Formal features in child and adult code-mixing*

JUANA M. LICERAS (UNIVERSITY OF OTTAWA AND INSTITUTO UNIVERSITARIO ORTEGA Y GASSET) AND RAQUEL FERNÁNDEZ FUERTES (UNIVERSIDAD DE VALLADOLID)

ABSTRACT. In this paper we address the issue of the differences and similarities between the mental representation of language in the native bilingual child, the native bilingual adult and the non-native adult. We will show that the comparative priorities for the specification of uninterpretable features in a given pair of languages which are already present in the emergent bilingual grammar are carried out to the adult bilingual grammar but do not show up in the case of the non-native grammar. We will further show that in functional-lexical DP code-mixings, child and adult English/Spanish bilingual production data reveal a clear-cut preference for the Spanish D, without showing any specific preference for ‘gender matching’ items (those where the gender feature of the Spanish D agrees with the one of the Spanish translation equivalent of the English Noun). We will finally show that when processing code-switched English/Spanish or Spanish/English DPs, L1 Spanish speakers and non-native speakers share a preference for the English D followed by a preference for the default Spanish gender, the masculine. However, in the case of the L1 Spanish speakers, this preference is overridden by the ‘gender matching’ option described above. These results, we argue, are consistent with an extended version of the Grammatical Features Spell-out Hypothesis according to which in the process of activating the features of the two grammars, the bilingual child, who relies on the two lexicons, will make code-mixing choices which will favor the functional categories containing the largest array of uninterpretable features.

1. Functional-lexical mixings and the theory of grammar

Some researchers do not consider functional-lexical mixings such as the ones in (1) and (2), to be a grammatical option in adult bilingualism (Poplack 1980; Joshi 1985, Di Sciullo, Muysken & Singh 1986; Belazi, Rubin & Toribio 1994; Toribio 2001), even though the latter type have been widely attested (Poplack 1980; Azuma 1993; Myers-Scotton 1997; Myers-Scotton & Jake 2000; Jake, Myers-Scotton & Gross 2002).

(1)

a. No quiero chocAR
   not want chocke / -ar (Spanish infinitival marker)
   [Simon 3;4 (Fernández et al. 2002-2005)]

b. I am layING myself  (Spanish verbal root ‘wash’)
   [Leo 3;3(Fernández et al. 2002-2005)]

c. Io trinkO / -o (Italian 1st ps present marker)
   [Giulia 3;9-4;5 (Taeschner 1983)]

d. Nonours il a reitÉ
   teddy bear he has ridden / -é (French participle marker)
   [Ivar 2;00,29 [Köppe & Meisel 1995]]

e. Me, me pu, me pushAS push / a-s (Spanish 2nd ps present marker)
   [Lindholm and Padilla 1978]

(2)

a. OTRO book
   another (sing.masc.)
   [Manuela 1;9 (Deuchar CHILDES)]
b. UN sheep [Leo 2;7 (Spradlin et al. 2003a)]
a (sing. masc.)
c. DAS bateau [Ivar 2;00 (Köppe & Meisel 1995)]
the (sing. neuter)
d. LE man [Michael (Swain and Wesch 1975)]
the (sing. masc.)
e. UNA bird [Lindholm and Padilla 1978]

In the case of child bilingualism, these types of mixings are rather pervasive (though not abundant). Köppe and Meisel (1995) argue that functional-lexical mixings are possible in child language only before the corresponding functional category is projected or, if we rephrase this proposal in terms of features, before the specification of features for the two language systems has been fully implemented.

MacSwan (2000), following a well-established tradition, maintains that the mechanisms and constraints that account for monolingual grammars should account for code-switching systems (or bilingual grammars) and that the Minimalist Program can account for both the monolingual and the bilingual faculty. According to this author, the bilingual language faculty has two lexicons and two phonological components but one computational system. However, since in Chomsky’s (1995) model, X₀’s (words) are inputs to Phonological Form (PF), he maintains that code-switching within X₀ (or below) is not permitted.

We would like to take MacSwan’s (2000) proposal a step further in that we will assume that the lexicon has both stems and functional morphemes, as in Halle and Marantz’s (1993) Distributed Morphology. Therefore, as it is the case with a monolingual child who accesses the various lexical pieces and produces words such as the ones in (3), the bilingual child may access the two lexicons and produce instances or lexical-functional mixings such as the ones in (1) above.

