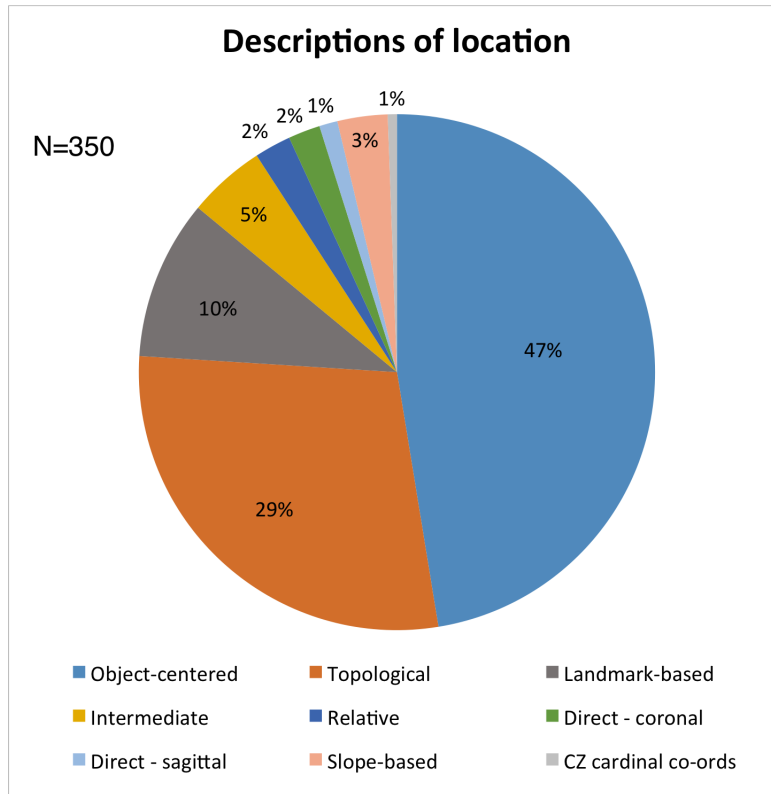
Figure 34: Plot showing the percentage (N=350) of descriptions used to describe the location of the ball of the B&C stimuli in the horizontal plane.

8.2.4   Discussion: usage

As can be seen from the quantitative data arising from the 5 runs of the B&C task I performed in Ocotepec - presented in Figures 34 and 35 - object-centered descriptions were clearly the favoured method of describing the location of the ball relative to the chair. Including the object-centered-like 'intermediate' descriptions, we can see that projective descriptions anchored by the intrinsic asymmetries of the Ground are overwhelmingly preferred in contexts such as those found in the B&C task, i.e., one in which a stereotypical Figure is located relative to a faceted, stereotypical Ground.

This pattern of use is consistent both with that observed throughout the other parts of my data - including more naturalistic varieties - and the general pattern of FoR prefer-

Descriptions of orientation

N=198

CZ cardinal 9%

Slope-based 12%

Relative 15%

Landmark-based 64%
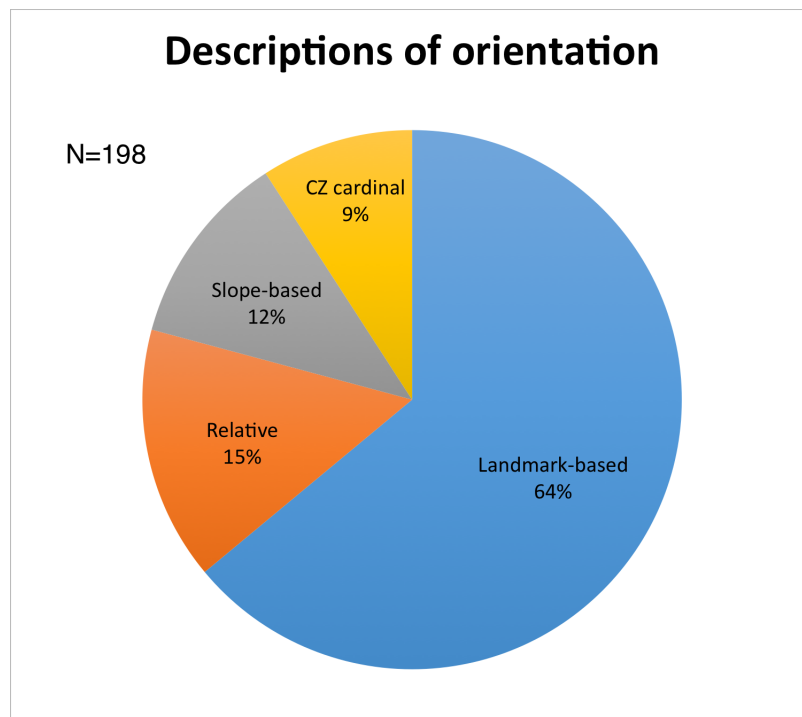
Figure 35: Plot showing the percentage (N=198) of descriptions used to describe the orientation of the chair of the B&C stimuli in the horizontal plane.

ences reported for speakers of Mesoamerican languages by the MesoSpace collaboration (see O'Meara and Pérez Báez (2011) for a summary, and the articles published as part of the same special issue for details).

Object-centered descriptions of motion are also observed, albeit marginally, in my data. In all cases the clause containing the spatial adjunct encoding the object-centered FoR is predicated by the verbal stem, *ʔuʔts.witu* 'turn', which is used to indicate a change in the direction of motion (in (322), for example).

(322) jak-kət-ə   teʔ *cuadra*=ʔomo **teʔji ʔuʔts-witu-ə teʔ=se**
       CAUS-pass-IMP DET block=LOC3   then fold-return-IMP NEUT=SIM
       j-tsəʔnaŋ=ʔomo
       3A-right=LOC3
       'Make it pass the block then turn to its right, like this' (AT, MG)

Given the broad variety of descriptions of motion available in my data it therefore seems reasonable to conclude that object-centered descriptions of motion are principally used in descriptions of change of motion direction. It is worth noting that this situation is not disimilar to that in English and is possibly related to the speaker wanting to provide information regarding the direction of motion relative to reference objects. The object-centered FoR is used more freely in descriptions of motion once 'general' direction of travel has been determined.

For completeness I note that there are no examples of object-centered descriptions of orientation found in my data, due to the fact that these are not possible. There are, however, a small number of descriptions of orientation that had the *appearance* of object-centered descriptions given during the B&C tasks performed in Ocotepec (see (323), for example).

(323) teʔ poʔks-tək=ʔis j-neʔ   j-teʔts.tək ø-ken-u   j-ʔaknja=ʔomo
       DET sit-INSTR=3GEN 3A-ANAP 3A-backrest 3B-look-CP 3A-left=LOC3
       'The chair's backrest is directed towards the left' (B&C 2-8, AT)

As will be discussed in more detail in the following section, the reason that this description is not object-centered despite the RSN *ʔaknja* 'left' being possessed by the Figure itself is that the assignment of this term to the Figure has not been done on the basis of the intrinsic asymmetries of the chair, but rather based on those imposed by the perspective of the speaker. This descriptions is therefore an example of a relative description of orientation.

8.3 The relative FoR

8.3.1 Introduction

The relative FoR is egocentric and, importantly, extrinsic, meaning that although the axes of the co-ordinate system are dervied from the bodily asymmetries of an speaker, the speaker themselves do not sit at the Origin. In a relative description of location, such as (324), therefore, the asymmetries of the speaker are used to project spatial regions from a separate Ground (the rock in (324)).

(324)   The girl is in front of the rock

In relative descriptions of orientation and motion - exemplified in (329) and (332) respectively - the asymmetries of the speaker are used to align either a facet of the Figure or its direction of motion.

(325)   The boy was facing to the right

(326)   The car accelerated to the left

(a) B&C 1-10   (b) B&C 1-3

Figure 36: The images described in (327) and (328) (Bohnemeyer and Pérez Báez, 2008).

8.3.2 Manifestation in CZ descriptions of location

One strategy[61] for expressing the relative FoR in CZ descriptions of location is the use of a spatial adjunct featuring an RSN from Table 14 possession by the Ground of the description. As can be seen by comparing the relative description in (327) (describing Figure 36a) and the object-centered description in (328) (describing Figure 36b) - both of which feature the RSN *tseʔŋna* 'side' possessed by a chair - the spatial adjuncts used to express both of these FoRs are formally identical.

(327) j-kopak=ʔomo ø-ʔit-u *pelota* ø-ʔəŋ-na   ø-ʔit-u   tumə
    3A-head=LOC3 3B-EXIST-CP ball 3B-to.be.lying-POS 3B-EXIST-CP one
    poʔks-tək …**j-tseʔŋna=ʔomo** *i* j-kopak=ʔomo
    sit-INSTR …3A-side=LOC3 and 3A-head=LOC3
    'A ball is by its head, there is a chair lying down …to its side and by its head'
    (C, B&C 1-10)

(328) teʔ poʔks-tək=ʔis **j-tseʔŋna=ʔomo** ø-ʔit-u   tumə *pelota*
    DET sit-INSTR=3GEN 3A-side=LOC3 3B-EXIST-CP one ball
    'The ball is to the side of the chair' (LG, B&C 1-3)

The descriptions in (327) and (328) represent examples of two distinct FoRs due to the basis on which the RSN *tseʔŋna* 'side' has been assigned to its possessor. In the object-centered description in (328) the 'side' of the chair has been assigned to the facet of the chair that is aligned perpendicular to the part of the object that performs its

---

[61]The other strategy is discussed in Section 9.4.
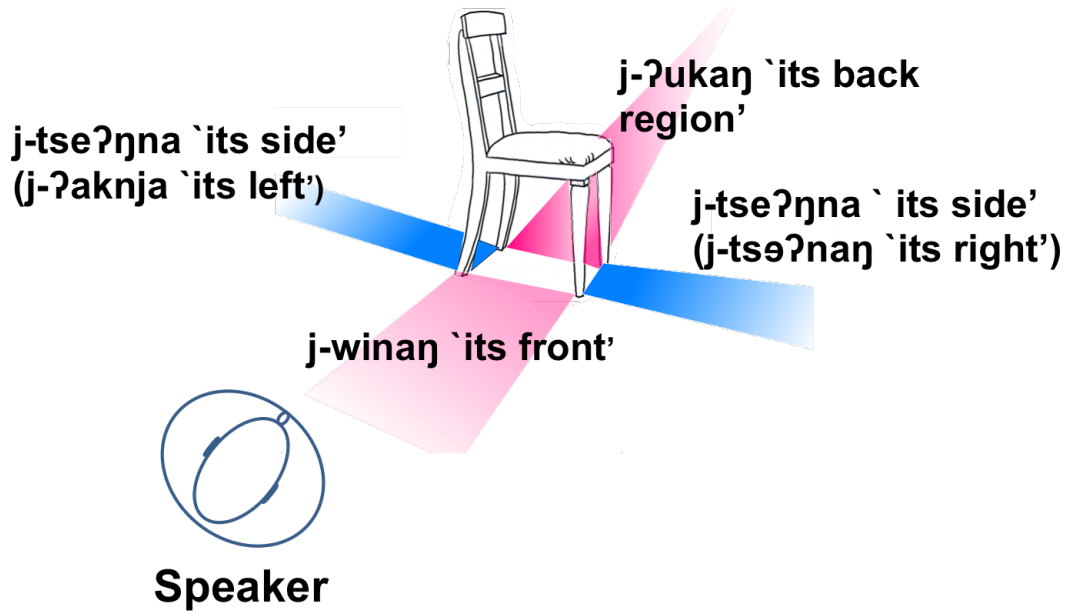
Figure 37: The assignment of those RSNs in Table 14 used to instantiate the relative FoR exemplified for a chair

primary function, the *intrinsic front*. In the relative description in (159), however, the 'side' of the object is the facet that is aligned perpendicular to the part of the object that is nearest to the speaker, the *relative front*. The relative assignment of those RSNs in Table 14 to a chair is shown in Figure 37 and can be compared with Figure 33 to better appreciate the differences between relative and object-centered descriptions of location.

8.3.3 Manifestation in CZ descriptions of orientation

The RSNs listed in Table 14 are also used to form relative descriptions of orientation. As can be seen from the representative example in (329), however, in contrast to those relative descriptions of location described above, relative descriptions of orientation typically feature RSNs possessed by their *Anchor* (the speaker) rather than their Origin (the Figure). Formally this is represented by the relevant RSNs taking the 1st person set-A suffix *n-*.

(329) jəʔki, jəʔ poʔks-tək **n-tsəʔnaŋ=ʔomo** ø-ken-u
    here, PRX sit-INSTR 1A-right=LOC3 3B-look-CP
    'Here, this chair is directed towards my right' (B, B&C 2-8)

(330) jəʔ poʔks-tək jəʔmə nə j-ken-u   **n-ʔaknja=ʔomo**
    PRX sit-INSTR here PROG 3A-look-DEP.II 1A-left=LOC3
    'This chair here is facing to my left' (MJ, B&C)

The PPs used to form relative descriptions of orientation (and motion) are the same as those used to form direct (egocentric, intrinsic) descriptions of location discussed in Section 8.4.2. That these descriptions of orientation are indeed relative in nature and not direct can be seen simply from the fact that, as explained in Section 3.5.1, it is not possible to have intrinsic descriptions of orientation. It can, however, be understood in more detail by considering that although the PPs in question denote spatial regions projected from the speaker, their combination with an orientational predicate requires - by virtue of the conceptual structure of descriptions of orientation - that the FoR that they define be centered on the *Figure* of the description.

As mentioned at the end of Section 8.2.4, although a considerable majority of relative descriptions of orientation featured RSNs possessed by the speaker, some consultants in fact formed such descriptions using the same RSNs possessed by the Figure, as in (331) (repeated from (323)).

(331) ø-ʔit-keʔt-u   tumə poʔks-tək j-neʔ **j-tsəʔnaŋ=ʔomo**
    3B-EXIST-REP-CP one sit-INSTR 3A-ANAP 3A-right=LOC3
    ø-ken-u=pə=ʔis=j-neʔ   nj-poʔks-ʔoj-tək
    3B-look-CP=REL=3GEN=3A-ANAP 2B-sit-ANTIP-INSTR
    'There is also a chair whose seat (lit: the thing used for you to sit) is directed
    towards the right (lit:its right)' (B, B&C)

8.3.4 Relative descriptions of motion in CZ

As demonstrated by the representative examples in (332) and (333), relative descriptions of motion in CZ feature the same type of PPs as are found in relative descriptions of

orientation, i.e., those that contain an RSN from Table 14 possessed by the speaker.

(332) ha   j-kiʔm-ə=pə=teʔ   n-neʔ   **n-ʔaknja=ʔomo,**
       NEG 3A-ascend-DEP.I=REL=PRED 1A-ANAP 1A-left=LOC3=PRED,
       n-tsəʔnaŋ=ʔomo=teʔ ø-məʔn-u=pə
       1A-right=LOC3=REL
       'It didn't ascend to my right, it descended to my left' (AT, MG)

(333) ø-ʔuʔts.witu-u teʔji,   n-neʔ   **n-tsəʔnaŋ=ʔomo**
       3B-turn-CP   MED;LOC2, 1A-ANAP 1A-right=LOC3
       'He turns there, to my right' (AT, MG)

Unlike what was described for descriptions of orientation, there are no examples of PPs containing 3rd person possessed RSNs being used to express the relative frame in descriptions of motion in my data. There is no obvious reason to believe, however, that this manifestation of the relative FoR is not also possible in the motion domain.

8.3.5 Discussion: relative use with faceted versus unfaceted Ground

As can be seen from Figure 34, in my B&C data the relative FoR was observed in descriptions of location with the sort of extremely low rate comparable with other MA languages[62]. This, however, underestimates the use of the relative FoR in descriptions of location on a small and intermediate scale in my wider data set. The principal reason for this underestimation is the fact that in the B&C stimuli the most typical Ground (the chair) is a faceted object and therefore capable of supporting those object-centered descriptions to which relative descriptions of location are formally identical.

Across both my B&C data and my wider data set, when there is a potential clash of the object-centered and relative frame, the object-centered frame is overwhelmingly preferred. The discrepancy between the frequency of use of the relative FoR in the two

---

[62]See O'Meara and Pérez Báez (2011) for a summary of the language sample investigated by the MesoSpace project and the other articles in the same special issue for details of the specific languages in this sample. Furthermore, see Danziger (2011) for a relevant discussion of Mopan Maya and Levinson (2003); Brown (2006), amongst others, for further details on the limited use of the relative in Tenejapan Tseltal.

Figure 38: The spatial array described in (334) (Levinson et al., 1992).

parts of my data therefore arises from its use in contexts in which the stated Ground does *not* support object-centered descriptions, such as that exemplified in (334). This description was used to describe the spatial array shown in Figure 38.

(334)　tumə ø-ʔit-u　　kuhj, **j-winaŋ=ʔomo** ø-ten-u　　teʔ pən.tsək.i
　　　　one　3B-EXIST-CP tree,　3A-front=LOC3　3B-stand-CP DET toy.person
　　　　'There is a tree, in front of it (lit: to its front) is the toy person' (P, OO)

8.3.6　Discussion: coronal versus sagittal uses of the relative

A further point of discussion arises from the fact that the uses of the relative FoR there were in my B&C data were all along the coronal (left-right) axis; this absence of sagittal

(sagittal) uses of the relative FoR is also observed in descriptions of location featuring faceted Grounds in my wider data set. In contrast, as can be seen from (334) (above) and (335) (describing the location of a toy figure relative to cylindrical glass placed on its end as part of a description of a motion event), the relative was used freely along both axes with facetless Grounds.

(335)　　…teʔji　　ø-tsəʔj-pa　　ø-ten-u=pə　　teʔ tsima=ʔis=j-neʔ
　　　　　…PRX;LOC2 3B-remain-ICP 3B-stand-CP=REL DET glass=3GEN-3A-ANAP
　　　　　j-ʔaknja=ʔomo
　　　　　3A-left=LOC3
　　　　　'Then it (the figure) remained standing to the left of the glass' (LG, E)

Variation between the use of the two axes of the relative FoR has now been observed in a number of languages - including the Mayan language Tseltal (Brown, 2006, p268) and Yucatec Maya (Bohnemeyer and Stoltz, 2006, p306) - and this suggests strongly that the two relative axes develop separately. Levinson and Wilkins (2006, p549) have further hypothesised that it is the sagital relative axis that develops before the coronal one, stating that "if a language has relative 'left' and 'right' expressions, then it certainly has relative 'front' and 'back' ones". The pattern of use in CZ suggests that when talking about the use of the relative FoR with faceted Grounds the order might actually be the reverse of that for facetless Grounds.

8.3.7　Discussion: age dependence of relative use

A final point to note regarding the use of relative descriptions of location in my data is that there is evidence that the likelihood of a CZ speaker using one of the relative descriptions described so far to locate a Figure along their coronal axis is related to their age[63]. One piece of evidence for this claim is the fact that across all my data there is a significantly larger number of relative descriptions provided by consultants in their

---

[63]There doesn't appear to be any equivalent effect along the sagittal axis, adding further evidence to the hypothesis that these two axes are in fact separate conceptual entities.

30s or younger than by speakers in their 40s or older. For example, during the B&C task only one of the relative descriptions is provided by a consultant older than 30, the consultant in question being 36.

My data suggests that when using an egocentric FoR to locate a Figure, older speakers prefer to use descriptions in which an RSN from Table 14 is possessed by themselves rather than some external Ground. An exchange that occured during a run of M&T that exemplifies this apparent generational difference in egocentric FoR preference is here reproduced. In the first part of this exchange the matcher (who was 21) offered for judgement by the director (aged 48) a description of the image that he thought she had previously described (shown in Figure 39).

(336)   **j-tsɘʔnaŋ=ʔomo** ø-ʔit-u?
        3A-right=LOC3   3B-EXIST-CP?
        'Is it (the person) to its (the tree's) right?' (JC M&T 2-4)

In response the director offered the description in 14, in which rather than refer to a facet of the prototypical Ground in the scene (the tree), she refers to her own left-hand side.

