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Contrasting Code-switching Theories:

Insights from Kaqchikel-Spanish code-switched nominal constructions

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ABSTRACT

The aim of this study is to improve our understanding of code-switching (CS) at conflict sites (where the grammars of two languages have conflicting rules). We examine Determiner-Noun-Adjective switches produced by Kaqchikel-Spanish bilinguals. Both languages differ in gender and word order: (i) Spanish has gender, Kaqchikel does not, and (ii) the adjective in Spanish is normally postnominal while in Kaqchikel it is prenominal (Bosque & Picallo, 1996; Brown, Maxwell & Little, 2006) (see examples 1 & 2, respectively).

(1) Spanish: *la casa roj-a*
def. .art fem house red-fem
'The red house'

(2) Kaqchikel: *ri käq jay*
def.art red house
'The red house'

Predictions on mixed nominal constructions (NCs), based on two theoretical approaches, the Matrix Language Frame model (MLF) (Myers-Scotton, 2002) and the Minimalist Program (MP) (Chomsky, 1995, 2000) are examined. Both approaches provide contrasting predictions regarding the language of the determiner and adjective position. The MP predicts that (i) the determiner language is provided by the language with the 'richest array of grammatical features' (Liceras, Spradlin & Fernández Fuertes, 2005; Moro Quintanilla, 2014) and (ii) the adjective language dictates the relative order of the adjective with respect to the noun (Cantone & MacSwan, 2009). The MLF model predicts that (i) the determiner language is provided by the Matrix Language (ML) of the clause, and (ii) the ML dictates the relative order of the adjective with respect to the noun. Previous studies, both based on naturalistic and experimental data, report different outcomes when examining the prediction accuracy of the two approaches for language of the determiner and adjective position in different language pairs (e.g. Herring, Deuchar, Parafita Couto & Moro Quintanilla, 2010; Parafita Couto & Gullberg, 2017; Blokzijl, Deuchar, Parafita Couto, 2017, Fairchild & Van Hell, 2015; Parafita Couto, Deuchar & Fusser, 2015; Stadthagen-González, Parafita Couto, Parraga & Damian, 2017; Balam & Parafita Couto, 2019; Pablos, Parafita Couto, Boutonnet, De Jong, Perquin, De Haan & Schiller, 2019).

In the present study, a total of 277 mixed NCs were elicited from 20 Kaqchikel-Spanish bilinguals through a Director-Matcher task (Gullberg, Indefrey & Muysken, 2009). Results show that (i) the determiner always appeared in Kaqchikel, supporting the predictions of the MLF (because the ML was always Kaqchikel) but not the MP, (ii) the adjective always occurred in postnominal position. In 164 out of 174 cases, the adjective language was Kaqchikel. This postnominal position was not predicted by any of the theoretical approaches. In monolingual Kaqchikel nominal constructions in this task, the adjective also occurred predominantly in postnominal position. Possible explanations for this can be drawn upon recent studies that report a task-effect (Bellamy, Parafita Couto & Stadthagen-González, 2018).

Keywords: code-switching, Kaqchikel, Spanish, nominal constructions

For those who Keep Calm and Love Linguistics.

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TABLE OF CONTENT

ABBREVIATIONS

All linguistic abbreviations in this thesis are according to the Leipzig Glossing Rules (2015) (see overview below). In every example, *italics* marks Kaqchikel, normal font marks Spanish, **bold** font marks the determiner.

1	first person
2	second person
3	third person
ADJ	adjective
ART	article
DEF	definite
DEM	demonstrative
DET	determiner
DIST	distal
F	feminine
INDF	indefinite
M	masculine
PL	plural
POSS	possessive
SG	singular

1. Introduction

Code-switching (CS), the back-and-forth switching between languages in the speech of bilinguals, follows predictable patterns and is governed by linguistic structural constraints (e.g. Bullock & Toribio, 2009). Over the past decades, scholars have been investigating the phenomenon of code-switching in different language pairs and across different communities (e.g. Blokzijl, Deuchar, Parafita Couto, 2017). Looking at Spanish-English bilingual conversational data, Pfaff (1979) found that code-switches tend to manifest more frequently between determiners and nouns, since structural conflicts between two languages do not arise in these sequences in this language pair. Hence, Poplack (1980) proposed the *equivalence constraint*, meaning that code-switches occur at points in discourse where the syntactic rules of both languages will not be violated. This constraint has been evaluated in conflict sites (where both grammars have conflicting rules) in different language pairs and results remain unclear. Among others, Belazi, Rubin & Toribio (1994:225-226) show evidence on Spanish-English and Tunisian Arabic-French code-switching data that the prediction of this *equivalence constraint* is incorrect when it comes to code-switches between verbs and its complements. They show in the Spanish-English data that, when word order is equivalent in both languages, there are still certain restrictions under which code-switching is allowed and where free code-switching is not possible. In the Tunisian Arabic-French they found evidence against the *equivalence constraint* where usually parallel structures in the relative clause, also disallows code-switches. Similar other counterexamples across other language pairs were also found by others (Bentahila & Davies, 1983; Myers-Scotton, 1997; Jake, Myers-Scotton & Gross, 2002; Cantone & Muller, 2008).

Instead, Di Scullio, Muysken & Singh (1986) proposed the *government constraint*, stating that there is a governmental relation between the constituents of a sentence and that code-mixing takes elements from the lexicon. It states that each grammar (government) motivates the code-mixes independently, in which a new type of grammar is created, a 'third grammar'. It also explains that a government holds the relation between elements, for which it sometimes disallows code-mixing. Clyne (1987) explains that CS is governed solely by monolingual constraints. This means that the point where the code-switch occurs, the trigger word, cannot be accounted for as a code-switch and it does not have any syntactic connection with either languages. In case of a code-switch in the other language, the grammatical constraints of the current language governs the syntactic structure of the sentence. Belazi et al.

(1994) propose that the word and its morphosyntactic features follow the constraints of the language from which it is drawn. In continuation, they propose that no type of intergrammar or code-switching specific constraints is applicable and explain this by the theory that code-switches are constrained solely by Universal Grammar. Santorini and Mahootian (1995) argue that bilingual speech is rather governed by monolingual constraints, independently of syntactic discrepancies between the languages. Others have suggested a switching asymmetry between the two languages, meaning that one language always (syntactically) dominates over the other in bilingual speech (i.a. Joshi, 1985; Myers-Scotton, 1997, 2002; Jake, Myers-Scotton & Gross, 2002). These different views on CS regularities lead to two major approaches in CS theory, which each predict CS outcomes. The first approach is based on the Minimalist Program (Chomsky, 1995), a generativist view, in which CS predictions are based on the grammatical features of the lexical items and its underlying universal syntactic constraints. The second approach falls within the Matrix Language Frame (Myers-Scotton, 2002), which assumes a switching asymmetry between the languages. The predictions are based on the usage of one dominant language (Matrix Language) over the other one within each sentence. Interestingly, when comparing these theoretical approaches, the predictions on where these code-switches occur do not always correspond. When focusing on the nominal domain, more specifically on the determiner language and adjective word order, makes it interesting to test if the predictions of each approach fit the presented dataset and to see how the outcomes can be explained. Each of these approaches will be set out in detail in the following paragraphs.

The first approach falls within a generativist/lexicalist view. Liceras, Spradlin & Fernández Fuertes (2005), Liceras, Fernández Fuentes, Perales, Pérez-Tattam & Spradlin (2008), Moro Quintanilla (2014) and Cantone & MacSwan (2009) evaluate their data, on the basis of the Minimalist Program (MP) by Chomsky (1995). Each dataset differs in type, language pair and types of bilinguals (adults/children): spontaneous speech of Spanish-English, French-English and Italian-German bilingual children (Liceras et al. 2005,2008), Spanish-English spontaneous speech of bilingual adults in Gibraltar (Moro Quintanilla, 2014), and data from grammaticality judgement tasks of bilingual adults and spontaneous speech of younger children (Cantone & MacSwan, 2009). Liceras et al. (2005) propose that within bilingual speech, the lexical items from the language with the largest array of 'uninterpretable features' will surface (cf. Chomsky, 1995). For instance, when looking at mixed nominal constructions in the Spanish-English language pair, the Spanish determiner carries two of such features

(gender and number) and the English determiner does not (e.g. *el perro* (masculine) and *la casa* (feminine) versus 'the dog' and 'the house'). This means that, in mixed Spanish-English nominal constructions (NCs), the Spanish determiner will be preferred over English. When evaluating adjective word order, Cantone & MacSwan (2009) propose that no CS-specific constraints are required for the formation of bilingual patterns, since the properties of the lexical items of the individual grammars are sufficient (cf. Chomsky, 1995; MacSwan, 1999). This means that the position of the adjective is dependent on the monolingual structure of the language involved. For example, Spanish adjective usually comes in postnominal position (e.g. *casa roja*, 'house red'), while in English, the adjective comes in prenomimal position (e.g. 'red house'). In Spanish-English mixed NCs, it is then expected to find 'red *casa*' ('red house') and not '*casa* red' ('house red'). In this case, the adjective language is English, meaning that the adjective is expected to appear in English word order (prenominal).

The second theoretical approach assumes an asymmetry between the languages involved in code-switching: the Matrix Language Frame model (MLF) by Myers-Scotton (1997, 2002). It proposes that, in bilingual utterances, the Matrix language (ML) provides the morphosyntactic frame of the code-switched utterance, where the Embedded Language (EL) provides inserted material, normally content words (nouns, verbs and adjectives). The ML provides the grammatical elements (such as determiners, pronouns and inflectional morphemes). This means that the determiner will be provided by the ML, and not by the language with the largest range of 'uninterpretable features', as claimed by the theoretical approach within the MP. For instance, the Spanish-English utterance with a mixed NC, 'He reads a *libro* (book)' is acceptable for the MLF approach. The ML is English (as indicated by the pronoun 'he' and inflectional morpheme '-s') and the determiner corresponds to it (English 'a'). At the same time, the MLF proposes that the adjective word order will reflect the structural properties of the ML. This is independently of the adjective language, as claimed by the MP. For example, '*Él lee un libro* beautiful' ('he reads a beautiful book') is acceptable to the MLF approach, since the ML is Spanish (indicated by the pronoun '*Él'* (he) and the inflectional morpheme '*-e*' on the verb root *'le-*', from infinitive '*leer*' (to read)) and 'beautiful' appears in postnominal position, following the Spanish morphosyntactic structure. This in contrast with the proposal within the MP approach, which predicts that the lexical item 'beautiful' is in English and should come in prenominal position, since the adjective position should correspond to the English grammar.

In sum, both MP and MLF approaches make contrasting predictions regarding the language of the determiner and the adjective position. Scholars have examined and compared the accuracy of these approaches with different language pairs, using both naturalistic and experimental data, and report different outcomes. Studies regarding determiner language, based on naturalistic data, show support for both MP and MLF predictions (e.g. Herring, Deuchar, Parafita Couto & Moro Quintanilla, 2010; Eppler, Luescher, & Deuchar, 2016; Ramírez Urbaneja, 2019) or lend more evidence for the MLF approach (Parafita Couto & Gullberg, 2017; Blokzijl, Deuchar, Parafita Couto, 2017; Parafita Couto & Stadthagen-González, 2017), while experimental results sometimes do not point in a specific direction (e.g. Fairchild & Van Hell, 2015). In studies regarding the adjective position, some support both MP and MLF predictions for naturalistic data (Balam & Parafita Couto, 2019; Parafita Couto & Gullberg, 2017), as well as experimental data (Vanden Wyngaerd, 2016). However, in the majority of studies, based on (partly) naturalistic data (Parafita Couto, Deuchar & Fusser, 2015) and experimental methods (Parafita Couto et al., 2015), both show less convincing evidence for either theoretical approaches. Some studies do not find any convincing evidence for the support of the MLF and MP approaches at all (Stadthagen-González, Parafita Couto, Parraga & Damian, 2017; Pablos, Parafita Couto, Boutonnet, De Jong, Perquin, De Haan & Schiller, 2019).

The focus of this master thesis is on the way Kaqchikel[1] (Mayan) - Spanish bilinguals produce mixed nominal constructions (NCs). More specifically, we center on switches between determiner-noun and noun-adjective sequences. Kaqchikel is spoken in the Western Highlands of Guatemala by approximately 400,000 speakers (Garzon, 1998; Brown, Maxwell & Little, 2006). Most of these speakers are bilingual, as Spanish is the official language of Guatemala (i.e. of all governmental institutions). Kaqchikel is recognized as a national language by the Guatemalan government, as well as the other twenty languages of the Mayan language family, though education is mostly offered in Spanish (Heinze-Balcazar, 2014). When focusing on the nominal domain, we find that the grammars of both languages differ in gender-agreement on the determiner and the position of the adjective, both with reference to the noun. The Spanish

[1] Kaqchikel is the modern spelling adopted with the Guatemalan governmental approval of the current alphabet (1987). The most common alternative spelling is Cakchiquel, based in a system developed without the input of native speakers and linguists that adapts the Spanish alphabet to the Kaqchikel language (Brown, Maxwell & Little, 2006:8-9). In this thesis the spelling of Kaqchikel will be used to respect the hard work of Kaqchikel-identified linguists to assert ownership over their own language (inspired by Bennett, 2019:60).

determiner has gender: **una, la** for feminine (e.g. **una/la** casa, 'a/the house') and **un, el** for masculine (e.g. **un/el** perro, 'a/the dog').[2] It also reflects number, **las** (feminine) and **los** (masculine). The Kaqchikel determiner has no gender nor number: ***jun*** and ***ri*** for all nouns (e.g. ***jun/ri*** *jay*, 'a/the house' and ***jun/ri*** *tz'i'*, 'a/the dog) and the plural form usually needs a plural particle (e.g. ***ri*** *taq tz'i'* 'the PL dog'). In addition, the Spanish adjective normally takes the postnominal position (Bosque & Picallo, 1996), while the Kaqchikel adjective takes the prenominal position (see *examples 1* and *2*) (Rodriguez Guaján, 1994:147).

(1) Kaqchikel: ***ri*** *käq jay*
DEF.ART red house
'The red house'

(2) Spanish: **la** casa roja
DEF.ART.F house red.F
'the red house'

(3) *K'o* ***jun*** ***ru-****koton* *pim.*
'3.be INDF.ART 3SG.POSS-sweater thick
'he has a thick sweater'

According to Maxwell & Little (2006), in some cases, the adjective occurs postnominally. They mention it is argued this word order is influenced by Spanish, nevertheless this construction is found in old texts as well. However, this construction only occurs when the meaning is attributive and mostly when the noun is possessed (see *example 3)*, Maxwell & Little, 2006:82). In the majority of - if not in all - the Kaqchikel grammars, adjective position is explained to be prenominal (Rodríguez Guaján, 1994; García Mátzar, Toj Cotzajay & Coc Tuiz, 1999; Patal Majzul, García Mátzar & Espantzay Serech, 2000; Barrett, 2005; Maxwell & Little, 2006; Brown et al., 2006; Patal Majzul, 2013; Son Chonay, 2015; Maxwell, Son Chonay, Son Chonay & Carmela Rodríguez, 2015).

The differences in the nominal domain in these languages makes it interesting to evaluate how bilinguals deal with this grammatical contrast. For example, in a mixed NC, will the bilinguals produce the Spanish word order (e.g. casa *käq,* 'house red'), or the Kaqchikel word order (e.g. *käq* casa 'red house')? Similar questions can be asked for the determiner language: will they produce the Kaqchikel determiner with a Spanish noun (e.g. ***ri*** casa, 'the

[2] Henceforth, in examples in this thesis, italics marks Kaqchikel, normal font marks Spanish, bold font marks the determiner. Abbreviations follow The Leipzig Glossing Rules (2015).

house') or the gendered Spanish determiner with a Kaqchikel noun (e.g. **la**/ **el** *jay*, 'the (feminine/masculine) house')? Overall, is there a preference to use one combination over another, not only at the individual level, but also within the community? And if so, what are the reasons behind this?

We set out to answer these questions, building on previous work (Herring et al., 2010; Fairchild & Van Hell, 2015; Parafita Couto et al., 2015; Eppler et al., 2016; Vanden Wyngaerd, 2016; Blokzijl et al., 2017; Parafita Couto, Boutonnet, Hoshino, Davies, Deuchar & Thierry, 2017; Parafita Couto & Gullberg, 2017; Parafita Couto & Stadthagen-González, 2017; Stadthagen-González et al., 2017; Pablos et al., 2019; Balam & Parafita Couto, 2019) that approached the evaluation of two theoretical accounts (i.e., the Matrix Language Framework (MLF, Myers-Scotton, 1997, 2002) and a Minimalist Program approach (MP, Chomsky, 1995, 2000; Liceras et al., 2005; Liceras et al., 2008; Moro Quintanilla, 2014; Liceras, Fernandez Fuertes & Klassen, 2016)) by examining patterns of determiner-noun and adjective-noun switching.

First, to understand the bilingual speaking community, background information on the Kaqchikel-Spanish community will be provided (chapter 2). In order to understand the CS patterns, we will elaborate on the predictions on the language of the determiner and adjective position of the two mentioned theoretical approaches in the Literature Review (chapter 3). In continuation, based on previous research, the research questions and hypotheses of this study will be presented (chapter 4). Next, the methodology will be motivated and explained (chapter 5). Furthermore, the details of the coding and analysis will be explained (chapter 6) and results will be presented (chapter 7). Finally, conclusions on the outcomes of this study are drawn and possible implications of the carried out study and its findings will be discussed in the discussion section.

2. Background

This chapter sets out the bilingual Kaqchikel-Spanish community and their language situation. It describes the possible influence of Spanish on the Mayan languages in Guatemala. Due to the many Mayan languages and a large range of linguistic materials on each of them, and the relevance of this study, only a selection of language materials related to Kaqchikel is given.

The final paragraph of this chapter provides an overview of the Kaqchikel and Spanish conflict site in the nominal domain.

2.1 Kaqchikel (Mayan)

In Guatemala, twenty-four languages are spoken: Spanish, the Arawakan language Garífuna, the language isolate Xinka, and twenty-one languages of the Maya family. Approximately seven million people of the entire population of Guatemala is indigenous (estimates of the indigenous population range from 40% to 60%). The number of speakers of indigenous languages is estimated in 2001 over three million in Guatemala, or only 50–60% of the indigenous population at that time (Richards, 2003; England, 2006).

Garífuna is the language of an Afro-Caribbean group (Garífuna) located in the southeastern harbor areas, in Livingston and Puerto Barrios. Both the area and the amount of speakers are small in Guatemala. The Garífuna spoken in Guatemala has ties to the larger Garífuna communities of Honduras, Belize and Nicaragua. The Garífuna people only arrived in Guatemala in 1805 (Richards, 2003:54). Xinka is a moribund language in southeast Guatemala. It once consisted of four related languages, of which only one not is not extinct (yet) (Campbell, 1997:166; England, 2006). The remaining Xinka speakers are estimated to be fewer than ten.

Kaqchikel is spoken over a wide area in the western highlands of Guatemala, mostly in the municipality of Chimaltenango and around Lake Atitlan, and belongs to the Eastern Branch of the Mayan language family. More specifically, to the K'iche'an Branch. The Kaqchikel language has its closest relations to K'iche' and Tz'utujil, also spoken in the area around Lake Atitlán and also belonging to the K'iche'an Branch of the Mayan language family (see *figure 1*). Kaqchikel is one of the four largest Mayan languages spoken in Guatemala: K'iche', Q'eqchi', Mam and Kaqchikel (in that order). Within Kaqchikel, there are many dialects, which vary from town to town, on lexical and phonological levels (Heinze-Balcazar, 2015). An overview of the distribution of all Mayan languages spoken in Mexico, Belize and Guatemala is shown in *figure 2*.

The exact amount of speakers of Kaqchikel remains unclear. An estimation is around 400.000 to half a million speakers (Garzon, 1998; Maxwell, 2006; Brown, Maxwell & Little, 2006; England, 2006). According to Maxwell (2006), estimates of number of speakers are

highly political. Both Mexico and Guatemala praise the ethnic richness of their countries, however, they recognize the indigenous identity only ancestrally. The surrounding countries El Salvador and Honduras do not recognize any modern Maya as a traditional ethnicity and the populations were solely counted as Spanish speaking, despite the (immigrated) Mayan speaking populations. Starting from 2001, only Honduras of the latter two countries opened limited bilingual education in rural areas (although without materials) (Maxwell, 2006).

