

**Egocentric Frames of reference in Chiapas Zoque descriptions of
location and orientation**

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1. Introduction

Spatial frames of reference (FoRs) are defined by Bohnermeyer and O'Meara (2012) as,

coordinate systems that partition space into distinct regions which serve as search domains for the interpretation of spatial relators in language and cognition. These relators can be used to locate entities and describe their orientation and motion.

Perhaps the clearest examples of the use of linguistic FoRs are descriptions that feature the western cardinal directions, as in these there is a direct mapping from the axes of a well-known non-linguistic coordinate system to linguistic spatial relators. An example of an English locative statement in which such a linguistic FoR is used is given in (1).

(1) The ball is west of the house

FoRs have been a topic of particular interest to linguists since it was observed that speakers of some languages, most famously Tzeltal (Brown and Levinson, 1993) and Guugu Yimithirr (Levinson, 1997), preferentially used FoRs akin to the western cardinal directions, so-called absolute frames, to describe spatial arrays on small scales. Given the restriction of such FoRs to spatial descriptions on geographical scales in most European languages, such an observation was somewhat unexpected and suggested strongly a greater level of cross-linguistic variation in the use of linguistic FoRs than had previously been considered. This anticipated cross-linguistic variation has subsequently been confirmed by studies such as those presented in, for example, Pederson et al. (1998) and Levinson and Wilkins (2006). The demonstration of a correlation between the linguistic FoRs preferred by speakers of a language when describing spatial arrays on a small scale and the cognitive FoRs they prefer when completing a simple spatial task has also made space a key domain for the debate around the possible whorfian effects of language on cognition (see Levinson et al. (2002) and Majid et al. (2004), but also Li and Gleitman (2002) for an alternative perspective on these results). This, in turn, has provided further impetus to determine the nature and extent of the variation in this area of spatial language.

In recent times the Mesoamerican linguistic area has been a particular focus of research on linguistic FoR use. A notable feature of the data to result from this research is an apparent dispreference for FoRs based on the perspective of a speech act participant (SAP), so-called *egocentric frames*, that cuts across the genetic affiliations of this diverse linguistic region. A hypothesis that has resulted from this observation is that the productive systems of part-naming terminologies that are another ubiquitous feature of the languages of the region may be related to this pattern of FoR use and, indeed, may more generally serve as a cross-linguistic “linguistic predictor” (Bohnmeyer and Pérez Báez, 2008, p1) of a dispreference for egocentric FoRs. The assesment of this hypothesis has been the principle aim of the Mesospace project, under whose auspices the FoR use of an extensive and diverse group of languages spoken in Mesoamerica and beyond have been documented.

This paper aims to perform two functions. Firstly, it will present the FoR-use data obtained through the use of Ball and Chair (B&C) communicative task (the task designed by the Mesospace project to investigate cross-linguistic FoR usage in descriptions of location and orientation on small, manupable scales) with ten speakers of Chiapas Zoque (CZ; Mixe-Zoque), in the Mexican town of Ocotepéc, Chiapas. This data will represent the first published FoR-use data for a language from the Zoquean branch of the Mixe-Zoque language family and only the second from the language family as a whole, following the that presented for Auyutla Mixe by Romero-Méndez (2011). Secondly, given the centrality of egocentric FoRs to the direction of research into linguistic FoR use, this paper will present a detailed discussion of the manner in which such frames are expressed in locational and orientational descriptions in CZ and also how they were used by CZ speakers during the B&C task.

The specific focus of the paper will be what the data to be presented tells us about the status of the relative FoR in the locational domain in CZ. This frame is one of two conceptually distinct egocentric FoRs in the locational domain (details to be given below) and its use has been observed to be considerably restricted cross-linguistically. Indeed, it has been reported that a number of languages across the world lack such a frame entirely (including, for example, Hai//om and Mopan (Pederson et al., 1998) and Jaminjung (Schultze-Berndt, 2006)). I will argue that my B&C data, when combined with my wider data set, suggests that the productive use of the relative frame in CZ is, firstly, a relatively recent phenomenon resulting from contact with relative-dominant Spanish, and, secondly, is a developing linguistic resource in terms of the contexts in which it may be used. I also show that this developing status provides an insight into the development path of the relative frame more generally, specifically the order in which uses of the relative frame are developed along the two axes of the SAP: the left-right (coronal) axis and the front-back (sagittal) axis. My data shows that in CZ coronal uses of the relative frame have developed before sagittal ones when locating figures relative to *featured* ground objects. This is the reverse order to the universal order of development for the relative frame proposed by Levinson and Wilkins (2006). I therefore propose that Levinson and Wilkin’s description holds only for *unfeatured* grounds and propose that with featured grounds the order of development of the relative frame has the potential to vary considerably cross-linguistically.

As a final introductory comment, it is important to note that in this paper the designation “egocentric FoR” will be used exclusively to refer to those FoRs in which the axes of the FoR are derived from the *asymmetries* of the body of the observer, such as that utilised in (3). This definition deliberately excludes those FoRs in which the axes are derived through the use of the observer as a landmark, such as (2). This exclusion is based on the argument made by Bohnemeyer and O’Meara (2012) that these landmark-based egocentric FoRs are conceptually distinct from other egocentric FoRs and will therefore have quite different formal expressions and usage patterns. This separation of landmark-based egocentric frames from those in which the axes are derived from the asymmetries of the observer is also the standard approach taken in the literature (see O’Meara and Pérez Báez (2011) for example), albeit with slightly different nomenclature (discussed in more detail below).

- (2) [The car]_{figure} is facing [me]_{anchor}
 (3) [The man]_{figure} is facing right, anchor = SAP

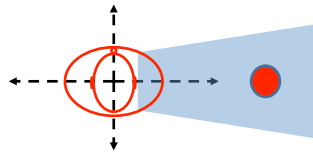
This paper will be structured as follows. In the following section I will introduce the aspects of the theory of linguistic frames of reference that will be central to the discussion to be had below. In Section 3, I will then discuss some of the typological features of CZ that are pertinent to the description of egocentric frames, as well as providing an introduction to the genetic lineage of the language and the sociolinguistic context in which it is spoken. In Section 4, I will present the methods used in collecting the data on which the analyses presented here are based and which will be the focus of the discussion presented in Section 7. In Section 5, I will provide a first description of the structure of spatial descriptions in CZ, with a focus on those aspects that are relevant to the expression of egocentric FoRs. These egocentric frames are then specifically discussed in Section 6. In Section 7, I will present my B&C data, first discussing its general features in the context of the wider literature, before focusing on the pattern of egocentric FoR use evidenced therein. Finally, in Section 8, I will discuss in detail the use and status of the relative frame in descriptions of location in CZ.