(337)   teʔ ŋ-kaʔe **n-ʔaknja=ʔomo=te** ø-ʔit-u=pɘ
        DET M-youth 3A-left=LOC3=PRED   3B-EXIST-CP=REL
        'The boy is to my left' (BR, M&T 2-4)

The director subsequently gave a description in which she used the figure of the boy as a Ground and provided an object-centered description of the location of the tree. She then finally offered the description of the scene in (338), in which it is clear that she considered the spatial adjunct *j-tsɘʔnaŋ=ʔomo* '3A-right=LOC3' to be object-centered rather than relative in nature. This can be seen from the fact that this is the only way in which (338) is a felicitous description of Figure 39.

197

Figure 39: M&T 2-4 (Levinson et al., 1992), described in (336)-(338)

(338) hiʔn=te **j-tsəʔnaŋ=ʔomo=pə** teʔ kuhj **n-tsəʔnaŋ=ʔomo=te**
    NEG.NV=PRED 3A-right=LOC3=REL DET tree 1A-right=LOC3=PRED
    ø-ʔit-u=pə
    3B-EXIST-CP=REL
    'It isn't to its (the boy) right, it's to my right' (BR, M&T 2-4)

It is standard in the literature to classify any description of location in which a Figure is located through reference to a facet of a speaker as featuring the *direct* (egocentric, intrinsic) FoR discussed in the following section. In Sections 8.4.4 and 11 I will argue that in fact apparently direct descriptions of location such as that in (338) would be better classified as instances of *Groundless* relative descriptions. This reclassification would then redefine the generational difference observed in the preferred form of expressing egocentric FoRs to one between relative descriptions in which a Ground is explicitly stated (younger speakers) and ones in which a Ground is inferred from context (older speakers).

Regardless of the precise nature of this generational difference, it seems reasonable to hypothesise that it is a product of the increase in contact with Mexican Spanish that speakers of CZ have experienced over the last few decades. Indeed, it is an interesting observation that the youngest generation that show signs of an increased use of prototypical relative descriptions of location (those that reference a facet of the Ground and not

the speaker) are those that were born around the time (approximate 30 years ago) that the highway first arrived in Ocotepec, bringing with it increased outside influence. Similar increases in the use of relative descriptions of location under the influence of Mexican Spanish have been observed for Otomi (Otomanguean, Mexico; Hernández-Green et al., 2011) and Tseltal (Mayan, Mexico; Polian and Bohnemeyer, 2011).

8.3.8 Discussion: usage in descriptions of orientation and motion

Across the whole of my data set, relative descriptions of orientation were used with a similar frequency to that of other angular-anchored FoRs, for example, the slope-based FoR that has been mentioned a number of times already (and will be discussed in Section 9.3). It was, however, used considerably less frequently than landmark-based FoRs. As will be discussed more in Section 10.2.3, this is in keeping with the observation made by Bohnemeyer (2011) that speakers of languages who prefer to use object-centered descriptions of location usually prefer the use of landmark-based FoRs in descriptions of orientation.

In descriptions of motion in Ocotepec - either on a small scale, like in referential communication tasks, or a larger one, like describing routes around town - the relative FoR was used very infrequently compared to the slope-based FoR and the two intrinsic FoRs (the object-centered FoR and the direct FoR).

When motion that had been observed on a computer screen was described, however, it was not uncommon for speakers to make reference to the 'left' or 'right' of the screen. An example of this usage is shown in (339).

(339) tumə jomo nə   j-maŋ-u   j-neʔ   j-tsəʔnaŋ=ʔomo
       one   women PROG 3A-go-DEP.III 3A-ANAP 3A-right=LOC3
       'A women is going to its (the screen) right' (ME, TRAJ)

8.4 The direct FoR

8.4.1 Introduction

The frame of reference referred to as the *direct* FoR in the literature is, like the object-centered FoR, intrinsic, however, in contrast to the object-centered FoR, it is also *ego-centric*. The combination of these properties means that in direct descriptions both the Anchor and the Origin are the speaker. In descriptions of location, such as (340), the Figure is therefore located relative to the speaker using directions derived from their own bodily asymmetries.

(340)   The ball is to **my right**

In direct descriptions of motion, such as (341), these intrinsic bodily asymmetries are used to define the direction of travel of the speaker.

(341)   I moved to **my left** to let the car past

8.4.2 Manifestation in CZ

The direct frame is also manifested in CZ through the use of those RSNs listed in Table 14. In contrast to relative descriptions, however, in direct descriptions these RSNs are possessed by the speaker, as indicated by their marking with the 1st person Set A suffix *n-*. Examples of direct descriptions of location and motion are shown in (342) and (343) respectively.

(342)   teʔ *pelota* n-winaŋ=ʔomo ø-ʔit-u
         DET ball   1A-front=LOC3 3B-EXIST-CP
         'The ball is in front of me (lit: in my front region)' (B, B&C 2-8)

(343)   ø-məʔn-jah-u=ʔtsi   həsikə ʔuʔts.witu-jah-u=ʔtsi n-ʔaknja=ʔomo
         3B-descend-PL-CP=1ABS then   turn-PL-CP=1ABS   1A-left=LOC3
         'We descended, then we turned to our left' (AT, E)

200

8.4.3 Discussion: usage patterns

In those descriptions of motion in which the speaker was the Figure - consultants describing routes they have taken, for example - the direct FoR was used consistently in my data. As is exemplified in the typical example in (344), in this context it was standard practice for speakers to describe *changes* of direction using the direct FoR, but directed motion using the slope-based FoR discussed in Section 9.3.

(344) teʔji   ø-ʔuʔts.witu-jah-keʔt-u=ʔtsi ʔən   n-dzəʔnaŋ=ʔomo,
       PRX;LOC2 1A-turn-EXCPL-REP-CP=1ABS 1PRO.GEN 1A-right=LOC3,
       ø-məʔn-jah-keʔt-u=ʔtsi   una cuadra . . .
       1A-descend-EXCPL-REP-CP=1ABS one block
       '*Then we turned to our right, we descended one block . . . '* (AT, E)

In this type of context, it was also commonly the case that speakers used the direct FoR to locate objects relative to themselves. An example of this is provided in (345), which was given during a guided walk around Ocotepec when the speaker was walking down the road that runs between the church and the town hall.

(345) *la iglesia* ø-tsəʔj-pa   n-ʔaknja=ʔomo *i* n-tsəʔnaŋ=ʔomo
       the church 3B-remain-ICP 1A-left=LOC3   and 1A-right=LOC3
       ø-tsəʔj-pa   *la presedencia*
       3B-remain-ICP the   presedency
       '*The church is on my left and the presendency is on my right*' (AT, E)

Both of the uses described above would also be typical in languages, such as English, in which the relative FoR is dominant.

8.4.4 Discussion: hybrid descriptions of location

It is clear from the data arising from referential communication tasks, however, that the direct FoR plays a more central role in the description of location in CZ than it does in those languages in which the relative FoR is dominant. This can be seen from

the frequent, and systematic, use of the direct FoR that would be uncommon in such languages.

These uses come in two varieties. One of these occurs when speakers describe spatial arrays in which a prototypical Figure (such as the ball in the B&C task) is located between the speaker and a prototypical Ground (the chair in the B&C task). I suggest that for speakers of languages in which the relative FoR is dominant it would be more natural to locate the Figure relative to the prototypical Ground than themselves. In the context of the B&C task, however, a CZ speaker does not have access to the relative FoR due to the faceted nature of the chair (see discussion of the usage of the relative FoR above). If an egocentric FoR is to be used to locate the ball, therefore, it is necessary to use the *direct* FoR and to locate the Figure relative to the speaker. An example of precisely this usage - taken from my B&C data - is presented in (346), which was used to describe Figure 40a.

(346) jəʔ=se   n-neʔ   n-winaŋ=ʔomo ø-ʔit-u   teʔ *pelota*, nas=ʔomo
      PRX=SIM 1A-ANAP 1A-front=LOC3 3B-EXIST-CP DET ball,   ground=LOC3
      'The ball is like this, in front of me on the ground' (B, B&C 2-8)

The second variety is similar to the first in that it also features a prototypical Figure and Ground located 'in front of' the speaker. In contrast to the first variety, however, the Figure and Ground being described in this variety of description are located side-by-side along the coronal (left-right) axis of the speaker. Despite the location of the Figure being significantly more prototypical of a description locating it relative to the 'front' of the speaker - i.e., it was closer to the speaker's *sagittal* (front-back) axis than their coronal one - it is commonly observed in my data that speakers of CZ describe the location of Figures in this type of context through reference to their own coronal axes. An example of precisely this type of description - used to describe Figure 40b - is presented in (347).

| (a) B&C 2-8 | (b) B&C 4-7 |

Figure 40: The images described in (346) and (347) respectively (Bohnemeyer and Pérez Báez, 2008).

(347)   teʔ j-*pelota* tumɘ=pɘ=ʔis=j-neʔ   ø-ʔit-u   n-tsɘʔnaŋ=ʔomo
           DET 3A-ball one=REL=3GEN=3A-ANAP 3B-EXIST-CP 1A-right=LOC3
           'The ball of one (photo) is to my right' (BR, E)

Pertinently, unlike the first variety of 'unusual' (from the perspective of an English speaker) direct usage, this second variety is only possible if a prototypical Ground is present in addition to the prototypical Figure. If only the Figure is present then this type of description becomes unfelicitous. This was determined using the following process. First a consultant was asked to describe the location of a ball in a spatial array such as that in Figure 40b created using an actual chair and ball (this is represented schematically in Figure 41a). If the consultant did not locate the ball through reference to their coronal axis (i.e. they didn't use a description in which the spatial adjunct was *n-tsɘʔnaŋ=ʔomo* 'to my right', *n-ʔaknja=ʔomo*, 'to my left' or *n-tseʔŋna=ʔomo* 'to my side') they were asked whether this type of description was acceptable. The chair was then removed from the spatial array (the resulting spatial array is represented schematically in Figure 41b) and the process repeated.

    This process was carried out with 10 consultants. All 10 provided or accepted the 'coronal direct' descriptions of the location of the ball when the chair was present. In contrast, 9 out of 10 of the same consultants rejected the coronal direct description of

203
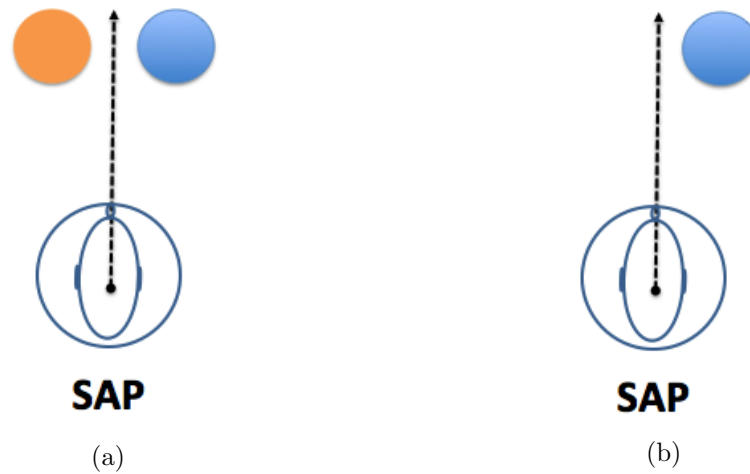
Figure 41: The two spatial arrays described by consultants during my test of the felicity of coronal direct descriptions of location for a Figure located closer to the sagittal axis of a speaker than the coronal one. In this schematic representation the yellow circle is the chair and the blue one the ball.

the location of the ball (which hadn't moved) in the absence of the chair. It seems reasonable to conclude, therefore, that the use of a coronal direct description to describe a Figure located significantly more closely to the sagittal (front-back) axis of the speaker than the coronal (left-right) relies on the presence of an *unstated* Ground.

In Section 11.7, I will argue that the fact an unstated Ground is a neccesary requirement for this type of description is evidence that they are in fact not direct in nature. More specifically, I will argue that this type of description should be considered as instances of *Groundless* relative descriptions of location. For ease of reference, I will refer to the Groundless relative descriptions of location expressed using spatial adjuncts more typically associated with the direct FoR as *hybrid* descriptions of location.

9 The vertical absolute FoR and related FoRs

9.1 Introduction

In this section I will first introduce the vertical absolute FoR in CZ, that is the FoR that is typically analysed as being Anchored by the gravitational field of the earth (or alternatively the location of the Ground). I will then describe the two FoRs that are expressed using a subset (at least) of the same linguistic resources. Each of these FoRs are of quite distinct conceptual nature, but can all still be related directly to the notion of differences in elevation.

The first of those FoRs that have transparently developed from the vertical absolute FoR that I will describe will be the slope-based FoRs that form a core component of the strategies for expressing spatial properties in CZ (Section 9.3). I will subsequently (in Section 9.4) describe the use of formal elements primarily associated with the vertical absolute FoR to express the relative FoR.

9.2 Vertical absolute FoR

9.2.1 Introduction

The *vertical absolute* FoR is that which is anchored by the gravitational field of the earth (see Bohnemeyer and Pérez Báez, 2008, for example). In other words, the fact that all objects are attracted towards the centre of the earth - and will free-fall in this direction if unopposed - creates an asymmetry in the vertical direction. As this direction is fixed relative to the earth as a whole, it is usually considered an absolute FoR[64]. A prototypical example of the vertical absolute frame - encoded in the preposition *above* - is presented in (348)

---

[64]It should be noted that as the presence of the Earth's magnetic field is a necessary condition for its use (it can't be used in gravity-free contexts, for example) it can not be considered to have been abstracted from its Anchor.

(348)   The clouds are above the mountain

As noted by Levinson (2003, p75-76) and Bohnemeyer and Pérez Báez (2008), however, in ordinary circumstances the asymmetry introduced by the earth's gravitational field is aligned with that introduced by the asymmetry of our own bodies: the latter of course being a result of the effects of the former over the course of evolution. This asymmetry allows us to define the 'up' and 'down' directions in our field of vision, which can then be used as the basis of descriptions of external spatial arrays. In most circumstances, therefore, it is equally valid to describe descriptions such as that in (349) as being examples of a vertical *relative* FoR as a vertical absolute one.

(349)   The shelf is above the table

Due to the overlap of the vertical relative and absolute FoRs in most naturally occurring contexts, it has not been possible, based on my data, to distinguish which FoRs are referenced in those formal elements used to express location in the vertical direction. I have therefore decided to retain the terminology of vertical absolute FoRs commonly used in the literature. Notwithstanding this, the use of terminology associated with the vertical direction to express the relative FoR in the *horizontal* direction is explored in Section 9.4.

9.2.2 Linguistic manifestation of FoR

The vertical absolute FoR can be encoded in both the spatial adjunct and the predicate of descriptions of all three spatial domains. In the spatial adjunct of a description, the vertical absolute FoR is encoded in three contrastive pairs of formal elements: the 'vertical' RSNs *kəs* 'top' and *kəʔ* 'bottom'; the 'vertical' spatial adverbs *kəhsi/kəhsmə* 'above' and *kəʔji/kəʔmə* 'below'; and the locative clitics *kəhsi* 'LOC4' and *kəʔmə* 'LOC5'. Spatial descriptions featuring one of each of these pairs are presented in (350), (351) and

(352) respectively.

(350) ø-ʔit-keʔt-u   ʔeja=pə   tumə poʔks-tək, teʔ=ʔis
       3B-EXIST-REP-CP different=REL one sit-INSTR 3PRO=3GEN
       j-**kəs**=ʔi=se   ø-ʔit-u   *pelota*
       3A-top=LOC2=SIM 3B-EXIST-CP
       'There is a different chair, above it (lit: at is above region) is a ball' (F, B&C
       3-8)

(351) teʔ ʔune **kəhsmə** ø-ten-u   i   teʔ tuwi **kəʔji** ø-ʔit-u
       DET child above   3B-stand-CP and DET dog below 3B-EXIST-CP
       'The child is stood above and the dog is below' (AT, FSp17)

(352) teʔ misu ø-ʔit-u   teʔ kot-ʔoj-tək=**kəʔmə**
       DET cat 3B-EXIST-CP DET put-ANTIP-INSTR=LOC5
       'The cat is under the table (lit: the thing used for putting things on)' (MAR,

       TRPS 31)

In the predicates of spatial descriptions, the vertical absolute FoR can be encoded
through the use of the contrastive pair of CoL roots *kiʔm* 'ascend' and *məʔn* 'descend'.
In descriptions of motion these roots can appear either as independent verbal stems, as
in (353), or as part of the type of serial verb constructions (SVCs) described in Section
5.4, as in (354).

(353) (teʔ sawa-mətsik) **ø-kiʔm-u**   kəhsmə ø-pak-nuʔk-u   teʔ tək=ʔis
       (DET air-toy)   3B-ascend-CP above 3B-hit-arrive-CP DET house=3GEN
       j-kopak=kəhsi
       3A-head=LOC4
       '(The balloon) ascended to hit against the roof of the house' (B, TC)

(354) ø-put-u   teʔ=mə   (sutu=ʔomo) tumə paloma, teʔ=ʔis
       3B-exit-CP MED=LOC1 (hole=LOC3) one dove,   3PRO=3ERG
       ɟ-tək-naʔts-u   teʔ ŋ-kaʔe jak-piti-**məʔn**-u
       3A-do-to.be.frightened-CP DET M-youth CAUS-roll-descend-CP
       'A dove exited there (from inside the hole), scared the boy and he fell downwards
       (like a ball)' (B, FS p14)

In descriptions of orientation and location these roots are obligatorily serialised with another verbal root. In the case of descriptions of orientation the SVCs in question contain either *ken* (or *ʔəʔm*) 'look', as in (355).

(355) teʔ tijək (poʔks-tək) jəʔ=se   nə   j-ken-məʔn-u   teʔ
      DET thing (sit-INSTR) PRX=SIM PROG 3A-look-descend-DEP.III DET
      poʔks-pa=pə=kəhsi nas=ʔomo,   nas=kəhsi ø-ʔit-u
      sit-ICP=REL=LOC4 ground=LOC3, ground=LOC4
      'The thing (chair) is like this, it's looking downwards, the part that is sat on is
      on the floor' (R, B&C 1-11)

These roots can also be serialised with dispositional roots - such as *ten* 'stand' in (357) - or transitive roots indicating caused change of location as part of resultative constructions - such as *kot* 'put' in (356).

(356) …ø-ʔəŋ-u=pə=te   nas=ʔomo *i* teʔ=ʔis   j-kuhj=kəhsi
      …3B-lie-CP=REL=PRED ground=LOC3 and 3PRO=3GEN 3A-tree=LOC4
      ø-kot-**kiʔm**-u   tumə *pelota* …
      3B-put-ascend-CP one   ball   …
      'It (a chair) is lying on the ground and a ball has been put on top of its spindles
      (lit: tree)' (LG, B&C 3-5)

(357) jəti   teʔ ʔune tsaʔ=kəhsi ø-ten-**kiʔm**-u   nə
      PRX;LOC2 DET child rock=LOC4 3B-stand-**ascend**-CP PROG
      j-weh-haj-u   nike teʔ j-nahk-une
      3A-shout-call-DEP.III a.lot DET 3A-frog-child
      'Now the child is stood on top of a rock shouting a lot for his small frog' (AG,
      FS p18)

The interpretation of CoL roots appearing in descriptions of location and orientation is described in Section 5.4. To repeat this account briefly here, in descriptions of orientation the direction encoded by the CoL root (i.e. 'up' and 'down' in the case of *kiʔm* 'ascend' and *məʔn* 'descend') indicates the direction of orientation of the Figure. In the case of descriptions of location the semantics of the CoL roots is associated with
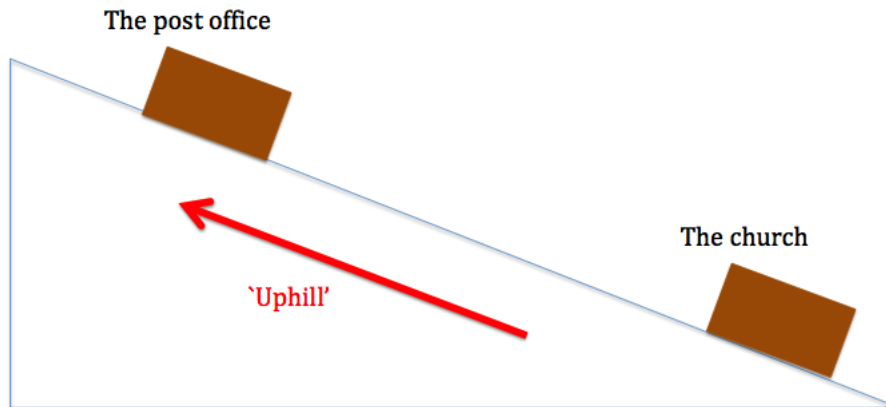
Figure 42: The spatial array described in (358)

a motion event (real or fictive) that preceded the location of the Figure being described.

