How Code-Switching Informs Syntactic Theory:
Insights from Nominal Ellipsis and Adjacency in Belgian Dutch/French

Natasja A. Delbar

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Under the supervision of Dr. M. C. Parafita Couto and Dr. A. K. Lipták
Second reader: Prof. dr. L. C. J. Barbiers

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Abstract

Discussions concerning syntactic aspects of code-switching (CS) phenomena are currently ongoing. This thesis looks at two such phenomena, nominal ellipsis (NPE) and linear adjacency, and shows how empirical investigation of CS contexts helps inform linguistic theory. This was accomplished by presenting 23 Belgian Dutch/French (BD/FR) bilinguals with a two-alternative forced choice judgment task and comparing their choices through t-tests to check for significance. Experiment 1 examines whether the choice of grammatical gender on adnominal ellipsis remnants reveals a morphosyntactic link between a FR elided noun with a BD antecedent. The results show that no such link can be observed for NPE in this language pair; this is contra González-Vilbazo and Ramos (2015), Merchant (2015) and Nee (2012), who have found evidence of a such a link between elided elements and antecedent in code-switched clausal and VP-ellipsis, as well as general evidence against structural theories of ellipsis (e.g., Merchant, 2001; 2004). Experiment 2 explores the Matrix Language Framework (MLF) (Myers-Scotton, 1993; 1995), a popular model that predicts that the determiner language will match the matrix language (ML) in code-switched DPs. However, effects of linear adjacency between the determiner and the inflection on the main verb (which determines the ML) have not yet been considered within the MLF. The DP was given as a post-verbal complement (adjacent), and as a post-verbal adjunct and a pre-verbal complement (non-adjacent). The results show that linear adjacency has no effect on determiner language. Moreover, the results also do not fit into the MLF. This thesis is the first empirical study to examine NPE theory in a code-switched environment, as well as the first to investigate linear adjacency effects on code-switched DPs. This work also provides insight into CS patterns in the BD/FR language pair, a relatively understudied bilingual population that frequently employs CS but is not a close-knit community. Taken together, these findings show that gathering empirical CS data from distinct bilingual populations is crucial, adding new and contrary insights and aiding the construction of linguistic theory.

Keywords: code-switching, French, Belgian Dutch, nominal ellipsis, gender, linear adjacency, determiner language, two-alternative forced choice task

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Contents

Abbreviations and Acronyms

1	first person	ML	matrix language
2	second person	MLF	Matrix Language Frame model
3	third person	MP	Minimalist Program
2AFC	two-alternative forced choice	N	neuter
ACC	accusative	NOM	nominative
ACT	actual	NPE	nominal (or noun phrase)
ART	article		ellipsis
BD	Belgian Dutch	PERF	perfect
CS	code-switching	PL	plural
DEF	definite	PostVA	post-verbal adjunct
DET	determiner	PostVC	post-verbal complement
DAT	dative	PreVC	pre-verbal complement
F	feminine	PRO	pronoun
FOC	focus	PRS	present
FR	French	RFL	reflexive
HAB	habitual	SG	singular
M	masculine	VPE	verb phrase ellipsis

0. Introduction

Code-switching (CS), or using two or more languages in one conversation, has gained an undeniable position of interest within the field of linguistics. This may in part be ascribed to the multifunctionality of the phenomenon itself, as it can be used to inform us on many linguistic contexts. On the one hand, looking at CS in itself holds a great breadth of information on how language could, and is, used by multilingual speakers. Taking into account that the majority of people do in fact speak more than one language (Kupisch & Rothman, 2018), neglecting to pay attention to how CS behaves would leave a gap in understanding linguistic phenomena.

On the other hand, CS is often useful for its ability to reveal unknown features of language that are not visible when that language is used by monolingual speakers, nor when used in monolingual contexts. For example, by inspecting so-called 'conflict sites', or places where the grammars of two languages fundamentally differ, researchers have been able to examine several phenomena in new ways (González-Vilbazo & López, 2012; Ebert, 2014; Bellamy et al., 2018). Examples of these conflict sites include the Determiner Phrase (DP), which will be the focus throughout this thesis. An example of a DP conflict is how gender is expressed on the determiner when CS between two languages with different gender systems, for example Italian (masculine and feminine) and German (masculine, feminine and neuter).

(1) *Italian*/GERMAN[1]

a. *Ho* *mangiato* *una* *mela*
   I eat.PERF DET.F apple.F

b. ICH HABE EINEN APFEL GEGESSEN
   I have DET.M apple.M eat.PERF

c. *Ho* *mangiato* {*un* / *una*} APFEL
   I eat.PERF DET.M/ DET.F apple.M

d. ICH HABE {EINEN/EINE} *mela* GEGESSEN
   I have DET.M / DET.F apple.F eat.PERF
   'I have eaten an apple.'

(Adapted from Cantone & Müller, 2008, p. 812)

[1] Throughout this thesis, all multilingual examples will exemplify the font used for each language on the first line, apart from Belgian Dutch/French examples. For these, Belgian Dutch will always be in UPPERCASE; French will always be in *italics*. Monolingual examples, regardless of the language, will use the convention of *italics*.

The noun 'apple' has a different gender in Italian and German (1a-b), and thus a conflict may arise in the code-switched sentences (1c-d) how to mark gender on the determiner, which is in a concord relationship with the noun.[2] Gender assignment is but one example of a conflict. This thesis will look at two different phenomena concerning syntactic structure and CS and will focus on how intuitions of Belgian Dutch (BD)/French (FR) bilinguals can inform theories of syntax.

First, I will examine gender concord conflict sites to analyze the architecture underlying the syntactic structure of nominal ellipsis (NPE), where a noun is missing, as seen for the Dutch NPE example in (2):

(2) *Ik eet de rode appel en jij eet de groene.*
I eat the red apple and you eat the green
'I eat the red apple and you eat the green one'

Since the first clause contains the phrase 'the red apple'– also called an antecedent – the noun 'apple' can be unpronounced in the second clause in Dutch. The meaning is still understood to be 'the green apple' and not something other than an apple, nor is the adjective 'green' nominalized. The notion of some kind of semantic recoverability of the intended meaning of the phrase using an antecedent is generally agreed upon (see for an overview of approaches van Craenenbroeck & Temmerman, 2018, especially Table 1.1 on pp. 9-10), but researchers do not agree on whether or not syntactic structure is present. Assuming that there is full syntactic structure hidden in the ellipsis site remains only one of the main approaches currently in the running in the field of ellipsis research.[3] The most popular theory builds on work initially devised by Ross (1969) and refined by Merchant (2001, and onwards). Here, the assumption rests on the fact that ellipsis targets only the phonological form of the material for deletion, leaving the syntactic and LF structure remaining in the mental representation. A notable reason to follow this school of thought are the examples of case

[2] The terms gender 'concord' and gender 'agreement' are seen by some as denoting different relationships (see Liceras et al., 2016, pp. 114-15; also Bellamy et al., 2018, p. 28). Very simply put, gender concord is seen as shared within a DP, gender agreement is seen across DP boundaries, for example, in clauses containing a predicative adjective. Though most of the data in this thesis would be considered in a concord relationship by this measure, both terms are used intermingled throughout, as the distinction is not relevant in this work.
[3] For other views, see Hardt (1999), Culicover and Jackendoff (2005), and Ginzburg (2012); also, Merchant (2018) for an overview of ellipsis approaches.

agreement and gender concord relationships that survive ellipsis (Ross, 1969; Merchant, 2004; 2013a; 2014; Ott, 2014), see Ross's famous example of case-matching the elided element in German clausal ellipsis (i.e., sluicing):

(3) Verb *schmeicheln* 'flatter' assigning dative case

a. *Er will jemandem schmeicheln, aber sie wissen nicht*
He wants someone.DAT flatter but they know not
*{*wer / *wen / wem}.*
who.NOM who.ACC who.DAT
'He wants to flatter someone, but they don't know who.'

Verb *loben* 'praise' assigning accusative case

b. *Er will jemanden loben, aber sie wissen nicht*
He wants someone.ACC flatter but they know not
*{*wer / wen / *wem}.*
who.NOM who.ACC who.DAT
'He wants to praise someone, but they don't know who.'

(Ross, 1969, as cited in Merchant, 2018, p. 29)

Since the wh-remnant must receive a specific case in order to be licit, these examples are taken to show that there is more than just semantic representation of the missing material; there must be some type of syntactic representation between antecedent and the missing material as well. The case assigner is present in the syntax, but its phonological material has been deleted.

This has led to the question whether it is possible to use agreement in code-switched sentences as an indicator of the survival of syntactic structure, since differences in case or gender between languages can unequivocally show whether or not there needs to be more than a semantic representation. Some research has already been done in this area, and so far have revealed evidence – beyond that found in monolingual studies – that syntactic structure remains after ellipsis has taken place, favoring the silent-structure approaches (Nee, 2012; González-Vilbazo & Ramos, 2015; Merchant, 2015). Working with German/Spanish CS, González-Vilbazo and Ramos (2015) show that the German wh-remnant in TP-ellipsis – or sluicing – is sensitive to the case assigned by the Spanish antecedent verb, instead of agreeing with the case assigned by the elided German verb. This case shows that there must be some kind of syntactic representation surviving ellipsis. Similar conclusions

were formed by Merchant (2015) for VP-ellipsis in Greek/English CS and Nee (2012) for sluicing in Spanish/Zapotec CS.

However, these studies are, according to González-Vilbazo and Ramos's (2018) review, the only three to empirically question what happens to ellipsis in CS. Therefore, this thesis aims to add to the burgeoning field of ellipsis and CS by looking at yet another type of ellipsis, namely NPE and gender concord, to see if comparable results favoring the silent-structure approach can be achieved. In addition, previous studies lacked a robust participant pool, with González-Vilbazo and Ramos (2015) only having six bilinguals and Merchant (2015) only having two bilinguals as basis for their results. This first experiment, as well as the second one described below, comprised of up to 23 bilinguals, which should give a better indication of the homogeneity or variation of the judgments. In this first experiment, I used a Two-alternative Forced Choice (2AFC) judgment task to ask BD/FR bilinguals which gender they preferred in code-switched sentences with NPE. The stimuli have been designed in such a way that the ellipsis antecedent is in BD and the elided DP is in FR. Since the gender systems of these languages differ, the choice reveals whether or not a syntactic link between antecedent and elided noun may be assumed through the 'conflict' of using semantically equivalent noun pairs which have a different gender in each language. Adnominal ellipsis remnants, in this case a determiner and an adjective, carried either the gender markings matching the antecedent or the elided noun. By choosing which gender they preferred, the participants' responses showed that no such link can be assumed in the case of BD/FR NPE, as there was a strong preference to match the gender of the adnominals to that of the elided noun.

The second project focusses on the theoretical notion of a Matrix Language (ML), within the widely examined Matrix Language Framework (MLF) model, developed by Myers-Scotton (1993, 1995). Based upon the model's assumption that an utterance starts as an "abstract grammatical frame" (Myers-Scotton & Jake, 2015, p. 418), specific linguistic elements are allowed within the frame depending on the parameters of the language supplying said frame, also called the ML. When two languages are mixed, as in CS situations, the question is how morphosyntactic elements from the

other language, also called the embedded language (EL), may be expressed in the ML frame. The MLF proposes that, at least in intraclausal CS, certain morphemes and syntactic structures are preferably in the same language as that of the ML. The ML, usually the language of the inflection on the main verb (also known as the matrix verb), thus provides the morphosyntactic frame for the entire utterance and will restrict how, which and where elements from both languages will be inserted; these restrictions are known as the Uniform Structure Principle, the System Morpheme Principle, and the Morpheme Order Principle (Myers-Scotton, 2006).

Many of these works (e.g., Jake et al., 2002; Herring et al., 2010; Blokzijl et al., 2017; Parafita Couto & Gullberg, 2019, using corpus data; Parafita Couto & Stadthagen-González, 2019 using judgment data) have investigated the code-switched DP. The data in these studies often – though not always – consisted of a transitive clause with a code-switched DP immediately following the matrix verb. According to the MLF, the predicted pattern is for the determiner to be in the same language as the ML (also known as "the Bilingual NP Hypothesis", Jake et al., 2002, p. 78), as in example (4), a naturalistic utterance (Herring et al., 2010), where the inflected verb *(i)s* and the indefinite determiner *a* are both English, with a Spanish noun inserted after the determiner.

(4) *English*/SPANISH
because your mom's a VIEJA
old.lady

(Herring et al., 2010, p. 560)

The MLF can be considered as an alternative to generativist theories predicting the determiner language which are based on the presence of phi features in both languages, with the language with the most phi features on the determiner defining the determiner language (e.g., Liceras et al., 2008; Liceras et al., 2016; Moro Quintanilla, 2014). In a comparative study between these MLF and generativist accounts, Parafita Couto and Stadthagen-González (2019) found that the acceptability of code-switched English/Spanish DPs was higher for stimuli with the determiner and ML in the same language (see (5a) and (5b)), suggesting the MLF is the better predictor, since Spanish would always be preferred over English in a phi features approach (contra (5b)).

(5) *English*/SPANISH

a.	EDGAR QUERÍA	{ESTOS/**these*}	*shoes*
b.	*Edgar wanted*	{*ESTOS/*these*}	ZAPATOS

(Parafita Couto & Stadthagen-González, 2019, p. 355)

Due to the observed linear adjacency of the inflected verb and determiner, however, it is difficult to tease apart whether this pattern bore out better due to an ML effect, or simply due to a straightforward effect of adjacency of the determiner to the matrix verb.

In Experiment 2, I looked at identical code-switched DPs at different positions in the sentence in order to gauge whether the choice of language for the determiner is influenced by its linear adjacency to the inflected verb in any way. Using a 2AFC judgment task again, the same BD/FR bilinguals were asked whether they preferred the determiner in a code-switched DP to be in the same language as the ML or not for (i) an immediately adjacent post-verbal complement, (ii) a post-verbal adjunct with an intervening complement, and (iii) a pre-verbal complement. The results indicated no significant differences between the results for the differently placed DPs, showing that linear adjacency likely has little to no impact on the choice of language for the determiner. Moreover, no preference for a determiner matching the ML at all could be identified in any of the positions, creating more questions surrounding the influence of the ML.

Both the projects described in this work present novel elements that have not been explored before. This thesis will be the first to investigate NPE theory in a code-switched environment, with the aim to detect whether or not NPE shows similar results to those found for clausal and VP-ellipsis. Secondly, although the predictions of the MLF regarding code-switched DPs have been studied extensively, the possible impact of adjacency effects has, to my knowledge, only been noted by López and Parafita Couto (2021). Therefore, this thesis will also be the first to empirically examine the influence of adjacency in code-switched DPs throughout a clause. My overall aim is to take stock of how the findings fit into the existing literature, and to pinpoint areas of further study in subsequent, more targeted studies. Finally, on a more general note, the BD/FR language pair has not been extensively studied, despite the existence of a robust bilingual population (Janssens, 2008;

Blommaert, 2011). Thus, an additional benefit of this paper is to add to the knowledge pool on the BD/FR bilingual community and its practices.

In what follows, I will continue by expanding on some relevant theoretical background concerning CS and CS in the DP, as well as discuss some methodological difficulties that CS research should take into account (Section 1). This will be followed by a comprehensive report on Experiment 1 on the topic of NPE in Section 2, and by the report on Experiment 2 concerning the effect of linear adjacency on determiner language in Section 3. I will conclude by providing a summary of the salient findings of this work and looking ahead to what future research might bring (Section 4).

1. Preliminaries on Code-Switching

I will start with some theoretical considerations by briefly introducing CS in general in Section 1.1.1. I will provide an overview of the BD/FR bilingual community, as well as an overview of research that has investigated BD/FR CS in Section 1.1.2. Finally, I will end this preliminary section by reviewing literature addressing some methodological concerns regarding CS research in Section 1.2.

1.1. Theoretical Considerations

1.1.1. What Is Code-Switching

As mentioned in the introduction, CS is used as a general term for any situation where two or more language 'codes' are used interchangeably in one conversation. This may encompass everything from interclausal or intersentential CS (switching languages between clauses but keeping to one language within a clause) to intraclausal or intrasentential CS (switching languages within the clause). In addition, contexts wherein one person utters a sentence in one language and their interlocutor replies in the other language may also be considered CS.

For the purposes of this thesis, I will define a code-switch as the point in the clause, or between clauses, where a switch is made from one language to another. CS is thus any linguistic situation where at least one such switching point has occurred. Below are some examples of English/Dutch interclausal (6a) and intraclausal (6b) code-switched sentences:

(6) *English/*DUTCH

No code-switching: *I love Jane's pretty dress, it's so colourful!*

a. Interclausal: *I love Jane's pretty dress,* HIJ IS ZO KLEURRIJK!

b. Intraclausal: *I love Jane's pretty* JURK, *it's so* KLEURRIJK!

However, CS is not just alternating random words or phrases between multiple languages. If we assume that CS is just a product of bilinguals' language faculty, then the mechanisms for CS should be subject to explanations just as monolingual language is. Within the generative framework, habitual CS by bilinguals is considered another expression of that speaker's I-language (as defined by Chomsky, 1986, p. 24; see also López, 2020). Just as is the case for monolingual speakers following the grammatical rules of a language, bilinguals are thus subject to rules and restrictions as well (González-Vilbazo et al., 2013; Badiola et al., 2018). In addition, bilinguals can, and will, create new constructions that are unique to certain CS contexts and are not seen in the respective monolingual contexts. López (2018) cites examples such as mixed morphologies in German/Spanish *alamanisiert* 'germanised' (from the Spanish root *alemanis-* 'german-' and the German suffix *-iert* '-ized', p. 2) or the light verb construction *hacen klingen* 'did sound' (with Spanish *hacer* 'do' and German *klingen* '(to) sound', p.2). Similar verb constructions have also been investigated by Balam et al. (2020), who found that different communities of bilinguals had diverging intuitions on the bilingual compound verbs combining a Spanish verb like *hacen* 'do' with an English infinitive, with some communities accepting it as licit and others not. Just like monolinguals, bilinguals have firm judgments depending on how their I-language is formed by the combined grammars of the languages they, and their community, command. López (2018) argues that CS is in fact the natural consequence of bilinguals simultaneously co-activating the grammars of the languages they speak (p. 3).

One of the main benefits of using CS to study linguistic phenomena is that when combining two languages incompatibilities may arise between the different grammars. Especially in research on morphosyntax, using code-switches at the point of 'conflict sites' is a fruitful way of discerning what rules are present in CS as well as a way of deducing more information on the languages in

monolingual settings. [4] Conflict sites are found in places where languages differ in what is grammatical and how licit linguistic structure is formed, for example gender concord between languages with differing gender systems (see also Section 2.1.1). Examining these sites enables researchers to identify patterns in CS. Moreover, the way bilinguals resolve said conflicts can reveal more about the phenomenon under examination, as well as associated theoretical concepts. Examples of research into numerous features at different kinds of conflict sites can be found in the nominal domain (e.g., Liceras et al., 2008; Parafita Couto, Munarriz, et al., 2015; Bellamy et al., 2018; Parafita Couto, Deuchar, & Fusser, 2015; Vanden Wyngaerd, 2017; 2021; Pablos et al., 2019; Parafita Couto & Gullberg, 2019; Stadthagen-González et al., 2019; Vaughan-Evans et al., 2020), but also in the verbal domain (González-Vilbazo & López, 2012), or in the clause (Ebert, 2014).

It is the nominal domain that will be the focus in this work. The three main traits that may clash in the code-switched DP are DP-internal word order (examined in e.g., Parafita Couto, Deuchar, & Fusser, 2015; Vanden Wyngaerd, 2017; Pablos et al., 2019; Stadthagen-González et al., 2019; Vaughan-Evans et al., 2020), gender concord between the nominal modifiers such as the determiner and adjective and gender assignment (e.g., Liceras et al., 2008; Parafita Couto, Munarriz, et al., 2015; Bellamy et al., 2018; Vanden Wyngaerd, 2021), and language asymmetry regarding which element in the DP is in which language (MacSwan, 1999; 2009; Myers-Scotton, 1993; 1995; 2006; Myers-Scotton & Jake, 1995; 2015; Liceras et al., 2008; Herring et al., 2010; Blokzijl et al., 2017; Parafita Couto & Stadthagen-González, 2019). Gender concord will be considered in Experiment 1 with interclausal CS involving NPE, determiner language and adjacency will be investigated in Experiment 2 for intraclausal CS.

1.1.2. Bilingualism in Belgium: Belgian Dutch/French Code-Switching

Now that some general features of CS have been introduced, it would be interesting to zoom in on the Belgian bilingual community and what research has been done on (B)D/ FR CS, since the

[4] Poplack (1980) was one of the first to draw attention to the importance of conflict sites within CS. With her "equivalence constraint" (p. 586), she argued that CS occurs mostly at points where two languages do not come into conflict.

languages being used do shape the questions possible. (Walloon) French and (Belgian) Dutch have been spoken for centuries in the region and are presently both official languages of Belgium.[5] Despite the lengthy association of the languages however, there is a difference in that monolingual (Standard) Dutch and French are still often encountered. Generally, Belgians are required to learn the non-native language in school from the age of 10 onwards (Vogl & Hüning, 2010, pp. 242-43), but in practice most people need and use only one language for daily life, with the general exception of the people living close to or working across the language border and those living in the capital of Brussels (Vogl & Hüning, 2010). Creating monolingual regions with their own administrative powers was in fact the object of the 'language-border law' of 1963 (Blommaert, 2011, p. 246, who furthermore provides an extensive historical overview on language ideology and policy in Belgium). This situation creates the interesting effect of nearly all inhabitants of Belgium being able to somewhat speak (at least) both languages, but much fewer inhabitants able to speak both languages *well*, regularly and from an early age.

