

## THE REPRESENTATION OF GENDER IN THE MIND OF SPANISH-ENGLISH BILINGUALS: INSIGHTS FROM CODE-SWITCHED ADJECTIVAL PREDICATES

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**ABSTRACT.** This study examines bilinguals' gender use strategies in code-switched agreement (e.g. *the moon es bonita*) and concord (e.g. *la moon*) structures. Thirty-five L1 Spanish-L2 English adult bilinguals and 43 L1 English-L2 Spanish adults with an intermediate (N=18) or advanced (N=25) level of proficiency in Spanish completed an acceptability judgment task in which they rated code-switched Adjectival Predicates and Determiner Phrases. The results show that only the L1 Spanish-L2 English bilinguals prefer the Adj (in the case of agreement) or the D (in the case of concord) to be marked for the gender of the Spanish translation equivalent of the English N, but that all groups rate agreement structures higher than concord structures. Both of these findings corroborate previous work on intrasentential code-switching, however, this is the first study to offer an account for the contrast in processing difficulty between agreement and concord structures. We argue that this difference can be explained in terms of the way in which the features are valued in agreement and in concord. Under the double-feature valuation mechanism (Licerás et al., 2008), in agreement both features are valued in a single direction, while in concord the features are valued in two different directions. It is the unidirectionality of the feature valuation mechanism in agreement that makes code-switched agreement structures such as Adjectival Predicates easier to process.

**Keywords:** Spanish-English bilinguals, gender in code-switching, double-feature valuation mechanism, agreement, concord, directionality in feature checking, analogical criterion

**RESUMEN:** En este trabajo se examinan las estrategias de uso de género de los bilingües en estructuras con alternancia de código de concordancia de predicado adjetivo (e.g. *the moon es bonita*) y en estructuras de acuerdo de determinante y sustantivo (e.g. *la moon*). Un grupo de 35 adultos bilingües con L1 español y L2 inglés y 42 adultos con L1 inglés y L2 español, con español de nivel intermedio (N=18) y de nivel avanzado (N=25), completaron una tarea de juicios de aceptabilidad en la que tenían que asignar un valor a Predicados Adjetivos y a Sintagmas Determinantes con alternancia de código. Los resultados muestran que solamente los bilingües con L1 español prefieren que el Adj (en el caso de la concordancia de predicados adjetivos) o el Det (en el caso del acuerdo entre determinante y sustantivo) esté marcado con el género de la palabra española con la que se traduce el sustantivo inglés, mientras que todos los grupos dan una puntuación mayor a las estructuras de concordancia de predicado adjetivo que a las de concordancia de determinante y sustantivo. Si bien ambos resultados confirman los que se han obtenido en estudios previos sobre alternancia de código dentro de la oración, este es el primer trabajo que trata de explicar el contraste que se produce a la hora de pro-



cesar las estructuras de concordancia de predicado adjetivo y las de acuerdo entre determinante y sustantivo. Lo que defendemos aquí es que esta diferencia se puede explicar a partir de la forma en que los rasgos se cotejan en estas dos estructuras. Según el mecanismo del doble cotejo de rasgos (Liceras et al., 2008), en la concordancia de predicado adjetivo los dos rasgos se valúan en una sola dirección mientras que en la concordancia de determinante y sustantivo se valúan en dos direcciones diferentes. Es precisamente la unidireccionalidad del mecanismo de valuación que caracteriza a la concordancia de predicado adjetivo lo que hace que esas estructuras de alternancia de código sean más fáciles de procesar.

**Palabras clave:** Bilingües español-inglés, género en la alternancia de código, mecanismo de doble cotejo de rasgos, concordancia de predicado adjetivo, acuerdo de determinante y sustantivo, direccionalidad del cotejo de rasgos, criterio analógico

## 1. Introduction

Examining how bilinguals process grammatical gender in code-switched utterances not only helps us to refine formal proposals on the grammar of code-switching but also provides further insight into how features such as gender are represented and processed in the bilingual mind. Intrasentential code-switching in spontaneous speech is widely attested in child and adult bilinguals with diverse linguistic profiles (e.g., Spanish-English (Liceras, Spradlin & Fernández-Fuertes, 2005; Myers-Scotton & Jake, 2001; Moyer, 1993; Poplack, 1980), Japanese-English (Azuma, 1993), Spanish-German (Eichler, Hager & Müller, 2012; González-Vilbazo, 2005), French-German (Radford, Kupisch, Köppe & Azzaro, 2007), Italian-German (Cantone & Müller, 2008; Eichler, Hager & Müller, 2012), and French-Italian (Eichler, Hager & Müller, 2012)). Previous research on Spanish-English bilinguals' use of gender in intrasentential code-switching has revealed two different strategies: agreement with the Spanish translation equivalent of the English noun (as in 1 and 2) and the use of masculine agreement as a default (as in 3 and 4).

- (1) the moon<sub>[lunaF]</sub> es bonita<sub>[beautifulF]</sub>  
'the moon is beautiful'
- (2) la<sub>[theF]</sub> moon<sub>[lunaF]</sub>  
'the moon'
- (3) the moon<sub>[lunaF]</sub> es bonito<sub>[beautifulM]</sub>  
'the moon is beautiful'
- (4) el<sub>[theM]</sub> moon<sub>[lunaF]</sub>  
'the moon'

The use of each of these strategies has been shown to vary according to the language profile of the bilinguals (i.e. their dominant language) and the type of code-switched structure (e.g. concord or agreement) (see Liceras, Fernández-Fuertes & Klassen, 2016 for an overview).

In this article, we focus on L1 Spanish-L2 English and L1 English-L2 Spanish bilinguals' gender agreement strategies in code-switched Adjectival Predicates such as (1) or (3). Using an acceptability judgment task, we investigate whether these bilinguals display different strategies in concord (e.g. Determiner Phrases, DPs) and agreement structures (e.g. Adjectival Predicates) and how formal proposals of code-switching can account for the results.

