Contrasting code-switching theories: insights from Kaqchikel-Spanish code-switched nominal constructions

Bierings, E.; Parafita Couto, M.C.; Mateo Pedro, P.; Bennett, R.; Henderson, R.; Harvey, M.

CONTRASTING CODE-SWITCHING THEORIES: INSIGHTS FROM KAQCHIKEL-SPANISH CODE-SWITCHED NOMINAL CONSTRUCTIONS*

EMMA BIERINGS
Leiden University, The Netherlands

M. CARMEN PARAFITA COUTO
Leiden University, The Netherlands

PEDRO MATEO PEDRO
University of Maryland, U.S.A.

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).

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 in press; Pablos, Parafita Couto, Boutonnet, De Jong, Perquin, De Haan & Schiller 2018).

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

1 Introduction

Code-switching (CS) is a back-and-forth switching between languages in the speech of bilinguals, it follows predictable patterns and is governed by linguistic structural constraints (e.g. Bullock & Toribio 2009). The focus of this paper is on the way Kaqchikel (Mayan) - Spanish bilinguals produce mixed nominal

* We are grateful to the Organizing Committee of the FAMLi 5 Conference for making this publication possible and for the two anonymous reviewers who gave valuable feedback on the conference abstract. A special thanks to the University of Maryland for the set up of the Guatemala Field Station and their organizers for having created the opportunity to carry out this research. We also thank Erika Imelda López Sicajan for her hard work on all transcriptions and to all who participated in this study. We thank Leiden University and their Uhlenbeck Scholarship Programme for the financial support.

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. Most of these speakers are bilingual, since 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. However, education is mostly offered in Spanish (Heinze-Balcazar 2015). 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 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').[1] 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 that this word order is influenced by Spanish, though 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 Matzar, Toj Cotzajay & Coc Tuiz 1999; Patal Majzul, García Matzar & Espantzay Serech 2000; Barrett 2005; Maxwell & Little 2006; Brown, Maxwell & Little 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 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, Deuchar, Parafita Couto & Moro Quintanilla 2010; Fairchild & Van Hell 2015; Parafita Couto, Deuchar & Fusser 2015; Eppler, Luescher, & Deuchar 2016; Vanden Wyngaerd 2016; Blokzijl, Deuchar, Parafita Couto 2017; Parafita Couto, Boutonnet, Hoshino, Davies, Deuchar & Thierry 2017; Parafita Couto & Gullberg 2017; Parafita Couto & Stadthagen-González 2017; Stadthagen-González, Parafita Couto, Parraga & Damian 2017; Pablos, Parafita Couto, Boutonnet, De Jong, Perquin, De Haan & Schiller 2018; Balam & Parafita Couto 2018) that approached the evaluation of two theoretical accounts (i.e., the Matrix Language Framework

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

(MLF, Myers-Scotton 1997, 2002) and a Minimalist Program approach (MP, Chomsky 1995, 2000; Liceras, Spradlin, Fernández Fuertes 2005; Liceras, Fernández Fuertes, Perales, Peréz-Tattam & Spadlin, 2008; Moro Quintanilla 2014; Liceras Fernandez Fuertes & Klassen 2016)) by examining patterns of determiner-noun and adjective-noun switching. In the following section, we elaborate on the predictions of these two theoretical approaches.

2 Background

The MP and MLF approaches make predictions about what is possible in code-switched structures, i.a. in the nominal domain. Liceras, Spradlin & Fernández Fuertes (2005, 2008), Moro Quintanilla (2014) and Cantone & MacSwan (2009) evaluate their data, based on the MP (Chomsky 1995, 2000). Liceras et al. (2005, 2008) 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 (NCs) in the Spanish-Kaqchikel language pair, the Spanish determiner carries two of such features (gender and number) and the Kaqchikel determiner does not (e.g. 'el perro' (masculine, 'the dog') and 'la casa' (feminine, 'the house') versus *ri tz'i'* and *ri jay* ('the house' and 'the dog' respectively). This means that, in mixed Spanish-Kaqchikel NCs, the Spanish determiner will be preferred over Kaqchikel. 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 instance, following Kaqchikel and Spanish grammars, it is then expected to find '*käq* casa' ('red house') and not 'casa *käq*' ('house red'). In this case, the adjective language is Kaqchikel, meaning that the adjective is expected to appear in Kaqchikel word order (prenominal).