9.3 Slope-based FoRs

9.3.1 Introduction

In my terminology, a slope-based FoR is one whose axes are defined by the direction of change of elevation of a slope. An example of the use of a slope-based FoR is the English example presented in (358), which could be used to describe the spatial array depicted schematically in Figure 42.

(358)   The post office is **uphill** of the church

In English, a general condition for the use of slope-based descriptions is that the Figure is located on the anchoring slope. As such, a slope-based description in English is invariably a prototypical example of the use of a geomorphic FoR.

Based on the descriptive accounts available, it appears that slope-based FoRs are amongst the most commonly occurring geocentric FoRs cross-linguistically, having been attested in languages as diverse as Meseño Cora (Uto-Aztecan, Mexico; Soto, 2011) and

Newari (Indo-European, Nepal; Niraula et al., 2004). Many of the reported slope-based FoRs differ from that found in English both in the role they play in everyday spatial reference and their fundamental conceptual nature. The best known example of both of these divergent characteristics is the Tseltal of Tenejapa system of slope-based reference that has already been mentioned numerous times. In terms of conceptual nature this has been categorised firmly as an absolute FoR by Brown and Levinson (2000)[65]. It is also said to be the case that this absolute slope-based FoR is the most commonly used FoR when describing Figures that are not in close proximity to the stated Ground (Brown and Levinson, 1993); when the Figure and Ground are in close proximity the object-centered FoR is preferred.

In the remainder of Section 9.3, I will discuss the slope-based system of reference used by speakers of CZ in Ocotepec. Specifically, in Sections 9.3.2 and 9.3.3 I will introduce the means through which it is expressed, before attempting to place it on the conceptual spectrum that runs from geomorphic (like the slope-based system in English) to absolute (like that in Tenejapan Tseltal) in Section 9.3.4. Finally, in Section 9.3.5, I will describe how this slope-based FoR is used in CZ.

9.3.2 Manifestation in CZ predicates

Slope-based FoRs are encoded in CZ using a subset of those linguistic resources used to express the vertical absolute FoR. These resources include the two CoL verbal roots *kiʔm* 'ascend' and *məʔn* 'descend', which can be used with a sense of CoL 'uphill' and 'downhill' in descriptions of motion (as in (359)) or in a related directional sense in descriptions of orientation (as in (360), describing a car parked on a slope with its front facing towards the top of the hill).

---

[65]See also Levinson (2003); Brown (2006).

(359)   *una kwadra* **ø-kiʔm-jah-u=ʔtsi**,   **ø-kiʔm-jah-u=ʔtsi**,
one block   3B-ascend-EXCPL-CP=1ABS, 3B-ascend-EXCPL-CP=1ABS,
ø-wit-jah-u=tsi   kiʔm-ə=ʔomo
3B-walk-EXCPL-CP=1ABS ASCEND-N=LOC3
'We ascended one block, we ascended, we walked on the slope' (AT, E)

(360)   kəhsi nə   **j-ken-kiʔm-u**   teʔ *kaɾo*
above PROG 3A-look-ascend-DEP.III DET car
'The car is facing uphill (lit: up above)' (AT, E)

In descriptions of orientation and motion the verbal roots *kiʔm* 'ascend' and *məʔn* 'descend' can be used with a slope-based sense in all of the same contexts in which they can be used with a vertical absolute sense, i.e., as independent verbs of motion and in SVCs that predicate descriptions of motion or orientation. Unlike when these verbal roots are used with a vertical absolute sense, however, it appears - based on the judgement of consultants - not to be possible to use *kiʔm* 'ascend' and *məʔn* 'descend' to form locational predicates encoding a slope-based FoR.

9.3.3   Manifestation in spatial adjuncts

Slope-based FoRs can also be encoded within the spatial adjunct of a spatial description. Overwhelmingly this slope-based semantics is encoded in the 'vertical' adverbs *kəhsmə/kəhsi* 'above' and *kəʔmə/kəʔji* 'below'. Unlike the 'vertical' CoL roots, these adverbs can be used to form slope-based descriptions of all three domains. This is demonstrated by the three examples presented in (361) (describing a bar located at the bottom of a hill), (362) (describing a car located on a slope) and (363) (describing part of a route that ascends a slope).

(361)   teʔji   *mas* **kəʔji=se** ø-ʔit-u   tumə *cantina* ...
MED;LOC2 more below=SIM 3B-EXIST-CP one   bar
'There, further down the hill is a bar' (AT, E)

(362)   **kəʔmə** nə   j-ken-min-u   teʔ *kaɾo*
         below PROG 3B-look-come-DEP.III DET car
         'The car is looking towards us, downhill (lit: below)' (AT, E)

(363)   ø-maŋ-pa=te,   ø-kiʔm-pa=te   **kəhsi**
         1B-go-ICP=1INC, 1B-ascend-ICP=1INC above
         'We go, we ascend uphill (lit:above) ' (JC, E)

There are also a small number of descriptions in my data in which one of the 'vertical' RSNs (*kəs* 'top' and *kəʔ* 'bottom') is used in a slope-based manner. One of these descriptions was that in (364), in which the location of a tree that was slightly uphill from a consultant's house (and therefore of a similar elevation) was described.

(364)   n-tək=ʔis   **j-kəs=mə=kaŋ**   ø-ʔit-u   tumə tsjina-kuj
         1A-house=3GEN 3A-top=LOC1=APPROX 3B-EXIST-CP one orange-tree
         məha=pə
         big=REL
         'Uphill from my house (lit: roughly, at the top of my house) is a big orange

         tree' (ME, E)

A significant majority of this type of slope-based description of location was, however, given by a single consultant and, when asked, other consultants generally judged this use of the vertical RSNs to be unacceptable.

There are no instances in my data in which either of the two locative clitics with vertical senses - *kəhsi* 'LOC4' and *kəʔmə* 'LOC5' - are used in a slope-based manner. The consensus amongst consultants was also that such usages were unacceptable.

9.3.4   Discussion: Conceptual nature of slope-based FoRs

Most of the uses of slope-based FoRs in my data - including all of those given as examples so far in this section - are prototypically geomorphic in nature. This means that, as in their English equivalents, the Figures whose spatial properties were being described were located on (or at least very near) the slope that functioned as the Anchor. These

212

geomorphic uses of slope-based FoRs include descriptions of Figures located in towns other than Ocotepec. An example of one of these descriptions is that in (365), which is describing part of the route that the consultant takes to the church in the neighbouring town of Coapilla. From discussions with consultants it has been established that the descending described does indeed involve a change of elevation.

(365) waʔ=te   n-nuʔk-u   *iglesja*=ʔomo **ø-məʔn-pa=pə=te**
       in.order.to=1INC 1A-arrive-CP church=LOC3 1B-descend-ICP=REL=PRED
       ø-tsəʔj-pa=mə te? *carro*
       3B-remain-ICP DET truck
       'In order that we arrive in the church, I descend where the trucks stop (lit:
       become stationary' (AT, E)

It is also clear from my data, however, that in some contexts slope-based FoRs are used to describe the properties of Figures that are located on flat surfaces. These uses occur both on small scales and the scale of the town. Examples of the former are presented in (366)-(368), all of which were provided during referential communication tasks and described the spatial properties of the Figure in the horizontal plane.

(366) kuhj teʔmə   ø-ʔit-u   teʔ=mə   ø-min-pa=mə=k
       tree MED=LOC1 3B-EXIST-CP MED=LOC1 3B-come-ICP=LOC3=APPROX
       tuh, pən-tsəki ø-ʔit-u   jəʔ=mə **kəhsmə**
       rain, man-figure 3B-EXIST-CP PRX=LOC1 above
       'A tree is towards the north (lit: from where the rain comes), the toy person is
       above here' (P, OO)

(367) **kəʔmə**, ø-ʔit-u-mə   teʔ *kwadra*, hiŋə   nitsək-ə, **kəʔmə**
       below, 3B-EXIST-CP=LOC1 DET square, DIST.LOC1 begin-IMP below
       nitsək-ə, teʔji   jak-wijəŋ-**kiʔm**-ə
       begin-IMP MED;LOC2 CAUS-straight-ascend-IMP
       'Downhill (lit:below), where the card is, begin there! Begin downhill! Then
       make move it straight up in the uphill direction (lit: make it ascend straight)'
       (AT, MG)

(368) teʔ poʔks-tək ø-ten-u=pə   *pero* **kəhsi** ø-ʔəʔm-**kiʔm**-u=pə=te
       DET sit-INSTR 3B-stand-CP=REL but above 3B-look-ascend-CP=REL=PRED

213

j-poʔks-ʔoj-tək
3A-sit-ANTIP-INSTR
'The chair is stood upright, but its seat is facing uphill (lit: in an upwards direction, above)' (AG, B&C 3-9)

An example of the use of slope-based FoRs in a town-scale description of a Figures located on a flat surface is shown in (369). In this description the consultant was describing the action of a football player playing on the new football pitch at the southern edge of Ocotepec (at the foot of the main slope) kicking a ball that was already towards the southern end of the pitch further in that direction.

(369)   j-nep-**məʔn**-jah-u   kəʔmə=pə *pelota*
           3A-kick-descend-EXCPL-CP below=REL ball
           'They kicked the ball, which is below, downhillwards (lit:down)' (R, E)

Descriptions such as (366)-(369) share properties with both geomorphic and absolute descriptions and are equally distinct from both of these types of description. For example, descriptions such as (366)-(369) are absolute-like (and therefore ungeomorphic-like) in the sense that they are used to describe Figures that are neither located on an incline nor, in the case of those descriptions given during referential communication tasks, even within sight of an incline. This suggests that speakers have, to some extent, *abstracted* the directions associated with the anchoring slope, which, as discussed in Section 7.3.4, is a defining property of absolute FoRs.

Unlike absolute FoRs, however, slope-based FoRs need to at least be in the vicinity of the slope by which they are anchored. All of the descriptions provided above, for example, were anchored either by the main slope of the town - on which the Figure was located at the time, even if its incline could not be seen - or a smaller slope at the foot of which the recording location for referential communication tasks sat. Based on the judgements of consultants, this close proximity of the Figure to the anchoring slope is a necessary requirement for the use of slope-based FoRs in CZ. As as a result it is possible

to say that they do not have another of the defining properties proposed for *absolute* FoRs, *fixedness*.

In summary, the properties of slope-based FoRs in CZ described above suggest that they occupy an intermediate position along the conceptual cline linking prototypical geomorphic descriptions (such as slope-based descriptions in English) and prototypical absolute descriptions (like those slope-based descriptions described for Tenejapan Tseltal). Interestingly, Polian and Bohnemeyer (2011) describe the use of seemingly conceptually equivalent slope-based FoRs amongst speakers of Tseltal in various locations. Given the disagreement in the literature associated with the definition of absolute FoRs, these intermediate descriptions offer a potentially fruitful area for further research into the conceptual nature of geocentric FoRs.

9.3.5   Discussion: pattern of use

On the scale of the town, slope-based descriptions are the dominant strategy for describing motion (in routes around the town, for example) and orientation (the orientation of buildings, cars and people). Examples of slope-based descriptions of these domains - taken from a description of a journey around Ocotepec conducted by myself and a consultant - are shown in (370) and (371).

(370)   **ø-məʔn-jah-u=ʔtsi**   teʔji   n-hak-jah-u=ʔt   teʔ
         3B-descend-EXCPL-CP=1ABS MED;LOC2 1A-cross-EXCPL-CP=1ERG DET
         calle hiŋə ø-ʔuʔts.witu-jah-keʔt-u=ʔtsi, **ø-kiʔm-jah-u=ʔtsi**   *otra*
         street DIST 3B-turn-EXCPL-REP-CP=1ABS, 3B-ascend-EXCPL-CP=1ABS other
         una   *kwarda*=kəhsi
         INDEF block=LOC4
         'We descended, then we crossed the street, there we turned, we ascended again another block' (AT, E)

(371)   hiŋə nike=naʔak   ø-ʔit-jah-u   *carro*=taʔm
         DIST many=CONTR 3B-EXIST-EXCPL-CP car=PL
         ø-*estasion*-tsək-jah-u=pə,   wene ø-ʔit-jah-u
         3B-park-do-EXCPL-CP=REL, some 3B-EXIST-EXCPL-CP

215

ø-ken-**məʔn**-jah-u=pə   wene ø-ken-**kiʔm**-jah-u=pə
3B-look-descend-EXCPL-CP=REL some 3B-look-ascend-EXCPL-CP=REL
'There were many cars that were parked there. There were some that were directed downhill (lit:downwards) and some that were directed uphill (lit:upwards)'
(AT, E)

In the locational domain slope-based FoRs are the most commonly used *extrinsic* FoR, though they are still used considerably less frequently than object-centered descriptions. An example of a slope-based description of location on the scale of the town is the description of the location of one of the goals of the new football pitch in Ocotepec. The pitch is located at the bottom of the main slope of the town, with which it is aligned. This description, therefore, locates the goal in question at the end of the football pitch furthest from the centre of Ocotpec.

(372)   teʔji   ø-ʔit-u   teʔ *campo*=ʔis j-*porteria*, metsa. tumə
        MED;LOC2 3B-EXIST-CP DET field=3GEN 3A-goal,   two.   one
        ø-ʔit-u   **kəʔmə** . . .
        3B-EXIST-CP below
        'The pitch's two goals are there (on the pitch). One is downhill (lit: below)
        . . .'

It is on this scale that some consultants find it acceptable to use the 'vertical RSNs' in a slope-based manner. An example of such a use is shown in (373) (repeated from (364)).

(373)   n-tək=ʔis   **j-kəs=mə=kaŋ**   ø-ʔit-u   tumə tsjina-kuj
        1A-house=3GEN 3A-top=LOC1=APPROX 3B-EXIST-CP one   orange-tree
        məha=pə
        big=REL
        'Uphill from my house (lit: roughly, at the top of my house) is a big orange

        tree' (ME, E)

As described, slope-based FoRs are also used regularly in descriptions of spatial arrays located outside of Ocotepec, but only in typically geomorphic scenarios i.e. the

216

spatial array being described is located on an incline. See for example the description of motion located within the nearby town of Coapilla, in which slopes are a similarly salient feature of the topography.

(374) nj-wijəŋ-təhkəj-pa   wihtpa həsika nj-məʔn-pa   tumə *kwadra* teʔ
       2B-straight-enter-ICP first   then   2B-descend-ICP one   block   DET
       entrada=ʔomo
       entrance=LOC3
       'First you enter straight ahead. Then you descend one block from the entrance'
       (R, E)

As indicated by the data arising from the B&C task - shown in Figures 34 and 35 - slope-based descriptions are a frequently used strategy for describing the orientation of objects on a manipulable scale. The B&C data also shows that in descriptions of location the slope-based FoRs are extremely marginal compared to the object-centered FoRs and intermediate descriptions, but used with a frequency comparable to other extrinsic FoRs. This equality of use across extrinsic FoRs is representative of my data as a whole, however, as with all extrinsic FoRs, the faceted nature of the Ground in the B&C stimuli lead to a suppression of slope-based FoRs in descriptions of location relative to my wider data set.

A key feature of the use of slope-based FoRs on a small scale is the fact that they are expressed purely through the use of the 'vertical adverbs' *kəhsmə/kəhsi* 'above' and *kəʔmə/kəʔji* 'below'. Unlike on the scale of the town, the 'vertical RSNs' were not unambiguously used in a slope-based manner[66]. As will be discussed in Section 11, a consequence of relying on spatial adverbs for the expression of slope-based FoRs is that all small scale descriptions of location in which a slope-based FoR is referenced do not feature an explicitly stated Ground.

The pattern of use of slope-based FoRs across different scales described is very similar

---

[66]There are a small number of descriptions in which a vertical RSN *might* be being used in a slope-based manner. However, all of these descriptions came from a single consultant who seemed to use possession marking quite erratically compared to all other consultants.

to that reported for varieties of Tseltal spoken in the adjacent region of Chiapas (Polian and Bohnemeyer, 2011). This pattern of use was explained by Polian and Bohnemeyer (2011) through reference to the notion of *anchor salience*: slope-based FoRs are used more commonly on an intermediate scale because the slopes by which they are typically anchored are most salient on that scale. On a smaller scale, particularly indoors and when the spatial array is located on a flat surface, the slope is significantly less salient. On a scale larger than the town or valley, the small slopes typically used as Anchors by speakers of CZ (and some dialects of Tseltal) also become less salient when compared to landmarks associated with larger scales (such as towns and cities located many miles distant). The exception to this is of course when the directions associated with a slope have been entirely abstracted as in the case of the Tseltal spoken in the community of Majosik' (Brown and Levinson, 1993; Brown, 2006).

9.4 Sagittal uses of 'vertical' linguistic resources

9.4.1 Introduction

A third use of the formal elements primarily associated with the vertical absolute FoR is in the formation of spatial descriptions along the sagittal axis of the speaker. In this type of description the sagittal axis of the speaker appears to be envisioned as being a slope at the foot of which is located the speaker. The direction towards the speaker is then conceptualised as being 'down' and that away from the speaker as 'up'. Equally, objects that are located at some distance from the speaker can be described as being 'above' and those nearby as being 'below'. This situation is represented schematically in Figure 43.

Although the use of vertical terminology to form spatial descriptions along the sagittal axis of a speaker does not appear to be cross-linguistically common, it is notable that a similar system has been described for neighbouring Tseltal (Brown and Levinson, 1993, p60).

kəhsi/kəhsmə `above'

kiʔm ` ascend/up'

kəʔmə/kəʔji ` below'

məʔn ` descend/down'

SAP
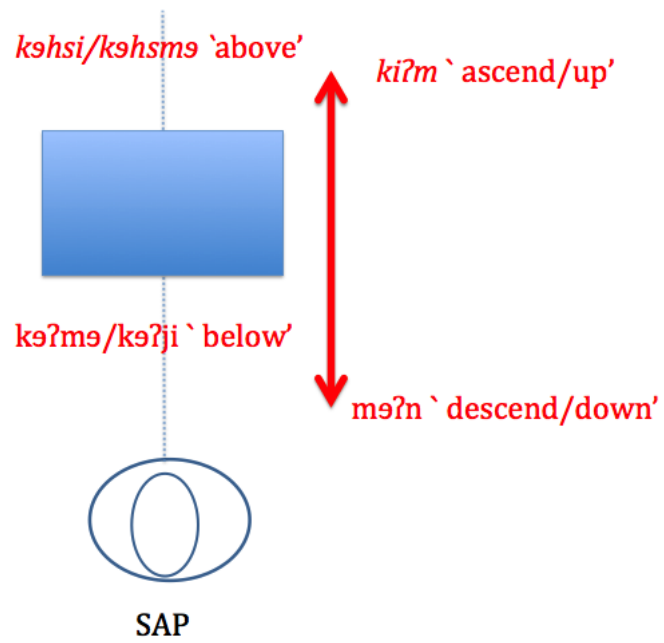
Figure 43: Schematic representation of the sagittal axis expressed using 'vertical' terminology in CZ. The blue object is any entity that could be the basis for a division of this axis into two parts.