2. Concepts and Definitions

Before progressing further it is necessary to introduce some technical notions that will be used throughout my discussion. Let me begin by defining what I mean by location and orientation. In the literature, a distinction has been made between “standing information” and “facing information” (Levinson and Wilkins, 2006, p545). The difference between these two types of spatial information is defined as that between statements that specify a spatial region in which an object can be found (locative statements) and those that align a facet of an object with an *external* direction (orientational statements). An example of each of these types of statement, accompanied by a schematic representation of their conceptual structure, is given in Figure 1.

The semantics of locative and orientational statements are generally discussed in terms of a small number of conceptual entities. During the course of this paper I will make use of three of these: the *figure* (the object whose spatial properties are being described) the *ground*

Location: ``*The ball is to the person's right.*''



Orientation: ``*The person is facing east.*''

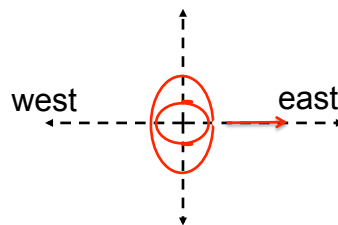


Figure 1: Examples of typical locative and orientational statements accompanied by schematic representations of their conceptual structure. In both cases the red ellipses represent the body of a person.

(the object relative to which the figure is *located*) and the *anchor* (the object that is the basis for the axes of the FoR). To illustrate each of these conceptual entities, labelled examples of English locative and orientational statements are given in (4) and (5) respectively.

(4) [The dog]_{figure} is to the left of [the house]_{ground} , anchor = SAP

(5) [The boy]_{figure} is facing [the church]_{anchor}

In terms of these conceptual entities, the key difference between locative and orientational statements is the fact that the latter do not feature ground objects in the sense I have defined above. This can clearly be seen from the two examples given above.

The key entity in the classification of FoRs is the anchor (the SAP in egocentric descriptions), the properties of which are used to define all of the FoRs in common use in the literature. It is argued, however, that due to their differing logical properties (namely, their different sensitivities to rotation of the figure-ground array) it is necessary to identify two distinct egocentric frames in the location domain (Danziger, 2010). In the case of one of these subcategories, the so-called *direct* frame, the anchor and ground are the same object (the SAP), thus making it an *intrinsic* frame. In contrast, in the *relative* frame (Levinson, 2003), the ground object is some object other than the SAP. These two distinct types of egocentric frame are exemplified in (6) and (7) respectively.

(6) [The ball]_{figure} is in front of [me]_{ground=anchor}

(7) [The ball]_{figure} is in front of [the tree]_{ground} , anchor = SAP

Given their lack of ground objects, a subdivision of orientational statements can not be made on the same basis. Notwithstanding this, in the literature the term *direct* is sometimes applied to orientational statements in which the location of the SAP is defined through reference to a specific facet of the SAP (usually the front), such as in (8), as although they are conceptually more similar to landmark-based descriptions, the felicity of these statements retains a sensitivity to the rotation of the anchor (the SAP) not associated with standard landmark-based descriptions. I have retained this terminology in the coding of my data in order to highlight some important conceptual differences found in the use of egocentric orientational descriptions in CZ. This will be discussed in more detail at the end of Section 6.

(8) The chair is facing my front

In the literature, all other non-landmark egocentric orientational descriptions are classified as *relative*, as they necessarily involve the interpretation of SAP-based spatial relators at some external point in space, that is, the location of the figure. Again, I will also follow this convention, though the nature of these descriptions in CZ also requires further discussion in Section 6.

3. The language and its speakers

CZ is a member of the Zoquean branch of the Mixe-Zoque language family. The Zoquean branch of the family has two further sub-branches, Gulf Zoquean and Zoquean Proper, the latter of which includes CZ, the two Zoques of Oaxaca (San Miguel Chimalapa and Santa Maria Chimalapa) and the recently identified Jitotolteco (Zavala, 2011). CZ is predominantly spoken in the area north west of the capital of the southern Mexican state of Chiapas, Tuxtla Gutierrez, but also in two communities in the neighbouring state of Tabasco. In total there are approximately 50,000 speakers of CZ, who are divided between four distinct varieties of the language, each associated with a different part of the Zoque region. Of these four varieties only the northeastern variety is still used as a community language and even then only in one or two municipalities. The present study is based on fieldwork performed by myself in the municipality of Ocotepec, which, according to the 2010 census, is the municipality with the highest rate of CZ use; it is estimated that more than 99% of the 11,878 people in the municipality speak CZ, 63% of whom are bilingual in CZ and Mexican Spanish¹.

Grammatically speaking², CZ is a polysynthetic head-marking language in which the morphological complexity is primarily associated with the verbal complex. CZ exhibits split ergativity in its alignment, with a nominative-accusative alignment occurring in some contexts of syntactic dependence (Ramírez Muñoz, 2015). One core argument is marked on its verb via a prefix, with the particular argument that is to be marked being determined by a hierarchy based on person number. Faarlund (2012) has described CZ as a “syntactically ergative” language in which ergative arguments predominantly precede the verb, while non-pronominal absolutive ones follow it; pronominal arguments tend to precede the verb independent of their case. He also notes, however, that all permutations of constituent order are possible given “the right context and information structure” (Faarlund, 2012, p120). An example of a typical CZ sentence is given in (9).³

- (9) *polisia*=ʔis=tam j-pək-jah-u=ʔuŋ məha=tam=pəʔ kuhj
police=3ERG=PL 3A-grab-3PL-CP=REPOR big=PL=REL tree
‘It’s said that the police grabbed big sticks’

In terms of its TAM system, CZ has been described as a language in which “tense is not overtly marked” (Faarlund, 2012, p88), but for which mood/aspect marking is obligatory. Furthermore, the aspect system of CZ has been categorised as being, like many other

¹Source Instituto Nacional de Estadística y Geografía (INEGI), 2010

²Unless stated otherwise, grammatical observations are based either on the Grammar of Chiapas Zoque produced by Faarlund (2012) or my own unpublished research

