Conflict sites in Spanish-English mixed nominal constructions
Testing alternative predictions

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Abstract

This thesis investigates mixed nominal constructions, both complex (with an adjective) and simplex. Such constructions create potential conflict sites in Spanish-English code-switching. Spanish and English differ for (1) adjective-noun order: Spanish typically has post-nominal adjectives, whereas English has pre-nominal adjectives, and (2) grammatical gender: Spanish has a binary gender system, while English does not.

A multi-task method was conducted in the Spanish-English bilingual community in Puerto Rico. The tasks comprised of an elicitation task (cf. director-matcher task, Gullberg, Indefrey, and Muysken 2008) and an auditory grammaticality judgment task.

The predictions from the Matrix Language Framework (MLF, Myers-Scotton 2002) and a minimalist analysis from Cantone and MacSwan (2009) are tested against the collected data.

The results from both tasks tend to indicate that the Matrix Language approach provides better predictions than the minimalist approach in every respect except for adjective-noun order constructions in the judgment task. This slight preference, however, is not significant. Toy task results for gender assignment in Spanish determiners indicate that there is a preference for the assignment of default gender, i.e. masculine in Spanish, rather than gender that is analogue to the translation equivalent of the noun. This preference is confirmed by judgment task results that include simple nominal constructions, but not by judgment task results for complex nominal constructions. I assume that adjectival presence in complex nominal constructions may have to do with this.

Implications of my results for the theories and the methodologies are discussed.

February 21, 2014 · Mayaguez, Puerto Rico · 🌐

Sometimes, I really don't know the word in English. I have to say it in Spanish. Even my thoughts are becoming bilingual...

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that's gonna start messing with your head man
February 21, 2014 at 5:34pm · Like · 👍 1

It feels good though!
February 21, 2014 at 5:35pm · Like · 👍 1

We make our own code 😐
February 21, 2014 at 5:54pm · Like

Wujuuu! You are officially a Puerto Rican! 🙂
February 21, 2014 at 6:44pm · Like · 👍 3

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Belinda Korver, 4 August 2016

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List of abbreviations and symbols

✓	Grammatical
X	Ungrammatical
Agr(P)	Agreement (Phrase)
AP	Adjective Phrase
BN	Simple DP stimuli
BS	Complex DP stimuli
CP	Complementizer phrase
D	Determiner
D+number	Switch produced by Director participant, cf. Appendix IV
DP	Determiner phrase
EL	Embedded Language
EPP	Extended Projection Principle
FEM	Feminine
IMP	Imperative
INF	Infinitive
INDF	Indefinitive
L1	First language
L2	Second language
M+number	Switch produced by Matcher participant, cf. Appendix IV
MASC	Masculine
MC	Fillers
MS	Fillers
ML	Matrix Language
MLF	Matrix Language Framework
MOP	Morpheme order principle
MP	Minimalist Program
N	Noun
NP	Noun Phrase
PL	Plural
PRS	Present
PST	Past
SG	Singular
SMP	System morpheme principle
TS	Practice Stimuli
UPRM	University of Puerto Rico, Campus Mayagüez

1   Introduction

1.1 Bilingual speech communities

When individuals from different monolingual communities are in contact, they can become bilingual. Bilingual individuals form bilingual speech communities (Mackey 2000). Such communities may differ in size: the use of bilingual speech is dependent on how and how much the languages are in contact and thus are able to influence each other. The following paragraphs define bilingualism and introduce the Spanish-English bilingual community in Puerto Rico.

1.1.1 Bilingualism

Bilingualism has long been defined as a speaker's equal control of two languages (Mackey 2000). Definitions nowadays vary from this native-like control of two languages to a passive control of two languages, of which only one is native-like ('Bilingual' in *The Concise Oxford Dictionary of Linguistics*; MacSwan 1997). Not only does bilingualism occur in bilingual speech communities, it also exists amongst a diffused group of individuals that have acquired a foreign language for personal reasons. In this regard, bilingualism has become the rule rather than the exception with respect to monolingualism.

Bilinguals have access to more than one language. The choice of language in a conversation or writing is determined by a variety of factors, such as the location, subject matter, or addressee (Wei 2000; Gardner Chloros 2009). For instance: a child from a Turkish family that migrated to the Netherlands can speak Dutch at school, but Turkish at home; an interpreter may need to use multiple languages during his/her hours of work; and I will write a postcard to my Spanish guest mother in Spanish rather than Dutch.

The choice of language becomes slightly more difficult to make when two verbally fluent bilinguals interact that have been exposed to the same languages since infancy (MacSwan 1997). Their proficiency in both languages allows them to alternate between the languages within one conversation. This 'code-switching' is a common phenomenon amongst bilinguals (section 1.2 elaborates on code-switching).

One of the bilingual speech societies in which bilingualism has led to frequent code-switching is Puerto Rico.

1.1.2 Linguistic situation in Puerto Rico

Puerto Rico is one of the several thousand islands in the Caribbean Sea and located southeast of North America and northeast of Latin America (cf. figure 1). The island

Figure 1 *Geographic location of Puerto Rico*

Source: Central Intelligence Agency, 'Puerto Rico: territory of the US with commonwealth status', The World Factbook *(www.cia.gov)*

became a territory of the United States in 1898. Before the U.S. acquisition, Puerto Rico had lived under the rule of the Spanish Crown for four centuries.

Since the changing of the guard at the end of the nineteenth century, the languages of the two colossi have both received several statuses. In 1902, the Official Languages Law established an indistinct usage of Spanish and English in Puerto Rican governmental offices and courts. Nine years later, Spanish was declared to be the "sole official language of the island" (Shenk 2011: 177). After two years, however, a law came that officialised both languages to be of "indistinct" usage again (Shenk 2011: 177).

Since 1917, when Puerto Ricans were granted American citizenship, there has been a major increase in circular migration between the island and the mainland (Vázquez Calzada 1978). It created a large Puerto Rican diaspora on the North American continent.

Acceptance of the use of both Spanish and English together with intensive contact between Puerto Ricans and U.S. mainland inhabitants have affected Puerto Rican Spanish. For instance, English phonology caused Spanish pronunciation of /r/ to be relaxed to /l/, and /s/ to often not be pronounced at all. The frequent contact between both languages also allowed for interchangeable use of Spanish and the English (Torres Torres 2010). One of the resulting language contact phenomena that are found in Puerto Rico is Spanish-English code-switching.

This thesis studies code-switching as it occurs amongst the Spanish-English bilingual community in Puerto Rico. To illustrate, an instance of code-switching that was uttered during the production task of the present study is included in (1) below. Examples throughout this thesis visually distinguish Spanish elements in italic text from English elements in regular text. It follows that the utterer started the sentence in Spanish and finished the sentence in English. The speaker inserted an English determiner and noun in the first half of the sentence, and a Spanish noun in the second half.

(1)   *Estaba*   *viendo*   the tree *y*   *la*   *oveja*
           be.PST.1SG   see.INDF   and D.FEM   sheep [FEM]
           'I was watching the tree and the sheep …

           and I was like, well,   *ovejas* eat like, I don't know, vegetation, obviously.
                                         sheep
           …and I was like, well, sheep eat like, I don't know, vegetation, obviously.'
           (Korver 2014, D8[1])

Bilingual utterances in Puerto Rico are part of 'Spanglish', which is a label used in society, not necessarily by linguists. It embraces the mixture of Spanish and English as it occurs in "Hispanic or Latino communities in the United States" and the effects of the overarching contact between the two languages and cultures (Ardila 2005: 60; Lipski 2007). Therefore, Spanglish not only includes code-switching, but also the popular culture on TV that surrounds the interaction (Torres Torres 2010; Rodríguez-González and Parafita Couto 2012).

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[1] Refers to specific switch produced by a Director participant, cf. Appendix IV for participant information.

1.2 Code-switching

It has been established that code-switching is the alternating use of two languages within the same conversation, triggered by speaker-external factors. Bilingual speakers are capable of switching between the languages effortlessly. Code-switching may occur in any bilingual speech community with any set of languages. Notwithstanding its widespread occurrence, code-switching is generally looked down upon –even by individuals that practice it- and seen as a lazy option or indicator of someone's lack of knowledge (Gardner-Chloros 2009, Zentella 1997). These attitudes make code-switching a rather stigmatized phenomenon, which needs to be taken into consideration when studying code-switching.

The sentences in (2) and (3) contain two types of code-switching: inter-sentential and intra-sentential code-switching. The speaker in (2) started his sentence in English and finished in Spanish. As the switch occurred between separate clauses, this is considered an inter-sentential switch. The speaker in (3) produced a single English word in an otherwise monolingual Spanish sentence. This is called an intra-sentential switch: multiple languages interact within a single clause. The present thesis explores intra-sentential switches, because it is interested in constructions within the determiner phrase.

(2)   My left could be your right, *o sea,*   *¿me*   *entiendes*?
                                          that is,   me   understand.PRS.2SG
        'My left could be your right, like, do you understand me?
        (Korver 2014, M2[2])

(3)   *El*   *último*   row: *yo tengo*   *cuadrado.*
        D.MASC   last.MASC   [*fila* FEM]   I have.PRS.1SG   square [MASC]
        'The last row: I have a square.'
        (Korver 2014, D9, appendix VII: 17)

The first studies into code-switching claimed that code-switched constructions are organized randomly (e.g. Gumperz 1964, 1967; Labov 1971; Lance 1975). Later studies, however, discerned patterns in code-switching (Poplack 1980). Poplack, one of the first linguists to study code-switching from a structural point of view, proposed the Equivalence Constraint (1980). This constraint states that language switches only occur

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[2] Refers to specific switch produced by a Matcher participant, cf. Appendix IV for participant information.

at linguistic sites in which none of the constituents of the interacting languages has to cross a syntactic rule. According to this principle, the switch presented in the first row in (4) is unproblematic: the constituents of both languages are organized in similar order, as illustrated by the second and third row.

(4) <u>Switched:</u> I   told him   that   *pa'que*   *la trajera*   *ligero.*

    <u>English:</u> I | told him |that | so that | he |would bring it | fast.

    <u>Spanish:</u> *(Yo)* | *le dije* |*eso* | *pa'que* | *(él)* | *la trajera* |*ligero.*

    (Poplack 1980: 586, figure 1)

Not long after its origination, the Equivalence Constraint was challenged by a number of linguists. Attested examples of code-switching indicated that it also occurred at sites where the grammars of the participating languages did, in fact, differ (Bentahilla and Davies 1983; Berk-Seligson 1986). Recent studies have focused on these so-called 'conflict sites' in order to discern patterns (e.g. Cantone and Macswan 2009; Herring, Deuchar, Parafita Couto, and Moro Quintanilla 2010; Parafita Couto, Deuchar, and Fusser 2015). It appeared that there are regularities in code-switching instances at conflict sites. Switches at conflict sites are particularly interesting because they illustrate which language or mechanism provides the structure in that phrase. Until this day, researchers are trying to account for the patterns.

Section 1.2.1 further elaborates on code-switching by briefly discussing two other language contact phenomena: code-mixing and language borrowing. Section 1.2.2 discusses the conflict sites in Spanish-English code-switching that are of interest in this study and 1.2.3 introduces two dominant linguistic approaches that try to account for patterns in conflict sites.

1.2.1 Code-switching, code-mixing, and language borrowing

Some studies have used the terms code-switching, code-mixing, and language borrowing interchangeably, while others make sharp distinctions. Muysken is one of the researchers that differentiate between code-switching and code-mixing (2004, 2013). In his opinion, code-mixing stands for the insertion of an element into an otherwise monolingual sentence, cf. figure 2, where A and B each stand for a constituent of a different language, and a and b stand for the words inside the node in that language (Muysken 2004).

Example (5) illustrates the insertion pattern: a Spanish element (*la oveja*) is inserted into an otherwise English sentence.
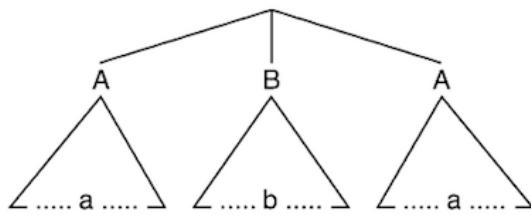
Figure 2 *Muysken's insertion pattern*

(Muysken 2004: 7, ex. 11)

(5)   So, we can put *la   oveja*   down the tree.
                        D.FEM sheep
        'So, we can put the sheep down the tree.'
        (Korver 2014, D8)

Code-switching, Muysken argues, is when there are alternating switches between two languages as in figure 3 and example (6). The example illustrates that the languages swich back and forth from Spanish to English, from English to Spanish, from Spanish to English, and finally back to Spanish. The language of the overarching constituent of alternating A and B is unspecified.
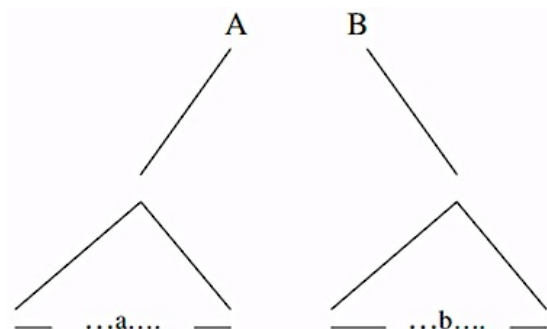
Figure 3 *Muysken's alternation pattern*

 (Muysken 2004: 7, ex. 12)

(6)   *Si tu   eres   puertorriqueño,* your father's a Puerto Rican, you should at least
        If you be.PRS.2SG Puerto Rican
        'If you're Puerto Rican, you're father's a Puerto Rican, you should at least

de	*vez en cuando,* you know,	*hablar*	*español.*	
from	time to time	speak.INDF	Spanish	

sometimes speak Spanish.'

(Deuchar, Muysken, and Wang 2008: 304, ex. 2)

This thesis makes exclusive use of the term code-switching. It thereby embraces both insertion and alternation as defined by Muysken, but remember that only intra-sentential switches are of interest.

Possible differences between borrowings and code switches were first studied by Poplack, Sankoff, and Miller (1988). They examined English second language (L2) loanwords in five francophone communities in Canada and distinguished between single-word and multi-word switches. They argued that multi-word switches were unambiguous code switches, whereas single-word switches could either be code switches, established borrowings, or 'nonce borrowings', which have not (yet) been established in the first language (L1).

Nonce borrowings form an ambiguous category because they resemble single-word code switches. This makes it difficult to assign a linguistic identity to single-word switches. Poplack et al. (1988) found similarities between single-word code switches and nonce borrowings; therefore some linguists have treated nonce borrowings as code switches. For further discussion on whether or not nonce borrowings should be distinguished from single word code switches, I refer to Stammers and Deuchar (2012), Poplack (2012), and Deuchar and Stammers (2012).

For the purposes of this thesis, I remain agnostic about the linguistic identity of single-word switches. All switched elements will be considered, as long as they are part of a mixed nominal construction.

I would like to make a final comment on two characteristics of language borrowings, 'morphological nativization' and loan translations. Morphological nativization is when a word from a L2 is incorporated into a L1 and behaves according to that grammar, for instance by conjugation (MacSwan 1997). The sentence in (7), which I heard in Puerto Rico, illustrates this. The stem of the English verb 'to trip' is borrowed, to which the common Spanish indefinite suffix –*(e)ando* is added.

(7)	*Tengo*	*mucho*	*que hacer,*	*estoy*	*tripeando*
	Have to.PRS.1SG	a lot	that do.INF	be.PRS.1SG	trip.INDF

'I have a lot to do, I'm tripping.'

It also happens that merely the pragmatics of a word from a different language are borrowed, which is called a loan translations or 'calque' (MacSwan 1997: 72). An example is 'flea market', which is translated and integrated into many other languages exactly the same.

Instances of morphological nativization and loan translations are not considered in this thesis.

1.2.2 Conflict sites in Spanish-English code-switching

As mentioned before, recent studies on code-switching have mainly focused on conflict sites, where the grammars of the languages involved differ. For most bilingual language pairs, code switches mainly appear in the determiner phrase (DP) in the form of a switch between determiners and their noun complements (Parafita Couto, Munarriz, Epelde, Deuchar, and Oyharçabal 2015: 305; Timm 1975; Pfaff 1979; Poplack 1980). Spanish and English form an interesting language pair, as their grammars allow for several conflict sites within the DP. The conflict sites that will be discussed in this thesis are concerned with adjective placement, choice of determiner language and, if the determiner is Spanish, gender in the determiner.

Adjective-noun order

In Germanic languages, such as English, adjectives are typically in pre-nominal position. This is different for Spanish and other Romance languages, in which adjectives are usually located post-nominally. This is exemplified in (8).

(8)   a. a very good meal

       b. *una*   *comida*   *muy buena*

          D.FEM   meal [FEM]   very good.FEM

          'a very good meal'

       (Zagona 2002: 89, ex. 28a)

Spanish also has pre-nominal adjectives. Qualifying adjectives may occur in pre- as well as post-nominal position, yielding different pragmatics (Bosque and Picallo 1996). The examples in (9) illustrate this.

(9)   a. *un*   *viejo*   *amigo*

        D.MASC   old.MASC   friend [MASC]

        'a long-time friend'

      b. *un*   *amigo*   *viejo*

        D.MASC   friend [MASC] old.MASC

        'an old friend'

      (Zagona 2002: 90, ex. 32b)

The adjectival use in (9a) is appositive: the adjective refers to someone that has been a long-time friend. The post-nominal adjective in (9b) illustrates the restrictive use of a qualitative adjective: it denotes the age of a friend.

    Adjectives that are not qualifying appear in a set manner: a fixed set of adjectives, such as specifiers, always appears pre-nominal, whereas relational adjectives, i.e. adjectives that show some relation to the object, always occur post-nominal (Zagona 2002). The examples in (10ab) illustrate that *varios*, a specifier, appears pre-nominally in Spanish. The phrase (11a) is grammatically incorrect: the adjective is a specific attribute of this noun, which requires the adjective to be post-nominal as in (11b).

(10)   a. *los varios libros*

       'the various books'

    *b. *los libros varios*

    (Zagona 2002: 95, ex. 48a)

(11)   *a. *un exquisito color*

     b. *un color exquisito*

      'an exquisite colour'

    (Zagona 2002: 89, ex. 28b)

Determiner assignment and gender

The article is pre-nominal in both Spanish and English. English has one definite article, 'the', and two indefinite articles, 'a' and 'an', the use of which depends on whether it precedes a consonant or vowel. The definite article can be combined with both singular and plural nouns, whereas indefinite articles only match with singular nouns.

Spanish, unlike English, has a binary masculine/feminine gender system. This means that nouns are grammatically categorized as feminine or masculine. The features of the noun (gender, number) require choice of determiner. This is illustrated in table 1 below.

Table 1 *Spanish definite and indefinite articles*

	Masculine SG e.g. *chico* (boy)	Feminine SG e.g. *chica* (girl)	Masculine PL e.g. *chicos* (boys)	Masculine PL e.g. *chicas* (girls)
Definite article	*el*	*la*	*los*	*las*
Indefinite article	*un*	*una*	*unos*	*unas*

The Spanish gender system is not only expressed through the determiner, but also through adjectives, which agree with the gender of the noun. Adjectives usually adapt feminine –*a* or masculine –*o* in concordance with gender of the noun (Harris 1991).[3] This is illustrated in (12).

(12)   a. *el chico italiano*
            'the Italian boy'
         b. *la chica italiana*
            'the Italian girl
         (Adapted examples from Harris 1991: 35, ex. 9)

1.2.3 Theoretical approaches towards code-switching

Different points of view exist about how to account for the 'contest' between the grammars of the involved languages in conflict sites. *Bilingualism: Language and Cognition* hosted a debate between proponents of two theoretical approaches that currently dominate the field (MacSwan 2005b; Jake, Myers-Scotton, and Gross 2005). Myers-Scotton, on the one hand, proposed the Matrix Language Framework (henceforth MLF). The MLF distinguishes a Matrix Language (ML) from an Embedded Language (EL) (1993). According to her model, the ML provides the morpho-syntactic frame in code-switching instances. MacSwan, on the other hand, criticizes the MLF, stating that the grammatical restrictions that define the distribution of code-switching are based on the

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[3] I refer to Harris 1991 for further information on the Spanish monolingual gender system.

grammars of the individual languages. MacSwan's theory is couched within the Minimalist Program (henceforth MP), to which a family of theories and linguists belong that employ a minimalist approach.

The following paragraphs elaborate on these two linguistic approaches to code-switching.

The Matrix Language Framework

Two main premises that underlie the MLF are the Uniformity Principle and the Asymmetry Principle (Myers-Scotton 2002). The *Uniformity Principle* is found in monolingual as well as bilingual speech. It is concerned with the preference of a uniform speech pattern structure, which makes it is an interesting tool in bilingual contexts. MLF proponents claim that code-switched elements tend to follow the ML structure. The *Asymmetry Principle* provides for this with a constructed division between a language that serves as the framework for a certain clause, and an EL that inserts elements. The asymmetry refers to a fundamental inequality between the efficiency of two or more languages inside a bilingual's language system, which facilitates code-switching (Jake and Myers-Scotton 2009).

The preference of clauses to be guided by ML rules gives material for prediction (Jake and Myers-Scotton 2009). That is, in code-switching situations where the grammars provide different structures, MLF proponents expect mixed phrases to follow the rules of the ML. Note that in one conversation, the ML can dynamically become the EL and vice versa. Therefore, alternating clauses can have alternating MLs (Jake, Myers-Scotton, and Gross 2002).