Nevertheless, there are enough exceptions to speak of a BD/FR bilingual community. For example, Blommaert (2011) states that of the Brussels-Capital Region's inhabitants, the only official bilingual region in Belgium, "8.6% qualifies as 'traditionally bilingual'" (p. 249), which amounts to about 86 000 people, a number corroborated by a survey by Janssens (2008) on people living in a BD/FR household in that region.[6] In addition, French-speaking Wallonia has been implementing many educational efforts in creating a bilingual school environment (Vogl & Hüning, 2010, pp. 243-44). This leads to the odd finding that, to the best of my knowledge, little research has been done on CS in the BD/FR bilingual community in Belgium. In the following paragraphs, I will briefly expand on the articles I was able to find.

[5] German is the third official language, but as the German-speaking community is both small enough in size and removed enough in distance to the rest of the population, it has relatively little impact on the larger Dutch and French-speaking communities (cf. Vogl & Hüning, 2010, p. 232).

[6] These numbers are not taking into account bilinguals who speak only one of the languages at home but have known and used the other since (early) childhood, nor bilinguals living outside the Brussels-Capital Region.

Treffers-Dallers (1992, 1994, 1999, 2002) has written a series of papers examining several aspects of the bilingual situation in Brussels specifically, focusing on the (socio)linguistic factors at play. Notable is the fact that, as stated above, Belgium is a historically and politically complicated web that has largely promoted monolingualism in the recent decades, with Brussels moving from largely Dutch-speaking in the 18th century, towards later being dominated by French as the prestige language until the early 20th century. More recently, the languages have become more balanced in use, though French is still more common (Treffers-Dallers, 2002). In Treffers-Dallers (1992), the author specifically mentions that use of CS is declining among the newer generations of Brussels' bilingual speakers, although she later shows that borrowings between the local French and Dutch varieties is very common, with lexical borrowings from French into Dutch more frequent on the one hand, and structural borrowings from Dutch into French much more common on the other hand (Treffers-Dallers, 1999). The opposition of CS versus borrowing is problematic and much debated among linguists. The distinction between whether a word is a code-switch or whether the word has progressed to become a loan word or borrowing in a language is difficult, as borrowings are expected to occur either in areas where heavy language contact (and thus bilingualism) exists or in technological and scientific environments where an 'academic' lingua franca is also often utilized besides the native language(s) (for additional information on this debate, please see e.g., Poplack & Meechan, 1998; Poplack & Dion, 2012; Stammers & Deuchar, 2012).

More recently, both Ameel et al. (2005) and Alferink and Gullberg (2014) looked at cross-linguistic interference in BD/FR bilinguals' lexicon and how it affects semantic categorization. Both Ameel et al., using a word-to-referent mapping task for common objects, and Alferink and Gullberg, using elicited descriptions containing placement verbs, found the same results: BD/FR bilinguals use a partially merged grammatical system, at least for the lexical representation of concepts. The salient point of these works is that, as has been mentioned above, bilingual speakers may diverge from implementing and internalizing their languages in the same manner as monolinguals do, as they co-activate both languages.

Finally, recent work by Vanden Wyngaerd (2017) has contributed specifically to syntactic considerations in BD/FR CS. Vanden Wyngaerd investigated linearization and adjectival agreement in the code-switched DP using an acceptability judgment task (more precisely, a 3-point Likert scale). Her findings are that the adjective patterns according to predictions made by MacSwan's (2009) generativist approach to CS within the Minimalist Program (MP), though she cautions that more extensive research needs to be done before this can be seen as conclusive (Vanden Wyngaerd, 2017, p. 467).

To conclude this section, a reflection on the choice of this language pair seems in order. One of the reasons that FR and BD were chosen for this study is linked precisely to the relative lack of data on this language pair. Specific languages allow for different phenomena to be investigated, and previous CS research has found that different community practices may also influence the results (e.g., Blokzijl et al., 2017). Therefore, it is always worthwhile to add data from additional languages and communities in order to map possible cross-linguistic tendencies in CS (as also mentioned in Bellamy and Parafita Couto, 2022; Parafita Couto et al., 2021). The second reason this pair was chosen was due to its particular suitability regarding the expression of gender between French and the Belgian variants of Dutch.

French, like other Romance languages, has two grammatical genders, namely masculine and feminine. Both the singular definite and indefinite determiner, as well as the adjective, have morphological markers to show gender agreement with the noun. Standard Dutch likewise has two genders, common and neuter, and these are visible adnominally through markers on the singular definite article and adjective. Historically, Dutch had three genders: masculine, feminine and neuter. During the Modern Period, the masculine and feminine merged into the single common gender category in the north of the Dutch-speaking region which provided the basis of Standard Dutch. However, Belgian varieties of Dutch maintain the three-way distinction to some extent up until this day (De Vogelaer & De Sutter, 2011). An overview of the gender systems and their expression is given in Table 1.

Table 1

Gender in French, Standard Dutch and Belgian Dutch

Language	Gender	Article	Adjective
		indef/def	'green'
French	masculine	*un/le*	*vert*
	feminine	*une/la*	*verte*
Standard Dutch	common	*een/de*	*groene*
	neuter	*een/het*	*groen*(indef)/*groene*(def)
Belgian Dutch	masculine	*ne(n)/de(n)*	*groene(n)*
	feminine	*een/de*	*groene*
	neuter	*e(en)/het*	*groen*

There may be a question of whether this dialectal expression of gender is still found amongst speakers today. However, research by Vanden Wyngaerd (2021) and Ghyselen and Van Keymeulen (2014) argues that Dutch-speaking Belgians are still able to operate within the three-way gender system, as the majority of speakers use either a dialect that retained it or *tussentaal* (lit. 'in-between language'). *Tussentaal* is a de facto supra-regional variety of BD that lies somewhere between the local dialect and Standard Dutch, and also still encompasses differences between masculine and feminine (Taeldeman, 2008, pp. 32-33). It should be noted however, that this difference may become covert due to phonological constraints that cause the deletion of the final *-n* in the masculine, resulting in (overt) syncretism between masculine and feminine gender markers (see Vanden Wyngaerd, 2021, pp. 81-82). In addition, dialects also differ in how exactly the phonotactics of the *-n* marker are expressed (De Vogelaer & De Sutter, 2011, p. 195). Still, contextually determined covert marking should not change the native intuition a speaker has on gender assignment.

In contrast, although it is likely that some bilinguals spoke a Walloon variety of French instead of Standard French, both these languages have the same binary gender system, making a clear distinction unnecessary. Thus, all Belgian/Francophone varieties of French in this work will be subsumed under the moniker 'French'. As will follow in Section 2, Experiment 1 heavily relies on this configuration of genders.

1.2. Methodological Considerations

Investigating CS calls for a consideration of some methodological difficulties beyond those shared with any other (linguistic) experiment, such as the choice of task. Due to the nature of CS, observations are being drawn from two or more languages. Combining these languages produces conflicts such as the ones described in the introduction, but additionally adds the issue of no 'standardized' grammar and little (corpus) data being available to compare data to. In addition, there is an impact from the specific sociolinguistic character of the bilinguals' community on the results, as specific norms and patterns become established in close-knit (bilingual) communities (Valdés Kroff, 2016; Blokzijl et al., 2017; Królikowska et al., 2019; Balam et al., 2020), leading to the necessity of meticulousness when designing and describing a CS experiment. Several works have been dedicated to examining methodological issues in work on CS (a.o. Gullberg et al., 2009; González-Vilbazo et al., 2013; Parafita Couto et al., 2014; Beatty-Martínez et al., 2018; Stadthagen-González et al., 2018), and below I will highlight some of the difficulties that have been taken into account in this study (see Section 2.3.3 below for the exact list of factors). The main take-away of the discussion surrounding these factors will be that when designing a CS experiment, it is necessary to carefully choose and describe the bilingual participant pool. Otherwise, no meaningful comparison can be made with other works, nor any result replicated.

1.2.1. Sociolinguistic Factors

Throughout the past decades, many sociolinguistic and extralinguistic factors have been shown to impact how bilinguals process their speech. Consequently, these factors must be taken into consideration when selecting participants for empirical studies. In what follows, highlights from research on several factors will be briefly summarized, though this is by no means a comprehensive list of research on this topic.

1.2.1.1. Bilingual Profile. Perhaps obvious, but the age and order of acquisition of the languages are important factors. Just as for monolingual speakers, the age of acquisition is crucial for bilinguals. Speakers may have a full, native grasp on multiple languages, as long as they are all

acquired at an early age (Meisel, 2011). In this case, one can speak of 'early' bilinguals. Relating specifically to grammatical gender, Guillelmon and Grosjean (2001) show that early English/French bilinguals process their perception of gender concord in French in the same manner as French monolinguals do, while late acquirers of English and French react differently (these latter are 'sequential' bilinguals). This was however tested in monolinguals French contexts. Important to note is that, besides age of acquisition, the amount of exposure to both languages is also of significance, especially in earlier years (Oller & Eilers, 2002). Unsworth (2013) has found that when ensuring comparable exposure time, Dutch/English bilingual children performed at the same level as Dutch monolinguals when it comes to producing the right gender markers in Dutch DPs.

Bellamy and Parafita Couto (2022) also note in their overview of literature on gender assignment strategies in code-switched DPs that such factors are of significance. First, the order of acquisition of the languages has consequences on the type of gender assignment strategy that is preferred, even within the same language dyad. Across language pairs, early bilinguals generally prefer default gender strategies, while sequential bilinguals, specifically when they learn a gendered language first, prefer the analogical gender strategy. The same holds for another factor, individual language dominance, understood as the relative dominance of one language over the other(s) for the bilingual speaker themselves, which may vary across the lifespan. Individual dominance for the speaker in a gendered language results in a preference for the analogical strategy, individual dominance in a non-gendered language results in a general preference for the default strategy.

1.2.1.2. Language Proficiency. Language proficiency correlating with CS behavior is a natural consequence when considering that proficiency will influence linguistic ability in general. Though a high proficiency in multiple languages is not enough to trigger CS all together, multiple studies agree that a higher proficiency increases the amount of CS a bilingual will engage in, as well as influence the type of CS (i.e., more intraclausal CS) and the possible switch sites (Poplack et al., 1988; Treffers-Daller, 1994; Poplack, 2004).

Proficiency can be measured in multiple ways. The most extensive, and reliable, way is asking participants to fill in standardized language proficiency tests. However, these are time-consuming for the participant to fill in. In addition, these often-multifaceted standardized tests are mostly available for languages such as (Standard) English, Spanish or German. Creating standardized tests for non-standard dialects is thus often also inefficient in practice for smaller studies. Furthermore, many bilinguals are not schooled in (some of) their languages, making such standardized measures invalid. A more efficient method is measuring proficiency through a self-reported score. Gathercole and Thomas (2007, p. 214) found that self-reported language proficiency correlated with (vocabulary) tests measuring the proficiency of Welsh/English bilinguals. This correlation was also found by van Osch (2019, p. 21), who noted that for Spanish heritage speakers in the Netherlands the self-reported proficiency of Spanish correlated significantly with standardized Spanish proficiency tests and a lexical decision task.

1.2.1.3. Attitudes Towards Code-Switching. Both speaker-external and speaker-internal attitude may influence how bilinguals position themselves towards CS. Many bilingual language speakers encounter negative comments, as it was a long-held assumption that speaking multiple languages makes a person unable to communicate as well in those languages as a monolingual would – an assumption even held by early scientists (e.g., Jespersen, 1922; Saer, 1923). Though it has been proven that native bilingual speakers have some differences in certain areas of cognitive and linguistic performance, such as lexical retrieval, it is not so that they perform worse. In other areas, such as executive control, bilinguals show signs of greater competency when compared to monolinguals (first shown by Peal and Lambert (1962); a more recent example is Bialystok (2009)). In addition, the social status of the languages spoken may play a role in how CS bilinguals are perceived. Montes-Alcalá (2000) found that, besides language proficiency, lack of education and general illiteracy may also be associated with Spanish/English CS in the US. However, she observed that social stigma does not seem to impede the use or the type of CS, even when said prejudices are held by the

people who code-switch themselves, though (self-reported) frequency of CS is linked to positive attitudes by Dewaele and Wei (2014, p. 246).

Though effects of attitude on Forced Choice tasks have not been studied, Badiola et al. (2018) show that attitudes towards CS and language mixing does have an effect in acceptability judgment tasks such as Likert tasks. Spanish/English bilinguals were shown to give higher scores to code-switched utterances by those participants that had a more positive attitude when the stimuli were already scored high by all participants. Negative effects of attitude were not found for lower-scoring stimuli nor for participants who had a more negative stance towards CS.

1.2.2. Source of the Code-Switched Data

CS is primarily a feature of spoken language, and is less seen in written language, although it can be found in written registers as well (González-Vilbazo et al., 2013; Koronkiewicz & Ebert, 2018). CS or bilingual data, as any other linguistic data, may come from several sources. These sources can range from naturalistic speech or text that is recorded or gathered in a corpus to elicited data and judgment tasks in completely controlled contexts. However, CS data does present some additional challenges.

The informal nature of CS has immediate consequences on how research with naturalistic data can be carried out. Most of these studies make use of relatively small participant groups that are interviewed or recorded. The past years has seen the development of some large-scale bilingual corpora; particularly notable are the *BangorTalk* corpora for bilingual communities using either English, Spanish or Welsh, compiled by Deuchar et al. (2014). These corpora allow researchers to access large amounts of natural data in an ecologically valid environment. However, bilingual corpora are time-consuming to construct and, especially when looking for specific contexts, the chance of finding enough tokens that can be used to address the research question is low. Another downside of corpora is that just because a certain construction is not found, it does not mean that that structure is not licit (i.e., the 'negative evidence' problem). From a more practical standpoint, few corpora are freely available (López, 2018, p. 6; Gullberg et al., 2009, p. 23).

Although acceptability judgment tasks have long been used in syntactic experiments (Schütze & Sprouse, 2013), opinions on employing judgment tasks within the field of CS are mixed, with both proponents (e.g., González-Vilbazo et al., 2013; Stadthagen-González et al., 2018; López, 2020) and detractors (e.g., Muysken, 2000; Gullberg et al., 2009). Problems cited include the fear that negative attitude towards CS may affect acceptability scores and the fact that researchers cannot always be certain that the constructed bilingual stimuli used in judgment tasks will also be used in a natural setting. However, the great advantage of judgment data is that it allows for researchers to explicitly test between minimally different constructions, which is especially important for grammar-oriented studies. Specifically, the two-alternative forced choice task (2AFC), or simply forced choice task is not meant to force a strict choice between acceptable and unacceptable, but rather offers the participant two alternatives where either one, both or neither of these two choices are acceptable. The usual instruction is just to choose the most (or least) acceptable of the two, making it an excellent tool when searching for possible differences in acceptability between stimuli, as well as indicating the relative size of the difference (Schütze & Sprouse, 2013, pp. 31-32).

Data from elicited speech occupies the mid-ground between these sources of data but has the disadvantage of being labor intensive: controlling everything in such a way that speakers produce a suitable number of the desired type of phrases is not trivial. In addition, some structures are easier to elicit than others, especially if the speakers should not know the target. It is advisable for larger studies to mix naturalistic, elicited and acceptability judgment data in order to fully understand a phenomenon, especially in the CS field where there is much variation in results due to extralinguistic factors. This is also expressed by Gullberg et al. (2009), who advocate that different questions require different sources of data, and that combining data from naturalistic, elicited and judgment sources is necessary to gain a comprehensive overview of what CS entails.

1.2.3. Modality

As stated in the previous section, CS is more often found in speech. This begs the question what the influence of task modality is on judgments in experimental studies. The literature is divided

on the consequences of choosing aural stimuli or written stimuli in CS tasks. González-Vilbazo et al. (2013) mention that there are differences in results when using the two modalities. Aural stimuli have the advantage of perhaps appearing more natural to bilinguals, as well as being able to control for prosody and phonological factors; however, they require more testing and are harder to implement. In contrast, written stimuli lack control over phonological confounds, but are easier logistically. Furthermore, González-Vilbazo et al. (2013) showed with judgment results that acceptability is affected by modality, with aural Spanish/English CS stimuli generally judged more acceptable than their written equivalent (p. 10); this means that the choice of modality also has consequences on results. van Osch et al. (2018) also discuss how to deal with modality-based confounds in their experiment on heritage speakers versus L2 learners of Spanish in the Netherlands, since heritage speakers would likely be more familiar with spoken language, while L2 learners of Spanish are more familiar with written language. Their solution was to present all stimuli bimodally: written and aurally. Lastly, Montes-Alcalá and Lapidus Shin (2011) found that gender assignment strategies differed between oral discourse and written discourse in Spanish/English.

Koronkiewicz and Ebert (2018) investigated the impact of modality on acceptability judgments in more detail and found that specific types of syntactic structures may differ in how they react to modality, but that there is no global effect of modality on judgment ratings. The key factor, according to the authors, is that the difference in relative acceptability of the structures, when compared against the other structures in the same modality, is kept. However, it seems logical to question whether modality effects on specific syntactic structures also interacts with an effect of language/bilingual community. Koronkiewicz and Ebert (2018) tested Spanish/English bilinguals from Chicago, USA. It would be interesting to see how their structure-specific and global results would compare using Spanish/English bilinguals from, for instance, Miami or Spain, as well as comparing against bilinguals speaking altogether different languages.

2. Code-Switching and Nominal Ellipsis: Gender as Probe for Syntactic Structure

This section will discuss Experiment 1. In Section 2.1, I will provide the necessary theoretical background on gender in the DP in CS contexts, as well as on ellipsis and CS. This will lead to the research question and the hypothesis in Section 2.2. Section 2.3. will describe the methodology I used, followed by the results in Section 2.4. Section 2.5 will conclude by discussing the theoretical and methodological implications of the results found.

2.1. Theoretical Background

2.1.1. Gender Assignment in the Code-Switched DP

Gender may be defined as "classes of nouns reflected in the behavior of associated words" (Hockett, 1958, as cited in Corbett, 1991, p. 1). Languages differ in how many grammatical genders are present. They also differ as to which elements show concord with the noun. However, if the language in question has distinct grammatical genders, the gender feature of the noun will be shared with all adnominal elements within the DP that are marked for gender (Corbett, 1991). Take for example the following monolingual phrase in FR, a language with masculine and feminine gender:

(7) *La* *petite* *maison*
DEF.ART.F small.F house.F

The feminine noun *maison* 'house' triggers the femininely gendered form of the definite article and adjective to appear and gender concord can be seen.

Conflicts arise when languages with different gender systems are combined in (intraclausally) code-switched DPs. Observe FR again, this time mixed with English in (8):

(8) English/*French*
The *maison*

In (8), the phrase as written will surface as the only option, as English has no gendered articles and therefore the definite article cannot agree with the feminine FR noun in any way. However, what happens when the languages are switched as in (9)?

(9) English/*French*
{*La/Le*} house

In monolingual FR, the feminine article *la* is found, but the trigger for this is in the feminine FR noun *maison* and here we only have the genderless English noun 'house'. In theory, there is thus no gender on the English noun that can agree with either feminine *la* or masculine *le*. On the other hand, FR does not have a genderless form for the definite article that could agree with English 'house'. This results in a conflict that bilinguals must solve when CS, not only when mixing genderless and gendered languages but when mixing any two differing gender systems.

Research has shown that there are several possible 'solutions' that are employed by bilinguals when encountering this situation (e.g., Bellamy & Parafita Couto, 2022), depending not only on the bilingual profile (i.e., the order of acquisition of language, the languages being combined, or the frequency of using CS by the bilinguals), but also the CS habits of (geographically) different communities that are using them (e.g., Królikowska et al., 2019); even the type of experimental task used to investigate assignment may play a role (e.g., Bellamy et al., 2018). The three most common strategies that are implemented to solve gender assignment are the default gender, the analogical gender, and the phonological gender strategy.

Three examples are given below illustrating what the different strategies would predict to be the most likely gender assignment for a code-switched DP with a FR definite article plus an English noun. When using the default strategy, the majority of code-switched DPs will 'default' to one gender that is present in that language (10a). Using the analogical gender strategy, gender will be assigned according to the translation equivalent of the noun (10b). Finally, phonological gender assignment works by bilinguals using phonological (or morphological) markers associated with certain genders in one language and consulting them in the other language, see (10c).

(10) a. Gender assignment according to default (masculine) strategy in *French*/English

Le (M) cat (M) *Le* (M) pick (F) *Le* (M) comb (M)

b. Gender assignment according to analogical strategy in *French*/English

Le (M) cat (M) *La* (F) pick (F) *Le* (M) comb (M)

c. Gender assignment according to phonological strategy in *French*/English

La (F) cat (M) *Le* (M) pick (F) *Le* (M) comb (M)

The default strategy in (10a) would straightforwardly predict all gender features to adhere to one gender, in this example masculine gender. The analogical strategy in (10b) would predict that the realization of the definite article is masculine for 'cat' and 'comb', since the translations *chat* 'cat' and *peigne* 'comb' are masculine nouns in FR, while *pioche* 'pick' is feminine and thus receives the feminine definite article. Finally, according to a study by Lyster (2006), the phonology of the final phonemes in 'pick' and 'comb', i.e., -/k/ and -/m/, would likely predict masculine gender in FR, while the -/t/ in cat would predict feminine gender in FR (p. 75).[7] Applying that to the English nouns results in the pattern seen in (10c).

Exploring the literature on gender assignment in code-switched DPs shows great variation in the findings, and particularly shows how difficult it is to control for all possible confounds. In the rest of this section, I will present some – but by no means all – of these findings.

