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Gender assignment in mixed noun phrases: State of the art

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Abstract

Noun phrases (NPs) constitute one of the most frequent sites where bilingual speakers code-switch. In this chapter we aim to provide a comprehensive overview of research into grammatical gender assignment in mixed NPs, namely NPs containing a noun from one language and a gender-agreeing element from another. We outline the three main gender assignment strategies observed in mixed NPs: (i) translation equivalent, (ii) shape-based, and (iii) default, and in which language pairs, using which tasks, they have been observed. We discuss how the order of acquisition of the gendered and non-gendered language, language dominance, task type, and community norms combine with linguistic properties to modulate gender assignment patterns. Findings suggest that bilinguals who learned a gendered language first seem to prefer the translation equivalent strategy. Since insufficient data from a wide variety of language dyads is currently available,-we are cautious about offering further generalisations. Nonetheless, we highlight findings suggesting that more habitual code-switchers prefer the masculine default strategy. In order to progress beyond the current state-of-the-art, we suggest that the field needs to expand into more language dyads, as well as extend research on individual language dyads, using multiple methodologies and in communities differing in their code-switching frequency.

Keywords

Code-switching, mixed noun phrases, grammatical gender, gender assignment, bilingualism

1. Introduction

In recent years, the field of linguistics has seen a surge in interest concerning how bilinguals process (e.g. Valdés Kroff 2012; Pablos et al. 2019; Vaughan-Evans et al. 2020), produce (e.g. Parafita Couto, Deuchar & Fusser 2015; Balam 2016; Parafita Couto et al. 2015 Valdés Kroff 2016; Blokzijl, Deuchar & Parafita Couto 2017; Parafita Couto & Gullberg 2019) and evaluate

(e.g. Anderson & Toribio 2017; Parafita Couto & Stadthagen-González 2017) mixed nouns phrases. Much of this research has focused on how grammatical gender is assigned in mixed noun phrases, one of the most frequent switch sites in the bilingual speech of some communities (Eichler, Hagen & Müller 2012: 237; cf. Deuchar & Quay 1999; Ezeizabarrena 2009).

We define grammatical gender in terms of agreement, namely as "classes of nouns reflected in the behaviour of associated words" (Corbett 1991: 1, following Hockett 1958: 231). When we refer to the gender of a noun, we are using this as shorthand for the gender assigned to its agreeing elements, such as determiners or adjectives. Equally, when we speak of a gender system, or how many gender classes a particular language possesses, we are referring to these agreement classes.

Mixed noun phrases contain minimally two elements, a gendered element from one language and a noun from another language, which may or may not possess a gender system. Gender can be marked on the determiner, as in (1a), or on a different modifier element in the absence of a determiner, such as an adjective (1b), or on both, depending on the grammatical categories present in the languages in question. Gender may occur in only one of the languages in the dyad, as in (1a-b), or in both (1c). There are also cases where the noun comes from the gendered language and the determiner from the non-gendered language, e.g. Spanish-English the *casa* 'the house', but we will not consider these here (for discussion see Blokzijl et al. 2017; Parafita Couto & Gullberg 2019; see also Section 2).

(1) a, *la* house 'the.$_{\text{FEM}}$ house'[1] (*Spanish*-English; López 2020: 100)

b. *d-aqqo*^{n} mdinar 'big.$_{\text{D}}$ river' (*Tsova-Tush*-Georgian; Bellamy & Wichers Schreur u.r.)

c. *el* gürtel 'the.$_{\text{MASC}}$ belt.$_{\text{MASC}}$' (*Spanish*-German; López 2020: 108)

Mixed noun phrases such as those in (1a-c) constitute intraclausal (as opposed to interclausal) switches, which are encountered in the code-switched speech of many, but not all, bilingual communities (Deuchar 2020; cf. Muysken 2000, who refers to intra-clausal switching as code-mixing and inter-clausal as code-switching). We define code-switching here following Deuchar

[1] The following abbreviations are used in this chapter: D D gender, DAT dative, DEF definite, FEM feminine, GEN genitive, J J gender, MASC masculine, NEUT neuter.

(2012: 1) as "an activity which may be observed in the speech (or writing) of bilinguals who go back and forth between their two languages in the same conversation".

The precise points within the clause at which speakers switch, as well as which language contributes the different elements (i.e. function vs. content words) are constrained by various linguistic and extralinguistic factors (e.g. Myers-Scotton & Jake 2000; Parafita Couto et al. 2014; Beatty-Martínez, Valdés Kroff & Dussias 2018). Code-switching researchers are especially interested in switch points that constitute 'conflict sites' between the two languages, namely features which contrast in the two languages, such as the presence or absence of gender, or the order of noun and adjective (see Poplack & Meechan 1998).

Mixed noun phrases can therefore be considered a rich vein from which patterns of bilingual speech can be tapped. The key question with specific reference to gender in mixed NPs is: how do speakers assign a particular gender category to the other-language noun? Further to this, why do speakers opt for a particular gender assignment strategy over another? Which factors modulate this choice? (e.g. Munarriz-Ibarrola et al. in press).

There are numerous studies, stretching back over a century, focusing on how borrowings are integrated into a gendered language, often in relation to immigrant communities (e.g. Flom 1903; Haugen 1969; Reed 1942; Weinreich 1953). Borrowing and code-switching are often considered to be related phenomena, with the former constituting the outcome of the latter (e.g. Backus 2015; Gardner-Chloros 2009; Myers-Scotton 2002). However, differentiating between the two remains a divisive issue in bilingualism research, especially in relation to single word insertions, the focus of this chapter (see Deuchar 2020).

We consider as code-switches those lexical items that do not appear in the monolingual dictionary of the language into which they have been inserted or, in the absence of an authoritative dictionary, do not form part of the linguistic repertoire of monolinguals (where they exist) in the same region (compare also Muysken's (2000) notion of "listedness"). Some would classify these items as 'nonce words' or 'nonce borrowings', depending on how they pattern with respect to the recipient language and, by extension, established loanwords (Poplack 2018: 7). The authors of the studies presented in this overview define their single-word insertions as code-switches, therefore we will not delve into the thorny borrowing vs. code-switching debate any further.

The ever-expanding body of studies on gender assignment produces a wide variety of

data, using multiple methods and analyses, from various language pairs in different regions and countries, leading to a situation where we seemingly know a lot about specific communities, but much less about the overarching picture. The findings reported here stem from four main data collection methods: (i) naturalistic production, stored as corpora, where participants are recorded speaking freely, often in the absence of the researcher; (ii) guided production, either alone or in pairs, where participants react to stimuli provided by the researcher, such as the Frog Story or 'map task' (see also Gullberg, Indefrey & Muysken 2009); (iii) judgement tasks, where speakers are asked to provide evaluations in either written or spoken form to mixed language material; and (iv) online psycholinguistic methods, such as Event Related Potentials, which tap into the processing of mixed NPs.

In this chapter we aim to provide a comprehensive, up-to-date overview of our knowledge to date, taking stock of the various language dyads studied and methodologies adopted.[2] Its structure is as follows: In Section 2 we present the evidence supporting the three principal gender assignment strategies encountered in the literature, in both adult and child language. The same study may appear in various sections since it is rare for a speaker community to use only one gender assignment strategy. Section 3 presents the extralinguistic factors that play a role in gender assignment, namely type of bilingual, type of task, and community norms. A discussion of how the aforementioned linguistic and extralinguistic factors modulate gender assignment preferences, as well as the lacunae in the body of knowledge is presented in Section 4, while Section 5 concludes with recommendations for future research.

2. Linguistic factors

For languages possessing a grammatical gender system, the assignment of gender to inserted other-language nouns[3] is obligatory, irrespective of whether or not the donor language also has

[2] We cannot claim complete exhaustivity of the literature on the topic but, having searched in English, French, German and Spanish, we consider this review to cover a significant proportion of studies published to date.

[3] Deuchar (2020) refers to single-word code-switches as 'lone other-language items' (LOLIs), Aaron (2015) labels them 'singletons' while Poplack (2018) would call them 'nonce words' or 'nonce borrowings' depending on their status. We do not opt for a single term, following the conventions used by different authors where they are used, but often refer to them as 'other-language nouns' or 'insertions'.

gender (Stolz: 2008: 400). Corbett (1991: 81) claims that gender is assigned to borrowings "in essentially the same way as are native words", that is, according to semantic, or a combination of semantic and formal (phonological and/or morphological) principles (Pensalfini & Meakins 2019; Poplack, Pousada & Sankoff 1982; Violin-Wigent 2006).