The MLF (Myers-Scotton 1997, 2002) assumes an asymmetry between the languages involved in code-switching. It proposes that, in bilingual utterances, the Matrix language (ML) provides the morphosyntactic frame of the code-switched utterance, where the Embedded Language (EL) is inserted. The ML provides the grammatical elements (such as determiners, pronouns and inflectional morphemes) and the EL consists mainly of content morphemes (nouns, verbs and adjectives). For instance, 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.
3SG-read a beautiful book
'he reads a beautiful book'

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

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. *Example (5)* contains the Spanish Embedded Island 'libro hermoso', in which the Spanish syntactic structure is applied in the entire 'chunk'. 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. *Table 1* summarizes the predictions regarding determiner language and adjective-noun order derived from each approach.

Scholars have examined and compared the accuracy of the predictions of these approaches with different language pairs, using both naturalistic and experimental data, and report different outcomes. These studies will be set out in the following subsections. We will provide separate reviews on each switch type.

Table 1.
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).

2.1 Previous studies on Det N mixes

Liceras et al. (2005, 2008) and Moro Quintanilla (2014) 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). The MLF approach takes these (morpho-)syntactic structures into account and several studies provide evidence in favor of these predictions on the determiner language (e.g. Herring et al. 2010; Blokzijl et al. 2017; Parafita Couto & Gullberg 2017). They compared the MP and MLF predictions in different data types and report different outcomes. An overview of these studies is presented in *table 2*.

Table 2.
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 language 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)

Table 2 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.

2.2 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 in press). An overview is provided in *table 3*.

Table 3.
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 (2017)	three naturalistic corpora	- Spanish-English (Miami, U.S.A) - Welsh-English (Wales, UK) - Papiamento-Dutch (The Netherlands)	partly supported in all language pairs (less than MLF)	supported in all language pairs, Embedded Islands most 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 (in press)	naturalistic data (sociolinguistic interviews)	Spanish- English (Northern Belize)	evidence for support, relatively less than MLF	highly supported, Embedded Islands most common pattern

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 in press). 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). While Parafita Couto & Gullberg (2017) and Balam & Parafita Couto (in press) specifically confirm Pfaff's (1979) observation that switches between noun and adjective are less common than between determiner and noun-adjective clusters, Pablos et al. (2018) provide evidence against these patterns.

In sum, *tables 2* and *3* 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 this question, we present our current study in the following section.

3 The present study

We examined Kaqchikel – Spanish nominal constructions produced by bilingual 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), Kaqchikel determiner does not (e.g. ***ri*** *jay* and ***ri*** *tz'i'*, respectively). The 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 4* presents an overview of the different determiners with examples in both languages (Kaqchikel: Brown et al., 2006:158-159).

Table 4.
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** / **estos**	**este** perro 'this dog' **estos** perros 'these dogs'	**esta** / **estas**	**esta** casa 'this house' **estas** casas 'these houses'	***re … re'*** / ***re*** + plural particle/ suffix + ***re'***	***re*** *tz'i **re'** / **re** jay **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** perros 'those dogs'	**esa** / **esas**	**esa** casa 'that house' **esas** casas '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'*

Table 4 solely shows determiners that are relevant for this study (no quantifiers, etc.). The Kaqchikel indefinite article *jun* is ambiguous to the numeral *one* and Kaqchikel definite articles are optional in some plural contexts. The Kaqchikel proximal *re … re'* and distal *la … la'* demonstratives normally enclose the noun phrase, meaning that, i.a. 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).

4 Method

We used a Director-Matcher Task (henceforth DMT) to elicit noun phrases. 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. 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 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).