Leopoldo Tzian (1994) points out that official governmental censuses in Guatemala consistently underestimate the number of Mayas compared to surveys done by linguists, by international development agencies, and by health workers. To understand the inconsistencies in the numbers and approximate total of Mayan (and thus Kaqchikel) speakers in Guatemala, an overview is provided of several sources in *table 1*. It gives those for Guatemala by: official census figures for the Mayan population, Tzian's data, the figures of AJPOPAB'CHI' (the Commission for the Officialization of the Indigenous Languages of Guatemala), and those of the Ministry of Education Survey for 2003. The most considerable contrast is between the ethnically identified Maya and those who speak their mother tongue (Maxwell, 2006:551).

Maxwell (2006) also notes that the variety in spelling (of the names) of Mayan languages reflects not only the writing tradition of various authors (English, Hispanic, Mayan), but also implies a political orientated undertone. In Guatemala, Mayans won official recognition of their own orthographies. In Yucatecan Maya (Mexico), the tradition of changing orthographies is still intact.

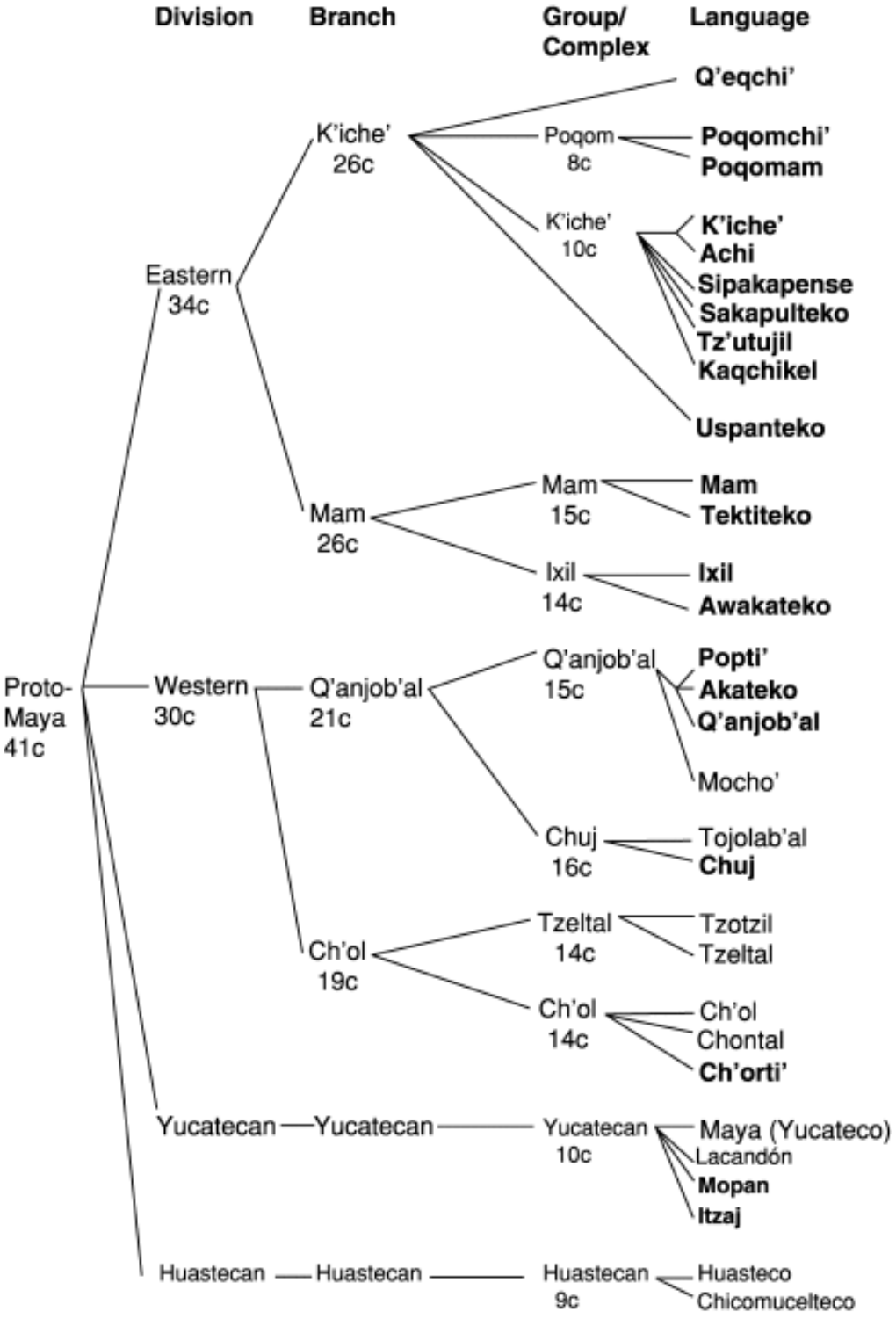

Figure 1. The Mayan language family (Kaufman, 1974: 85).

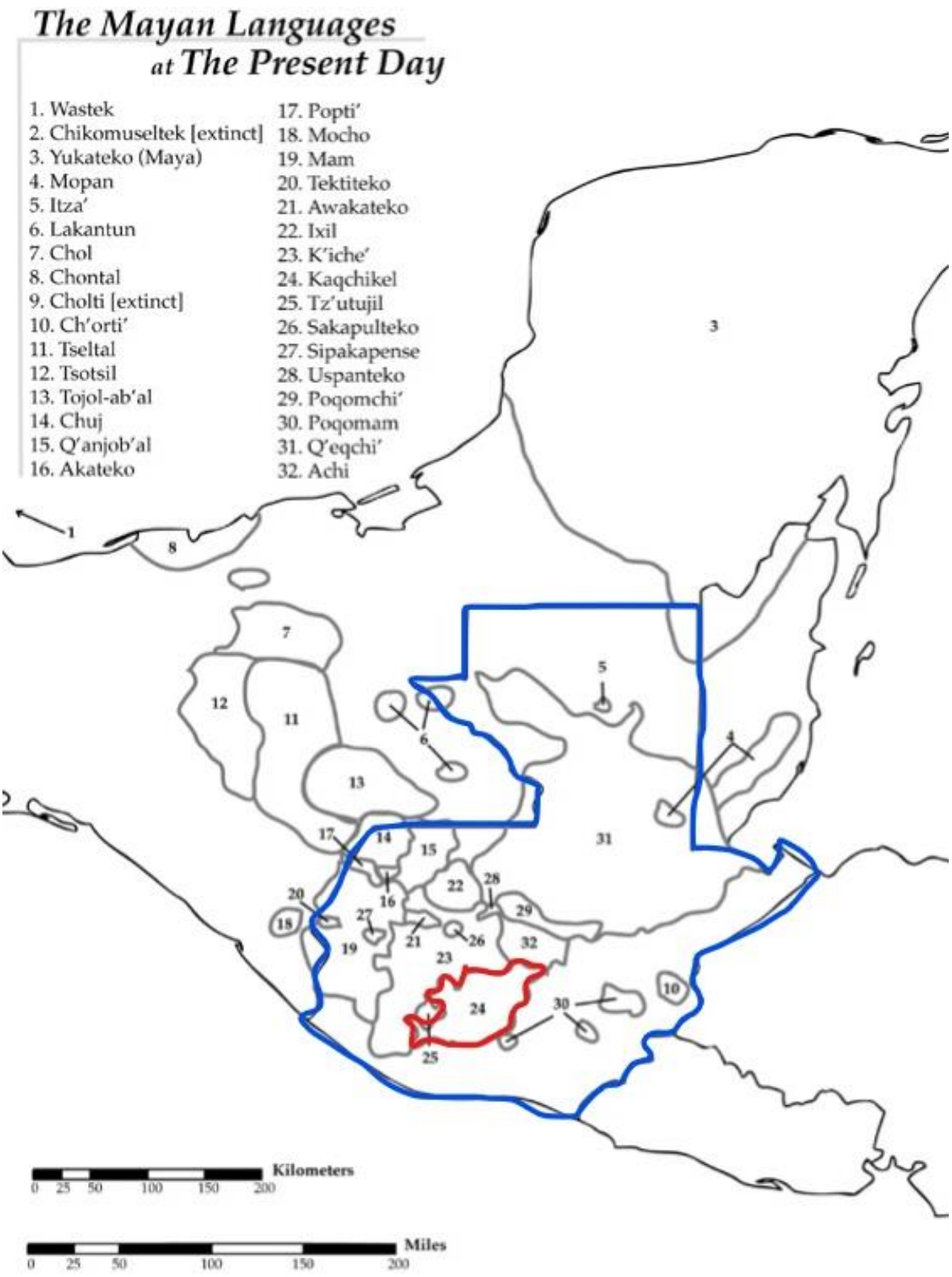

Figure 2. Distribution of all thirty-two Mayan languages in Southern Mexico (north), Belize (east) and Guatemala (marked in blue). The red mark represents the Kaqchikel speaking area (Law, 2014:25).

Table 1. Population figures (Maxwell, 2006:550).

Language	Etnic count, 2002	Speaker count, 2002	Tzian (1994)	Ajpopab‘achi’, (1998)	Ministry of Education, 2003
K'iche'	1 270 953	890 596	1 842 115	647 624	922 378
Q'eqchi'	852 012	716 101	711 523	473 749	726 723
Mam	617 171	477 717	1 094 926	345 548	519 664
Kaqchikel	832 968	444 954	1 002 790	343 038	475 889
Q'anjob'al	159 030	139 830	205 670	75 155	99 211
Poqomchi'	114 423	92 941	259 168	94 714	69 716
Ixil	95 315	95 315	130 773	47 902	69 137
Achi	105 992	82 640	n/a	15 617	51 593
Tz'utujiil	78 498	63 237	156 333	57 080	47 669
Chuj	64 438	59 048	85 002	50 000	38 253
Popti'	47 024	34 038	83 814	39 635	38 350
Akateko	39 370	16 562	39 826	40 991	5572
Ch'orti'	46 833	11 734	74 600	27 097	9105
Poqomam	42 009	11 273	127 206	46 515	9548
Awakateko	11 068	9613	34 476	18 572	16 272
Sakapulteko	9763	6973	42 204	3 033	3940
Sipakapense	10 652	5687	5944	4 409	6344
Uspanteko	7494	3971	21 399	12 402	1231
Mopan	2891	2456	13 077	8500	468
Itzaj	1983	1094	1783	650	123
Teko	2077	1144	4755	4895	1241

2.2 Spanish influence and language shift

In *table 1* in the previous section is shown that populations of speakers range from around a hundred (Itzaj) to close to a million (K'iche'). Language shift into Spanish is affecting all the indigenous languages, but in most indigenous groups, the majority of the population still speaks the indigenous language (England, 2006).

Language shift into Spanish is reducing the number of speakers of indigenous languages in Guatemala. It has been noticed from the early 90s by Brown (1991), in which he states that expanding industrialization compels the Maya to acquire Spanish as the national (and international) language. He reports that bilingual parents may choose to teach their offspring only Spanish and thus trigger an intergenerational language shift. He conducted data from four Kaqchikel towns of central Guatemala and compared it with the language and ethnic policies affecting the Maya in colonial documents. The data from the surveys from over four hundred households included fluency levels and patterns of usage in Spanish and Kaqchikel. The comparison between the fluency levels of the speakers in these towns reveal the rate and scope of a current language shift. England (2006) confirms that the shift, in most instances, has been fairly recent (within the last twenty years), and she remarks that Mayas themselves are not fully aware of the extent of the shift. Despite the self-evident fact that children are not learning the language in many areas, Mayas still tend to think of their communities as composed entirely of speakers of a Mayan language. England (2006) notes that the extent of shift into Spanish differs significantly for different regions and languages. In general, proximity to a major urban center or an international border increases the degree of language shift and loss, but local factors may speed up or retard the extent of the shift. Languages themselves range from moribund (Xinka) to highly endangered (Itzaj, Mopan, and Garífuna) to moderately or slightly endangered. Even the languages with the largest number of speakers include geographical areas that show advanced language loss (for instance, in the city of Quetzaltenango in the K'iche' area). In spite of increased shift, a majority of the population in Mayan towns speaks a Mayan language (England, 2006: 167-168). Be that as it may, the exact numbers remain unclear, as seen in Maxwell's *table 1* in the previous section, where is stated that only half of the Maya population actually speaks the language.

When it comes to recent governmental organization regarding the Mayan languages, Maxwell (2006) explains that the Academia de las Lenguas Mayas de Guatemala, a semi-

autonomous branch of the government, is authorized to promote and develop materials for the national languages in Guatemala. In southern Mexico, the federal government provides bilingual educational support and is supplemented by the efforts of the Academia de La Lengua Maya in Yucatán, Campeche, and Quintana Roo and by Sna Tz'ib'alom, the independent writers' cooperative in Chiapas.

Even though Kaqchikel is not in immediate danger of extinction, it does require special attention in the upcoming generations (England, 2006). Many Kaqchikel revitalization projects and language revival organizations have emerged since the beginning of the 90s. In the late 90s, Martinez, Sicajol Perez, Colop, Ajquijay On, Son Chonay, Aju, Rodriguez & Vasquez Lucas (1997) found evidence that at least 22% of their participants of the Sololá region displayed influence of Spanish on their Kaqchikel. They also observed greater influence on noun phrases than on verb phrases. In addition, they found that gender and age were factors contributing to this speech variation. Several scholars have found Spanish influence in Kaqchikel syntax (e.g. change in word order, Holmquist & Kahn, 2017) or an increase in Spanish loanwords (Heinze, 2004). Kaqchikel is one of the twenty-one Mayan languages officially recognized by the Guatemalan government. However, the political language of the country remains Spanish, which means that all governmental and educational institutions and formalities are in Spanish only (with exception of several Mayan-Spanish bilingual schools). In larger towns in the Kaqchikel speaking area (e.g. Patzún and Tecpán), some bilingual education is offered, nevertheless this is restricted to primary and secondary educational levels. Nowadays, the majority of the newest generation does not show interest in receiving this bilingual education and opts for monolingual Spanish schooling.

2.3 Linguistic research, textbooks and grammars on Kaqchikel

Overall, in (monolingual) Mayan Linguistics, including research on Kaqchikel, agent focus, topicalization and verbal morphology (among other topics) are relatively well-discussed (i.a. Tummons, 2010; Erlewine, 2016). Though bilingual research on Kaqchikel and Spanish is scarce, several work has been done on the influence of other Mayan languages on Guatemalan Spanish (e.g. Kany, 1972; Martin 1978,1985; Egido, 2003; García Tesoro 2002, 2011; Elsig, 2015, 2017). These scholars, for instance, observed the usage of the following syntactic sequence in Guatemalan Spanish: indefinite article – possessive – noun, such as *una – mi - tacita de café* ('a-my-cup of coffee', Martin 1978, 1985). In Standard Spanish, the possessive pronoun usually comes after the noun. Due to this remarkable difference, this particular

syntactic structure has been investigated and forms the base of an academic debate whether this construction either (i) is transferred from Mayan languages into Guatemalan/ Southern Mexican Spanish (for all Mayan languages this is the standard sequence), or (ii) has been present in colonial Spanish and under influence of the Mayan languages, this construction has been able to 'survive' over the past centuries. The latter theory is seemingly more plausible, according to research.

As mentioned, linguistic research on bilingualism in the Kaqchikel-Spanish community is limited. However, there are several works on monolingual Kaqchikel. On a syntactic level, the potential change in word-order in Kaqchikel, the change from VOS to SVO preference (like Spanish), is under debate among Mayan linguistics. Brody (1984) and England (1991) were the first who brought this under attention. Based on these observations, several scholars reported indeed a possible shift from VOS to SVO word order with their data collected by sentence comprehension tasks (Kiyama, Tamaoka, Kim & Koizumi, 2013; Koizumi, Tamaoka, Kiyama, Kim, Ajsivinac Sian & García Matzar, 2014; Holmquist & Kahn, 2017). Others found contrasting evidence in the outcomes of their sentence production and judgement tasks data (Yanes, 2014; Kubo, Ono, Tanaka, Koizumi, & Sakai, 2015 (Kiyama, Sun, Kim, Tamaoka, Koizumi 2017:23)). Kiyama et al. (2017) explain that word order in Mayan languages had always been flexible. Their results on the reaction times on a picture matching task indicate a relation between the rate of Kaqchikel-Spanish bilingualism and word order preference. They found that the more frequent Spanish is used by the speaker, the faster he or she processed and produced SVO word order. Also, the preference for SVO was significantly higher than for VOS. Several Kaqchikel grammars also explained, before Kiyama et al.'s (2017) observations, that Mayan word order is flexible, but VOS is highly preferred (i.a. Tichoc Cumes, Ajsivinac Sian, García Mátzar, Espantzay, Cutzal & Alonzo Guaján, 2000; Ajsivinac Sian, García Mátzar, Cutzal & Alonzo Guaján, 2004).

Besides the linguistic research on Kaqchikel, several grammars and textbooks have been compiled, especially since the early 90s, due to the awareness of the increasing presence of Spanish in the daily lives of the Maya speakers. Among one of the revival programs that emerged in the 90s, is the research organization Oxlajuuj Keej Mayab' Ajtz'iib' (OKMA), under the direction of Nora England. Under this organization, several revival projects were assigned. One project, called Proyecto Lingüístico Francisco Marroquín (PLFM), produced grammars, dictionaries and narratives of various Mayan languages, among which Kaqchikel

(Brown, 1998; Barrett, 2005). There are a number of available texts (i.a. Brinton 1969; Maxwell & Hill, 2006; Yool 1994, 1996), grammars (Brown et al., 2006; Guzmán, 1984; Herbruger & Diaz, 1956; Rodríguez Guaján, 1994) and dictionaries (Coto, 1983; Rodríguez Guaján, Tzian Guantá & Rodríguez Guaján, 1990; Ruyan Canu & Coyote Tum, 1991; Cojti Macario, Chacach Cutzal & Armando Cali, 1998) produced under PLFM on Kaqchikel. Most of the work about the Kaqchikel community is about changes in identity, cultural heritage and shifts (e.g. Little, 2003; Fischer & Hendrickson, 2003; Artis & Herda, 2005; Koechert & Pfeiler, 2013; Bennett, Maxwell, Du & Truitt, 2014; Bennett, 2019), and some explicitly involve the Kaqchikel language in the research (e.g. Garzon & England, 1991; French, 2008; Heinze-Balcazar, 2008; Duncan, 2014; Matsumoto, 2015).

To summarize, when we review the literature on the Kaqchikel speaking area, particularly on the overall decreasing number of Maya speakers, and the research on the clear language shift towards Spanish (England 1998, 2006; Brown, 1991; Garzon, 1998; Garzon, Richards & Simón, 1998; Maxwell, 2006), along with the reaction on this observation of emerged revival programs, it is clear that the 'survival' of Kaqchikel depends on influences from different perspectives. For instance, it shows that the Guatemalan government only partly includes Kaqchikel (e.g. in bilingual education), but mostly implies the usage of Spanish when it comes to any type of governmental affairs. As a reaction, for bilingual parents, this gives more reason to speak Spanish to their children and use Kaqchikel more as a 'home language', parallelly recognizing that their children would form a stronger base for nationally and internationally orientated future perspectives by knowing Spanish.

Considering all these important factors and influences while investigating linguistic phenomena within the Kaqchikel-Spanish community, we now continue to set out the linguistic details to be studied in the present master thesis.

2.4 Nominal domain Kaqchikel and Spanish

For this study, we examined Kaqchikel – Spanish nominal constructions produced by bilinguals speakers from Patzún (Guatemala). As mentioned in the *Introduction*, the Spanish determiner reflects gender of the noun (e.g. **la** casa 'the house' for feminine, and **el** perro 'the dog' for masculine), while the Kaqchikel determiner does not (e.g. ***ri*** *jay* and ***ri*** *tz'i'*, respectively). Adjectives in Kaqchikel are usually prenominal (***ri*** *käq jay*, 'the red house'), in contrast to the Spanish postnominal position (**la** casa roja, lit. 'the house red') (see *example 1* and *2*). *Table 2*

presents an overview of the different determiners with examples in both languages (Kaqchikel: Brown et al., 2006:158-159).

Table 2.