The MLF focuses on the Complementizer Phrase (CP), which roughly resembles a clause. There are two principles that allow for ML identification: the System Morpheme Principle (SMP) and the Morpheme Order Principle (MOP) (Myers-Scotton 1993).

(13)   The System Morpheme Principle:

In Matrix Language + Embedded Language constituents, all system morphemes which have grammatical relations external to their head constituent (i.e. which participate in the sentence's thematic role grid) will come from the Matrix Language.

(14)   The Morpheme Order Principle:

In Matrix Language + Embedded language constituents consisting of singly occurring Embedded Language lexemes and any number of Matrix Language morphemes, surface morpheme order (reflecting surface syntactic relations) will be that of the Matrix Language.

In other words, the SMP does not apply to *all* system morphemes, merely a subset that has 'grammatical relations external to their head constituent'. These 'outsiders', as they are called, are part of a conjugation and therefore receive linguistic information from another word in the utterance, outside the word to which the morpheme is attached. Outsiders should come from the ML. In many data sets, the SMP determines ML through inflections of the finite main verb (Myers-Scotton 1993). In (15), the SMP identifies the ML through the finite subject-verb agreement: *la próxima* (the next one) matches the inflection of the main verb. The ML, Spanish, provides this verbal agreement.

(15)   *La*   *próxima*   *es*   *el*   green square.
       D.FEM   next one.FEM   be.PRS.3SG   D.MASC
       'The next one is the green square'
        (Korver 2014, D3, appendix VII: 12)

The MOP states that in mixed constituents with at least one EL element and multiple ML elements, the surface word order will follow the order of the ML. Hence, the MOP identifies the ML through the word order of a particular CP (Myers-Scotton 1993). Elements that are not part of the frame of the clause can internally follow a different structure (Jake and Myers-Scotton 2009). Such elements, in which the EL provides the grammatical structure, are called embedded language islands. This is illustrated in (16), where the English element follows English rules for adjective placement: pre-nominal, rather than post-nominal for Spanish.

(16)   *Esto   es un*   embedded language island.
       This   is an
       'This is an embedded language island.'

Since Spanish and English are both subject-verb-object languages, and thus will have

fairly similar word order, the SMP will often prove to be the more relevant test to determine the ML from clauses in this thesis. For instance, the MOP cannot determine a ML in (16): the sentence follows subject-verb-object order, which is required by both languages. The SMP, on the other hand, notes that Spanish provides subject-verb agreement (*esto es*), which therefore makes Spanish the ML. This also highlights the working of embedded language islands: as the ML is Spanish, we would expect post-nominal adjectives (according to the rules of the ML), but the adjectives in the language island in (16) are located pre-nominally, which agrees with the rules of the English EL.

Because of the amount of linguistic information that ML identification requires, the MLF assumes that the clause or sentence is both the minimal and the maximal unit of analysis. The amount of information that is required in Myers-Scotton's framework allows for the formulation of assumptions about language production and competence (Herring et al. 2010).

The Minimalist Program
Code-switching in minimalist terms is the alternating use of the lexicons from different languages. Minimalist interpretations are based on the assumption that the same mechanisms that account for monolingual grammars can explain bilingual grammars.

Mahootian proposed the Null Theory, which states that code-switching is unrestricted as long as no constraint towards universal grammar is violated (1993). Minimalist theories therefore do not require restrictions specifically for code-switching (MacSwan 2009). Rather, linguists that employ a minimalist approach attempt to account for bilingual speakers' competence using exactly the same apparatus as for monolingual speech. In code-switching, words that originate from the separate lexicons will compose a mixed sentence.

The MP accounts for code-switching by the mechanisms of three operations: Select, Merge, and Move (MacSwan 2000). The operation Select picks words from a lexicon and places them in the numeration, a subset of the lexicon used to construct a derivation. The operation Merge uses the items in the numeration to make hierarchically arranged syntactic items. The final operation Move builds new structures of the syntactic objects formed in the previous operation. Feature checking ensures that features -such as number, person, or gender- of related lexical items match at every step. These operations indicate that features of the lexical items determine phrase structure.

MP analyses exclude inter-sentential code-switching from their approach by assuming that the clause or sentence is the maximal unit of analysis (Herring et al. 2010). MacSwan's model is purely representational for linguistic competence, with no claims as to how this relates to processing in production or comprehension (Herring et al. 2010).

The MP searches for evidence in naturalistic data, but also collects additional data through the use of judgment tasks (MacSwan 1999). Naturalistic data provides evidence of what happens in code-switching, while not all code-switching is formed correctly according to rules and patterns. At this point, additional "negative evidence" from bilinguals' judgments allows for the deduction of models that over-identify "well-formed constructions" (Cantone and MacSwan 2009: 254).

Negative evidence can be obtained by the addition of stimuli that are predicted to be non-grammatical to stimuli that are expected to be grammatical according to rules and predictions of a theoretical approach. Accordingly, it can be tested whether these false stimuli are indeed judged as wrong or less acceptable compared to the actual test stimuli. This allows for the construction of generative theories (Cantone and MacSwan 2009). However, as mentioned earlier, it should be taken into account that code-switching is a highly stigmatized phenomenon. This stigma may influence judgments towards code-switched sentences in general (MacSwan 1997). Indeed, judgment task results in a recent multi-task study into adjective-noun order in Welsh-English code-switching proved to be of limited value as they did not match the natural and elicited data (Parafita Couto et al. 2015a). The authors suggested the use of study techniques that measure less conscious reactions than those that are required in judgment tasks.

1.3 The study

Code-switching can be studied in a variety of ways, for instance sociologically, grammatically, or neurologically (e.g. Heller 1988; Herring et al. 2010; Lei, Akama, and Murphy 2014). Generally speaking, code-switching studies are divided between those that focus on social and those that focus on grammatical aspects (MacSwan 1997). Social studies explore factors exogenous to the speaker, such as the addressee or subject matter. Grammatical studies, like this thesis, aim to find regularities and patterns in code-switching. Section 1.3.1 gives a brief account of a difficulty in the collection of code-switching data, while section 1.3.2 introduces the research questions and method for this study.

1.3.1 Collecting code-switching data

The social influence on code-switching needs to be taken into account by researchers that are not member of the language community of the participants; their mere presence during the performance of research tasks may influence the desired bilingual output. Unintentional exercise of influence on data is a common difficulty for code-switching studies.

There have been several suggestions to prevent code-switching from being influenced by factors that are involved by the study of it. To begin with, it has been suggested to study written forms of code-switching. Code-switching in writing, however, is not necessarily representative of speech. Think of e.g. bilingual poetry, in which code-switching instances may be motivated by rhyme scheme. A second suggestion was to provide bilingual speakers with a recording device so that they can record themselves during everyday conversations. While this enables the study of naturalistic, uninfluenced code-switching (at least not by a researcher's presence), it has many drawbacks. It is, for instance, difficult to control for relevant switches and it takes a great amount of time to transcribe an extensive corpus (Deuchar, Davies, Herring, Parafita Couto, Carter 2014; Gullberg, Indefrey, and Muysken 2008). A third suggestion concerns the use of study techniques that target specific switches relevant for a specific study. The data that this yields are consequently considered (semi-) *controlled*, rather than naturalistic or spontaneous.

The best way to avoid the involuntary influence problem is to use a multi-task approach (Gullberg et al. 2008). Doing so, a researcher is able to gather (semi-) naturalistic speech, but also controlled data. The present study employs a multi-task approach by combining a semi-controlled technique with a controlled study technique. The first is the 'director-matcher task', also referred to as the 'toy task' (Gullberg et al. 2008). In this task, two participants are asked to play a game together. Although their speech is free, its content is restricted. This is because of the carefully chosen toys used in the game to elicit certain linguistic constructions. Toy task data therefore fall under semi-controlled study techniques. The second task is an acceptability judgment task. The aim of this task is for each participant to individually rate recorded sentences on a Likert scale from 'always unacceptable' to 'always acceptable' or an equivalent of these values (Gullberg et al. 2008). The tasks will be discussed in more detail in chapter three.

1.3.2 Research questions

The differences between Spanish and English grammar for adjective-noun order and gender assignment in determiners (section 1.2.2) provide an interesting context for a study into conflict sites in code-switching. I will test the predictions of two theoretical approaches to data gathered in Puerto Rico to establish which hypotheses are borne out. The following research questions will be addressed:

1. How do Spanish-English bilinguals resolve adjective-noun order in code-switching situations?
2. What determiner-noun combinations are possible? If the determiner is in Spanish, what are the gender assignment mechanisms?
3. To what extent do the MLF and MP cover the data and are their predictions accurate?
4. To what extent is production of and are judgments towards gender assignment in code-switched DPs influenced by early versus late bilingualism?

The next chapter is concerned with the formulation of hypotheses to the research questions.

1.4 Thesis overview

The next chapter provides an overview of the literature that forms the background for this thesis. It presents the reader with hypotheses to the research questions. The third chapter elaborates on the method that is employed to collect data. The chapter contains a section that describes the tasks (3.1) and a section that goes into procedure and methodological considerations (3.2). In the fourth chapter, I present the results of my study. The chapter is divided into several sections: the first entails data from the background questionnaire and thus gives insight into the participants in this study (4.1), the following sections present the data for each research question separately. The fifth chapter answers the research questions and discusses the findings of this study. It also indicates how the main findings, where possible, fit into the existing literature and gives suggestions for further research. A final chapter concludes this thesis.

2 Literature review

There are several theoretical approaches that attempt to account for patterns in code-switched conflict sites, where the grammars of the languages involved differ. As introduced in the previous chapter, I compare the predictions of two approaches that currently dominate the field of studies into conflict sites: the MLF and a minimalist approach. Proponents of the MLF, proposed by Myers-Scotton, believe in an asymmetrical relationship between the two languages that are involved in code-switching, yielding a matrix language and an embedded language (Myers-Scotton 1993). In general, proponents of the MLF argue that the pattern in a code-switched clause follows the grammatical rules of the ML, which is determined by the SMP or MOP principle. Analyses belonging to the MP are based on the idea that there are no constraints on code-switching per se, but that universal grammar should be respected.

This chapter formulates hypotheses for the research questions that were introduced in section 1.3.2. Adjective-noun order is discussed in section 2.1 and choice of determiner language in 2.2. The sections on MLF refer to mixed nominal constructions as noun phrases (NPs) rather than DPs, as the MLF sees the noun –and not the determiner- as the head of such phrases (Myers-Scotton 2002).

The MLF and MP do not make predictions about gender assignment, therefore section 2.3 draws on other approaches in order to formulate predictions regarding conflict resolution for gender assignment in the determiner. Section 2.4 hypothesizes the relative coverage and accuracy for the MLF and MP. The hypotheses that are established in sections 2.1 through 2.4 will be summarized in 2.5.

2.1 Adjective-noun order

The first subsection discusses MLF predictions for word order, the second explores the predictions according to the MP approach that will be employed.

2.1.1 MLF: Following the ML

According to the MLF model, the language of the main grammatical frame of a sentence determines the grammatical rules for that particular sentence. Hence, the order of adjective-noun constructions is determined by the language that is identified to be the

ML. If SMP and/or MOP analysis determines a Spanish ML, the noun should follow Spanish grammatical rules for word order. An English ML will require a pre-nominal adjective. Adjective placement is thereby merely dependent on the ML, and is not affected by the language of the adjective. In (17a), the SMP identifies a Spanish ML, because the Spanish inflection on verb (*está*) agrees with the subject (*ese paño* blue). The adjective is, accordingly, located post-nominally. The English ML in (17b) causes pre-nominal adjective placement.

(17) a. ¿*Dónde está ese paño* blue?　　　　noun-adjective　　　ML Spanish

　　　b. Where is that *azul* cloth?　　　　　adjective-noun　　　ML English

　　　c. ¿*Dónde está ese* blue cloth?　　　　adjective-noun　　　ML Spanish

　　　　'Where is that blue cloth?'

(Adapted from Arias and Lakshmanan 2005: 105, ex. 5c)

Remember from section 1.2.3 that embedded language islands –which are not part of the frame of the clause- are permitted to internally follow a different structure. Hence, the sentence in (17c) is also allowed by MLF predictions. A recent study by Parafita Couto and Gullberg (manuscript) investigated determiner-noun-adjective constructions in Welsh-English, Spanish-English, and Papiamento-Dutch code-switching and found that DPs with adjective-noun islands appeared more frequent than DPs that had a switch between the adjective and the noun. For Spanish-English, they found that Spanish determiners were followed by English islands, rather than the reversed.

2.1.2 MP: Underlying word order structures

For MP predictions regarding adjective-noun order in code-switching, this thesis employs the analysis of Cantone and MacSwan, two linguists within the MP. Cantone and MacSwan build on an earlier proposal made by Cinque. According to Cinque, a Universal Base determines word placement (1995, 2005). He states that in that Universal Base, adjectives universally precede nouns. The previous chapter indicated that this is the case for English, but not for Spanish (cf. section 1.2.2). The different surface word order for Romance languages, including Spanish, is the result of overt movement of the noun so that it raises across the adjective. The following paragraphs elaborate on this.

　　　Heads (words), such as nouns, may undergo movement in order to value their features (e.g. of case). Such movements may be covert or overt. Covert movements are

driven by weak features and do not result in a surface order that is divergent from the Universal Base. This is the case for English, as is illustrated with the help of (18). English agreement (Agr) has a weak Extended Projection Principle (EPP) feature, so the noun phrase (NP) values it features covertly and can stay in situ (Cantone and MacSwan 2009).

(18)

(Own example)
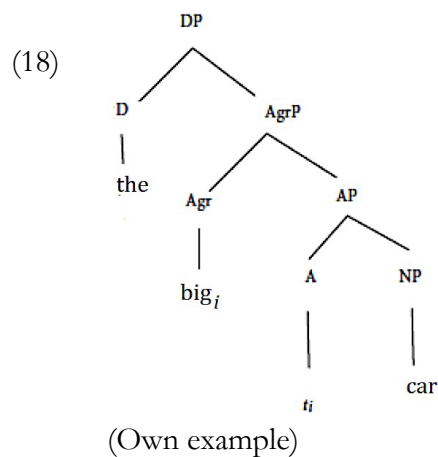
Overt movements from the noun to a position above the adjective are triggered by strong features and result in a visible difference at the surface order. This movement is due to a strong EPP feature, which requires the strong feature to be checked in a higher position (Hornstein, Nunes, and Grohmann 2005). The result is a phrase in which the noun precedes the adjective in the eventual surface level (Cantone and MacSwan 2009). So, in Spanish, the noun has overtly moved from the lower NP position in adjective phrase (AP) to the higher NP position in AgrP due to the strong EPP feature of Agr. The resulting movement is demonstrated with an arrow in (19):

(19)
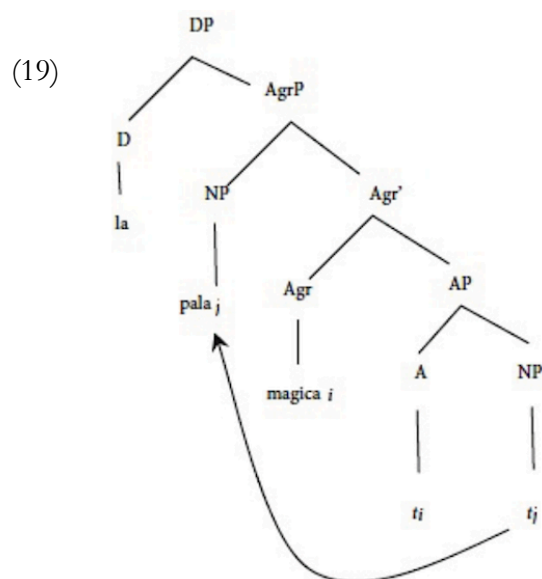
('the magic shovel', Cantone and MacSwan 2009: 268, ex. 16)

The covert movement in English and the overt movement in Spanish accounted for the descriptive generalization that the language of the adjective determines adjective-noun order (Cantone and MacSwan 2009; MacSwan 2013).

Hence, if a clause includes an English adjective, I expect it to be located pre-nominally, as in (20a). If a clause includes a Spanish adjective, I expect it to be in post-nominal position, as in (20b).

(20) a. *el*   big *coche*
   D.MASC   car [MASC]
   'The big car'
  b. *la*   *pala*   magic
   D.FEM shovel [FEM]
   'The magic shovel'

The analysis of Cantone and MacSwan is supported by their study on German-Italian code-switching (2009). This language pair, like Spanish-English, consists of a Romance language with post-nominal adjectives (Italian) and a Germanic language with pre-nominal adjectives (German).

2.2 Language of the determiner

The subsection below presents MLF predictions for language of the determiner (2.3.1). It is followed by an elaboration on MP predictions (2.3.2).

2.2.1 MLF: Following the ML

According to the MLF, the language of the determiner in code-switched NPs should come from the ML (Herring et al. 2010). Consider the following sentences in (21):

(21) a. *ya*   *empezó*   *el*   spring break
   already begin.PST.3SG D.MASC
   'The spring break already began'
  b. because your mom's a *vieja*
           old_lady [FEM]
   'Because your mom's an old lady.'
   (Herring et al. 2010, 560, ex. 8 and 9)

Because Spanish and English have the same word order in the phrases in (21), the MOP is not a useful principle to determine the ML. The SMP, on the other hand, does help in distinguishing the ML for both sentences: the suffix on the verb in (21a), *empezó*, matches the subject of the sentence, therefore the ML is Spanish and the determiner is in line with the prediction; (21b) includes English subject-verb agreement ('your mom is') and therefore the language of the determiner, English, is the same as the ML.

2.2.2 MP: Valuing phi-features

It has already been stated that the Spanish language has a binary gender system and English does not. Using phi-features for determiners (D) in (22) and nouns (N) in (23), this can be depicted as in (22) and (23):

(22)   a. Spanish D, phi = {person, number, gender}
         b. English D, phi = {person, number}

(23)   a. Spanish N, phi = {person, number, gender}
         b. English N, phi = {person, number}

Chomsky proposed a minimalist analysis in which the determiner receives its features when it seeks agreement with the noun, which has inherent features (2000, 2001). In order to agree with the noun, a determiner is able to delete and value its own features. Because a determiner is able to delete its own features, (24a) would work in code-switching situations. In contrast to (24b), the first combination allows the Spanish determiner to value its features (MacSwan 2005a):

(24)   a. Spanish D, phi = {person, number, gender}
             English N, phi = {person, number}
         *b. English D, phi = {person, number}
             Spanish N, phi = {person, number, gender}

The ungrammaticality from the construction in (24b) follows from the lack of an inherent third feature to the English determiner, gender, due to which it cannot seek agreement with the noun.

The importance of feature checking led to the Grammatical Features Spell-Out Hypothesis (Liceras, Spradlin, Senn, Sikorska, Fernández, and De la Fuente 2003), which states that bilinguals will indeed combine a Spanish determiner with an English noun while the reversed is virtually non-existent.

The lack of the gender feature on English determiners resulted in the descriptive generalization that in Spanish-English code-switching, the determiner will mainly come from the Spanish language (Moro Quintanilla 2014; also found by Parafita Couto and Gullberg manuscript).

2.3 Gender assignment

MLF and MP approaches regarding the determiner only make predictions about language, not gender. This is problematic, because if Spanish provides the language of the determiner, it is unspecified which gender should be assigned to the determiner, i.e. if *el* or *la* should be produced. To illustrate, the MLF would account for both determiners in (25).

(25)   *Est-o*   *es*   *el /*   *la*   example.

        This-MASC   be.PRS.3SG   D.MASC   D.FEM   [*ejemplo* MASC]

        'This is the example.'

        (Own example)

In a study into code-switching from a minimalist perspective, Parafita Couto and Putnam found that Spanish masculine determiners can accompany any English noun. Feminine determiners, on the other hand, may only appear in combination with an English noun that has a Spanish, feminine translation equivalent. This is summarized in (26). The only combination that their finding rules out is a feminine determiner with a noun that has a masculine translation equivalent.

(26)   a. *el*   book   BUT NOT   *la   book

         D.MASC   [*libro* MASC]   D.FEM

        b. *el*   table   AND   *la*   table

         D.MASC   D.FEM   [*mesa* FEM]

        (Parafita Couto and Putnam: ex. 2)

The following paragraphs explore what earlier studies have found regarding gender assignment in mixed DPs. Note that they are written from neither a MLF nor MP perspective.

In 1982, the first researchers into Puerto Rican Spanish-English code-switching focused on gender assignment (Poplack, Pousada, and Sankoff 1982). They found that three factors predominantly influence gender assignment in the determiner: animate referents, translation equivalents, and phonological suffixes. The first concern nouns that receive gender according to physiological sex of the animate referent. For instance, the Spanish equivalent of 'the journalist', as illustrated in (27), receives its gender based on the animate referent. If the noun refers to a masculine person, it will receive a matching masculine determiner. Feminine referents, on the other hand, require feminine *la*.

(27) *el*   */ la*   *periodista*
      D.MASC   D.FEM   journalist
      'the journalist'
      (Own example)

The second factor is concerned with the translation equivalent of the noun. The English nouns in (28) received a determiner that is analogue to the gender of their Spanish equivalents. This analogical criterion is formalized as the Gender Double-Feature Valuation Mechanism (Liceras, Fernández Fuertes, and Klassen in press: 4).