Early typologies of gender assignment strategies focused on how borrowings are integrated into a recipient language, but importantly acknowledged that there was no single way to do this, even within one language. In relation to English nouns in Pennsylvania German, Reed (1942: 25-26) identified four gender assignment strategies, which form the basis for subsequent typologies (notably Arndt 1970; Ibrahim 1973; Stolz 2008).

First are nouns that have taken over the gender of the German nouns they displace (their *translation equivalent* in the terms adopted in Section 2.1), akin to Weinreich's (1953) "semantic association with a displaced native equivalent" (cited in Arndt 1970: 244-245), and Stolz's (2009) "gender copy" for dyads comprising two gendered languages (see Section 2.1.1). Second are nouns ending in a type of suffix that normally characterizes a particular gender in German ("morphological analogy" as per Weinreich (1953), and could likely be subsumed under our *shape-based strategy* in Section 2.2). Third are nouns whose gender is determined by the 'natural' sex of an animate (often restricted to humans)[4], a strategy claimed to supersede all others in gender assignment (Montes-Alcalá & Lapidus Shin 2011: 120; but see Balam 2016, Valdés Kroff 2016 for counter-evidence). Fourth are nouns that have been given the feminine gender, because [the English] definite article [ðiː/ðə] phonetically resembles the German feminine definite article *die* [diː]. Weinreich (1953) replaces this final type with a category based on the relative productiveness of the genders in the recipient language (most closely associated with a *default strategy*, see Section 2.3).

In relation to German, Arndt (1970: 245) adds three additional influences: graphic analogy (which can reasonably be associated with our *shape-based strategy*), homonymity (also referring to a *translation equivalent*), and assignment by semantic categories (related again to the *translation equivalent*, see also Montés Alcalá & Lapidus Shin 2011 for a discussion of gender assignment and its relation to hyperonymy). These early typologies are infrequently cited in contemporary literature, but in them we can recognise the three main gender assignment

[4] Corbett (1991) refers to this process as semantic assignment.

strategies that have been identified in published studies on code-switching in mixed NPs and which are presented in detail in this chapter.

In a mixed noun phrase, the determiner and the noun belong to different languages. It has been claimed that bilingual speakers prefer mixed noun phrases where the determiner comes from their gendered language, such as the Spanish-English ***la*** *table*, to those where the determiner is genderless, such as the English-Spanish *the* ***mesa*** (e.g. López 2020: 88-89; Liceras el al. 2008 for production only, but see Blokzijl et al. 2017; Parafita Couto & Stadthagen-González 2017; Parafita Couto & Gullberg, 2019 for counter-evidence).

Formal accounts supporting this prediction appeal to feature checking and the interpretability of the gender feature in each language. Liceras et al. (2008: 828) cite the "intrinsic Gender feature of the Spanish Noun and the intrinsic Gender Agreement feature of the Spanish Determiner", both of which are absent in English, as exemplified in the pair *the table* and la_{FEM} *mesa*. Similarly, Moro Quintanilla (2014) accounts for this asymmetry in terms of the "presence of an uninterpretable gender feature on the Spanish determiner, as opposed to its absence on the English determiner" (p. 222).

However, neither Liceras et al. (2008) nor Moro Quintanilla (2014) look outside of the noun phrase for an explanation of why these patterns occur. Indeed, various studies have demonstrated that the language of the determiner is congruent with that of the matrix language of the clause, as in 'my mom got the *manguera* (hosepipe)' (from the Bangor-Miami corpus, Deuchar et al. 2014), where the matrix language provides key functional categories, such as finite verb morphology (Myers-Scotton 2002; see also Blokzijl et al. 2017; Eichler et al. 2012; Herring et al. 2010; Parafita Couto & Gullberg 2019). The choice of language of the determiner as opposed to the choice of gender of the determiner are separate issues, and should therefore be treated separately from an empirical perspective.

To reiterate, in this chapter we focus on mixed noun phrases where the determiner (or other gender-bearing element in the absence of the category of determiner) is marked for gender and the other-language noun may or may not originate from a gendered language. In cases where it does, then gender may or may not be predictable from the semantics and/or form of that noun.

Let us now turn to the three gender assignment strategies that have been attested in code-switching contexts, which we term: (i) translation equivalent, (ii) shape-based, and (iii) default.

2.1. Translation equivalent strategy

Also referred to in previous literature as rhyme analogy, synonymic gender, gender copy, analogical gender (see references in Montes-Alcalá & Lapidus Shin 2011), as well as the "analogical criterion" (Liceras et al. 2008), speakers using this strategy assign gender to an other-language insertion on the basis of the gender of its translation equivalent in the recipient (or matrix) language. Various studies have found a preference for this strategy, including in language dyads where only one language has gender, and others where both languages possess a gender system.

2.1.1. Dyads with one gendered language

Perhaps most recently, Bellamy & Wichers Schreur (under review) find an overwhelming preference for the translation equivalent strategy amongst Tsova-Tush—Georgian early sequential bilingual adults (n = 12) in Georgia. Tsova-Tush possesses a five-way gender system, comprising masculine, feminine, and three 'neuter genders', labelled B, D and J for the form of the agreement markers.[5] This preference is almost at ceiling in semi-naturalistic speech elicited via a director-matcher task, but less pronounced in a forced-choice acceptability judgement task. Note also that the translation equivalent strategy was applied to all instances of code-switched noun phrases in a corpus of Tsova-Tush speech (Wichers Schreur, 2018), but the number of tokens is too low (n = 5) to be instructive. Example (2) demonstrates how the Georgian noun (in italics) receives J gender agreement on the adjective since the Tsova-Tush translation equivalent *sango* 'yard' is a J gender noun.

(2)	j-axxe^{n}	*ezŏ*
	J-long	yard
	'long yard'	

[5] Masculine and feminine genders include only masculine and feminine humans respectively, while the remaining genders are both animate and inanimate, from a variety of semantic domains (see Wichers Schreur (in press) for an in-depth discussion).

Relatedly, Liceras et al. (2008) demonstrate that their L1 Spanish-L2 English adult participants in Spain (n = 72) also prefer the translation equivalent strategy in a Likert scale judgement task, although their other experimental groups opt for a default strategy in both spontaneous speech and judgements (see Section 3). Late sequential L1 Spanish-L2 English bilinguals (n = 35) prefer the translation equivalent strategy over any other in an acceptability judgement task, in contrast to L1 English speakers with an intermediate level of L2 Spanish (n = 43), who showed no clear preference (Klassen & Liceras 2017).

L1 Spanish speakers (five adults and eight children) in Spain also display a preference for the same strategy in both a 4-point acceptability judgement task and a gap-filling production task (Gómez Carrero 2015: 36). In a forced-switch elicitation task, L1 Spanish-L2 Basque and Spanish-dominant 2L1 Basque-Spanish speakers (n = 17) also relied predominantly on the translation equivalent strategy (Munarriz-Ibarrola et al. in press). Similarly, 12 early young bilingual Basque-Spanish bilinguals also prefer the translation equivalent strategy over a shape-based strategy in an adapted version of Liceras et al.'s (2012) English-Spanish reading acceptability judgement task (Iriondo 2017).

On the basis of a corpus of naturalistic spoken and written bilingual speech, some Estonian nouns inserted into Russian are assigned gender on a "semantic" basis, such as *tolmulapp* 'duster', which takes feminine gender marking in line with its Russian translation equivalent *trjapka* (Zabrodskaya 2009: 369). Notably, the majority of speakers in this corpus were sequential bilinguals, with Russian as their L1. Finally, while the naturalistic corpus data from German-English bilinguals (n = 20) in the USA contains evidence for multiple gender assignment strategies, the translation equivalent emerges as a strong tendency (Füller & Lehnert 2000). It is noteworthy that these final two corpus studies do not show a preference for a default strategy; the translation equivalent seems particularly prevalent in experimental tasks in some communities.

2.1.2. Dyads with two gendered languages

Studies including two gendered languages are less numerous than those including just one. Cantone & Müller (2008) find that four Italian-German speaking children aged 1;8-5 encode on the determiner (which is most frequently Italian) the gender of the noun (which is in the other

language), irrespective of its gender in the same language. Stolz (2009) refers to this process as 'gender copy' in relation to Romance loanwords (as identified in the dictionary) in Maltese. The same children also, more frequently, provide mixed NPs in which the noun takes the gender of the switched noun rather than that of its equivalent, where they differ (Cantone & Müller 2000: 821). Similarly, Spanish-German bilinguals in Barcelona assign gender to code-switched masculine and feminine nouns on the basis of their gender, not that of the translation equivalent, as in (3a-b) where Spanish determiners are italicised.