(3)
a. GO-ED
b. SAB-O [know + first person sing.]

The existence of two phonological components implies that constituents such as the ones in (1) will either be sent to the English or to the Spanish phonological component, and that adjustments may be made for ensuring their interpretation. Thus, we believe that cases such as (1) are possible even in a grammar where all features are fully specified. However, their productivity—their existence—will be dependant on their interpretability at the two interface levels, which implies that only when the meaning of the stems is preserved in the resulting morpho-phonological shape, with or without adjustments, a given form will make its way into the bilingual system.

In this paper we will only be investigating mixings of free morphemes and substantive categories, specifically D(eterminers) and N(ouns), as in (2). In order to account for the types of functional-lexical mixings in (2), we have to assume that the realization (instantiation) of the computational system will have to conform to each of the two languages. Therefore, the
bilingual child will have to specify the array of features that give form to the functional categories in each language so that the operations MERGE, AGREE and MOVE (Chomsky 1995, 1998) converge. It follows from this that the choices and code-mixing patterns that the bilingual emergent systems display may provide us with information about the features that are activated and how this is accomplished, thus constituting a reflection of how language is represented in the mind of the bilingual child. In the case of the adult bilingual systems, the code-mixing choices and patterns should also respect the constraints imposed by the computational system in that MERGE, AGREE and MOVE should not violate any checking requirements.

Drawing from the well-attested intuition that a basic conflict in the requirements of the two grammars is responsible for ungrammaticality in adult code-switching (Poplack 1980; DiScuillo, Muysken and Singh 1986; Woodford 1987; Belazi, Rubí and Toribio 1994; etc.), MacSwan (1999) adopts Chomsky’s (1995) stipulation according to which features cannot ‘mismatch’ if the derivation is to converge, and accounts for the different grammaticality patterns of the Spanish/Nahuatl code-mixing examples in (4) and (5) on the basis of the mismatch that occurs between the phi-features (Person and Gender) of the Spanish pronominal system and the phi-features of Nahuatl in the case of the second and the third person, and the lack of such a mismatch in the case of the third person. In the latter case, there is no mismatch because the Nahuatl verb does not enter into a checking relation with the Determiner Phrase (DP) due to the fact that it does not contain a subject agreement morpheme.

(4)

a. *Yo nikoas tlakemetl
   yo ni-kkoa-s tlake-me-tl
   I 1S-3Os-buy-FUT garment-PL-NSF
   ‘I will buy clothes’

b. *Tú tikoas tlakemetl
   tú ti-kkoa-s tlake-me-tl
   you/SING 2S-3Os-buy-FUT garment-PL-NSF
   ‘You will buy clothes’

(5)

a. Él kikoas tlakemetl
   él ø-ki-koa-s tlak-eme-tl
   he 3S-3Os-buy-FUT garment-PL-NSF
   ‘He will buy clothes’

b. Ella kikoas tlakemetl
   ella ø-ki-koa-s tlake-me-tl
   she 3S-3Os-buy-FUT garment-PL-NSF
   ‘She will buy clothes’

Sentences (4a) and (4b) are ungrammatical because the D phi-features of the Spanish pronoun do not match the D phi-features borne by T(ense) in the first and second person of
the Nahuatl verb, as shown in (6). In the case of (5a) and (5b), there is no mismatch because no D phi-features are borne by T on the third person of the Nahuatl verb, as shown in (7).

(6)
\[
\begin{array}{c}
\text{DP} \\
[uT, \Phi^{\text{Spanish}}]
\end{array}
\begin{array}{c}
\text{TP} \\
[T, u^{\text{Nahuatl}}]
\end{array}
\]

(7)
\[
\begin{array}{c}
\text{DP} \\
[uT, \Phi^{\text{Spanish}}]
\end{array}
\begin{array}{c}
\text{TP} \\
[T]
\end{array}
\]

[Φ: agreement]

This implies that the theory does not sanction all instances of functional-lexical mixings as ungrammatical in the adult bilingual grammar. Therefore, we should be able to account for the functional-lexical mixings involving a D and an N attested in the adult bilingual data, as shown in (2) above and also in (8).