9.4.2 Linguistic manifestation of FoR

The vertical motion roots are attested with this type of sagittal sense in descriptions of motion and orientation but not location. An example of a description of motion featuring a sagittal use of *məʔn* 'descend' is that presented in (375). This description is identified as being sagittal based on two observations. Firstly, the use of the vertical motion root *məʔn* 'descend' has been combined with the proximal deictic spatial adverb *jəʔmə* meaning that the direction of travel being described is unambiguously towards the speaker. The second observation is that this can not be a slope-based description due to the fact that in the context in which this description was given the sagittal axis of the speaker was perpendicular to both of the potential anchoring slopes (the main slope of the town and the salient slope at the foot of which was located the recording location).

(375)　həʔ jəʔ=mə=kaŋ　　maŋ-pa　**ø-məʔn-ʔəj-i**
　　　　yes, PRX=LOC1=APPROX AUX:go-ICP 3B-descend-DIR-DEP.II
　　　　'Yes, it's going to descend towards here' (MJ, MG)

An example of a description of orientation featuring a sagittal use of *məʔn* 'descend' is provided in (376). As with the description of motion above, the speaker has combined the use of this root with an adjunct that unambiguously indicates the direction of orientation of the chair to be towards the speaker. As this description was provided in the same location as the description of motion above, a slope-based interpretation can again be ruled out.

(376)　jəʔki　　nə　　j-ken-məʔn-keʔt-u　　tumə poʔks-tək ø-ten-u=pə
　　　　PRX;LOC2 PROG 3A-look-descend-DEP.II one　sit-INSTR 3B-stand-CP=REL,
　　　　jəʔki　　nə　　j-ken-u　　　ʔəhtsi　ø-ʔit-u=mə=ʔtsi
　　　　PRX;LOC2 PROG 3A-look-DEP.III 1PRO.ABS 3B-EXIST-CP=LOC1=1ABS
　　　　'Here is a chair that is standing facing (lit:looking) downwards, here it is facing
　　　　(lit:looking) towards where I am' (MJ, B&C 2-1)

Of those spatial adjuncts used to encode the vertical absolute FoR, two were also consistently used with an egocentric sense: the vertical spatial adverbs and, notably, the vertical RSNs. An example of both of these elements being used in a description of location during the Maze Game is presented in (377). In this description the direction being indicated is towards the edge of the grid that was furthest away from the speaker.

(377)   **kəhsi** ken-kiʔm-ə   teʔ *calle=ʔis*   **j-kəs=ʔi=se**
           above look-ascend-IMP DET street=3GEN 3A-top=LOC2=SIM
           'Make it look upwards, above, at the top of the street' (R, MG)

As can be seen from the description in (378), a consequence of the use of the vertical RSNs in a sagittal manner is that, unlike in slope-based descriptions, vertical deictic descriptions can explicitly express a Ground. Again, despite appearances, this description located the Figure in the horizontal plane, this time at the side of a Ground closest to the speaker.

(378)   teʔ=kəʔmə, teʔ=ʔis   **j-kəʔ=ʔi=se**   maŋ-pa   m-kot-ə   teʔ
           DET=LOC5 3PRO=3GEN 3A-top=LOC2=SIM AUX:go-ICP 2A-put-DEP.I DET
           popo=pə
           white=REL
           'By it, on your side of it (lit: at its below region) you are going to put the white one' (AT, E)

That said, there are still many examples of the use of the vertical spatial adverbs to form descriptions of location in which no Ground is explicitly stated. An example of such a description is that in (379), in which again, the Figure was located at the 'near' side of a Ground located in front of the speaker.

(379)   teʔ j-nuni=kəʔmə,   **kəʔji=se** ø-ʔit-u   teʔ tʃibu
           DET 3A-backside=LOC5, below=SIM 3B-EXIST-CP DET sheep
           'The sheep is by its backside (the backside of a toy cow in the photograph and previously mentioned), belowish' (AT, OO)

Finally, there were a small number of occasions during referential communication tasks of different sorts that a director attempted to use one of the two vertical locative clitics (*kəhsi* 'LOC4' and *kəʔmə* 'LOC5') in a deictic manner. However, it was notable that on each occasion that they were used in this manner some additional explanation was initially required to clarify their deictic nature. This appears to suggest that such uses are quite marginal.

9.4.3 Discussion: conceptual nature

In their description of the similar system of reference used in Tseltal, Brown and Levinson (1993) have decribed the use of vertical/slope-based terminology to describe locations along the sagittal axis of a speaker as *deictic* in nature. The use of the vertical CoL roots *kiʔm* 'ascend' and *məʔn* 'descend' to indicate CoL in the directions towards and away from the deictic centre certainly meets this characterisation. Similarly, the description of locations far away from the speaker as *kəhsi/kəhsmə* 'above' and those close by as *kəʔmə/kəʔji* 'below' is very similar to the use of the more standard deictic adverbs *jəʔmə/jəʔki* 'here' and *hiŋə* 'there (distal)'.

The use of the vertical RSNs *kəs* 'top' and *kəʔ* 'bottom' to locate Figures along the sagittal axis, but relative to Grounds other than the speaker, does not fit this deictic characterisation. Instead, these uses - and those marginal uses of the vertical postpositions with the same function - appear to be conceptually equivalent to the sagittal uses of the relative FoR. This use of terminology primarily associated with the vertical absolute FoR to express an FoR anchored by the SAP is striking, as it runs counter to the general cross-linguistic tendency for relative FoRs to be expressed using terminology associated with the object-centered FoR (Levinson and Wilkins, 2006). It also *suggests* a close relationship between relative and deictic expressions, which would not necessarily be expected if the relative FoR is conceptualised as the projection of the bodily axis of the SAP onto some external object (see Levinson (2003) for a description of this con-

ceptualisation). I believe the relationship between these two types of spatial description is in need of further study.

10 Landmark-based FoRs and related FoRs

10.1 Introduction

In this section will be discussed those FoRs that are either synchronically head-anchored or whose form clearly indicates their origin as head-anchored FoRs. These FoRs include those anchored by ad-hoc landmarks (discussed in Section 10.2) and the equivalents of the western cardinal co-ordinates that comprise three named half-axes: an 'east-west' axis deriving from the location of the rising and setting of the sun and an approximately orthogonal half axis derived from the general direction from which rain enters the valley in which Ocotepec is located (roughly the north).

10.2 Landmark-based FoRs

10.2.1 Introduction

In my terminology a landmark-based FoR is simply any FoR that is in the terminolgoy of Bohnemeyer and O'Meara (2012) *head-anchored*, i.e., the direction of its axes are defined by the line joining the Origin of a description and the *location* of the Anchor of the FoR. This is in contrast to angular-anchored FoRs the axes of which are defined through reference to an *angle* (usually zero) relative to a known direction. An example of a landmark-based FoR in English is shown in (380).

(380)   The man is towards the hill from the castle

Another contrast with angular-anchored FoRs is that the Anchors of head-anchored FoRs are usually *ad hoc* rather than conventionalised.

Landmark-based FoRs have been observed in all languages surveyed so far and have frequently been found to be amongst the most used FoRs in descriptions of orientation (see discussion in Section 10.2.3).

10.2.2 Linguistic manifestation of landmark-based FoR

As has been stated repeatedly, all spatial adjuncts in CZ denote locations. It might therefore be argued that all projective descriptions in CZ are anchored by locations and are therefore head-anchored. For many spatial adjuncts, however, it is necessary to refer to a conventionalised *direction* in order to determine the location being specified. For example, in order to determine the location specified by the vertical adverb *kəhsi* 'above' it is necessary to refer to the vertical direction[67]. As the location denoted by spatial adjuncts such as this *derive from* directions, I have analysed these as expressing angular-anchored FoRs despite their locational semantics.

In my analysis, therefore, landmark-based FoRs are expressed exclusively by those spatial adjuncts that express specific locations that do not derive from any conventionalised directions. This type of spatial adjunct typically comes in one of two forms: PPs headed by *mə* 'LOC1' (as in (381)) and place-denoting adverbial clauses (as in (382) and (383)).

(381)   **sulu=ʔis j-tək=mə**   ø-tsəʔj-pa   teʔ *pelota*
        Sulu=3GEN 3A-house=LOC1 3B-remain-ICP DET ball
        'The ball is towards where Sulu's house is (lit: the ball is where Sulu's house is)' (JL, B&C 3-11)

(382)   **ø-ʔit-uə=mə**   **sulu=ʔis j-tək**   ø-ken-maŋ-keʔt-u j-teʔts-tək
        3B-EXIST-CP=LOC1 Sulu=3GEN 3A-house 3B-look-go-REP-CP 3A-lean-INSTR
        'Its (the chair's) backrest is also directed towards where Sulu's house is' (JL, B&C 2-6)

---

[67]Or one of the slope-based and egocentric directions discussed in Section 9.3.

(383) …teʔji ø-maŋ-ʔəj-u **teʔ popo=pə pama ø-ʔit-u=mə** …
PRX;LOC2 3B-go-DIR-CP DET white=REL cloth 3B-EXIST-CP=LOC
'…*then it went towards where the white cloth is* …' (C, SCE)

Examples of landmark-based descriptions of space featuring spatial adjuncts other than those two featured above are presented in (384) and (385).

(384) j-tseʔŋna=ʔomo, ***maestro clemente*=ʔis j-ʔaŋ=ʔomo=kaŋ**
3A-side=LOC3,   teacher   Clemente=3GEN 3A-outside.area=LOC3=APPROX
ø-ʔit-u   tumə *pelota*
3B-EXIST-CP one ball
'*To its (the chair's side), towards approximately where Teacher Clemente's outside area is, is a ball*' (AU, B&C 2-12)

(385) poʔks-tək ø-ten-u=pə   ø-ken-u   **kama+njeʔŋ-kəhs=ʔi**
sit-INSTR 3B-stand-CP=REL 3B-look-CP hill-top=LOC2
'*A chair that is stood upright is directed towards the top of the hill*' (AU, B&C 4-12)

The projective nature of landmark-based descriptions of orientation (as in (382) and (385)) and motion (as in (383)) is unambiguous due to the conceptual structure of both of these types of description. The projective nature of landmark-based descriptions of location such as (381) and (384) is far less clear. This is due to the fact that the semantics of those spatial adjuncts used to express landmark-based FoRs are fundamentally topological. For example, the semantics of the spatial adjunct in (381) (*sulu=ʔis j-tək=mə* 'where's Sulu's house is') specifies the location of Sulu's house due to the co-locationary semantics of *mə* 'LOC1'. Similarly, the spatial adjunct in (384) specifies a location within the region surrounding 'Teacher Clemente's house'.

The projective, landmark-based interpretation of apparently topological descriptions of location such as these is therefore obtained *pragmatically*. Specifically, it is my analysis that these apparently topological descriptions obtain their projective interpretation when both speaker and listener know that the Figure being described can not literally be

225

located in the location stated. Given this knowledge, I suggest that listeners interpret the spatial adjuncts in descriptions of location such as (381) and (384) as defining a *direction* in which the Figure can be found from some unstated Ground obtained from context.

An example of just such a context is the B&C task, in which both (381) and (384) were given. In this context the matcher knows that the 'ball' of the description can not literally be located either in neighbours' houses or outdoor regions and therefore these descriptions were instead interpreted as disambiguating the side of the 'chair' the 'ball' could be found. The analysis and use of Groundless descriptions of location such as these is discussed in detail in Section 11.

10.2.3   Discussion: usage during B&C task

As can be seen from Figure 34, in descriptions of the location of the ball landmark-based FoRs were used with a similar frequency to other allocentric FoRs, but rarely relative to object-centered and intermediate descriptions during the B&C task. As can be seen from Figure 35, however, landmark-based FoRs were clearly the most frequently used FoRs in descriptions of orientation.

The preference for landmark-based descriptions of orientation amongst speakers of languages who favour object-centered descriptions of location is a well established phenomenon in the literature; see Terrill and Burenhult (2008), for example, for a description of the prevelance of landmark-based FoRs in Jahai (Mon-Khmer, Malay Peninsular) and Lavukaleve (Papuan isolate, Soloman Islands). Bohnemeyer (2011) has hypothesised that this correlation of preferences across domains arises due to the lack of a "default perspective" amongst speakers of languages who favour object-centered descriptions of location. This is contrasted with speakers of languages who favour relative descriptions of location - and therefore by default take a perspective based on the body of the speaker when describing spatial arrays - and speakers of languages such as Tseltal (Mayan, Mex-

ico; Brown and Levinson, 2000) or Guugu Yimithirr (Paman-Nyungan, Australia; Haviland, 1993) who show a preference for the use of a particular environmentally-anchored FoRs.

It is important to note that, impressionistically, the above prediction slightly overstates the use of these frames across different scales and in different contexts. The principal reason for this appears to be that in many contexts, particularly on intermediate and geographical scales, slope-based descriptions appear to constitute a "default perspective" for speakers in Ocotepec. In descriptions of motion, landmark-based FoRs were, again impressionistically, used with a frequency somewhere between the rates observed for descriptions of location and orientation. This is due to a combination of the dominance of slope-based descriptions or the formally related egocentric descriptions discussed in Section 9.3 and the marginal role of the object-centered FoR in descriptions of this domain (discussed in Section 8.2).

10.3 CZ cardinal co-ordinates

10.3.1 Introduction

The cardinal co-ordinates - exemplified for English in (386)-(388) - are those directions that originally were anchored by two celestial bodies: the sun along the east-west axis and the North Star along the north-south axis.

(386) The boat headed west from the island

(387) The garden was south facing

(388) The school was to the east of the ferry terminal

Being both fixed relative to the earth as a whole and, to some extent, abstracted from their original Anchors, they are often considered to constitute the archtypal absolute

FoR[68].

In this section I will discuss two independent sets of axes used by speakers of CZ that when combined are approximately equivalent to the Western cardinal co-ordinates. As will be described in Section 10.3.2, in the case of the 'east-west' axis the equivalence between the CZ and Western cardinal co-ordinates is high, both being anchored by the motion of the sun. Along the direction perpendicular to the solar-anchored axis the equivalence is more approximate, both in the sense of the direction in which it points (the CZ version is not anchored by the North Star or the magnetic field of the earth) and the extent to which CZ speakers see an equivalence between the CZ terminology associated with this axis and the 'equivalent' Spanish terms.

10.3.2 The solar-anchored axis

The solar-anchored axis, as the name indicates, is that which is anchored by the points on the horizon where the sun rises and sets. The directions that define this axis are typically expressed through the use of adverbial clauses in which the location of the event of the sun appearing or disappearing is described. Usually these adverbial clauses are predicated by verbs formed from two roots that refer specifically to celestial events, *tsoʔt* 'to come up (celestial objects)' (exemplified in (389)) and *təʔp* 'go down (celestial objects)' (exemplified in (390)).

(389)   jəʔ poʔkstək jəʔ=mə   ø-ken-keʔt-u   jəʔ=mə
         PRX chair   PRX=LOC1 3B-look-REP-CP PRX=LOC1
         ø-tsoʔt-u=mə   **jəʔ hama ø-tsoʔt-pa=mə**
         3B-come.up.celestial-CP=LOC1 PRX sun   3B-come.up.celestial-ICP=LOC1
         hama
         sun
         'This chair here is directed towards the east (lit: where this sun came up; where

---

[68]As mentioned above, in the case of the western cardinal co-ordinates, this abstraction is, however, often overstated, particularly as they are often calculated using an instrument (a compass) that relies on the presence of a natural phenomenon that is aligned with one of these directions (the Earth's magnetic field).

the sun comes up)' (P, B&C 1-2)

(390) **ø-tǝʔp-pa=mǝ**   **hama** ø-ten-u   teʔ pǝn.tsǝki
       3B-go.down.celestial-ICP=LOC1 sun   3B-stand-CP
       'The toy man is stood to the west (lit: where the sun goes down)' (P, OO)

These place-denoting adverbial clauses predicated by the celestial object-specific verbs have undergone a process of univerbation to produce two spatial adverbs *hamtǝʔpimǝ* 'where the sun goes down (in the west)' and *hamtsoʔtemǝ* 'where the sun comes up (in the east)' that can be used in place of the clauses (those in (389) and (390) respectively) from which they originate. Examples of the use of these terms are presented in (391) and (392).

(391)   jǝʔ=mǝ   ø-ken-u   jǝʔ=mǝ   **hamtǝʔpimǝ**
       PRX=LOC1 3B-look-CP PRX=LOC1 where.the.sun.goes.down
       'Here, it is directed towards the west (lit:where the sun goes down)' (P, B&C
       1-9)

(392)   jǝʔ   ø-ken-jah-u   *este* jǝʔki **hamtsoʔtemǝ**
       PRX 3B-look-3PL-CP HESIT HESIT where.the.sun.comes.up
       'These are directed towards the east (lit: where the sun comes up)' (BR, M&T)

On occasion, the CoL root *put* 'exit' is also used in a place-denoting adverbial clause to refer to this axis, specifically the half axis pointing west. An example of this use is shown in (393).

(393)   teʔ poʔks-tǝk nǝ   j-ken-maŋ-u   **ø-put-pa=mǝ**   hama
       DET sit-INSTR PROG 3A-look-go-DEP.III 3B-exit-ICP=LOC1 sun
       'The chair is facing towards the west (lit: where the sun exits)' (B, E)

Although synchronically all of the terms described above are consistently mapped on to the Spanish terms *oriente* 'east' and *poniente* 'west', and can therefore be taken to be fixed relative to the world as a whole, originally it is reasonable to assume that they

referred to directions that were specific to the valley in which Ocotepec is located; it is also possible that the direction that these terms referred to varied through the year as a result of the earth's orbit around the sun. Such variable and localised directions would perhaps be better characterised as being geomorphic in nature, however in their current incarnations the categorisation as absolute seems the most appropriate.

10.3.3 North-south axis

As described in Section 9.3, the slope on which Ocotepec sits is orientated roughly south-north. As a result, the most common geocentric FoR used to refer to directions perpendicular to the solar-anchored axis is the geomorphic FoR anchored by the main slope of the town. With the exception of one consultant who, when pushed, gave the terms *kəhsmə nahsomo* 'above on the ground' and *kəʔmə nahsomo* 'below on the ground' as the CZ equivalents to the Spanish terms *norte* 'north' and *sur* 'south', consultants generally rejected any equivalence between the slope-based and north-south axes.

There is, therefore, no standardised CZ terminology used to refer to the directions perpendicular to the solar-anchored axis. As can be seen from the description in (394), however, the Spanish loan terms that refer to this axis are synchronically treated as CZ terms with regards to the application of productive morphology.

(394)   jəʔ=mə   **norte=mə=kaŋ**   ø-ʔit-u   pən
          PRX=LOC1 north=LOC1=APPROX 3B-EXIST-CP person
          'The person is to the north' (P, OO)

In referential communication tasks, consultants regularly used indigenous spatial adjuncts to supplement their use of the Spanish terms mentioned above. When referring to a southerly direction consultants principally referred to those towns that are along the road that runs roughly south through the Zoque region to the state captial, Tuxtla Gutierrez. The closest of these towns, *kunjəʔmə* 'Coapilla' (whose lights are visible from

Ocotepec at night) was also the most regularly used (see (395), for example).

(395)   waka=ʔis   tʃibu teʔ=ʔis   j-tseʔŋna=ʔomo ø-ʔit-u   . . . kunjəʔmə
              cow=3GEN, sheep 3PRO=3GEN 3A-side=LOC3   3B-EXIST-CP . . . Coapilla
              nə   j-ken-maŋ-u
              PROG 3A-look-go-DEP.III
              'The sheep is to the side of the cow and facing (lit:looking) towards Coapilla
              (south)' (P, OO)

Ocotepec sits at the northern end of the road from Tuxtla Gutierrez and it is presumably for this reason that the only population centre that is regularly referred to when talking about the northerly direction is the distant city of *Villahermosa* (Tobasco): a common destination for Zoques to go and find work. A second location that is referred to with some regularity when indicating the northerly direction is the nearby volcano, Chichonal - using its name in Spanish, CZ or simply the Spanish term *volcan* 'volcano' - which is located roughly to the north of Ocotepec and is deeply salient to many inhabitants in Ocotepec due its eruption in 1983 and the subsequent evacuation of many people from the area.