An overview of the Spanish and Kaqchikel determiners.

Type of determiner (Det)	Spanish Det (masculine)		Spanish Det (feminine)		Kaqchikel Det	
	Det	*Example*	Det	*Example*	Det	*Example*
Indefinite article (/plural)	**un** / **unos**	**un** perro ‘a dog’ **unos** perros ‘some dogs’	**una** / **unas**	**una** casa ‘a house’ **unas** casas ‘some houses’	***jun*** -	***jun*** *tz’i’* / ***jun*** *jay* ‘a dog’/ ‘a house’
Definite article (/plural)	**el** / **los**	**el** perro ‘the dog’ **los** perros ‘the dogs’	**la** / **las**	**la** casa ‘the house’ **las** casas ‘the houses’	***ri*** / ***ri*** (optional) or ***ri/ø*** + plural particle or ***ri/ø*** + obligatory suffix	***ri*** *tz’i’* / ***ri*** *jay* ‘the dog’/ ‘the house’ ***(ri)*** *tz’i’* ‘the dogs’ ***(ri)*** *taq tz’i’* ‘the dogs’ ***(ri)*** *ixöq* / ***(ri)*** *ixoq-i* ‘the woman’ / ‘the women’
Proximal demonstrative (/plural)	**este**	**este** perro ‘this dog’	**esta**	**esta** casa ‘this house’	***re … re’***	***re*** *tz’i* ***re’*** / ***re*** *jay* ***re’***

	/ **estos**	**estos** perro**s** 'these dogs'	/ **estas**	**estas** casa**s** 'these houses'	/ ***re*** **+** plural particle/ suffix **+** ***re'***	*'this dog'/ 'this house'* ***re*** *taq tz'i'* ***re'/*** ***re*** *ixoq-i* ***re'*** *'these dogs'/ 'these women'*
Distal demonstrative (/plural)	**ese** / **esos**	**ese** perro 'that dog' **esos** perro**s** 'those dogs'	**esa** / **esas**	**esa** casa 'that house' **esas** casa**s** 'those houses'	***la … la'*** / ***la*** **+ plural particle/ suffix +** ***la'***	***la*** *tz'i* ***la'*** */* ***la*** *jay* ***la'*** *'this dog'/ 'this house'* ***la*** *taq tz'i'* ***la'/*** ***la*** *ixoq-i* ***la'*** *'these dogs'/ 'these women'*

The table solely shows determiners that are relevant for this study (no quantifiers, etc.). Bearing in mind that we will evaluate the MLF and MP theoretical accounts, only determiners that would have underlying *phi*-features, such as the Spanish determiners *el* and *la* that reflect grammatical gender of the noun, are relevant. The Kaqchikel indefinite article *jun* is homophonous with the numeral *one* and Kaqchikel definite articles are optional in some plural contexts (Brown et al., 2006). The Kaqchikel proximal *re … re'* and distal *la … la'* demonstratives normally enclose the noun phrase, meaning that adjectives and plural particles are framed (e.g. ***re*** *nïm taq tz'i'* ***re'***, '**this** big PL dog **this**', 'these big dogs') (Brown et al., 2006:158).

3. Literature review

The MP and MLF approaches make predictions about what is possible in code-switched structures, for instance in the nominal domain. In this chapter, we closely evaluate each approach, and review previous literature and findings.

3.1 MP

3.1.1 Determiner language

Within the MP, Liceras et al. (2005) proposed their *grammatical features spell-out hypothesis* (GFSH) which states that in the process of activating the features of the two grammars, choices on code-switches are made which favor functional categories containing the largest array of uninterpretable features (cf. Chomsky, 1995). Contrarily, when both languages have similarly rich uninterpretable features, no particular language is preferred. This GFSH is based on patterns observed in bilingual child speech and accounts for the functional-lexical mixing patterns that prevail in the case of determiner-noun switches. In those patterns is found that determiners with such rich uninterpretable features (such as the reflection of gender and number of the noun on the determiner) is preferred and the noun follows in the other language. Liceras et al. (2005) tested Spanish-English and French-English bilingual child speech data and found that in both language pairs, Spanish and French determiners were preferred over English. This favored the GFSH, since Spanish and French both have a larger amount of such uninterpretable features than English (both have gender and number). They similarly tested Italian-German data and did not find any preference for determiners in either language. This also supported the GFSH, since Italian and German have an equal amount of uninterpretable features. Though the GFSH is based in child speech, is it expected to play a role in developing linguistic competence, so it will be carried out into adulthood. Liceras et al. (2008) continued testing the GFSH by examining and comparing Spanish-English, French-English and Italian-German naturalistic child speech data and experimental data from L1 English/French adult learners of Spanish and L1 Spanish learners of English. In the child spontaneous speech data, they found evidence in favor of the GFSH for all three language pairs, since Spanish/French determiners were preferred over English and Italian-German showed no preference. The Judgement Task results on Spanish/English CS showed a preference for English determiners over Spanish for the L1 English/French learners of Spanish. In contrast, the L1 Spanish learners of English showed preference for Spanish determiners. According to Liceras et al. (2008), the former groups provided evidence favoring the GFSH due to 'grammaticalized functional categories' in their L1 grammar (where solely L1 can be activated). The latter group provided evidence for the activation of these functional categories (gender and number in this case). Within the same line, Moro Quintanilla (2014) investigated bare nominals in Spanish-English bilingual speech. While Spanish generic nominals require an expletive determiner, English does not (e.g. ***El*** *vino se*

hace de la uva, '∅ wine is made out of grape' (Moro Quintanilla, 2014:215)). She reported that her spontaneous Spanish-English speech data from Gibraltar followed the Full Interpretation Principle. Chomsky (1995) came up with this principle which states that the performance systems can interpret the linguistic expression that is generated by the language. It means that, every element appearing in a linguistic structure must be interpreted, and no item is unnecessary. He argues that each speaker has fully attained the knowledge of the language to be able to perform in the most efficient manner of transmitting all necessary grammatical information (which he expresses by valued and unvalued (un)interpretable *phi*-features). Moro Quintanilla (2014) used bilingual spontaneous speech data, assuming that code-switching involves the same principles of monolinguistic competence. She followed this Principle by assuming that the Spanish determiner (with more underlying, necessary, grammatical information, such as gender and number) would be preferred over the absence of English determiners in code-switched (bare) nominal constructions. In sum, this meant that the switch would mostly occur with Spanish determiner and English noun and not vice versa. Moro Quintanilla (2014) found that Spanish determiners were indeed preferred over English determiners in her production data.

3.1.2 Adjective word order

In terms of adjective word order, Cantone and MacSwan (2009) suggest that the properties, i.e. the underlying syntactic rules of the adjective position regarding the noun, of the lexical items of the individual grammars are sufficient to explain the observed CS patterns in their Italian-German bilingual speech data. The German adjective normally takes prenominal position, while in Italian it can take both prenominal and postnominal positions, depending on the adjective class. An interesting difference between the two languages is that in German, the article is omitted when the noun is possessed (*mein Haus*, 'my house') while in Italian the article remains (*la mia casa*, lit. 'the my house'). Cantone and MacSwan (2009) investigated the grammatical contrasts of these languages in judgement data of bilingual adults and naturalistic (child) speech. In both data types, they found support for the claim that the language of the adjective determines the adjective-noun word order. In addition, they found that adjective word order is independent of the determiner language.

To summarize, following the MP approach of Liceras et al. (2005, 2008), Moro Quintanilla (2014) and Cantone and MacSwan (2009) towards code-switches within determiner-noun-adjective sequences, they predict that (i) the language of the determiner is

provided by the language with the richest array of uninterpretable features and (ii) adjective word order relative to the noun is determined by the language of the adjective.

3.2 MLF model

Joshi (1985) was one the first to investigate CS on a syntactic level and gives as one of the characteristics that speakers tend to agree on which language the mixed sentence is "coming from". He calls the dominant language of the utterance the Matrix language, and the other the Embedded Language. He recognizes that the two language systems are systematically interacting with each other in the production and comprehension of the mixed sentences.

Within the same line, the Matrix Language Frame Model (MLF) by Myers-Scotton (1993) is designed to explain classic code-switching (CC): "CC includes elements from two (or more) languages varieties in the same clause, but *only one of these varieties is the source of the morphosyntactic frame for the clause*" (Myers-Scotton, 2006:241). It is a way to account for both sentence processing and production of bilingual speech (Myers-Scotton, 1993, 1999, 2002). The MLF explains that, in bilingual language production, both languages do no participate equally in resulting structures (structural asymmetry). The recognition of this asymmetry proposes that a code-switched utterance consists of the Matrix language (ML), which provides the morphosyntactic structure of the code-switched utterance and the Embedded Language (EL), which is inserted in this frame. The ML provides the grammatical elements (such as determiners, pronouns and inflectional morphemes) and the EL consists mainly of content morphemes (nouns, verbs, adjectives and some adverbs). Following the Uniform Structure Principle, Myers-Scotton (2002:8) states that it is not possible to have different syntactic structures of two or more languages into one utterance, though Embedded Language structures are allowed on the Embedded islands.

3.2.1 The two MLF principles

Myers-Scotton proposed two principles to identify the Matrix Language of the mixed utterance: (i) *the Morpheme Order Principle*, stating that in ML + EL constituents, consisting of at least one EL lexeme and any number of ML morphemes, the surface structure of the constituent is that of the ML, and (ii) *the System Morpheme Principle*, stating that all system morphemes having grammatical relations external to the head constituent, will come from the ML (Myers-Scotton, 2002:59). For instance, if we follow these principles, according to Myers-Scotton (2002) it is likely to encounter Kaqchikel-Spanish code-switched utterances as in *example 4*. It

consists of the Kaqchikel ML, indicated by the pronoun *nu-* (3s) and by the inflected (finite) verb *-sik'ij* ('read') (both system morphemes), in which the Spanish EL is inserted (by the content morpheme 'libro' (book)).

(4)

Kaqchikel ML: *Nu-sik'ij* ***jun*** *jeb'ël* libro.
3S-read a beautiful book
'he reads a beautiful book'

(5)

Spanish ML: Él lee **un** *wuj* hermoso.
he read.3s a book beautiful.M
'he reads a beautiful book'

The *Morpheme Order Principle* states that when the ML is Kaqchikel, it provides the morphosyntactic frame of the full utterance, the adjective word order then follows the Kaqchikel structure. For this reason, the Spanish 'libro' (book) comes after the adjective *jeb'ël* (beautiful). In addition, the determiner is in Kaqchikel, since all system morphemes having grammatical relations external to the head constituent [book], comes from the Kaqchikel ML (the *System Morpheme Principle*). The mirrored variant of Spanish ML is shown in *example 5*. As long as the morphosyntactic rules of the ML are not violated, there is room for Embedded Islands. These are isolated 'chunks' of the EL, following the EL structure (see *example 6* and *7*).

(6)

Kaqchikel ML: *Nu-sik'ij* ***jun*** libro hermoso.
3S-read a book beautiful.M
'he reads a beautiful book'

(7)

Spanish ML: Él lee **un** *jeb'ël wuj*
he read.3s a beautiful book
'he reads a beautiful book'

Example (6) contains the Spanish Embedded Island 'libro hermoso' (beautiful book). In this case, the Spanish syntactic structure is applied in the full 'chunk', which makes it acceptable for the MLF model. This means then that *'*Nu-sik'ij* ***jun*** libro *jeb'ël*' is not acceptable, since *jeb'ël* does not match the ML,nor the EL structure in an Embedded Island. In sum, an overview of the predictions by each theoretical approach is given by *table 3 in the next paragraph*.

3.3 Overview MP and MLF predictions

Table 3 summarizes the predictions regarding determiner language and adjective-noun order derived from each approach. Table 4 and 5 provide examples of Spanish-Kaqchikel determiner-noun code-switches and NCs with an adjective (respectively) and the related acceptability of

Table 3.

Overview of MP and MLF predictions on determiner language and adjective word order.

Theoretical approach	Predictions
MP	**Determiner**: the determiner language is provided by the language with the 'richest array of grammatical features' (i.e. Spanish). **Word order**: the adjective language dictates the word order (if Kaqchikel, then prenominal, if Spanish, then postnominal).
MLF	**Determiner**: the ML of the clause provides the determiner (if Kaqchikel ML, then Kaqchikel; if Spanish ML, then Spanish). **Word order**: the ML dictates the word order (if Kaqchikel ML, then prenominal; if Spanish ML, then postnominal).

Table 4.

*MLF & MP predictions on the language of the determiner in Kaqchikel-Spanish NCs (✓ =acceptable/ **X** =not acceptable, italics=Kaqchikel/ normal=Spanish/ bold=determiner).*

	MLF	MP
1. *Nu-sik'ij* ***jun*** libro. 3S-read a book 'he reads a book'	✓	**X**
2. *Nu-sik'ij* **un** *wuj*. 3S-read a book 'he reads a book'	**X**	✓

3. Él lee **un** *wuj*. he read.3s a book 'he reads a book'	✓	✓
4. Él lee ***jun*** libro. he read.3s a book 'he reads a book'	X	X

each theoretical approach. For these overviews, the two possible MLs are taken into account. The ML is Kaqchikel for the sentences in rows 1 & 2 in *table 4*, and the sentences in rows 1-4 in *table 5*. The others have Spanish as their ML.

Table 5. MLF & MP predictions on the adjective position in Kaqchikel-Spanish NCs (✓=acceptable/ X=not acceptable, italics=Kaqchikel/ normal=Spanish/ bold=determiner).

	MLF	MP
1. *Nu-sik'ij* ***jun*** *jeb'ël* libro. 3S-read a beautiful book 'he reads a beautiful book'	✓	✓
2. *Nu-sik'ij* ***jun*** libro *jeb'ël.* 3S-read a book beautiful 'he reads a beautiful book'	X	X
3. *Nu-sik'ij* ***jun*** hermoso *wuj*. 3S-read a beautiful.M book 'he reads a beautiful book'	✓	X
4. *Nu-sik'ij* ***jun*** *wuj* hermoso. 3S-read a book beautiful.M 'he reads a beautiful book'	X	✓
5. Él lee **un** hermoso *wuj*. he read.3s a beautiful.M book 'he reads a beautiful book'	X	X
6. Él lee **un** *wuj* hermoso. he read.3s a book beautiful.M 'he reads a beautiful book'	✓	✓

7. Él lee **un** *jeb'ël* libro. he read.3s a beautiful book 'he reads a beautiful book'	X	✓
8. Él lee **un** libro *jeb'ël.* he read.3s a book beautiful 'he reads a beautiful book'	✓	X

Table 4 and table 5 clearly show that the predictions of the MLF and MP theoretical approaches regarding code-switched utterances do not always agree. Scholars have examined and compared the accuracy of the predictions of these approaches with different language pairs, using both naturalistic and experimental data. First, a brief overview is given on different research methods to test these approaches. The studies which tested both approaches report different outcomes and those will be set out in the following sections. We will provide separate reviews on each switch type.

3.4 Research methods

Within the field of research in code-switching patterns in the nominal domain, several methodological approaches are used in different types of data (Gullberg, Indefrey & Muysken, 2009; Munarriz & Parafita Couto, 2014). Naturalistic data can be obtained by spontaneous speech recordings in different settings (e.g. peer group interactions, family gatherings, sociolinguistic interviews, etc.). It is a common method for exploring code-switching patterns. The advantage of evaluating spontaneous speech data is that it is considered the closest form of the representation of naturalistic speech. In some cases, another advantage is the large dataset. However, collecting and transcribing a corpus is time-consuming and the accountability is not straightforward for various reasons (the privacy of the recorded bilinguals, incomplete transcriptions, etc.). Also, code-switches within NCs cannot be foreseen and could (yet not necessarily) occur only sporadically.

Another common methodology to elicit bilingual noun phrases, and used in the present study, is the Director-Matcher Task (henceforth DMT). A great advantage of the DMT is the rapidity in which it is set up and carried out by the participants. It has been successfully used in other studies on code-switching (Gullberg, Indefrey & Muysken., 2009). In the DMT, two participants sit in front of each other, with a board in between them. One participant, the Director, has pictures in front of him/her in a vast order. The other, the Matcher, has the same

pictures in front of him/her, but in a random order. The Director instructs the Matcher, so the order of the pictures matches both sides. During this task, the speech production is recorded and later transcribed for analysis. Besides the DMT, many other experimental methods are used when examining the nominal domain, such as different types Acceptability Judgement tasks, Picture Naming tasks (online and offline processing), Auditory Judgement tasks and others (Gullberg et al., 2009; Munarriz & Parafita Couto, 2014).

3.5 Previous studies on Det N mixes

Several studies compared the MP and MLF predictions in different data types and report different outcomes. Most studies provide evidence in favor of the predictions on both MLF and MP accounts, regarding the determiner language (e.g. Herring et al., 2010; Blokzijl et al., 2017; Parafita Couto & Gullberg, 2017). An overview of these studies is presented in *table 6*.

Table 6.

An overview of studies comparing MP and MLF predictions on the determiner language.

Reference	Data type(s)	Language pair(s)	Findings on MP	Findings on MLF
Herring et al. (2010)	two naturalistic corpora	- Spanish-English (Miami, U.S.A.) - Welsh-English (Wales, UK)	highly supported in both language pairs	highly supported in both languages pairs (no statistical difference with MP)
Fairchild & Van Hell (2015)	Picture Naming Tasks (one online, one offline processing)	- Spanish-English (Pennsylvania State University, U.S.A.)	dataset does not match predictions	dataset does not match predictions
Eppler et al.(2016)	naturalistic corpus	German-English (London, UK)	highly supported	highly supported (no statistical difference with MP)

Blokzijl et al. (2017)	two naturalistic corpora	- Spanish-English (Miami, U.S.A) - Nicaraguan Creole English(NCE)-Spanish (S.A.A.R.N., Nicaragua)	solely supported in Spanish-English, not in NCE-Spanish	highly supported in both language pairs
Parafita Couto & Gullberg (2017)	three naturalistic corpora	- Spanish-English (Miami, U.S.A) - Welsh-English (Wales, UK) - Papiamento-Dutch (The Netherlands)	highly supported in Spanish-English & Welsh-English, not in Papiamento-Dutch	highly supported in all language pairs
Parafita Couto & Stadthagen-González (2017)	Acceptability Judgement Tasks (two types)	- Spanish-English (Mexicans in the U.S.A.)	partly supported	supported (more than MP, as found in previous corpus data)
Ramírez Urbaneja (2019)	The bilingual child corpora and one bilingual adult corpus	-Spanish-English (two child corpora in U.S.A., one in Spain. Adult corpus, U.S.A.)	highly supported	highly supported, slightly more than MP

Liceras et al. (2008) and Moro Quintanilla (2014) successfully supported the MP, but only because in many cases, the Matrix language was Spanish or Welsh and provided the (gender featured) determiner in the same language. They do not provide information about the morphosyntactic frame in which the mixed NCs appeared, nor do they consider the proportion of mixed versus non-mixed NCs (Blokzijl et al., 2017). Herring et al. (2010) compared the MP and MLF accuracies through two naturistic corpora of Welsh-English and Spanish-English bilinguals. The Welsh-English bilinguals were living in Wales, and two groups of Spanish-English bilinguals living in Miami were examined. They looked at the language of the

determiner in code-switched noun phrases (NPs) and compared this with the language of the finite verb, to indicate the Matrix Language. In the data analysis was found that both MP and MLF theoretical approaches were highly accurate in explaining the data and no statistical difference in accuracy was found between the two. In the same line, Blokzijl et al. (2017) examined the same theoretical models, based on a larger dataset. They used corpus data of Spanish – English bilinguals from Miami, as well as production data from Nicaraguan Creole English – Spanish bilinguals, from the South Atlantic Autonomous Region of Nicaragua. They found that in the Miami corpus, English determiners with Spanish nouns were more frequent and in the Nicaraguan corpus, it was vice versa. In both corpora was found that in all cases, the determiner matched the Matrix Language of the clause, thus the MLF model is strongly supported. In addition, the MP approach is less supported, since the language of the determiner in the Nicaraguan corpus mostly occurs in Nicaraguan English Creole, which does not have grammaticalized gender feature. Fairchild & Van Hell (2015) tested Spanish-English bilinguals who were all heritage speakers of Spanish. Through several picture naming tasks, the authors examined the accuracy of the MP and MLF predictions regarding determiners within mixed nominal phrases. They analyzed the participants' reaction times when performing the tasks, comparing sentences with Spanish determiner - English noun and English Determiner - Spanish noun switches. In all tasks resulted that the reaction times were significantly higher with Spanish determiner – English noun in comparison with English determiner – Spanish noun. These results support neither MP nor MLF predictions.