(3) a. *la* Hose 'the.$_{\text{FEM}}$ trousers(f)' (cf. el pantalón - masculine)

b. *el* Gürtel 'the.$_{\text{MASC}}$ belt(m)' (cf. la cintura - feminine) (adapted from López 2020: 108)

The mixed NPs in (3a-b) clearly demonstrate that the Spanish determiner is assigned the same gender as that of the German noun. Neuter nouns, for which there is no analogical gender category in Spanish, are also assigned a masculine determiner, such as *el brötchen* 'the.$_{\text{MASC}}$ bun.$_{\text{NEUT}}$' (González-Vilbazo 2005, cited in López 2020).

Treffers-Daller (1993) analysed naturalistic and elicited production data from 34 Dutch-French bilinguals in Brussels and found a strong preference for an analogical strategy based on the gender of the noun in the original language. The French gender system distinguishes masculine and feminine gender, partly overlapping with the Brussels Dutch system, which, unlike Netherlands Dutch, distinguishes three genders (masculine, feminine and neuter). The Dutch-French bilinguals assigned the gender of French nouns to French noun insertions in Dutch. Nouns that are, for example, masculine in French received Dutch masculine gender when inserted in Dutch rather than the gender of the Dutch translation equivalent.

Nonetheless, the way in which the translation equivalent strategy emerges in mixed noun phrases between gendered languages, including those with more extensive gender systems has yet to be treated. How gender would map between two systems differing in extent and internal assignment principles, including how a default would be assigned (if at all) are empirical questions worth pursuing (see Section 4). We now turn to the next strategy.

2.2. Shape-based strategy

Speakers may associate an element of the code-switched noun from the donor language - often, but not always, its ending - with a similar element in the recipient language, thereby assigning the former the gender associated with the latter. This has been referred to as the phonological strategy in much of the previous literature (e.g. Munarriz-Ibarrola et al. in press), but we will refer to it here as a shape-based strategy, since examples from the literature do not always refer to spoken data or tasks. Indeed, in written code-switches, orthographic similarities (which largely reflect the phonological form of the words) determine gender assignment according to this principle (Montes-Alcalá & Lapidus Shin 2011: 122).

It is striking that the shape-based strategy has been reported less frequently than the other two attested gender assignment strategies (translation equivalent and default). In a multi-task study focusing on Basque-Spanish bilinguals (n = 30), Parafita Couto et al. (2015) found that participants associated the Basque definite marker *–a* with the Spanish feminine marker *–a* in naturalistic speech and also preferred this form in a judgement task, resulting in mixed forms such as *la liburu-**a*** 'the.FEM book-DEF' (cf. *el libro* 'the.MASC book').

Badiola & Sande (2018) find a similar pattern in a judgement task with Basque-Spanish simultaneous bilinguals (n= 21), whereby Basque nouns terminating in *-a* without a definite marker are also assigned the Spanish feminine definite article *la*, such as *la **azterka*** 'the.FEM exam' (Badiola & Sande 2018: 17). Adding to the Basque-Spanish debate, Munarriz-Ibarrola et al. (in press) find that L1 Basque-L2 Spanish bilinguals (n = 13) rely predominantly on the shape-based strategy in a forced-switch elicitation task (see also Section 2.3 on how these studies present conflicting results regarding the use of default strategy).

Similarly, in an online two response forced-choice acceptability judgement task, Purepecha-Spanish bilinguals (n = 12) demonstrated a preference for the Spanish feminine definite article *la* with inserted Purepecha nouns terminating in *-a*, as in *la japonda* 'the.FEM lake', where *el lago* is a masculine noun in Spanish (Bellamy, Parafita Couto & Stadthagen-González 2018).

In a comparative experimental and observational study of Russian-English bilinguals in Russia and the USA, Chirsheva (2009: 75) found that the "phonological shape of English code-switched nouns plays the most important role in their gender assignment" with Russian adults in the USA using this strategy 89% of the time, as opposed to 65.3% for Russian students in Russia

with English as their L2. One of the various strategies employed by Russian-Estonian bilinguals in Estonia is to assign case and gender, or gender alone, on the basis of the phonological shape of the Estonian noun. For example, the Estonian term *kaïbemaks* 'value added tax' is treated as a second declension masculine Russian noun (i.e. with zero ending) and therefore receives the masculine genitive marking *-a*, see (4), where Estonian is marked in italics.

(4)	No	eto	bez	*kaïbemaks*-a
	But	this.MASC	without	value.added.tax-GEN.MASC

'But this without value added tax' (Zabrodskaya 2009: 369)

Likewise, Leisiő (2001, reported in Chirsheva 2009: 64) found that when Finnish nouns are inserted into Russian in code-switching contexts, the prevailing gender assigned is feminine due to their phonological shape and consequent association with feminine forms in Russian.

Finally, Bellamy & Wichers Schreur (under review) also show how the similarity between the initial phonological segment of the inserted Georgian word and the form of the Tsova-Tush gender marker (B, D or J) significantly influences the gender assigned in a three response forced choice acceptability judgement task, although the effect is also observed to a lesser extent in production. Recall that Tsova-Tush marks gender word-initially, which may have made it more salient to the participants in this study, since the repetition may create an alliterative association.

2.3. Default strategy

Perhaps the most common gender assignment strategy encountered in the literature is the default strategy, where speakers use one gender for most other-language insertions, irrespective of their semantic and morpho-phonological properties, as well as the gender of their translation equivalent.[6] On the basis of naturalistic corpus data, it has been demonstrated that various Spanish-English speaker communities apply a masculine default to the vast majority of English nouns in mixed noun phrases. Otheguy & Lapidus (2003: 214) found that 87% of English

[6] It may be, however, that the fact that this strategy is so frequently encountered in the literature is due to the over-representation of Spanish-English studies.

language insertions (ELIs) in the 33 sociolinguistic interviews that they conducted with Latinos in New York City were assigned masculine gender, in contrast to the 53% of nouns taking masculine gender in the unilingual Spanish speech of three of their informants. The other 13% of inserted English nouns were assigned feminine gender on the basis of phonology and animacy: first, word-final schwa or /-*ar*/ in English was interpreted as -*a* in Spanish, attracting feminine gender, see (5).

(5) boiler > *la boila*
report card > *la repocá* (Otheguy & Lapidus 2003: 215)

Second, biological sex determined the grammatical gender of a noun, such that a woman who drinks heavily, for example, was *una lush* 'a.$_{\text{FEM}}$ lush' (Otheguy & Lapidus 2003: 215).

Aaron (2015) finds a similar preference for the masculine default in Spanish-English code-switching in the naturalistic speech of bilinguals from northern New Mexico (see Torres Cacoullos & Travis, in preparation). Of the 239 'singleton' nouns elicited in this dataset, 101 (42%) were assigned masculine gender, as opposed to just 16 (7%) feminine, although the majority (51%) were assigned no gender at all (Aaron 2015: 469). The author states that this preference for masculine assignment "likely has nothing to do with code-mixing tendencies per se, but may rather simply follow from patterns and preferences that are internal to Spanish" (*ibid*), namely that masculine has an unmarked or default status (e.g. Beatty-Martínez & Dussias 2019).

Clegg & Waltermire (2009) analysed the naturalistic speech of 15 Spanish-English bilinguals in northern New Mexico according to three factors: biological gender of the inserted noun, synonymic gender (i.e. the gender of the translation equivalent), and the terminal phoneme of the inserted noun. Using the VARBRUL programme (Rand & Sankoff 1990), the authors demonstrate that nouns referring to animate referents are categorically assigned the gender of the referent, but for inanimates, the terminal phoneme is the deciding factor: English nouns with typical masculine Spanish endings are assigned masculine gender in 89% of instances, although it is unclear whether this is a phonological analogy or a default strategy. In contrast, English nouns ending in phonemes typically associated with feminine nouns in Spanish are assigned

feminine gender in only 50% of cases. This asymmetry suggests that a masculine default strategy also applies.