(28) a. *el*   building   b. *la*   butterfly
      D.MASC   [*edificio* MASC]   D.FEM   [*mariposa* FEM]
      'the building'   'the butterfly'
      (Poplack et al. 1982: 11)

The third factor concerns nouns with phonological shapes in one language that would signal a certain gender according to the grammar of the other language. In Spanish, most nouns have typical gender endings, such as *–o* (masculine) and *–a* (feminine), but also consonants such as *–r* and *–n* (both masculine) (Jake et al. 2002: 83). This means that if an English noun ends in *–a*, as in (29) , it will probably be marked as feminine and therefore receive a Spanish feminine determiner.

(29)   *la*   orchestra

D.FEM   [*orquesta* FEM]

Note that some determiner assignments can be accounted for more than one explanation. For instance, (29) is also congruent with the analogical gender as 'orchestra', *orquesta*, is also feminine in Spanish.

Poplack et al. (1982) found that, when applicable, physiological sex overrides the other factors. Phonological shape, when applicable, has great influence on determiner assignment in Puerto Rican code-switched DPs as well. The analogical criterion applied to 84% of the cases in produced Puerto Rican code-switched DPs. Of all switches that were analogically masculine, 97% were assigned masculine gender. This number was lower for analogically feminine nouns, of which 78% were assigned feminine gender. A later study into gender assignment found that the analogical criterion has more influence than phonological shape in Spanish-English mixed DPs (Jake et al. 2002).

Jake et al. (2002) found that if the gender of the determiner could not be explained by any of the three factors discussed above, the determiner is likely to have been assigned the default gender of the host language, or matrix language.

Studies on monolingual Spanish grammar and language acquisition established that masculine is the default gender in Spanish (Roca 1989, Harris 1991). The instance in (30) demonstrates how it can be determined that masculine is the default gender in monolingual Spanish.

(30)   *Tienes*   *demasiados*   *"paras" en ese párrafo;*
        'You have   too many.MASC   "paras" in that paragraph;

        por ejemplo,   mira: este   "para" está de más.
        for example,   look: this.MASC   "para" is superfluous.'
        (Harris 1991, 43, ex. 20)

The preposition *para* means 'for' and is inherently genderless. The adjectives *demasiados* and *este* have no trigger to take on masculine gender. Still, they show unambiguous masculine concord. It follows that masculine is the default gender.

The unmarked gender in code-switching is dependent on the host language or on established community norms that may vary per code-switching society (Valdés-Kroff in

press). Poplack et al. (1982) affirmatively found that norms for Spanish-English code-switching in New York differed from code-switching or even monolingual norms in Madrid, and that norms for French-English code-switching in Montreal differed from those in Paris. Hence, conclusions drawn in this thesis are restricted to Puerto Rican Spanish-English code-switching.

The default status of masculine gender in Spanish has implications for studies into bilingualism. A variety of studies into Spanish-English code-switching acknowledged a basic asymmetry between the languages to establish the host language and the matching default gender (Jake et al. 2002; Liceras et al. in press; Valdés Kroff in press; Eichler, Hager, and Müller 2012). Some found that Spanish masculine determiners were combined with English nouns of which the translation equivalent was feminine, while Spanish feminine determiners were not combined with English nouns with a masculine translation equivalent (e.g. Montes-Alcalá and Lapidus Shin 2011, Dussias et al. 2013).

Cantone and Müller studied gender in Italian-German code-switched DPs (2008). They argued that the gender of the noun is switched along with the language of the noun. This will be illustrated in (31) below (Italian in italic text). The Italian determiner in (31a) carries masculine gender due to the masculine gender on the German noun. This is interesting, because (31b) illustrates that the noun's translation equivalent in Italian is feminine. It follows that the Italian sentence in (31a) did not only switch to German, but also adapted the determiner to match the gender of the German noun. Hence, the noun's gender switches together with the language. In (31c), the determiner has taken on feminine gender as a consequence of the insertion of an Italian, feminine noun. The same noun is masculine in German, cf. (31d). It follows that all determiners carry the gender feature of the (switched) noun.

(31)   a. *Ho mangiato un*   apfel
                   D.MASC   [MASC]
         b. *Ho mangiato una*   *mela*
                   D.FEM   [FEM]
         c. Ich habe eine   *mela*   gegessen
                   D.FEM   [FEM]
         d. Ich habe einen   apfel   gegessen
                   D.MASC   [MASC]
         ('I ate an apple', Cantone and Müller 2008: 812, ex. 1-4)

Cantone and Müller's finding implies that gender features can be transmitted across languages in bilingual utterances.

Other code-switching studies focused on a contrast between early bilinguals, who have learned two languages simultaneously from birth or since early childhood, and late bilinguals, who learned a sequential second language (L2) post-childhood. They found several extra-linguistic factors that influence gender assignment in code-switching. For instance, Valenzuela, Faure, Ramirez- Trujíllo, Barski, Pangtay, and Diez (2012) studied to what extent early and late bilinguals differed with respect to preference regarding gender assignment in Spanish-English code-switching. They found that early bilinguals combined masculine determiners with English nouns that had feminine translation equivalents more often than did L2 English speakers. The authors argued that early bilinguals possibly consider switches within the DP as borrowings and therefore assign them masculine default gender. This is an interesting suggestion, but falls without the scope of this thesis as I refrain from distinguishing between (nonce) borrowings and single-word code-switches.

Affirming the finding of Valenzuela et al., an earlier study found that early bilinguals prefer assignment of the default gender, whereas late bilinguals prefer meeting the analogical criterion (Liceras, Fernández Fuertes, Perales, Pérez-Tattam, and Spradlin 2008).

2.4 Coverage and accuracy

The reason behind the comparison of two theoretical approaches is to test their potentially conflicting predictions towards code-switching and evaluate their relative coverage and accuracy (Herring et al. 2010). Coverage of a model refers to the amount of (extracted) data that can be used to test predictions. Accuracy is defined by the correctness of the predictions for attested examples.

A study by Herring et al. (2010) found that MP predictions are able to cover for more data than MLF predictions, as the MP requires a minimal unit of analysis. This means that even if a participant produces single DPs without further linguistic context, these utterances can be analysed. The MLF, on the other hand, needs additional linguistic context to determine the ML in order to make predictions. This divergence is exemplified with the help of (32). The MP prediction considers the determiner in this Spanish-English switched phrase, notices that it is in Spanish, and evaluates that as correct since this combination allows the determiner to value its features (as discussed in

section 2.2.2). MLF predictions, on the other hand, cannot be evaluated because the phrase contains too little linguistic information to identify a matrix language: for instance, there is no verb to determine subject-verb agreement.

(32)   *la*   thesis
         D.FEM   [*tesis* FEM]
         'the thesis'
         (Own example)

Previous studies have already tested MLF and MP analyses to code-switched DPs. Parafita Couto et al. (2015a) performed a study on adjective-noun order in Welsh-English code-switching. Welsh has post-nominal adjective placement, whereas English has pre-nominal adjective placement. It was found that the MLF relatively accounted for more naturalistic and elicited data than the MP, although the MP and MLF approach only differed for a small amount of stimuli. A more recent study examined adjective-noun order in Dutch-French code-switching and found support for the MP (Vanden Wyngaerd 2016). Sentences that were predicted to be grammatical by this theoretical approach were scored significantly more positively than sentences that were predicted to be ungrammatical. Such a difference was not found for the MLF approach.

Herring et al. (2010) tested MLF and MP predictions to the language of the determiner in naturally occurring Spanish-English and Welsh-English code-switching. Their data provided support for the predictions of both analyses and show no statistical difference between their accuracy. This study did not look into gender assignment. Fairchild and Van Hell (2015) also explored predictions from both theoretical approaches to the language of the determiner in Spanish-English determiner-noun constructions. The MP expects a Spanish determiner and the MLF does so when there is a Spanish ML. However, it was found that Spanish determiner - English noun combinations were not processed easier than other combinations and that adding a ML did not have an effect on this processing. Therefore, their study supported neither of the theoretical models. They were able to account for this by the WEAVER++ model (cf. Fairchild and Van Hell 2015 for more information on this model).

2.5 Summary of predictions

The following tables summarize the hypotheses that have been established in the previous sections. Table 2 provides the hypotheses for adjective-noun order, table 3 for choice of determiner language, and table 4 for gender assignment in the determiner. The final paragraphs make some additional comments related to the predictions for gender and related to coverage and accuracy for the MLF and MP approach.

Table 2 *MLF and MP predictions for adjective-noun order*

	MLF	Cantone & MacSwan
Spanish pre-nominal adjective, e.g. *azul* cloth	✓ if ML is English	X
Spanish post-nominal adjective, e.g. cloth *azul*	✓ if ML is Spanish	✓
English pre-nominal adjective, e.g. blue *paño*	X if ML is Spanish	✓
English post-nominal adjective, e.g. *paño* blue	X if ML is English	X

Table 3 *MLF and MP predictions for language of the determiner*

	MLF	Cantone & MacSwan
English determiner, e.g. a *vieja*	✓ if ML is English	X
Spanish determiner, e.g. *el* spring break	✓ if ML is Spanish	✓

Table 4 *Predictions for gender assignment in Spanish determiners*

Influences on gender assignment	Examples
Physiological gender (sex of referent)	*el* journalist / *la* journalist
	el periodista / *la periodista*
Analogical gender (translation equivalent)	*el* building / *la* butterfly
	el edificio [MASC] / *la mariposa* [FEM]
Phonological shape (typical suffix)	*la* orchesta
	la orquesta [FEM]

In addition to what is enlisted in table 4, I expect to find combinations in which masculine determiners are combined with nouns that have feminine translation equivalents, but not the reversed (*el* house, cf. *la casa* [FEM]). This has to do with the influence of **default masculine gender** in Spanish grammar.

I also hypothesize that constructions in which a masculine determiner is combined with a noun with a feminine translation equivalent are used more often by **early bilinguals** than **late bilinguals**. The former prefer assignment of default gender, whereas the latter prefer meeting the analogical criterion.

Coverage and accuracy
I expect that the MP will cover more data, as it is able to make predictions about a minimal unit of analysis.

Earlier studies that tested the accuracy of the two theoretical approaches showed divergent results. For adjective-noun order, one study found slight support for the MLF, whereas a second study found significant support for the MP approach. For the language of the determiner, one study found support for both approaches, while the results of a second study did not align with either theoretical approach. It is evident that the debate between the two approaches has not been solved (yet).

Chapter one and two established the research questions and hypotheses. The next chapter goes into the method that is employed to obtain semi-controlled and controlled data, which are going to be tested against the hypotheses.

3   Methodology

This chapter gives an overview of the methods that are used for the collection of data. It starts with a section that describes the tasks from the multi-task approach, comprising (1) a referential communication task for the collection of semi-natural speech and (2) an acceptability judgment task for experimental data. A second section discusses procedure and methodological considerations.

3.1 Task descriptions

I used tasks with varying degrees of spontaneity and restrictiveness. This generates data that provides evidence of (1) what is produced and judged as acceptable by Spanish-English bilinguals and (2) what is judged as unacceptable, yielding negative evidence (as explained in section 1.2.3). The semi-controlled and controlled data can be compared to rules and predictions as established by the MLF and MP and theories concerning gender assignment.

The subsections below discuss the two tasks that are employed in this study: the director-matcher task (3.1.1) and the acceptability judgment task (3.1.2). Subsection 3.1.3 addresses the background questionnaire that was distributed amongst participants.

3.1.1 Director-matcher task

In the director-matcher task, pairs of bilinguals work together to complete a game-like task. Because the task uses toys, it is also referred to as the 'toy task'. As shown in figure 4, two participants sit in front of each other but are separated by a cardboard, which is there so that the participants cannot see each other's toys. The participants each face a grid that contains sixteen everyday objects differing in size and color. Both grids contain identical objects, but display them in a different order. The goal of the task is to end up with two identically arranged grids.

Figure 4 *Participants completing the toy task*

At the beginning of the task, the participants are assigned roles: one becomes 'director', the other 'matcher'. The director participant does not touch the items on his/her board, but verbally instructs the matcher how to rearrange the objects on his/her board so that both grids will match in the end. There is no set time in which the participants have to complete the task (Gullberg et al. 2008). Also, directors are free to decide in what specific manner they want to instruct the matcher: some make up a story, others refer to rows and columns as A1 – D4 and play something that resembles 'battleship', yet others merely list the items from left-to-right, top-to-bottom. In order to minimize the potentially influencing effects of my presence, I made sure to leave the room when the task was ready to be performed. Section 3.3 will further elaborate on this and other methodological considerations.

As was introduced in 1.3.1, the toy task aims is to collect semi-controlled data from conversations between bilinguals. It does so with the help of elicited conversation tasks. The setup is manipulated in such a way that the participants are likely to produce utterances that are of interest in the particular study (González-Vilbazo, Bartlett, Downey, Ebert, Heil, Koronkiewicz, and Ramos 2013). Therefore, toy task data are considered semi-controlled (Gullberg et al. 2008).

In the present study, mixed DPs –including adjectives- are targeted to elicit data that contains the conflict sites of word order and determiner assignment. Table 5 presents the binary pairs of items that are used to trigger switches. Six DPs include two adjectives, one for colour and one for size. This is to investigate whether the amount of adjectives influences adjective placement: perhaps there will be instances in which one will be placed pre-nominally (according to English rules) and the other post-nominally

(according to Spanish rules).

Table 5 *Items used in the toy task*

English	Spanish
Red heart	*Corazón rojo* (MASC)
White heart	*Corazón blanco* (MASC)
Big tree	*Arból grande* (MASC)
Small tree	*Arból pequeño* (MASC)
Red book	*Libro rojo* (MASC)
Blue book	*Libro azul* (MASC)
Green / small square	*Cuadrado verde / pequeño* (MASC)
Red / big square	*Cuadrado rojo / grande* (MASC)
White sheep	*Oveja blanca* (FEM)
Grey sheep	*Oveja gris* (FEM)
Blue / big chair	*Silla azul / grande* (FEM)
Black / small chair	*Silla negra / pequeña* (FEM)
Green / big table	*Mesa verde / grande* (FEM)
Red / small table	*Mesa roja / pequeña* (FEM)
Pink hand	*Mano rosa* (FEM)
White hand	*Mano blanca* (FEM)

The table illustrates that I used four nouns that are masculine in Spanish (heart, square, tree, book) and four nouns that are feminine in Spanish (sheep, chair, table, hand). It is interesting to see what determiners will be assigned to the nouns. This enables the study of gender assignment mechanisms in the determiner.

Four of the eight English nouns have phonological endings according to Spanish grammar ('square', 'hand', 'chair', 'table'). These phonological shapes could influence gender assignment. Two of these typical endings match the gender of the translation equivalent of the noun (masculine ending /r/ in 'square' and feminine ending /d/ in 'hand'), and the other two do not match the gender translation equivalent of the noun (masculine ending /r/ in 'chair' and masculine ending /l/ in 'table'). The latter two, if produced in a code-switched context, provide the opportunity to explore which factor has more influence: phonological shape or analogical gender.

Finally, the nouns and adjectives are chosen carefully. The nouns have

unambiguous translation equivalents in both languages. This means that for instance 'battery' could not be used, as this translates to *la batería* as well as *la pila*. Regarding adjectives, I made sure to avoid the use of toys that required adjectives that only exist in the English form in Puerto Rican Spanish, such as 'brown'. There is no brand name, title, or other text on the toys, to avoid any references to the items by their brand names.

3.1.2 Judgment task

Controlled data acquisition can be applied to several types of switches. In the present study, I am concerned with switches at the sentence level. The sentence level requires study techniques that focus on internally created switches by bilingual speakers. They vary from silent reading tasks in which eye movement is followed, to free speech in 'code-switch-mode' assignments in which participants can talk freely over a subject, to neurocognitive methods, which make use of bilingual processing through ERP (electrophysiological) techniques (Gullberg et al. 2008). The task that will be used in this study is the judgment task.

Some tasks that are involved with the acquisition of controlled data employ an 'offline' method, while others employ an 'online' method. The former do not have a time limit and require a bilingual's well-considered answer to a certain question. The latter do have a set time limit, in which response time is measured in order to rate speakers' acceptance of stimuli (Gullberg et al. 2008).

Traditionally, grammaticality and acceptability judgment tasks are off-line tasks. They consist of written sentences that need to be judged. Participants can be asked to assess grammaticality (whether or not the switch grammatical) or acceptability (degree to which the switch is acceptable) of stimuli (e.g. Bhatia and Ritchie 1996; Sobin 1984). Participant judgment is used to analyse their competence.

More recent studies incorporate auditory versions of the judgment task, in which participants hear instead of read the sentences. The auditory aspect is a useful tool to prevent the sentences from being judged based on what the participants read instead of hear. This is important because written stimuli may evoke prescriptive attitudes about code-switching as it usually happens in speech. Therefore, written sentences are disposed to receive stronger negative judgments. Recorded sentences, moreover, may be combined with questions of familiarity, such as: "does this sentence sound like something you might have heard?" (Gullberg et al. 2008: 14).

Taking the aforementioned into account, the present study incorporates an

auditory, acceptability judgment task. Acceptability judgments are usually rated on a Likert scale represented in the form of smileys. The Likert scale that is used in this study is shown in figure 5. They survey is created using Qualtrics, an online survey tool.[4]

Figure 5 *Likert scale used in this study*

The number of choices on a Likert scale –even or uneven- is a debated topic, because it somewhat guides the responses. The presence of a neutral mid-point, i.e. with an uneven number of options, has indicated an avoidance of the extreme left or right options. An even amount of choices, on the other hand, has been argued to force the participants to favour either end of the scale (e.g. Garland 1991). However, respondents are found to rather not respond to a question if there is no neutral option, than to "pick sides" (Guy and Norvell 1977: 203). This can be circumvented if the researcher uses a digital survey tool that is able to force responses.

Although some researchers argue that a middle category represents uncertainty and "grammatical indeterminacy," the present study does incorporate a mid-point (Tremblay 2005: 139, 140). This decision is made because the middle option is given an explicit interpretation that does not necessarily indicate grammatical indeterminacy: it means that the particular sentence may, in fact, be accepted in certain social settings but less, or not at all, in others.

The interpretations of the five smiley buttons as presented to the participants are listed in table 6. The interpretations of the smileys are translated into grades ('score', table 6) for further analysis. It follows that a low mean score corresponds to a high level of acceptance towards a stimulus, and vice versa.

Table 6 *Likert scale for judgment task*

Smiley	Description	Score
😊	Always permitted	1

---

[4] Link to survey: https://uleidenss.eu.qualtrics.com/SE/?SID=SV_9pHpQDGEI8uhkep

🙂	Almost always permitted	2
😐	Sometimes permitted	3
🙁	Almost never permitted	4
😩	Never permitted	5

Stimuli

Although judgment tasks can be used for several linguistic levels, the present study is concerned with the sentence level (to allow MLF predictions). Therefore, full sentences function as stimuli. Judgment tasks usually consist of test stimuli, which are directly related to the research purpose and filler stimuli, which function as distractors.

The current task consists of 108 bilingual sentences, of which 84 are stimuli and 24 are fillers. The fillers are 24 bilingual sentences that contain verb-adverb switches, unlike the DP-internal switches that are of interest in this thesis. It is crucial that the distractors are bilingual sentences just like the test sentences, so that the participants do not take particular notice of switched sentences. All sentences are checked for naturalness by a Puerto Rican Spanish-English bilingual. I also arranged that she would read the sentences out loud, so that I could record her. These recordings were used in the judgment task. Her involvement in the checking and recording process is crucial, because ill-formed sentences may be judged as unacceptable due to external influences such as lexical differences or pronunciation rather than the switch. The actual test stimuli are divided into two types:

- Type 1 stimuli are 72 sentences that contain complex DPs with a determiner, adjective, and a noun.
- Type 2 stimuli are 12 sentences that contain simple DPs with a determiner and a noun.

The paragraphs that follow will elaborate on their internal division.

An extensive list of the stimuli is provided in Appendix I: A (test stimuli type 1), B (test stimuli type 2), and C (distractors). For the type 1 and type 2 stimuli it is also specified whether the stimuli are grammatical (✔) or ungrammatical (X) according to MLF and MP predictions.

Type 1 stimuli contain mixed complex DPs in object position. The goal of these sentences is to look at degrees of acceptability towards noun-adjective word order,

language of the determiner, and gender assignment. Regarding the latter, it is decided to control for analogue and default gender and leave the factors of physiological sex phonological shape out of consideration. The reason behind this is that the stimuli otherwise become too complex.

Figure 6 below indicates the way in which the stimuli are constructed. The basis is formed by: English noun with a masculine translation equivalent, English noun with a feminine translation equivalent, Spanish masculine noun, and Spanish feminine noun. These nouns are each combined with a Spanish feminine determiner, a Spanish masculine determiner, or an English determiner. These combinations allow for judgments regarding determiner-noun combinations for language and gender. A next step inserts adjectives into the DPs so that they allow for adjective-noun order judgments. English nouns are combined with Spanish post-nominal and pre-nominal adjectives and Spanish nouns are combined with English post-nominal and pre-nominal adjectives. As follows from the figure, 24 stimuli are established as such. As each category that is illustrated below occurs twice, once in a Spanish ML and once in an English ML, we now have a subtotal of 48 stimuli.
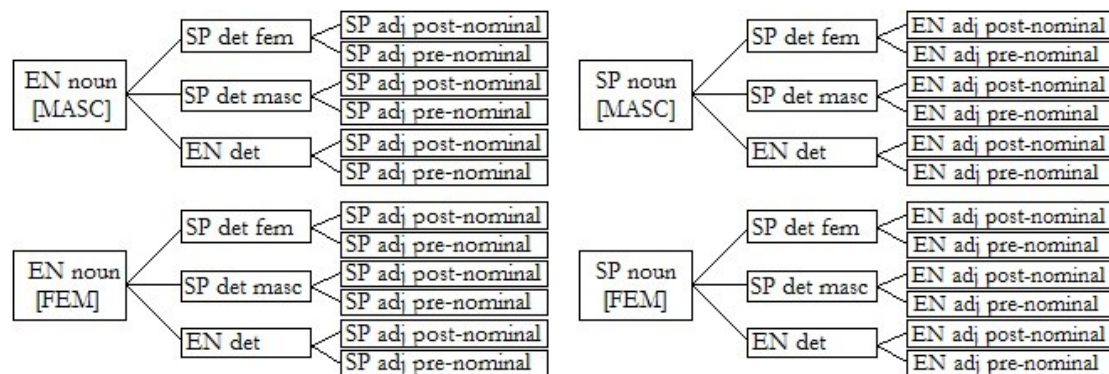
Figure 6 *Division of type 1 stimuli (switch between adjective and noun)*

The 48 stimuli discussed in the previous paragraph all have a switch between the language of the adjective and the language of the noun. I am, however, also interested in islands that have the noun and adjective in the same language, as illustrated in (33).