(8)

a. SE hombre kikoas se kalli 
   [MacSwan 2000]
   se hombre 0-ki-koa-s se kalli
   a man 3S-3Os-buy-FUT a house
   ‘A man will buy a house’

b. EL doorway
   EL research
   EL vacuum
   EL weekend
   UNA broom
   UNA pier
   TANTAS things
   TUS co-workers

These types of mixings have also been attested in the data produced by Martin, an English near-native speaker of Spanish, and by his L1 Spanish speaker interlocutor when code-mixing into English (Franceschina 2001). However, according to Franceschina, while all of Martin’s examples have a masculine D, the ones produced by the native Spanish speaker contain masculine and feminine Ds which happen to match the Spanish translation equivalent of the English N.

In what follows, we will provide an account of D+N code-mixings produced by bilingual children and bilingual adults, as well as of grammaticality judgments on this type of mixings produced by native and non-native speakers of Spanish in order to show that: 1) the language that provides the D to the code-mixed DP in the majority of cases is the language whose D
contains more uninterpretable features (Gender and Number versus only Number in the case of Spanish and French versus English); 2) in the case of the emergent grammar, this is so because in the process of specifying the uninterpretable features, the free morphemes which encode more uninterpretable features are more important for the requirements of the computational system; 3) in the case of the adult bilingual, this preference for the Spanish D seems to continue; 4) Spanish L1 speakers confronted with DP-internal code-mixings require matching of uninterpretable features, while non-native speakers of Spanish do not impose these requirements to code-mixed utterances, a behaviour that we attribute to the fact that adults who acquire a language do not specify features the way children do.

2. The bilingual (English/Spanish) DP system

The feature specification of the English DP and the Spanish DP share the feature Number but not the feature Gender. We will assume, drawing a parallelism with Pesetsky and Torrego’s (2001) proposal concerning the relationship between nominative case (nominative case is a T feature on D) and agreement (Φ) (agreement is a D feature on T), that Gender is an N feature on D and that Gender Agreement is a D feature on N. Thus, inherent Gender and Gender Agreement have to be valued and deleted in the case of the Spanish DPs in (9a), but none have to be valued in the case of the English DPs in (9b).

(9)
a. La [uGen:fem., Φ] casa [Gen:fem., uΦ]
   El [uGen:masc., Φ] libro [Gen:masc., uΦ]

b. The [ ] house [ ]
   The [ ] book [ ]

If we follow MacSwan’s (2000) rationale, all of the code-mixed DPs in (10) would be possible because even though the Spanish D bears the unvalued N feature Gender, the English N does not bear the Gender Agreement D feature, as shown in (11).

(10)
a. La house / La woman
   b. La book / La man
   c. El book / El man
   d. El house / El woman

(11)
La[uGen:fem., Φ] house [ ]
El[uGen:masc., Φ] book [ ]
However, if we assume that the D Agreement feature of the Spanish D requires that the Noun bears a matching feature, none of the mixings in (10) would be possible, unless the English N is assigned the D feature that the Spanish N bears in the Spanish translation equivalent, in which case (10a) and (10c) would be grammatical in a Spanish/English (or English/Spanish) bilingual grammar.

Spanish grammarians (Roca 1989) have proposed that the masculine D is the default form. If this is interpreted as implying that it can value a masculine or a feminine Gender Agreement phi-feature, (10d) a masculine by default D would also be a grammatical option. In fact, based on the code-switched DPs produced by Martin, the near-native speaker of Spanish, and his native interlocutor, Franceschina (2001) argues that the masculine D may be the default form for non-native and near-native speakers but not for native speakers, since only the latter use both masculine and feminine Spanish Ds with English Ns.

With respect to the cases of code-mixings where the D is provided by English, the prediction would also be that both of the examples in (12) would be possible because the English D does not bear a N Gender feature or a Gender Agreement feature, as shown in (13).

(12)

a. The casa / The mujer
b. The libro / The hombre

(13)

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DP
The [ ]      casa [Gen: fem., uΦ]
The [ ]      libro [Gen: masc., uΦ]
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Alternatively, none would be possible if the presence of the corresponding Gender Agreement phi-feature on D is a requirement or if the intrinsic G feature of N had to be valued and deleted on D.

Thus, in terms of feature matching, it looks as if the theory would allow any or none of the possible code-switching alternatives (depending on whether or not the absence of a feature is considered to lead to convergence). What child and adult code-mixing data tell us is that there are clear-cut tendencies that should be accounted for.