## 2. The gender feature in Spanish and English

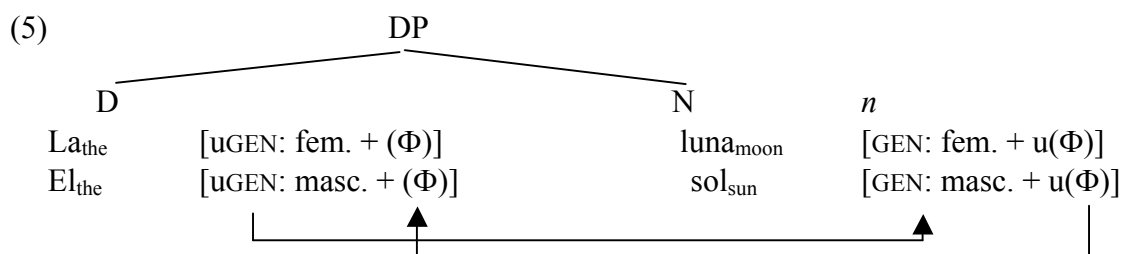
Gender is an abstract morphosyntactic feature not deducible from the meaning of the noun that serves as a nominal classifier (Corbett, 1991; Roca, 1989; Harris, 1991). English does not display a formal gender feature but rather has a semantic – or natural – gender system in which gender is only marked pronominally (e.g. *he/she/it*). In contrast, Spanish has a binary grammatical gender system in which approximately 52% of the nouns are classified as masculine and 45% feminine (Bull, 1965)<sup>1</sup>. Masculine is considered to be the least-marked and therefore default gender value, and thus the gender feature is formalized as  $[\pm\text{feminine}]$  (Roca, 1989; Harris, 1991). Gender marking on nouns in Spanish is phonologically regular, with the word ending *-o* corresponding to masculine in almost all instances (99.87%) and *-a* corresponding to feminine somewhat less reliably (96.30%), though still in the vast majority of cases (Teschner & Russell, 1984). Gender is also marked through agreement on determiners, adjectives, participles and pronouns.

## 3. Formal account of gender agreement strategies

### 3.1. Agreement with the Spanish translation equivalent of the English noun

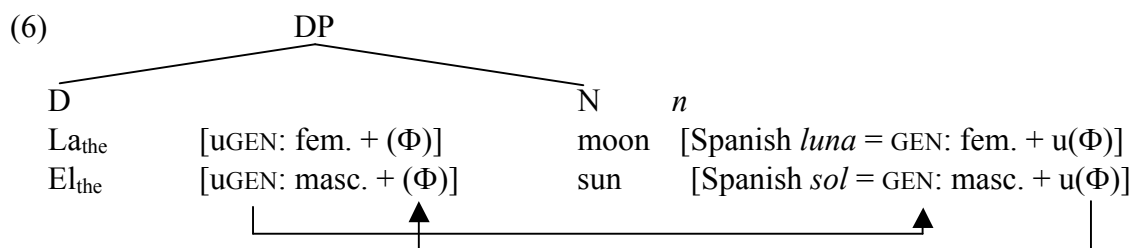
The gender use strategy in which the bilingual prefers or produces an Adjective (Adj; in the case of agreement) or Determiner (D; in the case of concord) that agrees with the Spanish translation equivalent of the English Noun (N) has been referred to as the ‘analogical criterion’ (Otheguy & Lapidus, 2005). Liceras and colleagues (2008) offer a minimalist syntactic account of the analogical criterion, the *double-feature valuation mechanism*, which is an extension of Pesetsky and Torrego’s (2001) proposal applied to concord and agreement structures. Fundamentally, the proposal states that in order to establish agreement in Spanish two features must be valued: a GENDER feature (GEN) and a GENDER AGREEMENT feature ( $\Phi$ ).

Establishing a parallel relation with Pesetsky and Torrego’s (2001) proposal according to which nominative case is seen as a Tense feature on D and agreement as a D feature on Tense, Liceras and colleagues (2008) assume that there is a relationship between inherent lexical GENDER (GEN) and GENDER AGREEMENT ( $\Phi$ ). This implies that GEN is seen as an N feature on D and  $\Phi$  as a D feature on N. Inherent lexical GEN is a formal property of Nouns that have a functional category, *n*, which functions as a nominalizer (Kihm, 2005), along the same lines as the verbalizing *v* proposed by Marantz (1997) within the framework of Distributed Morphology. The diagram in (5) is a simplified illustration of the valuation mechanism that occurs in the Spanish DP.

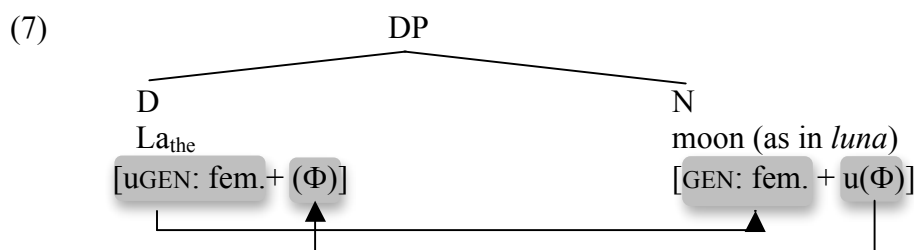


<sup>1</sup> The remaining 3% are nouns such as *periodista* (‘journalist’) that can be used as either masculine or feminine (Clegg, 2010).

Spanish DPs have the uninterpretable GEN feature in D (feminine in *la* and masculine in *el*) that needs to be valued and properly deleted when matched with the interpretable GEN feature in *n* (feminine in *luna* and masculine in *sol*). Regarding  $\Phi$ , *n* contains the uninterpretable  $\Phi$  feature that needs to be valued via matching with the corresponding interpretable  $\Phi$  feature in D.

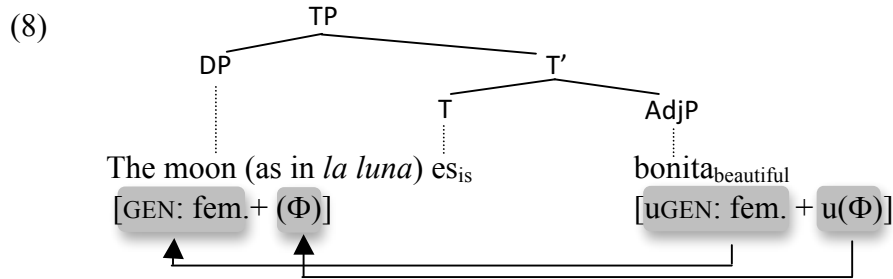


While this valuation mechanism does not take place in English DPs due to the lack of a GEN feature, the presence of the  $\Phi$  feature on the Spanish D requires that the GEN feature be valued in switched DPs consisting of a Spanish D and an English N. In order to comply with the analogical criterion, the Spanish N imposes its *n* inherent  $\Phi$  feature on the English N, even though it is not phonetically realized, as shown in (6).