(33)   [SP det]   + [EN noun + adj]

        [EN det]   + [SP noun + adj]

The constructions that go with this pattern are illustrated in figure 7 below. Again, there

is an English noun with a masculine translation equivalent, an English noun with a feminine translation equivalent, a Spanish masculine noun, and a Spanish feminine noun. This time, these nouns are only combined with determiners from the other language (remember from (33)). Finally, adjectives in the same language as the noun are added both post-nominally and pre-nominally. All categories occur twice: once in a Spanish ML sentence, once in an English ML sentence. This means that 24 complex stimuli are constructed as such. These 24 language island sentences together with the 48 mixed adjective-noun sentences make for 72 complex stimuli.
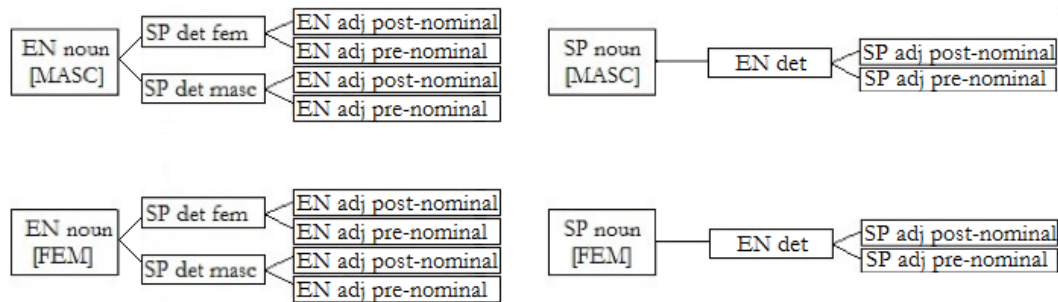
Figure 7 *Division of type 1 stimuli (adjective-noun islands)*

Type 2 stimuli concern simple DPs in object position as they focus solely on determiner-noun combinations. They are additional to the type 1 stimuli as they explore what happens in sentences that are not potentially influenced by the presence of an adjective. Figure 8 (cf. Appendix I: B, BN1-3, BN7-9) and figure 9 (cf. Appendix I: B, BN4-6, BN10-12) illustrate the division of stimuli. Each category as presented in the figures appears in the judgment task once.

It follows from figure 8 that there are four stimuli (first two branches; stimuli BN2-3, BN8-9) that have the determiner and noun in the same language. These sentences with determiner-noun islands function as fillers.
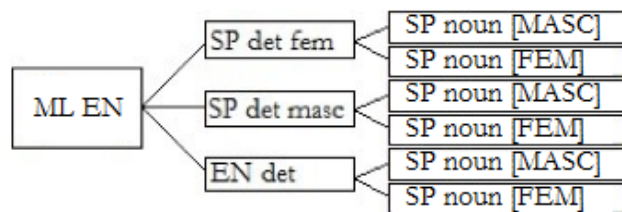
Figure 8 *Division of type 2 stimuli: ML English*
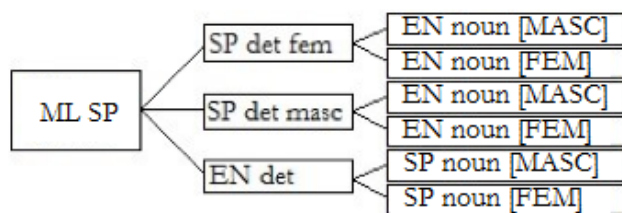
Figure 9 *Division of type 2 stimuli: ML Spanish*

The 72 type 1 stimuli and 12 type 2 stimuli make a total of 84 test stimuli.

3.1.3 Background questionnaire

A third component of the research is concerned with the collection of background information of the participants. The background questionnaire can be found in Appendix II.[5] Participants decided whether they wanted to fill out the Spanish or English version. In order to be able to describe the participants, the following information is asked:

- Personal information, such as gender and age (Q2 through Q8);
- Self-reported language proficiency (Q9 and Q10);
- Social contact within the family, at school, and with friends (Q11 through Q20);
- Stance towards languages and communities (Q21, Q22, and Q23);
- Attitudes towards code-switching and reported use (Q24 and Q25).

3.2 Procedure

The method is organized as follows:

1. Researcher asks consent for the use of participants' production and judgment data (five minutes);
2. Participants perform the director-matcher task in pairs (five minutes);
3. Participants individually complete the judgment task (30 minutes);
4. Participants fill out the background questionnaire (five minutes).

The entire performance lasts about 45 minutes. At the end, the participants receive an edible reward.

The following sections discuss participant recruitment, task briefing, and methodological considerations.

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[5] It is an adaptation of the Bangor questionnaire, used in studies on www.bangortalk.org.uk..

3.2.1 Participant recruitment

The participants were recruited at the University of Puerto Rico in Mayagüez (UPRM) through the use of a friend-of-a-friend approach. The prerequisite for the participants was that they are bilingual, more or less of same age and educational background, and have lived in Puerto Rico for a significant part of their lives. This ideally yields participants that are functional in both Spanish and English. All approached students are explicitly instructed to form their own pairs, as earlier studies found that acquainted persons are more likely to perform switches if the conversation resembles a normal, everyday situation (Zentella 1997).

Twenty-eight bilingual speakers were recruited to participate in the toy task. The original plan was that all bilinguals that participated in the toy task would also participate in the auditory judgment task in order to make within-subject comparisons (Gullberg et al. 2008). However, the many recorded stimuli from the judgment task occasionally caused Qualtrics to stop working halfway through the experiment. Consequently, merely fifteen participants were able to fill out the judgment task.

All but two participants filled out the background questionnaire. Luckily, this is unproblematic, as these two participants produced zero switches in the elicitation toy task and were unable to perform the judgment task. Therefore, their input will not be needed to analyse produced switches or sentence judgments, for instance based on a distinction between early/late bilingualism. All participants gave their consent for the use of their contribution to this study.

The first section of chapter four discusses the participants in detail, based on their responses to the background questionnaire.

3.2.2 Tasks and briefing

The first contact with the participating students was made when they received an invitation from their professor to join a research project. The email informed them about the researcher and the search for students to participate in a study into the language situation in Puerto Rico. Those that were willing to partake were informed that the experiment took up to 45 minutes. If the participants agreed, the researcher met with them at a time and location that had been agreed upon.

The pairs took a seat at a table on which the cardboards for the toy task were already arranged. Remember from 3.1.1 that the setting was in such a way that the participants could not see each other's grids. All participants then signed a consent form for the toy task (Appendix III: A) and the judgment task (Appendix III: B). They were informed about the ID of their pair, as they needed to fill that out when they performed the judgment task. After these formalities, a pre-recorded introduction with instructions for the toy task was played. Full instructions can be read in Appendix V. As soon as the instruction started to play, I started the recording device (Sony PEM d50) and left the room.

When the participants completed the toy task, they called the experimenter back into the room. They were then individually seated in front of a laptop or computer with headphones and could begin with the auditory judgment task. The participants were required to fill out their role (director/matcher) together with the corresponding ID of their pair. This information was vital for later transcription purposes. The auditory judgment task as presented to the participants can be found in Appendix VI. The task was automatically followed by the background survey, also created in Qualtrics. Thirteen participants were unable to complete the judgment task (due to technical issues). They could skip this task and start with the background questionnaire.

3.2.3 Methodological considerations

It was already established that bilingual speech is influenced by external factors, e.g. conversation partner or location. The 'observer's paradox' means that bilingual speakers tend to alter their manner of speech in the presence of people that are not members of their speech community. This explains why no one except the acquainted bilingual pair self should be present during the performance of the toy task. Environments also influence language choice, depending on the speaker's level of comfort or set norms at that place (e.g. classroom, office) (González-Vilbazo 2013). Therefore, the participants were given two options to conduct the experiment: an office at the university campus or their house.

To create an environment that permits code-switching, this study ensured to make use of 'priming' throughout several stages of the experiments. Priming can be used to activate both languages in the brains of bilinguals and therefore is a useful tool to trigger code-switching mode amongst participants (González-Vilbazo et al. 2013; Grosjean 1998). In this study, a Puerto Rican bilingual student (the same that read the

stimuli) narrated the pre-recorded introduction to the toy task in code-switching mode. (34) contains an excerpt from the introduction (taken from Appendix V):

(34)   You are asked to talk to each other *para completar el* (to complete the) task.

The introduction to the judgment task was given in written code-switching mode as well, as can be seen in Appendix VI. An example is provided in (35).

(35)   In this section, *por favor indica con los smileys si las frases dadas* (please indicate with the smileys if the given phrases) would be permitted in everyday speech.

Another point of attention is a (lack of) focus of the participants. It was already mentioned that all the tasks together took about 45 minutes to be completed. After the formalities and the director-matcher task, the participants still needed to fill out the rather lengthy judgment task. In order to prevent the first stimuli from being judged with more attention than the last, they were presented in randomized order for each participant (Gullberg et al. 2008).

The consent forms, Appendix III, inform the participants about important facets of their contribution, for instance their anonymity. By signing the consent form, they also take notice of the fact that some of their data may be presented in written form in the eventual thesis. It also stresses their voluntary participation and the lack of compensation. I, in return, ensured that the files with the participants' recordings would be transferred to a protected computer to which only I had access.

4   Results

This chapter presents the data that are collected in the study. The first section gives a description of the participants based on the results from the background questionnaire. The subsequent sections follow the order of the research questions: adjective-noun order, determiner language, gender assignment in the determiner, MLF and MP coverage and accuracy, and, finally, results for early versus late bilinguals. Each section first presents production data and then turns to judgment data.

4.1 Participants

The previous chapter already stated that 26 participants filled out the background questionnaire. All responses are summarized and can be found in Appendix IV. I will present the answers to the most relevant questions in this section.

Participants that went to the same university responded incongruently to questions 15, 17 and 19 (regarding private/public schools). Because of this, I assumed that there was some misunderstanding regarding the private/public state of schools and therefore decided to leave these questions out of consideration.

As most of the participating pairs consisted of a female and a male participant, the sexes were equally represented (13 men; 13 women). The participants had a mean age of 26, ranging between 19 and 51. The summarized answers to the questionnaire (Appendix IV) indicate that there were two deviating, older participants (born in 1962 and 1975). The reason behind their participation is that they were chosen as conversation partner by bilingual students. Because this study seeks to acquire semi-natural speech from conversations between acquaintances, the students were allowed to form pairs with these two non-students

15 participants have lived in Puerto Rico all their lives. Due to a high level of circular migration between the island and the mainland, as much as eleven participants have lived both on the mainland and in Puerto Rico (six grew up on the mainland and then moved to Puerto Rico, five grew up in Puerto Rico and then moved to the mainland to come back later). Most participants identified with the Puerto Rico nationality, as figure 10 illustrates. Moreover, zero participants identified with the 'U.S.

American' nationality, which was one of the given options. The participant that responded 'other' specified his answer with 'Iberocelta caribeño'.

Do you consider yourself to be mainly...?

- Latin American
- Puerto Rican
- Other
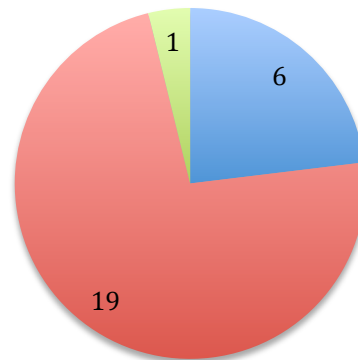
Figure 10 *Feelings of nationality amongst participants (Q23)*

The charts in figure 11 below illustrate that all respondents learned Spanish during childhood. 22 did so for English, yielding four participants that learned English as L2 post-childhood (after primary school). This means that there are 22 early bilinguals relative to the amount of four late bilinguals.

Since when have you been able to speak Spanish?

- Age of 2 or younger
- Primary school

Since when have you been able to speak English?

- Age of 2 or younger
- Age of 4 or younger
- Primary school
- Secondary school
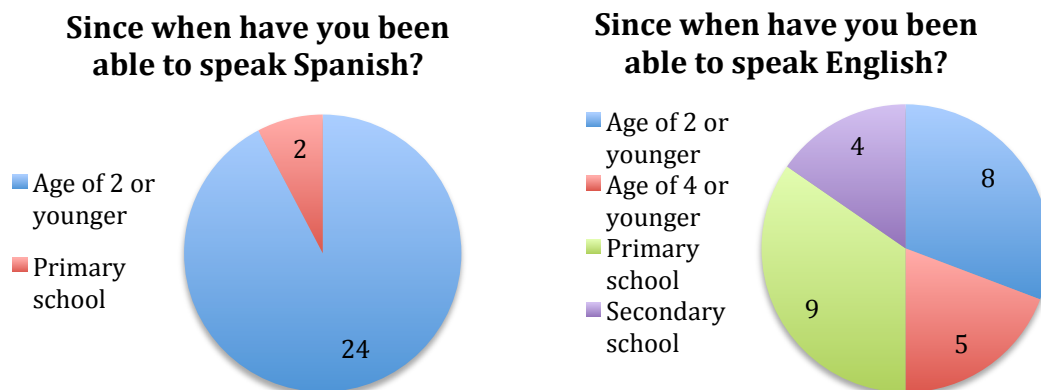
Figure 11 *Age at which participants acquired a language (Q7 and Q8)*

The bar graph in figure 12 illustrates self-reported proficiency for Spanish and English. It follows that most bilinguals feel (fairly) confident in extended conversations in Spanish (25 out of 26). The one participant that responded to feel 'confident in basic conversations' for Spanish responded with the same answer for English, so it might be that this person is prudent about his/her proficiency. For conversations in English, the proficiency distribution is different; 20 people are (fairly) confident in extended conversations, and six are confident in basic conversations. Of the four late bilinguals,

two felt confident in basic conversations in English and two (fairly) confident in extended conversations in English.

How well do you feel you can speak Spanish/English?
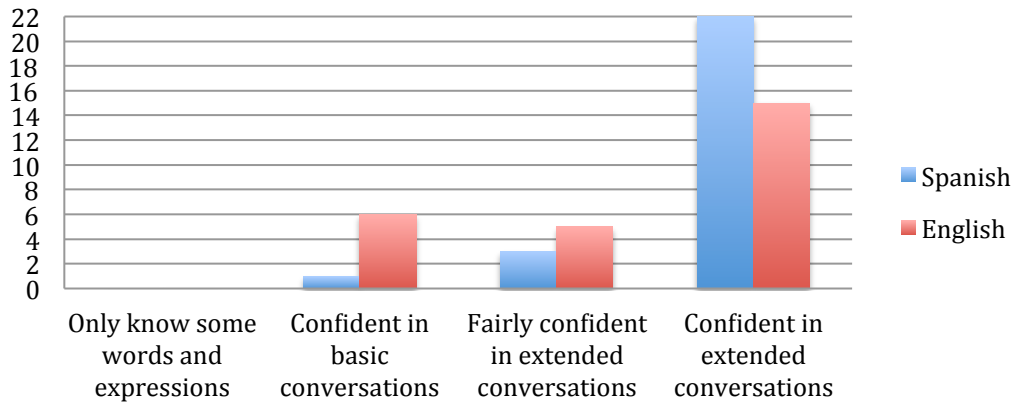
Figure 12 *Self-reported language proficiency (Q9 and Q10)*

When asked to what extent the participants agree with the statement that 'in everyday conversation, I keep the Spanish and English language separated' (Q24), five responded that they (strongly) agree, cf. figure 13. This means that five participants claimed to not engage in code-switching. 18 participants, on the other hand, report that they do code-switch.

In everyday conversation, I keep the Spanish and English language separated
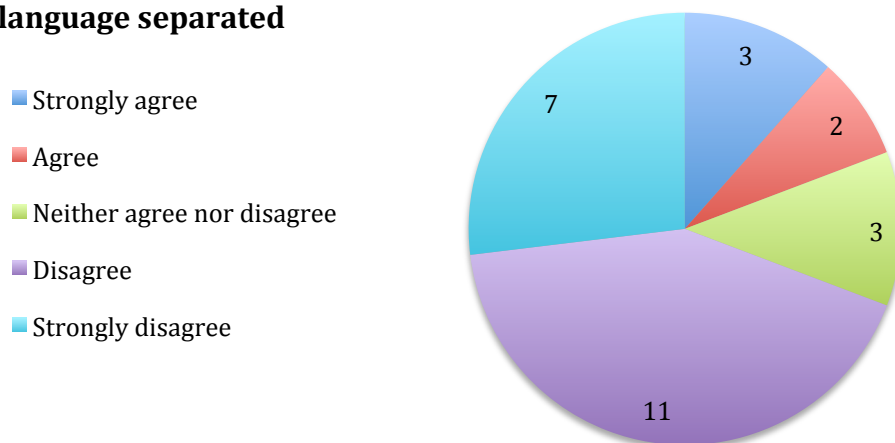
Figure 13 *Participant responses regarding reported use of code-switching (Q24)*

As much as eleven participants responded that they (strongly) agree with the statement that 'people should avoid mixing Spanish and English in the same conversation' (Q25),

cf. figure 14. In other words, eleven participants disapprove and thirteen approve of code-switching.

People should avoid mixing Spanish and English in the same conversation

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
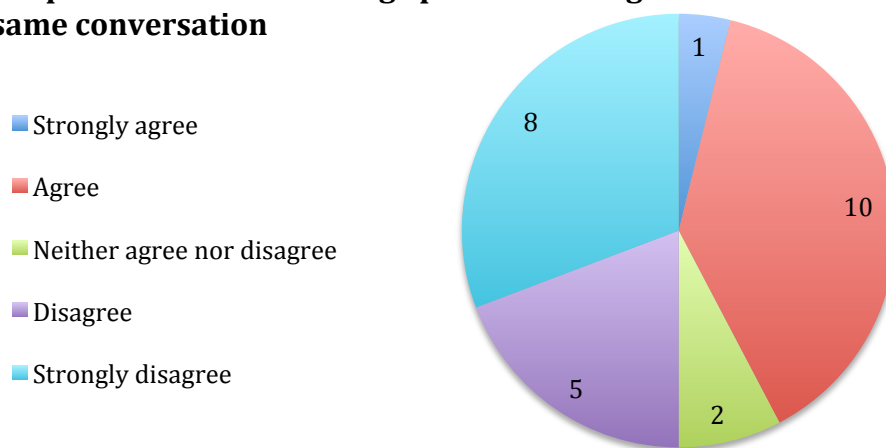
Figure 14 *Participant responses regarding attitudes towards code-switching (Q25)*

Although 18 participants responded that they code-switch (figure 13) and 13 participants responded that they do not oppose code-switching (figure 14), only seven participants produced switches during the toy task. Appendix IV indicates the amount of switches produced per participant. The participants that produced switches are students (BA and MA), with a mean age of 23. All seven are early bilinguals and feel 'confident' or 'fairly confident' in extended conversations in both languages. They indicated to have at least one conversation partner with whom they frequently speak in code-switching mode.

4.2 Adjective-noun order

4.2.1 Toy task data

In the background questionnaire, 18 people indicated that they code-switch (Q24). Only eight participants, however, produced switches during the toy task. The seven 'switchers' were divided over seven pairs. The remaining pairs performed the task completely monolingually, either in Spanish (five times) or English (once).

Several switches have been produced in the form of monolingual determiner-noun sequences, as in (36), or at sentence boundaries, as in (37). Remember that these

types of switches are not considered in this study, as they do not contain relevant information for conflict resolution within mixed DPs.

(36)   *La oveja* (the sheep) sits under a small tree.
         (Korver 2014, D8)

(37)   Is it the white one *o la negra* (or the black one)?
         (Korver 2014, M10)

All mixed DPs that minimally included a determiner and noun were extracted from the toy task recordings and transcribed for analysis. Seven participants produced a total of 17 DP-internal switches. A list of the extracted DPs can be found in Appendix VII. The appendix presents the DPs in the full sentences in which they were produced.

15 of the 17 mixed DPs contain an adjective. These instances are relevant for the analysis on adjective-noun order and are repeated below in table 7. The table illustrates that the ML could not be identified (marked by '?') in two cases. The reason behind this is that these DPs were produced without further linguistic context, such as in (38) below. The ML cannot be identified with the use of SMP and/or MOP due to a lack of linguistic information: there is no difference discernable in subject-verb-object order nor are there any clues for finite subject-verb agreement. As a consequence, the MLF cannot make any predictions about these instances.