Table 6 illustrates that, on one hand, naturalistic data overall support the MLF model predictions, independently of the language pair. On the other hand, MP predictions are only supported by naturalistic data in particular language pairs (e.g. not in NCE-English (Blokzijl et al., 2017), nor in Papiamento-Dutch (Parafita Couto & Gullberg, 2017)). In their experimental data, Parafita & Stadthagen-González (2017) found that participants accepted both Spanish and English determiners, as long as the determiner was in the same language as the ML of the clause.

3.6 Previous studies on N Adj mixes

When comparing the two theoretical approaches on adjective word order, previous studies also report different outcomes (Parafita Couto et al., 2015; Parafita Couto et al. 2017; Vanden Wyngaerd, 2016; Parafita Couto & Gullberg, 2017; Stadthagen-González et al., 2017; Pablos et al., 2018; Balam & Parafita Couto, 2019). An overview is provided in *table 7*.

Table 7. An overview of studies comparing MP and MLF predictions on adjective word order.

Reference	Type(s) of data	Language pair(s)	Findings on MP	Findings on MLF
Parafita Couto et al. (2015)	-Naturalistic corpora -elicitation tasks -auditory judgement task	Welsh-English	corpus & elicitation task: no convincing evidence for support. judgement task: inconclusive	corpus & elicitation tasks support MLF (more than MP), but need more evidence to draw conclusions on judgement
Vanden Wyngaerd (2016)	Grammaticality Judgement Task	French-(Brabant)Dutch (Brussels, Belgium)	highly supported (more than MLF)	Supported, less than MP
Parafita Couto et al. (2017)	ERP (online comprehension)	Welsh-English	no convincing support	supported (more than MP), but complementary evidence needed
Stadthagen-González et al. (2017)	two types of Judgement Tasks	Spanish-English (Mexicans in the U.S.A.)	no particular support, but combined explanation with MLF	no particular support, but explanation combined with MP
Parafita Couto & Gullberg	three naturalistic corpora	- Spanish-English (Miami, U.S.A) - Welsh-English	partly supported in all language pairs (less than	supported in all language pairs, Embedded Islands most

(2017)		(Wales, UK) - Papiamento-Dutch (The Netherlands)	MLF)	common pattern
Pablos et al. (2018)	ERP (online comprehension)	- Papiamento-Dutch (The Netherlands)	no particular support	no particular support, no preference between noun-adjective switches
Balam & Parafita Couto (2019)	naturalistic data (sociolinguistic interviews)	Spanish- English (Northern Belize)	evidence for support, relatively less than MLF	highly supported, Embedded Islands most common pattern

Parafita Couto et al. (2015) focus on adjective-noun order and they examine the predictions of these two models within Welsh-English mixed nominal constructions. They use naturalistic corpus data, elicitation tasks and an auditory judgement task to get a broad range of distinct data. Data from the corpus and elicitation task indicated that the MLF model was most accurate for explaining the position of the adjective. However, only a small amount of the data was plausible to compare both models and no definite conclusions can be drawn. Stadthagen-González et al. (2017) also investigated the contrasting predictions of the two models on adjective – noun word order in mixed constructions by using two types of Judgement Tasks. They conclude with their data that insights from different frameworks should be combined. They state that features are important, as in the lexicalist/generative view, but there should be considered that adopting constructionist approaches could provide insights among this phenomenon as well. Their results suggest that the adjective position is partially, but not entirely dependent on the verb. Also, in Welsh-English and Papiamento-Dutch bilingual corpora, Parafita Couto & Gullberg (2017) found that their results support both models on word order,

but MLF is more accurate in predictions on the language of the determiner. This is because most examples with adjectives are Embedded language islands.

Studies with naturalistic data found support for MLF predictions (with a slight superiority over MP) on adjective word order (Parafita Couto et al., 2015; Parafita & Gullberg, 2017; Balam & Parafita Couto, 2019). However, experimental studies point into different directions. Either one approach is supported over the other (Vanden Wyngaerd, 2016; Parafita Couto et al., 2017) or neither theoretical predictions are convincingly supported (Parafita Couto et al., 2015; Parafita Couto et al., 2017; Stadthagen-González et al., 2017; Pablos et al., 2018). A pattern that emerges from Parafita Couto & Gullberg (2017) and Balam & Parafita Couto (2019)'s naturalistic production data confirms Pfaff's (1979) observation that switches between noun and adjective are less common than between determiner and noun-adjective clusters. Noun insertions are preferred over adjective insertions. This also explains why the predictions of both theoretical models agree on this matter.

4. Research questions & Hypothesis

In sum, *tables 6* and *7* illustrated no convincing evidence for either theoretical approach. This leads to the research question of the current study on Kaqchikel-Spanish bilinguals: *Which code-switching patterns of the language of the determiner and adjective position will occur within mixed NCs in Kaqchikel-Spanish bilinguals' speech and to what extent will they support or reject MP and MLF predictions?* To answer these questions, we present our current study in the following section.

The present study will continue in the light of the previously mentioned studies on CS NCs, examining the theoretical approach on MP accounts and within the MLF model. For the current study, the understudied language pair Kaqchikel (Maya) – Spanish was examined in Patzún, Guatemala. Based on the conflict site as set out in paragraph 2.4, we will answer the main question by the following sub-questions:

1) Which language of the determiner will be preferred in production and to what extend?
   1.1. Will this support or not support the predictions of the MLF model?
   1.2. Will this support or not support the predictions of the MP model?

2) Which position of the adjective will be preferred in production?
   1.1. Will this support or not support the predictions of the MLF?
   1.2. Will this support or not support the predictions of the MP?

As discussed in the previous section, MLF and MP approaches provide contrasting predictions. Regarding the language of the determiner, according to the MLF model, it is predicted that the language of the determiner is provided by the Matrix Language, the dominant language of the clause. Since (finite) verbs are part of the Matrix Language and not the Embedded Language, these are the indicators that will provide the language of the determiner in mixed nominal constructions. According to the MP, it is predicted that the determiner will always be in Spanish, since Spanish has the surfacing grammaticalized functional categories *gender* and *number*, and Kaqchikel has not. Regarding the position of the adjective, according to the MLF model, it is predicted that the position of the adjective will be determined by the syntactic structure of the Matrix Language. According to the MP, it is predicted that the position of the adjective will be determined by the syntactic structure of the adjective itself. This will lead to the following hypotheses:

(i) If the MLF predictions are correct, we expect to find the determiner language in Spanish when the Matrix language is Spanish and determiner in English when the Matrix language is English. If the MP approach predictions are correct, we expect to find the determiner language in Spanish.
(ii) If the MLF predictions are correct, we expect to find the adjective in postnominal position when the Matrix language is Spanish and the adjective in prenominal position when the Matrix language is Kaqchikel. If the MP approach predictions are correct, we expect to find the adjective in prenominal position when the adjective language is Kaqchikel and postnominal position when the adjective language is Spanish.

5. Method

For this study, we used the Director-Matcher Task (DMT, as described in section 3.4). The instructor of this task was an insider of the Kaqchikel-Spanish bilingual community, so the participants felt confident while speaking both languages. To limit the consequences of the

observer's paradox (Labov, 1972), the researcher was not present during the task. Afterwards, all participants filled out a sociolinguistic background questionnaire, including their age, gender, (linguistic) educational background, profession, self-rated proficiency, frequency of use and age of onset of both languages. It also questioned language attitude towards both languages and attitudes on CS. Participants answered on a 1-5 Likert Scale (Likert, 1932), for self-rating questions. For the language attitude, the Semantic Differential Technique was used, in which participants choose between opposites (e.g. if the language is ugly or beautiful, see also Baker, 2006:214). See Appendix C for the complete background questionnaire.

5.1 Participants

20 participants (16 female, 4 male), born and raised in Patzún (Guatemala), participated in the study. Age ranged between 16-70 years old ($\bar{x}$=39). 4 out of 20 (20%) acquired both Kaqchikel from birth and Spanish at school, 14 out of 20 (70%) acquired Kaqchikel from birth and Spanish later at school (± age 5) and 2 out of 20 (10%) acquired Spanish from birth and Kaqchikel later at school (± age 5). Most participants rated to be equally comfortable in both languages (13 out of 20, 65%), the rest felt more comfortable speaking in Kaqchikel (7 out of 20, 35%) (none in Spanish). When they were asked what they speak most, in general, 8 out of 20 (40%) rated both languages, 7 out of 20 (35%) rated Kaqchikel and 5 out of 20 (25%) rated Spanish.[3]

5.2 Procedure

The participants performed the DMT in three rounds. After each round, the participants switched places, so the Matcher became the Director and vice versa (see *table 9*). The order of the pictures was round-specific, so this was similar for each set of participants.[4] Instructions of the task were given by a third person, each round in a different language mode.[5] *Table 9* shows this was in Kaqchikel, Spanish and code-switching mode, respectively.

[3] See Appendix A and B for the information sheet and consent forms.

[4] The participants were never literally asked to perform the task in either languages. The participants freely selected their language(s), frequency-switch-points and directionality of code-switches. In this sense, participants freely code-switched and were not obliged to perform otherwise.

[5] In two cases, the instructor had to perform the task with a participant. In the first case, she started (and ended) as the Director. In the second case she started (and ended) as the Matcher. Her speech production was not taken into analysis.

Table 8.

Procedure of the DMT in three different rounds.

ROUND	DIRECTOR	MATCHER
1. Kaqchikel mode	*Participant 1*	Participant 2
2. Spanish mode	Participant 2	*Participant 1*
3. Code-switching mode	*Participant 1*	Participant 2

In the Kaqchikel and Spanish mode, the instructor gave the instructions in Kaqchikel and Spanish (respectively), so the participants were primed to perform in those languages. In the code-switching mode, the instructor gave instructions in mixed Kaqchikel-Spanish constructions. A small text was prepared by the instructor, so all participants received similar instructions (see Appendix E for all texts). Since participants were not forced to stay in these language modes, they sometimes produced bilingual NCs in round 1 and 2 as well. Each language mode was recorded and later transcribed. Only the speech production of the code-switching mode was analyzed. The Kaqchikel and Spanish mode data was used to see which monolingual patterns were produced. This might give insights on the patterns that will arise in code-switching.[6]

5.2.1 Items

The pictures used in the DMT, contained 24 different nouns. These were equally divided masculine and feminine gendered in Spanish (12 masculine and 12 feminine) and were also selected on canonicity and non-canonicity. Spanish grammatical gender-agreement of the noun can be reflected on determiners and adjectives. When the noun ends in feminine *-a* (e.g. casa, 'house'), the determiner is feminine **la** and adjectives usually take the feminine suffix *-a* (e.g. **la** casa roj-a, 'the red house'). With the Spanish noun ending in masculine *-o*, the determiner is masculine **el** and adjectives usually take the masculine suffix *-o* (e.g. **el** pelo roj-o 'the red hair'). When Spanish nouns end in *-a* or *-o*, the gender-agreement is 'canonical'. The noun is 'non-canonical' when the gender is not predictable by the noun's ending (e.g. **el** sol 'the sun' and **la** nube, 'the cloud'). We balanced the canonicity versus non-canonicity to see if it has an effect on the choice of the determiner language. To elicit adjectives, each different noun appeared in

[6] See Appendix H for the information sheet the instructor used to note down all remarks during the task.

two of the four colors: red, black, white, yellow, all selected for the Spanish canonical endings (‘rojo, negro, blanco, amarillo,’ respectively). This gives the total amount of 24x2= 48 tokens (see *table 10*). *Figure 5* illustrates some examples (see Appendix F and G for the complete list of tokens and pictures).

Table 9.

The total of 24 different nouns, represented into the pictures of the DMT.

	Canonical	*Non-canonical*	**Total masculine/feminine**
MASCULINE	6	6	**12**
FEMININE	6	6	**12**
Total	**12**	**12**	**24**

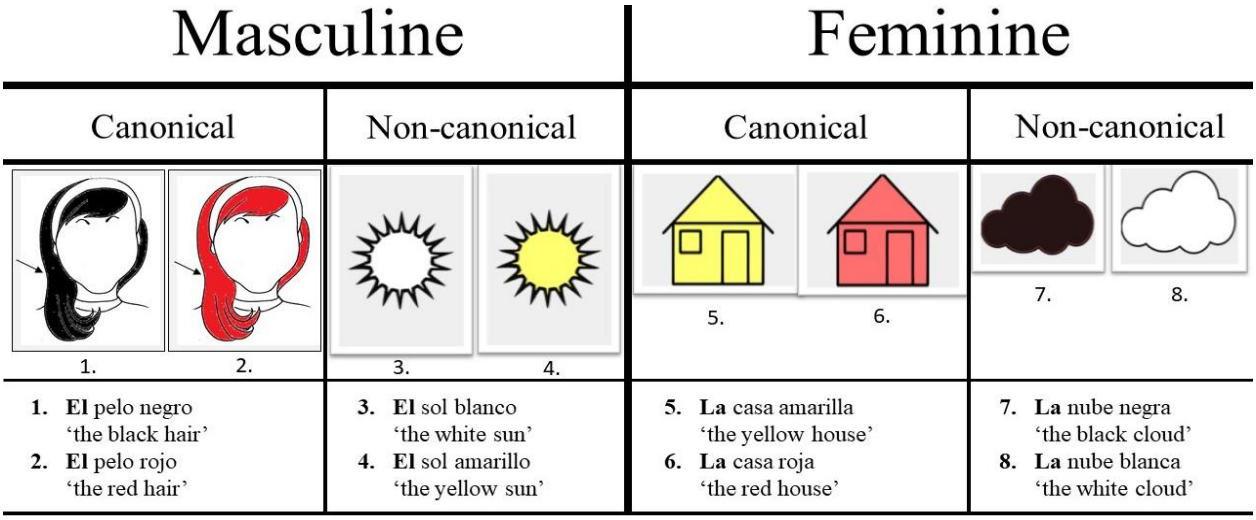

Figure 3. Four out of twenty-four different nouns, each appearing in two different colors.

6 Coding and analysis

Each set of participants produced three recordings from the DMT, one for each language mode. Every file was transcribed and coded. The distribution of these phrases with NCs are shown in the *Results* chapter of this paper. For the analysis, only the code-switching mode recordings were used (round 3). Since participants were not directly instructed to mix the languages, monolingual phrases also occurred in this data. Nominalized adjectives were included in the

count of monolingual Kaqchikel phrases (e.g. ***ri*** *säq* 'the white one'). Only one similar mixed construction was found (e.g. ***ri*** melón, the red one). *Table 11* shows the overall distribution of the total produced NCs of this mode.

Table 10.

Total distribution of NCs found in the 'code-switching mode' of the DMT data.

	Total NCs with Determiner	*Total NCs with Adjective*	*Total NCs*
Monolingual Kaqchikel NC	372 *(65,3%)*	404 *(61,7%)*	523 *(59,6%)*
Monolingual Spanish NC	13 *(2,3%)*	77 *(11,8%)*	78 *(8,9%)*
Bilingual NC	184 *(32,3%)*	174 *(26,6%)*	277 *(31,5%)*
Total NC	**569 (100%)**	**655 (100%)**	**878 (100%)**

Of the total 878 produced NCs, the majority were monolingual Kaqchikel (523, *59,6%*), followed by 277 (*31,5%*) bilingual NCs. Monolingual Spanish NCs only counted 78 (*8,9%*) cases. Roughly two-third of all bilingual NCs included a determiner (184/277, *66,4%*) and 174 out of 277 (*62,8%*) included an adjective.

Each phrase was coded for its language (bilingual, monolingual Spanish or monolingual Kaqchikel), structure type (verb+NC, NC with determiner, NC with adjective or other), NC type (determiner-noun-adjective, determiner-noun, noun-adjective), adjective placement (prenominal. postnominal) and if bilingual, the language pattern was coded (e.g. Kaqchikel-Spanish). Determiners included possessive prefixes (Kaqchikel), (in)definite articles and demonstratives (except for *la*, to be discussed in the following paragraph). All phrase types with category 'other' were excluded (mostly phrases with single nouns or with confirmative *yes/ aha*), all others were counted to observe the distribution of monolingual and bilingual NCs.

To test the MLF predictions, at first, the ML identification was based on the finite verb (following Herring et al, 2010; Parafita Couto & Gullberg, 2017). However, in the majority of the cases, the ML could not be determined by this criterium (roughly 80% for NCs with determiner and 90% for NCs with adjective). Myers-Scotton's (2002:59) *Morpheme Order* and

System Morpheme Principles for ML identification state that the ML provides (i) the (morpho-)syntactic frame with corresponding word order, and (ii) all system morphemes unrelated to their head constituent within the full utterance. In our data, we found constructions with multiple determiners in Kaqchikel occurring before the Spanish noun. These system morphemes follow a systematic order, restricted to Kaqchikel grammar and not possible in Spanish grammar. Since these determiners depend on each other, we would argue that this structure is an indicator for the ML. Following the second principle, we argue that the two bound morphemes in our dataset (two Kaqchikel possessive prefix *ru-* on Spanish noun) also belong to the ML.

6.1 Analysis of the determiner language

In all mixed NCs of our code-switching mode dataset (184 out of 569 NCs), *all* determiners appeared in Kaqchikel. In some cases, bilingual determiner-noun constructions appeared with two or three determiners (n=29, see *example 8* and *9*).[7] Sometimes, one or two determiners were combined with the Kaqchikel diminutive *ti*, prior to the noun and a free morpheme.[8]

Example 10 shows the Kaqchikel distal demonstrative *la* (usually *la...la',* see *table 2* in paragraph 2.4, now reduced to *la*). The DMT pictures were within reach of each participant, so a distal demonstrative was not expected in the dataset. The Spanish feminine definite article is also *la*. To prevent incorrect interpretation of the data, all NCs with *la* were excluded from data analysis (n=32). In continuation, multiple nouns were counted as one and found in three types of NCs (noun-adjective, determiner-noun-adjective and multiple determiner-noun-adjective). There were only few constructions with noun compounds and multiple determiners. Three

[7] *Ri ri* was only produced once (*example 9*). The reduplication of definite article *ri* implies the sense of a pronoun 'this' (Brown et al., 2006:159).

[8] For the analysis *ti* was included. It appeared 38 times in the dataset, of which 26 times in the position as second or third determiner. It remains unclear to the author if this free morpheme is restricted to the sense of diminutive, or if it should be treated as the adjective 'small' (both options in Brown et al., 2006). In some cases, *ti* appeared prior to an adjective (*ti käq,* 'TI red'), where the exact sense remains unclear. It could also be an argument to exclude all cases with *ti*. However, in this section, switches between determiner and noun are counted as a bilingual NC and language of the determiner itself is examined. In addition, in 29 cases, *ti* comes after one or two determiners. Since there are no switches between those determiners (nor *ti*), there is no strong argument to leave these cases out. Only the 12 cases with *ti* in first determiner position are arguable to be excluded, since no determiner follows *ti* in each of these cases.

examples are given which clarify these compounds in each of the three categories (*example 11*, *12* and *13* for each pattern, respectively).

(8)

Jun ***ri*** corazón *q'äq*

INDF.ART DEF.ART heart black

'a black heart' (DMT-07, P1)

(9)

Ri ri' ***jun*** ***ti*** círculo *säq*

this INDF.ART TI circle white

'this white circle' (DMT-10, P1)

(10)

Jun ***la*** nube *säq*

INDF.ART DEF.ART.F/DEM cloud white

'The/that white cloud' (DMT- 08, P1)

(11)

Juego de niño-s *käq*

game of child-PL red

'red children's game'

(referring to a swing) (DMT-04, P1)

(12)

Jun cepillo de dientes *q'än*

INDF.ART toothbrush yellow

'a yellow toothbrush' (DMT-13, P1)

(13)

Jun ***ru-****naq* ***a-****wäch* melón

INDF.ART 3.POSS-seed 2.POSS-eye melon

'a red eye' (DMT-15, P1)

6.2 Analysis of the adjective position

Mixed NCs with adjective appeared 174 times out of a total of 655 NCs. In *all* cases adjective came in postnominal position. Only 10 out of 174 adjectives were in Spanish, the other 164 in Kaqchikel. Some constructions with adjective contained a modified noun with an adjectival phrase (see *example 14*). In this example, the switch occurs between the Kaqchikel noun *che'* and the modifying Spanish noun *color*. In some cases, the Kaqchikel *ru-* (3.POSS) was prefixed to the Spanish noun *color.* These constructions with adjectival phrases were all excluded from analysis (n=18), unless the switch occurred between determiner and noun (*example 15 and 16*).