In (7) the D bears an inherent  $\Phi$  feature and an uninterpretable GEN feature while the N bears an inherent GEN feature and an uninterpretable  $\Phi$  feature. In the process of acquisition, the bidirectional (right-to-left in the case of the  $\Phi$  feature and left-to-right in the case of the GEN feature) valuation of the two uninterpretable features is carried into the switched DP (illustrated by the arrows in 7). This implies that the uninterpretable feminine GEN feature in the Spanish D is valued by the inherent feminine GEN feature that ‘moon’ acquires from the Spanish translation equivalent *luna*. It also implies that the uninterpretable  $\Phi$  feature inherited by ‘moon’ is valued by the inherent  $\Phi$  feature of the Spanish D *la*. Both have the feminine value so the valuation mechanism does not crash (i.e. the switch abides by the analogical criterion).

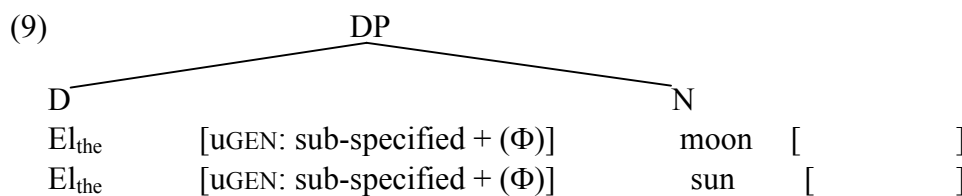
Building on the proposal with DPs, the *double-feature valuation mechanism* also accounts for the use of the analogical criterion in switched predicate agreement structures such as that in (8).



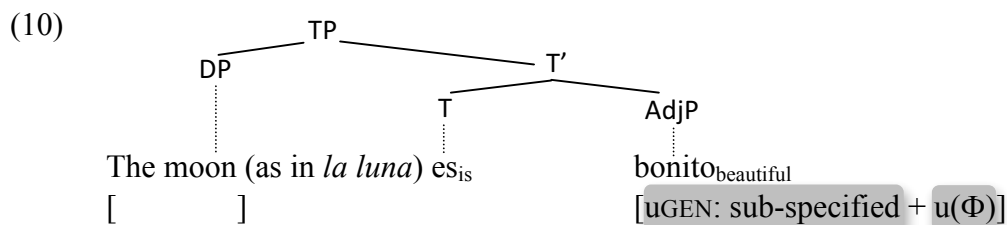
In this case, the Spanish adjective *bonita* bears two uninterpretable features, GEN and  $\Phi$ . The valuation mechanism takes place between the DP subject (which has inherited the valued GEN and  $\Phi$  features from the Spanish equivalent *la luna*) and the Spanish Adjective. The arrows illustrate that, in agreement structures, the feature valuation process is unidirectional as both features are valued from right-to-left.

### 3.2. Masculine agreement as a default

Another attested gender strategy in Spanish-English code-switching is the use of masculine agreement as a default. Masculine is considered to be the default value in Spanish (Harris, 1991; among others) and a significant body of research has also shown it to be the learner default (see for instance Franceschina, 2001). In switched DPs where the masculine as default option holds, the Spanish D does not need to share its features and the lexical item that normally bears the masculine value is used with any Spanish N regardless of its inherent GEN value, as shown in (9).



In (9), since the feature GEN is sub-specified, there is no clash of features even if a masculine D co-occurs with a [+fem] N (e.g. when the Spanish translation equivalent of the English N is feminine).



In agreement structures if the feature GEN is also sub-specified, such as in (10), masculine as default option will also hold. Thus, there will be no clash of features even if a masculine AdjP co-occurs with an English DP that contains an English N with a [+fem] translation equivalent in Spanish.

#### 4. Previous research

##### 4.1. Spanish dominant Spanish-English bilinguals

The majority of experimental code-switching data from Spanish-dominant bilingual adults has shown that these speakers prefer and produce switches that adhere to the analogical criterion.

This preference has been shown in acceptability judgment tasks in which speakers rated code-switched sentences containing Adjectival Predicates and DPs matched or mismatched in gender with the Spanish translation equivalent of the English N. With respect to the analogical criterion in concord structures, Liceras and colleagues (2008) found that L1 Spanish-L2 English bilinguals rated gender-matching switched DPs (as in 11) significantly higher than gender non-matching ones (as in 12) ( $p=.001$ ).

- (11) El niño está abriendo **la<sub>F</sub> door**. (as in *puerta<sub>F</sub>*)  
 ‘The boy is opening the door.’
- (12) El pájaro está en **el<sub>M</sub> hand**. (as in *mano<sub>F</sub>*)  
 ‘The bird is on the hand.’

Liceras’ 2013 follow-up study including both agreement (Adjectival Predicates) and concord (DPs) structures again revealed that L1 Spanish-L2 English bilinguals living in Spain and in Canada rated gender-matching switches significantly higher than non-matching ones ( $p<.001$ ). There was also a tendency for both groups to show a stronger preference for the analogical criterion in agreement (as in 13) than in concord structures (as in 11), though this effect was not statistically significant.

- (13) The house es **pequeña<sub>F</sub>**. (as in *la<sub>F</sub> casa<sub>F</sub> es pequeña<sub>F</sub>*)  
 ‘The house is small.’

Valenzuela and colleagues (2012) also found evidence of L1 Spanish-L2 English bilinguals’ preference for the analogical criterion in switched agreement and concord structures. In a sentence selection task where they were asked to choose the most natural-sounding response to short switched dialogues, these bilinguals opted for the gender-matching reply with both copula constructions (14a) and DPs (15a).