In contrast, Balam (2016) found that biological gender was not deterministic in gender assignment. Indeed, in this extensive study of the naturalistic production of 62 speakers of Northern Belizean Spanish, Balam (2016: 420) found that 99.6% of tokens were marked with masculine gender, including both male and female human referents (e.g. *los nuns* 'the.$_{\text{MASC}}$ nuns', *los women* 'the.$_{\text{MASC}}$ women').

Similarly, Valdés Kroff (2016) reported on the gender assignment preferences of Spanish-English speakers in the Bangor Miami Corpus. Of the 304 mixed noun phrases containing a Spanish determiner and an English noun, 297 (93.7%) were assigned masculine gender and just 8 (2.5%) feminine. This means that masculine gender was being used with almost all nouns, irrespective of the gender of their translation equivalent. The small number of feminine-marked mixed noun phrases almost completely concerned female human referents, such as *la assistant* 'the.$_{\text{FEM}}$ assistant' (cf. *la asistente/ayudante*; Valdés Kroff 2016: 290). That said, female animates who would usually be assigned feminine gender in unilingual Spanish were also assigned masculine gender as in (6).

(6)	Ella	es	un	*renaissance*	*woman*
	She	be.3.SG	ART.DEF.MASC	renaissance	woman

'She is a renaissance woman.' (adapted from Valdés Kroff 2016: 291)

DuBord (2004) analysed mixed noun phrases as occurring in interviews with 18 Mexican-American Spanish-English bilinguals in Southern Arizona. Overall, 130 of the 174 tokens (74.7%) transcribed were assigned masculine gender and 43 (24.7%) assigned feminine gender. One token (0.6%) was assigned both genders. Biologically masculine (animate) referents received masculine assignment in an almost unambiguous 96.2% of cases, while feminine assignment to feminine animates was also high (75%) but based on far fewer tokens: 8 as opposed to 27. Phonologically masculine nouns were assigned masculine gender in 82.3% of cases overall, while phonologically feminine nouns were only assigned feminine gender in 38.9% of cases. Phonologically neutral tokens were also assigned masculine gender in the majority of instances (70.7%), indicating a default strategy (see DuBord 2004: 34). When the

translation equivalent of the inserted English noun was masculine, masculine gender was assigned in 82.3% of cases, whereas the same calculation for the feminine is just 40%. Moreover, the four nouns with no clear translation equivalent in Spanish were all assigned masculine gender (DuBord 2004: 35). While it is hard to adjudicate between assignment strategies for masculine nouns, the preference for masculine gender with phonologically and semantically (as well as biologically) feminine nouns is indicative of a default strategy.

Chaston (1996: 201) identifies 42 code-switched noun phrases in his corpus of Spanish-English bilinguals (n = 18) of Mexican heritage in Texas, 40 of which are assigned masculine gender. He acknowledges that this tendency is not merely a coincidence, but is unsure whether it occurs because the speaker does not know the gender of the Spanish translation equivalent, or because speakers tend to select the masculine article with English words or new cognates (Chaston 1996: 202). More recently, using a two response forced choice acceptability judgement task, Delgado (2018) has shown how heritage Spanish-English bilinguals in Chicago (n = 21) assign masculine gender to all non-familial words, including newly encountered words, but use the feminine (and masculine) for the translation equivalent in the familial setting.

In an acceptability judgement task, Liceras et al. (2008) found a masculine default preference for adult Spanish L2 speakers (n = 142, of whom 61 were L1 English and 74 L1 French), in contrast to the translation equivalent for Spanish L1 speakers (n = 72). Moreover, in her study of the natural speech of one L1 English-L2 Spanish speaker living in Argentina, Franceschina (2001: 239) found that he "only used masculine forms of articles in combination with English nouns." In a Sentence Selection Task,[7] heritage Spanish-English simultaneous bilinguals in Canada assigned masculine gender to English nouns with a feminine translation equivalent in 40-50% of cases, with the ending of the noun (i.e. *-a*, *-e* or a consonant) not playing a significant role (Valenzuela et al. 2012). Regarding simultaneous Basque-Spanish bilinguals from Gernika (n = 21), Badiola & Sande (2018) identified a masculine default strategy in response to a 7-point Likert scale acceptability judgement task. Participants provided higher acceptability ratings to Basque nouns without lexical *-a* accompanied by a Spanish masculine determiner, irrespective of the gender of the translation equivalent. In contrast, Basque nouns

[7] In this task "participants read a dialogue between two bilingual speakers that included either a code-switched DP or an agreement copula sentence. They were asked to choose the concluding statement that sounded most natural to them" (Valenzuela et al. 2012: 486).

with lexical *-a* were given higher ratings with a feminine determiner, also regardless of the gender of the translation equivalent (Badiola & Sande 2018: 31-32; cf. Parafita Couto et al. 2015).

Moving away from language dyads including Spanish, Chirsheva (2009 and references therein) lists various language pairs in which nouns are assigned masculine gender as a default, namely Russian-English, American Norwegian-English, American Lithuanian-English, American Portuguese-English, American Italian-English and French-English, although these may be references to borrowing rather than code-switching, following the definition we provide in Section 1. Nonetheless, the clear preference for a masculine default is striking. Some studies on Dutch (which differentiates between common and neuter gender) in contact with other languages also point towards common gender as a default. Clyne (1977; see also Clyne & Pauwels 2013) analyses a corpus of elicited production data of 200 English-Dutch bilinguals in Australia and reports a common gender default as the main strategy, driven by the phonetic similarity between the Dutch determiner [də] and the English determiner [ðə]. Boumans (1998) analysed naturalistic speech recordings of 15 Moroccan Arabic-Dutch bilinguals in the Netherlands and found that common gender was also assigned in all cases of Moroccan Arabic insertions into Dutch.

However, the default need not always be masculine. Take, for example, the findings of Parafita Couto et al. (2015), where Basque-Spanish bilinguals re-interpret the word-final definiteness marker *-a* in Basque as analogical with the feminine gender, leading to a feminine default (see also Section 2.2). Weinreich (1953: 45) reports a feminine default tendency for borrowed English nouns in American German and American Yiddish, but only as one of several gender assignment strategies. While not strictly a feminine default, English nouns with a masculine-like phonetic form in Ukrainian were assigned feminine gender in 42% of cases, twice as often as the masculine gender (21%) by 25 L1 Ukrainian-L2 English speakers residing in the USA. English nouns with feminine-like phonetics receive feminine gender in 88% of cases, but never masculine (Budzhak-Jones 1998: 176). Note, however, that the gender of the translation equivalent was not provided for the English code-switches in Budzhak-Jones' study, therefore many of these instances of seemingly default strategy may in fact be more appropriately analysed as applying the translation equivalent strategy. having presented an overview of gender assignment in mixed NPs in adult speech; let us now consider what occurs child language.

2.4. Child code-switching patterns

Studies of gender assignment in mixed noun phrases amongst children are still uncommon in the code-switching literature; we provide a short overview of the most notable ones here. Cantone & Müller (2008) focus on the free production of four simultaneous German-Italian bilingual children aged 1;8-5, finding that the translation equivalent strategy is preferred. Radford et al. (2007) find similar (but not unambiguous) results for a single Italian-English bilingual child (Lucy), although she also uses a number of hybrid forms, whereby a terminal vowel is added to the English noun in order to render it gendered, like Italian, as in *la butterflaia ~ la farfalla* ('the.$_{\text{FEM}}$ butterfly.$_{\text{FEM}}$'). Reminiscent of the Spanish-German data presented in Section 2.2.2, both balanced and unbalanced bilingual children of German and French, Italian or Spanish (n = 13) or two of these Romance languages "more frequently mark the gender of the noun actually switched on the determiner than the gender of the equivalent noun" (Eichler et al. 2012: 250). Notably these two studies both involve German and Spanish bilingual children. However, Ezeizabarrena (2009) finds no clear preference for a single gender assignment strategy in the small number of tokens elicited in the speech of a bilingual Basque-Spanish child, in a longitudinal sample of over 20 hours of adult-child conversation.

Balam, Lakshmanan & Parafita Couto (2021), in contrast, demonstrate that early simultaneous Spanish-English bilingual children (n = 40) of different grade levels (second to fifth grade in English immersion and two-way bilingual programmes) in Miami use the masculine default strategy when assigning gender to English code-switched nouns in Spanish. In both cases the children evince native-like acquisition of the respective gender systems in unilingual speech, but display differing behaviour in mixed noun phrases (see also Section 4).

