

Linguistic theory and code-switching data

Feature matching restrictions ... and beyond

Juana M. Liceras¹, Raquel Fernández Fuertes², Rachel Klassen¹

University of Ottawa¹, Universidad de Valladolid²

Aim

To illustrate how constraints beyond MP and DM shape bilinguals' use of grammatical gender in code-switching

- *processing constraint #1: spontaneous production vs interpretation*

La_[theF] house The casa_[houseF]

- *processing constraints #2 & 3: interpretation vs production in experimental tasks*

El_[theM] / La_[theF] chair The chair es bonito/a_[beautifulM/F]

Formal linguistics & code-switching data

- Many authors have claimed that the same principles that constrain individual grammars also constrain code-switching:
 - Pre-minimalism. Sankoff & Poplack, 1981; Woolford, 1983; DiSciullo, Muysken & Singh 1986; Myers-Scotton, 1993, 1997; Belazi, Rubin & Toribio, 1994; among others.
 - MP and DP. Unimodal bilinguals: MacSwan, 1999, 2000, 2009; Liceras et al., 2008; González-Vilbazo & López, 2011; Lohndal, 2013; Alexiadou et al., 2015; Klassen, 2016; among others. Bimodal bilinguals: Lillo-Martin, Müller & Chen Pichler, 2016.

Background: *spontaneous vs interpretation data*

- Previous research has revealed that, while English D-Spanish N switched DPs such as ‘the casa’ are rarely found in spontaneous production data, such switches are interpretable and accepted in experimental interpretation tasks:
 - English-Spanish DPs (Licerias et al., 2008)
 - German-English DPs (Jorschick et al., 2010)

(1) La house [the_{SP fem} house]

(2) The casa [the house_{SP fem}]

Background: *spontaneous vs interpretation data*

- Moro's (2000, 2014) adoption of Chomsky's (2000) constraint on feature checking fails to account for the overwhelming acceptance of English D-Spanish N DPs

D

(3a) **La [Person, Number, Gender]**

(3b) **The [Person, Number]**

N

house **[Person, Number]**

casa **[Person, Number, Gender]**

In (3a) the phi-features of the English N are a subset of the phi-features of the Spanish D so the latter can be valued. In (3b) the phi-features of the Spanish N are not a subset of the phi-features of the English D, which means that the gender feature of the Spanish N is not valued and the derivation crashes.

Background: *spontaneous vs interpretation data*

- Furthermore, this constraint disregards the fact that balanced bilinguals in Gibraltar as well as Spanish-dominant English-Spanish bilinguals do not accept all Spanish D-English N DPs but show a significant preference for those in which the Spanish D agrees with the Spanish translation equivalent of the English N (following the *analogical criterion*), as in (4) versus (5).

(4) La house / El book [the_{SP fem} house(*casa*_{SP fem})] / [the_{SP masc} book(*libro*_{SP masc})]

(5) El house / La book [the_{SP masc} house(*casa*_{SP fem})] / [the_{SP fem} book(*libro*_{SP masc})]

Processing Constraint #1

- The *Grammatical Features Spell-Out Hypothesis* (Liceras et al., 2008) states that the presence of a highly grammatisized feature such as gender agreement (ϕ) determines code-switching preferences in the preference for (1) versus (2) in spontaneous production and the preference for (4) versus (5) in both spontaneous production and interpretation.

(1) La house [the_{SP fem} house]

(2) The casa [the house_{SP fem}]

(4) La house [the_{SP fem} house(*casa*_{SP fem})]

(5) El house [the_{SP masc} house(*casa*_{SP fem})]

Background: *experimental data*

- Previous research has shown that Spanish-dominant Spanish-English bilinguals assign English nouns the gender of the ‘translation equivalent’ in Spanish (*analogical criterion*¹)

concord

El_[theM] book_[libroM]

La_[theF] table_[mesaF]

agreement

The car_[cocheM] es bonito_[beautifulM]

The chair_[sillaF] es bonita_[beautifulF]

- The preference for gender-matching code-switched structures has been shown for both concord (Liceras et al., 2008, 2013) and agreement (Liceras et al., 2013; Valenzuela et al., 2012)

¹ term used by Otheguy & Lapidus (2005)

Background: *experimental data*

- In contrast, English-dominant Spanish-English bilinguals tend to use/prefer masculine agreement as a default strategy (*masculine as default*)

concord

El_[theM] book_[libroM]

El_[theM] table_[mesaF]

agreement

The car_[cocheM] es bonito_[beautifulM]

The chair_[sillaF] es bonito_[beautifulM]

- This has been attested with both concord (Liceras et al. 2008, 2013) and agreement (Klassen & Liceras, 2015) code-switched structures

Gender in concord vs agreement: *Study*

In this study, English- and Spanish-dominant² Spanish-English adult bilinguals performed two code-switching tasks:

1. acceptability judgment task (interpretation)
2. written sentence completion task (production)