(14) ***Jun*** *che'* color *säq*

INDF.ART tree color white

'a tree, colored white' (DMT-06, P2)

(15)

Jun círculo ***ru-****b'onil* *säq*

INDF.ART circle 3SG.POSS-color white

'a circle, colored white' (DMT-19, P1)

(16) ***Jun*** escoba color *q'äq*

INDF.ART broom color black

'a broom, colored black' (DMT-08, P1)

6.3 Analysis on the frequency of use of Kaqchikel and Spanish

6.3.1 Frequency of use of both languages

Participants were asked to rate the frequency of use for each language over eight different speech domains on a Likert Scale, ranging from 1-5 (1=nothing, 2=almost nothing, 3=so so, 4=quite a bit, 5=a lot). *Figure 3* illustrates how frequent each language is used among the participants in various contexts. It shows that in all questioned spontaneous speech domains, except for Public Transport, Kaqchikel is more frequently used than Spanish.[9]

[9] While 19 participants had to be excluded from data analysis, their answers in the background questionnaire can still be used to obtain a better impression of the bilingual Kaqchikel-Spanish speaking community in Patzún. See Appendix D for an entire overview of the average of all participants and for each speech context.

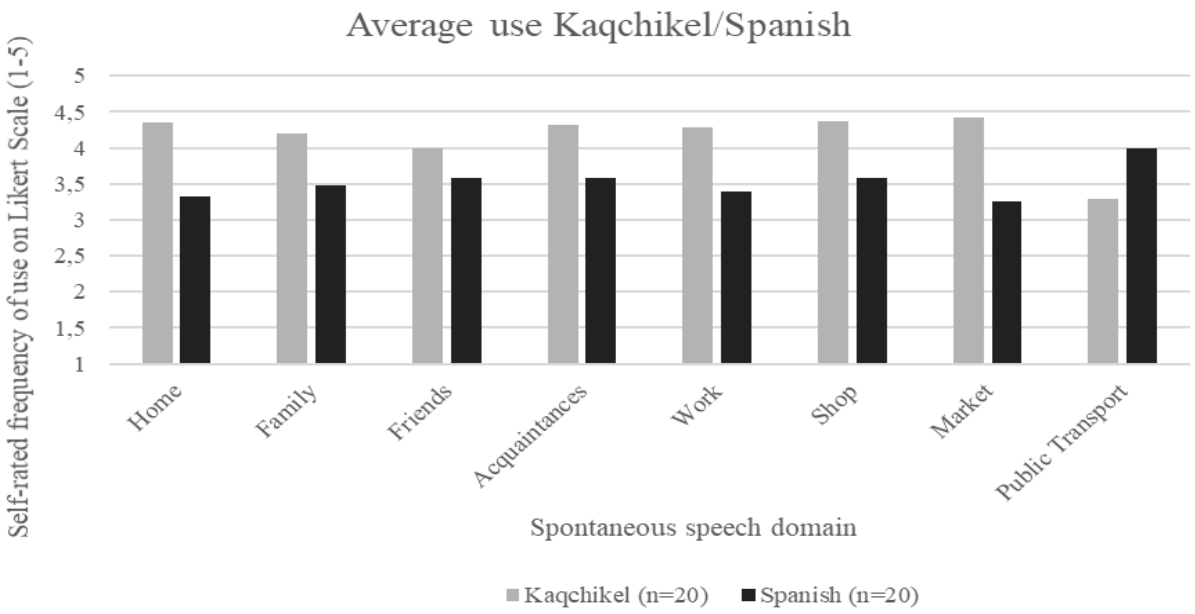

Figure 4. Average frequency of use of Kaqchikel and Spanish in eight different speech domains, conducted by self-ratings of all participants on a 1-5 Likert Scale.

6.3.2 Age and frequency of use

Paragraph 2.2 explained that Kaqchikel is not in danger of extinction, but that it does require (extra) attention for the newest generations. We need to consider this fact when dealing with the current data over a large age range. *Figure 3* shows averages on frequency of use, but does not give information about any correlation between age and frequency of use. We looked at this frequency of use and age correlation of the eight mentioned speech domains. In *figure 4*, we

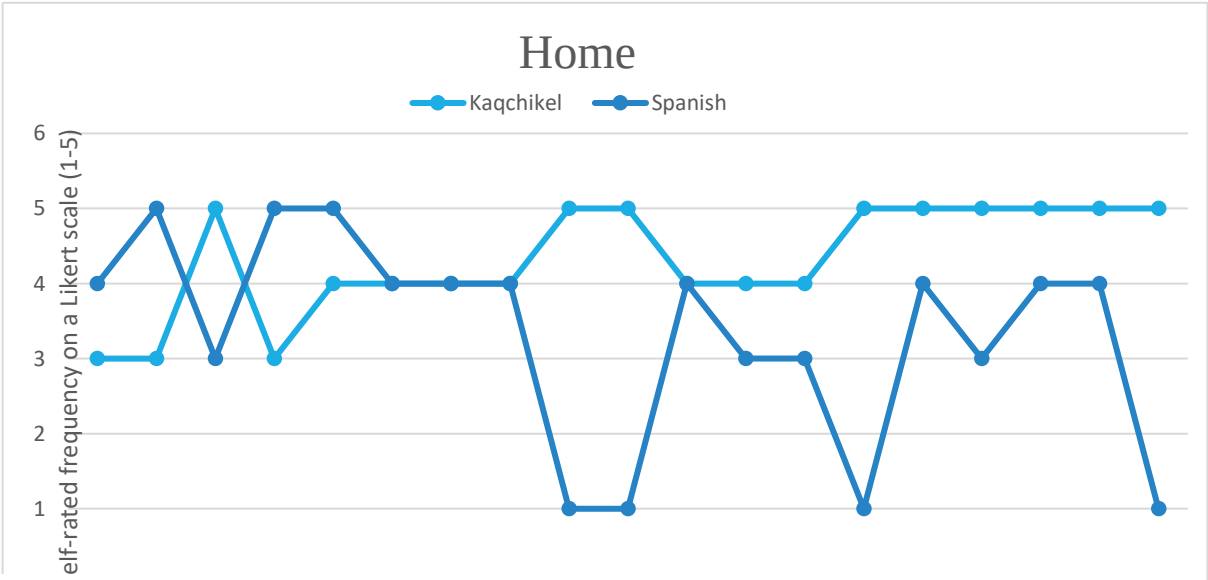

Figure 5. Frequency of use of Kaqchikel and Spanish, self-rated by all participants (n=19) on a 1-5 Likert Scale, in relation to the age.

explored the age and frequency rate for the speech domain 'Home'. This speech context is most relevant for acquiring the language(s) (or teaching the child). In *figure 4*, [10] age is set up against the self-rated frequency on a 1-5 Likert Scale for both Kaqchikel and Spanish (see original version in part 2 of Appendix D).

We clearly see in *figure 4* that, after the approximate age of 38, Kaqchikel is used more frequently over Spanish (henceforth, the point (age) where the frequency of use clearly switches to one predominant *or* another language is called *frequency-switch-point*). Another notice is that, before this age, Spanish is more prevailing in general, though Kaqchikel is still used. From the frequency-switch-point, a bigger gap in frequency of use between the two languages is observed in comparison with the speakers under the age of 38. It is important to notice, as it illustrates that the languages are either both used frequently, or one of them is (almost) not used at all, in comparison with the other. Taken into account that 1=nothing/ no use of the language on the right side of the frequency-switch-point, we could carefully consider this as a difference between certain age groups and it is likely related to the language shift as described in paragraph 2.2. However, bearing in mind that it does not imply anything about the proficiency of the speaker in each language. When exploring the other speech domains, we see similar patterns. An overview is given in *table 8*. The corresponding graphs of each domain are found in Appendix D.

Table 11.

Overview of frequency of use of Kaqchikel and Spanish in relation to age of eight different speech domains.

	Frequency-switch-point of frequency of use (age)	*Most frequent language before frequency-switch-point*	*Most frequent language after frequency-switch-point*
Speech domain			
Home	38	both	Kaqchikel

[10] The data of one participant is incomplete for this speech domain. Not all participants filled out this part, for which some speech domains data *n* is lower than 20.

Family	31	both	Kaqchikel
Friends	38	Spanish	Kaqchikel
Acquaintances	38	both (slightly more Spanish)	Kaqchikel
Work	31	both	Kaqchikel
Shop	30	both	Kaqchikel
Market	18	Spanish or N/A	Kaqchikel
Public Transport	38	Spanish	both

This table shows that before the frequency-switch-point, (i) the most frequently used language is either Spanish, or (ii) both Kaqchikel and Spanish, and (iii) Kaqchikel is never the most frequently used language. And, (iv) in contrast with after the frequency-switch-point, Kaqchikel is most frequently used in all domains. Except for 'Public Transport', yet the frequency of use of Spanish is equal in this domain. It is remarkable that the frequency-switch-point in the domain 'Market' is relatively low (age 18). Most likely, this is due to the many Mayans of the surrounding rural areas selling their goods on this particular market. They usually come from small towns where the Kaqchikel language is better preserved. Moreover, most of the sellers are from an older generation and either monolingual Kaqchikel of less proficient in Spanish. This combination of factors makes it logical that Kaqchikel is more predominant in the 'Market' speech domain, and youngsters would possibly *need* to speak Kaqchikel to be able to communicate.[11]

[11] It was remarkable that the youngsters of this study (around the age 20 and below), almost all apologized for their Kaqchikel not being 'as of their grandmother's', and they were filled with doubt if they would be suitable for the study. It was interesting to hear that they referred to that 'grandmother's Kaqchikel' as the 'pure Kaqchikel', indicating that what they spoke, it was either a mixture or a 'footprint of what it once was'.

7. Results

7.1. Results on the determiner language

A total of 184 bilingual NCs with determiner were found in the code-switching mode dataset of the DMT. These constructions either contained one, two or three determiners. The distribution of different types of determiners (plus *ti*), are represented in *table 12*.[12]

Table 12.

Types of determiner in mixed NCs with Determiner (Det).

				TOTAL per Det
	Det 1	*Det 2*	*Det 3*	**type**
INDF ART (*jun*, 'a')	144	3	0	**147**
DEF ART (*ri* / *ri ri*, 'this'/ 'the')	20	1	0	**21**
POSS prefix (*ru-*, 'its')	0	2	0	**2**
Q pronoun (*achike*, 'which')	8	0	0	**8**
DIM (*ti*, 'TI')	12	23	3	**38**
TOTAL per Det	**184**	**29**	**3**	**216**

This table shows that the most common (first) determiner is the Kaqchikel indefinite article *jun*. Most importantly, it also shows that *all* determiners were produced in Kaqchikel. This particular Kaqchikel construction with multiple consecutive determiners occurred 29 times.

7.1.1. Overview of the ML identification

The determination of the ML in this dataset is based on (i) finite verb inflection, (ii) multiple determiner and (iii) bound morphemes, illustrated by *table 13*. When following Myers-Scotton's (2002) two principles for identification of the ML, at most in 61 out of a total of 184 mixed NCs the ML could be determined. In the other (at least) 123 cases, MLF predictions are not applicable for this dataset. *Table 14* shows that in all cases the ML is always Kaqchikel

[12] See Appendix I for all bilingual NCs with determiner.

and always combined with (a) Kaqchikel determiner(s). This is self-evident, since it is previously mentioned that all determiners are in Kaqchikel.

Table 13.

Identification of the Matrix Language (ML) in mixed NC with Determiner (Det).

DETERMINATION ML	*TOTAL*
Verb (inflection)	36
Multiple Dets	23
Bound morphemes (POSS)	2
TOTAL	**61**

Table 14.

Combinations with ML and Det (1,2,3).

	Det (1,2,3) Kaqchikel	*Det (1,2,3) Spanish*
ML Kaqchikel	61	0
ML Spanish	0	0

7.2. Results on adjective word order

In *table 11* it was shown that a total of 174 bilingual NCs with adjective were found. Only three different patterns were found that included an adjective in mixed NCs. In *table 15* it is shown how these types were distributed throughout the dataset. The most common pattern is with Determiner (Det) + Noun (N) + Adjective (Adj) (n=89), closely followed by N + Adj (n=72). The less produced pattern includes multiple determiners (n=13). In all 102 cases, the Kaqchikel determiner(s) were followed by a Spanish noun. The adjective was in most constructions in Kaqchikel, except for a few cases (*example 17* and *table 16*). Remarkably, all adjectives (both in Kaqchikel as Spanish) came in postnominal position.[13]

(17) *Ti'ij* asado
meat grilled.M
'grilled meat' (DMT-05, P1)

[13] See Appendix J for all bilingual NCs with adjective.

Table 15.

Different types of mixed NCs with adjective (Det=determiner, N=noun, Adj=adjective).

Mixed NCs	TOTAL
N + Adj	72 (41,4%)
Det + N + Adj	89 (51,1%)
Multiple Det + N + Adj	13 (7,5%)
TOTAL NCs with Adj	**174 (100%)**

Table 16.

Distribution of Kaqchikel and Spanish adjectives in the code-switching mode dataset of the DMT.

	Only Adj	N + Adj	**TOTAL per language**
Kaqchikel	164	0	**164** ***(94,3%)***
Spanish	4	6	**10** ***(5,7%)***
TOTAL NCs	**168**	**6**	**174** ***(100%)***

Table 15 illustrates the division of Kaqchikel and Spanish adjectives. Of all 174 mixed NCs with adjective, only 10 were in Spanish *(5,7%)* (see *example 18*). From these 10 NCs, in 6 cases, the noun was also in Spanish (see *example 19*). In all other 164 cases, the adjective was Kaqchikel combined with a Spanish noun. When identifying the ML, we find in all 19 out of 174 mixed NCs (11,0%) the Kaqchikel ML (see *table 17*).

(18) *Jun* *jay* melón
INDF.ART house melon
'a red house' (DMT-15, P1)

(19) *Jun* columpio rojo
INDF.ART swing red.M
'a red swing' (DMT-14, P1)

Table 17. Determination of the Matrix Language (ML) in mixed NC with adjective.

DETERMINATION ML	*TOTAL*
Verb (inflection)	7
Multiple Dets	10
Bound morphemes (POSS)	2
TOTAL	**19**

7.3. Outcomes MP and MLF predictions

The predictions on MP and MLF accounts for the determiner language and adjective position are represented in *table 18* and *table 19* respectively.

Table 18.

MP and MLF prediction outcomes regarding language of the determiner.

Match	Theoretical approaches	
	MP	MLF
YES	0	61
NO	184	0

Table 19.

MP and MLF prediction outcomes regarding adjective word order.

Match	Theoretical approaches	
	MP	MLF
YES	10	0
NO	163	19

From *table 18* it can be concluded that, in all 184 cases of mixed NCs with determiner, the present dataset does not lend evidence for the predictions of MP accounts, since all determiners appeared in Kaqchikel. For the 61 out of 184 cases (33,1%) that the ML could be identified (all Kaqchikel), this dataset provides support for the MLF. As illustrated by *table 19*, predictions on adjective word order of the MP account were only accurate in 10 cases (*5,7%*), since all adjectives were in postnominal position. Only 10 of those were in Spanish, the rest in Kaqchikel. In all 19 cases where the ML was identified (all Kaqchikel), the adjective appeared in postnominal position. For this reason, the present dataset does not lend evidence for MLF predictions on this matter.

Conclusion

In this study, we aimed to improve our understanding on CS patterns within the nominal domain in the Kaqchikel-Spanish language pair. In order to explain these patterns, we drew upon explanations from two major theoretical approaches. The contrasting predictions of the generativist approach of the Minimalist Program and the Matrix Language Frame model were examined. Semi-spontaneous data was collected within the bilingual Kaqchikel-Spanish community in the Guatemalan Highlands of Patzún, by using a Director-Matcher Task. Results

showed that (i) the determiner always came from Kaqchikel, supporting the predictions of the MLF (since the ML was always Kaqchikel) but not the MP, (ii) the adjective always occurred in postnominal position. In 164 out of 174 cases, the adjective language was Kaqchikel. This postnominal position was not predicted by any of the theoretical approaches. The participants performed the DMT in three rounds, with Kaqchikel and Spanish mode serving as control for the patterns that arise in the bilingual mode. When looking at data from the Kaqchikel mode, the adjective also occurred predominantly in postnominal position. Only a few cases were found were the adjective was postnominal, which is highly remarkable. Also, the majority of switches emerged due to noun insertion (e.g. '***jun*** casa *käq*', 'a house red'). Only a few instances were found where switches between noun-adjective did not occur, all with Spanish clusters (e.g. ***jun*** columpio rojo, 'a red swing', in 6 out of 174 mixed NCs).

When we draw upon the Kaqchikel mode data of the DMT, and in some cases in the Spanish mode data, many relative clauses were produced (e.g. Kaqchikel mode: ***jun*** *jay* ***ru-*** *bonil käq*, 'a house its-color red' (the house that is red)). Within the code-switching mode NCs, there was a variety in how this modifying phrase was produced; mostly with 'color' in Spanish, or '***ru-***color', including the Kaqchikel possessive prefix ***ru-***. In Kaqchikel mode data this structure was highly productive, not only with the Kaqchikel equivalent (***ru-****b'onil*), but also with the Spanish 'color' and '***ru-***color'.

Discussion

Kaqchikel is a minority language and several revitalization programs have emerged since the 90's (i.a. Brown et al., 2006; Rodríguez et al.; Barrett, 2005). In the present study, we gained insights in the frequency of use within the community, in relation to the age of the participants and observed that, between approximately age 31-38, the language with the highest frequency of use switched predominantly into Kaqchikel after that point. This reflects the description of previous reports on language use and shift in the bilingual Kaqchikel-Spanish community (i.a. Brown, 1991; England, 2006; Maxwell, 2006). This may mutually reflect the outcomes of the Kaqchikel-Spanish structures in the present dataset and the possible explanations for divergence on prescribed Kaqchikel grammars.

The Kaqchikel grammars all explain that the adjective should take the prenominal position, in contrast with the entire dataset of the present study (Rodríguez Guaján, 1994; García Mátzar et al., 1999; Patal Majzul et al., 2000; Barrett, 2005; Maxwell & Little, 2006; Brown et al., 2006; Patal Majzul, 2013; Son Chonay, 2015; Maxwell et al., 2015). Remarkably, when we draw upon the Kaqchikel mode data of the DMT, and in some cases in the Spanish mode data, many relative clauses were produced. Following the grammars and taking Maxwell & Little's (2006) remark into account that Kaqchikel adjectives solely occur postnominally with attributive meaning, a possible and most plausible explanation for the postnominal occurrence of the adjective in the entire dataset, is that these constructions should be treated as reduced relative clauses. In the sense that '*käq*' (red) in '***jun*** *jay käq*' ('a house red') is not an attributive adjective, but rather the remnant of a relative clause 'a house that is red'.

A possibility is that the usage of those reduced relative clauses is due to a task-effect of the DMT, meaning that this particular pattern has been used by the bilinguals as a strategy to perform the task. Given that this structure was found in all language modes of the task (Kaqchikel, Spanish and code-switching mode), it is likely that participants used this construction as a strategy to solve the DMT. Task effects in CS research are also found by Bellamy, Parafita Couto & Stadthagen-González (2018) in their study on gender-assignment strategies of Purépecha-Spanish bilinguals. The participants took part in two types of elicitation tasks, one production (DMT) and one comprehension task. For each task, participants adopted different gender-assignment strategies. These findings show that performance strategies can depend on task type and therefore the authors suggest that future research needs to explore naturalistic data to identify the natural direction and points of switches for their data.