2.1.1.1. Results from CS with only one language having gender. Bellamy et al. (2018) investigated CS between Purepecha, a genderless language, and Spanish, which has a binary gender system. They found that different strategies were used by the bilingual speakers depending on the task they did. In the production task, a masculine default was preferred, while in the comprehension tasks, phonological cues were of significance to the gender assignment within mixed DPs. Parafita Couto, Munarriz, et al. (2015) explored Basque (genderless) and Spanish CS (Spanish Det + Basque N) in both naturalistic and judgment data. Both types of data showed evidence for a phonological strategy, but a significant portion of the nouns adhered to the feminine default gender strategy as well, though likely as a result from phonological cues. More recently, Munarriz-Ibarrola et al. (2021) found that this difference in strategies in Basque/Spanish CS could be explained by a difference in the bilinguals' predominant languages. In contrast, Badiola and Sande (2018) found evidence that speakers preferred the masculine default strategy for the same language pair. However, they did find evidence that when the phonological shape of the noun included a final *-a* on the Basque noun, a feminine default Spanish determiner was preferred. Vanden Wyngaerd (2021) looked at BD/English

[7] Note that Lyster (2006) argues that morphophonological cues aligning with a grammatical gender can account for up to 80 percent of all French nouns, making gender fairly predictable in French.

and FR/English CS and found that a default feminine gender was preferred in BD/English mixed DPs (though she notes that this may be due to the feminine gender article *de* showing syncretism with the Standard Dutch common gender article *de,* p. 128), while FR/English bilinguals uniformly used the analogical strategy for gender assignment.

Even within one language pair, namely Spanish/English, researchers have found that bilinguals use different strategies in different contexts. Some research shows that adults in the US tend to prefer the masculine default strategy (Poplack et al., 1982; Jake et al., 2002). Otheguy and Lapidus (2003), as well as Valdés Kroff (2016) and Balam (2016), find similar results, but also stress the impact semantic gender could have for human/animate referents, which may override the masculine default in the case of female referents (though this is not always the case, as seen from the findings by Valdés Kroff (2016, pp. 291-92)). In contrast, Spanish/English bilinguals from Gibraltar seem to prefer the analogical strategy (Moyer, 1993 and Liceras et al., 2006, as cited in Bellamy et al., 2018, p. 34). In addition, which language is learned first is a factor when choosing strategies (Munarriz-Ibarrola et al., 2021; Bellamy & Parafita Couto, 2022). Research is also divided between children preferring either the analogical strategy (Liceras et al., 2012) or a default strategy (Balam et al., 2021), whereas adults seem to prefer to use the masculine as default (Valenzuela et al., 2012). Klassen and Liceras (2017) add to this by showing that language dominance may also determine the degree of preference, as their Spanish L1/English L2 participants clearly preferred the analogical strategy, while their English L1/Spanish L2 speakers showed no such (significant) preference. Finally, Trawick and Bero (2022) recently contributed to this discussion by showing that, while the analogical gender strategy was found most impactful in their (Mexican-)Spanish/English bilingual population, factors such as prototypicality of the noun and referentiality of the noun also effect gender assignment. The range of findings here for one language dyad clearly stresses the importance of describing and, if necessary, controlling for confounding extralinguistic factors.

2.1.1.2. Results from CS with both languages having gender. Moving on to research covering CS between languages that both have (different) gender systems, a similar diversity of results is seen.

Cantone and Müller (2008) investigated gender assignment amongst Italian/German bilingual children and found that one half of the children used the analogical strategy, and the other half did not seem to use any strategy discussed here. A tension point for German and Italian could have been what happens with German neuter gender in switches (since Spanish and German share a masculine and a feminine class); however, the authors do not show any examples where a neuter determiner or noun was used. Boers et al. (2020) discuss gender assignment strategies by Spanish/Dutch bilinguals. They found that for a Spanish Det + Dutch N the participants used either the default masculine gender strategy or the analogical strategy for gender assignment. For a Dutch Det + Spanish N the participants mostly used the default common gender strategy. Furthermore, in both language combinations, some participants also used a strategy based on (monolingually atypical) word order, which the authors ascribed to the language pair under investigation. Greidanus Romaneli et al. (2021) found for Portuguese/Dutch that speakers preferred a common default in Dutch and masculine default in Portuguese. CS between two gendered languages thus seems to deliver even more strategies, such as word order, to explore in the future.

Experiment 1 will look at gender agreement in ellipsis contexts, which is governed by different mechanisms than fully realized phrases, and thus has a different focus compared to the works mentioned in the previous paragraphs. It is not the aim of this paper to delve deeply into gender assignment strategies in BD/FR CS; however, these collected findings do imply that there are a great many factors that may alter how gender agreement is achieved by bilinguals, and therefore must be kept in mind.

2.1.2. Introducing Ellipsis

The syntactic phenomenon that will be examined in Experiment 1 is ellipsis. Ellipsis is the term for what happens when part of a sentence is left silent. This can happen with just a single word (e.g., nominal ellipsis (NPE), ex. 11), entire phrases (e.g., predicate ellipsis, ex. 12) or even with the majority of the clause left out (e.g., clausal ellipsis, ex. 13).

(11) Nominal ellipsis
I have two sisters and you have four <~~sisters~~>.

(12) Predicate ellipsis
Charlotte can play the piano and Maria can <~~play the piano~~>, too.

(13) Clausal ellipsis
I put the letter somewhere, but I don't know where <~~I put the letter~~>.

These are by no means the only types of ellipsis; for a more complete overview and examples of ellipsis types, I refer the reader to van Craenenbroeck and Merchant (2013). In the examples, it is clear that the phonological expression of the material is missing (i.e., 'PF-deletion'), while at the level of semantics (and pragmatics) (i.e., 'LF') the material is retained in some way. But what about the syntactic material?

The exact syntactic process behind ellipsis is still up for debate and several theories abound on what exactly transpires when ellipsis takes place. This leads to the first question that any successful syntactic theory must be able to answer: is there syntactic structure that corresponds to the missing material in the ellipsis site? Most theories can be slotted into one of three schools of thought. The first approach argues that all linguistic material is deleted when ellipsis applies, leaving the ellipsis site 'empty' of phonological and syntactic structure (e.g., Culicover & Jackendoff, 2005; Ginzburg, 2012). The second approach states that there is complete deletion of phonological material but only a reduction in syntactic structure at the ellipsis site, leaving some kind of null proform at the ellipsis site (e.g., Hardt, 1999; Ludlow, 2005). The third approach, probably most productive in the generative framework, maintains full syntactic structure underlying the ellipsis site with only the phonological material undergoing deletion (e.g., Merchant, 2001).

Interestingly, in all of the examples (11-13) above the intended meaning is still able to be understood, even though part of the overt material is not expressed. Ellipsis is not a particularly rare phenomenon, especially in informal and spoken language, and in natural language some form of ellipsis is often even preferred over explicitly saying the entirety of the intended message (compare (14a-d) as an answer to the question in (14)).

(14) *Who did you say gave you the flowers?*

a. *Charles did I say gave me the flowers.*
b. *Charles gave me the flowers.*
c. *Charles did.*
d. *Charles.*

This has started many researchers questioning how the semantic and pragmatic meaning is able to survive the deletion of (at least) the phonological form. A major clue is the presence of an antecedent, a piece of (linguistic) material that must be present and share its meaning with the elided material, see example (15):

(15) *I have two* [*sisters*]$_{\text{ANTECEDENT}}$ *and you have four* <~~*sisters*~~>$_{\text{ELIDED}}$.

This leads to the second major question of ellipsis theories: what is the nature of the identity relationship between the antecedent and the elided elements? And is this relationship based on syntactic similarity, semantic similarity, or both? Again, opposing views abound. For a comprehensive summary of possible answers to these questions, see Merchant (2018).[8] In this work, I will limit myself to testing the questions of underlying structure and identity in the structural approach to ellipsis, starting with the assumption that (a) there is syntactic structure present in the ellipsis site, and (b) this syntactic structure entertains an identity relation with its antecedent (when present) that is syntactic in nature.

A key reason for adopting the structural approach is the ample evidence of so-called 'connectivity effects', for example, syntactic dependencies surviving ellipsis. The basis of the theory was founded by Ross (1969), when he made the observation illustrated in (3a), repeated below in (16), which suggests that there must be some syntactic structure which is able to assign the correct dative case in German, instead of the accusative case that would be assigned by the immediately preceding verb *wissen* 'know'. The fact that dative case is assigned to the wh-phrase implies that it

[8] Note that Merchant (2018) also discusses the third of the 'big questions' within ellipsis research, namely what licenses the ellipsis operation. While this third question will be left aside in the rest of this work, in sum: it seems that only givenness is a precondition, for all ellipsis types. The existence of actual syntactic or prosodic licensing is currently debated, see for example Saab and Lipták (2016) wherein they argue there is not a syntactic but a morphological licensing constraint in NPE.

was assigned by unpronounced missing material which contains the verb *schmeicheln*, capable of assigning the dative case marker.

(16) *Er will jemandem schmeicheln, aber sie wissen*
he want someone.DAT flatter, but they know
*nicht {*wen / wem}.*
not who.ACC who.DAT
'He wants to praise someone, but they don't know who.'

(Ross, 1969, as cited in van Craenenbroeck & Temmerman, 2018, p. 9; Merchant, 2018, p. 29)

Examples containing plural agreement also show similar effects, see (17):

(17) *Beth's wedding was in Bond Chapel, and Rachel's nuptials were in Rockefeller Chapel.*
a. *Beth's wedding was in Bond Chapel, and Rachel's* {**were/was*} *in Rockefeller Chapel.*
b. *Beth's nuptials were in Bond Chapel, and Rachel's* {*were/*was*} *in Rockefeller Chapel.*

(Adapted from Merchant, 2018, p. 31)

The singular-triggering *wedding* and its plural-triggering synonym *nuptials* are fine without ellipsis, but when they are unpronounced, plural agreement on the verb shows that only one of the synonyms is allowed, namely the one (morphosyntactically) matching the antecedent.

Though not the only proponent of this approach, Merchant (2001, 2004, 2013a, 2013b) has been the main advocate for structure-preserving theories building on what Ross (1969) started, and Merchant's 'Move-and-Delete' approach has been extensively written and expanded upon. For other noteworthy takes on the structural approach, including thoughts on identity within this approach, please see (amongst others) Lasnik (2001), Aelbrecht (2010), Chung (2013), Lipták (2015), and Merchant (2018).

2.1.3. Ellipsis and Code-Switching

Adding CS to ellipsis research leads to new ways that connectivity effects and the identity relation can be probed. Little research has been done on CS and ellipsis, despite both fields being very active in producing new works. To my knowledge, three studies empirically examining some aspect of ellipsis under CS conditions make up the entirety of the discipline (Nee, 2012; González-Vilbazo & Ramos, 2015; and Merchant, 2015), along with one state-of-the-art literature review by

González-Vilbazo and Ramos (2018). The following paragraphs will present what these authors have found so far.

González-Vilbazo and Ramos (2015) investigated sluicing, a form of clausal ellipsis whereby the only surviving element of ellipsis is the wh-phrase remnant. Sluicing was already known to have a connectivity effect, namely the case-matching requirement shown in example (16) above, suggesting a syntactic structure underlying the ellipsis site. González-Vilbazo and Ramos delved deeper into case-matching effects by extending examples like (16) to code-switched variants, see (18):

(18) *Spanish*/GERMAN

Without ellipsis:

a.	*Juan*	*amenazó*	*a alguien*	ABER	ICH	WEIß	NICHT
	Juan	threatened	someone.ACC	but	I	know	not
	{*WEN / **WEM**}		ER	GEDROHT		HAT.	
	who.ACC	who.DAT	he	threatened		has	

With ellipsis:

b.	*Juan*	*amenazó*	*a alquien*	ABER	ICH	WEIß	NICHT
	Juan	threatened	someone.ACC	but	I	know	not
	{**WEN** / *WEM}.						
	who.ACC	who.DAT					

(González-Vilbazo & Ramos, 2015, p. 3).

Data such as this show that the case-matching effect is still in place even though an interclausal code-switch has occurred. In (18a), without ellipsis, the wh-phrase bears dative case assigned by *gedroht* 'threatened' in the otherwise monolingual German clause. However, the wh-phrase in (18b) changes to its accusative form *wen* when sluicing takes place, despite the overt material in the second clause still being all in German. In this instance, it can only have received this accusative case from the Spanish antecedent verb *amenazó* 'threatened'.[9] This suggests that a solely semantic identity relationship is not enough, since *gedroht* and *amenazó* do carry the same meaning. The authors therefore conclude that there must be an additional morphosyntactic component to the identity requirement between antecedent and elided phrase. This posits that (18a) is underlyingly as in (19):

[9] González-Vilbazo & Ramos (2015) also point out that theories "based on pragmatic inference" would have to show why these case-correlates between antecedent and remnant exist, and the wh-remnant does not, for instance, surface only in a 'default case' form (p. 25).

(19) *Spanish*/GERMAN

Juan	*amenazó*	*a alquien*	ABER	ICH	WEIß	NICHT
Juan	threatened	someone.ACC	but	I	know	not
WEN	< ~~*Juan*~~	~~*amenazó*~~>				
who.ACC	< Juan	threatened>				

with the elided Spanish *amenazó* responsible for the accusative form *wen* in German.

Earlier work by Nee (2012) into Spanish/Zapotec CS also looked at sluicing; however, she investigated the precise form of the verbal complement. In sentences like (20), where the antecedent Zapotec verb takes a simple DP as complement but the Spanish equivalent verb takes a PP complement, the remnant wh-phrase needed to be compliant with the complement structure required by the antecedent verb:

(20) *Zapotec*/SPANISH

Juany	*gunien,*	PERO	NO	SÉ	QUIÉN.
Juan	spoke	but	not	know.1SG	who

'Juan spoke, but I don't know who (to).'

(Nee, 2012, p. 43, as cited in Merchant, 2015, p. 202)

In contrast, when the antecedent language was Spanish, the remnant wh-phrase needed to be prepositional:

(21) *Zapotec*/SPANISH

JUAN	HABLO	CON	ALGUIEN,	*per*	*kednanadia*	*tu*	*cun*.
Juan	spoke	with	someone	but	not.know.1SG	who	with

'Juan spoke with someone, but I don't know who with.'

(Merchant, 2015, p. 202)

This data is in accordance with the conclusions found by González-Vilbazo and Ramos (2015), namely that there needs to be more than a semantic equivalence between antecedent and the elided material.

Based upon these articles, Merchant (2015) makes the following generalization:

(22) "All apparently cross-language ellipses involve code-switching at the ellipsis site (into the language of the antecedent)" (p. 202).

However, he shows the apparent difficulty of this generalization by providing examples of Greek/English predicate ellipsis. Consider the examples in (23):

(23) *Greek*/ENGLISH

Píres	*tin*	*tsánda*	*mazí*	*su*?
took.2S	the	bag	with	you

'Did you take the bag with you?'

a. YES, I DID

b. * YES, I DID	*píra*	*tin*	*tsánda*	*mazí*	*mu*
	take.ACT.PERF.PAST.1S	the	bag	with	me
c. * YES, I DID	*pern*	*tin*	*tsánda*	*mazí*	*mu*
	take[stem.form]	the	bag	with	me

(Merchant, 2015, p. 204)

The connectivity effects plus the generalization discussed above strongly suggest that the equivalent to (23a) without ellipsis would match either (23b) or (23c) with a Greek verbal phrase. However, both these options are ungrammatical when fully pronounced. Rather than discarding the notion of some kind of syntactic identity relationship, Merchant (2015) uses views from the Distributed Morphology framework to argue that the Greek verbal root will attempt to move to the tense head T in order to be spelled out – i.e., a vocabulary item inserted for it – but crashes during derivation since the T head is unavailable in this CS context. However, ellipsis 'saves' the derivation, due to ellipsis preventing the need for the verbal root and all other heads up to T to be inserted, so it does not matter that the root cannot move up to the already occupied T position. Consequently, he also promotes the view that there is a structural relationship present.

The results of the studies in the previous paragraphs have several implications on how the interaction between CS and ellipsis is governed. First, all three datasets discussed have shown that the language in the ellipsis site seems to match the language of the antecedent, even though between the two elements a code-switch has occurred. This implies that there needs to be more than a simple semantic identity relationship between the two, as the meaning of a proposition is not dependent on a language. In CS examples like (19) and (20-21), where the non-elliptical version is also licit, the facts provide an argument for some kind of stricter parallel syntactic identity being present, which also implies that there must be syntactic structure at the ellipsis site. Indeed, the finding that case-matching occurs according to the antecedent language in clausal ellipsis entails that it is syntactic in nature. However, this would be more difficult to prove in language pairs in which you

cannot translate something from one language to the other, or not without also changing the syntactic structure drastically. Nevertheless, finding more data like these would provide new evidence on how future work should approach the big questions of syntax.

Finally, from a CS perspective, if it is true that there is full syntactic structure matching the antecedent language, then these data also imply that ellipsis would instantiate an additional code-switch at the point of the ellipsis site, as in the generalization in (22). Therefore, one could speak of 'covert' intraclausal CS. The question is whether or not this covert CS is in some way different from overt intraclausal CS. One possible way of finding out might be to employ neural imaging techniques in order to compare what happens during language processing of covert (i.e., with ellipsis) versus overt CS.[10]

The aim of the first experiment in this study is to expand upon the currently limited data available in this area. So far, examples of clausal and predicate ellipsis have been studied. I would add NPE to this since, as also noted by González-Vilbazo and Ramos (2018, p. 475), this is a third commonly seen type of ellipsis that has not been explored so far. Languages differ in which types of ellipsis they license, and they may also restrict some types of ellipsis to certain registers (van Craenenbroeck & Temmerman, 2018, p. 2). However, it is possible to study NPE in BD/FR CS, since both FR and Dutch allow NPE to take place (cf. Corver & van Koppen, 2018, pp. 745-48 for Dutch NPE; Dagnac, 2018, pp. 810-14 for FR NPE).

NPE is a cover term for a group of phenomena that involve the deletion of the noun phrase, or some element within the noun phrase (a.o.: Hankamer & Sag, 1976; Eguren, 2010; Corver & van Koppen, 2011; Merchant, 2014; Saab & Lipták, 2016; Saab, 2018). Since there sometimes is deletion of only a single element, it is not always easy to distinguish ellipsis – i.e., deletion of (at least) phonological material – from base-generated proforms with no overt realisation. These two are also commonly known as surface anaphora and deep anaphora respectively, terms introduced by

[10] Research using electro-encephalogram (EEG) measurements has in fact managed to find different signals for different types of code-switches (e.g., Beatty-Martínez & Dussias, 2017; Fernandez et al., 2019; Zeller, 2020; Rossi et al., 2021). Therefore, it seems plausible to assume that there may be a difference between covert versus overt CS.

Hankamer and Sag (1976). Saab (2018) considers this distinction and attempts to sketch how NPE phenomena can be correctly categorised to separate the true ellipsis occurrences from deep anaphora, and index what is licensed in which language(s). To distinguish between the two readings, Saab's example from Spanish is repeated:

(24) *Los* *perro-s* *inteligente-s* *y* *los* *tonto-s*
DET.M.PL dog.M-PL smart-PL and DET.M.PL fool.M-PL
son *indistinguible-s*
be.PRS.3PL indistinguishable-PL
Surface anaphor reading: 'Smart dogs and foolish dogs are indistinguishable.'
Deep anaphor reading: 'Smart dogs and foolish people are indistinguishable.'

(Saab, 2018, p. 530)

In Spanish, expressions such as *los tontos* 'the foolish' can, just as in English, refer to a particular group of people, just as *the rich* or *the famous* do; this is the deep anaphor reading. Depending on the precise syntactic process and context however, *los tontos* may also be the adnominal ellipsis remnant of *los perros tontos*, where *perros* 'dogs' is phonologically deleted but remains semantically active through the identity relationship with the antecedent phrase *los perros inteligentes.* This would be the surface anaphor reading.

Though there are ways to check whether or not the cases of FR NPE that will be used in this experiment are truly surface anaphora, for the purpose of this paper it is enough to know that if there is structure underlying the gap, then gender agreement with the antecedent will 'prove' ellipsis, since the presence of gender concord necessitates the presence of a surface anaphor capable of checking the gender feature probe by the determiner and adjective in the ellipsis site (see Saab, 2018, pp. 538-40). However, if there is no clear agreement with the antecedent found, then nothing can be said about whether these FR clauses have surface or deep anaphora. Since this work does not aim to prove the existence of NPE in FR, nor in general, this is a question that is left to future work.

As observed for sluicing above, gender concord in NPE must also adhere to antecedent-remnant matching in monolingual contexts. Gender mismatches between antecedent and remnants are considered incorrect by speakers for at least Spanish (see (25)), Brazilian Portuguese, and Greek (Saab, 2018).

(25) a. **el* *tío* *de* *María* *y* *la* *de* *Pedro*
DET.M.SG uncle of Maria and DETF.SG of Pedro
b. *el* *tío* *de* *María* *y* *el* *de* *Pedro*
DET.M.SG uncle of Maria and DET.M.SG of Pedro
'Mary's uncle and Pedro's.'

(Saab, 2018, p. 539)

Taking the facts from this gender-matching requirement in NPE, together with the previous CS results by González-Vilbazo and Ramos (2015) that suggest case-matching effects are still visible when antecedent and remnants are no longer in the same language, a new avenue of investigation opens.

2.2. Experiment 1: Research Question, Hypothesis and Predictions

The research question following from the above literature is whether or not gender concord would show similar matching effects with NPE in BD/FR CS contexts, as had been found previously for case agreement in clausal ellipsis in Spanish/German CS (González-Vilbazo & Ramos, 2015). This generates Hypothesis 1:

H1: In interclausal CS, the gender of the determiner and adjective associated with an elided FR nominal phrase will match with the gender of the BD antecedent noun.