Similarly, Fernández Fuertes, Liceras & Bel (2011) find that simultaneous bilingual Spanish-English children (n = 11) provide a higher reference score for a default option in an acceptability judgement task than L1 Spanish children. Finally it is also worth mentioning the study by Jorschick et al. (2011) on the naturalistic speech of three German-English bilingual children aged two to four years, in which the authors provide evidence that these children prefer the translation equivalent strategy at a higher than chance level.

While data regarding the acquisition of code-switching patterns in children, including gender assignment in mixed noun phrases, is still in its infancy, the results available suggest that different strategies may occur in unilingual and code-switched speech, and that these patterns are learned in childhood.

For reference, an overview of the main findings of each study presented in this section can be found in Appendix 1. The role of type of bilingualism will be treated in the following section, along with other extralinguistic factors.

3. Extralinguistic factors

As should be clear from Section 2, there seems to be variability between bilingual speaker communities, even of the same language pair, as to which gender assignment strategy is applied most frequently in a given study. It is also rare for one speaker community to use only one strategy. However, it should be noted that the populations studied vary across a number of extralinguistic factors, namely order of acquisition of the languages in question (i.e. the type of bilingual), the type of data and tasks that gave the results, the medium of the language under investigation (written vs. oral), and community norms. We will outline here how results pattern in line with these factors.

3.1. Type of bilingual

Studies of gender assignment include a wide variety of bilingual speaker types: simultaneous (2L1), early and late sequential, heritage speakers, and L2 learners. The extent to which these speaker groups code-switch, and therefore use and/or hear mixed noun phrases on a regular basis, also varies between studies. It is important, therefore, to draw out the main findings from these varying groups.

It has been claimed that early simultaneous bilingual adults are more likely to show a preference for the (masculine) default gender assignment strategy (López 2020; Liceras et al. 2008), a claim largely supported by the results in Badiola & Sande (2018), focusing on simultaneous Spanish-Basque bilinguals. In contrast, sequential bilinguals who learned the gendered language first (in this case, Spanish) may be more likely to prefer a translation equivalent strategy (e.g. Iriondo 2017; see also Liceras et al. 2016, Fernández Fuertes et al. 2011

for Spanish-English). Bilinguals who had Spanish as (one of) their L1(s) and Basque as their L2 were found to rely predominantly on the translation equivalent strategy in an elicited forced-switch production task, whereas those who had Basque (no gender) as their sole L1 mainly preferred a shape-based (here, phonological) l strategy (Munarriz-Ibarrola et al. in press).

Furthermore, Bellamy & Wichers Schreur (under review) find that sequential Tsova-Tush-Georgian bilinguals also prefer the translation equivalent strategy, particularly in production, which seems to support López's (2020) claim since Tsova-Tush possesses a five-way gender system. However, the participants in Parafita Couto et al. (2015) were predominantly L1 Spanish, acquiring Basque (ungendered) on average at the age of 3.46 (+/- 1.55), yet they displayed a preference for a feminine default strategy in mixed NPs. We discuss possible explanations for these preferences in Section 4.

Also relevant to the choice of gender assignment strategy is a bilingual's relative dominance in the two languages although, again, this is not always reported in code-switching studies (e.g. Zabrodskaya 2009). Moreover, individual dominance should not be conflated with language dominance at the societal level. Dominance is dynamic, therefore an individual's dominant language in childhood may not be the same as in adulthood, and fluctuation between the two is likely to occur across the lifespan (e.g. Grosjean 2001). It has been claimed that if a speaker's dominant language is Spanish (i.e. a gendered language), then this speaker should prefer the translation equivalent strategy (López 2020: 78; Klassen & Liceras 2017: 82; see also Otheguy & Lapidus 2003; Liceras et al. 2008).

Corroborative findings are reported by Fuller & Lehnert (2009) for German-dominant German-English bilinguals; recall that German possesses a three-gender system while English lacks grammatical gender. By the same token, bilinguals dominant in a non-gendered language should prefer a default strategy (e.g. Klassen & Liceras 2017: 83). This claim is supported by Gómez Carrero (2015) for L1 English-L2 Spanish speakers in Spain, Valenzuela et al. (2012) for heritage Spanish speakers in Canada who are dominant in English, and Liceras et al. (2008) for L1 English-L2 Spanish bilinguals (but see Klassen & Liceras 2017 for inconclusive results for L2 Spanish-L1 English bilinguals), and by Munarriz-Ibarrola et al. (in press) for Spanish-Basque bilinguals. However, such a preference is not found among the Tsova-Tush-Georgian participants in Bellamy & Wichers Schreur's (under review) study; all were dominant in Georgian, an ungendered language, yet they showed a marked preference for the translation

equivalent strategy, with little to no evidence of a default strategy in comprehension and production respectively. Perhaps this counter-evidence highlights the need for more studies investigating language pairs beyond Spanish-English.

3.2. Task type

A variety of methods have been employed to investigate gender assignment in mixed NPs, each of which elicits a particular type of data, for which different preferences have been observed. For production, both spontaneous and semi-spontaneous, or guided speech have been collected: spontaneous speech from a particular speech community is drawn together in a corpus, which is then transcribed and annotated accordingly. Perhaps the best known and most widely used corpus in code-switching studies so far is the Bangor Miami corpus[8] of Spanish-English speakers, 35 hours of spontaneous recorded conversation, fully accessible online (Deuchar 2013; see Blokzijl et al. 2017 and Valdés Kroff 2016 for examples of studies analysing data from this corpus). An additional corpus of Spanish-English bilingual speech is the New Mexico Spanish-English Bilingual (NMSEB) Corpus (Torres Cacoullos & Travis 2015, in prep.), although it is not publicly available.[9]

Semi-spontaneous production is elicited in many studies, since collecting this type of data enables the researcher to control more carefully for the features under investigation, especially those that occur infrequently in corpora. Methods utilised include (semi)-structured interviews (e.g. Otheguy & Lapidus 2003), prompted monologues (e.g. Pearson 2002 who used the 'frog story'), and interactive game-like tasks, such as the director-matcher or 'toy task' (e.g. Bellamy et al. 2018, see Gulberg et al. 2009 for a description), or the related map task (e.g. Beatty-Martínez & Dussias 2017).

Acceptability judgement tasks are often used to test 'comprehension', although given the negative social attitudes often associated with code-switching, it is debatable as to what precisely judgement tasks are tapping into (e.g. Stadthagen-González et al. 2018). Nonetheless, both Likert

[8] See bangortalk.org.uk. This site also includes spontaneous data from Welsh-English bilinguals (the Siarad corpus), as well as Welsh-Spanish bilinguals in Patagonia.

[9] Note that other bilingual corpora also exist, such as the extensive Ottawa-Hull corpus of French-English bilingual speech although it is also not open access and has not, to the best of our knowledge, been used to systematically study gender assignment patterns in this community (see Poplack 2018).

scale (e.g. Liceras et al. 2008) and forced-choice (e.g. Bellamy et al. 2018) judgement tasks are found reported in the literature (see also Parafita Couto & Stadthagen-González (2017) on determiner assignment in mixed NPs, using both types of judgement task).

Furthermore, psycholinguistic online methods to code-switching are being increasingly applied to investigate how code-switches, including mixed NPs, are processed. Underpinning this line of research is the hypothesis that comprehension ought to reflect production patterns, for example when masculine default agreement is applied to both masculine and feminine nouns, what Valdés Kroff (2012: iii) calls a "production asymmetry".

Indeed, Valdés Kroff et al. (2017) employed the visual world paradigm to demonstrate how Spanish-English bilinguals reflected their asymmetric use of gender in mixed NPs in comprehension. Using a 2-picture design with auditory input (typical to, and one of the key advantages of, this experimental paradigm), the authors tested whether gender, as marked on a Spanish determiner, facilitates the identity of the upcoming English noun (*ibid*: 6). They found that their bilingual participant group only made use of the feminine cue to facilitate noun identification, reflecting their propensity to use the masculine default in code-switching mode.

Fernández Fuertes, Gómez Carrero & Martínez (2020) also used eye-tracking to test how mixed NPs were processed by L1 Spanish-L2 English bilinguals (n = 19) in Spain. The results of a sentence-reading task indicated that participants processed gender-congruent switches faster than incongruent switches. In other words, mixed NPs formed according to the translation equivalent strategy were processed faster than those adhering to a masculine default. The authors relate these findings to those of Liceras et al. (2008), claiming that they support an adapted version of their Grammatical Features Spell-Out Hypothesis, which states that code-switching choices will favor the functional categories containing the largest array of uninterpretable features.