Other possible explanations for the patterns found, yet less plausible, can be drawn upon recent studies that report a change in word order in Kaqchikel (Kiyama et al., 2013; Koizumi et al., 2014; Holmquist & Kahn, 2017). Holmquist & Kahn (2017) examined language maintenance and shift (in another bilingual Kaqchikel-Spanish town) and found that both Spanish and Kaqchikel are 'unstable' languages. They conclude that native Kaqchikel speakers suffer more language loss, both in passive and active knowledge of the language, in comparison with earlier generations. The younger participants rated themselves to be better in Spanish. Given that the position of the adjective in this study is most likely due to a strategy to perform the task, and since this word order in the shape of a relative clause has been productive before (Tichoc Cumes et al., 2000; Ajsivinac Sian et al., 2004), it is unlikely to speak of a change in

word order. Even more, since all participants, with a broad age range, performed the task in a similar way. Nevertheless, it is feasible to consider that a shift occurs in preference to place the adjective in a postnominal position and therefore developing a preference for reduced relative clauses instead of preferring the usual prenominal position of the adjective. With this being a pilot study, to be able to gain insights on this matter, further research using complementary, naturalistic data is needed to explore these preferences.

Another interesting finding in this language pair, is that the majority of all switches are between determiner-noun and noun-adjective (e.g. 'jun *casa* käq', 'a house red'). While Parafita Couto & Gullberg (2017) and Balam & Parafita Couto (2019) observed with their naturalistic data that most switches occur between determiner and noun-adjective clusters, the data of the present study shows the opposite. Only a few instances were found where this was the case, all with Spanish clusters (6 out of 174 mixed NCs).

As for the language of the determiner, the data of the present study does not lend evidence for the predictions of either MP or MLF. This confirms the findings of several previous studies which compared the MP and MLF predictions on naturalistic data (Blokzijl et al., 2017; Parafita Couto & Gullberg, 2017). A remark about the present dataset is that both the ML and all determiners occurred in Kaqchikel. With the present study and dataset, for this bilingual community, with this particular DMT, a prominent pattern is established. Since there is no variation in the pattern, when looking solely at the ML and the language of the determiner, we reflect on this established pattern in regard to the MLF. While both the ML and the language of the determiner were in the same language, it does not inform us which determiner language surfaces if the ML occurred in Spanish, nor does it inform us if the Spanish ML ever appears in bilingual clauses, let alone bilingual NCs. For now, we can solely conclude that, when the ML is Spanish, the entire utterance is in Spanish (which represents only 8,9% of the total NCs in the dataset, or only even 2,3% for NCs with determiner). It needs to be further explored in complementary data if bilingual (nominal) patterns occur with Spanish as a ML and which determiner language will then be depicted.

With this being a pilot study in this language pair, some methodological considerations have to be highlighted. First, the participants performed the DMT in pairs. While Directors had to give instructions to the Matcher, this means that the Matchers never produced much output in each round. In this study, we started with a total of 39 participants. Almost half of them had

to be excluded for data analysis (n=19), since those who acted as Matchers did not produce (i) bilingual NCs, (ii) no data at all, or (iii) were younger than 16 years old. Second, we used a wide age range to get first insights at overall patterns in this community. However, we recognize that these patterns may vary in between generations and that further research is necessary to establish these variations. Also, in the design of our study, we included a balanced amount of canonical versus non-canonical Spanish nouns. All determiners were in Kaqchikel and only 6 instances of Spanish noun-adjective clusters occurred. If we want to explore gender-assignment in further research, it would be interesting to examine the use of canonicity and evaluate the types of strategies that arise.

The last methodological consideration is the implication of using the Semantic Differential Technique (Baker, 2006:214), in which participants choose between opposites (e.g. if the language is ugly or beautiful). The majority of the participants were not familiar with any type of academical experiment or task performance. In any case, the researcher had to make sure the participants would feel comfortable when participating. This also means we had to pay extra attention to the formalities and forms that needed to be filled out. Explaining the opposites that are each illustrated in a schedule of The Semantic Differential Technique in the background questionnaire was particularly a challenge. At the end, all participants rated both Spanish and Kaqchikel equally high (both the highest). Based on solely these results, one would conclude that their language attitude on both languages would be outstandingly and equally positive. However, in the cases the participants were not aware of the manner to fill in these schedules (most cases), both the DMT instructor and the researcher had to go through the schedules and give examples how they could answer the questions. This most possibly would have effected their answers and it is probable that for this reasons no variation was found. Notably, the answers to the other question related to language attitudes (the last part of the background questionnaire), had a broader variety. A remark in general on the language attitudes in this study, is that most of the participants who participated, recognized the importance of research on their language and this was the main reason to participate. This gives the impression that, for those who chose not to participate, might have the opposite attitude. With the combination of the mentioned reasons, no conclusions can be drawn on the language attitudes of the participants on this dataset.

In sum, insights of this study reveal that in this CS community there is a clear asymmetry in usage between Kaqchikel and Spanish in mixed NCs. We found that all determiners and the

majority of the adjectives were in Kaqchikel, while all nouns were in Spanish. The ML was in Kaqchikel in all evaluated cases. This asymmetry could partly be explained by Myers-Scotton's (2002) MLF model, and to a lesser degree by the MP approach. What could not be explained by the MLF is the consistent choice of the production of the Kaqchikel ML in the dataset and no usage of the Spanish ML at all. Blokzijl et al. (2017:9) describes the suggestion (as suggested by Bhatt, 2013) that the directionality of CS may depend on the language of power or with social superior status. The language of power, politically, seems convincingly Spanish in this case. However, the usage of the language many Kaqchikel speakers learn and speak at home, may raise Kaqchikel in ranking above Spanish when it comes to social inclusion. This is rather a suggestion than an explanation and needs further exploration to be able to draw any conclusions. Furthermore, in conclusion, we argue that due to a task-effect, NCs with reduced relative clauses arise. Future research using naturalistic and other types of elicited data is needed to see if similar results are obtained. We should also extend our empirical base to other Mayan languages and see if similar patterns emerge in mixed NCs.

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APPENDIX A – INFORMATION SHEET & CONSENT FORM

Información para participantes de investigación lingüística

Universidad de Leiden, Países Bajos

Investigadora: Emma Bierings

Título de estudio: **Corpus Bilingüe Kaqchikel-Español**

Universiteit Leiden

Estimado/a participante,

Por este medio le queremos pedir su colaboración en la colección de datos para un corpus bilingüe para una investigación lingüística. Esta investigación es parte de un proyecto de la Universidad de Leiden, Países Bajos. A continuación describiremos el contenido de la misma.

Propósito del proyecto
Actualmente el idioma Kaqchikel es hablado por alrededor de 400.000 hablantes en Guatemala. La influencia del español como el idioma oficial, hace que el Kaqchikel tenga pocos contextos de uso. En las últimas décadas, varios programas de revitalización han sido introducidos en las nuevas generaciones, especialmente en la Educación Bilingüe Intercultural para rescatar la pérdida de este idioma.

En este proyecto coleccionaremos datos del idioma Kaqchikel y español hablado en familias bilingües de Tecpán y Patzún, Chimaltenango. Estos datos se usarán para estudiar el uso de los dos idiomas en las comunidades referidas. Estos datos nos ayudarán a obtener un mejor entendimiento del uso del idioma Kaqchikel en relación al español. En el futuro, estos datos pueden ser usados para investigar varios aspectos y variantes del idioma Kaqchikel, con el objetivo de contribuir en programas de educación y revitalización del idioma en la comunidad.

El material será completamente anónimo, para los usos académicos dentro de la Universidad de Leiden (Países Bajos), Universidad de Maryland (E.E.U.U.) y la Universidad del Valle, Altiplano (Guatemala). Así mismo para investigadores nacionales e internacionales, estudiantes, que quieran tener acceso a estos datos.

Procedimiento
La colección de datos se realizará en tres partes. Primero pediremos a los participantes llenar un cuestionario de información general. Después les pediremos hacer una tarea corta, siguiendo instrucciones dirigidas. Luego se les pedirá hacer una conversación espontánea entre los participantes. Este proceso durará aproximadamente una hora.

Participación voluntaria
La participación en esta investigación lingüística es voluntaria. Si usted decide participar esperamos que usted participe en todas las tareas. En cualquier momento que usted

decida dejar de participar, no habrán consecuencias, ya que la participación es totalmente voluntaria.

Confidencialidad del participante
Toda la información recabada en este estudio será estrictamente confidencial. Todos los datos estarán procesados y archivados anónimamente y con un código. Los datos no serán accesibles a cualquier persona que no tenga ninguna relación con la investigación.

Quejas
En caso que usted encuentre algún problema con respeto a la información dada incorrecta u insuficiente sobre la participación en este estudio, o si desea hacer alguna queja sobre la manera en que este estudio fue realizado o como usted fue tratado como participante, es recomendable que comente sus inconveniencias con el experimentador de este estudio. También puede presentar la queja a uno de los supervisores de este proyecto: Dra. M. C. Parafita Couto (Universidad de Leiden, Países Bajos) y/o Dr. P. Mateo Pedro (Universidad de Maryland y UVG-Altiplano).

Consentimiento
Para que usted pueda participar en este estudio, le pedimos su consentimiento, firmando la hoja adjunta.

Información de contacto

Experimentadora: Emma Bierings
Teléfono: (00502) 3177 4689 (Guatemala)
(0031) 6 40552467 (Países Bajos)
Correo electrónico: emmabierings21@gmail.com

Supervisora: Dra. M. C. Parafita Couto (Universidad de Leiden, Países Bajos)
Teléfono: (0031) 71 527 2644 (Países Bajos)
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Supervisor: Dr. P. Mateo Pedro (Universidad de Maryland y UVG-Altiplano)
Teléfono: (502) 5513-7737 (Guatemala)
Correo electrónico: pmateo@uvg.edu.gt o pmateo@umd.edu.

Información de consentimiento

Universidad de Leiden, Países Bajos

Supervisora: Dra. M.C. Parafita Couto (Universidad de Leiden)
Supervisor: Dr. P. Mateo Pedro
(Universidad de Maryland & UVG-Altiplano)

Investigadora: Emma Bierings

Título del estudio: Corpus Bilingüe Kaqchikel-Español

Información de consentimiento

Al firmar este formulario, usted confirma que ha leído y comprendido el formulario de información de participante, que aparece en la hoja anterior. Así mismo, usted también confirma que está de acuerdo con el proceso del estudio, como se describe en el mismo formulario.

Participante
Yo he leído y comprendido el formulario de información de participante y estoy de acuerdo en participar en este estudio.

Nombre: …….. Firma: …….

Fecha: …… Lugar: ……..

APPENDIX B – CONSENT FORM – under 18

Permiso para participantes menores de 18 años

Universidad de Leiden, Países Bajos

Supervisora: Dra. M.C. Parafita Couto (Universidad de Leiden)
Supervisor: Dr. P. Mateo Pedro
(Universidad de Maryland & UVG-Altiplano)

Investigadora: Emma Bierings

Título del estudio: Corpus Bilingüe Kaqchikel-Español

Por este medio yo_____ padre/madre de familia, autorizo que

mi hijo/a _____ participe en el estudio lingüístico mencionado en la hoja de información adjunto.

Nombre: …… Firma: ……

Fecha: …… Lugar: ……

4/4

APPENDIX C – LANGUAGE BACKGROUND QUESTIONNAIRE

Cuestionario de información general

Código de participante: Fecha: Hora: Lugar:

Número corpus: Número DMT: Puntos: D:

Nombre: Sexo: M / F

Fecha de nacimiento: Lugar de nacimiento:

Lugar de residencia: Celular:

Profesión: Correo electrónico:

Parte 1:

1. ¿**En qué idioma se siente mejor al hablar?**

Kaqchikel / español / ambos

2. ¿Con qué frecuencia habla usted el Kaqchikel y el español?

Kaqchikel: nunca / casi nunca / mas o menos / bastante / mucho

Español: nunca / casi nunca / mas o menos / bastante / mucho

3. ¿En qué nivel habla usted el Kaqchikel y el español?

(1=muy poco/ 2=poco/ 3=mas o menos/ 4=bien/ 5=muy bien)

Kaqchikel: 1 2 3 4 5

Español: 1 2 3 4 5

4. ¿En qué nivel comprende usted el Kaqchikel y el español?

(1=muy poco/ 2=poco/ 3=mas o menos/ 4=bien/ 5=muy bien)

Kaqchikel: 1 2 3 4 5

Español: 1 2 3 4 5

5. Cuando usted sueña, en qué idioma lo hace?

Kaqchikel / español / ambos

Parte 2:

1. Por favor, indique con qué frecuencia habla usted el Kaqchikel o el español en los siguientes lugares.

1= nada 2= casi nada 3= mas o menos 4= bastante 5= mucho

En la casa

Kaqchikel	1	2	3	4	5
Español	1	2	3	4	5

Con el resto de la familia

Kaqchikel	1	2	3	4	5
Español	1	2	3	4	5

Amistades

Kaqchikel	1	2	3	4	5
Español	1	2	3	4	5

Conocidos

Kaqchikel	1	2	3	4	5
Español	1	2	3	4	5

Trabajo

Kaqchikel	1	2	3	4	5
Español	1	2	3	4	5

Tienda

Kaqchikel	1	2	3	4	5
Español	1	2	3	4	5

Mercado

Kaqchikel	1	2	3	4	5
Español	1	2	3	4	5

Transporte público

Kaqchikel	1	2	3	4	5
Español	1	2	3	4	5

Parte 3:

1. ¿A qué edad empezó usted hablar el Kaqchikel y el español?

Kaqchikel:

Español:

2. ¿En qué idioma recibió usted su educación? Y ¿por cuántos años?

Primaria:

Kaqchikel/ español/ los dos Cuántos años:

Básico:

Kaqchikel/ español/ los dos Cuántos años:

Diversificado:

Kaqchikel/ español/ los dos Cuántos años:

Universidad:

Kaqchikel/ español/ los dos Cuántos años:

3. ¿Ha recibido usted clases de Kaqchikel o español como segundo idioma? ¿Por cuánto tiempo?

Kaqchikel: si / no Cuánto tiempo:

Español: si / no Cuánto tiempo:

4. ¿Escribe usted el Kaqchikel y el español?

(1=nada/ 2=poco/ 3=mas o menos/ 4=bien/ 5=muy bien)

Kaqchikel:	1	2	3	4	5
Español:	1	2	3	4	5

5. ¿Lee usted el Kaqchikel y el español?
(1=nada/ 2=poco/ 3=mas o menos/ 4=bien/ 5=muy bien)

Kaqchikel: 1 2 3 4 5

Español: 1 2 3 4 5

6. ¿Qué idioma habla o hablaba usted con sus padres y con qué frecuencia?

1= nada 2= casi nada 3= mas o menos4= bastante 5= mucho

Kaqchikel: 1 2 3 4 5

Español: 1 2 3 4 5

Otro idioma:

	1	2	3	4	5

7. Si usted tiene hijos, en qué idioma se comunican y con qué frecuencia lo hace?

Tengo hijo(s) / No tengo hijo(s)

1= nada 2= casi nada 3= mas o menos 4= bastante 5= mucho

Kaqchikel: 1 2 3 4 5

Español: 1 2 3 4 5

Otro idioma:

	1	2	3	4	5

8. ¿Habla usted otro idioma Maya? ¿En qué nivel?

Si / no

1=muy poco 2=poco 3=mas o menos 4=bien 5=muy bien

_____ 1 2 3 4 5

_____ 1 2 3 4 5

9. ¿Habla usted algún idioma extranjero? ¿En qué nivel?

Si / no

1=muy poco	2=poco	3=mas o menos	4=bien	5=muy bien
_____	1 2	3	4	5
_____	1 2	3	4	5

Parte 4

1. ¿Cómo considera usted el idioma Kaqchikel y el español?

Indique de número 1 (=nada) hasta número 5 (=mucho) que opina.

Kaqchikel:	antiguo	1	2	3	4	5	moderno
	desamigable	1	2	3	4	5	amiguable
	no influyente	1	2	3	4	5	influyente
	no inspirante	1	2	3	4	5	inspirante
	feo	1	2	3	4	5	bonito
Español:	antiguo	1	2	3	4	5	moderno
	desamigable	1	2	3	4	5	amiguable
	no influyente	1	2	3	4	5	influyente
	no inspirante	1	2	3	4	5	inspirante
	feo	1	2	3	4	5	bonito

2. Circule la descripción que refleja su uso de los idiomas Kaqchikel y español.

1. Nunca mezclo el Kaqchikel y el español.
2. De vez en cuando mezclo el Kaqchikel y el español.
3. A veces sí, a veces no. No sé.
4. Mezclo el Kachikel y el español.
5. Mezclo bastante el Kaqchikel y el español.

3. ¿Qué opina usted de la mezcla de los idiomas Kaqchikel y español en una conversación?

1. Hay que evitar la mezcla de los idiomas.
2. No se debe mezclar, pero tampoco hace daño.
3. No sé.
4. No se puede evitar la mezcla de los idiomas, es parte de la comunidad bilingüe.
5. La mezcla de idiomas es una cosa interesante.

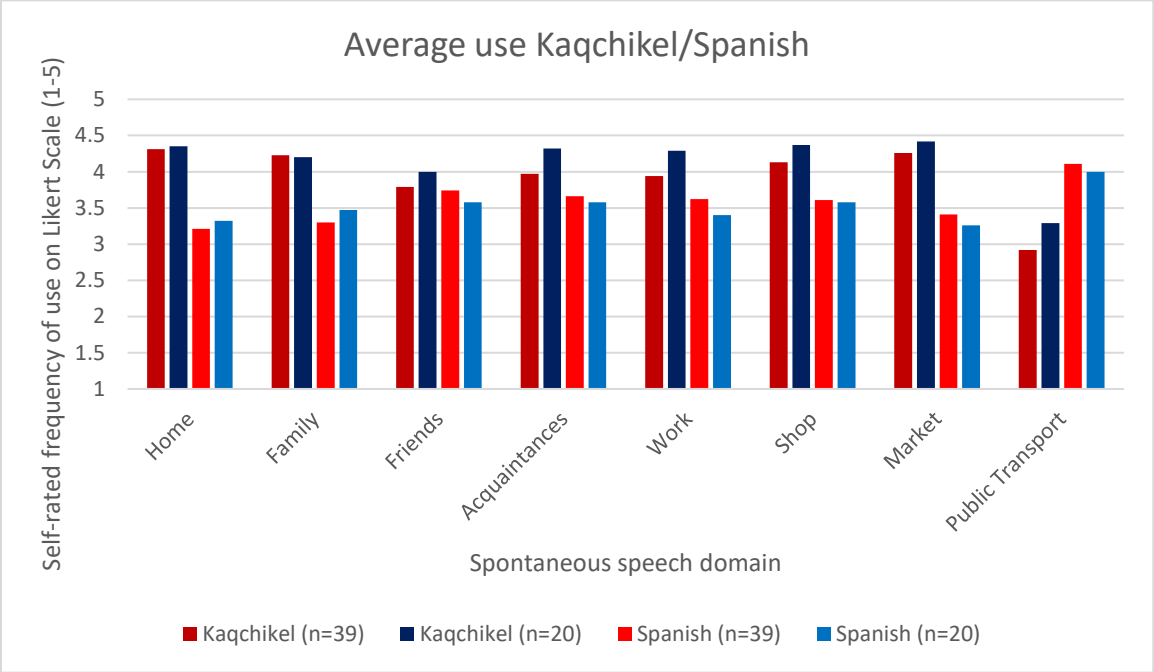
MATYOX CHAWE' CHIRE' A TO'IK !!!

MUCHAS GRACIAS POR SU PARTICIPACIÓN !!!