A final strategy for referring to the northerly direction found in my data is to use the fact that most afternoons rain clouds arrive above Ocotepec having entered over the northern edge of the valley. As can be seen from the representative example in (396), this event is referred to using place-denoting adverbial clause in the incompletive aspect.

(396)   jəʔki   jəʔ=mə=kaŋ   ø-tsəʔj-pa   tumə wakas jəʔki
              PRX;LOC2 PRX=LOC1=APPROX 3B-remain-ICP one   cow   PRX;LOC2
              ø-min-pa=mə   **tuh**, jəʔ=mə   ***norte***
              3B-come-ICP=LOC1 rain, PRX=LOC1 north
              'Here, around about here is a cow, here in the direction from which the rain
              comes, here the north' (EU, OO)

Given that none of the terms used to describe directions along the axes perpendicular to the solar-anchored axes are used *systematically*, my analysis is that, conceptually,

231

descriptions in which they are used should be classified as examples of landmark-based FoRs rather than as part of the same absolute FoR as the solar-anchored axis.

10.3.4 Discussion: descriptions of location

As with those other geocentric FoRs discussed so far, none of the linguistic resources used in expressing the "CZ cardinal co-ordinates" allow for the formation of a description of location in which a Ground is explicitly stated. This is exemplified in representative examples such as (397)-(399) (repeated from (390), (394) and (396) respectively).

(397) ø-təʔp-pa=mə   hama ø-ten-u   teʔ pən.tsəki
       3B-go.down.celestial-ICP=LOC1 sun   3B-stand-CP
       ‘The toy man is stood to the west (lit: where the sun goes down)’ (P, OO)

(398) jəʔ=mə   norte=mə=kaŋ   ø-ʔit-u   pən
       PRX=LOC1 north=LOC1=APPROX 3B-EXIST-CP person
       ‘The person is to the north’ (P, OO)

(399) jəʔki   jəʔ=mə=kaŋ   ø-tsəʔj-pa   tumə wakas jəʔki
       PRX;LOC2 PRX=LOC1=APPROX 3B-remain-ICP one   cow   PRX;LOC2
       ø-min-pa=mə   tuh, jəʔ=mə   norte
       3B-come-ICP=LOC1 rain, PRX=LOC1 north
       ‘Here, around about here is a cow, here in the direction from which the rain comes, here the north’ (EU, OO)

The consequences of this inability to explicitly state a Ground in descriptions of location are discussed more in Section 11.

10.3.5 Discussion: usage

The B&C data presented in Figures 34 and 35 show clearly that the solar-anchored FoR is an important strategy for describing the orientation of objects in CZ on a small scale. These data also show that this FoR is used at a similar level to all other extrinsic FoRs in the description of location on a small scale. In both of these regards the usage

232

of this absolute FoR is more similar to that of a 'referentially promiscuous' language such as, Yucatec Maya (Bohnemeyer, 2011) than either strongly absolute languages like, Tseltal (Polian and Bohnemeyer, 2011) or strongly relative languages such as Dutch (van Standen et al., 2006) or Japanese (Kita, 2006). Notably, none of those strategies for referring to the north-south axis described in Section 10.3.3 were used during the B&C task, the use of slope-based FoRs apparently being preferred. As would be expected from the pattern of use of geocentric FoRs cross-linguistically, the solar-anchored FoR is used significantly more frequently when describing spatial arrays on a larger scale, particularly when discussing locations outside of the valley in which Ocotepec is located.

Based on the data collected using referential communication tasks such as the Maze Game, it appears that both of the cardinal axes in CZ play a peripheral role in descriptions of motion on a small scale, egocentric and slope-based FoRs being the preferred method of describing motion on this scale. A similar situation was also observed for descriptions of routes around Ocotepec. It was only when descriptions of motion outside of the town of Ocotepec - particularly those routes not following established roads (for example, descriptions of routes peformed before the highway arrived) - were given that these "cardinal directions" were used with any significant frequency.

All of the solar-anchored descriptions given during the B&C task were given by the oldest, all-male dyad. Over the whole of my data set, however, the restriction of the use of this type of FoR to older males that this pattern suggests is not evidenced. Across my wider data set there are many examples of speakers of all ages using the solar-anchored directions freely on all scales; there is also no obvious evidence of the type of gender-related discrepancy in the use of absolute FoRs reported for Yucatec Maya, despite a superficially similar societal organisation, specifically the division of labour between males and females.

11 Groundless locative statements

11.1 Introduction

In this section I will discuss the fact that a subset of the FoRs available to speakers of CZ - those geocentric FoRs anchored by environmental features - can not feature in a basic locative construction (BLC) in which a Ground is explicitly stated. In fact, for locative constructions more generally, it is not possible to state all of the defining conceptual entities (i.e., the Figure, the Ground and the Anchor) within the same clause when using one of these geocentric FoRs to specify a location. Instead, the Figure and Anchor are always specified, while the Ground is inferred from context, linguistic or otherwise.

I will refer to locative constructions in which a Ground is specified as *Ground-featuring* locative statements. An example of a projective Ground-featuring locative statement, with the Ground phrase highlighted in bold, is shown in (400).

(400) te? tuwi **te? ?une=?is j-nuni=kə?mə** ø-?əŋ-u
       DET dog DET child=3GEN 3A-backside=LOC5 3B-lie-CP
       'The dog is lying down (lit: in the state of having lain down) below the boy's backside' (AU, FSp17)

In contrast, those locative constructions in which a Ground is not stated, and therefore must be inferred from context, will be referred to as *Groundless* locative statements. The FoRs that I will discuss in this section are restricted to appearing in just such Groundless locative statements.

To exemplify the typical form and use of these Groundless locative statements I have reproduced in full in (401) the exchange that occured between two consultants during the Ordering Objects referential communication task. During this exchange, Consultant 1 was the director of the task and Consultant 2 the matcher.

(401)   **Consultant 1**

234

Figure 44: The Ordering Objects stimulus being described in (401).

a. ø-ʔit-u   tumə kuhj
    3B-EXIST-CP one   tree
    'There is a tree'

b. teʔ=kəʔmə ø-ten-u   wijəŋ=ʔomo   teʔ pən-tsəki
    3PRO=LOC5 3B-stand-CP straight=LOC3 DET man-figure
    'By it (the tree) is stood, in a straight line, the toy man'

Consultant 2

c. ø-tsoʔt-pa=mə   hama?
    3B-come.up.celestial-ICP=LOC1 sun?
    'To the east (lit:where the sun rises)?'

Consultant 1

d. kuhj teʔ=mə   ø-ʔit-u   ø-min-pa=mə=k   tuh
    tree MED=LOC1 3B-stand-CP 3B-come-ICP=LOC1=APPROX rain
    'The tree, is there, to the north (lit: from where the rain comes)'

e. pən-tsəki teʔmə   ø-ʔit-u   jəʔ=mə,   kəhsmə,
    man-figure MED=LOC1 3B-EXIST-CP PRX=LOC1 above,
    kəhsmə=kaŋ
    above=APPROX
    'The toy man is above in this location, approximately above'

In (401-a), the director of the task uses an existential statement to introduce the entity that is then used as the Ground (the *tree*) of the BLC in (401-b). The matcher then offers the spatial adjunct in (401-c) with a questioning (rising) intonation. The response of the director to this question is to give the two descriptions in (401-d) and

(401-e), both of which are Groundless locative statements for which the *tree* is the (inferred) Ground. Immediately following these two Groundless locative statements, the matcher moved the toy figure into the correct position relative to the tree.

It is of course likely that Groundless locative statements analogous to those in (401) would, in the same context, be given by speakers of many other languages, English included. The critical difference between the use of these Groundless locative statements in CZ and their use in languages such as English, however, is the fact that in CZ they are *obligatory* if a speaker is to use a subset of their inventory of FoRs in a description of location. In contrast, in English the use of such Groundless constructions is always optional, it always being possible to explicitly state the Ground of a locative statement regardless of the FoR that it features.

The phenomenon of a subset of the FoR-inventory of a language not being expressable in Ground-featuring locative statements has previously been described - although not discussed - in a small number of languages. These include Yeli Dnye (isolate, Papua New Guinea; Levinson, 2006, p190), Jaminjung (Jaminjungan, Australia; Schultze-Berndt, 2006, p105) and Tseltal (Mayan, Mexico; Polian and Bohnemeyer, 2011, p884). The presence of the same phenomenon in unrelated languages spoken in, with the exception of Tseltal, locations some distance from where CZ is spoken suggests strongly that this phenomenon is the result of aspects of spatial language that are present cross-linguistically.

In this section, I first provide a descriptive account of the phenomenon of Groundless locative statements in CZ. I will begin in Section 11.2 by defining some technical notions that will be central to the discussion, in particular the notions of *binary* and *ternary* spatial relations. I then consider in Section 11.3, the formal strategies through which it is possible to form Ground-featuring locative statements in CZ. In Section 11.4, I then describe how these strategies for forming Ground-featuring statements differ from those available for the formation of locative statements featuring geocentric FoRs in CZ. In

Section 11.5, I then describe how Groundless locative statements are typically used in CZ and show that they are an important strategy for the description of location.

In the discussion part of this section, I consider what the obligatory use of Groundless locative statements, in CZ and those other languages in which they are attested, can tell us about the linguistic encoding of spatial relations more generally. In Section 11.6, I will propose that Groundless locative statements constitute an alternative *strategy* - compared to that of linguistically encoding all three defining conceptual entities - for the expression of location using extrinsic FoRs. In Section 11.6.1 I will then hypothesise that if it is possible to reference an extrinsic FoR in the BLC of a language it will also be possible to use that same FoR in Groundless locative statements *and* descriptions of orientation and direction of motion. And in Section 11.7, I argue for the existence of Groundless locative statements featuring the relative FoR.

11.2 Binary versus ternary spatial relations

When we are discussing the possibility of referencing a particular extrinsic FoR in a Ground-featuring locative statement we are actually talking about the ability to encode linguistically a particular *ternary spatial relation.* As explained by Levinson (2003) (and originally observed by Herrmann (1990)), ternary spatial relations are those that require the specification of three distinct conceptual entities. A locative statement featuring an extrinsic FoR is therefore an example of a ternary spatial relation as it is defined by a Figure, a Ground and an Anchor. In (402), the formal elements in which each of these conceptual entities are encoded are labelled for a locative statement featuring the vertical absolute FoR.

(402)   [teʔ səʔŋ-kuj]_{FIGURE} ø-ʔit-u   [kot-ʔoj-tək]_{GROUND} =[kəhsi]_{ANCHOR}
         DET shine-INSTR   3B-EXIST-CP put-ANTIP-INSTR   =LOC4
         'The light is above the table' (M, TRPS 13)

In contrast, a description of orientation or direction of motion in which an extrinsic FoR is referenced is an example of a *binary* spatial relation, as these are defined by just two conceptual entities: a Figure and an Anchor. This can be seen from (403) and (404) in which the defining conceptual entities are again labelled.

(403)　[jəʔ poʔks-tək]$_{\text{FIGURE}}$ jəʔmə ø-ken-keʔt-u　jəʔmə
　　　　PRX sit-INSTR　　　　HESIT 3B-look-REP-CP HESIT
　　　　[ø-tsoʔt-u=mə　　　　　jəʔ　hama]$_{\text{ANCHOR}}$ ...
　　　　3B-come.up.celestial-CP=LOC1 PRX sun　　　　...
　　　　'This chair is directed towards the east (lit: where this sun came up)' (P, B&C 1-2)

(404)　[teʔ ʃ-kaʔe]$_{\text{FIGURE}}$ nə　[j-kiʔm-u　　　kəhsi]$_{\text{ANCHOR}}$ ...
　　　　DET F-youth　　PROG 3A-ascend-DEP.III above　　...
　　　　'The young girl is ascending upwards ...' (AT, TRAJ)

Similarly, descriptions of location featuring an *intrinsic* FoR are also examples of binary spatial relations as these are defined by a Figure and a single entity that performs the function of both Anchor and Ground.

(405)　[teʔ poʔks-tək=ʔis　j-tseʔŋna]$_{\text{GROUND=ANCHOR}}$ =ʔomo ø-ʔit-u　　[tumə
　　　　DET sit-INSTR=3GEN 3A-side　　　　　　　　　=LOC3 3B-EXIST-CP one
　　　　pelota]$_{\text{FIGURE}}$
　　　　ball
　　　　'To the chair's side is a ball' (LG, B&C 1-3)

The ability to linguistically encode a ternary spatial relation is therefore synonymous with the ability to encode three distinct conceptual entities, whereas the ability to encode a binary spatial relation requires only the encoding of two conceptual entities. As will be explained, all of those FoRs available to CZ speakers can appear freely in constructions in which *two* conceptual entities are encoded. As a result, all CZ FoRs can be used to form fully-specified statements - i.e., ones in which all defining conceptual entities are linguistically encoded - of orientation and direction of motion. In contrast, only a

238

subset of CZ FoRs can feature in locative statements in which three conceptual entities are encoded. As a result, some extrinsic FoRs can only feature in locative statements in which two conceptual entities (the Figure and the Anchor) are encoded: these are the descriptions that I identify as Groundless locative statements.

A final point that it is necessary to make prior to discussing Groundless locative statements is that I follow Palmer (2015) in considering spatial relations featuring an absolute FoR as being *ternary* in nature. This is in contrast to the perspective taken by Levinson (2003), who considers them to be binary due to absolute FoRs being *abstracted* from their Anchor. As has already been discussed in Section 7.3.4, the degree of abstraction associated with absolute FoRs is a contentious issue.

11.3   Characteristics of Ground-featuring locative statements

As described in Section 3.2, basic spatial descriptions in CZ (including the BLC) contain a single, location-denoting spatial adjunct. In order to form a Ground-featuring locative statement that references an extrinsic FoR - or in other words, fully specify a ternary spatial relation - it is therefore necessary to encode both the Ground and the Anchor within the same spatial adjunct. In contrast, in order to fully specify a binary spatial relation - i.e. form a fully-specified description of orientation or direction of motion, or locative statement featuring an intrinsic FoR - it is necessary for the spatial adjunct of the statement to encode only the Anchor of the relation.

One way in which it is possible to state both Anchor and Ground as part of the same spatial adjunct is through the use of a PP headed by a locative clitic with at least one *projective* sense. The use of a locative clitic whose semantics specify an FoR allows for its complement to state the Ground of the statement. This strategy for fully specifying a ternary spatial relation can be seen in (406) (repeated from (402)), in which the locative clitic *kəhsi* 'LOC4' encodes the vertical absolute FoR - and therefore the Anchor of the spatial relation - and its complement, *səʔŋ-kuj* 'light' is the Ground of the statement.

239

(406)   [teʔ səʔŋ-kuj]$_{\text{FIGURE}}$ ø-ʔit-u   [kot-ʔoj-tək]$_{\text{GROUND}}$ =[kəhsi]$_{\text{ANCHOR}}$
             DET shine-INSTR   3B-EXIST-CP put-ANTIP-INSTR   =LOC4
             'The light is above the table' (M, TRPS 13)

The only locative clitics with projective senses in CZ are *kəhsi* 'LOC4' and *kəʔmə* 'LOC5'. As discussed in Section 9, the only FoR that these locative clitics are systematically used to express is the vertical absolute FoR, although some speakers also find it acceptable to use these in a relative way. This strategy for fully specifying a ternary spatial relation is therefore only systematically used for those for which the Earth's gravitational field is the Anchor, of which (406) is an example.

The second strategy for stating the Anchor and Ground of a description of location in the same spatial adjunct is to use a postpositional phrase featuring an RSN. As discussed in detail in Section 4.2.4, a subset of CZ RSNs can be assigned to their possessor based on an externally imposed asymmetry. RSNs assigned on this basis can be considered to encode an FoR, the Anchor of which is the entity that is the basis for the externally imposed asymmetry. For example, in (407) (used to describe the image in Figure 45) the RSN *ʔaknja* 'left' is assigned to the facet of the chair that is furthest to the left of the speaker's field of vision - rather than that which is 90 degrees anti-clockwise from the intrinsic 'front' - meaning that it encodes the *relative FoR*. The encoding of the relative FoR through the assignment of RSNs is discussed in Section 8.3.

(407)   [j-neʔ   j-ʔaknja=ʔomo]$_{\text{ANCHOR,GROUND}}$ ø-ʔit-u   [tumə *pelota*]$_{\text{FIGURE}}$
             3A-ANAP 3A-left=LOC3   3B-EXIST-CP one   ball
             nə   j-siti-u=pə,   ø-ten-u=pə
             PROG 3A-fly-DEP.III=REL, 3B-stand-CP=REL
             'To its left is a ball that is floating (lit:flying), and that is upright' (AT, B&C 2-2)

The Ground of the statement is then the possessor of the RSN, which in (407) is encoded anaphorically in the third person, Set A suffix *j-*.

Figure 45: B&C 2-2 (Bohnemeyer and Pérez Báez, 2008), described in (407)

PPs featuring RSNs are used to linguistically encode two types of ternary spatial relation: those that constitute locative statements featuring the relative FoR (as in (407)) and those that constitute locative statements featuring the vertical absolute FoR (as in (408)).

(408) [teʔ səʔŋ-kuj]_FIGURE ø-ʔit-u   [teʔ toto-kot-tək=ʔis]_GROUND
       DET shine-INSTR   3B-EXIST-CP DET paper-put-INSTR=3GEN
       [j-kəs=mə]_ANCHOR, GROUND
       3A-top=LOC1
       'The light is above the table (lit: the thing to put paper on)' (F, TRPS 13)

11.4   Characteristics of Groundless locative statements

11.4.1   Introduction

Three of the FoRs described in the previous sections can not *generally* feature in Ground-featuring constructions: the slope-based FoRs discussed in Section 9.3, the CZ cardinal co-ordinates discussed in Section 10.3 and the landmark-based FoRs discussed in Section 10.2[69]. All of these FoRs share the characteristic that they are not encoded in the semantics of a locative clitic nor can be used as the basis for the assignment of RSNs. As a result, the spatial adjuncts through which these FoRs are expressed encode only *the*

---

[69]The marginal use of Ground-featuring slope-based locative statements is discussed in Section 9.3.

Anchor of the description. As a result, the Ground of the description must be inferred from context. In the following sections, I describe the manner in which each of these FoRs is encoded in locative statements and will explain how this relates to their inability to feature in Ground-featuring locative statements.

11.4.2 Slope-based descriptions of location

With the exception of the extremely marginal use of the vertical RSNs *kəs* 'top' and *kəʔ* 'bottom', in a slope-based manner (discussed in Section 9.3), locative statements featuring a slope-based FoR are formed using one of the 'vertical' adverbs *kəhsi/kəhsmə* 'above' and *kəʔji/kəʔmə* 'below'.

An example of this type of locative statement can be found in (409), which is an extract from a description of a journey that the consultant and I had undertaken together. In the first two parts of this description ((409-a)-(409-b)) the consultant describes how he and I were stood in the town's football pitch, which he tells us has two goals. In (409-c), the consultant then states that one of the goals is located *kəʔmə* 'below'[70]. This description was referring to the fact that the goal in question was located at the 'downhill' end of the field, i.e., that which was furthest away from the top of the main slope of Ocotepec; there was no change of elevation observable along the length of the football pitch itself.

(409)   a.   teʔji   teʔ=se=ʔtsi   ø-ten-tsəʔj-jah-u   *campo*=ʔomo
                MED;LOC2 MED=SIM=1ABS 1B-stand-remain-EXCPL-CP field=LOC3

         b.   ø-ʔit-u   teʔ *campo*=ʔis j-*porteria* metsa
              3B-EXIST-CP DET field=3GEN 3A-goal   two

         c.   **tumə ø-ʔit-u**   **kəʔmə jəʔki**
              one   3B-EXIST-CP below HESIT

---

[70]The deictic adverb that follows *kəʔmə* in the description can be identified as a hesitation marker due to its intonation, volume and the fact that the consultant in question frequently used this term as a hesitation marker throughout his work as a consultant. It is not therefore considered to be relevant in the location specified by the locative statement.