- (14) Elisa: Ayer fue el cumpleaños de Fernando.  
 Juan: Really? And how was **the party**? (as in *fiesta<sub>F</sub>*)  
 a. Fue **fantástica<sub>F</sub>**  
 b. Fue fantástico<sub>M</sub>  
 ‘Elisa: Yesterday was Fernando’s birthday.  
 Juan: Really? And how was the party?  
 a/b. It was fantastic’
- (15) Juan: I had lots of fun anoche, pues, I ran into Sergio.  
 Elisa: Seriously? ¿Dónde lo viste?  
 a. En **la<sub>F</sub> party** (as in *fiesta<sub>F</sub>*)  
 b. En el<sub>M</sub> party  
 ‘Juan: I had lots of fun last night, well, I ran into Sergio.  
 Elisa: Seriously? Where did you see him?  
 a/b. At the party’

The preference for the analogical criterion in code-switching has also been shown in spontaneous data and is not limited to Spanish-dominant bilinguals. Simultaneous Spanish-English bilingual adults in Gibraltar produced significantly more switched Spanish-English DPs that adhere to the analogical criterion ( $p < .05$ ) than DPs that do not (Liceras, Spradlin & Fernández-Fuertes, 2005). In addition, simultaneous French-German bilingual children displayed a preference for the analogical criterion in their production of French-German switched DPs (Radford et al., 2007).

#### 4.2. *English dominant Spanish-English bilinguals*

In contrast to the Spanish-dominant Spanish-English bilinguals, a number of studies have shown that English-dominant bilinguals tend to opt for the use of masculine as a default strategy.

In their acceptability judgments, Liceras and colleagues (2008) found that L1 English-L2 Spanish bilinguals showed no significant preference for concord structures that adhered to the analogical criterion, rating switched DPs that exhibited the use of masculine as a default (as in 12) higher than gender-matching ones (as in 11).

Valenzuela and colleagues (2012) found further evidence of the lack of a clear preference for the analogical criterion in Spanish Heritage speakers' responses to the sentence selection task. While the Heritage speakers consistently selected gender-matching agreement and concord sentences with masculine Nouns, with feminine Nouns only 56% of selected switched DPs and 71% of selected copula structures adhered to the analogical criterion. These results are suggestive of a masculine as default strategy and also show that this group is significantly more sensitive to the analogical criterion in agreement than concord structures ( $p < .000$ ).

The use of a default strategy has also been shown in spontaneous Spanish-English data as well as experimental data from other bilinguals. In a semi-guided picture description task, L1 English-L2 French-L3 Spanish bilingual adults primarily produced Spanish-English switched DPs that displayed the use of a masculine as default strategy (Llama, Klassen, Collins & Cardoso, 2011). Interestingly, while the majority of studies have found that masculine is the gender value used as a default, Parafita Couto and colleagues (2016) show that Spanish-Basque adult bilinguals tended to use feminine as a default in rating auditory Spanish-Basque DPs.<sup>2</sup>

#### 4.3. *Use of gender in agreement versus concord structures*

It is interesting that many of the studies summarized above have shown that the use of gender in code-switching seems to vary according to the type of structure. While Liceras (2013) found that both groups of L1 Spanish-L2 English bilinguals adhered to the analogical criterion with both agreement and concord structures, there was some evidence that even these Spanish-dominant bilinguals were more sensitive to the analogical criterion in agreement. The data show that the L1 Spanish-L2 English bilinguals living in Canada were somewhat more sensitive to gender mismatch in Adjectival Predicates (rating of

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<sup>2</sup> It is relevant to note that the use of a gender default strategy in agreement and concord structures has also been shown in non-switched data from other languages such as L2 German (Klassen, 2016) and L2 Italian (Bianchi, 2013).

1.45 out of 4) than in switched DPs (1.8 out of 4) while the bilinguals living in Spain were clearly more sensitive to gender match with Adjectival Predicates (3.0 out of 4) than with switched DPs (2.55 out of 4).

Valenzuela and colleagues' 2012 study revealed that the higher sensitivity to the analogical criterion with agreement structures was significant with Spanish Heritage speakers. These bilinguals selected 15% more responses to the switched dialogues that adhered to the analogical criterion with copula structures than switched DPs.

Despite this emerging pattern in the data, to date no account has been put forward for these results. In the present study we aim to replicate this distinction between gender use in switched agreement and concord structures using a different task and by focusing on L1 English-L2 Spanish bilinguals with different proficiency levels in Spanish, in addition to L1 Spanish-L2 English bilinguals. Specifically, we address the following questions: 1) what gender use strategy to does each of these groups of bilinguals use in intrasentential code-switching; and 2) do these bilinguals treat agreement and concord structures the same?

## 5. Method

In this study, 2 groups of L1 English-L2 Spanish and 1 group of L1 Spanish-L2 English adult bilinguals completed an acceptability judgment task in which they rated code-switched sentences containing agreement and concord structures.

### 5.1. Participants

Forty-three L1 English-L2 Spanish and 35 L1 Spanish-L2 English adult bilinguals aged 18 to 40 participated in this experiment. The L1 English-L2 Spanish speakers were divided into two groups according to their level of proficiency in Spanish. Spanish proficiency was measured by the Wisconsin Spanish Placement Test (total of 36 points), with participants scoring up to and including 30 classified as intermediate and participants who scored 31 and higher considered to be advanced. A summary of the participants is presented in Table 1.

*Table 1. Participants.*

<b>Bilingual profile</b>	<b><i>N</i></b>	<b>Spanish proficiency level</b>	<b>Mean score (%)</b>
<b>L1 English-L2 Spanish</b>	18	intermediate	25.9 (71.94%)
	25	advanced	32.7 (90.83%)
<b>L1 Spanish-L2 English</b>	35	---	---

Both groups of L1 English-L2 Spanish speakers were recruited from Spanish language courses at the University of the West Indies in Trinidad and Tobago, and the L1 Spanish speakers were recruited in English Philology courses at the University of Valladolid in Spain. The age of acquisition of the L2 for all participants was either adolescence or adulthood as part of high school or universi-



ty classes. In addition to L2 Spanish, the L1 English participants also had some knowledge of Creole and French.<sup>3</sup>

### 5.2. Materials

The experimental stimuli consisted of 12 switched Adjectival Predicates of the type [English DP + *es* + Spanish Adj] as well as 12 switched DPs of the type [Spanish D + English N]. Half of each type of stimulus contained masculine Ns while the other half included feminine Ns. Each of these structures was presented as the response to a contextualizing question and also appeared with a picture. Examples of Adjectival Predicate and DP stimuli appear in (16) and (17), respectively.

(16)



Why do you like the building?

- **The building es moderno.**

(‘The building is modern.’)

(17)



What is the man doing?

- **El señor está mirando por el window.**

(‘The man is looking out the window.’)

The contextualizing question always appeared in English in the experimental stimuli. With the Adjectival Predicates, the response consisted of the entire experimental stimulus (DP + *es* + Adj). The DP stimuli were embedded in a Spanish response sentence and always appeared sentence-final.