4.1 Participants

All 20 participants (16 female, 4 male) were born and raised in Patzún (Guatemala). 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, 8 out of 20 (40%) rated both languages, 7 out of 20 (35%) rated Kaqchikel and 5 out of 20 (25%) rated Spanish.

4.2 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 5*). The order of the pictures was round-specific, so this was similar for each set of participants. Instructions of the task were given by a third person, each round in a different language mode.[2] *Table 5* shows this was in Kaqchikel, Spanish and code-switching mode, respectively. In the Kaqchikel and Spanish mode, the instructor gave the instructions in Kaqchikel and Spanish (respectively), so 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. 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

[2] 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.

mode was analysed. 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.

Table 5.
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

4.2.1 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 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. *Figure 1* illustrates some examples.

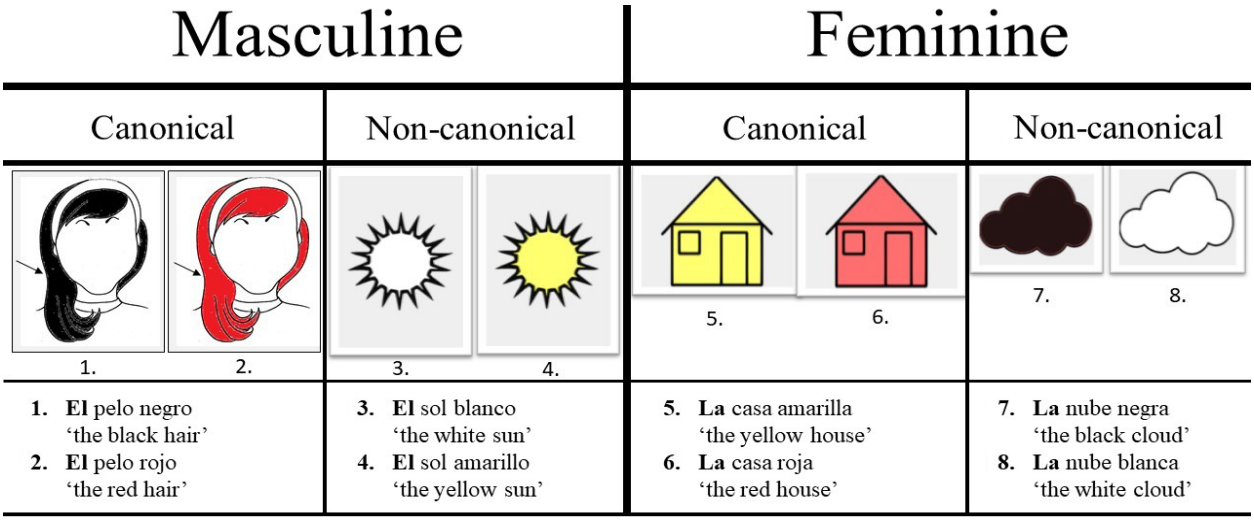

Figure 1. *Four out of twenty-four different nouns, each appearing in two different colors.*

5 Coding and analysis

For the analysis, only the code-switching mode recordings were used (round 3). *Table 6* shows the overall distribution of the total produced NCs of this mode.

Table 6.
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.

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.

5.1 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 (6)*).[3] Sometimes, one or two determiners were combined with the Kaqchikel diminutive *ti*, prior to the noun and a free morpheme.[4]

Example (7) shows the Kaqchikel distal demonstrative *la* (usually *la...la'*, see *table 4*, now reduced to *la*). The DMT pictures were within reach of each participant, so a distal demonstrative was not expected in the dataset. To prevent incorrect interpretation of the data, all NCs with *la* were excluded from data analysis (n=32). In continuation, noun compounds were counted as one noun (*example (8)* and *(9)*).

[3] *Ri ri* was only produced once (*example (11)*). The reduplication of definite article *ri* implies the sense of a pronoun 'this' (Brown et al., 2006:159).

[4] 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 authors 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.