This means that given the choice, speakers will prefer a sentence with an antecedent match above the choice with an antecedent mismatch as seen in the gender choice of the determiner and adjective as a result of the hypothesized syntactic identity relationship.

Depending on the gender combinations of the BD/FR noun pair, testing the first hypothesis will result in three differing predictions, if NPE behaves as seen in previous work. The accompanying examples (26-28) illustrate the predictions in P1(a-c), with option (a) always predicted to be the BD/FR bilinguals' preferred choice over option (b):

P1a: If the noun is **masculine in the BD antecedent** and the noun is **feminine in the elided FR NP**, then the option where the adnominal FR determiner and adjective in the second clause are marked as **masculine is expected to be the preferred choice**.

(26) a. IK EET DEN RODEN APPEL *et* *tu* *manges* *le* <~~APPEL~~>
I eat the.M red.M apple.M and you eat the.M <apple.M>
vert
green.M

b. IK EET DEN RODEN APPEL *et* *tu* *manges* *la* <~~*pomme*~~>
I eat the.M red.M apple.M and you eat the.F <apple.F>
verte
green.F

'I eat the red apple and you eat the green one.'

P1b: If the noun is **feminine in the BD antecedent** and the noun is **masculine in the elided FR NP**, then the option where the adnominal FR determiner and adjective in the second clause are marked as **feminine is expected to be the preferred choice**.

(27) a. HIER IS DE BELGISCHE KRANT, *là-bas* *se* *trouve* *la*
Here is the.F Belgian.F newspaper.F there RFL.PRO find the.F
<~~KRANT~~> *française*
<newspaper.F> French.F

b. HIER IS DE BELGISCHE KRANT, *là-bas* *se* *trouve* *le*
Here is the.F Belgian.F newspaper.F there RFL.PRO find the.M
<~~*journal*~~> *français*
<newspaper.M> French.M

'Here is the Belgian newspaper, there is the French one.'

P1c: If the noun has **neuter gender in the BD antecedent** and the noun is either **masculine or feminine in the elided FR NP**, the FR determiner and adjective cannot agree with the neuter BD noun; the option with the FR determiner and adjective **matching with the gender of the semantically equivalent FR noun is expected to be the preferred choice**.

(28) a. SANNE WOONT IN HET GROTE HUIS *et* *Robert* *vit* *dans*
Sanne lives in the.N big.N house.N and Robert lives in
la <~~HUIS~~> [→ defaults to translation *maison*] *petite*
the.F <house.N> house.F little.F

b. SANNE WOONT IN HET GROTE HUIS *et* *Robert* *vit* *dans*
Sanne lives in the.N big.N house.N and Robert lives in
le <~~*maison*~~> *petit*
the.M <house.F> little.M

'Sanne lives in the big house and Robert lives in the small one.'

Furthermore, there is the – perhaps superfluous – prediction that when the gender of both the BD noun and the FR noun are identical, i.e., both masculine or both feminine, gender concord

would indicate a match to both nouns. This was not tested in this experiment in order to keep the length of the experiment manageable for the participants. Options (a) and (b) were presented in a two-alternate forced choice task (2AFC).

2.3. Methodology

2.3.1. Variables and Conditions

The sentences presented contained interclausal CS, so that the antecedent language differed from the language of the clause containing NPE. To properly test H1, the conditions for the experimental stimuli needed to be designed so that the results would unambiguously show when there is gender concord and when there is not. This required two (categorical) variables to be controlled in the stimuli: gender and ellipsis. For the gender variable, there were two levels, namely a match between the gender of the antecedent noun and the determiner and adjective of the elided noun, and a gender mismatch between the gender of the antecedent noun and the determiner and adjective of the elided noun. In the case of an antecedent mismatch, the determiner and adjective showed concord with the elided noun, when the antecedent was masculine or feminine. When the antecedent had neuter gender, the mismatch option was recorded as mismatching the elided noun gender. These options are exemplified in (26-28) above, with the (a) option showing the Gender Antecedent Match level and the (b) option the Gender Antecedent Mismatch level.

All the sentence pairs with ellipsis were also presented without ellipsis as a control. In these variants, the option with the gender of the FR determiner and adjective matching the gender of the FR noun, now fully realized and spoken, is predicted to always be chosen, as there were no impediments. Note that if for these items without ellipsis participants would still choose to match the gender to the BD noun, the likely conclusion would be that these participants do not have a full grasp on monolingual gender in FR and their answers should be checked against language proficiency.

Therefore, the second variable of ellipsis also had two levels: whether there is ellipsis present or not, see (29).

(29) Ellipsis present

a.	IK	EET	DEN	RODEN	APPEL	*et*	*tu*	*manges*	*le*
	I	eat	the.M	red.M	apple.M	and	you	eat	the.M
	<~~APPEL~~>		*vert*						
	<apple.M>		green.M						

Ellipsis not present

b.	*IK	EET	DEN	RODEN	APPEL	*et*	*tu*	*manges*	*le*
	I	eat	the.M	red.M	apple.M	and	you	eat	the.M
	pomme		*vert*						
	apple.F		green.M						

Taken together, these variables resulted in a 2x2 factorial design. There was an additional variable introduced in this experiment pertaining to the antecedent gender type: masculine, feminine or neuter gender. This did not impact the general design in any way but allowed the observation of any differences due to the type of gender. The final design is shown schematically in Table 2. The two choices in the 2AFC task always differed according to the Gender Match variable.

Table 2

Independent Variables in Experiment 1

Variable	Value
Gender match	Match
	Mismatch
BD antecedent noun vs FR elided noun gender	masculine vs feminine (M/F)
	feminine vs masculine (F/M)
	neuter vs masculine or feminine (N/X)
Presence of ellipsis	Present
	Not Present

2.3.2. Stimuli

Experiment 1 consisted of 72 stimuli, six per condition, which all had an interclausal code-switch. The general structure of the items was:

(30) $[_{BD}$ XP – V – Det – A – N] – $[_{FR}$ (Conj) – XP – V Det – N – A]

The first set of 36 stimuli contained NPE of the final noun. The second set of 36 stimuli were a repeat of the first 36 items but without ellipsis.

Since BD recognizes three genders, the antecedent language of all items was BD, leaving the second clause in FR, which only recognizes two. This allowed for two types of gender mismatches of

the nouns: masculine in BD, feminine in FR (and vice versa), and neuter in BD and masculine or feminine in FR. Therefore, the first criterium the nouns had to conform to was that the translation equivalent of nouns in each language had to have the right combination of (mis)match in gender. The second criterium was that the FR noun could not have a prevalent synonym in FR that was of a different gender. This was to ensure that the participant could not have mentally substituted another word in the ellipsis condition that did not comply with the intended gender matching. The third criterium was that if the noun pair were cognates of each other, the pronunciation would have to clearly differ, since otherwise the final noun could have been treated as a code-switch to BD again in the non-ellipsis condition. For example, one of the noun pairs that was used is BD *regel* together with FR *règle* 'rule'. Although the written form is similar, phonologically they are quite distinct: compare BD /ɾe:xəl/ versus FR /ʁɛ:glə/.

Finally, an additional loose criterium for the nouns were that they should be more frequently used. Since both CS and ellipsis are a marker of spoken colloquial language, it would be less natural to use low-frequency or formal lexical items. Moreover, finding the right gender match was often quite difficult, especially for nouns of feminine gender in BD, as they are less common and often more abstract than masculine nouns. Aiming to use higher-frequency words helped to offset some of the resulting 'artificialness' for some of these stimuli.

Table 3 shows an overview of the noun pairs for Experiment 1, their gender, and their frequency according to the SUBTLEX-NL corpus for Dutch (Keuleers et al., 2010)[11] and from the Lexique corpus (New et al., 2004) for FR noun frequencies. The frequency is expressed as a number indicating how frequent a word token is per million tokens of the corpora, e.g., a word with frequency 50.0 expresses that when taking one million word tokens at random, on average, 50 of them will be that word. The average word frequency of the BD nouns was 164.1. The average word frequency for the FR nouns was 139.8.

[11] To my knowledge, there are no accessible corpora using exclusively BD vocabulary and sources. However, the SUBTLEX-NL corpus is based on "44 million words from film and television subtitles" (http://crr.ugent.be/programs-data/subtitle-frequencies/subtlex-nl), and thus is entirely based on spoken, and likely often non-standard Dutch and Dutch varieties and therefore was considered an adequate option.

Table 3

Overview of the Noun Pairs Used in Experiment 1

Pair	Belgian Dutch	Gender	Freq	French	Gender	Freq	Translation
1	*appel*	M	10.2	*pomme*	F	19.8	apple
2	*rok*	M	7.2	*jupe*	F	10.1	skirt
3	*auto*	M	458.0	*voiture*	F	388.9	car
4	*stoel*	M	51.2	*chaise*	F	32.7	chair
5	*dag*	M	848.6	*journée*	F	165.4	day
6	*regel*	M	77.3	*règle*	F	33.2	rule
7	*krant*	F	58.2	*journal*	M	72.5	newspaper
8	*groente*	F	4.7	*légume*	M	3.2	vegetable
9	*regering*	F	56.6	*gouvernement*	M	/ [a]	government
10	*kunst*	F	37.1	*art*	M	65.9	art
11	*liefde*	F	208.9	*amour*	M	450.5	love
12	*uitdaging*	F	15.7	*défi*	M	10.2	challenge
13	*ontbijt*	N	44.8	*petit-déjeuner*	M	50.3 [b]	breakfast
14	*boek*	N	150.9	*livre*	M	112.4	book
15	*snoepje*	N	6.5	*bonbon*	M	6.9	candy
16	*konijn*	N	18.9	*lapin*	M	26.6	rabbit
17	*huis*	N	818.9	*maison*	F	570.3	house
18	*gezin*	N	79.9	*famille*	F	357.8	family

[a] The word *gouvernement* ‘government’ did not appear in the Lexique corpus.
[b] The full compound *petit-déjeuner* ‘breakfast’ did not appear as a single token in the Lexique corpus, the frequency given here is an indication based upon the frequency of *déjeuner* ‘lunch, breakfast’, which likely has a similar distribution as *petit-déjeuner*.

Besides the criteria for the noun pairs, there was also one criterium for the accompanying adjectives in FR. Since the gender agreement markers on the adjectives and the determiners were the only sign of gender in the ellipsis condition for the final noun, whenever possible, the FR adjectives were chosen in such way that there was an audible difference in the masculine and feminine adjective.

The choice given to the participants was always between a gender matching according to the prediction made in Section 2.2 and the identical sentence with the mismatch; see examples (26-28)

above and Figure 6 further below in Section 2.3.6. See Appendix A2 for a complete list of the resulting 36 interclausal sentence pairs as implemented in the survey.

Experiment 1 and Experiment 2 (to be discussed in detail in Section 3) were conducted at the same time, so that the items from one experiment would function as fillers for the items of the other experiment, creating 54 stimuli pairs total. The choice was made to use aural stimuli in order to deal with the fact that BD has no stable written form. In addition, since the stimuli were always presented as pairs, the order of whether a gender match or mismatch was presented first was randomized by allowing a Random Number Generation function to randomly select half of the total of 54 pairs to be shown as mismatch first.

2.3.3. Background Questionnaire

As described in Section 1.2 above, there is ample evidence that sociolinguistic and extralinguistic variables may have a considerable effect on how and where bilinguals partake in CS. In order to determine whether or not the results gathered in the experiments were sensitive to such factors, a section consisting of a background questionnaire was added to the online survey. This background questionnaire took into account the following elements:

- Age of acquisition for both BD and FR.
- Language proficiency in both languages, measured via a self-reported score. Proficiency within a language was further divided into four subcategories: production and comprehension in spoken language (i.e., speaking and understanding) and production and comprehension in written language (i.e., writing and reading).
- Language use in various situations for both languages. This was divided into use within specific social environments (e.g., at home or at work) and use during specific activities (e.g., reading the newspaper or watching tv).
- A measure of how important they considered knowing each language.
- Use of BD/FR CS, divided into frequency of use and use within specific social environments, as well as the motivation for use.

- Personal attitudes towards CS, as well as what participants perceived as the community's – meant here as the inhabitants of Belgium – attitudes towards CS.
- General information on the language history of participants, specifically other languages known, languages spoken during their childhood at home and the language spoken during their attendance of primary and secondary school.
- Demographic information on the participant, including age, gender, location of birth and current location.

Twenty-eight questions were created in total, six of which were open questions and twenty-two were multiple choice. These questions were partially inspired by the (standardized) background questionnaires created for the Bangor Miami bilingual corpus (http://bangortalk.org.uk/) and the questionnaires designed for bilinguals by De Cat et al. (2021) and Kharkhurin and Wei (2015). For a full list of the questions, see Appendix A1. The results of the background questionnaire will be discussed in the next section on the participants.

2.3.4. Participants

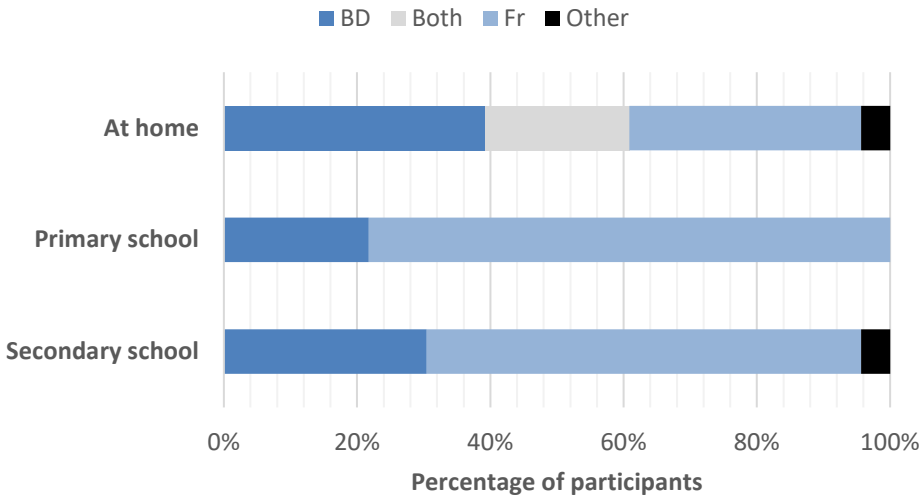
Twenty-three BD/FR speakers participated in Experiment 1 (13 female, 10 male; mean age = 39.26 years). Participants were required to identify themselves as a native speaker of at least one language (and preferably both), to have learned both languages at an early age and to have continued to use both languages regularly into adulthood. They were recruited through personal contacts, through a call for participants on the social network site Facebook, and within part of the student population of the Language and Linguistics departments of the Universities of Brussels and Leuven.

All participants were born in Belgium except for two (one in France and one in the Netherlands), and all participants currently reside in Belgium except for one living in France. The ones not born in Belgium do currently live there, and the one currently not living in Belgium was born there. Participants were asked which main language was spoken during their early youth at home

(≤ 3 years of age), at their primary schooling institute and at their secondary schooling institute. Results are found in Figure 1.

Figure 1

Main Language Input during Childhood at Home and in School (Group 1).



Within the participants, an additional distinction was made between those participants who learned both languages before the age of six (i.e., 'simultaneous bilinguals', 19 participants total) and those who learned only one language before the age of six and the other language later (i.e., 'sequential bilinguals', four total, of which three learned FR later, and one learned BD later). A second distinction was made between people who scored at least a cumulated score of 3.0 out of 4.0 on the self-reported proficiency scale in both languages (i.e., 'high-proficiency' bilinguals, 20 participants total) and those who had not (i.e., 'low-proficiency' bilinguals, of which two scored below 3.0 in FR and one scored below 3.0 in BD). One of the participants fit into both the sequential and low-proficiency category. Since in both cases only a small portion of the participants did not meet the 'ideal' profile, the responses of the different groups were not measured directly against each other. Rather, every statistical analysis was performed twice: once for the entire group of 23 (hereafter called G1), and once for the culled group of 17 participants that were both simultaneous *and* high-proficiency bilinguals (hereafter G2). A summary of the main extralinguistic factors concerning these two groups may be found in Table 4.

Table 4

Summary of the Main Extralinguistic Factors Describing the Two Participant Groups.

Factor	G1 (n=23)		G2 (n=17)	
Gender	F = 13; M = 10		F = 9; M = 8	
Dominant language	BD = 14; FR = 9		BD = 10; FR = 7	
	mean	range min-max	mean	range min-max
Age	39.26 (SD 20.31) y	16 - 77 y	39.00 (SD 19.16) y	16 - 76 y
AoA BD	1.22 (SD 2.17) y	0 - 8.00 y	1.06 (SD 1.78) y	0.00 - 5.00 y
AoA FR	2.26 (SD 3.48) y	0 - 10.00 y	0.88 (SD 1.67) y	0.00 - 6.00 y
Proficiency BD [a]	3.71/4.00	2.50 - 4.00	3.75 / 4.00	3.00 - 4.00
Proficiency FR [a]	3.59 /4.00	2.25 - 4.00	3.71 / 4.00	3.00 - 4.00
Frequency of active use BD [b]	54.70 %	10.00 - 96.25 %	47.81 %	10.00 - 96.25 %
Frequency of active use FR [b]	45.30 %	3.75 - 90.00 %	52.19 %	3.75 - 90.00 %
Frequency of passive use BD [b]	52.33 %	14.50 - 87.25 %	49.73 %	14.50 - 87.25 %
Frequency of passive use FR [b]	47.67 %	12.75 - 85.50 %	50.27 %	12.75 - 85.50 %
Frequency of CS [c]	3.26 / 5.00	1.00 - 5.00	3.12 / 5.00	1.00 - 5.00
Positive attitude CS [d]	3.61 / 5.00	1.00 - 5.00	3.53 / 5.00	1.00 - 5.00
Negative attitude CS [d]	2.43 / 5.00	1.00 - 5.00	2.41 / 5.00	1.00 - 5.00

[a] A higher score indicates a higher proficiency.
[b] The questions concerning frequency of use were posed as a slider with which participants could indicate the relative percentage of time spent using BD (versus FR).
[c] A higher score indicates a higher frequency of CS.
[d] A higher score indicates a higher level of agreement with the positive or negative statement.

As can be seen from the table, the general language proficiency of the participants was fairly balanced between BD and FR across the groups, though there is some individual variation present. The same can be said for the frequency of use between the languages, averaging around 50 %. However, there was quite a lot of individual variation here again, with very high maxima and very low minima. In addition, there was some variation when looking at the results in detail by different contexts for both active use and passive use of the languages, see Figures 2 and 3. Notably, Figure 2 shows that participants spoke both languages mostly in their work or school environment, while at home they more often tended to speak either one language or the other.

Figure 2

Frequency of BD and FR Used Actively across Environments (Group 1).

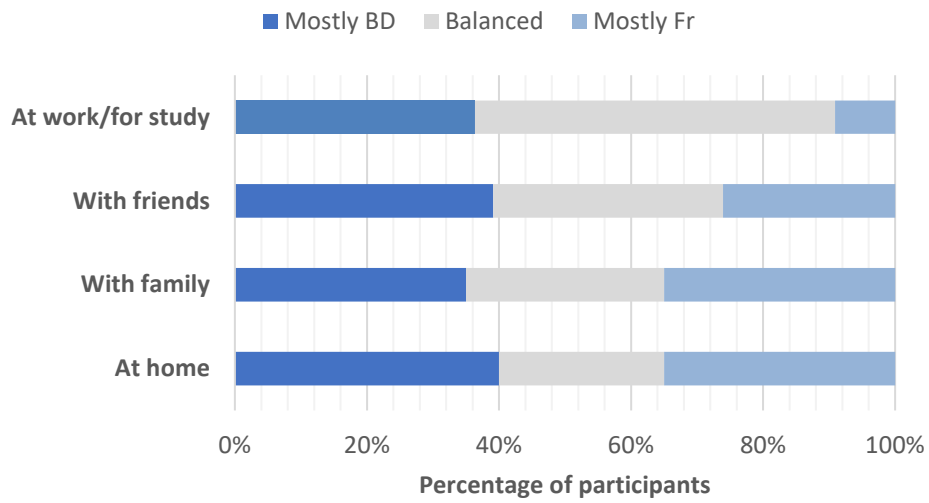
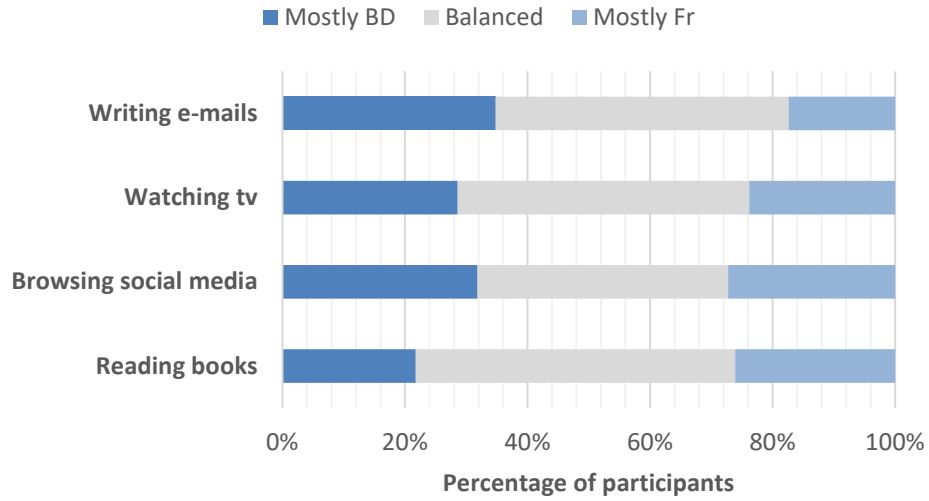


Figure 3

Frequency of BD and FR Used Passively across Media (Group 1).