While it is extremely important that data be gathered using different methods, we must also bear in mind that different tasks can elicit different gender assignment strategies, even within the same test population. Some tasks may well be drawing on top-down, social or pragmatic influences that manifest themselves as particular strategies, or switch costs in the case of processing studies (Beatty-Martínez et al. 2018: 3; see also Beatty-Martínez & Dussias 2019).

Take, for example, the multi-method study with early sequential Purepecha-Spanish bilinguals in Mexico reported in Bellamy et al. (2018). In the director-matcher task testing

production, the participants displayed an overwhelming preference (over 90%) for a masculine default strategy, whereas in the two option forced-choice acceptability judgement task, the phonology of the inserted Purepecha noun largely determined the gender agreement chosen in Spanish.

In a study using the same methodology, , Bellamy & Wichers Schreur (under review) found that Tsova-Tush—Georgian early sequential bilinguals preferred the translation equivalent strategy in a director-matcher task, but showed a more varied set of responses, with the shape-based strategy being more present, in a judgement task. Bierings, Parafita Couto & Mateo Pedro (2019) also found a similar possible task effect for their unexpected mixed noun-adjective order in a director-matcher task with Kaqchikel-Spanish bilinguals (n = 20) in Guatemala. Parafita Couto et al. (2015) had already identified differences in strategy as a function of data type, with the naturalistic speech of Spanish-Basque early sequential bilinguals displaying evidence of a shape-based strategy, but a feminine default emerged as the preferred strategy in a three-choice auditory judgement task (see also Gómez Carrero 2015).

Multi-method studies are still not the norm in code-switching research, with many continuing to rely solely on judgement tasks (e.g. Badiola & Sande 2018; Delgado 2018; Vanden Wyngaerd 2021). However, it is vital that naturalistic and experimental (both for production and comprehension) data are gathered for as many communities and language pairs as possible in order to be able to tease apart the results stemming from possible task effects from natural behavioural patterns (see Valdés Kroff 2016). Such a wealth of data would enable us to move further towards the long-term goal of a predictive model of gender assignment in code-switching.

3.3. Community norms

Code-switching is not equally common in all bilingual communities. In some, such as among Spanish-English speakers in Miami and Basque-Spanish speakers in Gernika (Basque Country), it is ubiquitous, occurring both intra- and inter-clausally (Badiola & Sande 2018: 22; Beatty-Martínez & Dussias 2019). Other communities show lower levels of switching, such as Spanish-English bilinguals in El Paso, Texas and Granada (Spain) (Królikowska et al. 2019). Consequently, we should take into account whether participants are habitual code-switchers or not when designing studies.

While still in its early stages, research that explicitly takes into account the variation inherent in the bilingual experience is advancing our understanding of how individuals produce, process and comprehend code-switches (Beatty-Martínez et al. 2018). The results of three production tasks undertaken by 32 heritage Spanish-English bilinguals highlighted how regular and infrequent code-switchers favoured the Spanish masculine determiner with an English noun whose translation equivalent is feminine (i.e. a gender mismatch, generally construed as a masculine default), whereas participants who did not engage in code-switching did not exhibit this tendency (Denbaum & Prada Pérez 2020: 28). Beatty-Martínez & Dussias (2017) used ERPs to show how habitual and non-habitual code-switches process congruent and non-congruent switches in the DP differently, as a function of their code-switching experience. Code-switches that adhered to patterns used in an accompanying production 'map task' resulted in no processing cost in the ERP experiment (see also Beatty-Martínez et al. 2018).

Moreover, input is crucial: the norms common to the wider speech community will be reflected in the communicative behaviour of the individual (Poplack 1980). These norms, in our case regarding choice of gender assignment strategy, are likely to be community-specific and therefore may not be shared by speakers of the same language pair in different places (cf. Gardner-Chloros 2009; Toribio 2017).

Królikowska et al. (2019) investigated gender assignment in mixed NPs in four Spanish-English speaking communities, namely Granada (Spain), Pennsylvania State University (USA), Puerto Rico (USA) and El Paso, Texas (USA) in order to identify whether differences can be observed between communities. Using a map task, they found that both the translation equivalent and default strategies were present in all communities, but that in Pennsylvania and Puerto Rico participants preferred the default strategy over the translation equivalent, whereas in Granada and El Paso, both were used with roughly equal frequency. Results from a language background questionnaire highlighted that the bilingual participants in Puerto Rico code-switched the most and those in Granada the least.

Balam (2016) also found that his participants, who also frequently engaged in code-switching, preferred the masculine default strategy. It appears, therefore, that there is a connection between amount of code-switching and assignment strategy: the more speakers switch, seemingly the more likely they are to use the default. More research is needed into

comparing communities sharing the same language pair (cf. Beatty-Martínez & Dussias 2019), also including naturalistic data from the communities in question (see Section 4).

Studying patterns in language pairs that keep one language constant but vary the second language (which may or may not be the dominant language) is also highly instructive as a way of trying to tease apart the relative contribution of linguistic and extralinguistic factors in gender assignment. Take, for example, pairs where Dutch occurs with a variety of other languages, such as Spanish, Papiamentu and Turkish, all spoken in The Netherlands. Van Osch et al. (this volume) find that "in code-switching mode, most speakers tend to assign common gender to inserted nouns, but some speakers also apply a gender assignment strategy based on the translation equivalent of the noun in Dutch [...]." While this study seems to indicate speakers converging on one preferred strategy, the extent to which this pattern is generalisable to other language dyads remains an area for much more research.

A further empirical question to be explored in more depth is whether languages sharing the same structure (which are also often genealogically related) also display the same gender assignment patterns when in contact with the same language. For example, do Spanish and Italian, which share a binary gender system descended from Latin, behave in the same way when spoken as one part of a dyad with German? González Vilbazo (2005; cited in López 2020: 108) claims that code-switched German nouns are assigned the same gender in Spanish, not the gender of the Spanish translation equivalent.[10] Therefore, German feminine nouns are marked with a Spanish feminine determiner, while masculine and neuter nouns are marked with a masculine determiner. Similarly, bilingual Spanish-German, Italian-German and French-German children prefer to mark the gender of the noun that has been switched over the translation equivalent, although this strategy does also occur (Eichler et al. 2012: 250). Unfortunately, there are too few studies of (closely) related languages to be able to comment further on this apparent parallel.

Moreover, situations where one language in the dyad is kept the same, both within the same country as well as in different locations, are instructive regarding gender assignment

[10] Note that Spanish-German here refers to the bilingual speaker community of this language pair in Barcelona studied by González-Vilbazo (2005), rather than to Spanish-German bilinguals more broadly. As we have seen from the Spanish-English data, data are required from many speaker communities in order to identify the code-switching patterns present. We thank an anonymous reviewer for ensuring we highlight this point.

patterns. Varieties of a number of European immigrant languages in the USA, including American Norwegian, American Lithuanian, American Portuguese and American Italian, all in contact with English, have been reported as using a masculine default for all loanwords (Chirsheva 2009: 64 and references therein). However, Weinreich (1953: 45) also reports that American German and American Yiddish assign a feminine default most frequently to English nouns in bilingual speech. This small sample already suggests that language pairs sharing one societally dominant language may not necessarily treat other-language insertions in the same way, indicating that multiple linguistic and extralinguistic factors are at work.

3.4. Child language acquisition

If input and community norms play such an important role in shaping the gender assignment strategies adopted by a particular community (amongst other features), then it is clear that we need to know how children acquire them. The code-switching patterns produced by adults in relation to those acquired by children is a seriously under-researched area in code-switching studies, but one that has the potential to greatly expand our understanding of this linguistically constrained but societally-variable speech activity (see Deuchar forthcoming for an overview of research into child code-switching).

Lanza (1997) represents probably the first attempt at such an endeavour, reporting on code-switching in both child utterances and adult responses for two simultaneous Norwegian-English bilingual children and their caregivers. There is evidence that one of the children involved in this study, Siri, not only repeats mixed noun phrases produced by her father, such as *i vindu-et* ‘the window-DEF.NEUT’ (where *vindu* is a phonologically adapted insertion of ‘window’), but also produces novel forms on the same template. Two of these forms follow the same gender assignment strategy - the translation equivalent - while one appears to follow a masculine default strategy (*ibid*: 144).