242

'Then we remained stationary stood like that in the field, there are two of the field's goals, one is below' (R, SCE)

The spatial adverb in (409-c) encodes the Anchor of the statement, but does not indicate its Ground. As spatial adverbs do not take any morphological marking associated with the Ground from which the location they denote is projected (equivalent to the marking for possession that occurs on RSNs), it is not possible to linguistically encode a Ground in a locative statement in which the spatial adjunct slot is occupied by a spatial adverb.

Although their use is extremely marginal, it is useful at this point to compare the statement in (409-c) with that in (410) (repeated from (364)) in which the vertical RSN *kəs* 'top' is used in a slope-based sense.

(410)   n-tək=ʔis   **j-kəs=mə=kaŋ**   ø-ʔit-u   tumə tsina-kuj
             1A-house=3GEN 3A-top=LOC1=APPROX 3B-EXIST-CP one   orange-tree
             muha=pə
             big=REL
             'Uphill from my house (lit: roughly, at the top of my house) is a big orange tree' (ME, E)

In this statement the vertical RSN *kəs* 'top' encodes the Anchor of the description (the main slope on which Ocotepec sits) through the basis of its assignment to its possessor (*n-tək* 'my house'). This possessor is then the Ground of the statement. It can be seen from this example that the use of the vertical RSNs in a slope-based sense allows for the construction of a Ground-featuring, slope-based locative statement in a way that the slope-based use of the vertical spatial adverbs does not.

11.4.3 The CZ cardinal co-ordinates

As described in Section 10.3, the CZ equivalents to the western cardinal directions are expressed either through the use of a place-denoting adverbial clause - as in (411) (repeated from (390)) - or, in the case of *east* and *west*, an adverb that has formed from

one of these clauses through a process of univerbation (as in (412)).

(411) **ø-tǝʔp-pa=mǝ**   **hama** ø-ten-u   teʔ pǝn-tsǝki
       3B-go.down.celestial-ICP=LOC1 sun 3B-stand-CP DET man-figure
       'The toy man is stood to the west (lit: where the sun goes down)' (P, OO)

(412) poʔk-stǝk ø-tǝk-nej-u   *piso*=kǝhsi, *i* *jǝʔmǝ*
       sit-INSTR 3B-to.be.thrown-ASSUMP-CP floor=LOC4 and HESIT
       ham.dǝʔp.pa.mǝ ø-ʔit-u,   j-koso=kǝʔmǝ, *pelota*
       to.the.west   3B-EXIST-CP, 3A-foot/leg=LOC5, ball
       'A chair is on the floor, as if thrown there, and to west, by its feet, is a ball'

       (P, B&C 3-7)

The adverbial clauses used to express these directions are headed by the locative clitic *mǝ* 'LOC1', which has co-locational semantics. The semantics of these clauses - and by extension the evolved adverbial forms - therefore literally specifies the location in which the event encoded in the predicate of the clause occurred, for example, *tǝʔ-pa=mǝ hama* literally specifies the location where 'the sun goes down'.

Of course, our knowledge of the world tells us that it is not possible for an object to literally be located where the sun goes down or rises. Equally, there is no specific location from which the rain in Ocotepec comes (*ø-min-pa=mǝ tuh*), which is the meaning of the adverbial clause often used to express one of the directions perpendicular to the solar-anchored axis. When used in locative statements, such as (411), therefore, these place-denoting clauses (and the adverbial forms) are given a *directional* interpretation, i.e., 'towards where the sun comes up/goes down (east/west)' or ' towards the direction from where the rain comes (north)'.

The significance of the directional, rather than co-locational, reading of these clauses is that it means the event stated therein (i.e. the rising/setting of the sun or the motion of the rain) is the *Anchor* of the description and not the *Ground*. Like spatial adverbs, place-denoting adverbial clauses can not take on any morphology to indicate a spatial relation with another entity. The directional interpretation of these spatial adjuncts that

244

I have argued for here therefore means that it is not possible to linguistically encode a Ground in the locative statements in which they appear.

11.4.4   Landmark-based FoRs

As described in Section 10.2, landmark-based FoRs in CZ are expressed through the use of place-denoting adverbial clauses, as in (413), or PPs headed by either *mə* 'LOC1' or, marginally, one of the other locative clitics (as in (414)).

(413) jəʔ *pelota* ø-ʔit-u   ø-ʔit-u=mə   sulu=ʔis   j-tək
       PRX ball   3B-EXIST-CP 3B-EXIST-CP=LOC1 Sulu=3GEN 3A-house
       'This ball is towards Sulu's house (lit: at Sulu's house)' (JL, B&C 2-5)

(414) **kama+njeʔŋ-kəs=ʔi** jəʔki   ø-ʔit-u   tumə *pelota*
       hill-top=LOC2   PRX;LOC2 3B-EXIST-CP one   ball
       'Towards the top of the hill (lit: at the top of the hill) here is a ball' (AU, B&C 4-11)

As with the spatial adjuncts that encode the CZ cardinal co-ordinates described above, the semantics of those PPs and place-denoting clauses that encode landmark-based FoRs denote a location defined relative to a stated object. In the case of (413), for example, the location denoted by the spatial adjunct is defined through reference to a spatial relation of co-location with the house of a neighbour (*Sulu*). Similarly, in (414) the location denoted is defined through a relation of co-location with the top of the hill adjacent to the recording location.

Also in line with my treatment of those spatial adjuncts that encode CZ cardinal co-ordinates, it is my analysis that those spatial adjuncts that encode landmark-based FoRs obtain their projective interpretation due to the incompatibility of their literal interpretation with the real world knowledge of the speech act participants (SAPs). Those descriptions shown in (413) and (414), for example, were provided during separate runs of the B&C task. As these runs were both conducted in an indoor location, the

director who gave these descriptions and the matcher who interpreted them knew that the Figure of these descriptions ('the ball') could not literally be located either 'at the top of the hill' or 'at Sulu's house'. Consequently, both of these spatial adjuncts were interpreted as indicating the direction in which the ball could be found from an unstated Ground: the chair of the B&C stimuli.

The directional interpretation of the spatial adjuncts in (413) and (414) means that rather than being the Grounds of topological locative statements, the hill and the neighbour's house are actually the *Anchors* of projective locative statements. Again, the fact that it is not possible to morphologically mark a stand-alone spatial adjunct (such as an adverbial clause or PP in this case) to indicate a spatial relation with an object means that it is not possible to encode a Ground in locative statements featuring those spatial adjuncts through which landmark-based FoRs are expressed.

11.5 Patterns of use

11.5.1 Introduction

In this section I will discuss the linguistic contexts in which Groundless locative statements are found in my data. This discussion will focus on the relationship between the inferred Grounds of Groundless locative statements and the surrounding linguistic context. There are two aspects of the following discussion that it is necessary to highlight. Firstly, it is a *general* discussion of the use of Groundless locative statements and will therefore feature some examples of locative statements that feature FoRs that can feature in Ground-featuring locative statements. All of the FoRs that can not feature in Ground-featuring locative statements *can* feature in all of the linguistic contexts described in the course of this discussion.

The second thing to note is that it is not possible to present an exhaustive account of the contexts in which Groundless locative statements occur in my data. Nor has it been possible to put together a comprehensive typology of such contexts; both of these

246

tasks will require further research. Instead, the discussion below describes the linguistic contexts that account for a considerable majority of those in which Groundless locative statements are observed in my data.

11.5.2 In conjunction with a Ground-featuring locative statement

The most common context in which Groundless locative statements are observed in my data is as part of a description that also features a Ground-featuring locative statement describing the same spatial array. In some cases the Ground-featuring statement appears before the Groundless one, as in (415). When this is the case it doesn't seem to be necessary that the Ground-featuring and Groundless locative statements are *adjacent*. It is also possible, however, for the Groundless statement to appear *before* the Ground-featuring one (as in (416)). When this is the case it does appear to be necessary that the two statements are adjacent.

(415)   a.   ø-ʔit-u   tumə kuhj
             3B-EXIST-CP one   tree
             'There is a tree'

        b.   teʔ=kəʔmə ø-ten-u,   jaʔjaʔi teʔ pən-tsəki
             3PRO=LOC5 3B-STAND-CP, far,   DET man-figure
             'By the tree, at some distance, is stood the figure of a man'

        c.   kuhj=ʔis   j-wijəŋ=ʔomo
             tree=3GEN 3A-straight=LOC3
             'in a straight line with it (lit: in its straight region)'

        d.   **jəʔmə ø-tsoʔt-pa=mə**   **hama**
             HESIT 3B-come.up.celestial-ICP=LOC1 sun
             'to the east (lit: where the sun comes up)' (P, OO)

(416)   **jəʔ *pelota* kəʔji ø-ʔit-u**,   poʔks-tək=ʔis   j-ʔuka=mə=k
        PRX ball   below 3B-EXIST-CP, sit-INSTR=3GEN 3A-back=LOC1=APPROX
        'This ball is downhill (lit: below), behind the chair (lit: approximately at the back of the chair)' (C, E; describing B&C 4-2)

That the Ground of a Groundless locative statement can indeed be inferred from the

Figure 46: The stimulus described in (415) (Levinson et al., 1992).

surrounding context and isn't always the deictic centre - as has previously been reported for the Groundless locative statements in Jaminjung (Schultze-Berndt, 2006, p105) - can be seen from descriptions of spatial arrays in which the Figure is located between the deictic centre and the aforementioned Ground. In this context the two different possibilities for the inferred Ground - i.e., the deictic centre and the Ground of some co-occurring Ground-featuring description - lead to opposite extrinsic descriptions of location.

The description of location reproduced in (415) was given in just this context, as the 'figure of a man' was located between the deictic centre and 'the tree' also shown in the stimulus; this spatial array is shown in Figure 46. This meant that although the 'figure of a man' was to be located to the east of the 'tree' it was in fact located to the west of the deictic centre. The fact that the Groundless locative statement used by the consultant featured the spatial adjunct *ø-tsoʔt-pa=mɘ hama* 'to the east' tells us that he was locating the Figure relative to the aforementioned 'tree' rather than himself.

11.5.3 Selected linguistic contexts

The majority of the Groundless locative statements in my data appear in the linguistic context described above. The contexts in which the remaining Groundless locative state-

ments in my data occurred were of a varied nature. In this section I will describe two specific contexts in which the majority of the remaining Groundless locative statements in my data were found.

One context in which Groundless locative statements appear relatively regularly in my data is following - though not necessarily immediately following - an existential statement. An example of this type of context is presented in (417). In (417-a) the existence of a chair is stated, and some of its properties described. This chair is then inferred to be the Ground of the Groundless locative statement that immediately follows in (417-b).

(417) a. (ø-ʔit-u)   poʔks-tək tumə ø-ten-u=pə   ø-ken-u=pə
          (3B-EXIST-CP) sit-INSTR one   3B-stand-CP=REL, 3B-look-CP=REL
          ø-tsoʔt-pa=mə   hama
          3B-come.up.celestial-ICP=LOC1 sun
          '(There is) a chair that is stood upright and directed towards the east'

       b. **kama+njeʔŋ-kəs=ʔi jəʔki ø-ʔit-u   tumə *pelota***
          hill-top=LOC2   here   3B-EXIST-CP one   ball
          'A ball is towards the top of the hill here (lit: at the top of the hill here)'
          (AU, B&C 4-11)

A second context in which Groundless locative statements are observed in my data regularly is following a description of the location of some object other than the Figure of the Groundless locative statement. The Figure of this preceding description of location is then inferred to be the Ground of the subsequent Groundless locative statement. An example of this use can be seen in the description of the spatial array shown in Figure 47, which was given during the Ordering Objects referential communicative task. To begin with, in (418), the director tells the matcher to place the purple cup (literally, the one like a yam) where the cover being used to divide the participants is; this is then clarified as meaning the middle of the table (*mesja*=ʔis j-kuk=ʔomo).

249

Figure 47: The image described in (418)-(421) (Levinson et al., 1992).

(418) tsima teʔ ø-ʔit-u=mə   nuʔs-tək teʔ kot-a *kamote*=pə,
      cup   DET 3B-EXIST-CP=LOC1 cover-INSTR DET put-IMP yam=REL,
      mesja=*ʔis*   j-kuk=ʔomo
      table=3GEN 3A-middle=LOC3
      ‘Put the purple one (lit: the one like a yam) where the cover is, in the middle of the table’ AT, OO

After the matcher clarifies whether or not the cup should be placed right up against the cover, the director instructs her, in (419), to place the green cup towards ‘where the whiteboard is’[71]. This instruction is itself related to those Groundless locative statements that reference landmark-based FoRs described in Section 11.4.4, as the location where the Figure is to be place is also calculated from an inferred Ground: the purple cup described in (418).

(419) teʔji   teʔ *pisaron*=mə=kaŋ   kot-a   teʔ tsuhtsi=pə
      PRX;LOC2 DET whiteboard=LOC1=APPROX put-IMP DET green=REL
      ‘Then put the green one towards the whiteboard (in relation to the purple cup)’ (AT, OO)

The director then states, in (420), that the ‘blue cup’ is located in the ‘downhill direction

---

[71]One of the walls of the room in which recording was taking place had a whiteboard on the wall. This was a common Anchor for landmark-based FoRs during referential communication tasks.

where we are'. This is done using a Groundless locative statement referencing an FoR anchored by the slope at the foot of which the recording location was located. As with the previous instruction, the Ground of this locative statement is the salient object from the previous statement, in this case the 'green cup'.

(420) teʔji jəʔmə kəʔmə ø-ʔit-u   teʔ *asul*=pə
       then here   below 3B-EXIST-CP DET blue=REL
       'Then the blue one is in the downhill direction here (lit: here, below)'

We are able to determine unambiguously that the intended Ground of the Groundless locative statement in (420) is the 'green cup' as in response to a clarificationary question from the matcher the director gives the additional locative statements in (421). This explicitly locates the 'blue cup' relative to the green one - this time using using a Ground-featuring, relative locative statement - before repeating the spatial adjunct from the previous Groundless locative statement and, finally, providing another Groundless spatial adjunct, in this case one encoding a landmark-based FoR in which the speaker is the Anchor.

(421) teʔ tsuhtsi=pə=ʔis   j-neʔ   j-tseʔŋna=ʔomo, jəʔmə kəʔmə,
       DET green=REL=3GEN 3A-ANAP 3A-side=LOC3,   here   below,
       ø-ʔit-u=mə   mihtsi
       3B-EXIST-CP=LOC1 2PRO.ABS
       'To the green one's side, in the downhill direction where we are, towards you'

A context closely related to the one described directly above features two Groundless locative statements, side by side, featuring spatial adjuncts that specify locations that are in opposition to each other. An example of this type of description, featuring the contrastive spatial adjuncts *kəhsmə* 'above' and *kəʔji* 'below' - given to describe the image in Figure 48 as part of a re-telling of the Frog Story - is presented in (422).
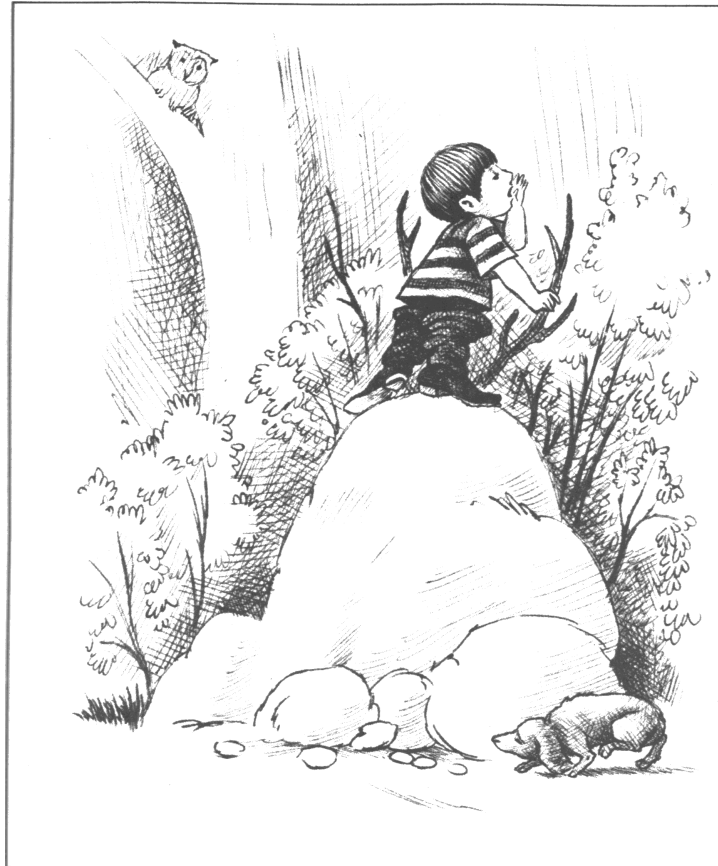
Figure 48: Page 17 of *Frog, where are you?* (Mayer, 1969), described in (422)

(422)   teʔ ʔune kəhsmə ø-ten-u   *i*   teʔ tuwi kəʔji ø-ʔit-u
           DET child above   3B-stand-CP and DET dog below 3B-EXIST-CP
           'The child is stood above and the dog is below' (JC, FS p17)

My analysis of descriptions such as this is that the two Groundless locative statements combine to form a fully-specified locative description: the Figure of each Groundless locative statement acting as the Ground of the other. In (422), for example, it is my analysis that 'the child' acts as the Ground of the locative statement for which 'the dog' is the Figure and 'the dog' the Ground for the locative statement in which 'the child' is the Figure.

This context is similar to that exemplified in (420) - that in which the Figure of a previously stated spatial description is inferred to be the Ground of a Groundless locative statement. These two contexts appear to differ, however, in their systematicity. This is evident from the fact that when two contrastive Groundless locative statements are used in this manner in my data they are always juxtaposed, suggesting that they are considered to be part of a single locative description. In contrast, there is usually no such indication of the relationship between the Groundless locative statement and the locative statement from which it is to "obtain" its Ground in contexts such as that exemplified in (420).

11.5.4   Groundless locative statements without salient linguistic context

Although rare in my data, it is possible for a Groundless locative statement to be used without there being an "obvious" Ground in the surrounding linguistic context. Excluding those cases in which the Ground is inferred from non-linguistic context, the nature of the inferred Ground can depend on various factors, with the FoR referenced and the scale of the description being the two most prominent.

Based on the small number of examples in my data - and discussions with consultants - it seems that the general rule of thumb for Groundless locative statements used on a

small scale is that if the Ground is not inferred from linguistic context it is assumed to be the deictic centre. An example of the use of a Groundless locative statement - in this case featuring the slope-based FoR discussed in Section 9.3 - for which the Ground is the deictic centre, and is therefore not taken from linguistic context, is shown in (423).

(423)   teʔ pən ø-ʔit-u   kəhsmə
        DET man 3B-EXIST-CP above
        The man is further up the hill (lit: above)' (B, E)

This was given during a discussion regarding how one might use the main slope of the town to locate objects. The consultant indicated that if a person was located adjacent to a house that was further up the street it would be entirely natural to refer to their location using the description in (423) without any linguistic context given.

In my data there is just a single example of a locative construction occuring without some linguistic context or, alternatively, very clear non-linguistic context from which a Ground can be inferred (for example during a referential communication task). The conditions for a Groundless locative statement to *not* take its Ground from linguistic context and instead take the deictic centre is therefore in need of further study.

Without the context provided by the consultant, it would be possible for the description in (423) to have a second interpretation. This would locate 'the man' in the 'uphill' part of Ocotepec. This is unambiguously defined as the part of Ocotepec uphill from the central square. The part of Ocotepec that lies downhill of the central square is referred to as *kəʔmə/kəʔji* 'below'.

An unambiguous case of the vertical adverbs being used in this manner is presented in (424), which was given as part of a narrative describing the changes that Ocotepec had undergone since the consultant was a child.