In addition to the experimental stimuli, two types of distractors and two types of fillers were included in the task. All the distractors and fillers contained intrasentential code-switching and included a picture so as to mirror the experimental stimuli. The distractors consisted of 12 switched Adjectival Predicates and 13 switched DPs which were similar to the experimental stimuli except that the Adjs and Ds appeared in English and thus there was no gender agreement or concord (see examples in 18 and 19).<sup>4</sup>

(18) La maleta is **big**.  
‘The suitcase is big.’

<sup>3</sup> Neither of these languages is expected to have influenced the results of this study given that the Creole is like English in that it does not have a formal gender feature and none of the nouns in the experimental stimuli had a different gender value in French than in Spanish.

<sup>4</sup> Note that there were equal proportions of Spanish and English sentences presented to the participants in this study. While the experimental stimuli consisted of a contextualizing question in English followed by a code-switched response, the distractors consisted of a contextualizing question in Spanish followed by a code-switch response. Due to the design of the stimuli, it is expected that both of the bilinguals’ languages were equally activated during the task.

- (19) She is singing **the canción**.  
 ‘She is singing the song.’

The fillers were comprised of 24 switches between the subject and the verb as well as 15 NN and deverbal compounds in Spanish and in English.

5.3. Design

The acceptability judgment task consisted of a total of 88 stimuli (24 experimental, 25 distractors and 39 fillers).

Table 2. Distribution of experimental stimuli

Structure	Adheres to the analogical criterion		Other agreement/concord	
	masculine Ns	feminine Ns	masculine Ns	feminine Ns
Adjectival Predicates	3	3	3	3
DPs	3	3	3	3

Gender agreement and concord in the experimental stimuli were manipulated such that half of the stimuli adhered to the analogical criterion (e.g. the Spanish Adj or D was marked for the gender of the Spanish translation equivalent of the English N that appeared in the sentence) and the remaining half did not. The distribution of the experimental stimuli appears in Table 2 with examples of each type of stimulus in (20)-(23) (analogical criterion indicated in bold).

- (20) masc N AdjPred      the building es **moderno<sub>M</sub>** / moderna<sub>F</sub>  
 (as in *el<sub>M</sub> edificio<sub>M</sub>*)  
 ‘the building is modern’
- (21) fem N AdjPred      the flower es **hermosa<sub>F</sub>** / hermoso<sub>M</sub>  
 (as in *la<sub>F</sub> flor<sub>F</sub>*)  
 ‘the flower is pretty’
- (22) masc N DPs          **el<sub>M</sub>** / la<sub>F</sub> sun  
 (as in *sol<sub>M</sub>*)  
 ‘the sun’
- (23) fem N DPs          **la<sub>F</sub>** / el<sub>M</sub> window  
 (as in *ventana<sub>F</sub>*)  
 ‘the window’

The stimuli were randomized such that the same type of stimulus could not appear more than three times consecutively and two lists were created to counterbalance the order of presentation. Written instructions in Spanish as well as a short practice session were presented at the beginning of the experimental session. The practice session consisted of 8 stimuli containing types of code-switches other than those in the experimental and distractor stimuli and was designed to acclimate the participants to intrasentential code-switching. Feedback was provided to the participants during the practice session in order to train them to use all the points on the Likert scale.

#### 5.4. Procedure

Participants performed a written acceptability judgment task in which they were asked to rate code-switched stimuli on a 4-point Likert scale indicated by emoticons and ratings (24). The ratings corresponded to the following values on the scale: 4 – *excelente* (excellent); 3 – *bastante bien* (quite good); 2 – *bastante mal* (quite bad); 1 – *muy mal* (very bad).



The task was administered in the classroom using PowerPoint. While the task was not timed, the participants were only able to view each stimulus for 8 seconds and were not permitted to go back. Each experimental session lasted approximately 45 minutes. Prior to the experimental task, the L1 English-L2 Spanish participants took a Spanish proficiency test and all participants completed a language background questionnaire.

#### 6. Results

Repeated-measures analyses of variance (ANOVA) were run on the mean acceptability ratings calculated by participant for each group. The factors were Gender (masculine Ns versus feminine Ns), Match (switch adheres to analogical criterion versus switch does not adhere to analogical criterion), Task (agreement versus concord) and Group (intermediate L2 Spanish versus advanced L2 Spanish versus L1 Spanish). Gender, Match and Task were within-subjects factors while Group was a between-subjects factor.

The omnibus ANOVA revealed significant main effects of Match ( $F(1,70)=63.679$ ,  $p<.000$ ,  $\eta_p^2=.476$ ), Task ( $F(1,70)=10.333$ ,  $p=.002$ ,  $\eta_p^2=.129$ ) and Group ( $F(2,70)=26.141$ ,  $p<.000$ ,  $\eta_p^2=.428$ ) but no main effect of Gender ( $F(1,70)=.150$ ,  $p=.699$ ). There were also significant two-way interactions between Gender and Group ( $F(1,70)=9.025$ ,  $p<.000$ ,  $\eta_p^2=.205$ ), Match and Group ( $F(1,70)=43.850$ ,  $p<.000$ ,  $\eta_p^2=.556$ ), and Gender and Task ( $F(1,70)=5.531$ ,  $p=.021$ ,  $\eta_p^2=.073$ ), as well as a three-way interaction between Gender, Task and Group ( $F(2,70)=7.364$ ,  $p=.001$ ,  $\eta_p^2=.174$ ). All of the data is presented in Tables 3 and 4.

Table 3. Mean ratings for agreement structures (Adjectival Predicates).

Group	Masculine Ns		Feminine Ns	
	<i>analogical criterion</i>	<i>other</i>	<i>analogical criterion</i>	<i>other</i>
<b>intermediate L2 Spanish</b>	2.68 (.14)	2.67 (.12)	2.77 (.13)	2.63 (.12)
<b>advanced L2 Spanish</b>	3.06 (.15)	3.17 (.14)	3.15 (.14)	3.11 (.14)
<b>L1 Spanish</b>	2.69 (.11)	1.55 (.11)	2.79 (.11)	1.77 (.10)

Standard Error of the Mean appears in parentheses.

Table 4. Mean ratings for concord structures (switched DPs).