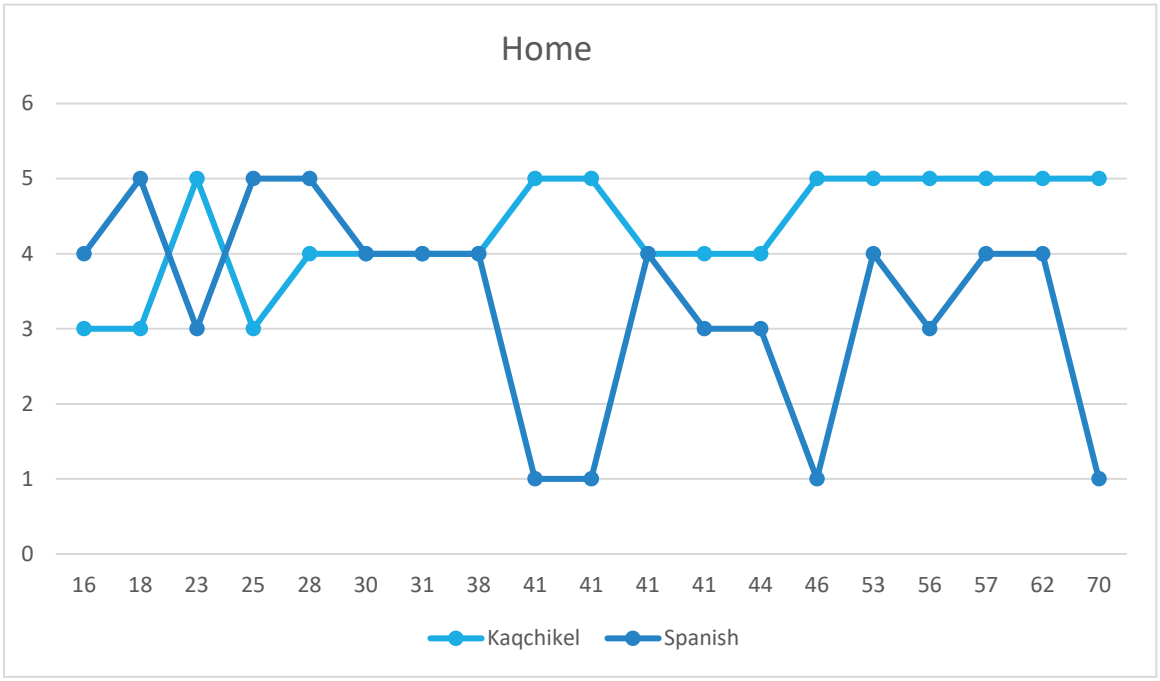
APPENDIX D – FREQUENCY OF USE

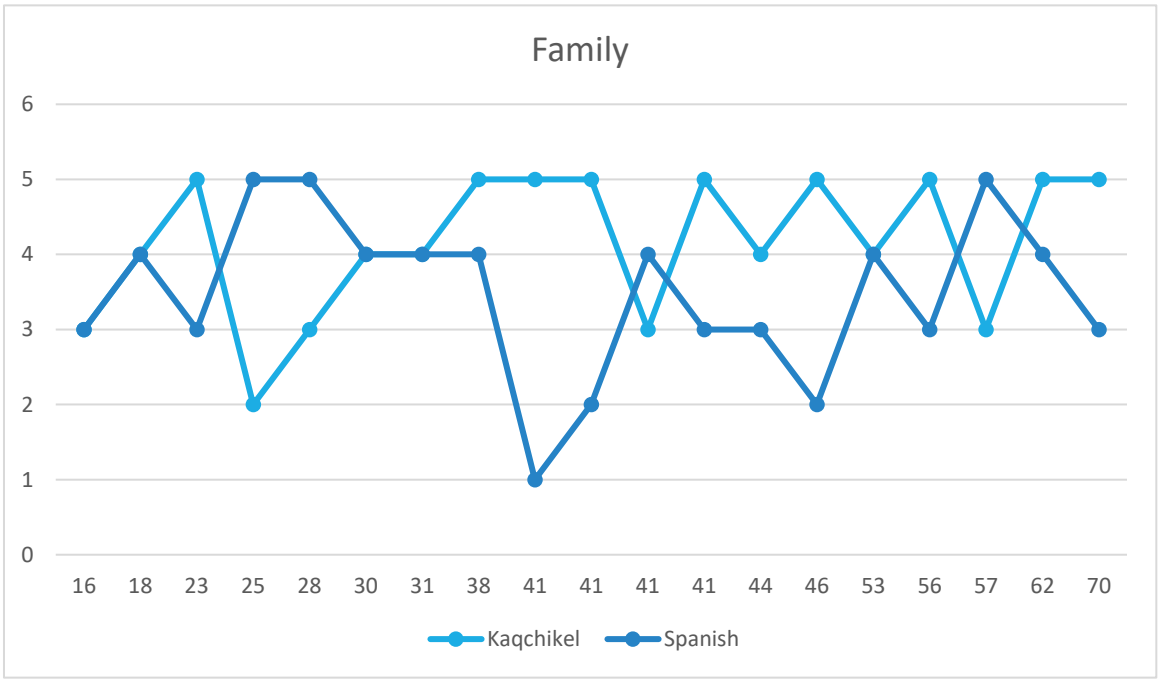
In the table below, averages are given from the entire dataset (in red, n=39), and from the analyzed participants (in blue, n=20). The analyzed dataset (n=20) shows similar results on self-rated frequency of use of both languages as the entire dataset (n=39) and it maintains its representativity for the community. In all domains, except with Public Transport, Kaqchikel is more frequently used than Spanish.[14]

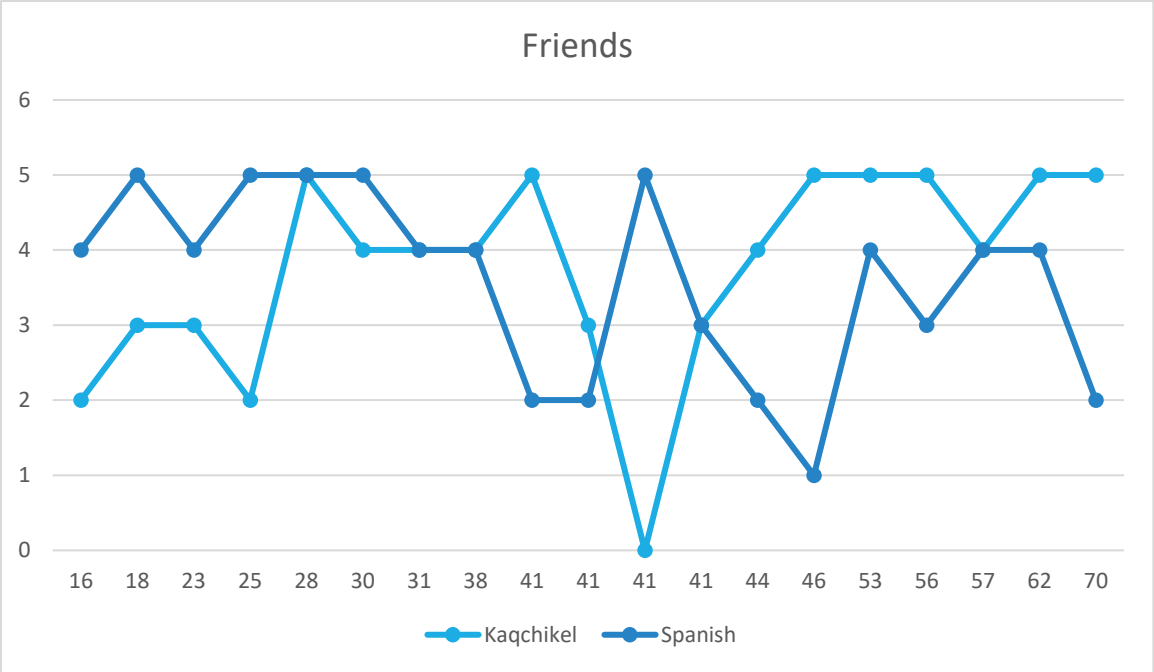
Table Appendix D. Average frequency of use of Kaqchikel and Spanish in eight different domains, conducted by self-rating of participants on a 1-5 Likert Scale.

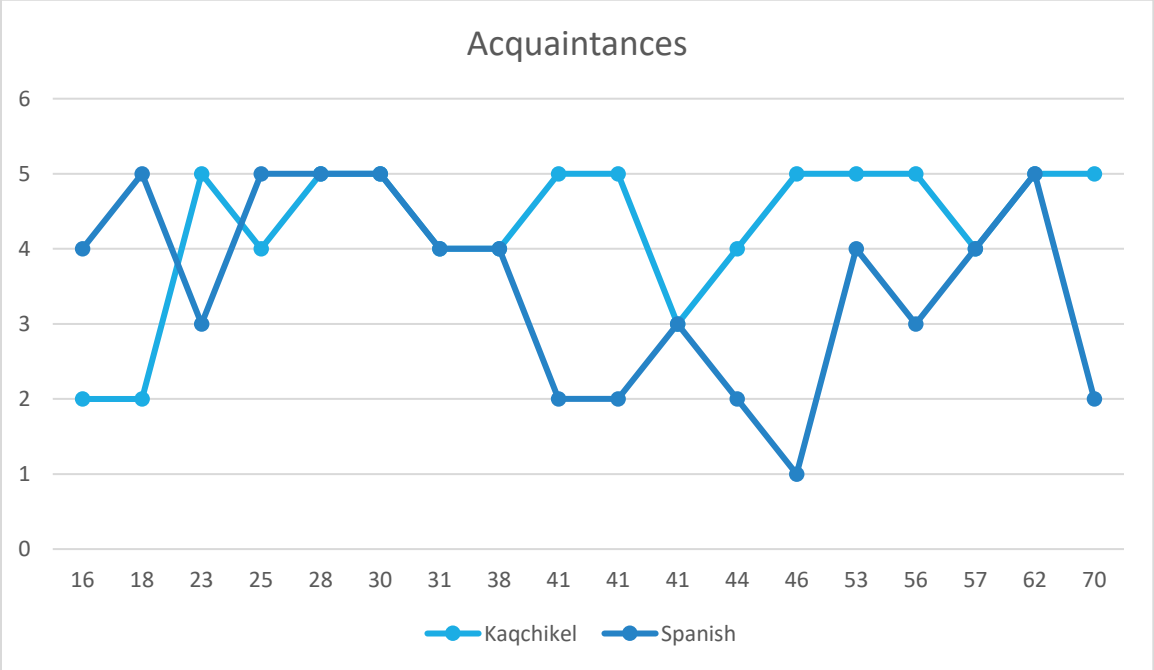


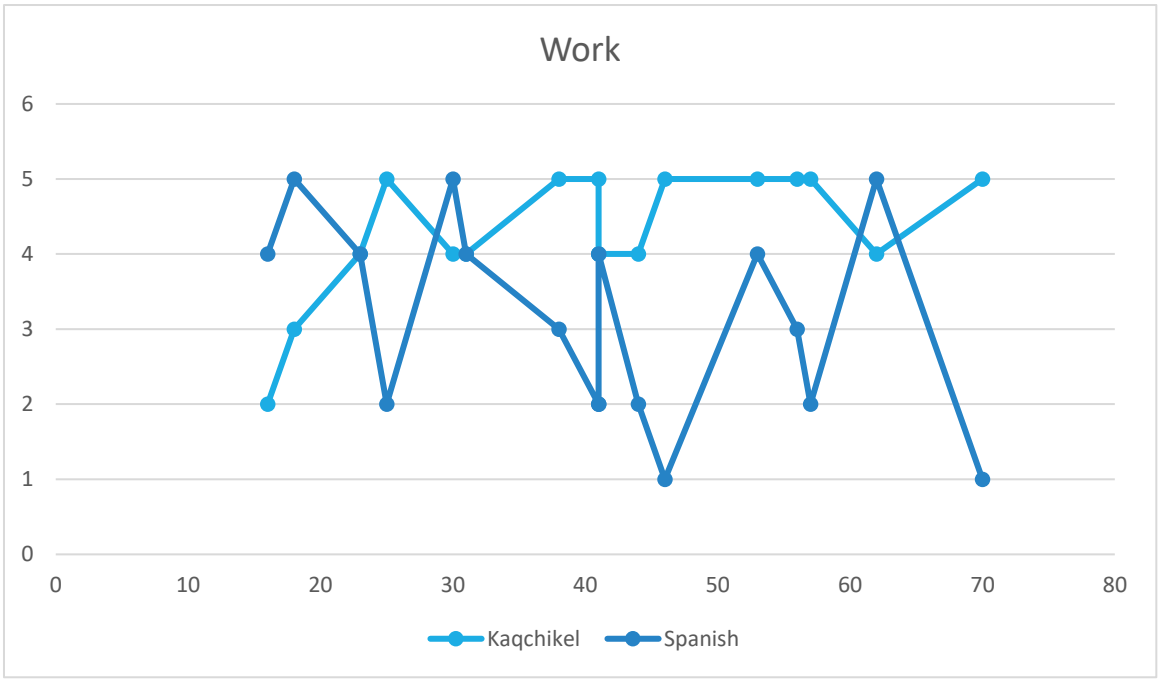
[14] Not all figures display the total number of participants (n=20). Not all participants filled out every frequency of use per language.


Home
6
5
4
3
2
1
0
16 18 23 25 28 30 31 38 41 41 41 41 44 46 53 56 57 62 70
Kaqchikel
Spanish


Family
6
5
4
3
2
1
0
16 18 23 25 28 30 31 38 41 41 41 41 44 46 53 56 57 62 70
Kaqchikel
Spanish


Friends
6
5
4
3
2
1
0
16 18 23 25 28 30 31 38 41 41 41 41 44 46 53 56 57 62 70
Kaqchikel
Spanish


Acquaintances
6
5
4
3
2
1
0
16 18 23 25 28 30 31 38 41 41 41 44 46 53 56 57 62 70
Kaqchikel
Spanish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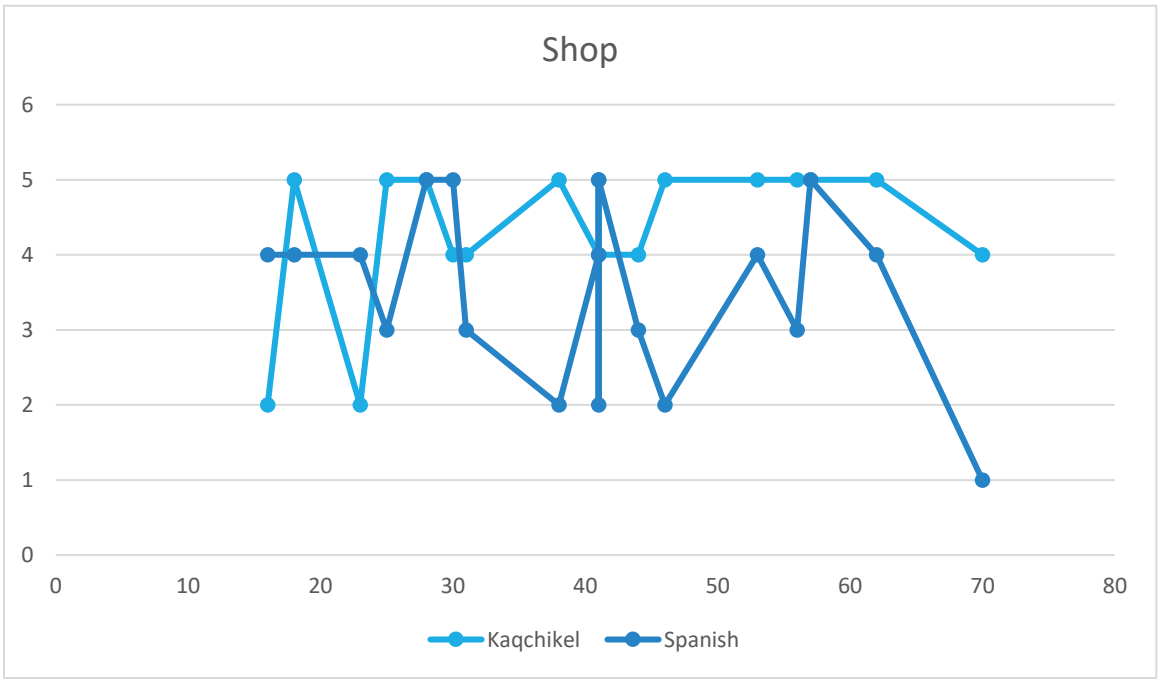
Kaqchikel
Spanish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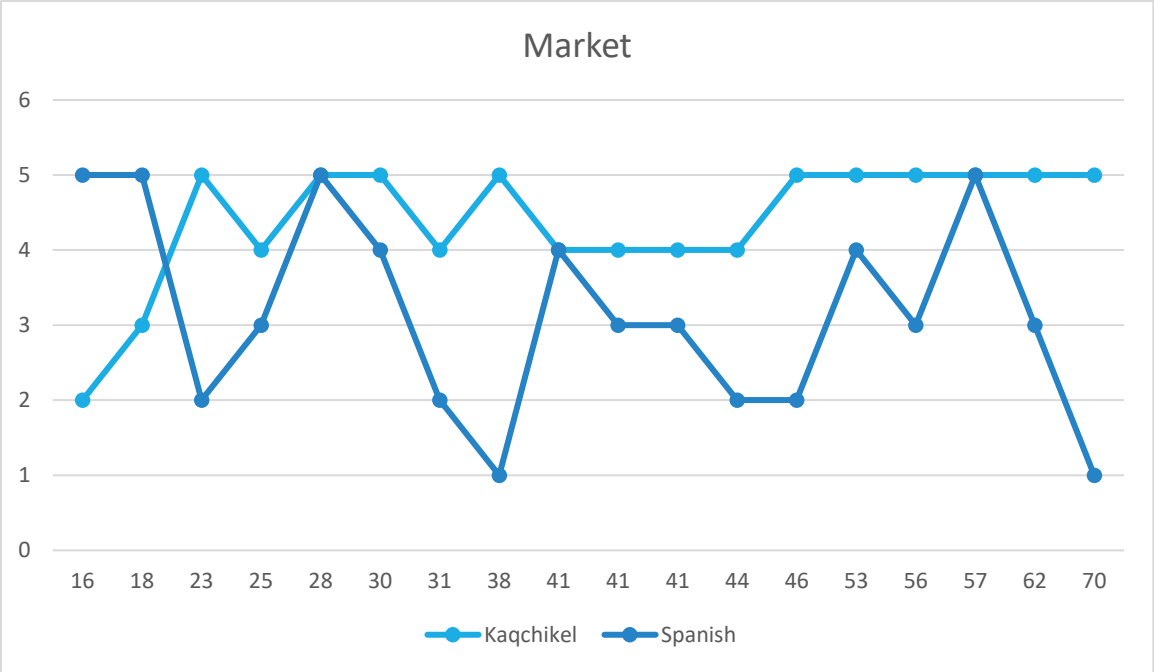
Kaqchikel
Spanish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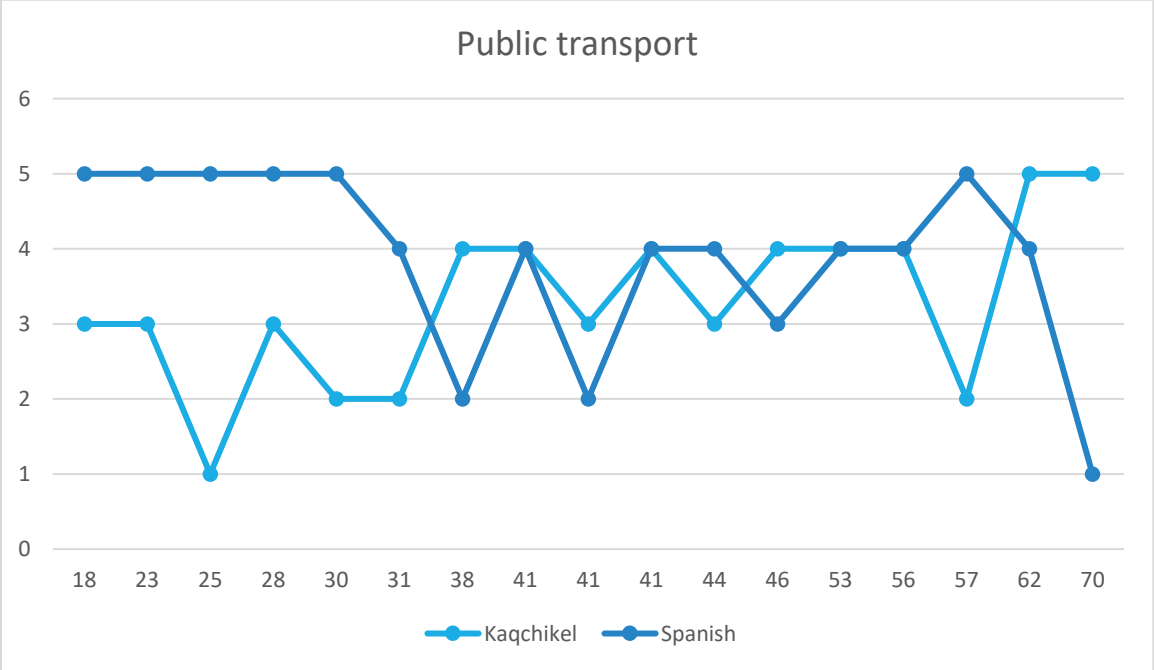
Kaqchikel
Spanish


Public transport
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18 23 25 28 30 31 38 41 41 41 44 46 53 56 57 62 70
Kaqchikel
Spanish

APPENDIX E – INSTRUCTIONS DMT

Documento de instrucciones para el DMT

To both participants:
"*Bueno* wakami' nib'en jun i*tarea* rik'in jujun *imagenes*. k'o chin ixch'okol nitzu' iwi'."