Using naturalistic data accessible in the CHILDES database (MacWhinney 2000), Balam et al. (2021) demonstrate that both second-grade and fifth-grade children (i.e aged around seven and ten, respectively) in English-immersion and two-way bilingual schools Miami display native-like acquisition of grammatical gender in Spanish, but in mixed noun phrases, they use masculine agreement with feminine translation equivalent nouns. The authors conclude that from

the age of seven, children in these communities utilise two different gender assignment strategies, one for unilingual Spanish contexts and one for bilingual contexts. They therefore acquire the two systems, each one appropriate to its own context; they are highly proficient bilinguals, who display little to no deviance from the so-called monolingual standard (MacSwan 2021: 88). Indeed, code-switching occurs in communities of stable bilingualism, such as Miami, as well as in "immigrant communities, regional minorities and native multilingual groups alike" (Gardner-Chloros 2009: 20).

In this section, we have seen how various extralinguistic factors can modulate the gender assignment strategy, which can differ depending on the order of acquisition of the languages involved, the type of task used to elicit such forms, as well as which norms have developed at the community level, irrespective of the language dyad. It is also worth underlining here the need for more corpora, of both unilingual and bilingual speech, to further investigate the relationship between code-switching in child and adult language, as well as to gain a more holistic picture of patterns between communities.

4. Discussion and future perspectives

Gender assignment in mixed NPs varies in non-random ways according to a number of linguistic and extralinguistic factors, notably language pair, type of bilingual task type, and community norms. Since some studies do not report all of these factors, their interaction and the relative importance of each one remains unclear. Consequently, both modeling and predicting the preferred gender assignment strategy or strategies for a particular speaker community is a complex task. Given the larger number of studies on Spanish-English code-switching, employing multiple methodologies and conducted in various speaker communities, we are in a position to outline some initial generalisations regarding the relationship between the factors we have reviewed here and the strategies observed. Given the paucity of studies focusing on other language pairs, especially those possessing more extensive gender systems, however, generalisations in an even broader sense remain distant.

4.1. Bilingual profile

In general terms, the sequential Spanish-English bilinguals tested to date have been shown to prefer the translation equivalent strategy, whereas early simultaneous bilinguals lean towards a masculine default (see Section 3.1). Importantly, the sequential bilinguals reported in these studies have learned the gendered language, Spanish, before the genderless language, English (see also Bellamy & Wichers Schreur under review; Munarriz-Ibarrola et al. in press, amongst others, for supporting evidence). However, recall that dominance also played a role in these latter studies. These findings contradict López's (2020: 78) claim that speakers whose dominant language is genderless will prefer the default strategy. Initial results would suggest, then, that acquiring the gendered language first is not the sole determinant of the translation equivalent strategy, but that dominance in the gendered language following simultaneous acquisition also suffices. The interaction and relative strength of factors should therefore be borne in mind when testing predictions in new (or the same) language pairs.

4.2. Mental representation of gender

But how can we account for these varying patterns based on order of acquisition? Munarriz-Ibarrola et al. (in press) relate the preference for the shape-based strategy by L1 Basque-L2 Spanish speakers to lexical representation, and more specifically that their Spanish gender representations are not so stable. Two main linguistic approaches to gender representation in the mental lexicon can be delineated: lexicalist and structural. In the lexicalist approach, a lexically-driven generative linguistic model of grammar, gender is assigned to lexical items (i.e. nouns) through rules in the lexicon, which is language-specific. Gender is therefore an inherent feature of a lexical item in the mental lexicon (see e.g. MacSwan 2000 for an application to bilingual grammar). The structural approach, in contrast, separates the lexical items from the gender features, with the latter being inserted late in the derivation. This approach is favoured by proponents of exoskeletal models of grammar, such as Distributed Morphology (see notably López 2020 for its application to gender in mixed NPs). Given the evidence that a different gender can be assigned to the same inserted noun in different contexts, a model that reflects this possibility in the bilingual grammar would be explanatorily preferable.

The two contrasting linguistic approaches to gender representation find parallels in the neurolinguistic and psycholinguistic literature. Results using different methodologies applied to

different language pairs provide conflicting support again for two models: (i) an integrated gender model in which both languages share a gender node (Salamoura & Williams 2007); and (ii) an autonomous representation model, which postulates that the two gender systems are independent from each other (e.g. Costa et al. 2003). Moreover, evidence converges to show that two distinctive mechanisms underlie grammatical gender selection, not just representation, cross-linguistically. First are languages in which the morpho-phonological cues present on nouns predominantly modulate gender; speakers of Romance languages such as Spanish or Italian make use of this mechanism, as the cognate noun *la luna* 'moon.$_{\text{FEM}}$' demonstrates. Second are languages that rely more on semantics than the relatively uninformative morpho-phonological properties inherent to the language's nouns; this mechanism is observed in Germanic languages such as Dutch and German (Wang & Schiller 2019: 5; Jescheniak, Schriefers & Lemhöfer 2014: 3). The L1 Basque speakers presented above may therefore be applying the morpho-phonological mechanism for gender assignment to Basque insertions into Spanish, in the same way as they would to gendered Spanish nouns. We may thus not be dealing with unstable representations as such, but representations associated to those of the L1.

In language dyads where both languages possess gender, if the gender systems are indeed integrated, which implies that the same gender node is activated when the two languages share the same gender but different ones are activated where there is a gender incongruence, then the translation equivalent strategy may only be triggered in cases where the gender is shared. In cases where the genders conflict, then other features, such as the phonology of the noun (i.e. something about its shape), may come into play. If, on the other hand, the gender representations are autonomous, then we might expect a more consistent use of the translation equivalent strategy. It should be underlined, however, that these are purely speculative hypotheses, but hypotheses that merit empirical investigation for a nascent predictive model of gender assignment.

We have also observed in this chapter that the same lexeme in one language can be assigned different genders in unilingual vs. code-switched speech (e.g. Balam et al. 2021), as well as in in response to different tasks (e.g. Bellamy et al. 2018). It is notable that Spanish-English bilinguals who code-switch frequently produce native-like gender agreement in unilingual Spanish contexts, but overwhelmingly resort to a masculine default when inserting lone English nouns in code-switching mode. This differential behaviour suggests that bilinguals

have different modes or speech styles at their disposal, akin to registers in monolingual speakers, which they engage in accordance with the social context. In this way, code-switchers "are driven to follow community-established norms", both in unilingual and mixed speech (Valdés Kroff 2016: 284; see also Valdés Kroff et al. 2017, Aaron 2015).

Bilinguals who form part of a code-switching community must therefore learn a hybrid system; they require a set of community-specific distributional patterns to be able to understand code-switched speech, as well as to be able to plan upcoming utterances. These patterns seem to be in place by around the age of seven, and follow through into adulthood: Balam et al. (2021) claim that a default gender is used in order to "prioritize a principle of economy [common to multilinguals] rather than to faithfully maintain the grammatical procedures of the gendered language" (see also Otheguy & Lapidus 2003). The use of the masculine determiner in mixed NPs therefore becomes a useful cue in comprehending code-switched speech (Valdés Kroff 2016: 293). In this way, Valdés Kroff (2016: 284) treats code-switching as "by and large a planned mode of bilingual speech [...] built from the bilingual's constituent languages".

However, it remains unclear whether such a principle of economy is common to all habitual code-switching communities, since research to date focuses solely on Spanish-English bilinguals. Variation in gender assignment, both in unilingual and code-switched speech, between speaker communities is to be expected due to the multiplicity of linguistic and extralinguistic influences acting on any language at any given time (Valdés Kroff 2016: 298). The norms that emerge are therefore modulated by these influences to different degrees; a more elaborated model of gender assignment in mixed NPs would include all of these factors both within and across language dyads.

Hybrid representation of gender, and perhaps also the principle of economy, could also be applied to the differential patterns observed in mixed NPs between tasks. We have seen how some bilinguals are able to assign a different gender to the same noun in different contexts, suggesting hybrid production, if not hybrid representation in the mental lexicon. Recall here the more unstable representation of Basque nouns in the Spanish-Basque lexicon suggested above; perhaps this flexibility allows for differential gender assignment depending on the type of trigger or data source, for example written vs. aural code-witched input. Particularly for nouns from a non-gendered language, the connection between the lexical entry and the syntactic gender node in mixed NP production requires further research (see also Klassen 2017). Indeed, instances of

bilinguals who assign a different gender to the same noun depending on situational context (or other factors) prove the most challenging, especially for linguistic models of gender representation. One could argue that late insertion approaches, such as Distributed Morphology, may be able to deal with these cases more effectively, but a great deal more theoretical work is required before more solid generalisations can be offered.