³The following abbreviations occur in the glosses of the examples found in this paper: 123, person number; A, set A prefix (subject of transitive verb, possessor); B, set B prefix (subject of intransitive verb; object of transitive verb); ABS, absolutive case; ANA, anaphor; ASSUM, assumptive; CP, completive aspect; DEP. II, dependent verb marker type 2; DIR, directional; DIST, distal; ERG, ergative case; EXIS, existential; GEN, genitive case; ICP, incomplete aspect; INST, instrumental case; LOC, locative; PRED, predicator; PL, plural; PRO, pronoun; PROG, progressive; PRX, proximal; REL, relativiser; REP, repetitive; REPOR, reportative; SIM, similaritive



B&C 2-3

Figure 2: Image 3, Set 2 of the B&C set of stimuli (B&C 3-2)

Mesoamerican languages, fundamentally completive-incompletive in nature. Although this topic is in need of further study, there are a number of pieces of evidence in my data to suggest that the aspectual contrasts marked in the language vary somewhat from this characterisation. Of particular relevance to the present discussion is the formation of resultative-like stative predicates from active verb roots through marking with the completive aspect marker, *-u*. An example of a resultative predicate being formed from an active verb through the use of the completive marker is shown in (10).

- (10) teʔ tsahj ø-woj-u=ma tsaʔ=kəhsi
 DEF rope 3B-wind-CP=still stone=on
 ‘The rope is still wrapped around the rock’ (TAM, R)

4. Methodology and coding

The data that are to be the primary focus of this discussion were collected using Mesospace’s B&C communicative task in the town of Ocoatepec, Chiapas, during January and February 2015. The set of stimuli used in this task consists of 48 photographs of a ball and chair in differing spatial configurations, divided evenly into 4 sets. An example of one of these photographs is shown in Figure 2.

During my investigation, the B&C task was performed as follows. To start, each player was presented with the first set of 12 photographs (the order in which the sets of photos should be tackled is part of the task design) arranged in to a 3 x 4 rectangle; the arrangement of photographs was different for each participant in order to prevent a photograph being identified through its location. One of the participants played the role of ‘director’ and initially had the task of selecting and describing one of the 12 photographs. The second participant, the ‘matcher’, had the task of identifying the photograph being described from the 12 photographs in front of them. Once the matcher believed they had identified the correct photograph, they informed the researcher, who compared the suggested photograph with that being described. If the correct photograph had been selected, then a button was placed on the relevant photograph in the director’s (but not the matcher’s) set. This process was repeated until each of the 12 photographs had been described and identified. The remaining three sets were then completed in precisely the same manner, with the role of di-

rector and matcher alternating between the participants, so that each participant played each role twice. This process was conducted with 5 distinct dyads of participants: 2 all-female and 3 all-male dyads. With the exception of both participants in Dyad 5, all participants were bilingual in CZ (L1) and Spanish (L2); both participants in Dyad 5 spoke Spanish fluently, though non-natively. The ages and gender of the dyads in my study are given in Table 1.

	Dyad 1	Dyad 2	Dyad 3	Dyad 4	Dyad 5
Gender	M:M	M:M	F:F	F:F	M:M
Age	36:19	27:20	28:22	18:21	50:52

Table 1: The gender and ages of the participants in the B&C communicative tasks performed in Ocotepéc.

All editions of the communicative task were conducted in the same location: in the front room (i.e adjacent to the road) of a house situated in the southern part of Ocotepéc. In each case the front-back axis of the participants was aligned west-east, while their left-right axis was aligned both with the predominant south to north incline of the town and the north to south incline of a small slope at the foot of which was located the recording location. All editions of the task were recorded for audio and video using separate microphones for each participant. All of these recordings were subsequently transcribed in ELAN with the help of native-speaker consultants.

4.1. Coding

The descriptions given by the participants were coded for a number of different categories of information (Bohnenmeyer (2011) identifies 6 different categories). Only two of these categories are relevant for the discussion to be had here: the location of the ball relative to the chair and the orientation of the chair in the horizontal plane. When coding my B&C data for this information, the following principles were applied:

- Only spatial relators used in positive descriptions of the image given by the director were considered
- Spatial relators were counted just once per image
- Spatial relators ambiguous between more than one FoR were coded inline with any non-ambiguous uses of the same term by the same participant. In the absence of any non-ambiguous uses, these ambiguous SRs were coded as ‘indeterminate’ along with those SRs the semantics of which are still under investigation; there were only two cases of unresolved ambiguity in my B&C data.

5. Spatial descriptions in CZ

Across all three spatial domains (location, orientation and motion) spatial descriptions in CZ typically consist of three elements: a predicate, a figure phrase and a single spatial

adjunct. Figure phrases in all three domains invariably take the form of an unmarked (absolute) noun or determiner phrase. Spatial adjuncts in contrast show considerable variation in their form (discussed in detail below), but exhibit no distinction, nor restriction, based on spatial domain, that is, a valid spatial adjunct can appear, unchanged, in any of the three domains. The predicates of spatial descriptions do vary between the spatial domains, making them the only element by which the type of spatial description can be identified. Given the variable constituent order at clause level in CZ, these three elements can essentially appear in any order in a spatial description depending on considerations of information structure. An example of a typical spatial description is given in (11).

- (11) teʔ *pelota* poʔkstək=kəhsi ø-ʔit-u
 DEF ball chair=on.top.of 3B-EXIST-CP
 ‘The ball is on top of the chair’ (B&C 3-5, C)

5.1. Predication

As mentioned above, the form of the predicate is the only formal feature that distinguishes descriptions of the three spatial domains. In a significant majority of locative statements, including (11), the predicate takes the form of the existential root, *ʔit*, marked for completive aspect. The only other locative predicates that occur with any regularity are dispositional predicates i.e. predicates that give information regarding *how* the figure is located in the stated location. These dispositional predicates are most commonly formed simply from active verb roots marked for the completive aspect, as in (12), but do also occur relatively frequently formed from a positional root (of the type common in Mesoamerican languages, Kaufman (1995)) derived by the characteristic *assumptive* morpheme, *nej*, which indicates that an object has assumed the position detailed by the semantics of the positional root. An example of a description featuring a positional root is given in (13).

- (12) ø-ten-u teʔ nahs=kəhsi tumə *limeta*
 3B-stand-CP DET ground=on one bottle
 ‘A bottle is stood on the ground’ (PSPV 28, AG)
- (13) ø-tək-nej-u j-ʔuka-ʔaŋ=kəʔmə jəʔ *pelota*
 3B-be.thrown-ASSUMP-CP 3A-back-region=in PRX ball
 ‘This ball is behind it (the chair), as if it had been thrown there’ (B&C 4-12, JL)

A typical orientational statement in CZ is predicated by a verb formed from the root *ken* ‘look’. When functioning as the predicate of an orientational statements this root appears with roughly equal frequency marked for the completive aspect, as in (14), and the continuous form, as in (15).