(38)   a. Okay, *el próximo* (the next) row.
         b. Okay, *el último* (the last) row.
         (Korver 2014, D9, appendix VII: 16 and 17)

Note, however, that because *próximo* and *último* are adjectives that are pre-nominal in Spanish, there is no conflict for adjective-noun order in these particular cases.

Table 7 *Data extraction from toy task for adjective-noun order*

	ML	Adjective language	N language	Adjective placement	MLF	MP
a. *el* left most column b. *el* big tree c. *el* green square d. *un* small green square e. *el* green square f. *el* top right corner g. *el* big tree	Spanish	English	English	pre-nominal	✓	✓
h. *la* row *numéro dos*	Spanish	Spanish	English	post-nominal	✓	✓
i. *(mi) último* square j. *el tercer* square k. *el último* row l. *el próximo* item	Spanish	Spanish	English	pre-nominal	✓[6]	✓*
m. *el libro* burgundy	Spanish	English	Spanish	post-nominal	✓	X[7]
n. *el próximo* row o. *el último* row	-	Spanish	English	pre-nominal	?*	✓*

As can be extracted from the table above, there were seven switches between a Spanish determiner and English adjective-noun component (a-g). The MLF allows these adjective-noun collocations as it considers them as embedded language islands (as discussed in section 1.2.3). The remaining eight switches were between an adjective and noun (h-o), just as in (39).

(39) I'm asking you, *que el   tercer* square *que va   a mi izquierda…*
              that D.MASC third square that go.PRS.3SG to my left…
       'I'm asking you, that the third square that goes from my left…'
       (Korver 2014, M2, appendix VII: 5)

       Six of the seven Spanish adjectives were produced in pre-nominal position (i-l, n-o). These six adjectives (*último, próximo, tercer*) are also pre-nominal in Spanish grammar. These instances are predicted by both theoretical approaches: the MP expects adjectives

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[6,*] The adjectives that were found here (*penúltimo, tercer, último, próximo*) are also pre-nominal in monolingual Spanish.
[7] Although Spanish sometimes uses 'burgundy' too, I have chosen to categorize it as a switched adjective. The reason for this is that the participant pronounced it in an English rather than Spanish accent.

to be located according to the grammar of the language in which it was found, and the MLF expects adjectives to be located according to the grammar of the language that forms the ML. Still, because both Spanish and English require pre-nominal adjective placement in these cases, there is no adjective-noun conflict. I therefore only demonstrate these instances in this section and will leave them out of consideration when the coverage and accuracy of both predictions is compared in section 4.5.1.

4.2.2 Judgment task data (type 1 stimuli)

All type 1 stimuli and their mean scores are included in Appendix I: A. Remember that the stimuli are rated on a Likert scale from 1 through 5, in which 1 is positive ('always permitted') and 5 is negative ('never permitted'). Zero stimuli received a mean score of 1 or 5. Most stimuli were rated 'sometimes permitted' (37 stimuli) and 'almost never permitted' (34 stimuli). This suggests that, generally, the sentences were scored rather negatively. However, statistic analysis (paired t-test) pointed out that sentences that did not follow any of the predictions made by the MLF nor MP regarding adjective-noun order or determiner language scored significantly more negatively than sentences that followed at least one of the predictions of the MLF or MP for either of the conflict sites (p=0.045). This already provides support for both theoretical approaches.

The mean scores provided in Appendix I: A allow for statistic analyses of the judgments regarding adjective-noun order. As the columns 'word order' illustrate, there are 24 stimuli that meet the predictions for adjective-noun order from both the MLF as well as the MP approach. 12 stimuli meet the predictions of only the MLF model, and another 12 stimuli meet the predictions of only the MP approach.

Because of the overlap between the predictions for some stimuli, I can apply statistics in two ways: (1) by including the overlapping stimuli in the calculation (yielding 36 stimuli for each prediction), or (2) by excluding the overlapping stimuli from the calculation (yielding 12 stimuli for each prediction). I will make both calculations where possible and refer to the first calculation as 'with overlap' and thereby include the stimuli that are divergent for MLF and MP predictions along with overlapping stimuli. I will refer to the second type of calculation as 'without overlap' and thereby exclusively include stimuli where the predictions of both models account for different stimuli.

Table 8 presents the mean scores for stimuli that include MLF predictions and stimuli that include MP predictions. Stimuli for which the predictions from both theoretical approaches overlap are included here. Statistical analysis (paired samples t-

test) of the mean scores indicates that the difference between the predictions is not significant at the 5% level (p=0.084). While the MP receives a somewhat more positive mean score, it cannot be concluded that it is a significant better predictor for word order.

Table 8 *Mean scores for adjective-noun order: MLF versus MP (with overlap)*

	MLF predictions	**MP predictions**
Number	36	36
Mean score	3.14	3.03
Significance	p=0.084	

Table 9 points out that when the overlapping stimuli are excluded from the calculation, the difference between mean scores for both predictors remains insignificant (p=0.083).

Table 9 *Mean scores for adjective-noun order: MLF versus MP (without overlap)*

	MLF predictions	**MP predictions**
Number	12	12
Mean score	3.57	3.25
Significance	p=0.083	

The mean score of 3.14 for 36 sentences that included MLF predictions contained six DPs with adjective-noun monolingual language islands. The other 30 DPs had language switches between the adjective and noun. Table 10 below points out that the stimuli that contained language islands, although they form a small group, received a more positive mean score than stimuli that contained a switch between the adjective and the noun. As these six sentences met the predictions of both theoretical approaches, the results in table 9 (for stimuli in which the predictions do not overlap) do not allow for a division between DPs with language islands and DPs with adjective-noun switches.

Table 10 *Mean scores for adjective-noun order: mis versus islands (with overlap)*

	Adj-noun mix	**Language island**
Number	30	6
Mean score	3.23	2.68

It follows that DP-internal switches with adjective-noun language islands were preferred. Within these six instances, in turn, switches from a Spanish determiner to an English island were preferred over switches from an English determiner to a Spanish island (mean scores: 2.59 compared to 2.87).

Results of analyses regarding (un-) grammaticality of the approaches are presented in table 11. These include overlapping stimuli. It indicates that there is a significant difference between stimuli that are grammatical (✓) and stimuli that are ungrammatical (X) according to MLF predictions (p=0.002). The same goes for MP stimuli (p=0.000). This means that both approaches make good predictions.

Table 11 *Mean scores for adjective-noun order: grammatical versus ungrammatical (with overlap)*

	MLF predictions		MP predictions	
	✓	X	✓	X
Number	36	36	36	36
Mean score	3.14	3.60	3.03	3.71
Significance	p=0.002		p=0.000	

Table 12 presents the results when stimuli that overlap are excluded from statistical analysis. It follows that sentences that are expected to be grammatical according to the MP still score more positively than those that are expected to be ungrammatical, although not significantly so (p=0.083).

Table 12 *Mean scores for adjective-noun order: grammatical versus ungrammatical (without overlap)*

	MLF predictions		MP predictions	
	✓	X	✓	X
Number	12	12	12	12
Mean score	3.58	3.25	3.25	3.58
Significance	p=0.083		p=0.083	

MLF stimuli, on the other hand, received more positive mean scores when they were ungrammatical rather than grammatical.

This MLF outcome may be affected by the fact that some stimuli had a determiner that did not match the matrix language. For instance, the word order in stimulus BS16, repeated below in (40), is grammatical. The ML is English, therefore we expect adjectives before the noun. The English ML would also account for an English determiner. However, a Spanish determiner is found.

(40)   I want   *el*   *verde*   book
              D.MASC   green
         'I want the green book'
         (Korver 2014, appendix I, BS16)

Statistical analysis indicated that the instances in which the language of the determiner was ungrammatical did not have a significant effect on the outcomes. Table 13 points out that there was only a slight preference for the six sentences in which MLF predictions for both conflict sites were met (mean score: 3.56) compared to those in which only MLF predictions for word order were met (mean score: 3.59). When word order and determiner language were both ungrammatical according to the MLF, the mean score (3.14) is more positive than when determiner language is grammatical (3.36). Interestingly, the latter instances all met MP predictions for both conflict sites (Appendix I: BS9, 15, 45, 51) or MP predictions for word order (BS22, 58).

Table 13 *Mean scores for adjective-noun order: divided by MLF predictions for determiner language*

	Word order MLF predictions ✓		**Word order MLF predictions** X	
	D language ✓	D language X	D language ✓	D language X
Number	6	6	6	6
Mean score	3.56	3.59	3.36	3.14
Significance	p=0.916		p=0.501	

Gender is a second feature for which it is interesting to explore whether it affects the mean scores of stimuli that are (un-) grammatical according to MLF predictions. Previous studies on gender assignment within the determiner found that default gender or analogue gender are often assigned in the determiner. Constructions with a feminine determiner in combination with a noun with a masculine translation equivalent , on the other hand, are ungrammatical. If I correct for the instances in which feminine *la* is combined with a masculine noun, the mean scores become more positive. Table 14 illustrates that there are 12 instances in which such a construction occurs (the columns under 'D fem'). It appears that ungrammatical gender constructions affect grammaticality judgments.

Table 14 *Mean scores for adjective-noun order: controlling for gender (with overlap)*

	ML Spanish				**ML English**			
	✓		X		✓		X	
Number	18		18		18		18	
Mean score	3.10		3.62		3.21		3.57	
	-D fem[8]	D fem	-D fem	D fem	-D fem	D fem	-D fem	D fem
Number	15	3	15	3	15	3	15	3
Mean score	3.05	3.36	3.58	3.85	3.20	3.25	3.48	3.94

[8] '-D fem' means that stimuli that have a mismatch in gender (feminine determiner with masculine noun) are excluded from the analysis. The mean scores for the stimuli that have a mismatch in gender are included separately under 'D fem'.

4.3 Determiner-noun combinations: language of the determiner

4.3.1 Toy task data

The 17 extracted DPs from the toy task (Appendix VII) contain 15 DPs that are relevant for determiner-noun assignment mechanisms. Remember that Appendix VII presents these DPs in the full sentences in which they were uttered.

The 15 relevant switches for determiner-noun combinations are repeated in table 15. The adjectives are placed in brackets to indicate their irrelevance for this section.

14 DPs contained a Spanish determiner (12 definite determiners *el/la* and two times the indefinite determiner *un*) and one DP contained an English determiner (definite 'the').

Table 15 *Data extraction from toy task for language of the determiner*

	ML	**D language**	**N language**	**MLF**	**MP**
a. *un* pattern	Spanish	Spanish	English	✓	✓
b. *el (tercer)* square					
c. *el* (big) tree					
d. *el* (green) square					
e. *un* (small green) square					
f. *el* (green) square					
g. *el* (big) tree					
h. *el (próximo)* item					
i. *el (ultimo)* row					
j. *el* (left most) column					
k. *el* (top right) corner					
l. *la* row *(numéro dos)*					
m. the *penúltimo*	English	English	Spanish	✓	X
n. *el (próximo)* row o. *el (ultimo)* row	-	Spanish	English	?	✓

To re-familiarize the reader with MLF predictions for determiner language: the Spanish finite subject-verb agreement in (41) (*el libro va*) account for a Spanish ML. As the language of the determiner should come from the ML, the presence of a Spanish determiner meets the predictions.

(41) *El   libro   va   en el*   left most column, down.
      D.MASC book [MAS] go.PRS.3SG   in D.MASC

      'The book goes in the left most column, down.'

      (Korver 2014, D2, appendix VII: 6)

The determiner was Spanish in 14 mixed DPs. The MLF can account for 12 of these instances (a-m). The remaining two instances (n-o) do not have an identifiable ML.

The single instance in which the English determiner appeared was in an English ML sentence, which therefore supports MLF predictions. It is transcribed in (42):

(42) It will be the   *penúltimo*   of that column.
                        penultimate [MASC]

      'It will be the penultimate of that column.'

      (Korver 2014, D2, appendix VII: 2)

4.3.2 Judgment task data (type 1 and 2 stimuli)

From calculations based on Appendix I: A, it can be deduced that the mean scores of the set of sentences that contained MLF predictions for determiner language do not differ significantly from those that contained MP predictions (paired samples t-test). This is illustrated in table 16. Table 17 presents the mean scores for the sentences that contain either MLF or MP predictions, without overlap. Although the stimuli that met MLF predictions received somewhat more positive scores, the p-values in both calculations give no reason to assume that it is a significant better predictor for language of the determiner.

Table 16 *Mean scores for determiner language: MLF versus MP (with overlap)*

	MLF predictions	MP predictions
Number	36	36
Mean score	3.32	3.41
Significance	p=0.273	

Table 17 *Mean scores for determiner language: MLF versus MP (without overlap)*

	MLF predictions	MP predictions
Number	12	24
Mean score	3.24	3.46
Significance	p=0.336	

Mean scores based on (un-) grammaticality for MLF and MP stimuli do not indicate a significant difference for MLF and MP predictions regarding language of the determiner. Table 18 presents the results of stimuli including those in which the predictions from the two approaches overlap, and table 19 does so for stimuli in which the predictions that overlap are excluded. None of the p-values is significant at the 5% level. It follows that for the MLF, sentences that met the predictions (✓) were rated more positively than those that did not meet the predictions (X). This is, however, not the case for MP predictions. This finding matches with the scores from tables 16 and 17, which indicated a slight preference for MLF predictions for determiner language.

Table 18 *Mean scores for determiner language: grammatical versus ungrammatical (with overlap)*

	MLF predictions		**MP predictions**	
	✓	X	✓	X
Number	36	36	48	24
Mean score	3.29	3.42	3.41	3.25
Significance	p=0.310		p=0.271	

Table 19 *Mean scores for determiner language: grammatical versus ungrammatical (without overlap)*

	MLF predictions		**MP predictions**	
	✓	X	✓	X
Number	12	24	24	12
Mean score	3.16	3.46	3.46	3.16
Significance	p=0.124		p=0.240	

The previous section found that stimuli with a mismatch in gender assignment (feminine determiner with masculine noun) influenced grammaticality judgments regarding adjective-noun order. Regarding choice of determiner language, there were also 12 stimuli that contained such an ungrammatical construction (6 times in a Spanish ML, 6 times in an English ML). When they are excluded from statistical analyses regarding MLF predictions for determiner language, it follows that the mean scores of this predictor become more positive. Hence, the presence of gender in the determiner has influence on the grammaticality judgments.

Table 20 *Mean scores for determiner language, type 1: controlling for gender (with overlap)*

	ML Spanish ✓		ML English X	
Number	12		12	
Mean score	3.41		3.49	
	-D fem	D fem	-D fem	D fem
Number	6	6	6	6
Mean score	3.22	3.60	3.38	3.60

Appendix I: B lists all type 2 stimuli together with their mean scores. A paired t-test for type 2 stimuli indicated that MLF predictions were rated more positively than MP predictions, but not significantly so (p=0.750, cf. table 21). This supports the results from type 1 stimuli.

Table 21 *Mean scores for determiner language, type 2: MLF versus MP (with overlap)*

	MLF predictions	MP predictions
Number	6	8
Mean score	2.74	2.90
Significance	p=0.750	

The same is found when sentences for which the MLF and MP provide the same predictions are left out of the calculation (table 22): MLF sentences are judged more positively, but not significantly so.

Table 22 *Mean scores for determiner language, type 2: MLF versus MP (without overlap)*

	MLF predictions	MP predictions
Number	2	4
Mean score	3.33	2.44
Significance	p=0.083	

4.4 Determiner-noun combinations: gender assignment in the determiner

4.4.1 Toy task data

Table 23 below again lists all determiner-noun combinations that were produced in the toy task and had a Spanish determiner. This time, the focus is on gender assignment in the determiner. The Spanish determiner was masculine for 13 instances and feminine for one instance. The feminine instance (l) met the gender of the translation equivalent.

The first two rows (a-h) contain switches of the type masculine determiner – English noun with masculine translation equivalent. This was the type of switch that was most frequently produced.

Any possible influence of physiological sex is left out of consideration, as none of the produced switches had animate referents.

Table 23 *Data extraction from toy task for gender assignment in the determiner*

	ML	**D language and gender**	**N language and gender in Spanish**	**Influence on gender assignment**
a. *un* pattern b. *el* (*tercer*) square c. *el* (green) square d. *un* (small green) square e. *el* (green) square	Spanish	Spanish MASC	English MASC	Analogical criterion Phonological shape Default gender
f. *el* (big) tree g. *el* (big) tree h. *el* (*próximo*) item	Spanish	Spanish MASC	English MASC	Analogical criterion Default gender
i. *el* (*último*) row j. *el* (left most) column	Spanish	Spanish MASC	English FEM	Default gender
k. *el* (top right) corner	Spanish	Spanish MASC	English FEM	Phonological shape Default gender
l. *la* row (*numéro dos*)	Spanish	Spanish FEM	English FEM	Analogical criterion
m. *el* (*próximo*) row n. *el* (*ultimo*) row	-	Spanish MASC	English FEM	Default gender

Table 24 leaves out the instances and features that distinguish them from each other (e.g. ML, D language). It follows that default gender accounted for most cases. The following paragraphs will discuss the tables in more detail.

Table 24 *Frequency and percentage for which the gender criteria accounted for produced switches*

	Analogical gender	**Phonological shape**	**Default gender**
Frequency	9	6	13
Percentage	64.3%	40% (100%)	92.9%

Analogical gender

Nine of the 14 instances (64.3%) have a determiner that correlates with the gender of the Spanish equivalent of the English noun (table 23, a-h, l). Eight of these have masculine agreement and one has feminine agreement.

Phonological shape

There are six cases (40%) in which phonological shape agreement accounts for gender assignment, as listed in (41) and (42). None of the endings of the nouns in the other switched constructions were typical for Spanish nouns. Therefore, all instances in which this factor could have played a role, it did (100%).

Five of the cases in which phonological shape played a role, listed below in (43), were also accounted for by the analogical criterion (table 23, a-e). They qualify for the phonological shape criterion because of their endings in /n/ and /r/, which are typical masculine endings in Spanish.

(43)   a. *un* pattern

        b. *un* small green square

        c. *el* green square

        d. *el* green square

        e. *el tercer* square

The sixth case that phonological shape is able to account for is repeated in (44).

(44)   *El*   top right corner

        D.MASC   [*esquina* FEM]

        (Korver 2014, D11, appendix VII: 15)

It follows that the English noun 'corner' is assigned *el* because its ending in /r/ signals masculine gender in Spanish. The Spanish translation equivalent for this noun is *la esquina*, which is feminine.

Default gender

In 13 instances (92.9%), default gender is assigned (table 23, a-k, m-n). There is only one instance in which another factor (analogue gender) accounted for gender assignment (table 23, l).

4.4.2 Judgment task data (type 1 and 2 stimuli)

The stimuli covered for gender assignment influenced by analogical gender and default gender, but not for physiological sex and phonological shape. Therefore, the latter two are left out of consideration in the presentation of the results and further analysis.

I will first present the results from type 1 stimuli (Appendix I: A). Table 25 illustrates that there is a significant difference (paired t-test) between stimuli that contained gender assignment according to the analogical criterion and those that contained default gender.

Table 25 *Number and mean scores assigned to gender criteria (type 1)*

	Analogical gender	**Default gender**
Number	24	24
Mean score	3.26	3.41
Significance	p=0.026	

Table 26 presents mean scores for stimuli that met the analogical gender criterion (Appendix I: A, BS13-18, 31-36, 49-54, 67-72), while table 27 does so for stimuli that contained default gender assignment (Appendix I: A, BS13-18, 31-36, 43-48, 61-66). Both tables are divided into columns that differentiate between mean scores assigned to DPs in the Spanish and English ML and columns that differentiate between the gender of the translation equivalent of the noun.

None of the p-values for ML and gender in tables 26 and 27 is significant at the 5% level. This means that there is no reason to assume that preference of either of the gender assignment criteria –analogical / default gender- is influenced by circumstantial factors such as the ML or the gender of the noun.

Table 26 *Number and mean scores for analogue gender: divided by ML and noun gender (type 1)*

	ML Spanish	ML English	Masculine noun	Feminine noun
Number	12	12	12	12
Mean score	3.18	3.33	3.31	3.21
Significance	p=0.131		p=0.382	

Table 27 *Number and mean scores for default gender: divided by ML and noun gender (type 1)*

	ML Spanish	ML English	Masculine noun	Feminine noun
Number	12	12	12	12
Mean score	3.35	3.47	3.31	3.51
Significance	p=0.055		p=0.125	

Type 2 stimuli (Appendix I: B) relevant for gender assignment are repeated together with their mean scores below in (45):

(45)   BN5 *Mira la ardilla subiendo* (Look at the squirrel climbing) *la* tree!   3.13

BN6 *Mira la ardilla subiendo* (Look at the squirrel climbing) *el* tree!   2.00

[*árbol* MASC]

BN11 *Puedes limpiar* (You can clean)   *la* table.   2.44

BN12 *Puedes limpiar* (You can clean)   *el* table.   2.20

[*mesa* FEM]

Results based on type 2 stimuli confirm the general influence of the analogical criterion and default gender on gender assignment. Although the small amount of data from type 2 stimuli does not allow for statistical analyses, it does indicate that stimuli that contained analogical gender (BN6, BN11) and/or default gender (BN6, BN12) scored better than the stimulus that did not assign gender according to any of the criteria (BN5). The latter consists of a feminine determiner with a noun that has a masculine translation equivalent, which is not expected indeed.

Opposed to the findings of type 1 stimuli, type 2 stimuli found that assignment of default gender was preferred over assignment of analogical gender. This could, however, be incidental because it is based on a small amount of stimuli.