Participants were also asked to list any other languages they spoke, with English being the language most frequently named (n=21), followed by German (n=9), Italian (n=7), Spanish (n=6), Russian (n=1), Romanian (n=1), and Swahili (n=1). Two participants indicated that they did not know any other language.

Regarding their use of CS, participants were asked to judge how much they would code-switch when talking to other bilinguals. Seven participants indicated they rarely to never code-

switched, five sometimes used CS, and 11 participants did so often to always (Figure 4). As a follow-up, they were also asked in which environments they code-switched. Results showed that participants code-switched the most when with friends (n=16) and the least at home (n=9) (Figure 5).

Figure 4

Self-reported Frequency of Code-Switching (Group 1).

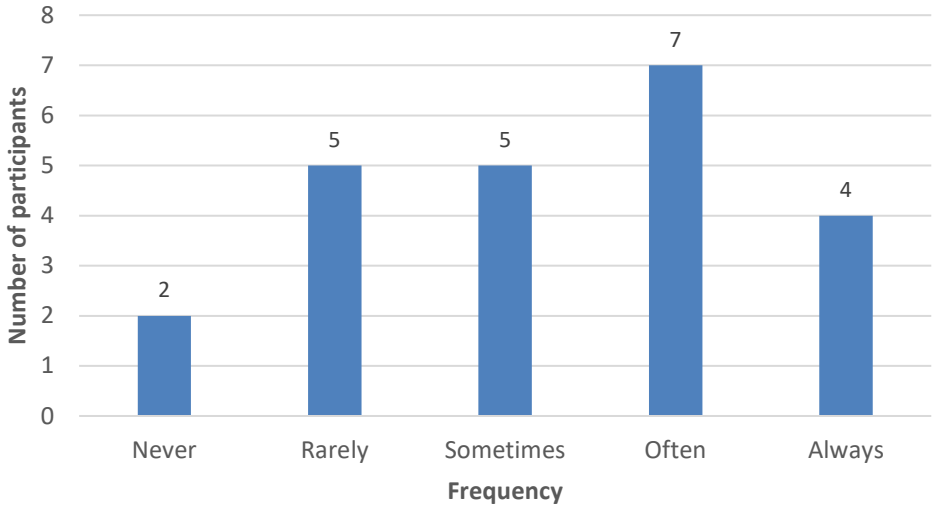
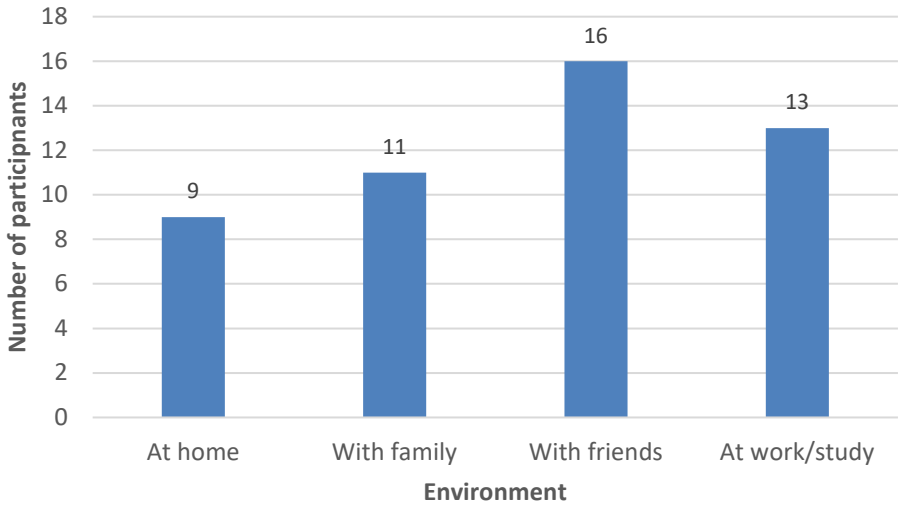


Figure 5

Environments Participants Reported to Code-Switch in (Group 1).



Finally, each participant was presented with three questions measuring their attitude towards CS. When confronted with a positive statement saying they themselves liked to mix their languages, only two participants disagreed. When presented with a negative statement stating that

they thought other people should not mix their languages, only two people agreed. However, for both statements nine participants were neutral on the matter. Taken together, this seems to point to the participants generally having either a positive attitude or being indifferent on the matter. This attitude shifted more negatively when asked how they thought Belgians in general perceived mixing languages. This question was asked to have an indication on how they perceived the attitude of the larger community instead of their personal opinion. Five participants (all BD dominant) indicated they thought that Belgians think CS should be disallowed, and just three participants chose to say that CS is alright by the community. The remaining participants either thought that the community would not care either way (n=7) or said that they did not know how the community thinks about this (n=8).

2.3.5. Recordings

All recordings were done by a female native BD/FR bilingual speaker aged 65, using the internal microphone of an Acer Aspire 5 computer. The speaker received the instructions in written form and was instructed to speak all sentences with her natural BD and FR accents and adjust phonetically and prosodically as felt most natural. In addition, the speaker was told to strictly obey the word order and to keep an even pace and intonation across all stimuli. All recordings were checked by the experimenter before proceeding.

The 108 stimuli were recorded in groups of ca. 10 items each, using the program Voice Recorder by Microsoft Windows to create M4A files. These files were then processed using Audacity (a cross-platform open-source software for audio processing; www.audacityteam.org), Windows version 2.4.2, as follows:

- Converting the stereo input to mono (to reduce file sizes);
- Normalizing the audio level to 0dB (for uniform volume);
- Splitting into pairs of phrases (to make individual stimuli in the survey);
- Reversing the sequence of phrases where required (as per randomization table);
- Adjusting the silent interval between phrases to 2 seconds;

- Adjusting the silent parts at the start and the end of a stimulus to 0.5 seconds each;
- Saving each stimulus as a separate audio file in MP3 format (standard setting, 170-210kbps bitrate).

The final files were subsequently uploaded to the online survey.

2.3.6. Procedure

All participants received a link to the Qualtrics survey together with a short statement providing some information on the experiment and the required profile to be an eligible candidate. After clicking on the link, the information was repeated once more, followed by the task instructions. Participants were told they were to hear sentence pairs in mixed BD and FR, and that they should choose whichever sentence they found to sound most natural for each experimental item. Next followed the informed consent form and then the warning that participants should make sure to have headphones on and/or be in a quiet place so that they would be able to clearly hear the auditory stimuli.

The next part of the survey consisted of the actual experiment. The 54 sentence pairs, 36 from Experiment 1 and 18 from Experiment 2, were presented in an individualized random order, one pair per page. The stimuli pairs would automatically start playing as soon as the page loaded and could be replayed manually if so desired by the participant. Two options were presented to the participants, labeled *zin 1* ('sentence 1') and *zin 2* ('sentence 2') whereby they could indicate their preferred choice, see Figure 6.

Up until this point in the survey, all written text had been presented in code-switched mode, as to prime both languages as well as promote the presence of language mixing in the participants (cf. González-Vilbazo et al., 2013, pp. 11-12). The sole exception was the informed consent form, presented in its entirety in both languages, since excellent understanding of it was crucial. After the experiment, the participants were given the choice to go on to the second part of the survey in whichever language they felt more comfortable in, i.e., either FR or Dutch.

Figure 6

Screenshot of the Experimental Task in the Survey.

This second part consisted of the background questionnaire. Here, participants were asked about their language proficiencies, their language use, their CS use, their attitudes to CS and asked for their demographic information. The survey ended with an option to leave additional comments on the survey. On average, the total time to take the survey was twenty minutes. All data were collected between 14 May and 23 June 2021.

2.3.7. Data Analysis

The experiments in this study are primarily focused on discerning whether there are any effects present at all by administering a 2AFC judgment task. As a result, the statistical analysis has been kept simple. First and foremost, it was important to investigate whether the choices the participants made in the two 2AFC tasks differed significantly from random choice (cf. Schütze & Sprouse, 2013, p. 32). To this end, the response means were compared against a random chance of 0.5, using a one-sample t-test or the Wilcoxon signed-rank test, depending on whether or not the data violated normality (which was checked using a Shapiro test for each subset of data). Every test was done twice: once for the G1 group and once for the G2 group. Moreover, within each group, the

tests were repeated again, once with the by-item choice means and once with the by-participant choice means.

In addition, the different condition choice means were also compared with pairwise (i.e., dependent) t-tests to see whether the conditions differed significantly from each other. As was the case for the one-sample t-tests above, every test was done for each of the groups.

The possible influence of extralinguistic factors were tested by way of a simple linear regression test per factor, and a multiple linear regression model for all factors, using a forced entry for the chosen predictor factors (cf. Field et al., 2012, p. 264). All calculations were performed using the R package (R Core Team, 2020) in the RStudio environment (RStudio Team, 2020).

2.4. Results

The first experiment questioned whether there was any trace of a preference for a match with the BD antecedent noun gender in code-switched NPE contexts, instead of a 'local' match with the elided FR noun gender. The stimuli were split into three conditions, a masculine antecedent with a feminine elided noun pair (M/F), a feminine antecedent with a masculine elided noun pair (F/M), and a neuter antecedent with either a masculine or a feminine elided noun pair (N/X). By using these three combinations, possible effects linked to specific gender could also be observed if present.

The results of the 2AFC task show that for G1, counter the predictions made in P1a and P1b above (Section 2.2), participants chose a match with the local gender of the elided FR noun 82.6% of the time for the M/F condition and 70.3% of the time for the F/M condition. For both conditions, these choices were significantly different from random chance (for M/F, by item: $t(5) = 4.1496$, $p = 0.009$; by participant: $V = 253$, $p < 0.001$; for F/M, by item: $t(5) = 3.585$, $p = 0.016$; by participant: $V = 188$, $p = 0.002$). The N/X condition, where the antecedent gender was unavailable and thus no antecedent match was anticipated, shows the expected result that participants preferred a match with the local elided noun in 81.2% of the cases (by item: $t(5) = -11.66$, $p < 0.001$; by participant: $V = 20$, $p < 0.001$). These results indicate that code-switched BD/FR NPE shows no clear sign of a syntax-preserving antecedent match. To check this result, the three gender conditions were tested against

each other to see whether there were significant differences between them. The p-values for all tests were greater than 0.05, meaning that the gender combination did not have a significant impact on the preference for a gender match with the elided noun.

One reason for the lack of expected results found above could be that some of the participants had not fulfilled the criteria of being an early and/or proficient bilingual. Therefore, the tests above were repeated for the smaller G2 group. However, the results did not change in any meaningful way. These participants still preferred a match with the elided FR noun in 82.4% of cases in the M/F condition (by item: $t(5) = 3.5502$, $p = 0.016$; by participant: $V = 136$, $p < 0.001$) and 71.6% of cases in the F/M condition (by item: $t(5) = 3.4028$, $p = 0.019$; by participant: $V = 95.5$, $p = 0.006$). In the N/X condition, participants preferred a match with the local elided noun 77.5% of the time (by item: $t(5) = -9.7759$, $p < 0.001$; by participant: $V = 17.5$, $p = 0.008$). Again, the conditions did not differ significantly from each other.

Figure 7 shows the results (given in the form of the percentage of local gender matches chosen) as compared to the random chance mean, Table 5 below sums up the results and the significance.

Figure 7

Results of Experiment 1.

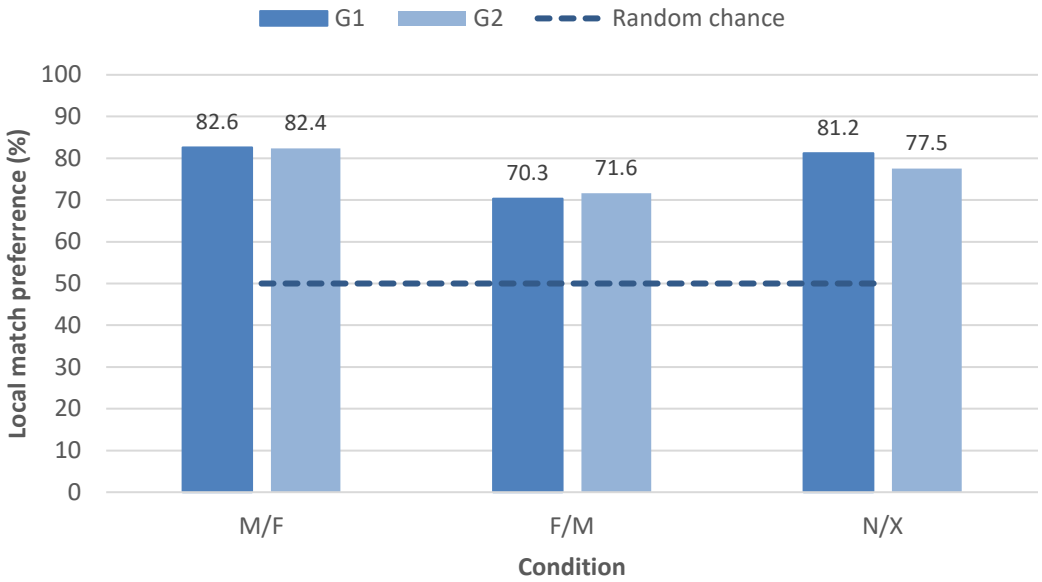


Table 5

Experiment 1: Local Gender Match Preference and Significance against Random Chance in Conditions with Ellipsis Present.

Condition	Group 1			Group 2		
	match preference (%)	significance [a]		match preference (%)	significance [a]	
		item	ptcp		item	ptcp
M/F	82.6	**	***	82.4	*	***
F/M	70.3	**	**	71.6	***	**
N/X	81.2	***	***	77.5	***	**

[a] Significance is shown by item and by participant (ptcp) with * standing for a p-value less than 0.05, ** less than 0.01, and *** less than 0.001.

Seeing as the results differ from random chance, but that adnominal gender seemingly does not agree with the gender of the ellipsis antecedent, it becomes necessary to investigate whether or not these results can be distinguished from the results of a gender choice made for stimuli without an elided noun. Since antecedent gender seems not to influence the participants' choice, it stands to reason that the local noun being elided or not may be irrelevant to determining the gender of the adnominal elements. Consequently, a post-hoc investigation between the distributions of the ellipsis and non-ellipsis version of each condition was conducted. Since there was little difference between the findings for the G1 and the G2 group, the following calculations are shown solely for the G2 group of most proficient bilinguals (as they most likely approach target-like gender assignment in monolingual contexts).

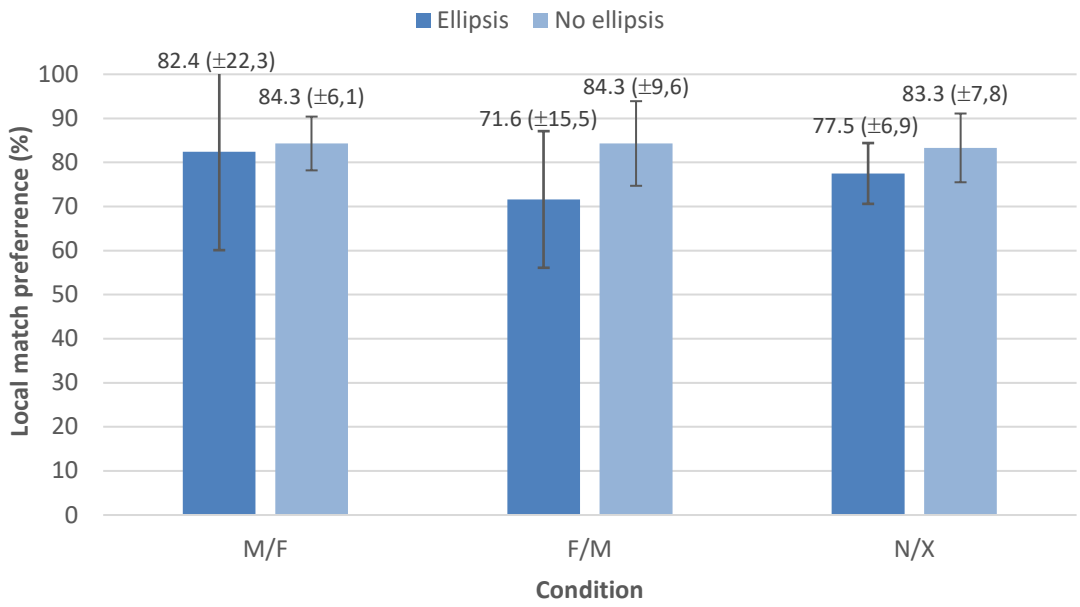
The preference means were largely similar in the no ellipsis conditions compared to the ellipsis conditions discussed above, with only one significant difference found for the means of the F/M conditions (using a paired t-test, the F/M local match preference mean with ellipsis was 71.6%, while the without ellipsis condition mean was 84.3%, $p = 0.041$). However, note that while the preference means are similar, the standard deviations, and thus spread in the distribution of choices, are much greater in the ellipsis conditions, despite an accessible antecedent gender being present (Figure 8). In contrast, in the N/X condition where the neuter antecedent ensures no other gender

but the local is available for the FR adnominals, the standard deviations are much more comparable. This indicates that there is more variation in preference in ellipsis conditions with an acceptable antecedent gender alternative to choose. Still, these results do not approach the magnitude of the findings noted by González-Vilbazo and Ramos (2015) for antecedent case in sluicing.

Though there is not enough conclusive evidence to state that ellipsis does influence gender marking in code-switched DPs according to an other-language antecedent, the significant difference between the F/M condition mean values and the change in the standard deviation values when comparing the ellipsis and no ellipsis stimuli results does signal that there seems to be some kind of underlying effect resulting from ellipsis.

Figure 8

Comparison Ellipsis vs. No Ellipsis Condition Results.



Finally, while it is not the main purpose of this work to study the impact of extralinguistic factors on CS data, it would be negligent to disregard the possible influence of such factors on the results found above. As was seen so far, there was little to no difference found between the results of the G1 and G2 group. However, this does not mean that there could be no influence present that is not visible at first glance. Therefore, several regression models were compiled in order to check

whether any factors were of significant influence on the average match preference per participant scores for the G1 group.

Simple linear regression models were conducted for eight individual extralinguistic factors to measure how much of the variation could be attributed to these factors. These were: the participants' age, gender, their average proficiency in BD, their average proficiency in FR, the age of acquisition of BD, the age of acquisition of FR, their frequency in using CS, and their general attitudes towards CS. For all single factors, no significant contribution to the results were found. Likewise, a multiple regression model, including all the predictor factors at once, did not show any significant factors extending an influence on the average match preference per participant scores. Therefore, this study could not find any evidence of extralinguistic factors playing a role in influencing results from 2AFC judgment data in CS. A possible explanation for this result will be examined in the Section 2.5.3 below.

2.5. Discussion

2.5.1. Theoretical Implications

In contrast to what was predicted, there seems to be no trace of any preference for antecedent gender in interclausally BD/FR code-switched sentences when a noun is elided. The preferred choice is illustrated in (31):

(31) IK EET DEN RODEN APPEL *et* *tu* *manges la* *verte*
I eat the.M red.M apple.M and you eat the.F green.F
'I eat the red apple and you eat the green one.'

Participants consistently preferred a gender match to the elided noun, regardless of which gender was present as antecedent. This means that the original hypothesis H1, repeated below cannot be proven, as the accompanying null hypothesis (H0) cannot be falsified on the basis of the data gathered here.

H1: In interclausal CS, the gender of the determiner and adjective associated with an elided FR nominal phrase will match with the gender of the BD antecedent noun.

H0: In interclausal CS, the gender of the determiner and adjective associated with an elided FR nominal phrase will match with the gender of elided FR noun.

The question of why the gender data collected are not behaving as predicted may have many answers. To start, previous results from CS signifying a syntactic relationship with the antecedent were found for clausal ellipsis (sluicing in German/Spanish, González-Vilbazo & Ramos (2015) and VPE in Greek/English, Merchant (2015)), while this thesis considered NPE. These ellipsis types target very different constituents, in size and nature, so it is not unthinkable that this difference can be related to the syntactic differences between the elided phrases and/or heads. Much is still unknown in general about the exact expression and structure of the gender feature and phrase in the nominal domain. However, most agree that Gender is located below NumP, at or under the *n*P level, resulting in a DP that contains at least [DP [NumP [*n*P [√P]]]], with modifiers occupying specifier positions or as complement to the root √ (Hawkins & Franceschina, 2004; Merchant, 2014; Saab & Lipták, 2016; Saab, 2018, p. 529). Number may vary under NPE, but Gender may not in monolingual contexts (Saab & Liptak, 2016, p. 94; Merchant, 2014, pp. 29-30).[12] Thus, Gender is expected to mandatorily be part of the elided material and should match between the antecedent and elided noun.[13] Consequently, ellipsis type is not an obvious reason for the observed difference.

CS results may also vary according to the language combination under investigation, since every unique combination of language grammars will expose different conflict points and commonalities, including for NPE. As stated, the BD and FR pair has not often been a target of research, and NPE has never been directly researched in this particular language dyad. Therefore, there is also a potential difference between the expression of NPE, and which part of the extended projection of the root can be elided in FR and BD.

[12] Note that this also implies that NPE as discussed herein is in fact a case of *n*PE. For an overview of consequent differences between *n*PE, NumP ellipsis and RootP ellipsis, see Saab (2018, pp. 550-59)

[13] Bobaljik and Zocca (2011) showed that gender is not invariant under NPE for certain nouns which have semantic (human) referents who are naturally gendered (e.g., titles, like 'princess'; professions like 'actress'; kinship terms like 'brother') in predicate nouns. Merchant (2014) also shows this for the similar nouns in Greek and adds that this also may fail when the noun is in an argument position. However, the nouns under ellipsis in this experiment deliberately did not contain such noun types, so it is doubtful that this fact, and the mechanism proposed to underlie it, caused the difference of judgment seen.