Group	Masculine Ns		Feminine Ns	
	<i>analogical criterion</i>	<i>other</i>	<i>analogical criterion</i>	<i>other</i>
<b>intermediate L2 Spanish</b>	2.90 (.11)	2.65 (.12)	2.32 (.14)	2.28 (.12)
<b>advanced L2 Spanish</b>	2.82 (.12)	2.59 (.14)	3.02 (.16)	2.81 (.14)
<b>L1 Spanish</b>	2.64 (.09)	1.64 (.10)	2.70 (.12)	1.53 (.10)

Standard Error of the Mean appears in parentheses.

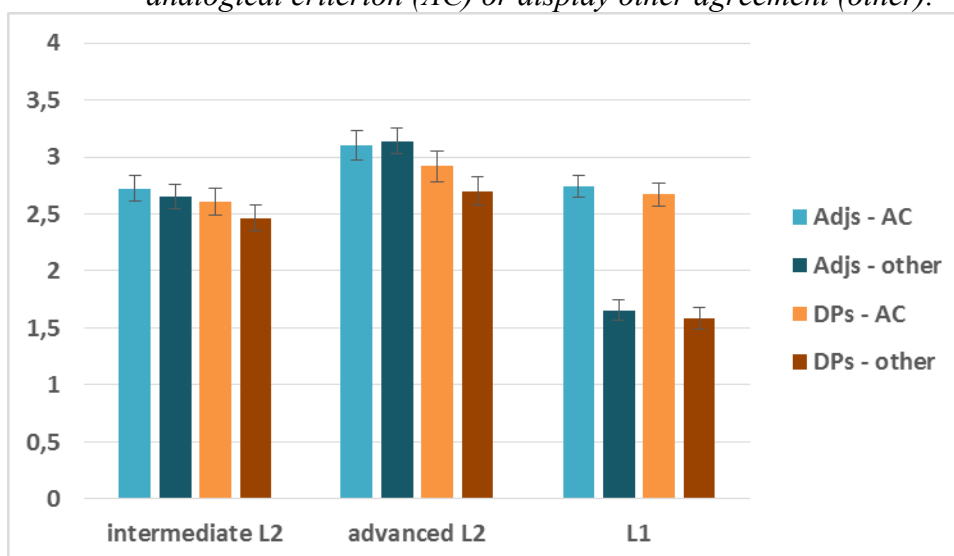
In order to determine the locus of the interaction between Match and Group, a univariate repeated-measures ANOVA was run for each level of Group. The effect of Match was significant for the L1 Spanish group ( $F(1,33)=119.613$ ,  $p<.000$ ,  $\eta_p^2=1.00$ ), but not significant for either the intermediate ( $F(1,23)=3.350$ ,  $p=.080$ ) or advanced ( $F(1,17)=3.924$ ,  $p=.064$ ) L2 Spanish groups (though there is a clear trend towards significance for the latter bilinguals).

Since the effect of Gender was significant in all of the remaining interactions, only the three-way interaction between Gender, Task and Group was further analyzed. To do so, a univariate repeated-measures ANOVA was run for each level of Gender at each level of Group. For the L1 Spanish and intermediate L2 Spanish groups, the effect of Task was significant with feminine Ns (L1 Spanish group:  $F(1,31)=4.233$ ,  $p=.048$ ,  $\eta_p^2=.513$ ; intermediate L2 Spanish group:  $F(1,23)=20.570$ ,  $p<.000$ ,  $\eta_p^2=.991$ ) but not masculine Ns (intermediate L2 Spanish group:  $F(1,23)=.490$ ,  $p=.491$ ; L1 Spanish group:  $F(1,31)=1.806$ ,  $p=.189$ ). The opposite result was found with the advanced L2 Spanish group: a significant effect of Task with masculine Ns ( $F(1,17)=6.733$ ,  $p=.019$ ,  $\eta_p^2=.687$ ), but not with feminine Ns ( $F(1,17)=1.168$ ,  $p=.295$ ).

### 6.1. Gender use strategies

The interaction between Match and Group reveals that only the L1 Spanish bilinguals rated switched agreement and concord structures in which the Adj or the D (respectively) is marked for the gender of the Spanish translation equivalent of the English N the highest ( $p<.000$ ). Figure 1 illustrates the mean ratings for agreement and concord structures in each group.

Figure 1. Mean ratings for Adjectival Predicates and DPs that adhere to the analogical criterion (AC) or display other agreement (other).



The L1 Spanish bilinguals' preference for both agreement and concord structures that adhere to the analogical is clearly evident in Figure 1 (compare light-coloured and dark-coloured bars). Though the intermediate L2 Spanish group shows a slight preference for concord structures that follow the analogical criterion and there is a trend towards such a preference in the advanced L2 group data ( $p=.064$ ), neither of these results is significant and there is almost no difference in the ratings of the agreement structures for either of the L2 groups.

Figure 2. Mean ratings for Adjectival Predicates and DPs that do not adhere to the analogical criterion by group and noun gender.