4.5 MP and MLF coverage and accuracy

4.5.1 Toy task data

The tables below contain absolute numbers and percentages for MLF and MP coverage and accuracy, overall in table 28 and divided by conflict site in tables 29 and 30. It follows that MP predictions covered for all data (24/24), whereas MLF predictions were unable to do so (22/24). MLF accuracy is therefore calculated based on the amount of data the approach was able to make predictions about (24 overall, 9 for adjective-noun order, and 13 for determiner language).

Tables 28 and 29 include the instances that contained embedded language islands. Remember, however, that they exclude instances that contained adjectives that are required to be in pre-nominal position in Spanish.

Table 28 indicates that the MP seems able to cover for more data, while the MLF, for those instances in which it is applicable, seems more accurate.

Table 28 *Coverage and accuracy for MLF and MP predictions: overall*

	MLF	**MP**
Coverage	91.7%	100%
	22/24[9]	24/24
Accuracy	100%	91.7%
	22/22	22/24

Table 29 presents coverage and accuracy for the conflict site of adjective-noun order. It follows that both approaches cover for all produced switches. In terms of accuracy, the MLF appears to be the better predictor. The MP was unable to account for one single instance in which an English adjective was produced post-nominally. This somewhat higher accuracy rate of the MLF is not confirmed by the slight (insignificant) preference for MP predictions in the judgment task.

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[9] I consider the toy task switches as individual switches if they contain clues for both adjective-noun order and language of the determiner. Cf. Appendix VII: 2 DPs that are solely relevant for language of the determiner; 2 DPs that are solely relevant for adjective-noun order; and 13 DPs that are relevant for both adjective-noun order and language of the determiner = 26. This makes a total of 2+2+26=30 DPs. From these are extracted the 6 instances in which Spanish, pre-nominal adjectives were produced = 24.

Table 29 *Coverage and accuracy for MLF and MP predictions: adjective-noun order*

	MLF	MP
Coverage	100%	100%
	9/9	9/9
Accuracy	100%	88.9%
	9/9	8/9

Table 30 indicates that again, the differences between the two predictions are not that big. The MLF is unable to cover for two instances that lacked enough linguistic context to identify the ML. Its accuracy rate, on the other hand, is 100%. The MP, which predicts to find the determiner in Spanish, is inaccurate for one instance in which an English determiner was produced. The relative higher accuracy of MLF predictions is confirmed by the slight preference towards MLF predictions that was found in judgment task results.

Table 30 *Coverage and accuracy for MLF and MP predictions: language of the determiner*

	MLF	MP
Coverage	86.7%	100%
	13/15	15/15
Accuracy	100%	93.3%
	13/13	14/15

4.5.2 Judgment task data

The accuracy of the approaches in the judgment task is measured based on the mean scores that were assigned to the sentences that controlled for each approach. I will first briefly reiterate what was already presented in sections 4.2.2 and 4.3.2.

- Word order: statistical analysis (both types of calculations) pointed out that sentences that met MP predictions received slightly more positive scores than sentences that met MLF predictions. It was found for both the MP and the MLF that ungrammatical sentences received significantly more negative scores than grammatical sentences, which supports both theoretical approaches. When the overlapping sentences were removed from these calculations, however, it appeared that the MP was the better predictor of the two.

- Language of the determiner: no statistic difference found (for neither type of calculation). MLF stimuli received a somewhat more positive mean score than

MP stimuli. MLF sentences that were grammatical also received a more positive score than sentences that were ungrammatical.

To provide a more general account, table 31 presents the results for stimuli that met *only* MLF or *only* MP predictions for *both* conflict sites and contrast them to stimuli that did not meet any prediction of either analysis. 18 sentences met MLF predictions for both adjective-noun order and language of the determiner and 24 stimuli that met MP predictions for both adjective-noun order and language of the determiner. Stimuli that contained MLF predictions for both conflict sites are judged significantly more positively than those that did not contain any MLF predictions (p=0.002). Such statistic significance is also found for the MP approach (p=0.019). This indicates that both theoretical approaches appear to be highly accurate, at least when they provide the structure for both conflict sites in one sentence.

Table 31 *Mean scores for both conflict sites: grammatical versus ungrammatical*

	MLF		MP	
	✓	X	✓	X
Number	18	18	24	12
Mean score	3.04	3.60	3.02	3.52
Significance	p=0.002		p=0.019	

4.6 Early and late bilingualism

4.6.1 Toy task data

As was mentioned in 4.1, all extracted switches from the director-task were produced by early bilinguals. 13 of the 14 DPs with a Spanish determiner were assigned default gender. The single exception, in which a feminine determiner was assigned, is illustrated in (46). It shows that analogical gender is assigned. As earlier research found that early bilinguals prefer assignment of default gender over assignment of analogical gender, I had rather expected this switch to be assigned default gender.

(46)   *El cuadrado verde está en* (The green square is in) *la*   row   *numéro   dos*

                                                                              D.FEM [*fila* FEM] number two

         (Korver 2014, D2, appendix VII: 7)

However, the participant that produced this switch also produced five other switches, which were all assigned default gender (Appendix VII, 6-10). There is even an instance in which this participant assigned default gender within the same determiner-noun combination as in (46). This is illustrated in (47).

(47)   *Está en* (It is in)   *el*   *último* row,   to the right of the sheep.
                                     D.MASC   last   [*fila* FEM]
        (Korver 2014, D2, appendix VII: 9)

4.6.2 Judgment task data

The judgment task results for type 1 stimuli in table 25, repeated here as table 32, indicated that sentences in which analogical gender was assigned to the determiner were rated significantly more positively than sentences in which default gender was assigned (p=0.026).

Table 32 *Number and mean scores assigned to gender criteria (type 1)*

	Analogical gender	Default gender
Number	24	24
Mean score	3.26	3.41
Significance	p=0.026	

Twelve of the fifteen participants that filled out the judgment task were early bilinguals. The other three were late bilinguals that learned English as a L2. It was hypothesized that early bilinguals prefer the assignment of default gender, but this is not confirmed by my results as stated in the paragraph above.

Although the group distribution is fairly uneven (12 early versus three late bilinguals), I will still make some statistical analyses to retrieve an indication of whether the results match the hypotheses.

A paired t-test pointed out that early bilinguals scored stimuli that contained analogue gender as well as stimuli that contained default gender significantly more positively than did late bilinguals (cf. table 33). Although it was expected that early bilinguals would indeed judge the assignment of default gender more positively than late bilinguals, this was not expected for the assignment of analogue gender because earlier studies found that early bilinguals preferred the assignment of default gender over analogical gender.

Table 33 *Number and mean scores assigned to gender criteria: divided by analogue/default gender (type 1)*

	Analogue gender		Default gender	
	early	late	early	late
Number	12	12	12	12
Mean score	3.06	3.86	3.38	3.97
Significance	p=0.001		p=0.022	

Table 34 indicates that no significant difference is found between early and late bilinguals' judgments towards assignment of analogue or default gender to determiners. The mean scores for both types of bilinguals indicate that the two groups slightly prefer analogical gender assignment over default gender assignment.

Table 34 *Number and mean scores assigned to gender criteria: divided by early/late bilinguals (type 1)*

	Early bilinguals		Late bilinguals	
	analogue	default	analogue	default
Number	12	12	12	12
Mean score	3.06	3.38	3.86	3.97
Significance	p=0.070		p=0.568	

While early bilinguals judged the sentences more positively than late bilinguals (table 33), they do not significantly prefer assignment of analogical or default gender (table 34). Still, it must be taken into account that the groups are very different in size.

Type 2 stimuli neither indicated a significant difference in the judgments of early and late bilinguals towards motivations behind gender assignment (table 35). Indeed, no difference was found at all in the judgments of early bilinguals to the DP that assigned analogical gender to the determiner and the DP that assigned default gender.

Table 35 *Number and mean scores assigned to gender criteria: divided by early/late bilinguals (type 2)*

	Early bilinguals		Late bilinguals	
	analogue	default	analogue	default
Number	1	1	1	1
Mean score	2.25	2.25	3.30	2.00
Significance	p=1.000		p=0.270	

5   Discussion

Recent studies into code-switching have focused on conflict sites, where the grammars of the languages involved differ. Within the Spanish-English bilingual language pair, conflict sites are likely to arise within mixed nominal constructions. For instance, Spanish grammar requires mostly post-nominal adjective placement, whereas English has pre-nominal adjective placement. Also, Spanish has a binary gender system and distinguishes between feminine and masculine nouns, adjectives, and determiners, whereas English does not.

There are several theoretical approaches that try to account for conflict resolution. This study tests two approaches that have dominated code-switching research since *Bilingualism: Language and Cognition* hosted a debate between the two (2005a; 2005b). The approaches yield, due to their different analyses, potentially conflicting predictions regarding resolution in conflict sites. This thesis therefore also compares the relative coverage and accuracy of both approaches. Neither approach formulates predictions regarding gender assignment in the determiner. Therefore, this study also relies on findings of previous studies on gender assignment.

5.1 Main findings

This section reiterates the research questions and discusses the hypotheses and main findings per question.

How do Spanish-English bilinguals resolve adjective-noun order in code-switching situations?
The MLF predicts the conflict site for adjective-noun order to be resolved according to grammatical rules of the ML. Sentences typically requires a post-nominal adjective if the ML is Spanish and a pre-nominal adjective if the ML is English. The MP predicts adjective-noun order to be according to grammatical rules of the language of the adjective. This prediction accounts for a post-nominal adjective if it is Spanish and a pre-nominal adjective if it is English.

It appears that Spanish-English bilinguals produce adjective-noun constructions according to the predictions of the MLF. Regarding judgments, the grammaticality

judgment task finds a slight preference for the MP predictions. I will now turn to an elaboration on this finding.

The toy task yields 15 switched DPs that contain clues for adjective-noun order resolution. In 13 instances there is an identifiable, Spanish ML, whereas in two instances, the ML cannot be identified. This means that for the 13 DPs for which the MLF is able to account, the analysis expects to find word order according to Spanish rules. However, there are seven instances of Spanish determiners combined with English adjective-noun islands as in (48). Here, the MLF allows for English word order within the island. All produced DPs can be accounted for by the MLF analysis.

(48)   Spanish ML   [Spanish determiner + English adjective + English noun]
        La próxima es   el   green   square.
        'The next one is the green square.'
        (Korver 2014, D3, appendix VII: 12)

The high amount of adjective-noun islands, in which Spanish determiners are combined with English islands, supports the finding of an earlier study by Parafita Couto and Gullberg (manuscript).

Eight DPs had an English adjective, while seven had a Spanish adjective. This means that the MP expects to find eight DPs that follow English rules and seven DPs that follow Spanish rules for word order. There is one exception to this expectation, repeated in (49). Here, the DP follows Spanish word order although the adjective is English. This may be an instance of a single-word adjective insertion.

(49)   *Al   lado del*   *libro* burgundy, *que   está?*
        To the side   of D.MASC   book   what   is it
        'Next to the burgundy book, what is there?'
        (Korver 2014, M1, appendix VII: 4)

Judgment task results find a slight preference for stimuli that met MP predictions. Interestingly, results for the MLF improved when I performed descriptive analyses that excluded stimuli with feminine determiners in combination with masculine nouns. This means that such mismatches have had an effect on the grammaticality judgments.

What determiner-noun combinations are possible? If the determiner is in Spanish, what are the gender assignment mechanisms?

I will first discuss the prior question. MLF predictions expect to find the determiner to be in the language of the ML, MP predictions expect to find the determiner to be in Spanish, due to its extra phi-feature for gender that lacks in English.

It is found that the language of the determiner in produced speech was always according to the rules of the MLF. Judgment task results also indicate a slight preference towards MLF predictions. The next paragraphs elaborate on this answer.

The toy task yields 15 switched DPs, of which 14 had Spanish determiners and one had an English determiner. The ML could be identified in 13 instances; it was Spanish in 12 cases and English in one case. Accordingly, the MLF expects to find 12 Spanish determiners and one English determiner. These hypotheses are indeed affirmed by the production data.

The MP prediction proves to be highly attested, too: it fails to account for only one instance. This instance, in which the determiner is found in English rather than Spanish, is repeated in (50).

(50)   It will be the   *penúltimo.*

                      penultimate

       (Korver 2014, D2, appendix VII: 2)

The instance in (50) also illustrates the single instance in which an English determiner was found in combination with a Spanish noun. This is in congruence with the findings of earlier studies, which found that Spanish determiners are more often used in combination with English nouns, than English determiners with Spanish nouns.

The judgment task results for type 1 and type 2 stimuli also indicate a slight preference towards determiners that are in the language of the ML, supporting MLF predictions.

I will now turn to the second question regarding determiner-noun combinations, which concerns gender assignment mechanisms. Earlier studies found gender assignment in the determiner to be influenced by: physiological sex of the animate referent, phonological shape of the noun, analogue gender of the translation equivalent of the

noun, and the default gender of the host language. Because the present study does not control for physiological sex, this factor is left out of consideration. In addition, the judgment task does not control for phonological shape. I expected analogical gender to prevail over phonological shape and assumed that default gender would function as a highly explanatory feature.

I found that if the determiner is Spanish, Spanish-English bilinguals most often produce default gender. This is confirmed by the preference towards assignment of default gender over analogical gender indicated by type 2 stimuli. Type 1 stimuli find a preference for analogical gender over default gender. This deviation may be accounted for by the fact that type 1 stimuli are complex and thus are influenced by the presence of an adjective, just as adjective-noun order judgments for MLF were influenced by a mismatch in gender between the determiner and noun. I will discuss this answer in more detail below.

The toy task found 14 instances in which a Spanish determiner was combined with an English noun. 13 determiners were masculine. The exception, in which a feminine determiner was produced, is accounted for by analogical gender. Phonological shape proves to be an accurate factor. However, four of the six DPs in which phonological shape could play a role contain the same noun ('square'), so it might be that it is this noun particularly that triggers masculine determiner assignment. Analogue gender and default gender are able to account for most instances (respectively nine and 13). These findings tie in with the results from earlier studies (Poplack et al. 1982, Jake et al. 2002).

The judgment task results for type 1 stimuli indicate that analogical gender assignment is judged significantly more positively than assignment of default gender. This contrasts with the preference for default gender assignment in produced DPs. Type 2 stimuli, however, do indicate a preference of default gender assignment over analogical gender assignment. Although I found that ML and noun gender did not influence judgments for gender assignment in type 1 stimuli, it may be that other factors, such as the presence of an adjective, did influence judgments and that the results from this set therefore deviate from the findings for type 2 stimuli. However, judgments for type 2 stimuli regarding gender assignment do confirm the toy task results. My findings add to the body of literature that argues for the assignment of default gender to determiners in code-switched DPs (e.g. Montes-Alcalá and Lapidus Shin 2011, Dussias et al. 2013).

To what extent do the MLF and MP cover the data and are their predictions accurate?

It was hypothesized that the MP will cover for more data. There was no significant preference expected to be found regarding the accuracy of one of the approaches over the other.

My expectation regarding coverage is affirmed, as toy task results indicate that the MP is able to account for all data, whereas the MLF is not -due to the production of DPs without surrounding CPs in a number of cases.

Although the predictions of both theoretical approaches only differ for a very small amount of switches, the MLF accounts for more (all) toy task data, both for adjective-noun order and language of the determiner. This agrees with a similar study into adjective-noun order in Welsh-English code-switching by Parafita Couto et al. (2015b), which also found that MLF predictions relatively accounted for more data. Earlier studies on determiner language found support for both approaches (Herring et al. 2010) or support for neither approach (Fairchild and Van Hell 2015).

As the extracted DPs for adjective-noun order as well as for language of the determiner are all (but one) located in Spanish ML sentences, it would be interesting to see if the MLF remains its 100% accuracy rate if there are more English ML sentences.

The relatively higher accuracy of the MLF for production is only confirmed by judgment task results regarding the language of the determiner. These results also indicate a slight preference towards determiners that are in the language of the ML, supporting MLF predictions. Judgment task results regarding adjective-noun order are divergent from my other findings as they indicate a slight preference for MP stimuli. An earlier study on adjective-noun order in Dutch-French code-switching also found support for the MP, as sentences that were grammatical according to the MP were scored significantly more positively than sentences that were ungrammatical (Vanden Wyngaerd 2016). The present study also finds such a significant difference for MP grammatical versus MP ungrammatical sentences. This is also found for MLF grammatical versus MLF ungrammatical sentences. When the overlapping stimuli are excluded from this calculation, however, it appears that the MP is preferred. Statistical tests proved that this is not due to ungrammatical determiner language for MLF sentences that had grammatical word order. However, when I controlled for gender mismatches (feminine determiner – noun with masculine translation equivalent), it appeared that MLF mean scores became more positive. Therefore, this has had an effect on the grammaticality judgments.

This study finds significant support for both theoretical approaches when sentences that are grammatical according to one approach are compared to sentences that are ungrammatical according to that same approach are compared. Sentences that meet the predictions for both conflict sites (word order and determiner language) are judged significantly more positively compared to sentences that do not meet any of the predictions. This goes for the MLF as well as the MP.

To what extent is production of and are attitudes towards gender assignment in code-switched DPs influenced by early versus late bilingualism?

I expected to find that late bilinguals prefer meeting the analogical criterion, whereas early bilinguals prefer assignment of default gender.

Only early bilingual participants produced relevant switched DPs in the toy task. Therefore, the production of late bilinguals cannot be analysed in this study. Default gender was assigned to the determiner in 13 of the 14 cases, and analogical gender in nine of the 14 cases. It follows that there is only one exception to the assignment of default gender, repeated in (51). The exception appears to be random, because the same participant later assigned default gender to the same English noun. This confirms the hypothesis that early bilinguals indeed prefer to assign default gender to determiners.

(51)   Spanish ML   *la*   row   *numéro   dos*

               D.FEM   [*fila* FEM]   number two

        (Korver 2014, D2, appendix VII: 7)

The judgment task data does account for both early bilinguals and late bilinguals. However, the group distributions are rather uneven in size, namely 12 versus three, respectively. The results indicate that both groups preferred assignment of analogical gender over default gender. This is unexpected, seen that there are more early bilinguals to judge sentences. Yet, this may be due to the fact that data for late bilinguals is based on the judgments of merely three people.

Although the toy task data cannot analyse results of late bilinguals, they confirm the hypothesis for early bilinguals. The judgment task data indicate that both groups prefer assignment of analogue gender over default gender. This is incongruent with both the hypothesis and the toy task data. Again, this may be due to the fact that late bilingual

data was retrieved from merely three participants –as opposed to 12 participants for early bilingualism.

5.2 Study limitations

This thesis has gathered substantial information to discuss its research questions. The employment of a multi-task approach proved useful; judgment task results were able to confirm or, if necessary, reconsider toy task results. This study found new data for the Spanish-English bilingual language pair. Still, the limitations of this study should not be ignored. There are several factors that will have influenced the study and thereby possibly limited the data.

Firstly, code-switching is socially influenced, which poses a challenge for elicitation of code-switched data. Some studies have successfully gathered data from the toy task (Parafita Couto et al. 2015a: 238 useful DPs), while others have not (Parafita Couto et al. 2015b: 1 useful DP). The toy task data for this study are likely to have been influenced by the fact that the researcher, me, is not a community member. I did try to overcome this by having instructions recorded in code-switching mode. Still, the participants already conversed with me prior to the experiment and therefore knew that I was neither a code-switcher nor a native speaker of either of the languages. Six pairs performed the task in monolingually, five times in Spanish and once in English. Although I noticed that the participants spoke more English than Spanish when I was in their presence, only two relevant switches were produced in English ML sentences in the toy task. As a consequence, MLF predictions could not be tested to actual production as extensively as I had hoped beforehand.

Secondly, the acceptability judgment task proved to be of use to confirm toy task results. However, a limitation of the judgment task is that, although a bilingual Puerto Rican checked all stimuli for naturalness, the judgments may be influenced by other factors such as intonation and semantics rather than the switch. I did not find a particular reason to believe that this was the case in my study, other than the fact that all stimuli received rather negative scores in general. This could however, also have to do with the stigma that surrounds code-switching.

A final limitation was caused by technical aspects. If the judgment task in Qualtrics had not stopped working halfway through some experiments, I would have received judgments from more participants. This would have allowed me to make more inter-subject comparisons.

5.3 Suggestions for further research

This study has made some interesting findings that could be used in further research.

To begin with, the toy task seemed to indicate that there were several nouns ('square', 'tree', 'row') that predominantly occurred in switched DPs. It could be interesting to investigate if there are several nouns that trigger switches, as opposed to nouns that do not (e.g. 'hand', 'heart', from table 4). It may be that Spanish-English bilinguals prefer expressing certain lexical items in one language over the other. For instance, the present study noticed that adjectives that indicated colour and size (green, big) were found in English six out of seven times and that adjectives that referred to a location (*ultimo, próximo*) were found in Spanish seven out of nine times in the switched constructions.

I found a difference in production versus judgment data regarding accuracy of MLF predictions for adjective-noun order. The toy task indicated a preference for MLF, whereas the MLF was overruled by MP predictions in the judgment task for adjective-noun order. Future research could investigate whether this difference may be accounted for by a task effect.

It appeared that Spanish determiners in combination with English adjective-noun islands appeared frequently in the toy task and were judged very positively in the judgment task. A study by Parafita Couto and Gullberg (manuscript) found that language islands occur more often than do DPs with a switch between the adjective and the noun. Future research could further explore adjective-noun islands and attempt to account why and under what circumstances exactly these instances occur more often.