Within this system, provided we take the view that these mixings may be grammatical, can we predict any preference in terms of directionality? In principle the alternatives are as follows:

a) In a Spanish D+English N DP, the D Gender Agreement phi-feature is not borne by the N and the N itself does not have the intrinsic G feature that is borne by the Spanish D (see 11).
b) In an English D+Spanish N DP, the intrinsic N Gender feature is not borne by the English D, and this D does not have the intrinsic Gender agreement phi-feature which is borne by the Spanish N (see 13).

If carrying and projecting Gender Agreement (an uninterpretable D phi-feature in N) is more important than carrying Gender (an inherent N feature in D), the Spanish D mixings would be the preferred option. If the opposite is the case, the mixings where English provides the D will be preferred.

3. D-N mixings in child bilingual spontaneous data

As Table 1 shows, the Spanish D is the preferred option in all the cases of English/Spanish bilinguals, even though, as we have argued elsewhere (Liceras 2002, Liceras et al. 2003; Spradlin et al. 2003a), the dominant language of all these children is not Spanish. In the case of Manuela, Leo and Simon, the dominant language was English when these code-mixings utterances were produced. In the case of Mario, Spanish and English alternated as dominant languages during the long period of time when Fantini collected the data.

| TABLE 1. Child bilingual D-N mixings: Spanish/English; French/English and Italian/German |
|-----------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Def Art 'the' | 1 | 18 | 1 | 3 | 7 | 2 | 1 | 10 | 4 | 5 | 6 |
| Ind Art 'a/n' | 4 | 16 | 3 | 1 | 5 | 1 | 2 | 1 | 6 | 1 | 8 |
| Dem. 'this' | 2 | 17 | 6 | — | — | — | — | 1 | 8 | 1 |
| Indef. 'another' | 11 | 5 | 3 | 1 | 1 | 1 | 3 | 1 | 1 | 3 | 2 |
| Poss. 'my' | 6 | — | 1 | — | — | — | — | — | — | — | — |
| Total | 16 | 24 | 22 | 5 | 18 | 3 | 6 | 13 | 16 | 17 | 17 |

The data on this table show that the English D is not a popular option in the child and adult bilingual data. We have argued that this is so (Liceras 2002; Liceras et al. 2003; Liceras, Spradlin and Fernández, forthcoming; Spradlin, Liceras and Fernández 2003b) because, as predicted by our Grammatical Features Spell-out Hypothesis (GFSH), phi-features are responsible for Agreement and they happen to be more important for the operation of the computational component than inherent features as such. In other words, it is the D (the functional category that projects) that imposes agreement upon the DP. Thus a D (the Spanish one) that has this capacity is more important than the N which simply contains the inherent feature. This is so in the case of child bilinguals because they have to specify the features that will make the computational component of the Spanish system work, and this computational component happens to require this type of agreement.
Our GFSH also predicts that in a language pair where the DPs of the two languages share the same number of uninterpretable features (Gender and Number in the case of Italian and German), children will not show a preference for any of the two Ds because they will have to activate both features in the two languages. As Table 1 shows, the code-mixed utterances produced by Lisa and Giulia (Taeschner 1983) confirm the prediction of the GFSH.

4. D-N mixings in adult bilingual spontaneous data

In the case of the adults, the computational component of the Spanish system is already in place, which implies that: (a) adult balanced bilinguals would also show a clear-cut preference for the Spanish D; (b) adult balance bilinguals would add a requirement to the code-mixed pattern: that the Spanish D agrees with the Spanish equivalent of the English N (or that some sort of inherent gender is assigned to the English N). As we will see, the reported production data that is available (Myers-Scotton and Jake 2001; Jake and Myers-Scotton 2002) does support the first assumption but not the second one.

Myers-Scotton and Jake (2001) comment on two studies dealing with spontaneous code-switching by adult Spanish/English bilinguals. According to these authors, in the Milian’s (1996) corpus, 63 out of 67 English Ns produced in so-called Matrix Language contexts, appeared with Spanish Ds. In the Pfaff’s (1979) corpus 747 out of 757 English Ns appeared with Spanish Ds.

Jake et al. (2002), in their analysis of a corpus of spontaneous production by Spanish/English adult bilinguals, found out that of a total of 230 English Ns, 161 appeared with a Spanish D, 21 were full English DPs and 48 had Ø D. In fact, they did not find any Spanish D + English N mixing (Myers-Scotton, personal communication).