- (14) teʔmə ø-ken-u *pisaron*=mə toʔme teʔ poʔkstək
 there 3B-look-CP whiteboard=LOC nearby DET chair
 ‘The chair is faced near where the whiteboard is’ (B&C 2-8, C)
- (15) j-neʔ j-ʔuka jəʔki nə j-ken-u
 3A-ANA 3A-back here PROG 3A-look-DEP.II

'Its (the chair's) back is facing here' (B&C 1-7, R)

An important aspect of orientational predicates in general is the use of so-called 'directionals', which, as in other MZ languages (Zavala, 2000), in CZ are a closed class of motion verbs with which other verbal roots may be serialised in order to provide additional directional information. Despite their origin as verb roots of motion, a key aspect of directionals is that no entailment of motion results from their use in serial verb constructions. These directional morphemes are used regularly in orientational statements and some, such as *kiʔm* 'DIR:up' and *məʔn* 'DIR:down', are inherently associated with particular FoRs. In the context of egocentric descriptions, the most commonly occurring directionals in my data were the deictic directionals *maŋ* 'DIR:hither' and *min* 'DIR:thither', the use of which are exemplified in (16) and (17). Given that deixis is tangential to the question of FoRs (Levinson, 2003), however, I will not discuss the use of directionals observed in my B&C data any further.

(16) teʔ sija ø-ken-maŋ-u ø-ʔit-u=mə ʔatʃə
 DET chair 3B-look-DIR:THITHER-CP 3B-EXIST-CP=LOC gentleman
'The chair is faced away from us, at where the gentleman is' (B&C 2-5, JL)

(17) teʔ poʔkstək jəʔmə ø-ken-min-u
 DET chair here 3B-look-DIR:HITHER-CP
'The chair is faced towards us, here' (B&C 2-1, C)

5.2. Spatial Adjuncts

As stated at the start of this section, spatial adjuncts in CZ are identical in form across the three spatial domains, as illustrated by the spatial descriptions given in (18)-(19). This uniformity across the domains means it is valid to talk of spatial adjuncts in general when discussing spatial descriptions in CZ, rather than being domain specific. There are three types of spatial adjuncts that can appear in declarative sentences in CZ:

- a postpositional phrase (PP), headed by a postpositional clitic (see (11)-(13) for example)
- a place-denoting adverbial clause headed by the locative case or, marginally, the indefinite place adverb *hudə* (see (18) and (19))
- a spatial adverb (see (17) and (15))

The class of egocentric descriptions considered in this paper are expressed solely through the use of PPs, so these will be the focus of the remainder of this section.

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

- (19) teʔ poʔkstək=ʔis j-teʔtstək ø-ken-maŋ-u ø-ʔit-u=mə
 DET chair=GEN 3A-backrest 3B-look-DIR:THITHER-CP 3B-EXIST-CP=LOC
 sulu=ʔis j-tək
 Sulu=GEN 3A-house
 ‘The chair’s backrest is faced away from us at where Sulu’s house is’(B&C 2-7,
 JL)

As can be seen from the examples given so far, a PP in CZ consists of a single NP marked by a postpositional clitic (which I will refer to simply as postpositions). These postpositions are a closed class of morphemes that includes the two locative cases of proto-MZ (Kaufman, 1997), plus three of their combinations with relational nouns (nominals that label parts of objects) that have become grammaticalised. These postpositions are listed in Table 2.

Postpositional Clitic	Semantics	Gloss
mə	collocation	LOC
i	collocation	LOC
ʔomo	inclusion, collocation	in/LOC
kəhsi	contiguity, superposition	against/on/on top of/above
kəʔmə	proximity, subposition	near/below

Table 2: The full list of the postpositional clitics in CZ

As can be seen from Table 2, in the horizontal plane the semantics of all postpositions in CZ is topological in nature, that is to say, they encode spatial relations that do not require an FoR for their interpretation. As a consequence, any projective element of a spatial description (that which makes reference to an FoR) featuring a PP must originate from the constituent NP, rather than the postposition. There are two distinct strategies for expressing projective spatial semantics in CZ, in the following section I will focus exclusively on that relevant to the expression of egocentric FoRs.

6. Egocentric descriptions in CZ

In order to utilise an egocentric FoR in a spatial description, CZ speakers must use a PP containing a relational noun. In the overwhelming majority of cases the relational noun in question belongs to a category that I will refer to as region-denoting terms (RDTs). These RDTs denote spatial regions that are associated with the surfaces of objects and in most cases also denote the surface itself. A list of the RDTs that are relevant to the expression of egocentric FoRs is given in Table 3. That these terms have “regional” semantics is evidenced by the fact that they are all still identifiably compounds of a surface-denoting relational noun and the morpheme *ʔaŋ*, which although derived from the CZ word for mouth also has semantics related to spatial regions. The regional semantics of *ʔaŋ* is clear from the use of *ʔaŋgə* (a nominalised form of this lexical affix) to mean ‘the area outside a building’ (see (20) for example). Indeed, the combination of *ʔaŋgə* and the postposition *ʔomo* (*ʔangomo*) has grammaticalised into a spatial adverb meaning ‘outside a building’.

- (20) poʔkstək ø-ken-u *maestro klementis*=ʔis **j-ʔaŋgə=ʔomo**
 chair 3B-look-CP Maestro Clementis=GEN **3A-outside.area=in**
 ‘The chair is faced towards Maestro Clementis’ outside area’ (B&C 4-10)

When used to form projective spatial relators, these RDTs are, with the exception of ʔuka=ʔaŋ ‘back region’, combined with ʔomo. The fact that ʔomo has the semantics of inclusion suggests that the semantics of these RDT-postposition combinations should be interpreted as denoting a non-specific location within the specified spatial region.

Region-denoting terms used in CZ egocentric descriptions
ʔakŋa ‘left side and associated region’
tsəʔnaŋ ‘right side and associated region’
tseʔŋna ‘side and associated region’
winəŋ ‘front region’ (win ‘front/face’)
ʔukaŋ ‘back region’ (ʔuka ‘back’)

Table 3: The list of region-denoting terms in CZ that are used in the expression of egocentric frames of reference. Where these terms do not also denote the surface of the object with which the region is associated, I have given the associated surface term

The only egocentric adjuncts in my B&C data that do not meet the description given so far are those that feature the Spanish loan terms *izquierda* ‘left’ or *derecha* ‘right’. As can be seen from the typical examples shown in (21) and (22), when appearing in egocentric descriptions these terms are treated, morphologically speaking, as if they were a typical CZ RDT, that is, they always appear marked for possession and are combined with the postposition, ʔomo. Based on this morphology, I have decided to treat these combinations of Spanish loan terms and CZ postpositions as equivalent to standard CZ RDT-postposition combinations.