(Español: "*Bueno, ahora van a hacer una tarea con unas imágines. Estarán sentados uno enfrente del otro.*")

(English: "*Ok, now you will start a small task with pictures. You will sit in front of each other*.)

To the Director:
Rat k'o chin nab'ij chire' ri awachib'il ronojel ri rub'eyal samaj k'o chin nb'en rija', chin keri' pa ruk'isb'äl che' kayi' i*tarea* junam yek'uje'. Rija' tikirel nub'en ronojel *pregunta* chin nub'ij we ronojel ri k'o chin nb'en xq'ax chuwäch.

(Español: "*Usted tiene que darle instrucciones a su compañero/a para que al final del juego los dos tableros estén organizados igual. El/ella puede hacer las preguntas que quiera para asegurarse de que te ha entendido bien.*")

(English: "*You have to give instructions to your partner, so at the end of the task, both boards will be equally organized. He/she can ask any question to make sure he/she understood you well.*")

To the Matcher:
Rat k'o chin nawak'axaj ronojel ri nub'ij ri awachib'il chawe' , chin keri' tikirel nanuk' ronojel ri *imagenes* achel nib'ix chawe', chin keri' pa ruk'isb'äl k'o chin junam yek'uje' ri *imagenes*. wakami' tikirel nab'en ronojel a*pregunta antes de que* nachop qa ri a*tarea*.

(Español: "*Usted tiene que escuchar bien las instrucciones de su compañero/a, y reorganizar las imágenes en el tablero para que al final están igual. Puedes hacer todas las preguntas que quieras para asegurarse de que entiendes las instrucciones.*")

(English: "*You have to listen carefully to the instructions of your partner and reorganize the pictures on the board, so at the end, they are equal. You ask any questions you want, to make sure you understand the instructions.*")

To both partipants:
Re jun *tarea* re' man k'ayew ta nab'en, roma' ri k'o chin ütz chuqa aninäq nib'en chire'. We k'o jun *imagen* man pa rub'eyal ta' niyaqa' nib'en *perder* jun i*punto*.

(Español: "Es una tarea fácil, pero tienen que hacerla rápido y bien, tan rápido como puedan. Por cada imagen que tengan colocado mal al final, pierden puntos (al final un punto menos)."

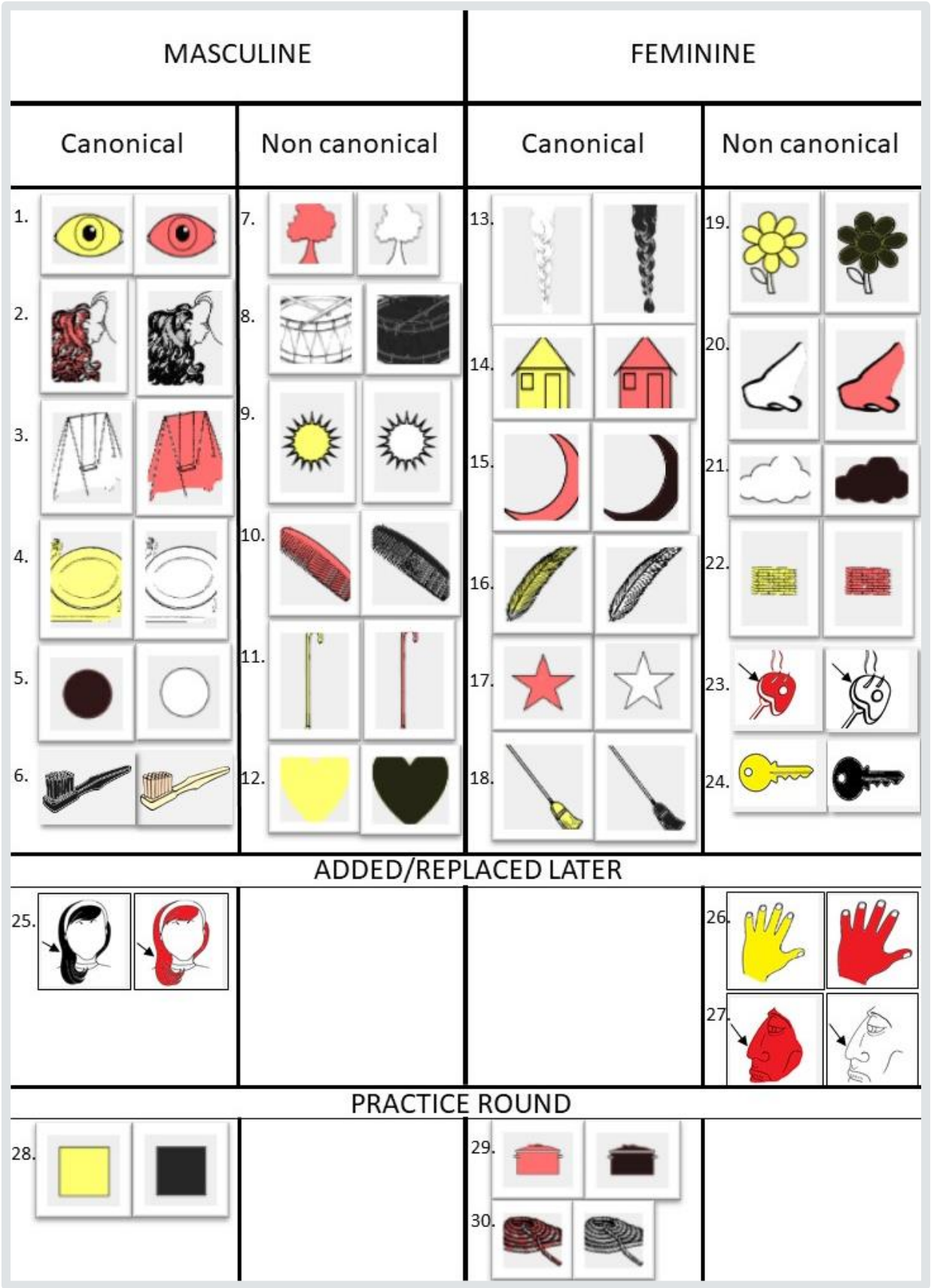
(English: "*It is an easy task, but you have to do it quickly and perform well, as fast as you can. For every picture which does not match at the end, you loose points (at the end one point less).*")

APPENDIX F – OVERVIEW TOKENS DMT

Several pilot sessions were carried out before the final tokens were chosen. Between 100 tokens, these were carefully selected. These 100 tokens included fillers with plural forms and other adjectives like *small* and *big*. The experiment was too long and the tokens had to be reduced. Therefore, it has been decided to leave the fillers out. During the task, four pictures (two nouns) were replaced and, just in case, one noun was added (see also Appendix G for an overview).

Original Tokens			Original Tokens			Extra item		
	Token	*Color*		*Token*	*Color*		*Token*	*Color*
1.	ojo	amarillo	2.	árbol	rojo	1.	mano	rojo
3.	ojo	rojo	4.	árbol	blanco	2.	mano	amarillo
5.	cabello	negro	6.	tambor	blanco		Practice round	
7.	cabello	rojo	8.	tambor	negro	1.	cuadrado	blanco
9.	columpio	blanco	10.	sol	amarillo	2.	cuadrado	rojo
11.	columpio	rojo	12.	sol	blanco	3.	olla	rojo
13.	plato	blanco	14.	peine	rojo	4.	olla	negro
15.	plato	amarillo	16.	peine	negro	5.	cuerda	amarillo
17.	círculo	blanco	18.	bastón	amarillo	6.	cuerda	negro
19.	círculo	negro	20.	bastón	rojo			
21.	cepillo	amarillo	22.	corazón	amarillo			
23.	cepillo	negro	24.	corazón	negro			
25.	trenza	blanco	26.	flor	amarillo			
27.	trenza	negro	28.	flor	negro			
29.	casa	amarillo	30.	nariz	blanco			
31.	casa	rojo	32.	nariz	rojo			
33.	luna	negro	34.	nube	blanco			
35.	luna	rojo	36.	nube	negro			
37.	pluma	amarillo	38.	pared	amarillo			
39.	pluma	blanco	40.	pared	rojo			
41.	estrella	rojo	42.	carne	rojo			
43.	estrella	blanco	44.	carne	blanco			
45.	escoba	amarillo	46.	llave	amarillo			
47.	escoba	negro	48.	llave	negro			

APPENDIX G – ITEMS



APPENDIX H – INFORMATION SHEET DMT

DMT Fecha: Participantes: P y P

Primera sesión: KAQCHIKEL

Director: _____

Recipiente: _____

Segunda sesión: Español

Director: _____

Recipiente: _____

PROBLEMAS	ACCIONES

Tercera sesión: Bilingüe

Director: _____

Recipiente: _____

PROBLEMAS	ACCIONES

APPENDIX I – TOTAL DETERMINER-NOUN SWITCHES

Spanish=green, Kaqchikel=black. Total of 184 NCs.

1.	jun plato q'an	2.	y ri ti corazón q'än
3.	achike color	4.	y ri tenedor,
5.	jun luna q'ëq	6.	ri peine
7.	jun plato q'än	8.	y ri ti tambor
9.	jun corazon q'än	10.	y ri pluma
11.	jun tambor q'äq	12.	ri ri jun ti circulo säq
13.	jun pluma q'än	14.	ti corazón q'äq
15.	jun ri corazón q'äq	16.	ti circulo q'äq
17.	jun cepillo q'äq	18.	y ri ti luna
19.	jun cepillo q'än	20.	ri ti cepillo q'äq
21.	jun pluma säq	22.	y ri ti columpio
23.	jun tambor säq	24.	y ri ti pared taq q'än
25.	jun plato säq	26.	i ri jun ti muñeca
27.	tayaqa jun estrella	28.	y ri llave
29.	tayaqa jun luna q'äq	30.	y jun cepillo q'än
31.	tayaqa jun ti estrella	32.	y ri ti pluma
33.	jun plato q'än	34.	y jun chik ti columpio
35.	tayaqa chik jun plato käq, ne'	36.	y ti tenedor ruk'uwan
37.	jun ti tambor k'a	38.	jun ti pedazo
39.	tayaqa jun ti redondo	40.	y ti tambor
41.	tayaqa jun ti circulo q'äq	42.	y ri ti plato
43.	ti circulo säq	44.	k'in ti tenedor
45.	tayaqa jun cepillo	46.	y ri jun ti trensa q'äq
47.	jun columpi	48.	ti pared
49.	jun pared	50.	y ri ti llave
51.	jun llave	52.	ri ti plato
53.	jun escoba	54.	q'in ti tenedor
55.	tayachik qa jun colompio	56.	tayaqa jun pluma q'äq
57.	ti tambor säq	58.	taqa jun nube säq
59.	jun plato säq	60.	taqa jun ch'umil
61.	tayachik qa jun peine qän	62.	taqa jun corazón q'än
63.	ti pared	64.	tachqa jun corazón

65.	jun llave	66.	tachqa jun luna
67.	achi modo	68.	taqa jun cepillo
69.	achike modo xabij pe'	70.	taqa jun columpio
71.	achike color?	72.	taqa jun pared
73.	achike color	74.	taqa jun llave
75.	achike color	76.	taqa jun cepillo
77.	achike modo ri	78.	jun pluma
79.	ti circulo que?	80.	taqa jun columpio
81.	achike color?	82.	taqa jun tambor
83.	jun pedazo ladrillo käq	84.	taqa jun nube
85.	Takanuj qa jun ti estrella käq	86.	jun pared
87.	jun ti luna q'äq	88.	tachqa jun llave
89.	ri ti estrella	90.	jun corazón q'än
91.	jun ti muñeca	92.	jun cepillo q'äq
93.	jun peine käq	94.	jun columpio melon
95.	jun tambor q'äq	96.	jun pedazo q'utun nsolsot käq
97.	o jun redondo	98.	jun pared q'än
99.	jun cepillo chin awäy q'än	100.	jun baston q'än
101.	jun pedazo q'utun nsolsot q'äq	102.	jun llave q'äq
103.	jun plato säq	104.	jun cepillo q'än
105.	jun llave q'äq	106.	jun escoba q'äq
107.	jun plato	108.	jun árbol säq
109.	jun corazón q'än	110.	jun pluma säq
111.	jun pedazo sa'on q'utun käq	112.	jun columpìo säq
113.	jun tambor q'äq	114.	jun pinsa säq
115.	jun pluma q'än	116.	jun tambor säq
117.	jun corazón q'äq	118.	jun plato säq
119.	jun àrbol käq	120.	jun nube q'än
121.	jun cepillo de diente q'äq	122.	jun baston melon
123.	jun columpio käq	124.	jun trensa q'äq
125.	jun cerco de ladrillo q'än	126.	jun pared melon
127.	jun llave q'äq	128.	jun trensa säq
129.	jun cepillo de dientes q'än	130.	jun llave q'än
131.	jun àrbol säq	132.	jun pared q'än

133.	jun pluma q'äq	134.	jun llave
135.	jun columpio säq	136.	jun tambor säq
137.	jun pedazo sa'on q'utun säq	138.	jun pared käq
139.	jun tambor säq	140.	jun llave q'än
141.	jun plato	142.	kami jun luna
143.	jun cerco de ladrillo käq	144.	jun pedazo ti'ij käq
145.	jun llave q'än	146.	jun tambor q'äq
147.	jun columpio rojo	148.	jun ti cepillo q'äq
149.	jun estrella	150.	jun ti pared
151.	jun estrella käq	152.	jun llave q'äq
153.	jun luna	154.	jun ti cepillo q'än
155.	jun jay melon	156.	jun pedazo ti'ij säq
157.	jun nube säq	158.	jun tambor säq
159.	jun estrella säq	160.	jun pared
161.	jun plato q'än	162.	jun ti llave q'än
163.	ri melon	164.	ri plato rub'onil q'än
165.	jun aq'a melon	166.	jun pedazo ti'ij rub'onil käq
167.	jun tambor q'äq	168.	jun tambor b'onil q'äq
169.	jun escoba q'än	170.	jun circulo rub'onil säq
171.	jun pluma q'än	172.	jun circulo rub'onil säq
173.	jun circulo säq	174.	jun circulo rub'onil qäq
175.	jun runaq awäch melon	176.	jun cepillo rub'onil q'äq
177.	jun corazón q'äq	178.	jun cepillo rub'onil q'än
179.	jun círculo q'äq	180.	jun pedazo ti'ij b'onil säq
181.	jun luna melon	182.	jun tambor b'onil säq
183.	jun árbol melon	184.	jun plato b'onil säq

APPENDIX J – TOTAL NOUN-ADJ SWITCHES

Spanish=green, K=black. Total of 174 bilingual NCs.

1.	estrella käq	2.	tayaqa jun luna q'äq
3.	estrella käq, ya	4.	jun plato q'än
5.	plato q'än	6.	tayaqa chik jun plato käq, ne'
7.	sol säq	8.	pedazo ladrillo q'än
9.	corazón q'än	10.	jun pedazo ladrillo käq
11.	corazón q'än	12.	Takanuj qa jun ti estrella käq
13.	escoba q'än	14.	jun ti luna q'äq
15.	pluma q'än	16.	y ri ti corazón q'än
17.	pluma q'än	18.	ri ri jun ti circulo säq
19.	pluma q'än	20.	ti corazón q'äq
21.	pluma q'än	22.	ti circulo q'äq
23.	circulo säq	24.	ri ti cepillo q'äq
25.	luna käq	26.	columpio Käq
27.	juego de los niños käq	28.	y ri ti pared taq q'än
29.	pared q'än	30.	y jun cepillo q'än
31.	pared q'än	32.	y ri jun ti trensa q'äq
33.	llave q'aq	34.	pluma säq?
35.	cepillo q'an	36.	columpio säq
37.	escoba q'äq	38.	columpio säq?
39.	pluma q'äq	40.	tayaqa jun pluma q'äq
41.	tambor säq	42.	taqa jun nube säq
43.	plato säq	44.	taqa jun corazón q'än
45.	llave q'an	46.	jun corazón q'än
47.	jun plato q'an	48.	jun peine käq
49.	corazón q'än	50.	jun tambor q'äq
51.	ti'ij asado	52.	corazón Käq
53.	tambor q'äq	54.	cepillo q'äq chin awäy
55.	pluma q'än	56.	llave q'äq
57.	pollo q'an	58.	jun cepillo chin awäy q'än

59.	plato säq	60.	jun pedazo q'utun nsolsot q'äq
61.	pollo käq	62.	tambor säq
63.	color q'än?	64.	jun plato säq
65.	color q'äq	66.	jun llave q'äq
67.	color q'äq	68.	k'in tenedor q'än
69.	jun luna q'ëq	70.	jun corazón q'än
71.	jun plato q'än	72.	jun pedazo sa'on q'utun käq
73.	jun corazon q'än	74.	jun tambor q'äq
75.	jun tambor q'äq	76.	jun pluma q'än
77.	jun pluma q'än	78.	jun corazón q'äq
79.	jun ri corazón q'äq	80.	jun àrbol käq
81.	jun cepillo q'äq	82.	jun cepillo de diente q'äq
83.	jun cepillo q'än	84.	jun columpio käq
85.	jun pluma säq	86.	jun cerco de ladrillo q'än
87.	jun tambor säq	88.	jun llave q'äq
89.	jun plato säq	90.	jun cepillo de dientes q'än
91.	jun àrbol säq	92.	jun pared melon
93.	jun pluma q'äq	94.	jun trensa säq
95.	jun columpio säq	96.	jun llave q'än
97.	jun pedazo sa'on q'utun säq	98.	luna q'äq
99.	jun tambor säq	100.	estrella säq
101.	k'in tenedor säq	102.	corazón q'än
103.	jun cerco de ladrillo käq	104.	peine käq
105.	jun llave q'än	106.	tambor q'äq
107.	nube q'än	108.	escoba q'än
109.	jun columpio rojo	110.	pluma q'än
111.	jun estrella käq	112.	luna q'än?
113.	jun jay melon	114.	circulo säq
115.	jun nube säq	116.	corazón q'äq
117.	jun estrella säq	118.	circulo q'äq
119.	jun plato q'än	120.	luna Käq

121.	ri melon	122.	cepillo q'äq
123.	jun aq'a melon	124.	columpio käq
125.	jun tambor q'äq	126.	ladrillo q'än
127.	jun escoba q'än	128.	llave q'äq
129.	jun pluma q'än	130.	cepillo q'än
131.	jun circulo säq	132.	escoba q'äq
133.	jun runaq awäch melon	134.	pluma säq
135.	jun corazón q'äq	136.	columpio q'äq
137.	jun círculo q'äq	138.	tambor säq
139.	jun luna melon	140.	plato säq
141.	jun árbol melon	142.	peine q'äq
143.	jun cepillo q'äq	144.	ladrillo käq
145.	jun columpio melon	146.	llave q'än
147.	jun pared q'än	148.	tambor q'äq
149.	jun baston q'än	150.	jun pared q'än
151.	jun llave q'äq	152.	jun tambor säq
153.	jun cepillo q'än	154.	jun pared käq
155.	jun escoba q'äq	156.	jun llave q'än
157.	jun árbol säq	158.	jun pedazo ti'ij käq
159.	jun pluma säq	160.	jun tambor q'äq
161.	jun columpìo säq	162.	jun ti cepillo q'äq
163.	jun pinsa säq	164.	jun llave q'äq
165.	jun tambor säq	166.	jun ti cepillo q'än
167.	jun plato säq	168.	jun pedazo ti'ij säq
169.	jun nube q'än	170.	jun tambor säq
171.	jun baston melon	172.	plato q'än
173.	jun trenza q'äq	174.	jun ti llave q'än