In terms of Gender, they report that out of the 161 Spanish Ds, 151 are marked for gender (the other 10 are possessives or appear with proper Ns.) 78 (52%) out of the 151 match the gender of the Spanish counterpart. Thus, the authors conclude that, as in Poplack, Posada and Sankoff (1982), neither phonology nor the translation equivalent predict the gender of the D in a code-switched DP.

These adult bilinguals do not behave like the native Spanish speaker in Franceschina’s (2001) study but rather like Martin, the near-native speaker, in that they seem to use masculine as default since out of the 78 matching DPs, 64 (82%) are masculine and out of the 73 non-matching, 71 (almost 100%) are masculine too.

5. D+N mixings in adult experimental data

Based on the confirmation that the code-mixing patterns seem to provide for the GFSH, we hypothesized that the representation of Gender in the Spanish DP would also prevail in the case of native speakers of Spanish and could be a diagnostic for native-like competence in the case of L2 learners of Spanish. In order to test these hypotheses we formulated a series of research questions and carried out an experiment as follows.
5.1. Subjects

We tested the following subjects:
—72 native speakers of Spanish studying English at a Spanish university.
—61 native speakers of English and 74 native speakers of French studying Spanish at a Canadian university.

Subjects were assigned to four different levels (Table 2) determined by Cantest (cloze test and reading comprehension) and SGEL test (multiple choice test) respectively.

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>L1 English</th>
<th>L1 French</th>
<th>L1 Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>N=20</td>
<td>N=12</td>
<td>N=6</td>
</tr>
<tr>
<td>B</td>
<td>N=15</td>
<td>N=24</td>
<td>N=23</td>
</tr>
<tr>
<td>C</td>
<td>N=15</td>
<td>N=24</td>
<td>N=36</td>
</tr>
<tr>
<td>D</td>
<td>N=11</td>
<td>N=14</td>
<td>N=7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>N=61</td>
<td>N=74</td>
<td>N=72</td>
</tr>
</tbody>
</table>

Subjects were also given a general questionnaire intended to determine their age, time spent in a Spanish or English speaking country, knowledge of other languages, etc.

5.2. Code-switching test

The main features of the code-switching test were as follows:
—Subjects rated each sentence on a scale of 1-5 (1 = sounds bad; 5 = sounds good).
—[+animate] nouns were not included.
—All entries included highly frequent words.
—We avoided cognates and words that are used in English or in Spanish (suéter, ‘pueblo’, ‘ciudad Juárez’), as well as words that graphically could have been from either language (e.g., ‘pared’ wall, which could also be an English verb).
—None of the nouns started with a vowel.
—No words with ‘l’ after EL were included.
—We used different Nouns for Spanish and English.
—Each sentence had between 7 and 10 words.
—Past and future tenses were avoided so that the sentences would be transparent for all levels.
—Common contractions were used.

The test items were distributed as follows:

• 32 SPANISH DETERMINER + ENGLISH NOUN 16 with article EL as in (14), 8 matching/8 non-matching, and 16 with article LA as in (15)

(14)

a. Me resulta difícil dormir en el plane.
   I find it difficult to sleep on the plane.
b. Voy a comprar flores para el church.  
I’m going to buy flowers for the church.

(15)

a. Adriana se pasa las vacaciones en la beach.  
Adriana spends her vacation at the beach.
b. Los pájaros están haciendo un nido en la tree.  
The birds are making a nest in the tree.

—32 ENGLISH DETERMINER + SPANISH NOUN: 16 Masculine Nouns as in (16) and 16 Feminine Nouns as in (17).

(16)
Peter’s mother wants him to sweep the suelo. (floor)

(17)
You have to be careful when driving in the nieve. (snow)

—18 DISTRACTERS which consisted of intrasentential code-switchings at pronominal subject/verb point: 9 begin in Spanish and finish in English as in (18) and 9 begin in English and finish in Spanish as in (19)

(18)
Ana sabe que nosotros eat dinner late  
Ana knows that we eat dinner late

(19)
Professor Martin says that you eres un buen estudiante  
Professor Martin says that you are a good student

—18 FILLERS which consisted of sentences with possible and non-possible deverbal compounds, 9 in Spanish and 9 in English, as in (20) and (21) respectively.