- (21) jəʔmə ø-ken-maŋ-u n-deretʃa=ʔomo teʔ poʔkstək hiŋə
 here 3B-look-DIR:THITHER-CP 1A-right=in DET chair DIST
 noʔtse=mə
 wall=LOC
 ‘Here, the chair is faced away from us, to our right, there where the wall is’ (B&C 3-10, LG)
- (22) jəʔki ø-ʔit-u tumə *pelota* n-ʔiskiʔerda=ʔomo
 here 3B-EXIST one ball 1A-left=in
 ‘Here there is a ball on our left-hand side’ (B&C 2-2, MJ)

As discussed in the introduction, it is standard in the literature to subdivide egocentric FoRs in the locational domain depending on whether the spatial regions specified by a description are associated with the SAP themselves or with some external object. In CZ, this conceptual difference is marked formally through the obligatory marking for possession of the RDT through which the FoR is manifested. As can no doubt be guessed, direct FoRs



B&C 2-2



B&C 2-4

Figure 3: The images described in (23) and (24)

are manifested through RDTs marked for first person possession (with the morpheme *n-*), as in (23), while relative FoRs are manifested through the marking of RDTs for third person possession (with *j-*), as in (24).

- (23) **n-**?akpa=?omo ø-ʔit-u jəʔ tumə *pelota*
 1A-left.region=in 3B-EXIST-CP HESIT one ball
 ‘There is a ball on my left-hand side’ (B&C 2-4, B)

- (24) **j-**neʔ **j-**?akpa=?omo ø-ʔit-u tumə *pelota* nə j-sidi-u=pəʔ
 3A-ANA 3A-left.region=in 3B-EXIST-CP one ball PROG 3A-fly-DEP.II=REL
 ‘To its (the chair’s) left, there is a ball that is flying’ (B&C 2-2, AT)

In contrast, the classification of egocentric orientational statements cuts across formal distinctions. This is primarily due to the fact that whereas the purpose of locational information is fundamentally to specify a region in which the figure can be found, orientational information must specify a *direction* with which a facet of the figure can be aligned. The result of this is that although in orientational statements such as (25), the orientational information is specified through precisely the sort of SAP-possessed RDTs that are used to form direct descriptions in the locational domain, the denotations of these terms when combined with orientational predicates suggests strongly that in such contexts these ‘direct’ adjuncts in fact function as directions interpreted at the location of the figure. Given this, I have classified orientational statements containing SAP-possessed RDTs, in addition to those featuring an RDT possessed by the figure, as in (26), as examples of *relative* orientational descriptions.

- (25) jəʔmə ø-ken-u n-tseʔɲna=?omo
 here 3B-look-CP 1A-side.region=in
 ‘Here it (the chair) is faced towards the side’ (B&C 1-3, LG)

- (26) teʔ poʔkstək=ʔis j-neʔ j-teʔts-tək jəʔ=se ø-ken-u
 DET chair=3GEN 3A-ANA 3A-lean-INSTR PRX=SIM 3B-look-CP
 j-ʔaknja=?omo
 3A-left.region=in
 ‘The chair’s backrest is faced to its left’ (B&C 2-8, AT)

The exception to the general rule that orientational descriptions featuring SAP-possessed

RDTs are classified as instances of the relative FoR are those descriptions in which a facet of the SAP is effectively used as a landmark. With the figure situated in front of the SAP, as is the case in the B&C task, this is the preferred interpretation of those orientational descriptions that make reference to the front of the SAP (*n-winaŋ*), such as that in (27). As stated in the introduction, I have classified this type of description as direct in the coding of my B&C data.

- (27) poʔkstək n-neʔ n-winaŋ=ʔomo nə j-ken-u
 chair 1A-ANAP 1A-front.region=in PROG 3A-look-DEP.II
 ‘The chair is facing towards my front’ (B&C 4-7, B)

It also needs to be mentioned that although the default interpretation of sagittal orientational descriptions appears to be direct in nature, a minority of CZ speakers also use the same sagittal PPs, usually (but not always) accompanied by the directional *maŋ* ‘DIR:thither’, to indicate the direction *away* from the SAP, as in (28). Elicitations have shown that when used in such a manner these sagittal PPs effectively encode the direction in which the SAP is facing and for this reason have classified such descriptions as relative in my B&C data.

- (28) **n-winaŋ=ʔomo** **ø-ken-maŋ-u** **hiŋəʔ** j-tseʔŋna=ʔomo
 1A-front.region=in 3B-look-DIR:thither-CP DIST 3A-side.region=in
 ø-ʔit-u tumə pelota
 3B-EXIST-CP one ball
 ‘It (the chair) is faced in front, there, away from us and at its side is a ball’ (B&C 1-8, LG)

With the forthcoming discussion in mind, it is necessary to highlight a property of relative descriptions in CZ that might not be obvious: the PPs through which the relative frame is manifested are identical in form to those used to express the intrinsic, object-centered frame, an example of which is given in (29). Given their identical form, these two types of description can be distinguished only by considering the basis on which the referenced spatial regions have been assigned to the ground object. If the assignment of the regions referenced in a description has been made on the basis of the intrinsic asymmetries of the ground object, as exemplified in Figure 4, it is an example of an object-centered description. If, on the other hand, the assignment has been made based on the perspective of the SAP, as exemplified in Figure 5, it is an example of a relative description. It is precisely because of the egocentric nature of the spatial regions referenced in relative descriptions that it is possible to have orientational descriptions, such as (26), in which the English translation is unfelicitous due to its apparently intrinsic nature.