Neither the MLF nor the MP makes predictions about gender. The stimuli in this task contained both Spanish determiners: masculine and feminine. Because earlier studies found that constructions in which a feminine determiner is combined with a masculine noun are ungrammatical, I tested whether sentences with that type of construction negatively influenced the mean scores for MLF stimuli. Indeed, mean scores for sentences in the judgment task that met MLF predictions improved when sentences that had a mismatch in gender were excluded from the analysis. This was the case for mean scores of the conflict site of adjective-noun order as well as choice of determiner language. Later studies could focus on this.

This study contributes to code-switching research as it confirmed the predictions of both theoretical approaches and found patterns, which allow for further research.

However, the debate between the accuracy of MP and MLF continues. Linguists have recently started to use neuroscience and other contemporary research methods to study code-switching. For instance, a study by Parafita Couto, Boutonnet, Hoshino, Davies, Deuchar, and Thierry (2013) used ERP technique to elaborate on an earlier study that denoted an insignificant preference for MLF predictions for adjective-noun order (Herring et al. 2010). The ERP technique was able to turn their finding into a significant preference towards the MLF. The advantage of this neuro-linguistic method is that it yields subconscious judgments towards code-switching, which are less likely to be influenced by prescriptive attitudes. Perhaps it is with the help of these new insights that it can be established definitively whether one theoretical analysis is more accurate than the other, and if so, which.

6 Conclusion

This thesis investigated conflict resolution within code-switched DPs regarding (1) adjective-noun order and (2) determiner assignment. Spanish typically has post-nominal adjective placement, whereas English has pre-nominal adjective placement. In mixed DPs, bilinguals may combine a Spanish determiner, which marks gender, with an English noun, which lacks gender. The study employed a multi-task approach that comprises an elicitation toy task and an auditory grammaticality judgment task. It explored theoretical analyses from the Minimalist Program and the Matrix Language Framework by comparing both approaches to data that was gathered in the Spanish-English bilingual community in Puerto Rico. As the MP and MLF do not make predictions for gender assignment in the determiner, the role of previously found influential factors was tested: phonological shape, analogue gender, and default gender. Earlier studies also found that physiological sex influences gender assignment, but this factor is left out of consideration in this thesis due to a lack of relevant data.

The results from the toy task denoted that the MP approach was able to cover for more data than the MLF. The MLF, in turn, accounted for all toy task data. This study did not find a significant difference to prove the accuracy of one approach over the other. This means that there are little implications for the theoretical approaches. However, the study did find significant support for the MLF as well as the MP approach when I compared sentences that were grammatical to sentences that were ungrammatical sentences according to their predictions regarding adjective-noun order. When sentences that met the predictions from both approaches were excluded from this calculation, the significance disappeared and the MP seemed to be a slightly more preferred predictor for adjective-noun word order. MLF predictions for choice of determiner language, on the other hand, were slightly preferred over MP predictions.

Regarding gender, toy task data indicated a preference towards assignment of the default gender over matching analogical gender of the translation equivalent. As all switches were produced by early bilinguals, these results tie in with earlier studies that found that earlier bilinguals prefer the assignment of default gender. Phonological shape also appeared to be influential for produced determiner-noun combinations in the toy task, however, there was only a small amount of data to which this factor applied. Experimental data from type 1 complex stimuli indicated that assignment of analogical

gender is judged significantly more positively than assignment of default gender. Because there were more early than late bilingual participants that completed the grammaticality judgment task, this result was rather unexpected. The judgments may, however, have been influenced due to the uneven group distribution of early versus late bilinguals. Also, judgments regarding the small group of type 2 simplex stimuli did indicate a preference for default gender over analogical gender.

All things considered, this thesis made several interesting findings. The corpus of studies on code-switching should continue to expand in order to completely determine the implications of attested data on MLF and the MP predictions.

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Appendix I   Judgment task content

A. Test stimuli, type 1

Masculine (translation equivalent of the) noun

Code	DP	Sentence	Word order MLF	MP	D language MLF	MP	Mean score
BS1	The tree *grande*	The kids are dancing around the tree *grande*	X	✓	✓	X	2.73
BS2	The *grande* tree	The kids are dancing around the *grande* tree	✓	X	✓	X	3.43
BS3	the *libro* green	I want the *libro* green	X	X	✓	X	3.63
BS4	the *green libro*	I want the green *libro*.	✓	✓	✓	X	2.64
BS5	the *cuadrado pequeño*	Juan has drawn the *cuadrado pequeño*	✓10	✓	✓	X	3.13
BS6	the *pequeño cuadrado*	Juan has drawn the *pequeño cuadrado*	X*	X	✓	X	2.93
BS7	*La* tree big	The kids are dancing around *la* tree big	X	X	X	✓	4.20
BS8	*La* big tree	The kids are dancing around *la* big tree	✓	✓	X	✓	2.69
BS9	*la* book *verde*	I want *la* book *verde*	X	✓	X	✓	3.88
BS10	la *verde* book	I want *la verde* book	✓	X	X	✓	3.80
BS11	*la cuadrado* small	Juan has drawn *la cuadrado* small	X	X	X	✓	3.75
BS12	*la* small *cuadrado*	Juan has drawn *la* small *cuadrado*	✓	✓	X	✓	3.27
BS13	*El* tree big	The kids are dancing around *el* tree big	X	X	X	✓	4.00
BS14	*El* big tree	The kids are dancing around *el* big tree	✓	✓	X	✓	2.60
BS15	*el* book *verde*	I want *el* book *verde*	X	✓	X	✓	2.73
BS16	*el verde* book	I want *el verde* book	✓	X	X	✓	3.73
BS17	*el cuadrado* small	Juan has drawn *el cuadrado* small	X	X	X	✓	3.87
BS18	*el* small *cuadrado*	Juan has drawn *el* small *cuadrado*	✓	✓	X	✓	3.40
BS19	The tree *grande*	*Quieren cortar* the tree *grande*	✓	✓	X	X	3.19
BS20	The *grande* tree	*Quieren cortar* the *grande* tree	X	X	X	X	3.93
BS21	the *libro* green	*Quiero* the *libro* green	✓	X	X	X	3.67

10,* For the embedded language islands in these cases, the MLF accepts the word order of the island language. For most adjectives in Spanish, both orders are allowed under certain pragmatic conditions, cf. section 1.2.2.

Code	DP	Sentence	Word order MLF	Word order MP	D language MLF	D language MP	Mean score
BS22	the green *libro*	*Quiero* the green *libro*	X	✓	X	X	3.00
BS23	the *cuadrado pequeño*	*Juan ha dibujado* the *cuadrado pequeño*	✓	✓	X	X	3.13
BS24	the *pequeño cuadrado*	*Juan ha dibujado* the *pequeño cuadrado*	X	X	X	X	3.13
BS25	*La* tree big	*Quieren cortar la* tree big	X	X	✓	✓	4.20
BS26	*La* big tree	*Quieren cortar la* big tree	✓	✓	✓	✓	2.88
BS27	*la* book *verde*	*Quiero la* book *verde*	✓	✓	✓	✓	3.50
BS28	*la verde* book	*Quiero la verde* book	X	X	✓	✓	3.87
BS29	*la cuadrado* small	*Juan ha dibujado la cuadrado* small	✓	X	✓	✓	3.69
BS30	*la* small *cuadrado*	*Juan ha dibujado la* small *cuadrado*	X	✓	✓	✓	3.47
BS31	*El* tree big	*Quieren cortar el* tree big	X	X	✓	✓	4.40
BS32	*El* big tree	*Quieren cortar el* big tree	✓	✓	✓	✓	2.33
BS33	*el* book *verde*	*Quiero el* book *verde*	✓	✓	✓	✓	2.60
BS34	*el verde* book	*Quiero el verde* book	X	X	✓	✓	3.50
BS35	*el cuadrado* small	*Juan ha dibujado el cuadrado* small	✓	X	✓	✓	3.53
BS36	*el* small *cuadrado*	*Juan ha dibujado el* small *cuadrado*	X	✓	✓	✓	2.94

Feminine (translation equivalent of the) noun

Code	DP	Sentence	Word order MLF	Word order MP	D language MLF	D language MP	Mean score
BS37	The table *grande*	I think we should paint the table *grande*	X	✓	✓	X	3.50
BS38	The *grande* table	I think we should paint the *grande* table	✓	X	✓	X	3.56
BS39	The *casa* blue	John likes the *casa* blue	X	X	✓	X	3.47
BS40	The blue *casa*	John likes the blue *casa*	✓	✓	✓	X	3.07
BS41	The *leche caliente*	Could you pass me the *leche caliente*?	✓*	✓	✓	X	2.60
BS42	The *caliente leche*	Could you pass me the *caliente leche*?	X*	X	✓	X	4.27
BS43	*La* table big	I think we should paint *la* table big	X	X	X	✓	3.93
BS44	*La* big table	I think we should paint *la* big table	✓	✓	X	✓	2.63
BS45	*La* house *azul*	John likes *la* house *azul*	X	✓	X	✓	2.87
BS46	*La azul* house	John likes *la azul house*	✓	X	X	✓	3.69
BS47	*La leche* warm	Could you pass me *la leche* warm?	X	X	X	✓	3.50
BS48	*La* warm *leche*	Could you pass me *la* warm *leche*?	✓	✓	X	✓	3.00
BS49	*El* table big	I think we should paint *el* table big	X	X	X	✓	3.75
BS50	*El* big table	I think we should paint *el* big	✓	✓	X	✓	2.60

Code	DP	Sentence					
		table					
BS51	*El* house *azul*	John likes *el* house *azul*	X	✓	X	✓	2.93
BS52	*El azul* house	John likes *el azul* house	✓	X	X	✓	4.00
BS53	*El leche* warm	Could you pass me *el leche* warm?	X	X	X	✓	4.31
BS54	*El* warm *leche*	Could you pass me *el* warm *leche*?	✓	✓	X	✓	3.93
BS55	The table *grande*	*Quiero pintar* the table *grande*	✓	✓	X	X	3.27
BS56	The *grande* table	*Quiero pintar* the *grande* table	X	X	X	X	3.20
BS57	The *casa* blue	*Le gusta* the *casa* blue	✓	X	X	X	2.67
BS58	The blue *casa*	*Le gusta* the blue *casa*	X	✓	X	X	3.44
BS59	The *leche caliente*	*Puedes pasarme* the *leche caliente*?	✓	✓	X	X	3.13
BS60	The *caliente leche*	*Puedes pasarme* the *caliente leche*?	X	X	X	X	4.33
BS61	*La* table big	*Quiero pintar la* table big	X	X	✓	✓	3.47
BS62	*La* big table	*Quiero pintar la* big table	✓	✓	✓	✓	2.47
BS63	*La* house *azul*	*Le gusta la* house *azul*	✓	✓	✓	✓	2.60
BS64	*La azul* house	*Le gusta la azul* house	X	X	✓	✓	3.73
BS65	*La leche* warm	*Puedes pasarme la leche* warm?	✓	X	✓	✓	3.00
BS66	*La* warm *leche*	*Puedes pasarme la* warm *leche*?	X	✓	✓	✓	3.57
BS67	*El* table big	*Quiero pintar el* table big	X	X	✓	✓	3.53
BS68	*El* big table	*Quiero pintar el* big table	✓	✓	✓	✓	2.67
BS69	*El* house *azul*	*Le gusta el* house *azul*	✓	✓	✓	✓	2.93
BS70	*El azul* house	*Le gusta el azul* house	X	X	✓	✓	3.60
BS71	*El leche* warm	*Puedes pasarme el leche* warm?	✓	X	✓	✓	4.13
BS72	*El* warm *leche*	*Puedes pasarme el* warm *leche*?	X	✓	✓	✓	3.93

B. Test stimuli, type 2

Masculine (translation equivalent of the) noun

Code	DP	Sentence	Mean score	D lang	
				MLF	**MP**
BN1	the *árbol*	They want to cut the *árbol*	3.07	✓	X
BN2	*la árbol*	The want to cut *la árbol*	2.73	X	✓
BN3	*el árbol*	They want to cut *el árbol*	2.81	X	✓
BN4	the *árbol*	*Mira la ardilla subiendo* the *árbol*!	2.60	X	X
BN5	*la* tree	*Mira la ardilla subiendo la* tree!	3.13	✓	✓
BN6	*el* tree	*Mira la ardilla subiendo el* tree!	2.00	✓	✓

Feminine (translation equivalent of the) noun

Code	DP	Sentence	Mean score	D lang	
				MLF	**MP**

BN7	the *mesa*	I think he left you the *mesa*	3.60	✓	X
BN8	*la mesa*	I think he left you *la mesa*	3.07	X	✓
BN9	*el mesa*	I think he left you *el mesa*	3.63	X	✓
BN10	the *mesa*	*Puedes limpiar* the *mesa*	2.93	X	X
BN11	*la* table	*Puedes limpiar la* table	2.44	✓	✓
BN12	*el* table	*Puedes limpiar el* table	2.20	✓	✓

C. Fillers

Code	Sentence
MS1	Juan *cocinó cuidadosamete* the turkey
MS2	Juan *cocinó* carefully the turkey
MS3	Juan cooked carefully *el pavo*
MS4	Juan cooked *cuidadosamente el pavo*
MS5	María *manejó rápidamente* the bus
MS6	María *manejó* swiftly the bus
MS7	María drove *rápidamente la guagua*
MS8	María drove swiftly *la guagua*
MS9	Susana *escribió carinosamente* the letter
MS10	Susana *escribió* affectionately the letter
MS11	Susana wrote *carinomente la carta*
MS12	Susana wrote affectionately *la carta*
MS13	Carlos *respondió sabiamente* the questions
MS14	Carlos *respondió* wisely the questions
MS15	Carlos answered *sabiamente las preguntas*
MS16	Carlos answered wisely *las preguntas*
MC1	Juan *cocinó* carefully *el pavo*
MC2	Juan cooked *cuidadosamente* the turkey
MC3	María *manejó* swiftly *la guagua*
MC4	María drove *rápitdamente* the bus
MC5	Susana *escribió* affectionately *la carta*
MC6	Susana wrote *carinosamente* the letter
MC7	Carlos *respondió* wisely *las preguntas*
MC8	Carlos answered *sabiamente* the questions

Appendix II   Background questionnaire

Please indicate if you were Director or Matcher followed by the number of your pair:

Q1 Would you like to fill out an English or a Spanish questionnaire?
○ English
○ Spanish

A. English

I would be grateful if you could give me the following background information to help me with my studies.

Q2 Are you:
○ Male
○ Female

Q3 Year of birth:

Q4 What is your present occupation (or if retired or unemployed, what was your last occupation before retiring or becoming unemployed)?

Q5 Please indicate the areas where you have lived for significant periods of your life:e.g.:La Habana, Cuba 1975-1993New York City, NY 1993-1999 New York City, United States 1995-2000   Ponce, Puerto Rico 2001-2004

Q6 What is the highest level of formal education you have completed?
○ Junior High or equivalent
○ High school or equivalent
○ Bachelor's Degree, Diploma of HIgher/Furher Education, or equivalent
○ Master's Degree, Doctorate, or equivalent
○ None of the above

Q7 Since when have you been able to speak Spanish?
- ○ Since I was 2 years old or younger
- ○ Since I was 4 years old or younger
- ○ Since primary school
- ○ Since secondary school
- ○ I learned Spanish as an adult, and I did so by: _____

Q8 Since when have you been able to speak English?
- ○ Since I was 2 years old or younger
- ○ Since I was 4 years old or younger
- ○ Since primary school
- ○ Since secondary school
- ○ I learned Spanish as an adult, and I did so by: _____

Q9 On a scale of 1 to 4, how well do you feel you can speak Spanish?
- ○ 1 Only know some words and expressions
- ○ 2 Confident in basic conversations
- ○ 3 Fairly confident in extended conversations
- ○ 4 Confident in extended conversations

Q10 On a scale of 1 to 4, how well do you feel you can speak English?
- ○ 1 Only know some words and expressions
- ○ 2 Confident in basic conversations
- ○ 3 Fairly confident in extended conversations
- ○ 4 Confident in extended conversations

Q11 Which language(s) did your mother speak to you while you were growing up (if applicable)?
- ○ Spanish
- ○ English
- ○ Spanish & English
- ○ Other (Please specify) _____
- ○ N/A

Q12 Which language(s) did your father speak to you while you were growing up (if applicable)?
- ○ Spanish
- ○ English
- ○ Spanish & English
- ○ Other (Please specify) _____
- ○ N/A

Q13 Which language(s) did any other guardian or caregiver speak to you while you were growing up (if applicable)?

○ Spanish

○ English

○ Spanish & English

○ Other (Please specify) _____

○ N/A

Q14 Through which language(s) were you predominantly taught at primary school?

○ Spanish

○ English

○ Spanish & English

○ Other (Please specify) _____

○ N/A

Q15 My primary school was

○ Public

○ Private

Q16 Through which language(s) were you predominantly taught at secondary school?

○ Spanish

○ English

○ Spanish & English

○ Other (Please specify) _____

○ N/A

Q17 My secondary school was

○ Public

○ Private

Q18 Through which language(s) were you predominantly taught at university?

○ Spanish

○ English

○ Spanish & English

○ Other (Please specify) _____

○ N/A

Q19 My university was

○ Public

○ Private

Q20 Make a list below of five of the people you speak to most in your everyday life, either in person or on the phone, e.g. your partner, your child, a friend, a workmate etc. Then note which language(s) you mostly speak with that person.

	Spanish	English	Equally Spanish & English	Another language
Fill in:	○	○	○	○
Fill in:	○	○	○	○
Fill in:	○	○	○	○
Fill in:	○	○	○	○
Fill in:	○	○	○	○

Q21 How would you rate the Spanish language on a scale of 1 to 5 regarding the following properties?

	1	2	3	4	5
Old-fashioned:Modern	○	○	○	○	○
Unfriendly:Friendly	○	○	○	○	○
Uninfluential:Influential	○	○	○	○	○
Uninspiring:Inspiring	○	○	○	○	○
Useless:Useful	○	○	○	○	○
Ugly:Beautiful	○	○	○	○	○

Q22 How would you rate the English language on a scale of 1 to 5 regarding the following properties?

	1	2	3	4	5
Old-fashioned:Modern	○	○	○	○	○
Unfriendly:Friendly	○	○	○	○	○
Uninfluential:Influential	○	○	○	○	○
Uninspiring:Inspiring	○	○	○	○	○
Useless:Useful	○	○	○	○	○
Ugly:Beautiful	○	○	○	○	○

Q23 Do you consider yourself to be mainly...?
○ Latin American
○ U.S. American
○ Puerto Rican
○ Other (Please specify): _____

Q24 To what extent do you agree with the following statement: "In everyday conversation, I keep the Spanish and English languages seperate."
- ❍ 1 Strongly disagree
- ❍ 2 Disagree
- ❍ 3 Neither agree nor disagree
- ❍ 4 Agree
- ❍ 5 Strongly agree

Q25 To what extent do you agree with the following statement: "People should avoid mixing Spanish and English in the same conversation."
- ❍ 1 Strongly disagree
- ❍ 2 Disagree
- ❍ 3 Neither agree nor disagree
- ❍ 4 Agree
- ❍ 5 Strongly agree

Thank you very much for your time and co-operation.

B. Spanish

Le estaría muy agradecido si me pudiera dar la siguiente información para ayudarme con mi estudio.

Q2 Es usted:
○ Hombre
○ Mujer

Q3 Año de nacimiento:

Q4 ¿A qué se dedica actualmente (si está jubilado o desempleado, ¿cuál fue su último trabajo antes de retirarse o entrar en el paro?)?

Q5 Por favor, indique los sitios donde vivió durante periodos largos: ex.:La Habana, Cuba 1975-1993New York City, NY 1993-1999 New York City, United States 1995-2000   Ponce, Puerto Rico 2001-2004

Q6 ¿Cuál es su nivel más alto de educación completado?
○ Escuela Intermedio o equivalente
○ Escuela Superior o equivalente
○ Bachillerato o equivalente
○ Maestría, Doctorado, o equivalente
○ Ninguno de los anteriores

Q7 ¿Desde cuándo habla español?
○ Desde que tenía dos años o incluso antes
○ Desde que tenía cuatro años o incluso antes
○ Desde la escuela primaria
○ Desde la escuela secundaria
○ Aprendí a hablar español de adulto, con este medio:

Q8 ¿Desde cuándo habla inglés?
○ Desde que tenía dos años o incluso antes
○ Desde que tenía cuatro años o incluso antes
○ Desde la escuela primaria
○ Desde la escuela secundaria
○ Aprendí a hablar español de adulto, con este medio: _____

Q9 En una escala del 1 al 4, ¿cómo piensa que es su nivel de español?
- ⭘ 1 Sólo sé algunas palabras y expresiones
- ⭘ 2 Puedo mantener conversaciones básicas
- ⭘ 3 Puedo mantener conversaciones un poco más avanzadas
- ⭘ 4 Puedo mantener todo tipo de conversaciones

Q10 En una escala del 1 al 4, ¿cómo piensa que es su nivel de inglés?
- ⭘ 1 Sólo sé algunas palabras y expresiones
- ⭘ 2 Puedo mantener conversaciones básicas
- ⭘ 3 Puedo mantener conversaciones un poco más avanzadas
- ⭘ 4 Puedo mantener todo tipo de conversaciones

Q11 ¿Qué lengua(s) le hablaba su madre cuando estaba creciendo (si es aplicable)?
- ⭘ Español
- ⭘ Inglés
- ⭘ Español e inglés
- ⭘ Otra (Por favor, especifique) _____
- ⭘ N/A

Q12 ¿Qué lengua(s) le hablaba su padre cuando estaba creciendo (si es aplicable)?
- ⭘ Español
- ⭘ Inglés
- ⭘ Español e inglés
- ⭘ Otra (Por favor, especifique) _____
- ⭘ N/A

Q13 ¿Qué lengua(s) le hablaba cualquier otro tutor cuando estaba creciendo (si es aplicable)?
- ⭘ Español
- ⭘ Inglés
- ⭘ Español e inglés
- ⭘ Otra (Por favor, especifique) _____
- ⭘ N/A

Q14 ¿En qué lengua(s) le enseñaban en la escuela primaria?
- ⭘ Español
- ⭘ Inglés
- ⭘ Español e inglés
- ⭘ Otra (Por favor, especifique) _____
- ⭘ N/A

Q15 La escuela primaria era
- ○ Publica
- ○ Privada

Q16 ¿En qué lengua(s) le enseñaban en la escuela secundaria?
- ○ Español
- ○ Inglés
- ○ Español e inglés
- ○ Otra (Por favor, especifique) _____
- ○ N/A

Q17 La escuela secundaria era
- ○ Publica
- ○ Privada

Q18 ¿En qué lengua(s) le enseñaban en la universidad?
- ○ Español
- ○ Inglés
- ○ Español e inglés
- ○ Otra (Por favor, especifique) _____
- ○ N/A

Q19 La universidad era
- ○ Publica
- ○ Privada

Q20 Haga una lista de las cinco personas que hablan más con usted en su vida diaria, tanto en persona como por teléfono, e.g. su pareja, su hijo/a, un amigo, un compañero de trabajo, etc. Después anote qué lengua (s) habla en general con esa persona.