(20)
En esa estación de tren hay dos botaslimpia [limpiabotas]  
In that train station there are two shoe shines

(21)
That boxer looks like a real breaker-bone [bone-breaker]

5.3. Research questions

Based on the predictions made by the GFSH, we formulated the following research questions:

a) Is there a preference for Spanish D in mixed DPs as in production data for L1 Spanish?
b) Do the L1 English speakers prefer the English D?
c) Are matching/non-matching items equally acceptable for L1 Spanish?
d) Do the L1 French speakers behave like L1 Spanish speakers?
e) Is there evidence for the claim of masculine as being the default form?

5.4. Results

Figure 1 shows that all three groups rate higher the sentences containing mixed DPs with an English D (16 and 17) than sentences containing mixed DPs with a Spanish D (14 and 15). The difference is significant in the case of the L2 Spanish groups and in the case of the L1 Spanish group, though to a lower degree in the case of the latter (p-value .0001 versus p-value < .0007).

FIGURE 1: English D versus Spanish D overall by L1

When we compare the choice of English D (16 and 17) with the choice of Spanish D in the cases of gender matching DPs (14a and 15a), the results are radically different for the L1 Spanish group. The non-native Spanish groups continue to show a significant preference for the English determiner as shown in Figure 2.

FIGURE 2: English D versus Spanish Matching D by L1
In fact, as shown in Figure 3, matching is not important for the non-native Spanish speakers. This coincides with the pattern reported by Franceschina in the case of Martin, the L1 English near-native speaker of Spanish who always produces Spanish masculine articles with English Ns. It looks as if non-native speakers do not deal with the phi-feature of the Spanish D.

FIGURE 3: Matching versus non-matching patterns by L1

The Spanish speakers, on the other hand, show a strong preference (the difference is significant) for the matching DPs, which we interpret as evidence that their computational system requires that the N bears the phi-D feature so that it can be valued and deleted.

What figure 4 shows is that masculine is the preferred option for non-native speakers, which implies that they only deal with the unspecified phi-feature (the masculine as default) [compare (11) above that we repeat here and (22)].
The native Spanish speakers prefer to ‘somehow’ force agreement (using the specified fem./masc. phi-feature) upon the English N, as in the revised version of (11) shown in (23).

In terms of whether the degree of L2 competence makes a difference, what Figure 5 shows is that the more proficient subjects get the less they like code-switched DPs. It also shows that L2 Spanish competence does not lead to native-like judgements in terms of preference for the Spanish D in matching DPs versus the English D, a preference that the Spanish L1 group shows regardless of their competence in English. The behaviour of the most advanced group—though the difference is not significant—seems to suggest some kind of ‘language attrition’, though we would like to be cautious when dealing with these groups because we do not think that the cloze test section of the CANTEST that we used allows us to discriminate proficiency levels in a precise way.
6. Conclusions

6.1. Production data

The production data that we have analyzed show that children prefer the Spanish D. We attribute this to their need to specify the unintepretable features of the Spanish DP. We would like to suggest that they start with non-specified DPs, as in (24).

(24)

$$\begin{align*}
&\text{D} & \text{DP} & \text{N} \\
&\text{El/La [uGen, } \Phi] & \text{house [ } & ] \\
&\text{El/La [uGen, } \Phi] & \text{book [ } & ]
\end{align*}$$

They go through a stage where their DPs are like the ones in (25); namely, the Gender Agreement phi-features of the Spanish D is present in the English N but it is not specified.

(25)

$$\begin{align*}
&\text{D} & \text{DP} & \text{N} \\
&\text{El/La [uGen, } \Phi] & \text{house [u}\Phi & ] \\
&\text{El/La [uGen, } \Phi] & \text{book [u}\Phi & ]
\end{align*}$$

Finally, if they continue to produce code-switched DPs as adult bilinguals, they seem to avoid sub-specification by choosing the default form as in (23) over the option represented by (11) which would stand for both matching and non-matching DPs.