- (29) teʔ poʔkstək=ʔis j-tseʔŋna=ʔomo ø-ʔit-u tumə pelota
 DET chair=GEN 3A-side.region=in 3B-EXIST-CP one ball
 ‘To the side of the chair is a ball’ (B&C 1-3, LG)

That the relative and the object-centered frames should be expressed by precisely the same

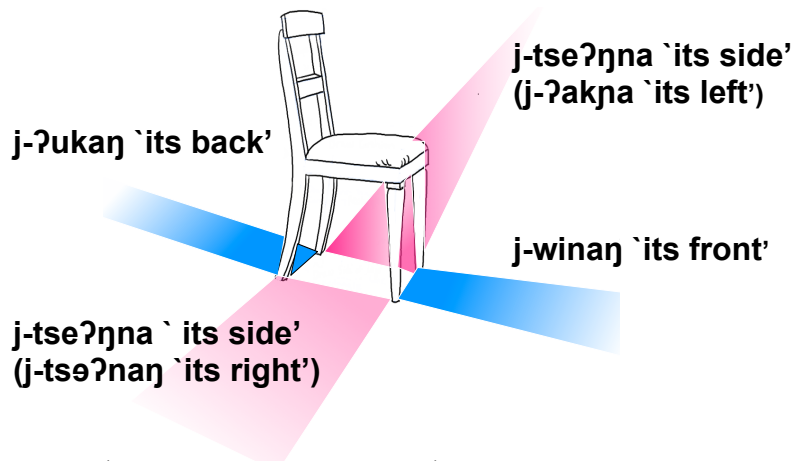


Figure 4: Diagram showing RDTs assigned to a chair in an object-centered manner

PPs is consistent with Levinson's (2003) hypothesis that, universally, relative descriptions develop out of intrinsic ones in order to deal with situations in which intrinsic descriptions can not be applied i.e. those in which the ground object is unfeatured. The nature of the development of the relative frame will be discussed in more detail in Section 8.

7. Results

All of the propositions describing the orientation of the chair and the location of the ball in the horizontal plane given during the 5 runs of the B&C task were coded for the FoRs they featured. Beyond those egocentric FoRs that are the focus of this paper, the inventory of FoRs used during the coding process was identical to that used by the MesoSpace collaborators (O'Meara and Pérez Báez, 2011). In addition to the egocentric and object-centered FoRs defined so far during the course of this paper, the MesoSpace inventory includes three non-intrinsic frames that are anchored by environmental features: the geomorphic, absolute and landmark-based frames. These three frames are distinguished based on the manner in which their axes are derived from their anchor. In the case of the geomorphic frame, the axes are modelled on the asymmetries of the environmental feature (the direction of a slope in CZ) in much the same way as the axes of the relative frame are based on the asymmetries of a SAP. In a landmark-based frame the axes are independent of the asymmetries of the anchor and are instead defined as the direction linking it to the ground (or figure in orientational statements). Finally, the absolute frame is generally defined in the literature as a frame in which the axes have been *abstracted* from its anchor, meaning that they are *fixed* and independent of the location of the figure. There is some debate in the literature (see (Levinson, 2003, p47-50) and Palmer (2015)) around the distinction of the absolute frame from the other two environmentally anchored frames and particularly around the meaning of the terms abstracted and fixed. For clarity of interpretation, in the data presented I have only classed those descriptions that use directions that are fixed in the sense of the west-

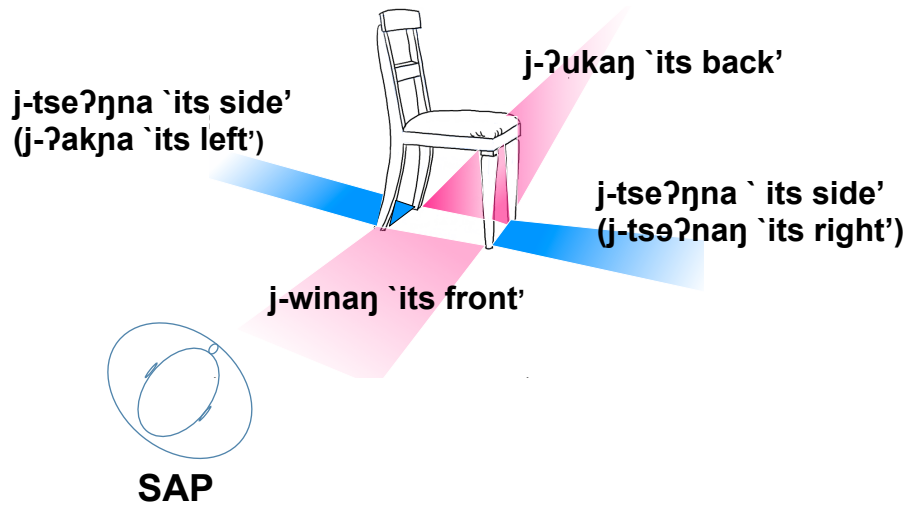


Figure 5: Diagram showing RDTs assigned to a chair in an egocentric manner

ern cardinal directions (i.e. relative to the earth as a whole) as absolute. All descriptions making reference to slopes were classified as geomorphic. Examples of all three of these geocentric descriptions are given in (30)-(32)

- (30) \emptyset -ʔit-u teʔ teʔse poʔkstək teʔse \emptyset -ken-məʔn-keʔt-u=pəʔ
 3B-EXIST-CP DET HESIT chair HESIT 3B-look-DIR:down-REP-CP=REL
 kəʔji
 below
 ‘There is a chair that is faced downhill’ (B&C 4-8, AT)
- (31) ...pero jəʔ pelota \emptyset -tsəʔj-pa \emptyset -ʔit-u=mə mih m-tək
 ...but PRX ball 3B-remain-ICP 3B-EXIST-CP=LOC 2PRO.GEN 2A-house
 ‘... but this ball is where your house is’ (B&C 4-8, JL)
- (32) pelota \emptyset -ʔit-u jəʔmə jəʔ tsoʔt-pa=mə hama
 ball 3B-EXIST-CP here PRX ʔ-ICP=LOC sun
 ‘Here, this ball, is in the east’ (B&C 1-7, P)

Considering the FoR data obtained using the B&C task (shown in Figure 6), there are some broad trends that are easily identifiable and are important for understanding the use of egocentric FoRs in CZ. Firstly, in common with speakers of all those Mesoamerican languages so far described (see Capistrán Garza (2011), Pérez Báez (2011), Polian and Bohnemeyer (2011) and Hernández-Green et al. (2011) in addition to those references already mentioned), CZ speakers clearly preferred the use of the object-centered frame when describing the location of the ball in a projective manner, such descriptions making up 48% of all horizontal locative propositions. Equally clear is the fact that topological (non-projective) descriptions were the second most common strategy when locating the ball, being used

with a frequency not dissimilar to that of the projective object-centered descriptions (33% of all propositions). Interestingly, a similarly favourable attitude towards non-projective descriptions was also observed in the one other MZ language so far investigated for FoR use, and is also a recurring theme of the data collected by the MesoSpace collaborators. Projective descriptions other than the object-centered FoR were used rarely in comparison, making up only 19% of all propositions given. Such frequency data places CZ amongst the most object-centered languages so far surveyed in Mesoamerica and places it alongside languages, such as Seri (Bohnenmeyer and O'Meara, 2012), that have been referred to as *intrinsic only* languages.