The FR NPE used in this experiment is described as "definite NPE" (i.e., having a remnant adjective or other sort of classifying constituent) by Dagnac (2018) and may "be found in any syntactic position" (p. 810). Dagnac continues by arguing that (FR) NPE may not be true ellipsis at all and that it must "rely on the distribution and potential anaphoric range of the remnants" (p. 812) in order to be tested. In this light, the lack of gender agreement found implies that the remnant cannot easily be formally linked through some kind of structural identity with the antecedent, and thus, may not be ellipsis at all. In contrast, Sleeman and Hulk (2013) show in their work that having a classifying adjective - such as *grand(e)* 'big'*, vert(e) '*green' and *bas(se)* 'low' – may be important. Such adjectives may be interpreted as having the partitive function of denoting a subset, which Sleeman and Hulk argue is necessary for licensing FR NPE. Moreover, their pilot study on L1 NPE acquisition by French and Dutch children revealed that partitivity seems to be crucial for L1 acquisition of NPE, and that this is the case in both FR and Dutch. Therefore, Sleeman and Hulk's (2013) work supports the assumption that PF-deletion type NPE takes place in the stimuli used in this thesis, though they do not exclude the possibility of a null pronoun ellipsis approach (p. 263). Other proposals highlight the role of contrastive focus in NPE operations (Corver & van Koppen, 2009; Eguren, 2010), [14] but again, this would not present a problem for the stimuli used here.

Turning to possible differences linked to factors based on CS theories, recall that bilinguals may resort to different gender assignment strategies when CS within the DP (see Section 2.1.1). If we assume for the moment that there is full structure underlying the ellipsis site, and that there exists a morphosyntactic identity relationship between the antecedent and the elided material (as argued by Merchant, 2015; González-Vilbazo & Ramos, 2015; 2018), then the stimuli would hold a second, covert intraclausal CS point at the ellipsis site: *le/la APPEL vert/verte* 'the green apple'. Take the unelided sentence (32):

(32) IK EET DEN RODEN APPEL *et* *tu* *manges* ***la*** ***pomme*** ***verte***
I eat the.M red.M apple.M and you eat the.F apple.F green.F
'I eat the red apple and you eat the green one.'

[14] Though, see Saab and Lipták (2016) and Saab (2018) for arguments against either partitivity or contrast being necessary for NPE.

(32) shows the final noun as the FR feminine *pomme*, with the appropriate gender markers on the adnominal elements. A morphosyntactic identity relationship for ellipsis would actually assume (33) to be preferred when ellipsis takes place, with the adnominal remnants matching the gender feature of the BD antecedent noun *appel*:

(33) IK EET DEN RODEN APPEL *et tu manges* ***le*** ***<~~APPEL~~>*** ***vert***
I eat the.M red.M apple.M and you eat the.M apple.M green.M
'I eat the red apple and you eat the green one.'

If, however, there should be an analogical gender strategy in pairing a FR determiner with a BD noun – even if that noun is then elided – different results are to be expected, ones that would be difficult to distinguish from the results found in Experiment 1 (i.e., mismatching the BD antecedent gender but matching the FR translation equivalent of the elided BD noun, see (34-36)).

(34) No CS
… *la pomme verte*
(35) CS: Analogical strategy (translation equivalent = *pomme*.F)
… *la* APPEL *verte*
(36) CS: NPE + Analogical strategy
… *la* <~~APPEL~~> *verte*

Recall that all noun pairs were chosen specifically so that the translation equivalents differed in gender, in order to allow matching and mismatching gender conditions in the 2AFC task. Influence from gender assignment strategies must therefore be considered a possible confounding factor in this work. Nevertheless, some insight might be gleaned from research on gender assignment in BD and FR.

To my knowledge, only Treffers-Dallers (1994) has reported on gender assignment strategies employed in BD/FR CS, specifically FR nouns inserted in BD clauses. She found that her BD/FR bilinguals preferred the analogical strategy, which is problematic for the interpretation of the results here. However, Vanden Wyngaerd (2017) discusses gender assignment strategies in her work on BD/FR CS in the DP but reported no results, "as results were not statistically significant" (p. 461). Some further insight might be gained from Vanden Wyngaerd (2021), who has reported further insight on BD/English and FR/English CS. For FR/English CS, she notes her participants preferred the

analogical gender assignment strategy in FR (p. 135; 139) and for BD/English she finds that the default strategy seems to be employed in BD, but that "[i]t is impossible to tell" from the results what the default gender would be if it was (p. 128). Though these results should not be considered transferable to BD/FR CS outright, as assignment strategies may differ within communities speaking the same languages, let alone different ones (Królikowska et al., 2019; Balam et al., 2020; Bellamy & Parafita Couto, 2022), they do point to bilinguals with (Belgian) FR as one of their languages employing the analogical strategy in at least one community. Bellamy and Parafita Couto (2022) also mention that two factors, namely the frequency of CS within a community and order of acquisition of the languages, seem to influence which strategy is preferred. Higher frequencies of CS correspond to a higher likelihood of default strategy. Early balanced bilinguals also appear to prefer the default strategy, while sequential bilinguals seem to prefer the analogical strategy.[15] The BD/FR bilinguals who participated in Experiment 1 were all balanced early bilinguals. The questionnaire results show that the (self-)reported frequency of CS differs wildly between individuals, with 12 participants using CS never to sometimes, and 11 often or always (see Figure 4 above). Therefore, extrapolation from previous research and extralinguistic factors presents inconclusive evidence of a likely strategy. Consequently, the lack of data on the participants' gender assignment strategies presents a limitation on the findings here.

In order to gain more insight into the interpretation of what a gender match or mismatch comprises of, it is vital that research be done into gender assignment strategies used by BD/FR bilinguals. The two most common ways of determining strategies are either by performing a director-matcher task in which a BD/FR speaker is encouraged to produce code-switches in the DP (cf. Bellamy et al., 2018; Boers et al., 2020) and investigating corpus data to see what is spontaneously produced by speakers. Since such a BD/FR corpus does not exist as of yet, the first method would be advisable to start with. Note that it should be possible to also elicit some answers including elided

[15] However, the findings concerning order of acquisition discussed in Bellamy and Parafita Couto's (2022) overview do discuss primarily gendered/non-gendered language dyads, and not CS with two gendered languages as seen in BD/FR CS.

elements in a director-matcher task, while finding instances of NPE in a corpus – especially with the desired combination of antecedent and local gender – may prove rarer.

2.5.2. Methodological Implications

Methodologically, some factors should also be taken into consideration. As stated previously, CS is sensitive to the environment it is used or presented in (see Section 1.2). This means that beyond the possible confounds discussed in the previous section, there are also matters such as task type (for example, Likert-score testing whether the sentences would be considered acceptable at all by participants), modality (providing the stimuli in written form instead of auditorily) or changing from language comprehension tasks to language production tasks.

This pertains especially to differences when it comes to the source of data, task type and participants between this work and previous works on CS and ellipsis. González-Vilbazo and Ramos (2015) report results as determined by Likert acceptability judgments of four adult bilingual speakers (p. 16, as well as footnote ix, p. 38). In contrast, Merchant (2015) lays out observations regarding VPE in Greek/English code-switched sentences that were taken from the spontaneous speech of two children in (separate) dialogues with their mother (pp. 199, 207-208). One point of attention here is the fact that it has been noted that bilingual children are freer in what they deem acceptable code-switched constructions when compared to adults (Wentz & McClure, 1976; as cited in González-Vilbazo & Ramos, 2018, pp. 466-67). Further points could be made regarding the source of the data, and task type. For example, the main work which inspired this thesis was that of González-Vilbazo and Ramos (2015), who used written stimuli instead of auditory, and their participants' task was to rate each sentence on a 5-point Liker scale in order to determine acceptability (p. 15), not weighing two sentences against each other in a 2AFC task. Though all these data are valid – and perhaps even necessary – in order to reach a comprehensive theory of ellipsis in CS contexts, direct comparison of results found in such diverse method is useless if done without due consideration towards methodological factors. It is therefore too early to accept or discard the results found in this thesis without further investigation.

There is also the question whether or not community differences have muddied the results. Balam et al. (2020), as well as Blokzijl et al. (2017), have noted that community norms exist in bilingual communities and will impact CS behavior, even when speaking the same languages. Balam et al. (2020) noted a difference between Spanish/English bilinguals from Northern Belize, from Puerto Rico, and from New Mexico in judging CS light verb constructions. Blokzijl et al. (2017) noted a distinction in determiner language preference in code-switched DPs between Spanish/English bilinguals in the US and Nicaragua. While all participants in this thesis are Belgian, covid measures at the time of data collection made it impossible to meet with participants in person, or to recruit at specific locations. Treffers-Dallers (1992, 1994, 1999, 2002) worked specifically in Brussels, and Vanden Wyngaerd (2017) also recruited in Brussels. The bilingual participants here were recruited at different locations (Brussels, Leuven, online), and the location of birth and residence also varied. It is thus likely that the participants did not belong to a single community and consequently operated under different community norms.

These considerations provide several interesting avenues for future experiments that are built upon this topic. Two options immediately come to mind regarding the differences between the results shown here and those found by González-Vilbazo and Ramos (2015). First, a repeat of Experiment 1 exactly as described within this thesis with German/Spanish bilinguals. Both Spanish and German (Saab, 2018) allow for NPE to occur, resulting in sentences such as (37):[16]

(37) GERMAN/*Spanish*

ICH	ESSE	DEN	ROTEN	APFEL	*y*	*tú*	*comes*	*la*
I	eat	the.M.ACC	red.M.ACC	apple.M	and	you	eat	the.F
<~~manana~~>		*verde*						
<apple.F>		green						

'I eat the red apple and you eat the green one.'

If the Spanish/German speakers also show a preference for the adnominal remnants to show a local gender match when elided, then it may be assumed that the difference is not due to the BD/FR language pair chosen here. If they do not show this preference, then further investigation in why this

[16] The example here is purely illustrative, and not meant to represent a true stimulus for an equivalent German/Spanish NPE experiment.

language dyad behaves differently should be the priority. A second option would be to repeat the experiment put forth by González-Vilbazo and Ramos (2015) with sluicing cases in BD/FR. However, neither of these languages have overt case markers on wh-words (nor anywhere else except on pronouns), so this would be impossible to directly replicate. Nevertheless, replicating their experiment with other language pairs that do have such case markers should be considered in order to anchor their results cross-linguistically if possible.

A final step would be to pay more attention to a methodologically diverse range of experiments to see whether results could be linked to specific experimental or task-related factors. Examples include having speakers judge acceptability scores on a Likert scale to see whether they are comfortable with NPE in CS at all, perform in-person interviews with speakers regarding their own views and attitudes on CS, as well as looking at possible influence of community variation between BD/FR speakers. Lastly, the larger job of designing and creating a corpus of BD/FR CS, which could also be used for other questions within the BD/FR CS field, would be a strong addition of natural CS data to draw from.

2.5.3. The (Non-)Influence of the Extralinguistic Factors

A final point of interest to mention in this discussion is the lack of any significant impact of the extralinguistic factors on the results of Experiment 1. Although evidence has been discussed in Section 1.2 that factors including bilingual profile, monolingual proficiencies or attitude towards CS may have an impact on the results of linguistic experiments using bilingual participants, no such impact was found in this experiment. Two considerations must be noted here.

First, it is important to note that this project did not set out to investigate extralinguistic factors and their importance. Consequently, instead of gathering a range of different types of bilinguals, the participants that were invited to join in in Experiment 1 were deliberately chosen to match a specific bilingual profile: Belgian (young) adults, native speakers of BD and/or FR, bilingual from an early age (3 years or earlier) and having used both languages regularly since then (see Table 4). The goal was to minimize the impact of extralinguistic factors, and the results indicate that that

goal seems to have been successfully achieved. Still, despite this homogeneity, the participants were not selected from a single bilingual community.

In addition, it should be noted that, due to the statistically small number of bilinguals participating, it is possible that small, or even medium effects were not able to be picked up by the regression models, which leads to the second consideration. Regression model estimations are dependent on the sample size used in the experiment and the effect size one wants to discover. Based on Field et al.'s (2012) recommended method of estimating sample (i.e., participant) size, to calculate the fit of a multiple regression model with eight predictor factors, the experiment would have required a minimum of 114 samples to work with (p. 274), covering large and medium sized effects (according to Cohen's criteria). In addition, the smaller the effect the predictor would have on the result, the higher this number will grow, reaching several hundred participants for the predictors considered here. For obvious reasons, this was not attainable for a project of this size (p. 274-75).

Therefore, it would be more correct in stating that the multiple regression model performed for Experiment 1 shows that it is statistically unlikely that the extralinguistic factors had a large effect on the preference results, in line with the goal of the experiment. However, medium and small effects might have been missed, and should smaller effects of these predictors on gender and ellipsis in CS be the desired object of investigation, more expansive research is required.

In sum, this thesis has found no evidence for a morphosyntactic link between a BD antecedent noun and FR adnominal remnants in NPE contexts, contrary to previous findings. However, this should not be taken as definite proof of no such link existing, as the type of ellipsis and how it affects nominal structure, gender assignment strategies by the speakers, the BD/FR language pair or a number of methodological factors may all have had an effect on the results. Further research is crucial to judge what may be the cause(s), for which this experiment may serve as an empirical base to start from.

3. Code-Switching and Determiner Language: Syntactic Effects of Adjacency

This section will describe the proceedings of Experiment 2. I will start by discussing the necessary theoretical background in Section 3.1 and present the hypothesis and predictions in Section 3.2. In Section 3.3, I will describe the methodology used for the experiment, and Section 3.4 will show the results. Finally, I will discuss the implications of the results found in Section 3.5.

3.1. Theoretical Background

3.1.1. Language of the Determiner

To start, the example of code-switched DPs such as (8) and (9), repeated here in (38), should be considered again:

(38) English/*French*
a. the *maison*
b. {*le*/*la*} house

The difficulties with gender assignment have been discussed in Section 2, but there is another issue at play relating to CS as in (38). For code-switched DPs, research has shown that the choice between the language used for the determiner, and the one used for the noun is not arbitrary (i.e., whether (38a) or (38b) is preferred). Speakers from different bilingual communities have preferences on which language is used for which element of the DP, creating an asymmetry in language choice (Liceras et al., 2008; Valdés Kroff, 2016; Herring et al., 2010; Jake et al., 2002; Blokzijl et al., 2017; Vanden Wyngaerd, 2017; Parafita Couto & Stadthagen-González, 2019). Two of the predictive theories that have been most influential are a theory within the Minimalist Program (MP), developed for CS by MacSwan (1999; 2009) and the Matrix Language Framework (MLF) proposed by Myers-Scotton (Myers-Scotton, 1993; 1995; 2006; Myers-Scotton & Jake, 1995; 2015). In the following paragraphs, I will briefly describe these frameworks – though the MP will not be explored in detail in this study – as well as present some empirical studies that have tested them both.

Predictions following from the MP for determiner language rest upon the notion of feature-checking (Chomsky, 1995). Within the current generative syntax approach, uninterpretable phi features denoting specific aspects of grammar (e.g., gender, person, number, etc.) are argued to be

present on the functional head of a (relevant) phrase. These phi features need to be 'checked' with an interpretable phi feature counterpart in order for the utterance to be well-formed going forward, and the process of checking that feature will drive syntactic processes (such as Merge, Move and Agree). For example, in the instance of gender assignment, the determiner head will contain an uninterpretable gender feature. The determiner will therefore act as a gender-probe and will try to seek out an available interpretable gender feature within its c-commanded domain. Once found, checking it will 'delete' the uninterpretable feature, thereby allowing the derivation of the sentence to continue to LF. If there is no counterpart interpretable feature accessible to check the probe, the syntax crashes and the sentence cannot be made well-formed.

In the generativist accounts of CS and language asymmetry by Liceras et al. (2008, 2016) and Moro Quintanilla (2014), the effect of determiner language asymmetry is correlated to the number of features the functional head in question has in both languages. Some research supports the idea that the language with the most features present on the functional head will be favored by native bilinguals as the language of the element occupying the head position (the "Grammatical Feature Spell-out Hypothesis", Liceras et al., 2008; 2016). For example, Liceras et al. (2008), Valdés Kroff (2016), Herring et al. (2010) and Jake et al. (2002) all found that Spanish is the preferred language for the determiner head in Spanish/English code-switched DPs. From the MP viewpoint, this can be explained by the fact that Spanish has two uninterpretable features on the determiner (gender, number), against only one uninterpretable feature on the English determiner head (number). By choosing a Spanish determiner, the maximum number of features may be specified (i.e., checked) during spell-out against the interpretable features of the noun. This is discussed in Moro Quintanilla (2014) in terms of a probe (i.e., features on the determiner) seeking a goal (i.e., features on the noun), ensuring code-switched DPs are licit "only when the unvalued features of the determiner include [all] the features of the noun" (Moro Quintanilla, 2014; see also Parafita Couto & Stadthagen-González, 2019, pp. 350-51 for a brief discussion on this topic).

A second theory that has been often used in explaining language asymmetry is that of the MLF, first developed by Myers-Scotton (1993). This approach rests upon the notion that code-switched clauses will have a single language be more influential, i.e., the matrix language (ML), and that that ML will provide the morphosyntactic frame for the clause. Furthermore, certain morphemes, which Myers-Scotton and Jake (2015) designate as late system or "outsider system morphemes" (p. 421), should preferably all be drawn from the ML of the code-switched sentence when inserted. In contrast, early system and content morphemes may be drawn freely from either the ML or the other language, called the embedded language (EL). Content morphemes are those morphemes assigning or receiving thematic roles; system morphemes are all others, such as affixes, clitics, and determiners (Myers-Scotton, 2006, pp. 244-46). This all comes together in certain principles that together define the MLF:

The Uniform Structure Principle:

> "A given constituent type in any language has a uniform abstract structure and the requirements of well-formedness for this type must be observed whenever the constituent appears. In bilingual speech, the structures of the Matrix Language are always preferred, but some Embedded structures […] are allowed if Matrix Language clause structure is observed." (Myers-Scotton, 2006, p. 243)

The Morpheme Order Principle:

> "In mixed constituents consisting of at least one Embedded Language word and any number of Matrix Language morphemes, surface word (and morpheme) order will be that of the Matrix Language. " (Myers-Scotton, 2006, p. 244)

The System Morpheme Principle:

> "In Matrix Language + Embedded Language constituents, all system morphemes which have grammatical relations external to their head constituents […] (i.e., which participate in the sentence's thematic role grid) will come from the Matrix Language." (Myers-Scotton, 2006, p. 244)

The ML of code-switched sentences can be determined by checking in which language the outsider system morphemes occur. In practice, the ML coincides with the language of the inflection on the finite verb in the Tense head. An example from Ewe/English CS can be seen in the second clause of (39):

(39) *Ewe*/ENGLISH

wo	*tsO-na*	*wo*	*fe*	*asi-wo*	*tsO-na*
they	take-HAB	they	possessive	hand-PL	take-HAB
WEED-*na*	GARDEN-*a*	*me-ɛ*			
weed-HAB	garden-the	in-FOC			

'They take [use] their hands to weed in the garden.'

(Adapted from Myers-Scotton, 2006, p. 247; originally from Amuzu, 1998, p. 56)

The ML in this example is Ewe, so it is Ewe which should provide the grammatical frame for the clause. This is seen from the Ewe HABITUAL affix *-na* on the English verb *(to) weed*, as well as the use of the Ewe determiner *-a* with the English noun *garden*. Finally, word order also follows Ewe rules, seen from the fact that the preposition follows rather than precedes the noun in *in the garden*. Going back to data on code-switched DPs, the determiner is seen as an outsider system morpheme. This has become known as the Bilingual NP hypothesis (cf. Jake et al., 2002).

Experimental work looking at which of the two theories is more robust in predicting determiner language is often difficult, especially in corpus studies, as frequently the language with more phi features and the ML coincide. A study by Parafita Couto and Stadthagen-González (2019) looking into this phenomenon that explicitly relies on judgment data has found results seemingly in favor of the MLF. They found evidence that the ML is the determining factor for the language of the determiner in mixed DPs. In other aspects, such as the word order in mixed DPs, the data from judgment studies are mixed, with results seemingly favoring the MP more (Vanden Wyngaerd, 2017), favoring the MLF more (Parafita Couto, Deuchar, & Fusser, 2015), favoring neither (Pablos et al., 2019) or incorporating elements from both theories (Stadthagen-González et al., 2019; Vaughan-Evans et al., 2020). Therefore, it seems clear that neither model is yet fully able to explain all types of data and may still need additional components to better them. Moreover, the creation of a hybrid theory has also been suggested (e.g., Jake et al., 2002; Stadthagen-González et al., 2019). This

conclusion is also drawn by Parafita Couto and Stadthagen-González (2019, pp. 357-58) themselves. Experiment 2 is thus meant as an endeavor to provide new data to resolve a gap in the MLF theory that has yet to be explored, namely that of linear adjacency.