6.2. Experimental data
The experimental data allow us to investigate the acceptance or processing of sentences with code-switched elements by native speakers of Spanish and English but our results cannot be compared to the previous results because the subjects who participated in the experiment were not balanced (or simultaneous) bilinguals but rather non-native speakers of English or Spanish with different levels of proficiency. However, these data allow us to answer the research questions formulated on the basis of the GFSH as follows:

a) Is there a preference for Spanish D in mixed DPs as in production data for L1 Spanish? The answer is no. In fact, overall, our subjects prefer the English D. We believe that this is so because since it is the D that projects and triggers agreement, by choosing a D that does not have a phi-feature, agreement does not have to be triggered and the processing of these elements does not create problems for the computational system. Therefore, this leads us to conclude that in terms of processing, the phi-feature of the D has more weight than the Gender feature of the N.

b) Do the L1 English speakers prefer the English D? Our results indicate that they do, which supports our claim that the English D creates less problems for the computational system.

c) Are matching/non-matching items equally acceptable for L1 Spanish? Matching items are the significantly preferred option, a pattern that is very different from the one that has been reported in the case of the spontaneous data produced by adult bilinguals. Once more we interpret these results as evidence that when L1 Spanish speakers are to process a code-switched DP whose D carries a gender phi-feature, they need to value and delete this feature and therefore tend to value and delete it by associating the English N to its Spanish equivalent. In other words, if there is a feature mismatched between the D and the N, the DP is highly dispreferred (the computation does not take place).

d) Do the L1 French speakers behave like L1 Spanish speakers? Even though French D also bears the uninterpretable feature Gender, our L1 French speakers do not behave like the L1 Spanish speakers. In the first place, these L1 French subjects are closer to the L1 English subjects in terms of choosing the English D. Second, these subjects are different from both the L1 Spanish and the L1 English group in that they are much more reluctant to accept mixed DPs. Finally, in terms of forcing agreement by choosing the matching DPs, it looks as if the phi-feature of the French D (and its computational value) is not ‘transferred’ to these subjects’ non-native Spanish.

e) Is there evidence for the claim of masculine as being the default form? In the case of the results obtained from the non-native speakers there seems to be evidence that masculine is the preferred form of the Spanish D. However, in the case of the L1 Spanish speakers, and unlike it was the case for the bilingual production data, our experimental data clearly show a preference for the matching over the masculine as default alternative (Figure 4).

6.3. The representation of the Gender feature in the mind of bilingual speakers, L1 speakers and non-native speakers
Our data show that, in terms of production, the Spanish D is the preferred code-switching option for child and adult bilinguals. This is so because in the process of acquisition, the D Agreement Gender (a phi-feature) is more relevant than the inherent feature Gender for the for the computational component that is represented in the mind of the bilingual.

In terms of processing, both options (English D/Spanish D) can be interpreted but unless there is matching, the lack of the phi-feature (the English D) seems to be the less problematic. The presence of an underspecified phi-feature (the default option) is also less problematic (as in White et al. 2004) than the presence of an specified phi-feature which does not trigger agreement. This is the reason why matching is the preferred option for the native speakers.

Therefore, while the spontaneous production data does not seem to show a clear preference for matching, the experimental data does. These results raise further questions that will have to be investigated. The first one is whether, as these results seem to suggest, the bilingual representation of gender and the L1 speaker’s representation of gender are different. These results also raise the question of whether the relevance of the Agreement Gender versus the inherent Gender feature is linked to the data elicitation tasks: spontaneous production versus acceptability judgments. One possible way of addressing both these issues that we are about to pursue is to investigate how adult bilinguals in a code-switching community will perform when confronted with this same experimental task.

REFERENCES


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1 See also Fuller and Lehnert (2000) for cases of German code-mixing into English.

2 This follows from the Grammatical Features Spell-out Hypothesis (GFSH) that we refer to below.

3 White et al. (2004), who also refer to similar findings by other researchers, report that English and French learners of Spanish, both in production and in comprehension tasks, tend to use masculine Determiners and Adjectives with feminine Nouns but not the opposite. White et al. (2004) suggest that this is consistent with the proposal that if masculine is the default form (Harris 1991) and features in the lexical items can be underspecified (Lumsden 1992), there should not be a clash of features when a masculine Determiner or a masculine Adjective co-occur with a [+fem] Noun, since they bear default agreement (non-specified). The opposite would result in a clash of features because a feminine Determiner and a feminine Adjective would bear the features [+fem] and would therefore clash with a [+mas] Noun.

4 This would be the case if we adopt Lumsden’s (1992) proposal that features in the lexical items can be underspecified.

5 German determiners have case but the case feature is not checked within the DP.