In the orientational domain, where the object-centered and topological strategies are not available (due to their lack of reference to external directions), the preferred strategy when formulating a description was to make reference to ad hoc landmarks, such as neighbours' houses, the video camera that was recording the task and, most widely distributed across participants, themselves. This preference for the use of ad hoc landmarks in orientational statements is inline with the observation made by Bohnemeyer and O'Meara (2012), that languages in which object-centered descriptions are favoured in the locational domain tend to favour the use of ad hoc landmarks in the orientational domain. It is notable, however, that the use of alternative strategies in the expression of orientation appear to be more common in CZ than has been reported for other languages in which ad hoc landmarks dominate (such as Seri O'Meara (2011)). As will be discussed in the next subsection, however, this is primarily due to the unusually large number of egocentric orientational descriptions used by a single dyad, though it is notable also that slope-based geocentric descriptions also form a significant (and more evenly distributed) proportion of the orientational descriptions given.

7.1. Egocentric FoRs

As can be seen from Figure 6, the use of egocentric descriptions varied considerably in its frequency across the two domains. In terms of overall use, in the locational domain egocentric FoRs were used in just 5% of propositions, whereas in the orientational domain they made up approximately 20% of all propositions. Based on the available published data, this differential between the rate of egocentric descriptions in the two domains is quite large. As can be seen from Table 4, however, the origin of this 'excess' in egocentric descriptions in the orientational domain is a single dyad (Dyad 4), who in the orientational domain preferentially used relative descriptions (mainly expressed through the use of Spanish loans) to describe chairs whose orientations were aligned with the coronal axis of the participants. Vitaly, however, the same dyad did not show the same degree of egocentricity in the locational domain, where, as for all dyads, object-centered and topological descriptions were strongly preferred. The relevance of this for the position of egocentric descriptions in CZ more generally will be discussed more in the following section.

There are two further features of my data that I wish to highlight with the forthcoming discussion in mind. Firstly, during the B&C task only one participant (from Dyad 3) used the relative frame in locational descriptions more than once and this same participant also accounted for the only relative descriptions of orientation formed from RDTs possessed by

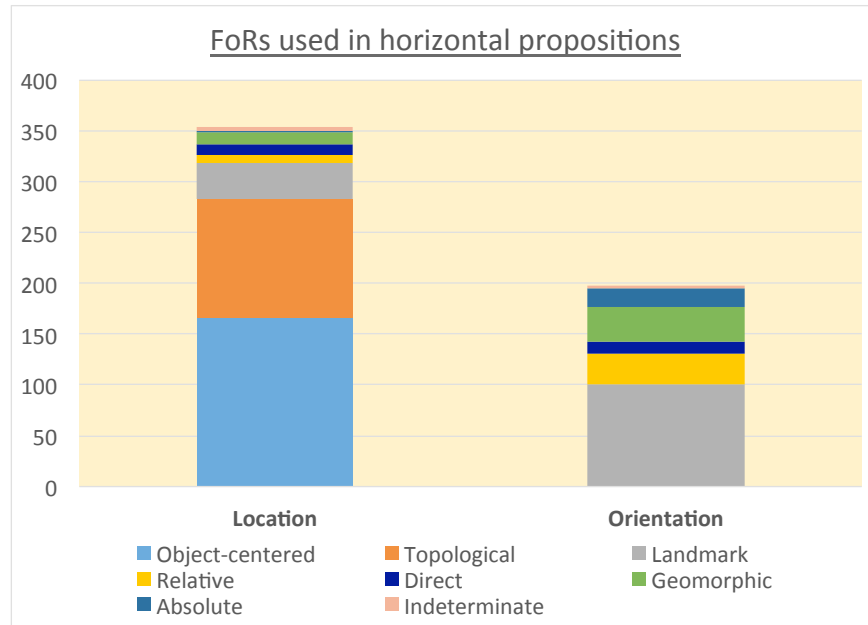


Figure 6: Bar charts showing the number of propositions giving spatial information in the horizontal plane coded for different frame of reference types

the chair. Based both on my B&C data and subsequent elicitations, such FoR usage is atypical in the context of featured ground objects. Secondly, the only dyad who did not give a single egocentric description of either domain was also the oldest dyad in my study, Dyad 5. Even during a follow-up elicitation session conducted using the B&C stimuli, no egocentric descriptions were spontaneously given by these participants, though both accepted direct locational descriptions and relative orientational descriptions when provided.

Domain	Dyad 1	Dyad 2	Dyad 3	Dyad 4	Dyad 5
Location (Relative/Direct)	2/0	2/5	4/0	0/6	0/0
Orientation (Relative/Direct)	0/0	2/5	6/0	23/7	0/0

Table 4: Uses of egocentric descriptions during B&C task broken down by dyad.

8. Discussion and summary

As noted in the previous section, the relative frame was used extremely infrequently in the locational domain (even by the standards of Mesoamerica) by the 10 CZ speakers who took part in the B&C task. I believe, however, that what use there was, when combined with the FoR usage observed in my wider CZ data set, supports two hypotheses. Firstly, that the productive use of the relative frame by CZ speakers to describe the location of objects is a relatively recent phenomenon, and, secondly, that the relative frame is still in the process



Figure 7: The image from the M&T stimulus (2-4), which is being discussed in examples (33) to (35)

of development as a linguistic resource in the locational domain. Furthermore, I suggest that there is evidence in my B&C data to suggest that the catalyst for the development of this linguistic resource in CZ is the increasing influence in Ocotepc of Mexican Spanish, a language whose speakers, including those in Ocotepc, typically make great use of relative spatial descriptions in both domains.

The first part of my hypothesis results from two observed features of my CZ data. Firstly, the seven CZ consultants older than 35 with whom I have worked have consistently shown a strong preference for the use of the direct frame on the few occasions when they have given egocentric descriptions of location. In fact, as it stands, I have not yet observed a *spontaneous* use of a relative locative statement by a CZ speaker older than 35⁴. This is in contrast with many of the younger consultants with whom I have worked, who have, in certain contexts (discussed further below), been observed to use relative locative statements freely. In order to gain an insight into the differing attitudes of CZ speakers of different ages to the use of the relative frame, it is instructive to consider an exchange that occurred between a consultant aged 45 and one aged 22 during a run of the Man and Tree communicative task; a communicative task very similar in nature to the B&C task already described (Levinson et al., 1992). During this run, the younger speaker offered the following relative locative description of the location of the boy in Figure 7 for assessment of the older speaker, who was playing the role of director.