4.3. The notion of default

Moreover, we should also consider more carefully what it means to possess a default strategy, especially in languages with more extensive gender systems, such as those found in Nakh-Daghestanian languages such as Tsova-Tush (on defining default, see Corbett & Fraser 1994). In Spanish, the most studied of the gendered languages in code-switching research, masculine is considered the default gender, because it is used in the absence of gender information about a lexeme. For example a noun lacking modification or an indefinite pronoun such as *nada* 'nothing' receives masculine agreement, as on the adjective in *para ti nada es buen**o*** 'for you nothing is good.$_{\text{MASC}}$' (Delgado 2018: 44;[11] see also Harris 1991; Roca 1989). It is also applied to agreement relating to groups of mixed animates, e.g. *los hombres y las mujeres son list**o**s* 'the.$_{\text{MASC.PL}}$ men and the.$_{\text{FEM.PL}}$ women are ready.$_{\text{MASC.PL}}$'. Masculine gender is therefore treated as the unmarked gender; Harris (1991) applies a privative feature system, whereby [*f*] denotes 'plus feminine' but its absence denotes masculine gender (see also López 2020 for discussion). As highlighted by Bellamy & Wichers Schreur (under review), it remains unclear how such a privative system could be applied to a more extensive, non-binary system. For example, all loanwords in Chechen (Nakh-Daghestanian) receive the J gender (named for the form of its agreement target), but it is unclear why it should be singled out as the default, given that it cannot be assigned an absence of a single feature, as is the case for Spanish. It is important that we understand how the default is assigned language-internally, amongst many other factors, not

[11] Delgado (2018) also finds that English nouns belonging to the non-familial sphere are uniformly assigned masculine gender (i.e. a default) in mixed Spanish-English NPs. Frequency likely also contributes to the familiarity of a given lexeme, therefore we follow the suggestion of an anonymous reviewer to also approach the notion of default from a usage-based perspective (see e.g. Hur, López Otero & Sánchez, 2020 on gender assignment in heritage Spanish speakers).

only to facilitate meaningful comparisons between groups, but also to be able to better understand the processes underpinning gender assignment.

5. Concluding remarks

Gender assignment in mixed NPs generally proceeds on the basis of three strategies: translation equivalent, shape-based, and default. A bilingual speaker community may use a combination of these strategies, or may overwhelmingly prefer just one, which in the case of many Spanish-English communities is often the default. Currently, however, there is insufficient data from a balanced cross-linguistic sample of language dyads to be able to draw clear conclusions as to which linguistic and extralinguistic factors condition these choices. That said, studies focusing on a single language dyad in various locations using multiple methodologies are highly instructive, since they enable us to begin to tease apart the various factors involved in the processing and production of gender assignment (Beatty-Martínez & Dussias 2019).

In order to advance our understanding of gender assignment in mixed NPs, therefore, two key advances are required: (i) a widening of the language dyads under investigation, particularly to include languages with non-binary or ternary gender systems; and (ii) an increase of studies on the same language dyad, ideally employing a ‘corpus to cognition’ approach, namely building experimental materials from naturalistic data (Beatty-Martínez al. 2018). Both avenues should also factor in frequency of code-switching in the community as well as order of acquisition of the languages in the dyad, since these factors are emerging as key factors in gender assignment patterns. A more comprehensive understanding of gender assignment would also contribute to the theoretical advancement of code-switching and bilingual grammar more generally.

Appendix 1: Overview of the studies reported in Section 2, their main gender assignment strategy, language pair(s) and their respective number of genders (in brackets), data collection type and age group studied

Gender assignment strategy	Reported in	Language pair (no. of genders)	Data collection method	Adults or children
Translation equivalent	- Bellamy & Wichers Schreur (u.r.)	- Tsova-Tush (5)-Georgian (0)	- Guided production	- Adults
	- Munarriz Ibarrola et al. (in press)	- Basque (0)- Spanish (2)	- Guided production	- Adults
	- Iriondo (2017)	- Basque (0)- Spanish (2)	- AJT (written)	- Adults
	- Klassen & Liceras (2017)	- Spanish (2)-English (0)	- AJT (written)	- Adults
	- Jorschick et al. (2011)	- German (3)-English (0)	- Naturalistic production	- Children
	- Gómez Carrero (2015)	- English (0)-Spanish (2)	- AJT (written), guided production	- Adults
	- Zabrodskaya (2009)	- Russian (3)-Estonian (0)	- Naturalistic production	- Adults

	- Cantone & Müller (2008)	- German (3)-Italian/French/Spanish (2)	- Naturalistic production	- Children
	- Liceras et al. (2008)	- Spanish (2)-English (0)	- AJT	- Both
	- Radford et al. (2007)	- Italian (2)-English (0)	- Naturalistic production	- Children
	- González-Vilbazo (2005)	- Spanish (2)-German (3)	- Naturalistic production	- Adults
	- Füller & Lehnert (2000)	- German (3)-English (0)	- Naturalistic production	- Adults
	- Treffers-Daller (1993)	- French (2)-Belgian Dutch (3)	- Naturalistic and guided production	- Adults
Phonological analogy	- Bellamy & Wichers Schreur (u.r.)	- Tsova-Tush (5)-Georgian (0)	- AJT (written and spoken), guided production	- Adults
	- Munarriz-Ibarrola et al. (in press)	- Basque (0)-Spanish (2)	- Guided production	- Adults
	- Badiola & Sande (2018)	- Basque (0)-Spanish (2)	- AJT (written)	- Adults

	- Parafita Couto et al. (2015)	- Basque (0)-Spanish (2)	- Naturalistic and guided production, AJT	- Adults
	- Chirsheva (2009)	- Russian (3)-English (0)	- Naturalistic production and observation	- Adults
	- Zabrodskaya (2009)	- Russian (3)- English (0)	- Naturalistic production	- Adults
Default	- Balam, Lakshmanan & Parafita Couto (2021)	- Spanish (2)-English (0)	- Naturalistic production	- Children
	Bellamy, Parafita Couto & Stadthagen-González (2018)	- Spanish (2)-Purepecha (0)	- Directed production	- Adults
	- Delgado (2018)	- Spanish (2)-English (0)	- AJT	- Adults
	- Badiola & Sande (2018)	- Basque (0)-Spanish (2)	- AJT	- Adults

	- Balam (2016)	- Spanish (2)-English (0)	- Naturalistic production	- Adults
	- Valdés Kroff (2016)	- Spanish (2)-English (0)	- Naturalistic production	- Adults
	- Aaron (2015)	- Spanish (2)-English (0)	- Naturalistic production	- Adults
	- Parafita Couto et al. (2015)	- Basque (0)-Spanish (2)	- Naturalistic and guided production, AJT	- Adults
	- Fernández Fuertes et al. (2011)	- Spanish (2)-English (0)	- AJT	- Adults and children
	- Chirsheva (2009)	- American Norwegian (3), American Lithuanian (2), American Portuguese (2), American Italian(2)-English(0)	- Naturalistic production (?)	- Adults
	- Clegg & Watermire (2009)	- Spanish (2)-English (0)	- Naturalistic production	- Adults

	- Zabrodskaya (2009)	- Russian (3)-English (0)	- Naturalistic production	- Adults
	- Liceras et al. (2008)	- Spanish (2)-English (0)	- Naturalistic production, AJT	- Adults and children
	- DuBord (2004)	- Spanish (2)-English (0)	- Naturalistic production	- Adults
	- Otheguy & Lapidus (2003)	- Spanish (2)-English (0)	- Naturalistic production	- Adults
	- Franceschina (2001)	- English (0)-Spanish (2)	- Naturalistic production	- Adult
	- Leisiő (2001)	- Russian (3)-Finnish (0)	- Unclear	- Adults
	- Budzhak-Jones (1998)	- Ukrainian (3)-English (0)	- Naturalistic production, observation	- Adults
	- Chaston (1996)	- Spanish (2)-English (0)	- Naturalistic production	- Adults

	- Clyne (1977) - Weinreich (1953)	- Dutch (2)-English (0) - American German/American Yiddish (3)-English (0)	- Naturalistic production - Production, observation	- Adults - Adults

Note that the same study can appear in more than one strategy. The reader is advised to consult the text for an interpretation of the results summarised here.

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