	Español	Inglés	Tanto español como inglés	Otra lengua
Hablo con:	○	○	○	○
Hablo con:	○	○	○	○
Hablo con:	○	○	○	○
Hablo con:	○	○	○	○
Hablo con:	○	○	○	○

Q21 ¿Cómo caracterizaría a la lengua española siguiendo una escala del 1 al 15 de acuerdo con las siguientes propiedades?

	1	2	3	4	5
Antigua:Moderna	❍	❍	❍	❍	❍
No amigable:Amigable	❍	❍	❍	❍	❍
No influyente:Influyente	❍	❍	❍	❍	❍
No inspirador:Inspirador	❍	❍	❍	❍	❍
Inútil:Útil	❍	❍	❍	❍	❍
Fea:Bonita	❍	❍	❍	❍	❍

Q22 ¿Cómo caracterizaría a la lengua inglesa siguiendo una escala del 1 al 15 de acuerdo con las siguientes propiedades?

	1	2	3	4	5
Antigua:Moderna	❍	❍	❍	❍	❍
No amigable:Amigable	❍	❍	❍	❍	❍
No influyente:Influente	❍	❍	❍	❍	❍
No inspirador:Inspirador	❍	❍	❍	❍	❍
Inútil:Útil	❍	❍	❍	❍	❍
Fea:Bonita	❍	❍	❍	❍	❍

Q23 ¿Usted se considera principalmente……?
- ❍ Latinoamericano
- ❍ Estadounidense
- ❍ Puertorriqueño
- ❍ Otro (por favor, especifique) _____

Q24 ¿Hasta qué punto está de acuerdo con la siguiente declaración?: "En mis conversaciones diarias, mantengo el español y el inglés separados."
- ❍ 1 Totalmente en desacuerdo
- ❍ 2 En desacuerdo
- ❍ 3 Ni de acuerdo ni en desacuerdo
- ❍ 4 De acuerdo
- ❍ 5 Totalmente de acuerdo

Q25 ¿Hasta qué punto está de acuerdo con la siguiente declaración?: "La gente debería evitar mezclar el español y el inglés en la misma conversación."

- ◯ 1 Totalmente en desacuerdo
- ◯ 2 En desacuerdo
- ◯ 3 Ni de acuerdo ni en desacuerdo
- ◯ 4 De acuerdo
- ◯ 5 Totalmente de acuerdo

Muchas gracias por su tiempo y colaboración.

Appendix III Consent forms

A. Toy task

Translanguaging in the Puerto Rican Context
University of Leiden, University of Puerto Rico at Mayagüez, and CeiBA
Consent to participate in a research study
Survey and Toy Task
Adult participants

Principal investigator: Belinda Korver, BA.
Contact email: b.e.l.korver@umail.leidenuniv.nl
Co-investigators: Catherine M. Mazak, PhD., M. Carmen Parafita, Ph.D.

We are asking for your participation in our research project. Your participation in this study is voluntary. You can choose not to participate, and you may revoke your consent to participate in the study, for whatever reason, without any consequences to you. You will be given a copy of this consent form. You should ask the researchers listed on this form, or any of their assistants, any questions that you have at any time during this process.

The objective of this study is to find out about the language practices of bilinguals in Puerto Rico. Your participation will take about an hour, about 20 minutes to complete a questionnaire and about 40 minutes to complete an experiment.

During the experiment, you will be asked to talk to another bilingual person to complete a task. You will be sitting at the same table as this person, but separated by a piece of cardboard. Your talk will be recorded as you work through the task together. Later, a researcher will transcribe the recording. No one will hear the recording except for the researchers. The digital audio files will be kept on a password-protected computer during data analysis. When data analysis is finished, the files will be destroyed.

The questionnaire and the audio recordings will NOT be identified with your name. Instead, you will receive a participant number which will identify your survey and your audio recordings. Your name will not be linked with this number, so the survey and audio files cannot be linked to your name in any way.

You will not receive any compensation for your participation in this research project. There are no unusual risks involved with participation in this study, and you are free to revoke your consent to participate at any time.

Participant's Consent:

By signing this I give my permission for the information I have given on the questionnaire to be used for research and/or teaching purposes only (including research publications and/or reports) as long as my identity remains anonymous.

I also give my permission for my **voice** to be recorded as part of the experiment.

I understand that, by signing this consent form, I give the researchers permission to present some of the data as part of their work in written and/or in oral form, without further permission from me.

_____   _____

Name of participant   Date

_____

Signature of participant

_____   _____

Name of researcher who obtained consent   Date

_____

Signature of researcher who obtained consent

B. Judgment task

Translanguaging in the Puerto Rican Context
University of Leiden, University of Puerto Rico at Mayagüez, and CeiBA
Consent to participate in a research study
Survey and Grammaticality Judgments
Adult participants

Principal investigator: Belinda Korver, BA.
Contact email: b.e.l.korver@umail.leidenuniv.nl
Co-investigators: Catherine M. Mazak, PhD., M. Carmen Parafita, Ph.D.

We are asking for your participation in our research project. Your participation in this study is voluntary. You can choose not to participate, and you may revoke your consent to participate in the study, for whatever reason, without any consequences to you. You will be given a copy of this consent form. You should ask the researchers listed on this form, or any of their assistants, any questions that you have at any time during this process.

The objective of this study is to find out about the language practices of bilinguals in Puerto Rico. Your participation will take about an hour, about 20 minutes to complete a questionnaire and about 40 minutes to complete an experiment.

During the experiment, you will be asked sit at a computer and listen to audio recordings of a person speaking Spanish and English. If you think the speaker is speaking correctly, you will press a button with a smiley face on it (☺). If you think the speaker is speaking badly, you will press a button with a frowning face on it (☹). If you are not sure, you will press the middle button.

The questionnaire and the results of the computer judgments will NOT be identified with your name. Instead, you will receive a participant number which will identify your survey and your computer judgment results. Your name will not be linked with this number, so the survey and computer judgment results cannot be linked to your name in any way.

You will not receive any compensation for your participation in this research project. There are no risks involved with participation in this study, and you are free to revoke your consent to participate at any time.

Participant's Consent:

By signing this I give my permission for the information I have given on the questionnaire to be used for research and/or teaching purposes only (including research publications and/or reports) as long as my identity remains anonymous.

I understand that, by signing this consent form, I give the researchers permission to present some of the data as part of their work in written and/or in oral form, without further permission from me.

_____   _____

Name of participant   Date

_____

Signature of participant

_____   _____

Name of researcher who obtained consent   Date

_____

Signature of researcher who obtained consent

Appendix IV   Background questionnaire responses

D = Director, M = Matcher

Questionnaire:	**D1** **English**	**M1** **English**	**D2** **Spanish**	**M2** **Spanish**	**D3** **English**	**M3** **English**	**D4** **English**
Q2: Sex	Male	Female	Male	Male	Male	Male	Female
Q3: Year of birth	1988	1989	1984	1990	1989	1962	1988
Q4: Occupation	Student	Student	Student	Student	Student	Professor	Student
Q4: Lived in	US, PR	US, PR	PR, US	PR	PR	US, PR	US, PR
Q5: Education	BA	BA	BA	High school	BA	MA	BA
Q6: Sp since	Primary	≤2	≤2	≤2	≤2	Primary	≤2
Q7: En since	≤2	≤2	≤4	≤2	Primary	≤4	≤2
Proficiency - Q8: Spanish - Q9: English	3 4	3 3	4 4	4 4	4 3	4 4	4 3
Caretakers - Q10: Mom - Q11: Dad - Q12: Other	Sp&En Sp&En Sp&En	Spanish English Sp&En	Spanish Spanish English	Sp&En n/a English	Sp&En Spanish n/a	Sp&En Spanish n/a	Spanish Spanish n/a
Schools - Q14: Primary - Q16: Secondary - Q18: University	Sp&En English English	English English Sp&En	English English Spanish	Spanish Spanish Sp&En	Spanish Sp&En Sp&En	Sp&En Sp&En Sp&En	Spanish Spanish Spanish
Q20: Social life - Spanish - English - Sp&En	0x[11] 2x 3x	1x 1x 3x	2x 1x 2x	2x 2x 1x	1x 1x 3x	3x 2x ox	3x 0x 2x
Properties - Q21: Spanish - Q22: English	453455 343453	343453 444453	555555 555554	255555 323452	323344 435453	442111 555454	345555 444353
Q23: Nationality	Puerto Rican	Puerto Rican	Other (Iberocelta caribeño)	Latin American	Puerto Rican	Puerto Rican	Puerto Rican
Q24: "I do not mix languages"	Fully disagree	Fully disagree	Fully disagree	Disagree	Neither	Agree	Disagree
Q25: "Separate languages"	Fully disagree	Fully disagree	Fully disagree	Fully disagree	Agree	Agree	Neither

Amount of switches produced	0	1	6	3	1	0	0

---

[11] Refers to amount of people that the participant spoke a certain language with.

Questionnaire:	M4 English	D5 English	M5 English	D6 English	M6 Spanish	D7 XXXX	M7 Spanish
Q2: Sex	Male	Female	Female	Male	Male	Male	Female
Q3: Year of birth	1988	1988	1988	1980	1990		1987
Q4: Occupation	Student	Student	Student	Student	Student		Student
Q4: Lived in	PR	PR	PR	PR	PR		PR
Q5: Education	BA	MA	BA	MA	High school		BA
Q6: Sp since	≤2	≤2	≤2	≤4	≤4		≤2
Q7: En since	Secondary	Primary	Secondary	Primary	Primary		Secondary
Proficiency							
- Q8: Spanish	4	4	4	2	4		4
- Q9: English	3	3	2	2	2		2
Caretakers							
- Q10: Mom	Spanish	Spanish	Spanish	Spanish	Spanish		Spanish
- Q11: Dad	Spanish	Spanish	Spanish	Spanish	Spanish		Spanish
- Q12: Other	Spanish	Spanish	Spanish	Sp&En	n/a		n/a
Schools							
- Q14: Primary	Spanish	Spanish	Sp&En	Sp&En	Sp&En		Spanish
- Q16: Secondary	English	Sp&En	Spanish	Sp&En	Sp&En		Sp&En
- Q18: University	Spanish	Sp&En	Sp&En	Sp&En	Sp&En		Spanish
Q20: Social life							
- Spanish	2x	0x	3x	1x	5x		4x
- English	0x	0x	0x	0x	0x		0x
- Sp&En	3x	5x	2x	4x	0x		1x
Properties							
- Q21: Spanish	434344	355555	555555	243425	555555		145455
- Q22: English	343343	345555	533354	544454	534252		155455
Q23: Nationality	Puerto Rican	Puero Rican	Puerto Rican	Latin American	Puerto Rican		Puerto Rican
Q24: "I do not mix languages"	Disagree	Fully agree	Disagree	Disagree	Neither		Disagree
Q25: "Separate languages"	Agree	Agree	Neither	Disagree	Agree		Agree

| Amount of switches produced | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Questionnaire:	D8 Spanish	M8 English	D9 English	M9 English	D10 English	M10 English	D11 English
Q2: Sex	Female	Female	Male	Male	Female	Female	Male
Q3: Year of birth	1994	1994	1992	1990	1981	1987	1991
Q4: Occupation	Student	Student	Student	Student	Student	Student	Student
Q4: Lived in	PR	PR	PR	US, PR	PR	Germany, US, PR	PR
Q5: Education	High school	High school	High school	BA	BA	BA	BA
Q6: Sp since	≤2	≤2	≤2	≤2	≤2	≤2	≤2
Q7: En since	Primary	Primary	≤2	≤2	≤4	≤4	≤2
Proficiency							
- Q8: Spanish	4	4	3	4	4	4	4
- Q9: English	4	4	4	4	4	4	4
Caretakers							
- Q10: Mom	Sp&En	Spanish	Spanish	Sp&En	Sp&En	Sp&En	Spanish
- Q11: Dad	Sp&En	n/a	Spanish	n/a	Spanish	Sp&En	Spanish
- Q12: Other	Sp&En	Spanish	Spanish	n/a	n/a	Sp&En	Spanish
Schools							
- Q14: Primary	Sp&En	Spanish	Sp&En	Spanish	Spanish	Sp&En	English
- Q16: Secondary	Sp&En	English	Sp&En	Spanish	Sp&En	Spanish	English
- Q18: University	Spanish	English	Sp&En	Sp&En	Sp&En	Sp&En	Spanish
Q20: Social life							
- Spanish	0x	2x	3x	2x	0x	3x	2x
- English	0x	0x	0x	1x	0x	0x	1x
- Sp&En	5x	3x	2x	2x	4x	0x	2x
Properties							
- Q21: Spanish	345455	434354	555555	543555	444343	343353	344535
- Q22: English	345454	343354	555555	455353	343353	345453	324343
Q23: Nationality	Latin American	Puerto Rican	Puerto Rican	Puerto Rican	Puerto Rican	Puerto Rican	Puerto Rican
Q24: "I do not mix languages"	Disagree	Disagree	Fully disagree	Agree	Disagree	Fully disagree	Fully agree
Q25: "Separate languages"	Agree	Agree	Fully disagree	Agree	Fully disagree	Fully disagree	Fully disagree

	D8	M8	D9	M9	D10	M10	D11
Amount of switches produced	2	0	3	0	0	0	1

Questionnaire:	**M11** **English**	**D12** **English**	**M12** **XXXX**	**D13** **Spanish**	**M13** **English**	**D14** **English**	**M14** **English**
Q2: Sex	Male	Male	Male	Female	Female	Female	Female
Q3: Year of birth	1975	1987		1985	1984	1988	1985
Q4: Occupation	Artist	Student		Student	Student	Student	Student
Q4: Lived in	PR, US	PR		PR	PR	PR, US	PR, US
Q5: Education	BA	BA		BA	MA	High school	BA
Q6: Sp since	≤2	≤2		≤2	≤2	≤2	≤2
Q7: En since	Primary	≤4		Primary	Primary	Secondary	≤2
Proficiency							
- Q8: Spanish	4	4		4	4	4	4
- Q9: English	4	4		2	2	4	4
Caretakers							
- Q10: Mom	Spanish	Spanish		Spanish	Spanish	Spanish	English
- Q11: Dad	Spanish	Spanish		Spanish	Spanish	Spanish	English
- Q12: Other	n/a	n/a		Spanish	Spanish	Spanish	Sp&En
Schools							
- Q14: Primary	Sp&En	Spanish		Spanish	Spanish	Spanish	English
- Q16: Secondary	English	Sp&En		Spanish	Sp&En	Spanish	Sp&En
- Q18: University	English	Spanish		Spanish	Sp&En	Sp&En	English
Q20: Social life							
- Spanish	3x	1x		0x	0x	3x	0x
- English	1x	1x		0x	0x	1x	2x
- Sp&En	1x	3x		5x	5x	1x	3x
Properties							
- Q21: Spanish	355555	332334		444455	244444	555555	443445
- Q22: English	535353	334353		444445	235355	555555	545354
Q23: Nationality	Latin American	Puerto Rican		Latin American	Latin American	Puerto Rican	Puerto Rican
Q24: "I do not mix languages"	Disagree	Fully disagree		Neither	Fully agree	Disagree	Fully disagree
Q25: "Separate languages"	Disagree	Disagree		Disagree	Fully agree	Disagree	Agree

Amount of switches produced	0	0	0	0	0	0	0

Appendix V   Toy task instructions

You are participating en *un estudio* that finds out about the language practices of bilinguals in Puerto Rico. This part will take about 5-10 minutes.

You are both bilingual speakers. You are asked to talk to each other *para completar el* task. Both of you are sitting in front of a cardboard with items on it, arranged in rows of 4 by 4. The items en el board of the person in front of you are differently arranged than yours. *El objetivo* of the task is to end up with two identically arranged boards.

The director helps the matcher with organising his/her toys in the order as they appear on his/her board. This will be done by conversing, since the two of you *estan separados* by a cardboard in the middle.

The task is completed when the items on the board of the matcher are in the same order as they are on the other cardboard. The matcher can ask the director questions *en cualquier momento*, because it is the matcher who will be the one that has to be sure *que todo este bien*.

Your talk will be recorded as you work through the task together.

Appendix VI   Judgment task lay-out in Qualtrics

[page 1] Introduction

I would be grateful si me pudiera dar la siguiente información to help me with my studies.
Please indicate the ID you got at el Toy Task.
E.g. Director 5
E.g. Matcher 10

In this section, por favor indica con los smileys si las frases dadas would be permitted in every day speech.
Before you start the real test, por favor practice the sentences below.

From left to right, estos smileys significan:
- Siempre permitted
- Casi siempre permitted
- A veces permitted
- Rara vez permitted
- Nunca permitted

	☺	☺	😐	☹	☹
TS1 [UNTIL TS4]	◯ TS1	◯ TS1	◯ TS1	◯ TS1	◯ TS1

[page 2] Judgment task

	☺	☺	😐	☹	☹
BS1 [UNTIL BS72]	◯ BS1	◯ BS1	◯ BS1	◯ BS1	◯ BS1

BN1 [UNTIL BN12], MC1 [UNTIL MC8], and MS1 [UNTIL MS16] are displayed in the same manner as illustrated above for TS1 [UNTIL TS4] and BS1 [UNTIL BS72].

Appendix VII   Toy task results

			Word order		D language	
			MLF	**MP**	**MLF**	**MP**
Determiner – noun						
1. <u>ML Spanish</u> *un* pattern		(D8)	n/a	n/a	✓	✓
Y que hace como un pattern?						
2. <u>ML English</u> the *penúltimo*		(D2)	n/a	n/a	✓	X
It will be the *penúltimo* of that column.						
Adjective – noun						
3. <u>ML Spanish</u> *(mi) último* square		(M2)	✓	✓	n/a	n/a
I'm asking you, *que el tercer* square *que va a la izquierda, eso es mi último* square.						
4. <u>ML Spanish</u> *el libro* burgundy		(M1)	✓	X	n/a	n/a
Al lado del libro burgundy, *que está?*						
Determiner – adjective – noun						
5. <u>ML Spanish</u> *el tercer* square		(M2)	✓*	✓*	✓	✓
I'm asking you, *que el tercer* square *que va a la izquierda, eso es mi último* square.						
6. <u>ML Spanish</u> *el* left most column		(D2)	X	✓	✓	✓
El libro va en el left most column, down.						
7. <u>ML Spanish</u> *la* row *numéro dos*		(D2)	✓	✓	✓	✓
El cuadrado verde está en la row *numéro dos, segundo cuadrado.*						
8. <u>ML Spanish</u> *el* big tree		(D2)	X	✓	✓	✓
Va directamente encima del big tree.						
9. <u>ML Spanish</u> *el último* row		(D2)	✓*	✓*	✓	✓
Está en el último row, to the right of the sheep.						
10. <u>ML Spanish</u> *el* green square		(D2)	X	✓	✓	✓
Vete primero al green square, count two to the right, and that's where it goes.						

11. <u>ML Spanish</u> *un* small green square (M2)   X   ✓   ✓   ✓
Tenía un small green square.

12. <u>ML Spanish</u> *el* green square (D3)   X   ✓   ✓   ✓
La próxima es el green square.

13. <u>ML Spanish</u> *el* big tree (D8)   X   ✓   ✓   ✓
Se ha puesta debajo un big tree.

14. <u>ML Spanish</u> *el próximo* item (D9)   ✓*   ✓*   ✓   ✓
Siguiente con la mesa y el próximo item *al lado…*
Okay*, imaginate que estamos en un parque.*

15. <u>ML Spanish</u> *el* top right corner (D11)   X   ✓   ✓   ✓
The small black chair *va en el* top right corner.

16. <u>ML ?</u>   *el próximo* row (D9)   ?   ✓*   ?   ✓
Okay, *el próximo* row.

17. <u>ML ?</u>   *el último* row (D9)   ?   ✓*   ?   ✓
Okay, *el último* row.

* These adjectives are pre-nominal in Spanish.