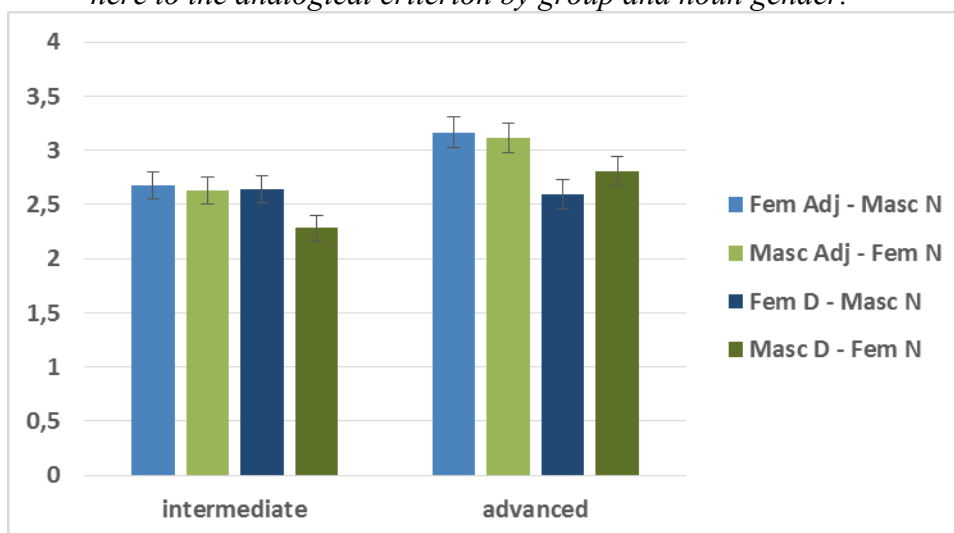


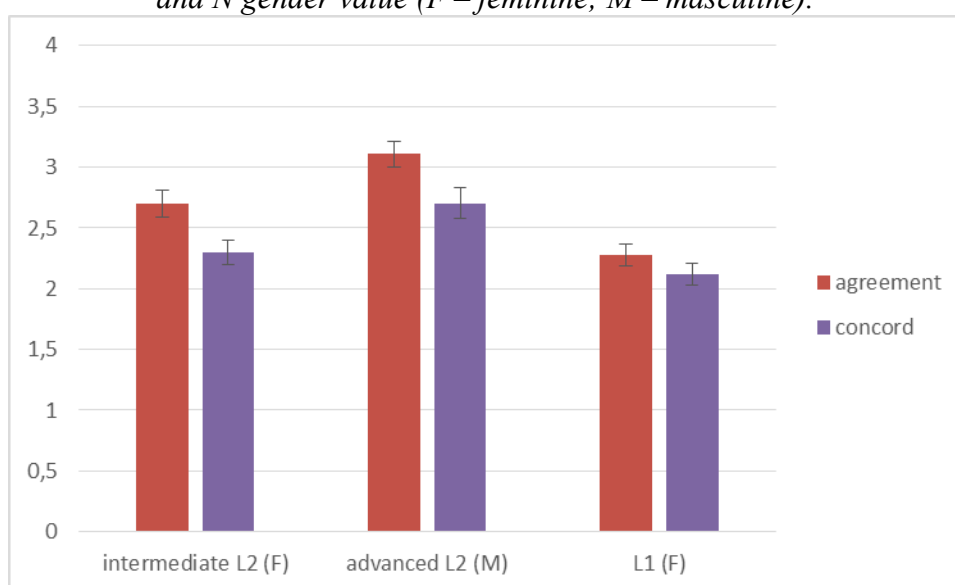
Figure 2 shows the L2 groups' mean ratings for agreement and concord structures that do not follow the analogical criterion, broken down according to the gender of the noun. Here again we see almost no difference in ratings for agreement structures containing masculine or feminine nouns, however the ratings for both the intermediate and advanced groups vary according to the gender of the noun in concord structures. The intermediate group rated switched DPs consisting of a feminine D and a masculine N higher than those consisting

of a masculine D and a feminine N while the advanced group displayed the opposite trend: masculine D-feminine N DPs were rated higher than feminine D-masculine N DPs.

### 6.2. Agreement versus concord structures

The contrast between agreement and concord structures in the data is shown in the three-way interaction between Gender, Task and Group that indicates that agreement structures were rated significantly higher than concord ones by all groups (intermediate L2:  $p < .000$ ; advanced L2:  $p = .019$ ; L1:  $p = .048$ ), but only when those structures contained feminine (in the case of the L1 Spanish and intermediate L2 Spanish groups) or masculine Ns (in the case of the advanced L2 Spanish group) (Figure 3).

Figure 3. Mean ratings for agreement and concord structures by group and N gender value (F – feminine; M – masculine).



It is also relevant to note that this effect varies according to the bilinguals' proficiency in Spanish. The magnitude of the difference between agreement and concord is highest with the lowest proficiency bilinguals and lowest with the native Spanish speakers.

## 7. Discussion

Interestingly, while these results show that L1 Spanish-L2 English and L1 English-L2 Spanish bilinguals differ in their gender use strategies in code-switching, they pattern similarly with respect to the difference between agreement and concord structures. In this section we discuss the implications of these findings and offer a formal account for the results.

### 7.1. Gender use strategies

It is clear from the data that the L1 Spanish bilinguals significantly prefer switched Adjectival Predicates and DPs that adhere to the analogical criterion ( $p < .000$ ). In fact, the difference between their mean ratings for analogical criterion versus other agreement is almost 1.1 (out of 4) for both Adjectival Predicates and DPs, which is a much larger difference in the means than with other

significant effects in the data. This finding is not surprising given the significant body of research that has consistently shown that Spanish-dominant bilinguals follow the analogical criterion, both in experimental (Liceras, Fernández Fuertes, Perales, Pérez-Tattam & Spradlin, 2008; Liceras, 2013; Valenzuela, Faure, Ramírez Trujillo, Barski, Pangtay, Diez, 2012) and spontaneous data (Liceras et al., 2005).

While the L2 Spanish groups do not show a significant preference for the analogical criterion, they also don't display a clear tendency towards the use of masculine as a default strategy that has previously been attested (Liceras et al., 2008; Valenzuela et al., 2012; Llama et al., 2011). In order to further investigate possible gender use strategies in the L2 Spanish groups, we examined the mean ratings for the switched Adjectival Predicates and DPs that did not follow the analogical criterion (Figure 2). There was very little difference in the ratings for Adjectival Predicates involving masculine and feminine Ns, however the advanced L2 group tended to rate DPs with feminine Ns higher than DPs with masculine Ns. In other words, these L2 Spanish bilinguals rate switches such as (25), where the feminine N appears with a masculine D, higher than switches such as (26), where the masculine N appears with a feminine D. This could be argued to be evidence of a preference for masculine concord as a default, though there was no evidence of a default strategy with agreement.

(25)  $e|_M$  window (as in  $ventana_F$ )

(26)  $la_F$  sun (as in  $sol_M$ )

Unlike the advanced L2 Spanish group, the intermediate L2 Spanish bilinguals rated non-analogical criterion DPs with masculine Ns slightly higher than those with feminine Ns. This effect could be due to the unstable representation of Spanish gender in the lower proficiency bilinguals. Even though the stimuli selected for this experiment were high-frequency, concrete nouns, the fact that the intermediate L2 speakers may not have fully acquired the gender of the nouns in the task could explain their opposite preferences to those of the advanced L2 speakers. The higher rating for switched DPs involving a feminine D and a masculine translation equivalent N (as in 26) follows from the fact that feminine is the marked gender value in Spanish (Roca, 1989; Harris, 1991) and thus is more salient in the grammar and also for the learner. For these reasons, L1 English speakers rate switches containing [+fem] Ds relatively high even when the Spanish translation equivalent N is masculine.