3.1.2. The Role of Linear Adjacency

As seen in the previous section, the MLF theory posits that the grammatical frame of a code-switched sentence is provided by the ML. Furthermore, the ML is, in practice, recognizable as the language of the finite Tense (or Inflection) head. Since the determiner is an outsider system morpheme, the language of the determiner should match the one of the ML. Thus, when the determiner in the DP is in the same language as the inflected verb, the MLF predicts that the acceptability rating will be higher; when it is the noun that shares the same language as the T head, the rating is expected to be lower. This is represented in (40), repeated from example (5):

(40) *English*/SPANISH

a. EDGAR QUERÍA {ESTOS/**these*} *shoes*
b. *Edgar wanted* {*ESTOS/*these*} ZAPATOS

(Parafita Couto & Stadthagen-González, 2019, p. 355)

However, much of the data on determiner language preferences rest on clauses where the verb in T is adjacent to its complement DP (including Jake et al., 2002; Herring et al., 2010; Blokzijl et al., 2017; Parafita Couto & Gullberg, 2019, all using corpus data; Parafita Couto & Stadthagen-González, 2019 using judgment data). This introduces linear adjacency between the inflection in T and the determiner. López & Parafita Couto (2021) have also observed this pattern and suggested that the determiner may be considered to be a clitic, with the inflected verb as its host. If so, it would be easy to assume that it is in fact this clitic-host relationship that governs the language of the determiner.

To my knowledge, no one has investigated the possible effect of linear adjacency on the choice of determiner language in code-switched (DP) complements experimentally.[17] Therefore, it

[17] Linear adjacency effects in verbal morphosyntactic phenomena have been found by Ostrove (2018) regarding the creation of portmanteaux over adjacent nodes in Irish verbal complexes; de Haas and Van Kemenade (2015) regarding variant verbal inflection patterns dependent on adjacency in Middle English; and van Urk (2020) regarding differential object marking for verb-adjacent pronoun and proper noun objects in Fijian.

could be of interest to investigate what happens when the code-switched DP, and therefore the determiner, is not directly bordering the verb in T. Two alternative structures will be considered in this work: a code-switched DP adverbial and a fronted code-switched DP complement. Both of these structures have a code-switched DP that is no longer linearly adjacent to the inflected verb.

Assume that adjacency would have some effect on determiner language in a code-switched DP. For a post-verbal DP complement (41a), the choice of determiner language would result directly from adjacency to T. For the DP adverbial (41b), the DP is no longer linearly adjacent to the verb. Interfering linguistic material – e.g., in the form of a (monolingual) DP complement – would weaken the effect of adjacency on the determiner. Therefore, there would be less pressure to prefer a same-language determiner over an other-language determiner. Finally, in the case of the fronted DP (41c), the inflected verb would occur after the noun, again having no effect of adjacency on the determiner, since the determiner in question would not be linearly adjacent to the verb due to the noun interfering.

(41) a. IK ZIE DE *fleur.*
'I see the flower.'
b. IK ZIE EEN BIJ OP DE *fleur.*
'I see a bee on the flower.'
c. DE *fleur* ZIE IK!
'The flower I see!'

The example in (41c) contains a focus-moved DP that has been fronted from its base-generated position. Before movement, (41c) is identical to (41a). If it is merely enough that linear adjacency was present at the time the phrase containing the code-switched DP and inflected verb merged, then (41a) and (41c) should have the same effect of adjacency on determiner language. If it is necessary that linear adjacency is only present in the final state of the utterance, then only (41a) will show adjacency effects.

Finally, when assuming an adjacency effect, what happens to the effect of an ML? It is not necessarily so that the ML effects found so far are entirely due to adjacency. Adding adjacency to the mix may merely weaken the effect currently ascribed completely to the ML. For example, the MLF

predicts that every utterance in (41) would preferably have the inflection on the verb and the determiner in the same language. However, this effect would not approach the magnitude reported so far, since adjacency would add an effect as well for the majority of the observations. Blokzijl et al. (2017) report that in their Miami corpus, 98.1% of code-switched DPs had matching ML and determiner language, and 99.7% of determiners matched the ML in their Nicaraguan corpus (pp. 7-8). Determining how much of this percentage can be assigned to which effect, would be a task for future studies.

3.2. Experiment 2: Research Question, Hypothesis and Predictions

The second research question of this work looks at whether or not the consequences of the ML on determiner language asymmetry – and therefore perhaps on other elements – are augmented by adjacency effects in BD/FR CS, leading into Hypothesis H2:

H2: The language of the determiner in intraclausal code-switches in the DP will be influenced by the determiner's linear adjacency to the inflected verb.

If adjacency effects are found, then there will be consequences to the current entrenchment of the MLF model regarding the choice of language in CS contexts. In addition, the size of the adjacency effect will need to be determined.

If H2 is true**,** the following predictions can be made:

P2a: If the determiner in a code-switched DP is **linearly adjacent to the inflected verb** (i.e., T head), then the language of the determiner **will preferably always match** with the language of the inflected verb to be acceptable to bilingual speakers.

(42) a. IK ZIE DE *fleur*.
b. *IK ZIE *la* BLOEM.
'I see the flower.'

P2b: If the determiner in a code-switched DP is **not linearly adjacent to the inflected verb** (i.e., T head), then the language of the determiner **may prefer to match** with the language of the inflected verb **but does not have to match** to be acceptable to bilingual speakers.

(43) a. IK ZIE DE BIJ OP DE *fleur.*
b. ?IK ZIE DE BIJ OP *la* BLOEM.
'I see the bee on the flower.'

(44) a. DE *fleur* ZIE IK.
b. ?*La* BLOEM ZIE IK!
'The flower I see!'

These predictions describe the effect of adjacency on the choice of determiner language: since the post-verbal adjunct DP is further away from T – i.e., the object complement or noun is intervening, see example (43-44) – then the adjacency effect between the inflected verb and the determiner disappears. In contrast, if there is no intervening material between T and the determiner, the presence of T adjacent to the determiner may exert full effect on it, see (42). Option (a) is thus predicted to be preferable to option (b) in example (41) – due to both an adjacency effect and a ML effect – and predicted to be marginally preferable in examples (43-44) – due to just an ML effect.

3.3. Methodology

3.3.1. Variables and Conditions

The conditions under which the second hypothesis could be tested require that there were two variables: the language of the outsider system morpheme (in this case the determiner) and the location of the DP where the intraclausal code-switch takes place. In order to investigate whether or not the choice of language, FR or BD, made a difference, a third variable was introduced: the language of the finite verb (i.e., the ML). The choice of specific language of the matrix clause is not predicted to have any effect on the data, as, to my knowledge, there is no research suggesting such a difference between (B)D and FR. Nevertheless, since both languages will be equally represented in the experiment, the results should show such asymmetry if present.

The determiner language variable had two levels: it either matched the language of the finite verb (Match condition) or the languages did not match (Mismatch condition), see (42a-b) above for an example. The DP containing the code-switch was located in one of three positions in the clause: as the post-verbal complement (PostVC condition), as (part of) the post-verbal adjunct (PostVA condition), or as the pre-verbal complement (PreVC condition), see (42-44) above. A final variable

was added to check whether there were any cross-linguistic differences concerning adjacency effects. The language of the verb was either BD (45a) or FR (45b).

(45) a. IK ZIE DE *fleur.*
b. *Je vois le* BLOEM.
'Jan sees the flower.'

The above produced an experimental design with 2x2x3 categorical variables for Experiment 2; for the schematic overview, see Table 6. The two choices in the task always differed according to the Language of the Determiner variable.

Table 6

Independent Variables in Experiment 2

Variable	Value
Language of determiner	Match
	Mismatch
Matrix language	Belgian Dutch
	French
Location of DP	post-verbal complement (PostVC)
	post-verbal adjunct (PostVA)
	pre-verbal complement (PreVC)

3.3.2. Stimuli

Experiment 2 consisted of 36 stimuli sentences, 12 per condition, all with an intraclausal code-switch. The code-switch was always located in a DP, and that DP was either a complement in its base position (46a), in a VP-adjunct after the complement (46b) or the complement focus-moved to the left periphery (46c). Half of the items in each condition were constructed with BD as the language of the verb and the other half were made with FR. In addition, in the focus-moved condition, an additional contrastive NP was added after the verb for the sake of naturalness since this construction commonly entails contrastive focus in both languages. This resulted in the following general item structure (with the location of the code-switch marked):

(46)a. DP – V – $[Det – N]_{CS}$
b. DP – V – DP – $[[Det – N]_{CS}]_{XP}$
c. $[Det – N]_{CS}$ – V – DP – NEG – DP

To reduce the possibility of gender playing a role in choosing one item over the over, a criterium was maintained that the genders of the noun pairs should be the same in each language, i.e., both masculine or both feminine. Moreover, the same noun pairs were used in each condition at the point of the code-switch, to reduce differences arising from lexical variation. As in Experiment 1, an effort was made towards two supplementary criteria: there should be no cognate pairs with the same pronunciation and higher-frequency nouns should be chosen. Table 7 shows the overview of the noun pairs chosen for Experiment 2, along with their gender and their frequency according to the SUBTEX-NL corpus and Lexique corpus already mentioned in Section 2.3.2. The average word frequency of the BD nouns was 19.9. The average word frequency for the FR nouns was 21.8. See Appendix A3 for a complete list of the 18 sentence pairs as implemented in the survey. As mentioned in Section 2.3.2, the order of when a language match or mismatch was presented first was randomized.

Table 7

Overview of the Noun Pairs Used in Experiment 2

Pair	Belgian Dutch	Gender	Freq	French	Gender	Freq	Translation
1	*bloem*	F	13.5	*fleur*	F	25.2	flower
2	*wandeling*	F	8.5	*promenade*	F	13.5	hike
3	*kat*	M	52.8	*chat*	M	57.7	cat
4	*zetel*	M	3.1	*canapé*	M	17.7	sofa
5	*beiaard*	M	/ [a]	*carillon*	M	1.6	carillon
6	*pen*	M	21.7	*stylo*	M	15.3	pen

[a] The word *beiaard* ‘carillon’ did not appear in the SUBTEX-NL corpus.

The background questionnaire, participants, recording of items, procedure, and data analysis of Experiment 2 were identical as described for Experiment 1, so I will refer the reader to the relevant Sections 2.3.3 to 2.3.7 above.

3.4. Results

The hypothesis was that the chosen language would not be solely dependent on the ML, but also be influenced by adjacency. However, the results show not only that this expectation was not

borne out, but additionally, there was barely a trace of an ML effect, which was unexpected based upon the claims found in literature.

For the full group of participants, G1, the language of the determiner matching with the language of T was only preferred 55.8% of the time in the PostVC (and immediately adjacent) condition. This result differed from random chance when looked at by item ($V = 21$, $p = 0.031$), but not by participant ($t(22) = 0.96885$, $p > 0.05$). In the PostVA condition, 60.1% of the participants choose to match the language of the determiner with the language of T, this was only significant by participant ($V = 120$, $p = 0.037$) and not by item ($t(5) = 1.7925$, $p > 0.05$). In the PreVC condition, matching languages was chosen less than half of the time, namely 43.5%. However, this was not significantly different from random chance (by item: $t(5) = -1.0607$, $p > 0.05$; by participant: $V = 52.5$, $p > 0.05$), which implies that there is no matching effect when the complement is fronted to the left periphery.

When restricting to the more proficient bilingual G2 group, very little change occurred to the result. Furthermore, where the results for G1 participants were significantly different from random chance in the PostVC and PostVA conditions, no such significant difference was found for the G2 group. 57.8 % of the time, G2 participants preferred a determiner-T language match in the PostVC condition, (by item: $t(5) = 2.2188$, $p > 0.05$; by participant: $t(16) = 1.1414$, $p > 0.05$). This preference was found in 59.8% of the cases in the PostVA condition (by item: $t(5) = 1.4649$, $p > 0.05$; by participant: $t(16) = 1.8983$, $p > 0.05$). Again, the results show that participants chose a language match least in the PreVC condition, namely 46.1% of the time (by item: $t(5) = -0.55793$, $p > 0.05$; by participant: $V = 36$, $p > 0.05$). The results in all conditions are thus statistically undistinguishable from the 50% random chance.

Despite there being little significant evidence to support the theory that the choices made by the participants are not in fact random, the results did show a significant difference between the PostVA and PreVC conditions (G1: $p = 0.036$; G2: $p = 0.028$), though only between these two conditions and not between any other ones. This does entail that no effect of adjacency can be

observed, since the greatest difference would have had to be seen between the PostVC and PostVA or PreVC conditions. Possible influence of the choice of language was also investigated: no significant differences were found between the results with BD or FR, though, considering the low (three each per condition) respective number of stimuli in each case, this outcome should be treated with caution.

Figure 9 shows the results of Experiment 2; note that these scores are close to the random choice mean. Table 8 contains the final summary of the experimental results, along with which results were significant.

Figure 9

Results of Experiment 2.

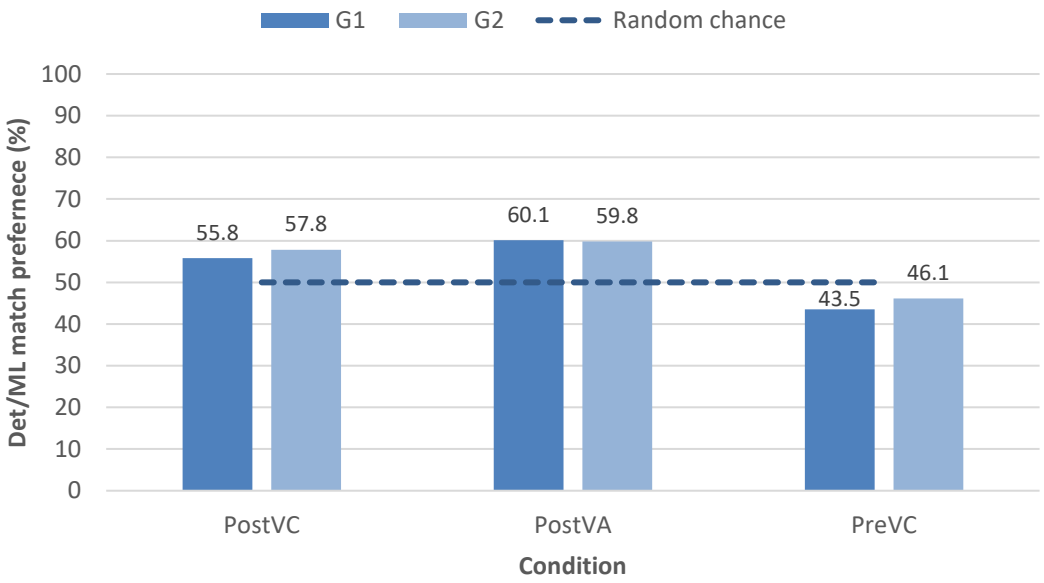


Table 8

Results of Experiment 2

Condition	Group 1			Group 2		
	match preference (%)	significance [a]		match preference (%)	significance [a]	
		item	ptcp		item	ptcp
PostVC	55.8	*		57.8		
PostVA	60.1		*	59.8		
PreVC	43.5			46.1		

[a] Significance is shown by item and by participant (ptcp) with * standing for a p-value less than 0.05.

Regarding the influence of extralinguistic factors, since the scores in Experiment 2 could not truly be separated from random chance in many cases, the regression models as conducted above for Experiment 1 were not repeated for this experiment.

3.5. Discussion

The results clearly showed that Hypothesis H2 – repeated below – cannot be confirmed:

H2: The language of the determiner in intraclausal code-switches in the DP will be influenced by the determiner's linear adjacency to the inflected verb.

This outcome is seen from the lack of significant preferences across the board, which means that this experiment indicates that linear adjacency does not impact the choice of determiner language. Despite this main outcome, small significant effects were found for both post-verbal conditions, but only when looked at per item (PostVC) or per participant (PostVA). These conditions only showed a slight preference for the determiner to match the verb language. This might be more likely to be explained by an ML effect since both post-verbal conditions had this. The conditions could not be significantly differentiated from each other. Since there is no previous empirical work suggesting linear adjacency is a known factor, this may be taken as confirmation that adjacency is not relevant to (determiner) language asymmetry in CS contexts.

However, when further comparing conditions, there was a significant result found between the PostVA and PreVC conditions:

(47) PostVA condition
   a. IK ZIE EEN BIJ OP DE *fleur*.
   b. IK ZIE EEN BIJ OP *la* BLOEM.
      'I see a bee on the flower.'

(48) PreVC condition
   a. EEN *fleur* HEB IK GEZIEN, NIET EEN VOGEL!
   b. *Une* BLOEM HEB IK GEZIEN, NIET EEN VOGEL!
      'A flower I saw, not a bird!'

For the PostVA condition, the determiner was preferred to be matching the same language as the language of T (47a). For the PreVC condition, the determiner was preferred to mismatch the language of T, while the noun matched the language of T (48b). This cannot be considered an effect

of linear adjacency, as the condition with the strongest predicted adjacency effect would be the PostVC condition. However, neither of these two conditions was found to be significantly different from the PostVC condition.

Looking to the literature, this may be explained by considering the cognitive cost of switching languages. If every transition from one language to the other carries with it a cognitive cost resulting from activating one language and suppressing the other, then the results above may reflect a speaker's effort in reducing unnecessary cognitive load by minimizing the amount of switches. However, the literature is divided on this topic. Some studies (e.g., Moreno et al., 2002; Ibáñez et al., 2010; Gullifer et al., 2013 (although the latter two focused on interclausal CS)) show little to no switching costs associated specifically with CS, while others (e.g., Soares & Grosjean, 1984; Proverbio et al., 2004; Meuter & Allport, 1999; Bosma & Blom, 2019; Adamou & Shen, 2019) do seem to find evidence for some type of cost.

In most cases, however, there are additional extralinguistic factors that influence the size of this cost – much like in all research on CS. Examples include findings presented by Adamou and Shen (2019), where Turkish-Romani bilinguals showed signs of greatly reduced switching costs depending on the frequency of the CS habits of the community, as well as the frequency of the lexical items used. Similar results were reported by Bosma and Blom (2019), who found that Dutch-Frisian bilingual children required more cognitive control (and thus experienced a higher cognitive cost) to switch from the majority community language (i.e., Dutch) to the minority language (i.e., Frisian) than a switch the other way around. In addition, Meuter and Allport (1999) showed that beyond the dominance of the languages in question in the community, the individual proficiency in the languages is also a factor, as their bilingual participants exhibited by having greater difficulty when needing to switch from their L1 English to a weaker L2 language. As a final example, Ibáñez et al. (2010) associated (a lack of) switching costs with preparedness and experience with translating in their study comparing professional translators with bilinguals. Taking into account all these factors, the

results found could plausibly be explained as a strategy to reduce switching costs, though the experiment as it stands cannot prove this.

Moreover, the stimuli here were specifically designed for the experiment, and there is no certainty that, for the PreVC condition especially, BD/FR bilinguals would choose to code-switch naturally in such environments, or how. Differences between natural CS behavior (extrapolated from corpora), elicitated data and judgment data of 'artificial' CS behavior have been reported before (Bellamy et al., 2022; Bellamy et al., 2018; Parafita Couto et al., 2015).

As said, the individual preference percentages per condition could not be distinguished from random chance. This outcome does, however, produce another question, since this means that there is also no effect of the ML to be found in the gathered data. The Bilingual NP Hypothesis is not seen, despite evidence being found in other works for other language combinations (e.g., Jake et al., 2002; Herring et al., 2010; Blokzijl et al., 2017; Parafita Couto & Stadthagen-González, 2019). This lack of clear language asymmetry suggests that there is no ML effect at all in the DP in BD/FR CS, or there is but another factor is preventing it from being visible.

It could be that there are no ML effects for this specific language combination, but this would seem unlikely considering the evidence in other languages. It could, however, match the results by Vanden Wyngaerd (2017), who found that the order of the adjective and noun in the BD/FR code-switched DP behaved more along the predictions of a generativist framework than those predicted by the MLF (p. 466). Just as the MLF makes predictions on which language outsider system morphemes such as the determiner are likely to occur in, so does the MP. The MP framework predicts no straightforward preference between BD and FR determiners since both languages have the same number of phi features (gender and number) on the determiner. It may be possible that, just like for the word order of elements within the nominal phrase in BD/FR, choice of determiner language in the code-switched DP is governed by phi features. Thus, in this language pair, no preference would be visible due to the balance between their phi features. Note, however, that Parafita Couto and Gullberg (2019) found that the generative approach was a good fit for their

observations of word order (with limited available data), but not for the choice of determiner gender in their study of code-switched DPs from three different bilingual corpora (p. 703). Thus, the results here continue to prove that adding novel data is crucial in order to progress beyond the current concepts of the MP and the MLF and to understand how (determiner) language asymmetry functions, as also previously called for by others (Jake et al., 2002; Eppler et al., 2017; Stadthagen-González et al., 2019; Parafita Couto & Stadthagen-González, 2019).

Methodologically, the same factors discussed in Section 2.5.2 may have impacted this experiment as well (i.e., bilingual profile, task type, etc.). Further interference due to experimental factors should be simple to determine by adjusting the parameters of the experiment in any future replications. These factors include the small stimuli number, or the fact that these stimuli were more focused on where the code-switch was placed within an extended clause rather than just testing the language of an immediately adjacent post-verbal determiner. Particularly of interest to the lack of significant ML effects found is the fact that most previous research is based on data taken from single, well-established CS communities, while, as mentioned before in Section 2.5.2, the participants here were not all part of such a community. Whether and how the absence of community norms and patterns influence determiner language in BD/FR remains to be discovered. It would be productive for future research to compare these results to a (larger) corpus of BD/FR CS data; something that does not yet exist. A corpus could give access to large amounts of production data that can be analyzed for naturally occurring (DP) language asymmetries and preferences regarding the ML, as well as used as a way of determining the communally dominant ML and community norms regarding the use of an ML.

4. Conclusion

In this thesis, I have set out to show how CS data may be implemented in the (empirical) study of syntactic phenomena. Two experiments were conducted: one concerning NPE and one concerning the choice of determiner language, in which BD/FR bilinguals were asked to judge the acceptability of carefully constructed stimuli in a 2AFC task. In addition, by using speakers from this

relatively understudied language dyad, I have made a small contribution to the overall knowledge pool on the BD/FR bilingual community. In these final paragraphs, I will reflect on the main theoretical and methodological findings, discuss some of the limitations of this work, and offer some suggestions for future exploration.