(424)   a.   kupkuj *era=naʔak*   ø-ʔit-u=mə   sjeʔŋomo jəʔ *iglesia*
             village 3.PST.ICP=CONTR 3B-EXIST-CP=LOC1 up.to   PRX church

254

> *ascension*, teʔ   sjeʔŋomo=naʔak kupkuj
> Ascension, 3PRO up.to=CONTR   village
> *'The village was up to where this church of the Ascension is, the village was up to it'*

b. jəʔki,   kəʔji ni-tijə=naʔak   ha   ʔit-ə   jəʔki
   PRX;LOC2, below no-thing=CONTR NEG.CP EXIST-DEP.I PRX;LOC2
   'Here, in the lower part of town (lit:below) there was nothing' (AU, N)

In (424) the consultant explains that when he was a child there were no houses in the part of town downhill from the centre of town, which he refers to as *kəʔji* 'below'[72]. As he was referring to the region surrounding the recording location - as indicated by his use of the deictic adverb *jəʔki* 'here' (and related gestures) - we can discount the possibility that it is the deictic centre functioning as the inferred Ground here.

11.6 Competing strategies for expressing ternary spatial relations

To recap, descriptions of location featuring extrinsic FoRs are defined by three distinct conceptual entities: the Figure, the Ground and the Anchor. The systematic use of Groundless locative statements featuring extrinsic FoRs show thats that the ability to use an extrinsic FoR to locate an object does not entail the ability to encode a ternary spatial relation linguistically. Instead, it appears that the linguistic encoding of ternary spatial relations - i.e., the formation of locative statements in which the Figure, the Ground and the Anchor are all encoded linguistically - is just one potential strategy for describing the location of an object using an extrinsic FoR.

The alternative strategy used by CZ speakers when using geocentric FoRs to locate an object is to use those linguistic resources used to linguistically encode *binary* spatial relations - such as descriptions of orientation and motion - to encode just the Figure and the Anchor of the description. I have termed the resulting locative statements *Groundless* as they do not feature a linguistically encoded Ground and therefore require

---

[72]Although this isn't a locative statement, the strategy used to describe the location being discussed could feature in one.

one to be inferred from context, linguistic or otherwise. The fact that similar strategies for expressing ternary spatial relations have been observed in unrelated languages in different parts of the world suggests strongly that this phenomenon is associated with the development of linguistic FoRs in general.

11.6.1 Hypothesis

All of those extrinsic FoRs that can not feature in linguistically encoded ternary spatial relations (i.e. in Ground-featuring locative statements) *can* feature in linguistically encoded binary spatial relations (i.e., descriptions of orientation and direction of motion). This same pattern is also noted in those other languages in which Groundless locative statements are obligatorily used with some extrinsic FoRs (Levinson and Wilkins, 2006; Schultze-Berndt, 2006; Polian and Bohnemeyer, 2011). As far as I am aware, however, there have been no accounts to date of an extrinsic FoR for which the opposite holds true, i.e., one that can feature in a linguistically encoded ternary spatial relation, but not a binary one.

This observed pattern is likely related to two general features of spatial language. Firstly, there is a well attested tendency for more complex spatial relations to be linguistically encoded following simpler ones. Indeed, it is often the case that the terminology associated with more complex spatial relations evolves directly from that associated with simpler ones. The best attested example of this is the development of the terminology associated with the projective object-centered FoR from that associated with topological spatial relations and specifically that featuring part-naming terms. This has been described as a general diachronic process by Heine (2003) and is actually exemplified by CZ (see Section 8.2). Another example of this general pattern of development is the tendency for what Levinson and Wilkins (2006, p563) refer to as "fully developed relative systems" - presumably those for which it is possible to encode both binary and ternary spatial relations - to evolve from, and in many cases share lexemes with, binary

object-centered systems. Given that ternary spatial relations are fundamentally based upon the binary spatial relation between Anchor and Origin that defines the FoR they feature, it would be in keeping with this general tendency for spatial relations to be linguistically encoded in order of increasing complexity if they were linguistically encoded at a later stage.

The second general feature of spatial language that I propose is important for understanding why all extrinsic FoRs can feature in linguistically encoded binary spatial relations, but some can not feature in linguistically encoded ternary ones, is the fact that descriptions of orientation require reference to an external direction (see the definition of a description of orientation in Section 3.5.1). This means that in order to state the orientation of a Figure it is *essential* to be able to linguistically encode a binary spatial relation - descriptions of orientation are defined by a Figure and an Anchor - featuring an extrinsic FoR. In contrast, it is never essential to be able to able to linguistically encode a *ternary* spatial relation featuring an extrinsic FoR, there being two alternative strategies available for locating objects that do not require this ability. Given that extrinsic binary spatial relations are an essential feature of spatial language, whereas extrinsic ternary spatial relations are not, it seems reasonable to suggest that the linguistic terminology required to encode extrinsic binary spatial relations develops before that required for extrinsic ternary ones.

Based on the available empirical data and the general features of spatial language described above, I hypothesise that the lexicalisation of ternary spatial relations featuring a particular FoR entails the lexicalisation of binary ones featuring the same FoR. Put another way, I hypothesise that if it is possible to form a Ground-featuring locative statement using a particular extrinsic FoR in a language it is also possible to form an orientational statement, a description of direction of motion *and* a Groundless locative statement using the same FoR.

11.7 Groundless locative statements featuring the relative FoR

11.7.1 Introduction

The instances of the Groundless locative statements that I have discussed up to now have been exclusively geocentric in nature, that is, the Anchor of the FoR they feature has been an environmental entity, such as a slope, the sun or an ad-hoc landmark. There does not, however, appear to be any a priori reason why such Groundless locative statements should be limited to geocentric FoRs. In particular, there does not appear to be any reason why they should not feature the egocentric extrinsic FoR, i.e., the relative FoR.

In this section I will argue that such relative Groundless locative statements do in fact exist. I will also argue that it is possible to identify the 'hybrid' descriptions of location anchored by the body of the speaker discussed in Section 8.4.4 as the manifestation of these relative Groundless statements in CZ.

11.7.2 Analysis of hybrid egocentric descriptions

In Section 8.4.4, I introduced the notion of a 'hybrid' description of location anchored by the speaker. These are descriptions, such as that in (425) (repeated from (347)), in which a Figure is located through the use of those spatial adjuncts typically analysed as expressing the direct FoR along the coronal axis, i.e., a spatial adjunct that explicitly references one of the coronal facets (*tsɘʔnaŋ* 'right' in (425)) of the speaker.

(425)　　teʔ　j-*pelota* tumɘ=pɘ=ʔis=j-neʔ　　　ø-ʔit-u　　　n-tsɘʔnaŋ=ʔomo
　　　　　DET 3A-ball　one=REL=3GEN=3A-ANAP 3B-EXIST-CP 1A-right=LOC3
　　　　　'*The ball of one (photo) is to my right*' (BR, E)

The particular descriptions in question, however, are atypical of direct descriptions of location. In the first instance, they are used to describe Figures - such as the ball in Figure 49, which is being located in (347) - that are located closer to the sagittal axis

Figure 49: B&C 4-7 (Bohnemeyer and Pérez Báez, 2008), described in (347)

of the speaker than the coronal, making their location through reference to the coronal axis of the speaker pragmatically marked; a more typical description of the location of a Figure in such a location relative to the speaker would be *n-winaŋ=ʔomo* 'in front of me'. Moreover, the judgements of consultants have shown clearly that the felicity of this type of description is dependent on there being a second object located adjacent to the Figure, suggesting that this 'additional' object is intrinsically linked to the conceptual structure of these descriptions.

Due to these characteristics it is my analysis that these 'hybrid' descriptions are better analysed as egocentrically-anchored analogues of those geocentric Groundless locative statements discussed so far in this section. In this scenario, these descriptions are interpreted as Groundless locative statements referencing the relative (i.e. egocentric, extrinsic) FoR.

The argument for this interpretation is similar to that of the Groundless locative statements featuring landmark-based FoRs described in Section 11.4.4. The 'hybrid' descriptions of location obtain their relative interpretation due to the fact that both speaker and interlocutor *know* that the Figure being described is not literally located in the vicinity of the speaker's coronal axis. They are therefore reinterpreted as Groundless locative statements in which the relative FoR is being used to locate the Figure relative to an unstated Ground that must be inferred from context. This analysis would explain the

259

fact that this type of description is common throughout the data arising from referential communication tasks, as in that context both participants know that the stimuli being described are located 'in front of' the director and it is often the case that these stimuli feature a stereotypical Ground (the chair in the B&C stimuli, for example).

The difference between relative Groundless statements, such as that in (425), and ones featuring a landmark-based FoR is that, whereas for landmark-based descriptions of location the semantics are usually co-locationary in nature - for example, in (426) the semantics of the description locates the ball *at* a neighbour's house -, the semantics of those spatial adjuncts that feature in relative Groundless locative statements are themselves projective, referencing as they do the direct FoR.

(426) jəʔ *pelota* ø-ʔit-u   ø-ʔit-u=mə   sulu=ʔis   j-tək
       PRX ball   3B-EXIST-CP 3B-EXIST-CP=LOC1 Sulu=3GEN 3A-house
       'This ball is towards Sulu's house (lit: at Sulu's house)' (JL, B&C 2-5)

11.7.3   Supporting evidence

The analysis of 'hybrid' descriptions of CZ as Groundless locative statements featuring the relative FoR is supported by similarities between their use in my data and that of the geocentric Groundless locative statements already described. One of these similarities is that for geocentric and relative FoRs alike, the spatial adjuncts that appear in Groundless locative statements are also used in descriptions of orientation and motion. In the case of the relative FoR these are the PPs featuring the RSNs *tseʔŋna* 'side', *ʔaknja* 'left' and *tsəʔnaŋ* 'right' marked for possession by the speaker. Examples of a proposed Groundless locative statement and a description of orientation featuring the RSN *tsəʔnaŋ* 'right' are shown in (427) and (428) respectively.

(427) teʔ j-*pelota* tumə=pə=ʔis=j-neʔ   ø-ʔit-u   n-tsəʔnaŋ=ʔomo
       DET 3A-ball one=REL=3GEN=3A-ANAP 3B-EXIST-CP 1A-right=LOC3
       'The ball of one (photo) is to my right' (BR, E)

(428) jəʔ poʔks-tək n-tsəʔnaŋ=ʔomo ø-ken-u
       PRX sit-INSTR 1A-right=LOC3   3B-look-CP
       'This chair is directed towards my right' (B, B&C 2-8)

The appearance of the same spatial adjuncts in Groundless locative statements and descriptions of orientation therefore links uncontroversial examples of Groundless locative statements - such as the slope-based ones described in Section 11.4.2 - and the proposed relative ones. It also demonstrates that the spatial adjuncts in question can be used to express an FoR centered on an ad hoc object, despite their semantics denoting a spatial region projected from the speaker; this conclusion comes automatically from the conceptual structure of descriptions of orientation - described in Section 3.5.1 - that require the Origin of the FoR they feature to coincide with the *Figure* of the description.

A further similarity between geocentric Groundless locative statements and those that I am proposing as their relative equivalents is their pattern of use during referential communication tasks: an prototypical example of a context in which I have proposed apparently direct descriptions of location gain a relative interpretation. In particular, it is notable that in this data direct descriptions featuring coronal RSNs possessed by the speaker[73] are predominantly used either following or juxtaposed with Ground-featuring locative statements, just as is described for geocentric Groundless locative statements in Section 11.5. An example of this use is shown in (429).

(429) poʔks-tək n-neʔ   n-winaŋ=ʔomo nə   j-ken-u   i   teʔ *pelota*
       sit-INSTR 1A-ANAP 1A-front=LOC3 PROG 3A-look-CP and DET ball
       j-tseʔŋna=ʔomo ø-ʔit-u,   **n-neʔ   n-tsəʔnaŋ=ʔomo ø-ʔit-u**
       3A-side=LOC3   3B-EXIST-CP, 1A-ANAP 3A-right=LOC3   3B-EXIST-CP
       teʔ *pelota*
       DET ball
       'The chair is facing my front and the ball is to its side, it is to my right' (B,
       B&C 4-7)

---

[73]This includes the use of the Spanish terms *derecha* 'right' and *izquierda* 'left' by two consultants who did not know the correct denotations of the CZ equivalents.

To give an indication of the extent to which these constructions were used in this type of context, in the 7 locative statements in my B&C data in which the sagittal facets of the speaker were referenced, 5 were following or juxtaposed with a locative statement in which the ball was explicitly located relative to the chair. The two uses of these 'hybrid' descriptions in alternative contexts were given directly following a description of the orientation of the chair, in precisely the manner described for Groundless locative statements featuring geocentric FoRs in Section 11.4. One of these descriptions is provided in (430).

(430) jəʔki nə   j-ken-məʔn-keʔt-u   tumə poʔks-tək ø-ten-u=pə,
       here PROG 3A-look-down-REP-DEP.II one   sit-INSTR 3B-stand-CP=REL,
       jəʔki n-*izquierda*=ʔomo ø-ʔit-u   tumə *pelota* …
       here   1A-left=LOC3   3B-EXIST-CP one   ball   …
       'Here a chair that is upright (lit: that is stood) is again facing towards here
       (lit: downwards), here to my left is a ball …' (MJ, B&C 2-2)

This pattern of use is also evident in the data arising from the other referential communication tasks performed in Ocotepec.

11.8   Summary

In this section I have described the phenomenon of ternary spatial relations featuring extrinsic FoRs being expressed through the use of Groundless locative statements, which are locative statements in which no Ground is encoded linguistically. I have also described how these Groundless locative statements are the only option if a CZ speakers wishes to express the location of an object using one of the geocentric FoRs available to them. In terms of the linguistic resources available to CZ speakers, this reliance on Groundless locative statements is associated with the lack of either a postposition encoding one of the geocentric FoRs or the possibility of using one of these FoRs as the basis for the assignment of relational spatial nouns.

Central to the importance of this phenomenon is the fact that there is nothing within the grammatical structure of CZ *preventing* one of these geocentric FoRs from being a basis on which RSNs are assigned. For example, there is nothing preventing the RSN *kəhsi* 'vertical top' from being assinged to the facet of an object which is the furthest towards where the sun sets rather than that which is closest to the top of the main slope of Ocotepec. I propose that this fact, in conjunction with the report of similar phenomena in languages as diverse as Jaminjung (Schultze-Berndt, 2006) and Yélî Dnye (Levinson, 2006), means that rather than being a peculiarity of CZ grammar, Groundless locative statements represent a general *strategy* for the linguistic expression of ternary spatial relations (i.e., descriptions of location featuring an extrinsic FoR). Furthermore, based on general principles of the development of spatial language, I have hypothesised that if it is possible in a language to linguistically encode a ternary spatial relation featuring an FoR (i.e., form a Ground-featuring locative statement) it will also be possible to linguistically encode a binary one, such as a description of orientation or direction of motion.

Finally, in light of my observations regarding Groundless locative statements I have reanalyzed a class of locative statements that have the appearance of direct (egocentric, intrinsic) descriptions, but which are used in a pragmatically marked manner. My reanalysis classifies these descriptions as instances of Groundless locative statements featuring the relative (egocentric, extrinsic) FoR. This reanalysis of superficially intrinsic descriptions (i.e., descriptions of location that have the same form as egocentric intrinsic, direct, ones) as in fact relative ones could impact on claims made in the literature regarding the absence (or near absence) of the relative FoR from particular languages and especially those linked to Whorfian effects (see Danziger, 2011, for example).

263

12 Conclusion

In this thesis I have presented a detailed investigation of the strategies used to describe the location, orientation and motion of objects by speakers of the variety of Chiapas Zoque spoken in the town of Ocotepec; this represents the first study of its kind for a Mixe-Zoquean language. To begin with (Section 3) I have provided an overview of *typical* descriptions of each spatial domain: location, orientation and motion. These basic spatial constructions consist of a predicate, a phrase denoting the Figure of the description (i.e., the entity being described) and a location-denoting spatial adjunct, the form of which does not vary across the different spatial domains indicating that they are not morphologically marked for their semantic role in the description; a description of those linguistic elements that make up CZ spatial adjuncts and their semantics is provided in Section 4.

Due to this uniformity of spatial adjuncts in CZ, the only feature that distinguishes descriptions of the three spatial domains in CZ is the predicate. In the case of basic locative constructions this predicate is a general/locative predicate, identifying CZ as Type Ia language in the typology of Ameka and Levinson (2007) alongside languages such as Yuctec Maya (Mayan, Mexico; Bohnemeyer and Stoltz, 2006). Basic descriptions of orientation are also predominantly predicated by verbs formed from a single root, in this case the perception root, *ken* 'look'; this root can, however, be serialised with a motion root in order to provide additional information regarding the direction of orientation.

The motion roots that appear serialised with *ken* 'look' in order to provide directional information form a paradigm of 12 roots (Table 20) that are semantically distinct from all other motion roots. As discussed in Section 5, the nature of this semantic division is the fact that this closed class of roots contains the only motion roots in CZ that encode a change of location relative to the reference location denoted by the spatial adjunct with which they co-occur; I refer to these roots as change of location (CoL) roots. A

consequence of their semantics and the uniformity of spatial adjuncts is this fact that the CoL roots are the only formal element that can assign path roles such as GOAL, SOURCE and VIA in CZ; each CoL root can assign a single path role, meaning that each reference location added to a description of motion (in the form of a spatial adjunct) must be accompanied by a predicate featuring a CoL root. In contrast, the spatial adjuncts that co-occur with non-CoL motion roots - most of which encode notions of manner - are interpreted as denoting the location of the entire motion event.

The exclusive encoding of path roles in a paradigm of verbal roots is prototypical of a *verb-framed* language in Talmy's (1985) well-known typology of lexicalisation patterns in descriptions of motion. CZ is atypical of this category, however, in the fact that it is possible for a verb - though not a root - to encode both path *and* manner notions. This is achieved through the type of serial verb construction that is a notable feature of CZ in general and - as has already been mentioned - is a key aspect of descriptions of orientation. This type of difficulty in locating serialising languages within Talmy's typology is well known.

In Section 6, I discussed the conceptualisation of motion within the CZ CoL roots. Through the use of non-verbal stimuli, verbal paradigms and consultant judgements it was found that the majority of these have semantics that is change of state like, i.e., punctual and telic. The exceptions to this picture are the roots *kiʔm* 'ascend', *məʔn* 'descend' and *maŋ* 'go', which when in combination with a spatial adjunct denoting the location of an entire motion event - and only this context - have semantics that appears to be atelic. My analysis of the lexical aspect of these verbs is that they should be classified as *degree achievement* verbs, which are verbs that encode gradual changes that do not have any inherent endpoint. A similar analysis of a similar paradigm of CoL roots has been presented for Yucatec Maya by Bohnemeyer (2004, 2007) and Bohnemeyer and Stoltz (2006).

A second aspect of the conceptualisation of motion discussed is the degree to which

the CZ CoL roots entail the motion of the entity that is their subject, i.e., the argument that is usually associated with the Figure of the description. This question was tested using non-verbal stimuli that I created specifically for the task. Based on the data resulting from the use of these stimuli it was possible to determine that the roots *put* 'exit' and *təhkəj* 'enter' do not entail the motion of their subject and therefore encode motion as *change of locative relation* events. In contrast, consultants almost unanimously agreed that the root *maŋ* 'go' does entail the motion of its subject; this semantics, coupled with the lexical aspect described above, means that *maŋ* 'go' encodes motion as *change-of-location* events. The results for the remaining CoL roots showed considerable inter-consultant variation and so it is not possible to categorically state whether their semantics are CoLR or CoL in nature.

My analysis of the semantics of CoL roots in CZ contributes to the existing literature in two ways. In the first instance, the similarity of the paradigm of CoL roots to those paradigms attested in Mesoamerican languages of various language families adds further evidence to this paradigm being a shared feature of the Mesoamerican linguistic area. Furthermore, the observation that in both CZ and Yucatec Maya (the languages for which detailed semantic analyses exist) there appears to be a tendency for roots with a *directional* component to their semantics to display a durative nature adds to the typology of the conceptual representation of motion presented by Levinson and Wilkins (2006, p533).