(6) ***Ri ri'*** ***jun*** ***ti*** círculo *säq*
this INDF.ART TI circle white
'this white circle' (DMT-10, P1)

(7) ***Jun*** ***la*** nube *säq*
INDF.ART DEF.ART.F/DEM cloud white
'The/that white cloud' (DMT- 08, P1)

(8) juego de niño-s *käq*
game of child-PL red
'red children's game'
(referring to a swing) (DMT-04, P1)

(9) ***jun*** cepillo de dientes *q'än*
INDF.ART toothbrush yellow
'a yellow toothbrush' (DMT-13, P1)

5.2 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 (10)*). In this example, the switch occurs between the Kaqchikel noun *che'* and the modifying Spanish noun *color*. These constructions with adjectival phrases were all excluded from analysis (n=18), unless the switch occurred between determiner and noun (*example (11)*).

(10) ***jun*** *che'* color *säq*
INDF.ART tree color white
'a tree, colored white' (DMT-06, P2)

(11) ***Jun*** círculo ***ru-****b'onil* *säq*
INDF circle 3SG.POSS-color white
'a circle, colored white' (DMT-19, P1)

6 Results bilingual data

6.1. 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 7*.

Table 7.
Types of determiner in mixed NCs with Determiner (Det).

	Det 1	*Det 2*	*Det 3*	**TOTAL per Det 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.

6.1.1 Identification of the ML

In order to examine MLF predictions, 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 8*. 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 9* shows that in all cases the ML is always Kaqchikel and always combined with (a) Kaqchikel determiner(s). This is self-evident, since it is previously mentioned that all determiners are in Kaqchikel.

Table 8.
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 9.
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

6.2 Results on adjective word order

In *table 6* 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 10* 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 174 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 (12)* and *table 11*). Remarkably, all adjectives (both in Kaqchikel as Spanish) came in postnominal position.

(12) *ti'ij* asado
meat grilled.M
'grilled meat' (DMT-05, P1)

Table 10.
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 11.
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 11 illustrates the division of Kaqchikel and Spanish adjectives. Of all 174 mixed NCs with adjective, only 10 were in Spanish *(5,7%)* (see *example (13)*). From these 10 NCs, in 6 cases, the noun was also in Spanish (see *example (14)*). 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 12*).

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

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

Table 12.
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**

6.3. Outcomes MP and MLF predictions

The predictions on MP and MLF accounts for the determiner language and adjective position are represented in *table 13* and *table 14* respectively.

Table 13.
MP and MLF prediction outcomes regarding language of the determiner.

Match	Theoretical approaches	
	MP	MLF
YES	0	61
NO	184	0

Table 14.
MP and MLF prediction outcomes regarding adjective word order.

Match	Theoretical approaches	
	MP	MLF
YES	10	0
NO	163	19

From *table 13* 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 14*, 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.

7 Conclusion

In this study, we aimed to improve our understanding of CS patterns within the nominal domain in the Kaqchikel-Spanish language pair. The contrasting predictions of the MP and the MLF model were examined. Data was collected within the bilingual Kaqchikel-Spanish community in the Guatemalan Highlands of Patzún through the 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, and (ii) the adjective always occurred in postnominal position, contra the predictions of both models. As for the language of the determiner, the data of the present study lend relatively more evidence for the predictions MLF over the MP. This confirms the findings of several previous studies which compared the MP and MLF predictions on naturalistic data (i.a. Blokzijl et al. 2017; Parafita Couto & Gullberg 2017). As for adjective position, in 164 out of 174 cases, the adjective language was Kaqchikel. In these cases, the 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 a baseline for comparison with the patterns that arise in the code-switching 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. 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'. 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'.

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 Purepecha-Spanish bilinguals. The participants participated 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.

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. Most of them had to be excluded for data analysis (n=17), since those who acted as Matchers did not produce (i) bilingual NCs, or (ii) no data at all. Second, we used a wide age range to get first impressions of overall patterns in this community. However, we recognize that these patterns may vary in between generations and that further research is highly needed to establish these variations. Finally, 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.

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 (2002) MLF model, and to a lesser degree by the MP approach. 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.