### 7.2. Agreement versus concord structures

The data show that the L1 Spanish and both L2 Spanish bilingual groups rate agreement structures significantly higher than concord ones (intermediate L2:  $p < .000$ ; advanced L2:  $p = .019$ ; L1:  $p = .048$ ).<sup>5</sup> This finding is in line with previous experimental research that has shown this as a tendency for L1 Spanish

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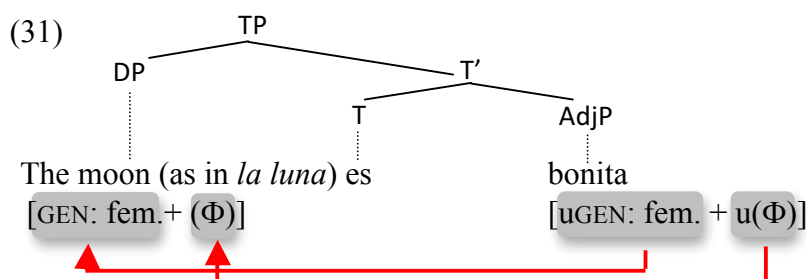
<sup>5</sup> It is difficult to offer a comprehensive account of the fact that the preference for agreement over concord structures was only a significant result with either feminine (L2 intermediate and L1 Spanish bilinguals) or masculine (L2 advanced Spanish bilinguals) Ns. Given the previous evidence both from code-switched gender and verbal agreement that supports the general findings of this study, we would attribute the influence of the gender value of the N to the need for more experimental stimuli in future tasks and the general difficulty in controlling precisely which element(s) of the stimuli influence the participants' ratings in any given judgment task.

bilinguals (Liceras, 2013) in acceptability judgments and as a significant result for Spanish Heritage speakers in a sentence selection task (Valenzuela et al., 2012). The effect of the structure on code-switching preferences has also been seen in other types of switches, such as switches between the subject and the verb. In comparing different subject types in subject-verb switches, Fernández Fuertes, Liceras and Alba de la Fuente (2016) found that DPs were significantly preferred over subject pronouns. Though the focus of the present study was gender rather than verbal agreement, a parallel can be drawn between the preferences in subject-verb switches and those in concord and agreement structures. In agreement structures such as (27), the switch occurs between the DP subject and the predicate, which is precisely the type of switch that is systematically acceptable with verbal agreement (28). Concord structures (as in 29), on the other hand, consist of a switch between a functional and a lexical category, which has been shown to be dispreferred both with switched DPs (where D is the functional category and N the lexical) and with subject pronoun-verb switches (in which *pro* is functional and V lexical) (30).

- (27) **the moon es** bonita                    **DP + V + Adj**  
       ‘the moon is beautiful’
- (28) **the boy bebe** agua                    **DP + V + N**  
       ‘the boy drinks water’
- (29) **la moon**                                 **D + N**  
       ‘the moon’
- (30) **tú cook**                                 **pro + V**  
       ‘you cook’

Though the contrast between agreement and concord structures has been found in processing tasks in previous research, no account for these findings has been offered. We would like to propose that this contrast can be explained by examining how the double-feature valuation mechanism is realized in code-switched Adjectival Predicates and code-switched DPs.

In code-switched agreement structures such as the one in (31), the translation equivalent of English N ‘moon’ (*luna<sub>F</sub>*) is retrieved and concord takes place to form the Spanish DP *la<sub>F</sub> luna<sub>F</sub>*. Then, ‘the moon’ is assigned the features of *la<sub>F</sub> luna<sub>F</sub>*, following which the unvalued GENDER and GENDER AGREEMENT features on the Adj are both valued to the left. Thus, in agreement structures, though both the GEN and the  $\Phi$  features must be valued, the valuation process is unidirectional.



In code-switched concord structures the double-feature valuation is realized differently. In (32), the English N (moon) subsumes the features of the transla-



tion equivalent Spanish N (*luna<sub>F</sub>*). Once the English N carries the features GENDER and GENDER AGREEMENT, the unvalued GEN feature on the Spanish D (*la<sub>F</sub>*) is valued to the right, and the unvalued  $\Phi$  feature on the N is valued to the left. While, like with agreement, there are two features that must be valued in concord structures, unlike agreement, in concord structures the feature valuation mechanism is bidirectional: the GEN feature is valued left-to-right while the  $\Phi$  feature is valued right-to-left.



We propose that it is the directionality in the double-feature valuation mechanism that determines the level of difficulty for bilinguals to process code-switched structures. The fact that agreement structures are rated higher by all groups is evidence that the feature valuation that goes in the same direction (only right-to-left) is easier to process than when the features must be valued in two directions (as in concord). It is also relevant to note that the magnitude of the effect decreases as the level of proficiency in Spanish increases, which is not surprising given that processing in Spanish is expected to be more costly for L2 speakers than L1 speakers.

## 8. Conclusions

The results from the present study have strengthened previous findings regarding Spanish-English bilinguals' gender use preferences in intrasentential code-switching, illustrating that L1 Spanish-L2 English bilinguals' preference for the analogical criterion is a robust finding that can be replicated with different groups and using different tasks. While we did not find significant evidence of a masculine as default strategy in the L1 English-L2 Spanish bilingual groups, we did see variability in these bilinguals' gender use preferences, which is consistent with other studies.

In this study we were also able to replicate Liceras' (2013) and Valenzuela and colleagues' (2012) findings with respect to the reduced difficulty in processing code-switched agreement structures, showing that there is a general preference for agreement structures with both L1 Spanish and L2 Spanish bilinguals. We have gone beyond these findings and have proposed a formal account that maintains that it is the unidirectionality of the double-feature valuation mechanism in agreement that results in these structures being easier to process than concord ones since, unlike agreement, in concord the feature valuation goes in both directions.

Future research should further examine the contrast between code-switched agreement and code-switched concord structures by using different tasks and also by including other types of data. With respect to tasks, using an online or timed task would offer further insight into the processing mechanisms behind these results. It would also be interesting to examine the effect of the difference in transparency between the Adj and the D, as it may be that Adjs are more

transparent given that, like nouns, they are marked with *-o* or *-a*, and even non-transparent Adjs (such as *verde*, ‘green’) can become transparent with a diminutive (*verdecito*, ‘a little green’, for instance). Finally, future work should investigate production data given that the preference for agreement over concord structures has only been shown in code-switched processing tasks (acceptability judgments, sentence selections) to date.

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