Theoretically, two main conclusions can be drawn from this work. Experiment 1 showed that, unlike previous work in CS and ellipsis, there is no indication of a syntactic relationship between the antecedent and elided material in BD/FR NPE. However, whether this is circumstantial or indeed a true lack of such a relationship remains to be seen. A specific limitation here is the absence of data on gender assignment strategies in BD/FR CS. Further research investigating gender assignment in the BD/FR code-switched DP is crucial to conclude on the exact interpretation of the results found. Nevertheless, this paper did not observe supporting evidence for structural approaches to ellipsis.

Experiment 2 showed that linear adjacency between the inflection on the verb and a determiner in a code-switched DP is unlikely to play a role on the language choice of the determiner. There was no significant evidence of any influence of adjacency, suggesting that linear adjacency may not be a meaningful factor to explain language asymmetry in CS environments. Furthermore, the experiment showed that, at least for BD/FR, the ML also does not seem to have any significant effect on the language of the determiner. More research into this latter observation is advisable in order to unify this result with earlier works describing extensive ML effects.

Though not the main goal of this thesis, a reflection on methodology also seems in order, especially as the literature suggests it has a striking role in CS research. Using a judgment task such as the 2AFC task can give strong insight into acceptable grammatical bilingual structures, showing clear preferences (cf. the gender match in Experiment 1) but also showing when certain factors seem to be irrelevant to CS choices (cf. adjacency in Experiment 2). Unfortunately, the data collection in this thesis took place during the covid crisis, precluding a more in-person approach to the bilingual speakers involved in this study. This limitation in recruitment not only resulted in some uncertainty regarding the exact bilingual profile of the participants, but also made it impossible to gather more

informal (judgment) data. However, statistical analysis proved that none of the extralinguistic elements queried in the questionnaire had a large effect on the results. In addition, the sociolinguistic data collected on the 23 participants will allow easier comparison with future empirical observations.

My aim for this work was to show the advantages of CS contexts when studying syntactic relationships. I have done so by providing two examples of how to manipulate tension points between two languages, which in both cases added new – and perhaps unexpected – insight into unstudied CS phenomena. Hence, beyond the immediate observations made in this thesis, it is also an example of how CS research may direct or challenge the progression of syntactic theory, especially when employing understudied language dyads like BD/FR. Finally, I add my voice to others who have called for more interdisciplinary and methodologically diverse research on CS phenomena. The addition of, for example, more data on syntactic patterns in BD/FR CS, or the creation of a BD/FR corpus, would allow for a much more fine-grained analysis than has been possible in this work. As such, I hope that linguists continue to recognize the opportunities in studying bilingual practices and how it can advance linguistic theory.

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Appendices

A1. Background Questionnaire

The questionnaire was available in both Dutch and French. The questions below represent the Dutch version of the background questions.

1. Vanaf welke leeftijd ben je begonnen met Nederlands te leren?

   __

2. Vanaf welke leeftijd ben je begonnen met Frans te leren?

   __

3. Hoe goed denk je dat je Nederlands kan verstaan?
   a. Ik kan enkel simpele woorden en uitdrukkingen begrijpen.
   b. Ik kan simpele gesprekken begrijpen.
   c. Ik kan diepgaandere gesprekken begrijpen.
   d. Ik kan vrijwel elk soort gesprek begrijpen.
4. Hoe goed denk je dat je Nederlands kan spreken?
   a. Ik kan enkel simpele woorden en uitdrukkingen zeggen.
   b. Ik kan simpele gesprekken voeren.
   c. Ik kan diepgaandere gesprekken voeren.
   d. Ik kan vrijwel elk soort gesprek voeren.
5. Hoe goed denk je dat je Nederlands kan lezen?
   a. Ik kan enkel simpele woorden en uitdrukkingen lezen.
   b. Ik kan simpele teksten lezen.
   c. Ik kan diepgaandere teksten lezen.
   d. Ik kan vrijwel elk soort tekst lezen.
6. Hoe goed denk je dat je Nederlands kan schrijven?
   a. Ik kan enkel simpele woorden en uitdrukkingen schrijven.
   b. Ik kan simpele teksten schrijven.
   c. Ik kan diepgaandere teksten schrijven.
   d. Ik kan vrijwel elk soort tekst schrijven.
7. Hoe goed denk je dat je Frans kan verstaan?
   a. Ik kan enkel simpele woorden en uitdrukkingen begrijpen.
   b. Ik kan simpele gesprekken begrijpen.
   c. Ik kan diepgaandere gesprekken begrijpen.
   d. Ik kan vrijwel elk soort gesprek begrijpen.
8. Hoe goed denk je dat je Frans kan spreken?
   a. Ik kan enkel simpele woorden en uitdrukkingen zeggen.
   b. Ik kan simpele gesprekken voeren.
   c. Ik kan diepgaandere gesprekken voeren.
   d. Ik kan vrijwel elk soort gesprek voeren.
9. Hoe goed denk je dat je Frans kan lezen?
   a. Ik kan enkel simpele woorden en uitdrukkingen lezen.
   b. Ik kan simpele teksten lezen.
   c. Ik kan diepgaandere teksten lezen.
   d. Ik kan vrijwel elk soort tekst lezen.
10. Hoe goed denk je dat je Frans kan schrijven?

   a. Ik kan enkel simpele woorden en uitdrukkingen schrijven.
   b. Ik kan simpele teksten schrijven.
   c. Ik kan diepgaandere teksten schrijven.
   d. Ik kan vrijwel elk soort tekst schrijven.
11. Welke andere talen spreek je nog?

    ___
12. Gebruik de slider om aan te geven hoeveel percent van je tijd je Nederlands en Frans spreekt...
    a. ...met je gezin
    b. ...met familie
    c. ...met vrienden
    d. ...voor je werk of studie
13. Gebruik de slider om aan te geven hoeveel percent van je tijd je Nederlands en Frans gebruikt...
    a. ...bij het lezen van boeken/tijdschriften/kranten
    b. ...op sociale media
    c. ...om televisie/films/Netflix te kijken
    d. ...om e-mails te schrijven
14. Hoe belangrijk is het voor jou dat je Nederlands kent?
    a. Extreem belangrijk
    b. Heel belangrijk
    c. Een beetje belangrijk
    d. Niet belangrijk
15. Hoe belangrijk is het voor jou dat je Frans kent?
    a. Extreem belangrijk
    b. Heel belangrijk
    c. Een beetje belangrijk
    d. Niet belangrijk
16. Verander je van taal wanneer je met andere (Nederlands/Frans) tweetaligen spreekt? Het kan zijn dat je sommige zinnen volledig in de ene taal zegt en dan voor een volgende zin de andere taal gebruikt, maar ook dat je in de zin van de ene taal stukjes zin of individuele woorden uit de andere taal gebruikt.
    a. Elke keer als ik met een andere tweetalige praat.
    b. Bijna elke keer als ik met een andere tweetalige praat.
    c. Soms als ik met andere tweetaligen praat.
    d. Ik doe dit nauwelijks als ik met andere tweetaligen praat.
    e. Ik mix mijn talen nooit. Ik hou mij altijd strikt aan één taal in mijn gesprekken met andere tweetaligen.
17. In welke omgeving(en) doe je dit?
    a. Met mijn gezin
    b. Met familie
    c. Met vrienden
    d. Bij werk of studie
    e. Nergens
18. Als je je talen soms mengt, waarom denk je dat je dit doet?
    a. Ik schakel over naar een andere taal wanneer ik een bepaalde emotie voel.
    b. Hoewel ik woorden in beide talen ken, schakel ik toch over op een andere taal om mijn boodschap beter over te brengen (meer precies).

   c. Hoewel ik woorden in beide talen ken, schakel ik toch over op een andere taal om iets ongebruikelijks te zeggen, om een speciaal communicatief effect te bereiken.
   d. Ik schakel over naar een andere taal wanneer ik een woord niet ken in de taal die ik momenteel spreek.
   e. Ik mix mijn talen nooit.
19. Ik vind het leuk om beide talen te gebruiken als ik met andere tweetaligen praat.
   a. Helemaal oneens
   b. Oneens
   c. Neutraal
   d. Eens
   e. Helemaal eens
20. Talen zouden door iedereen apart moeten gebruikt worden.
   a. Helemaal oneens
   b. Oneens
   c. Neutraal
   d. Eens
   e. Helemaal eens
21. Wat denk je dat mensen in België in het algemeen vinden over het mengen van talen in hetzelfde gesprek?
   a. Ze vinden dat mengen moet vermeden worden.
   b. Ze vinden niet dat mengen moet vermeden worden.
   c. Ze hebben geen specifieke mening hierover.
   d. Ik weet het niet.
22. Wat is je leeftijd?

   ___
23. Met welk gender identificeer je jezelf?
   a. Man
   b. Vrouw
   c. Anders
24. Wat is je geboorteplaats?

   ___
25. Wat is je huidige woonplaats?

   ___
26. Welke taal werd er gesproken thuis toen je 0-3 jaar was?
   a. Nederlands
   b. Frans
   c. Andere
27. Welke (hoofd)taal werd gebruikt op je basisschool?
   a. Nederlands
   b. Frans
   c. Andere
28. Welke (hoofd)taal werd gebruikt op je middelbare school?
   a. Nederlands
   b. Frans
   c. Andere

A2. List of Stimuli Pairs in Experiment 1

1. IK EET DEN RODEN APPEL *et tu manges le vert*
   IK EET DEN RODEN APPEL *et tu manges la verte*
   'I'm eating the red apple and you're eating the green one'
2. SARA DRAAGT NE LANGE ROK *et Sofie porte un court*
   SARA DRAAGT NE LANGE ROK *et Sofie porte une courte*
   'Sara is wearing a long skirt and Sofie is wearing a short one.'
3. TOM RIJDT MET NEN BLAUWEN AUTO *et Jean roule avec un argenté*
   TOM RIJDT MET NEN BLAUWEN AUTO *et Jean roule avec une argentée*
   'Tom drives a blue car and Jean drives a silver one.'
4. IN DE EETKAMER STAAT DEN HOGE STOEL *et dans le salon se trouve le bas*
   IN DE EETKAMER STAAT DEN HOGE STOEL *et dans le salon se trouve la basse*
   'In the dining room stands the high chair and in the living room stands the low one.'
5. MICHIEL WERKT VAAK DEN HELEN DAG *et Christel ne travaille que pendant un court*
   MICHIEL WERKT VAAK DEN HELEN DAG *et Christel ne travaille que pendant une courte*
   'Michiel often works the entire day and Christel only works a short one.'
6. SIMONE IS BLIJ MET DEN OUDE REGEL*, mais Clara préfère le nouveau*
   SIMONE IS BLIJ MET DEN OUDE REGEL*, mais Clara préfère la nouvelle*
   'Simone is happy with de old rule, but Klara prefers the new one.'
7. HIER IS DE BELGISCHE KRANT*, là-bas se trouve la française*
   HIER IS DE BELGISCHE KRANT*, là-bas se trouve le français*
   'Here is the Belgian newspaper, there is the French one'
8. IK EET GRAAG EEN ZOETE GROENTE *et tu préfères une salée*
   IK EET GRAAG EEN ZOETE GROENTE *et tu préfères un salé*
   "I like to eat a sweet vegetable and you like to eat a savory one.'
9. DI RUPO ZIT IN DE WAALSE REGERING *et Jambon est dans la flamande*
   DI RUPO ZIT IN DE WAALSE REGERING *et Jambon est dans le flamand*
   'Di Rupo has a seat in the Walloon government and Jambon has a seat in the Flemish government.'
10. STEPHAN HOUDT VAN DE KLASSIEKE KUNST *et Bea aime la nouvelle*
    STEPHAN HOUDT VAN DE KLASSIEKE KUNST *et Bea aime le nouveau*
    'Stephan loves the classical arts and Bea loves the new ones.'
11. GERT DENKT DAT EEN PASSIONELE LIEFDE BELANGRIJKST IS*, tandis qu'Anna pense que c'est la complète*
    GERT DENKT DAT EEN PASSIONELE LIEFDE BELANGRIJKST IS*, tandis qu'Anna pense que c'est un complet*
    'Gert thinks that a passionate love is most important, while Anna thinks that it is a well-rounded one.'
12. VOOR MIJ IS HET EEN NIEUWE UITDAGING*, mais pour vous, c'est une familière*
    VOOR MIJ IS HET EEN NIEUWE UITDAGING*, mais pour vous, c'est un familier*
    'For me it is a new challenge but for you it is a familiar one.'
13. KAREL NEEMT HET LUXE ONTBIJT *et Luc prend le commun*
    KAREL NEEMT HET LUXE ONTBIJT *et Luc prend la commune*
    'Karel is getting the fancy breakfast and Luc is getting the regular one.'
14. SANNE WOONT IN HET GROTE HUIS *et Robert vit dans la petite*
    SANNE WOONT IN HET GROTE HUIS *et Robert vit dans le petit*
    'Sanne lives in the big house and Robert lives in the small one.'

15. IK WIL HET VIERKANTE SNOEPJE *et tu veux le rond*
    IK WIL HET VIERKANTE SNOEPJE *et tu veux la ronde*
    'I want the square candy and you want the round one.'
16. FELIX DROOMT VAN EEN GROOT GEZIN *et Julie rêve d'une petite*
    FELIX DROOMT VAN EEN GROOT GEZIN *et Julie rêve d'un petit*
    'Felix dreams of a big family and Julie of a small one.'
17. MIJN ZUS LEEST HET FRANSE BOEK *et mon frère lit le néerlandais*
    MIJN ZUS LEEST HET FRANSE BOEK *et mon frère lit la néerlandaise*
    'My sister reads the French book and my brother reads the Dutch one.'
18. 'S OCHTENDS ZIEN WE EEN WIT KONIJN IN DE TUIN *et le soir nous voyons un brun*
    'S OCHTENDS ZIEN WE EEN WIT KONIJN IN DE TUIN *et le soir nous voyons une brune*
    'In the morning we see a white rabbit in the garden and in the evening we see a brown one'
19. IK EET DEN RODEN APPEL *et tu manges le pomme vert*
    IK EET DEN RODEN APPEL *et tu manges la pomme verte*
    'I'm eating the red apple and you're eating the green apple'
20. SARA DRAAGT NE LANGE ROK *et Sofie porte un jupe court*
    SARA DRAAGT NE LANGE ROK *et Sofie porte une jupe courte*
    'Sara is wearing a long skirt and Sofie is wearing a short skirt.'
21. TOM RIJDT MET NEN BLAUWEN AUTO *et Jean roule avec un voiture argenté*
    TOM RIJDT MET NEN BLAUWEN AUTO *et Jean roule avec une voiture argentée*
    'Tom drives a blue car and Jean drives a silver car.'
22. IN DE EETKAMER STAAT DEN HOGE STOEL *et dans le salon se trouve le chaise bas*
    IN DE EETKAMER STAAT DEN HOGE STOEL *et dans le salon se trouve la chaise basse*
    'In the dining room stands the high chair and in the living room stands the low chair.'
23. MICHIEL WERKT VAAK DEN HELEN DAG *et Christel ne travaille que pendant un journée court*
    MICHIEL WERKT VAAK DEN HELEN DAG *et Christel ne travaille que pendant une journée courte*
    'Michiel often works the entire day and Christel only works a short day.'
24. SIMONE IS BLIJ MET DEN OUDE REGEL*, mais Clara préfère le règle nouveau*
    SIMONE IS BLIJ MET DEN OUDE REGEL*, mais Clara préfère la règle nouvelle*
    'Simone is happy with de old rule, but Klara prefers the new rule.'
25. HIER IS DE BELGISCHE KRANT*, là-bas se trouve la journal française*
    HIER IS DE BELGISCHE KRANT*, là-bas se trouve le journal français*
    'Here is the Belgian newspaper, there is the French newspaper'
26. IK EET GRAAG EEN ZOETE GROENTE *et tu préfères une legume salée*
    IK EET GRAAG EEN ZOETE GROENTE *et tu préfères un legume salé*
    'I like to eat a sweet vegetable and you like to eat a savory vegetable.'
27. DI RUPO ZIT IN DE WAALSE REGERING *et Jambon est dans la gouvernement flamande*
    DI RUPO ZIT IN DE WAALSE REGERING *et Jambon est dans le gouvernement flamand*
    'Di Rupo has a seat in the Walloon government and Jambon has a seat in the Flemish government.'
28. STEPHAN HOUDT VAN DE KLASSIEKE KUNST *et Bea aime l'art nouvelle*
    STEPHAN HOUDT VAN DE KLASSIEKE KUNST *et Bea aime l'art nouveau*
    'Stephan loves the classical arts and Bea loves the new arts.'
29. GERT DENKT DAT EEN PASSIONELE LIEFDE BELANGRIJKST IS*, tandis qu'Anna pense que c'est une amour complète*
    GERT DENKT DAT EEN PASSIONELE LIEFDE BELANGRIJKST IS*, tandis qu'Anna pense que c'est un amour complet*

'Gert thinks that a passionate love is most important, while Anna thinks that it is a well-rounded love.'

30. VOOR MIJ IS HET EEN NIEUWE UITDAGING*, mais pour vous, c'est une défi familière*
    VOOR MIJ IS HET EEN NIEUWE UITDAGING*, mais pour vous, c'est un défi familier*
    'For me it is a new challenge but for you it is a familiar challenge.'
31. KAREL NEEMT HET LUXE ONTBIJT *et Luc prend le petit-déjeuner commun*
    KAREL NEEMT HET LUXE ONTBIJT *et Luc prend la petit-déjeuner commune*
    'Karel is getting the fancy breakfast and Luc is getting the regular breakfast.'
32. SANNE WOONT IN HET GROTE HUIS *et Robert vit dans la maison petite*
    SANNE WOONT IN HET GROTE HUIS *et Robert vit dans le maison petit*
    'Sanne lives in the big house and Robert lives in the small house.'
33. IK WIL HET VIERKANTE SNOEPJE *et tu veux le bonbon rond*
    IK WIL HET VIERKANTE SNOEPJE *et tu veux la bonbon ronde*
    'I want the square candy and you want the round candy.'
34. FELIX DROOMT VAN EEN GROOT GEZIN *et Julie rêve d'une famille petite*
    FELIX DROOMT VAN EEN GROOT GEZIN *et Julie rêve d'un famille petit*
    'Felix dreams of a big family and Julie of a small family.'
35. MIJN ZUS LEEST HET FRANSE BOEK *et mon frère lit le livre néerlandais*
    MIJN ZUS LEEST HET FRANSE BOEK *et mon frère lit la livre néerlandaise*
    'My sister reads the French book and my brother reads the Dutch book.'
36. 'S OCHTENDS ZIEN WE EEN WIT KONIJN IN DE TUIN *et le soir nous voyons un lapin brun*
    'S OCHTENDS ZIEN WE EEN WIT KONIJN IN DE TUIN *et le soir nous voyons une lapin brune*
    'In the morning we see a white rabbit in the garden and in the evening we see a brown rabbit.'

A3. List of Stimuli Pairs in Experiment 2

1. IK ZIE DE *fleur*
   IK ZIE *la* BLOEM
   'I see the flower'
2. HIJ MAAKT EEN *promenade*
   HIJ MAAKT *une* WANDELING
   'He is taking a walk.'
3. SAM WILT NEN *chat*
   SAM WILT *un* KAT
   'Sam wants a cat.'
4. *Elle entend* DEN *carillon*
   Elle entend le BEIAARD
   'She hears the carillon.'
5. *J'aime bien le* ZETEL
   J'aime bien DEN *canapé*
   'I love the couch.'
6. *Je vois un* PEN
   Je vois NE *stylo*
   'I see a pen.'
7. IK ZIE EEN BIJ OP DE *fleur*
   IK ZIE EEN BIJ OP *la* BLOEM
   'I see a bee on the flower.'

8. HIJ MAAKT FOTO'S TIJDENS DE *promenade*
   HIJ MAAKT FOTO'S TIJDENS *la* WANDELING
   'He is taking pictures during the walk.'
9. SAM WILT EEN SPEELTJE VOOR DEN *chat*
   SAM WILT EEN SPEELTJE VOOR *un* KAT
   'Sam wants a toy for the cat'
10. *Elle entend les touristes sous le* BEIAARD
    Elle entend les touristes sous DEN *carillon*
    'She hears the tourists beneath the carillon.'
11. *J'aime bien les coussins pour le* ZETEL
    J'aime bien les coussins pour DEN *canapé*
    'I love the cushions for the couch.'
12. *Je vois la marque sur le* PEN
    Je vois la marque sur DEN *stylo*
    'I see the brand on the pen.'
13. EEN *fleur* HEB IK GEZIEN, NIET EEN VOGEL!
    Une BLOEM HEB IK GEZIEN, NIET EEN VOGEL!
    'A flower I have seen there, not a bird!'
14. EEN *promenade* HEEFT HIJ DAAR GEMAAKT, NIET EEN AUTORIT!
    Une WANDELING HEEFT HIJ DAAR GEMAAKT, NIET EEN AUTORIT!
    'A walk he has taken there, not a car ride!'
15. NEN *chat* WIL SAM, NIET EEN HOND!
    Un KAT WIL SAM, NIET EEN HOND!
    'A cat Sam wants, not a dog!'
16. DEN *carillon elle entend, pas la cloche !*
    Le BEIAARD *elle entend, pas la cloche !*
    'The carillon she hears, not the bell!'
17. DEN *canapé j'aime bien, pas les chaises !*
    Le ZETEL *j'aime bien, pas les chaises !*
    'The couch I love, not the chairs!'
18. DEN *stylo je vois, pas le crayon !*
    Le PEN *je vois, pas le crayon !*
    'The pen I see, not the pencil!'