References

Baker, Colin. 2006. Psycho-Sociological Analysis in Language Policy, Chapter 12, p. 210-228, In: T. Ricento (ed.), *An Introduction to Language Policy: Theory and Method*. Malden, MA: Blackwell Pub.

Balam, Osmer & Parafita Couto, M. Carmen. In press. Adjectives in Spanish/English Code-Switching: Avoidance of Grammatical Gender in Bi/Multilingual Speech. *Spanish in Context*, 16(2).

Barrett, Rusty. 2005. Kaqchikel Grammar. Review of: Rodríguez Guaján (1994), among others. *International Journal of American Linguistics*, Vol.71(2), pp.215-221.

Belazi, Heidi, Rubin, Edward & Toribio, A. Jacqueline. 1994. Code-switching and X-bar theory: The functional head constraint. *Linguistic Inquiry*, 25, 221-237.

Bellamy, Kate, Parafita Couto, M. Carmen, & Stadthagen-González, Hans. 2018. Investigating Gender Assignment Strategies in mixed Purepecha-Spanish Nominal Constructions. *Languages*, 3(3), 28.

Bosque, Ignacio, & Picallo, Carme. 1996. Postnominal Adjectives in Spanish DPs. *Journal of Linguistics*, *32*(2), 349-385.

Blokzijl, Jeffrey, Deuchar, Margaret, & Parafita Couto, M. Carmen. 2017. Determiner asymmetry in mixed nominal constructions: The role of grammatical factors in data from Miami and Nicaragua. *Languages*, 2(4).

Brown, R. McKenna, Maxwell, Judith M. & Little, Walter E. 2006. *¿La ütz awäch? Introduction to Kaqchikel Maya Language.* Austin: University of Texas Press.

Bullock, Barbara E. & Toribio, A. Jacqueline. (eds.). 2009. *The handbook of linguistic code-switching*. Cambridge: Cambridge University Press.

Cantone, Francesca & MacSwan, Jeff. 2009. The syntax of DP-internal codeswitching. In L. Isurin, D. Winford, & K. de Bot (Eds.), *Multidisciplinary approaches to codeswitching* (pp.243-278). Amsterdam: John Benjamins Publishing.

Chomsky, Noam. 1995. The minimalist program. Cambridge, MA: MIT Press.

Chomsky, Noam. 2000. Minimalist inquiries: The framework. *In*: R. Martin, D. Michaels & J. Uriagereke (Eds.), *Step by step: Essays on minimalist syntax in honor Howard Lasnik* (pp. 89-155). Cambridge, MA: MIT Press.

Clyne, Michael. 1987. Constraints on code switching: How universal are they? *Linguistics*, 25: 739– 764.
Comrie, B., Haspelmath, M. & Bickel, B. (2015) *The Leipzig Glossing Rules: Conventions for interlinear morpheme-by-morpheme glosses by* www.eva.mpg.de/lingua/pdf/Glossing-Rules.pdf.

Di Sciullo, Anna Maria, Muysken, Pieter & Singh, Rajendra. 1986. Government and code-switching. *Journal of Linguistics*, 22: 1–24.

Eppler, Duran E., Luescher, Adrian & Deuchar, Margaret. 2016. Evaluating the predictions of three syntactic frameworks for mixed determiner-noun constructions. *Corpus Linguistics and Linguistic Theory*, 13(1), 27-63.

Fairchild, Sarah & Van Hell, Janet. 2015. Determiner-noun code-switching in Spanish heritage speakers. *Bilingualism: Language and Cognition*. Advance online publication. DOI: 10.1017/SS1366728915000619.

García Matzar, Pedro Oscar, Toj Cotzajay, Valerio & Coc Tuiz, Domingo. 1999. *Gramática del idioma Kaqchikel*. Antigua, Guatemala: Proyecto Lingüístico Francisco Marroquín.

Gullberg, Marianne, Indefrey, Peter & Muysken, Pieter. 2009. Research techniques for the study of code-switching. In: B.E. Bullock & A.J. Toribio (eds.), The Cambridge Handbook of Linguistic Code-switching. Part I, chapter 2, p. 21-39.