In the final part of this thesis (Part IV) I discussed the use of linguistic frames of reference (FoRs) by speakers of CZ. First and foremost, this part of my investigation identified the inventory of FoRs used by speakers of CZ and their linguistic manifestation. I concluded that CZ speakers make use of 6 linguistic FoRs to differing degrees: the object-centered FoR, the direct FoR, the relative FoR, landmark-based FoRs, a slope-based geomorphic FoR and a solar-based absolute FoR. Based principally on data obtained through the Ball and Chair referential communication task, it was possible to

conclude that, as with speakers of most of the Mesoamerican languages that have been surveyed, when locating a Figure relative to a faceted Ground the object-centered FoR is preferred. Equally, when orientating a Figure ,landmark-based descriptions anchored by ad hoc landmarks were the dominant type of expression. All other non-intrinsic FoRs were used with a similar frequency. This picture of FoR preference was similar across my data set as a whole, with the exception that on the scale of the village the slope-based FoR was used with a significantly increased frequency. In descriptions of motion slope-based descriptions dominate on all scales in my data.

Finally, a key observation made in this thesis (in Section 11) is that no geocentric FoR (i.e., one anchored by environmental entities) can feature in a basic locative construction in which a Ground is encoded linguistically. Instead, those locative statements in which they feature are obligatorily *Groundless*, meaning that the Ground of the description of location must be inferred from context, linguistic or otherwise. I have proposed that these Groundless locative statements are a previously unrecognised alternative strategy for encoding extrinsic FoRs linguistically. Furthermore, I propose that the ability to form a Ground-featuring locative statement featuring a particular extrinsic FoR entails the ability to form descriptions of orientation and direction of motion using the same FoR. The factors determining the use of Groundless as opposed to Ground-featuring descriptions of location is an area that requires further research; however, based on my data and that reported in Polian and Bohnemeyer (2011) it appears that this is related to the issue of *anchor salience*. Specifically, it appears that the more salient an anchor is to a speaker the more likely that it features in Ground-featuring descriptions of location.

In terms of wider research into the typology of linguistic FoRs, the key finding in this thesis is that some descriptions of location that appear to feature the direct (intrinsic, egocentric) FoR in fact feature the relative (*extrinsic*, egocentric) FoR. This means that it is likely that the relative FoR has been under-reported in many of the quantitative studies of linguistic FoR use that have appeared in the literature so far (for example,

Pederson et al., 1998; Levinson et al., 2002; O'Meara and Pérez Báez, 2011). Although this observation is unlikely to significantly change the FoR preferences already attested in the literature - and the Whorfian affects that have been associated with these (Levinson et al., 2002) - it could affect claims of Whorfian effects suggested to be associated with the near absence of relative FoRs (and other extrinsic FoRs) amongst certain linguistic groups (see Danziger, 2011 for example).

Bibliography

Abusch, D. (1985), On verbs and time, PhD thesis, The University of Massachusetts.

Ameka, F., de Witte, C. and Wilkins, D. (1999), Picture series for positional verbs: Eliciting the verbal component in locative descriptions, in D. Wilkins, ed., *Manual for the 1999 Field season*, Nijmegen: Max Planck Institute for Psycholinguistics, pp. 48–54.

Ameka, F. and Essegby, J. (2013), 'Serialising languages: satellite-framed, verb-framed or neither', *Ghana Journal of Linguistics* **2**, 19–38.

Ameka, F. K. and Levinson, S. C. (2007), 'Introduction: The typology and semantics of locative predicates: posturals, positionals, and other beasts', *Linguistics* **45**(5), 847–871.

Bertinetto, P. M. and Squartini, M. (1995), An attempt at defining the class of 'gradual completion verbs', in *Temporal reference, Vol 1: Semantic and syntactic perspectives*, pp. 11–26.

Bohnemeyer, J. (2003), The unique vector constraint, in E. van der Zee and J. Slack, eds, *Representing direction in language and space*, Oxford University Press, Oxford, pp. 86–110.

Bohnemeyer, J. (2004), 'Split intransitivity, linking and lexical representation: the case of Yucatec Maya', **1**, 67.

Bohnemeyer, J. (2007), The pitfalls of getting from here to there: Bootstrapping the syntax and semantics of motion event expressions in Yucatec Maya, in M. Bowerman and P. Brown, eds, *Cross-linguistic perspectives in argument structure: implications for learnability*, Lawrence Erlbaum, Mahwah, NJ, pp. 49–68.

Bohnemeyer, J. (2008), Elicitation task: frames of reference in discourse - the ball & chair pictures, in G. Pérez Báez, ed., *Mesospace: Spatial language and cognition in Mesoamerica. 2008 Field Manual*, University at Buffalo, SUNY, pp. 34–37.

Bohnemeyer, J. (2011), 'Spatial frames of reference in Yucatec: Referential promiscuity and task-specificity', *Language Sciences* **33**(6), 1006–1024.

Bohnemeyer, J. (2012), A vector space semantics for reference frames in Yucatec, in E. Bogal-Allbritten, ed., *Proceedings of the sixth meeting on the Semantics of Under-Represented Languages in the Americas (SULA 6) and SULA-Bar*, GLSA Publications, Amherst, pp. 15–34.

Bohnemeyer, J. and Brown, P. (2007), 'Standing divided: dispositionals and locative predications in two Mayan languages', *Linguistics* **45**(5), 1105–1151.

Bohnemeyer, J., Enfield, N. J., Essegbey, J., Ibarretxe-Antunano, I., Kita, S., Lüpke, F. and Ameka, F. K. (2007), 'Principles of event segmentation in language: The case of motion events', *Language* **83**(3), 495–532.

Bohnemeyer, J. and O'Meara, C. (2012), Vectors and frames of reference: Evidence from Seri and Yukatek, in L. Filipovic and K. M. Jaszczolt, eds, *Human Cognitive Processing*, Vol. 35, John Benjamins Publishing Company, Amsterdam, pp. 217–49.

Bohnemeyer, J. and Pérez Báez, G. (2008), Field manual: Mesospace, spatial language and cognition in mesoamerica. Manuscript.

Bohnemeyer, J. and Stoltz, C. (2006), Spatial reference in yukatek maya: a survey, in S. Levinson and D. Wilkins, eds, *Grammars of Space: Explorations in Cognitive Diversity*, Cambridge University Press, Cambridge.

Boroditsky, L. (2000), 'Metaphoric structuring: understanding time through spatial metaphors', **75**, 1–28.

Bowerman, M. and Choi, S. (2001), Shaping meanings for language: Universal and language-specific in the acquisition of semantic categories, in M. Bowerman and S. C. Levinson, eds, *Language acquisition and conceptual Development*, Cambridge University Press, Cambridge, pp. 475–511.

Bowerman, M. and Pederson, E. (1992*a*), Crosslinguistic perspectives on topological spatial relations. Unpublished manuscript.

Bowerman, M. and Pederson, E. (1992*b*), topological relations picture series, in S. C. Levinson, ed., *Space stimuli kit 1.2*, Nijmegen: Max Planck Institute for Psycholinguistics, p. 51.

Brown, P. (2006), A sketch of the grammar of space in Tseltal, in S. Levinson and D. Wilkins, eds, *Grammars of Space: Explorations in Cognitive Diversity*, Cambridge University Press, Cambridge.

Brown, P. (2012), 'Time and space in Tseltal: is the future uphill?', *Frontiers of Psychology* **3**, 212.

Brown, P. and Levinson, S. C. (2000), Frames of spatial reference and their acquisition in Tenejapan Tseltal, in L. Nucci, G. Saxe and E. Turiel, eds, *Culture, thought and development*, Lawrence Erlbaum, Mahwah, NJ.

Brown, P. and Levinson, Stephen, C. (1993), "Uphill' and 'downhill' in Tzeltal', *Journal of Linguistic Anthropology* **3**(1), 46–74.

Cauchard, A. (2014), A Study of Space in Caac, an Oceanic Language Spoken in the North of New Caledonia, PhD thesis, The University of Manchester.

Clark, H. and Wilkes-Gibbs, D. (1986), 'Referring as a collaborative process', *Cognition* **22**, 1–39.

Craig, C. (1993), 'Jakaltek Directionals: their meaning and their discourse function', *Languages of the World* **7**(2), 23–36.

Danziger, E. (2011), 'Distinguishing three-dimensional forms from their mirror-images: Whorfian results from users of intrinsic frames of linguistic reference', *Language Sciences* **33**(6), 853–867.

de Jong Boudreault, L. J. (2009), A Grammar of Sierra Popoluca (Soteapanec, a Mixe-Zoquean Language), PhD thesis, The University of Texas at Austin.

De la Cruz Morales, R. (2016), Constructions con predicados serialises en Zoque de Ocotepec, Chiapas: Estructura, semántica y gramaticalizacíon, Master's thesis, CIESAS.

Dowty, D. (1979), *Word meaning and Montague grammar*, Reidel, Dordrecht.

Engel, R. and Engel, M. A. (1984), *Diccionario Zoque de Francisco Leon*, Instituto Linguistico de Verano, Mexico.

Faarlund, J. (2012), *A Grammar of Chiapas Zoque*, Oxford University Press, Oxford.

Filipovic, L. and Ibarretxe-Anuñano, I. (2015), Motion, in E. Dabrowska and D. Divjak, eds, *Handbook of cognitive linguistics*, Mouton de gruyter, Berlin, pp. 537–545.

Harrison, R. W. and Harrison, M. B. (1981), *Diccionario Zoque de Copainala*, Instituto Linguistico de Verano, Mexico.

Haviland, J. B. (1993), 'Orientation in Guugu Yimithirr Pointing Gestures', *Journal of Linguistic Anthropology* **3**(l), 3–45.

Haviland, J. B. (1994), '"Te xa setel xulem" [The buzzards were circling]: categories of verbal roots in (Zinacatec) Tzotzil', *Linguistics* **32**(4/5), 691–742.

Heine, B. (2003), Grammaticalisation, in B. D. Joseph and R. D. Janda, eds, *The Handbook of Historical Linguistics*, Blackwell Publishing, Oxford, UK.

Hernández-Green, N., Palancar, E. and Hernández-Gomez, S. (2011), 'The Spanish loanword *lado* in Otomi spatial descriptions', *Language Sciences* **33**(6), 961–980.

Herrera Zendejas, E. (1995), Palabras, estratos y representaciones, PhD thesis, El colegio de Mexico.

Herrmann, T. (1990), 'Vor, hinter, rechts und links: Das 6h-model', *Zeitshrift für Literatur und Linguistik* **78**.

Himmelmann, M. (1998), 'Documentary and descriptive linguistics', **36**, 161–195.

Instituto Nacional de Estadística y Geografía (2010), Censo general de poblacíon y vivienda. Accessed: 2015-08-03.

Ishibashi, M., Kopecka, A. and Vuillermet, M. (2006), *Trajectoire: matérial visuel pour élicitation de données linguistiques*, Fédération de Recherche en Typologie et Universaux Linguistiques.

Jackendoff, R. (1983), *Semantics and cognition*, MIT Press, Cambridge, MA.

Jackendoff, R. (1990), *Semantic structures*, MIT Press, Cambridge, MA.

Jiménez Jiménez, S. (2014), Esbozo gramatical oraciones de relativo en el zoque de san miguel chimalapa, Master's thesis, CIESAS.

Johnson, H. A. (2000), A Grammar of San Miguel Chimalapa, PhD thesis, The University of Texas at Austin.

Kaufman, T. (1995), Positionals in Mije-Sokean. Unpublished manuscript.

Kearns, K. (2000), *Semantics*, St Martins, New York.

Kearns, K. (2003), 'Durative achievements and individual-level predicates on events', *Linguistics and philosophy* **26**(5), 595–635.

Kennedy, C. and Levin, B. (2008), Measure of change: The adjectival core of verbs of variable telicity.

Kita, S. (2006), A grammar of space in japanese, in S. Levinson and D. Wilkins, eds, *Grammars of Space: Explorations in Cognitive Diversity*, Cambridge University Press, Cambridge.

Krifka, M. (1998), The origins of telicity, in R. Rothstein, ed., *Events and grammar*, Kluwer Academic Press, p. 197.

Kutscher, S. and Schultze-Berndt, E. (2007), 'Why a folder lies in the basket although it is not lying: the semantics and use of German positional verbs with inanimate Figures', *Linguistics* **45**(5part6), 983–1028.

Levinson, S. (2006), The language of space in Yeli Dnye, in S. Levinson and D. Wilkins, eds, *Grammars of Space: Explorations in Cognitive Diversity*, Cambridge University Press, Cambridge.

Levinson, S. C. (2001), Motion verb stimulus, version 2, in S. Levinson and N. J. Enfield, eds, *Manual for the field session 2001*, Max Planck Institute for Psycholinguistics, Nijmegen, pp. 9–13.

Levinson, S. C. (2003), *Space in Language and Cognition: Explorations in Cognitive Diversity*, Cambridge University Press, Cambridge.

Levinson, S. C., Brown, P., Danziger, E., De Leon, L., Haviland, J., Pederson, E. and Senft, G. (1992), Man and tree & space games, in S. C. Levinson, ed., *Space stimuli kit 1.2*, Max Planck Institute for Psycholinguistics, Nijmegen, pp. 7–14.

Levinson, S. C., Kita, S., Haun, D. B. M. and Rasch, B. H. (2002), 'Returning the tables: language affects spatial reasoning.', *Cognition* **84**(2), 155–88.

Levinson, S. C. and Meira, S. (2003), 'Natural Concepts In The Spatial Topological Domain-Adpositional Meanings In Crosslinguistic Perspective: An Exercise In Semantic Typology', *Language* **79**(3), 485–516.

Levinson, S. C. and Wilkins, D. (2006), *Grammars of Space: Explorations in Cognitive Diversity*, Cambridge University Press, Cambridge.

Levinson, S. and Majid, A. (2013), 'The island of time: Yeli Dnye, the language of Rossel Island', *Frontiers of Psychology* **4**, 61.

Li, P., Abarbanell, L., Gleitman, L. and Papafragou, A. (2011), 'Spatial reasoning in Tenejapan Mayans.', *Cognition* **120**(1), 33–53.

Li, P. and Gleitman, L. (2002), 'Turning the tables: language and spatial reasoning.', *Cognition* **83**(3), 265–94.

Mayer, M. (1969), *Frog, where are you?*, Dial Books, New York.

McDermott, L. (2014), Topological relations in Chiapas Zoque, Master's thesis, SOAS.

Miller, G. and Johnson-Laird, P. (1976), *Language and perception*, Cambridge University Press.

Niraula, S., Mishra, M. C. and Dasen, P. (2004), 'Linguistic relativity and spatial concept development in nepal', *Psychology developing societies* **16**, 99.

O'Connor, L. (2007), *Motion, Transfer and Transformation: The Grammar of Change in Lowland Chontal*, John Benjamins, Amsterdam.

O'Meara, C. and Pérez Báez, G. (2011), 'Spatial frames of reference in Mesoamerican languages', *Language Sciences* **33**(6), 837–852.

Palmer, B. (2015), Topography in language: Absolute frame of reference and the topographic correspondence hypothesis, in R. De Busser and R. J. La Polla, eds, *Language Structure and Environment. Social, cultural and natural factors*, John Benjamins Publishing Company.

Pederson, E., Danziger, E., Wilkins, D. and Levinson, S. (1998), 'Semantic typology and spatial conceptualization', *Language* **74**(3), 557–589.

Pederson, E. and Senft, G. (1996), Route descriptions: interactive games with eric's maze task, in S. C. Levinson, ed., *Manual for the 1996 Field Season*, Max Planck Institute for Psycholinguistics, Nijmegen, pp. 15–18.

Piaget, J. and Inhelder, B. (1956), *The child's perception of space*, Routledge and Kegan Paul, London.

Polian, G. and Bohnemeyer, J. (2011), 'Uniformity and variation in Tseltal reference frame use', *Language Sciences* **33**(6), 868–891.

Ramírez Muñoz, E. (2016), Oraciones de complemento en el zoque de Ocotepec, Chiapas, Master's thesis, CIESAS.

Romero-Méndez, R. (2011), 'Frames of reference and topological descriptions in Ayutla Mixe', *Language Sciences* **33**(6), 915–942.

Schultze-Berndt, E. (2006), Sketch of a jaminjung grammar of space, in S. Levinson and D. Wilkins, eds, *Grammars of Space: Explorations in Cognitive Diversity*, Cambridge University Press, Cambridge.

Schultze-Berndt, E. and Himmelmann, N. (2004), 'Depictive secondary predicates in crosslinguistic perspective', *Linguistic typology* **8**, 59–131.

Slobin, D. (2004), The many ways to search for a frog: Linguistic typology and the expression of motion events, in S. Strömquist and L. Verhoeven, eds, *Relating events*

in narrative: Vol. 2. Typological and contextual perspectives, Lawrence Erlbaum Associates, Mahwah, NJ, pp. 219–257.

Smith, C. (1996), 'Aspectual categories of Navajo', *International journal of American linguistics* **62**, 227–263.

Soto, V. V. (2011), 'The "uphill" and "downhill" system in Meseño Cora', *Language Sciences* **33**(6), 981–1005.

Talmy, L. (1985), Lexicalisation patterns: semantic structures in lexical forms, in T. Shopen, ed., *Language typology and syntactic description, Vol. III*, Cambridge University Press, Cambridge, pp. 57–149.

Talmy, L. (2000), *Towards a Cognitive Semantics, Volume 1: Concept Structuring Systems*, MIT Press, Cambridge.

Terrill, A. and Burenhult, N. (2008), 'Orientation as a strategy of spatial reference', *Studies in Language* **32**(1), 93–136.

van Standen, M., Bowerman, M. and Verhelst, M. (2006), Some properties of spatial description in Dutch, in S. Levinson and D. Wilkins, eds, *Grammars of Space: Explorations in Cognitive Diversity*, Cambridge University Press, Cambridge.

Vendler, Z. (1957), 'Verbs and times', *Philosophical Review* **56**, 143–160.

Vilavicencion Zarza, F. G. (1990), El verbo zoque de francisco leon, chiapas: Raices minimas y tipologia, Master's thesis.

Vuillermet, M. and Desnoyers, A. (2013), *A Hunting Story – Yendo a Cazar*, Linguistics department, UC Berkeley.

Wichmann, S. (1995), *The relationship among the Mixe-Zoquean languages of Mexico*, University of Utah Press, Salt Lake City.

277

Wonderly, W. (1951*a*), 'Zoque I : Introduction and Bibliography', *International Journal of American Linguistics* **17**(1), 1–9.

Wonderly, W. (1951*b*), 'Zoque II: Phonemes and morphophonemes', *International Journal of American Linguistics* **17**(2), 105–123.

Wonderly, W. (1951*c*), 'Zoque III: morphological classes, affix list, and verbs', *International Journal of American Linguistics* **17**(3), 137–162.

Wonderly, W. (1951*d*), 'Zoque IV : Auxiliaries and Nouns', *International Journal of American Linguistics* **17**(4), 235–251.

Wonderly, W. (1952*a*), 'Zoque V : Other Stem and Word Classes', *International Journal of American Linguistics* **18**(1), 35–48.

Wonderly, W. (1952*b*), 'Zoque VI - Text', *International Journal of American Linguistics* **18**(4), 189–202.

Zavala, R. (2000), Inversion and Other Topics in the Grammar of Olutec (Mixean), PhD thesis, The University of Oregon.

Zavala, R. (2005), 'Olutec motion verbs: grammaticalization under Mayan contact', *Proceedings of the Annual Meeting of the Berkeley Linguistics Society* p. 139.

Zavala, R. (2011), El jitotolteco, una lengua zoqueana desconocida, in *Conference on Indigenous Languages of Latin America-V*, The University of Texas at Austin, Austin, Texas, p. 32.

Zavala, R. (2013), La constructión de posesión externa con aplicative en zoque dentro del contexto mesoamerica, in R. Zavala and E. L. Palancar, eds, *Clases léxicas, posesión y cláusulas complejas en lenguas de mesoamerica*, Publicaciones de la casa chata, Mexico.

Zavala, R. (2015), *Diccionario analitico del zoque colonial de Tecpatan, Chiapas (1793) de fray Juan Pozarenco*, INALI, Mexico.

Zwarts, J. and Winter, Y. (2000), 'Vector space semantics: A model-theoretic analysis of locative prepositions', *Journal of logic, language and information* **9**(2), 169–211.