- (33) **j-tsoʔnaŋ=ʔomo** ø-ʔit-u?
 3A-right.region=in 3B-EXIST-CP?
 'Is it (the boy) to its (the tree's) right?'

This was met with some confusion by the older speaker, who responded by giving the following direct description of the scene.

⁴Relative descriptions of spatial arrays featuring unfeatured grounds are often, though not always, accepted by older speakers during elicitation

- (34) teʔ ŋgaʔe n-ʔakɲa=ʔomo=teʔ ø-ʔit-u=pəʔ
 DET boy 1A-left.region=in=PRED 3B-EXIST-CP=REL
 ‘The boy is to my left’

The older speaker subsequently gives an object-centered description of the location of the tree (relative to the boy) before adding a further direct description of the scene.

- (35) hiʔn=teʔ j-tsəʔnaŋ=ʔomo=pəʔ teʔ kuhj n-tsəʔnaŋ=ʔomo=te
 NEG=PRED 3A-right.region=in=REL DET tree 1A-right.region=in=PRED
 ø-ʔit-u=pəʔ
 3B-EXIST-CP=REL
 ‘it isn’t to his right, the tree is to my right’

I believe that this exchange shows that relative locative statements form a productive part of the linguistic resources available to the younger CZ speaker when describing the location of a figure relative to an unfeatured ground, but that this is not the case for the older speaker. Such anecdotal evidence is consistent with the differing patterns of use of relative locative statements by speakers of CZ of different ages observed in my wider data.

The second aspect of my hypothesis (that the use of the relative frame in locative statements in a developing phenomenon) is based on the limited use of the relative frame observed during the B&C task. As I have already stated, younger CZ speakers consistently exhibit the productive use of the relative frame in contexts such as the M&T task, that is, one in which a figure can be located relative to an unfeatured ground. What can be inferred from the extremely limited use of the relative frame during the B&C task, therefore, is that the productive use of the relative frame in locative statements does not extend to contexts in which the ground object is *featured*, such as a chair. Such a restriction on the use of relative locative statements with featured grounds is a well established phenomenon, attested for a diverse group of languages, including Yukatek (Bohnemeyer and Stoltz, 2006) and Yeli Dnye (Levinson, 2006). Although overall the relative frame was used extremely rarely in locative statements during the B&C task, there was one participants who did use it preferentially (rather than more common direct frame) when giving egocentric descriptions of the location of the ball. I have since observed the same preference for relative locative statements over direct ones in contexts in which the ground object is featured amongst a number of other young CZ speakers. I believe that what these observations indicate is that the use of relative locative statements with featured grounds is also becoming a productive part of the linguistic resources available to CZ speakers, but at the moment this is restricted to younger speakers.

An interesting aspect of the developing nature of the relative frame in CZ is that it presents us with evidence that a well-known hypothesis regarding the development of the relative frame needs a slight modification. The hypothesis in question is Levinson and Wilkin’s (2006, p549) claim that, “if a language has relative ‘left’ and ‘right’ expressions, then it certainly has relative ‘front’, ‘back’ ones”. Across my wider data set it is certainly the case that with unfeatured grounds relative uses of *winaŋ* ‘front region’ and *ʔukaŋ* ‘back

region' outnumber relative uses of *ʔakʔa* 'left region' and *tsəʔnaʔ* 'right region'. There is therefore nothing to suggest that CZ violates this hypothesis in relation to the *initial* development of the relative frame from the object-centered one. In relation to the use of the relative frame with featured grounds, however, the situation is quite different. During the B&C task there was not a single relative usage of *winəʔ* 'front region' and *ʔukaʔ* 'back region' and just a single relative usage of *tseʔna* 'side region'; this is contrasted with the fact that these three terms featured in the vast majority of the object-centered descriptions given. The situation with *ʔakʔa* 'left' and *tsəʔnaʔ* 'right' was the exact opposite: these terms were used exclusively in a relative manner. This suggests, therefore, that in CZ, in the case of featured grounds, the order of development of relative terms along the two axes is the reverse of that with unfeatured grounds. Based on the pattern of relative use observed in my data, I hypothesise that for featured grounds relative terminology develops in reverse order to that in which the equivalent intrinsic terms are assigned. In CZ, for example, the intrinsic front of an object is the basis for the assignment of all other intrinsic terms. Once the front has been assigned there are a number of different mental operations that must be performed in order to assign the remaining terms. These vary in complexity from simple opposition (in the case of 'back'), to rotation of 90 degrees in any direction for 'side' and, finally, rotation of 90 degree in a specific directions for the assignment of the intrinsic left and right terms. It would be interesting to compare the development of the relative frame with featured objects in languages with different bases for assigning meronymic terminology.

Finally, I believe that the apparent changes in the linguistic behaviour of CZ speakers described above can be traced to the increasing influence of Spanish in Ocoatepec since the arrival of the paved road in the mid-1980s⁵. Evidence of the influence of Spanish on how CZ speakers convey spatial information comes from the descriptions given by the youngest dyad (Dyad 4) during the B&C task. As already discussed, Dyad 4 is a clear outlier in terms of the use of egocentric descriptions, these two participants alone accounting for more than half of all of the egocentric descriptions in my B&C data. I believe that such excessive (compared to the other participants) use of egocentric orientational descriptions by the youngest participants in my study is itself an indication of the effect of Spanish on the linguistic behaviour of CZ speakers, but this impression is amplified when it is considered that more than half of these egocentric descriptions were expressed using the Spanish loan terms *izquierda* and *derecha*. That this pattern of egocentricity was not replicated in the locational domain should not come as a surprise given that, unlike in the orientational domain, there is a well established *conventionalised* approach to describing location in the form of object-centered and topological descriptions. Finally, it should be noted that the development of the relative frame amongst speakers of Mesoamerican languages as a result of contact with Spanish is by now a well attested phenomenon, having been previously observed in both Tzeltal (Polian and Bohmeyer, 2011) and Otomi (Hernández-Green et al., 2011).

⁵This is attested both anecdotally in the town, but also by census data collected since this time

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