Heinze-Balcazar, Ivonne. 2015. *Retamaxik Ka'i Ch'ab'äl, Bilingüismo Kaqchikel, Kaqchikel-L1-y español-L2-*. Guatemala: Cholsamaj.

Herring, Jon Russell, Deuchar, Margaret, Parafita Couto, M. Carmen & Moro Quintanilla, Mónica. 2010. 'When I went to Canada, I saw the madre': Evaluating two theories' predictions about

codeswitching between determiners and nouns using Spanish-English and Welsh-English bilingual corpora. *International Journal of Bilingual Education and Bilingualism*, V. 13, p. 553-573.

Holmquist, Jonathan. & Kahn, Hana. 2017. Spanish and Kaqchikel-Maya: A study in town and village in Guatemala's central highlands. *International Journal of the Sociology of Language*, 2017(248), pp. 3-24.

Jake, Janice L., Myers-Scotton, Carol & Gross, Steven. 2002. Making a minimalist to codeswitching work: Adding the Matrix Language. *Bilingualism, Language & Cognition*, 5, 69-91.

Joshi, Aravind. 1985. Processing of sentences with intrasentential code switching. In D.R. Dowty, L. Kattunen, & A.M. Zwicky (eds), *Natural language parsing: psychological, computational and theoretical perspectives* (pp. 190–205). Cambridge: Cambridge University Press.

Labov, William. 1972. *Sociolinguistic patterns*. Philadelphia: University of Pennsylvania Press.

Liceras, Juana M., Spradlin, K.Todd & Fernández Fuertes, Raquel. 2005. Bilingual early functional-lexical mixing and the activation of formal features. *International Journal of Bilingualism*, 9(2), pp. 227-251.

Liceras, Juana M., Fernández Fuertes, Raquel, Perales, Susana, Pérez-Tattam, Rocío, & Spradlin, K. Todd. 2008. Gender and gender agreement in bilingual native and non-native grammars: A view from child and adult functional-lexical mixings. *Lingua*, 118, 827-851.

Liceras, Juana M., Fernández Fuertes, Raquel & Klassen, Rachel. 2016. Language dominance and language nativeness. In R.E. Guzzardo Tamargo, C.M. Mazak & M.C. Parafita Couto (eds.), S*panish-English code-switching in the Caribbean and the US* (pp. 107-138). Amsterdam: John Benjamins Publishing Company.

Likert, Rensis. 1932. A Technique for the Measurement of Attitudes. *Archives of Psychology*, 140, 1–55.

MacSwan, Jeff. 1999. *A minimalist approach to intra-sentential code-switching*. New York: Garland.

Maxwell, Judith, & Little, Walter E. 2006. *Tijonïk kaqchikel Oxlajuj aj =: Curso de idioma y cultura maya kaqchikel*. Guatemala: Editorial Junajpu.

Maxwell, Judith, Son Chonay, Gloria Enoe, Son Chonay, Ixcha'im Marliny, & Carmela Rodríguez, Ixim Nikté M.. 2015. *Maja'il Kaqchikel, Kaqchikel Autoaprendido, Nab'ey Xak - Nivel 1*. Guatemala: Editorial Maya' Wuj.

Myers-Scotton, Carol. 1997. *Duelling languages: Grammatical structure in codeswitching*. Oxford: Oxford University Press.

Myers-Scotton, Carol. 2002. *Contact linguistics: Bilingual encounters and grammatical outcomes*. Oxford: Oxford University Press.

Moro Quintanilla, Mónica. 2014. The semantic interpretation and syntactic distribution of determiner phrases in Spanish/English codeswitching. In J. MacSwan (ed.), *Grammatical Theory and Bilingual Codeswitching*. Cambridge, MA: MIT Press.

Munarriz Amaia. & Parafita Couto, M.Carmen. 2014. ¿Cómo estudiar el cambio de código? Incorporación de diferentes metodologías en el caso de varias comunidades bilingües, Lapurdum. Basque Studies Review XVIII: 43-73.

Pablos, Leticia, Parafita Couto, M. Carmen, Boutonnet, Bastian, De Jong, Amy, Perquin, Marlou, De Haan, Annelies & Schiller, Niels O.. 2018. Adjective-Noun order in Papiamento-Dutch code-switching. L*inguistic Approaches to Bilingualism*. Online-first Articles. DOI: 10.1075/lab.17036.pab

Parafita Couto, M. Carmen, Boutonnet Bastian, Hoshino Noriko, Davies Peredur, Deuchar Margaret & Thierry, Guillaume. 2017. Testing Alternative Theoretical Accounts of Code-Switching using Event-related Brain Potentials: A Pilot Study on Welsh-English.. In: *Bilingualism and minority languages in Europe: Current trends and developments.*. Newcastle: Cambridge Scholars. 242-256.

Parafita Couto, M. Carmen, Deuchar, Margaret & Fusser, Marika. 2015. How do Welsh-English bilinguals deal with conflict? Adjective-noun order resolution. In: Stell G., Yakpo K. (Eds.) *Code-switching at the crossroads between structural and sociolinguistic perspectives.*: Mouton de Gruyter.

Parafita Couto, M. Carmen & Gullberg, Marianne. 2017. Code-switching within the Noun Phrase: Evidence from Three Corpora. *International Journal of Bilingualism*. DOI: 10.1177/1367006917729543.

Parafita Couto, M. Carmen & Stadthagen-González, Hans. 2017. El book or the libro? Insights from acceptability judgments into determiner/noun code-switches, *The International Journal of Bilingualism*.

Patal Majzul, Filiberto. 2013. *Rusoltzij ri Kaqchikel. Diccionario Kaqchikel Estándar. Bilingüe Kaqchikel - Español*. Segunda edición. Guatemala: Editorial Maya' Wuy.

Patal Majzul, Filiberto, García Matzar, Pedro Oscar & Espantzay Serech, Carmelina. 2000. *Rujunamaxik ri Kaqchikel Chi': Variación dialectal en Kaqchikel*. Guatemala City, Guatemala.: Cholsamaj.

Pfaff, Carol W.. 1979. Constraints on language mixing: Intrasentential code-switching and borrowing in Spanish/English. *Language*, 55(2), 291-318.

Poplack, Shana. 1980. Sometimes I'll start a sentence in Spanish *y termino en Español*: Toward a typology of code-switching. *Linguistics*, 18, 581-618.

Rahimi, Meisam. & Dabaghi, Azizollah. 2013. Persian-English code-switching: A test of the Matrix Language Frame (MLF) model. *System*, 41, 322-351.

Rodríguez Guaján, José Obispo. 1994. *Rutz'ib'axik ri Kaqchikel. Manual de Redacción Kaqchikel.* Guatemala: Editorial Cholsamaj.

Santorini, Beatrice & Mahootian, Sharhzad. 1995. Codeswitching and the syntactic status of adnominal adjectives. *Lingua*, 96, 1–27.

Son Chonay, Elsa Beatriz. 2015. *Qawuj pa Kaqchikel, Nuestro libro Kaqchikel - segundo ciclo*. Guatemala: Editorial Maya' Wuj.

Stadthagen-González, Hans, Parafita Couto, M. Carmen, Párraga Alejandro & Damian, Markus. 2017. Testing alternative theoretical accounts of code-switching: Insights from comparative judgments of adjective–noun order, *The International Journal of Bilingualism*.

Valdés-Kroff, Jorge. 2016. Mixed NPs in Spanish-English bilingual speech: Using a corpus-based approach to inform models of sentence processing. In R.E. Guzzardo Tamargo, C.M. Mazak & M.C. Parafita Couto (eds.), *Spanish-English code-switching in the Caribbean and the US* (pp. 281-300). Amsterdam: John Benjamins.

Vanden Wyngaerd, Emma. 2016. The adjective in Dutch-French codeswitching: Word order and agreement. *International Journal of Bilingualism*, 21(4), 454-473.