Participants were divided into two groups according to Spanish proficiency (as measured by the Wisconsin Spanish Placement Test):

1. *intermediate*: up to and including 30 (/36) [mean: 25.9]
2. *advanced*: 31 and higher (/36) [mean: 32.7]

² since the Spanish-dominant bilinguals performed at ceiling in the second task, we will not present their data today

Acceptability Judgment Task

Acceptability Judgment Task

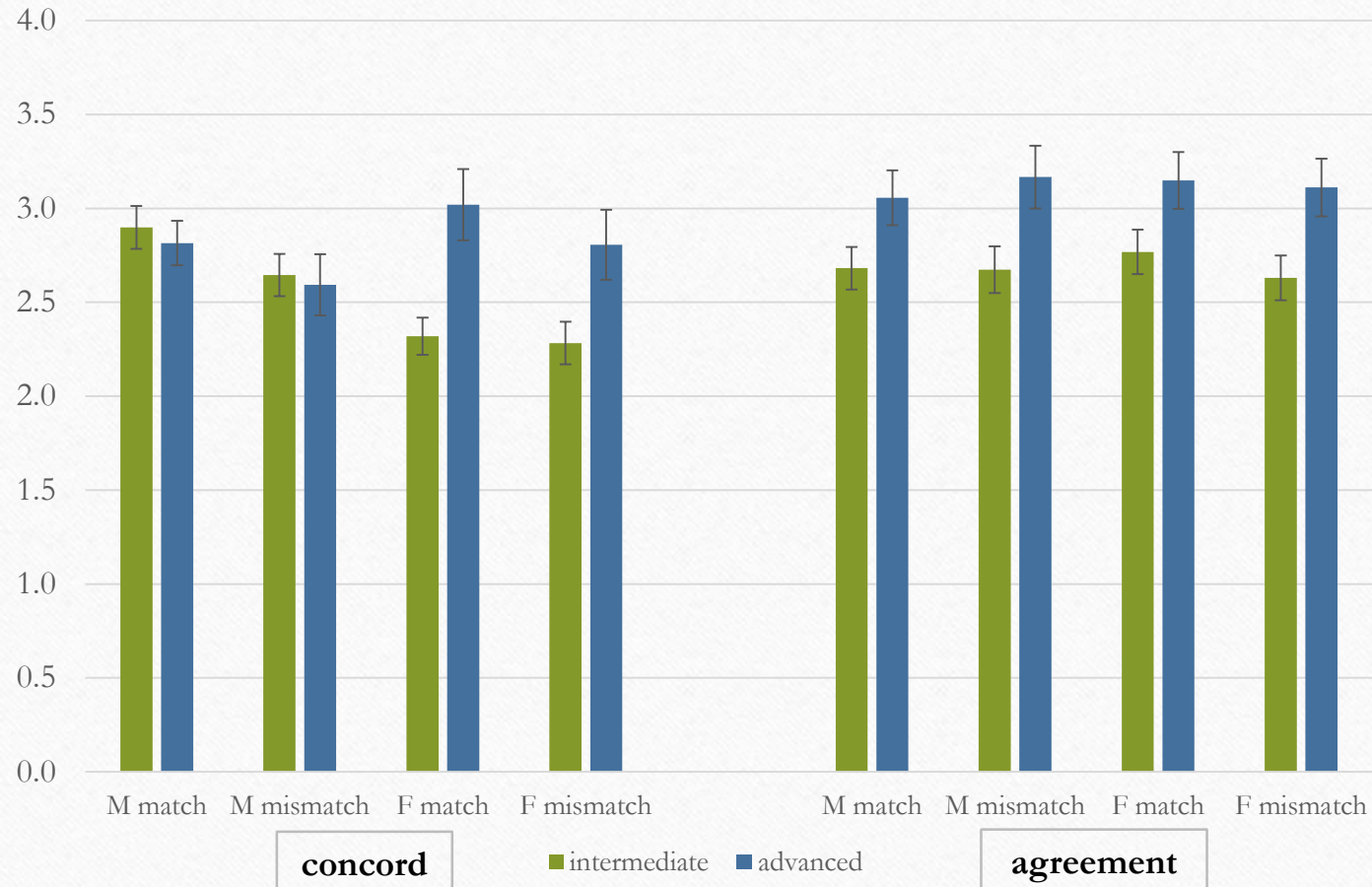
TASK

- rate code-switched sentences on a 4-point Likert scale
 - concord: $D_{SP} + N_{EN}$ (**el**_{the-M} **book**_{libro-M})
 - agreement: $DP_{EN} + es_{is} + Adj_{SP}$ (**the book**_{libro-M} **es** **pequeño**_{small-M})
- gender congruency between the Spanish translation equivalent of the English noun and the determiner (concord) or the adjective (agreement) was manipulated
 - match (analogical criterion)
 - mismatch

PARTICIPANTS

- 43 English-dominant Spanish-English adult bilinguals living in Trinidad & Tobago
 - intermediate: 25
 - advanced: 18

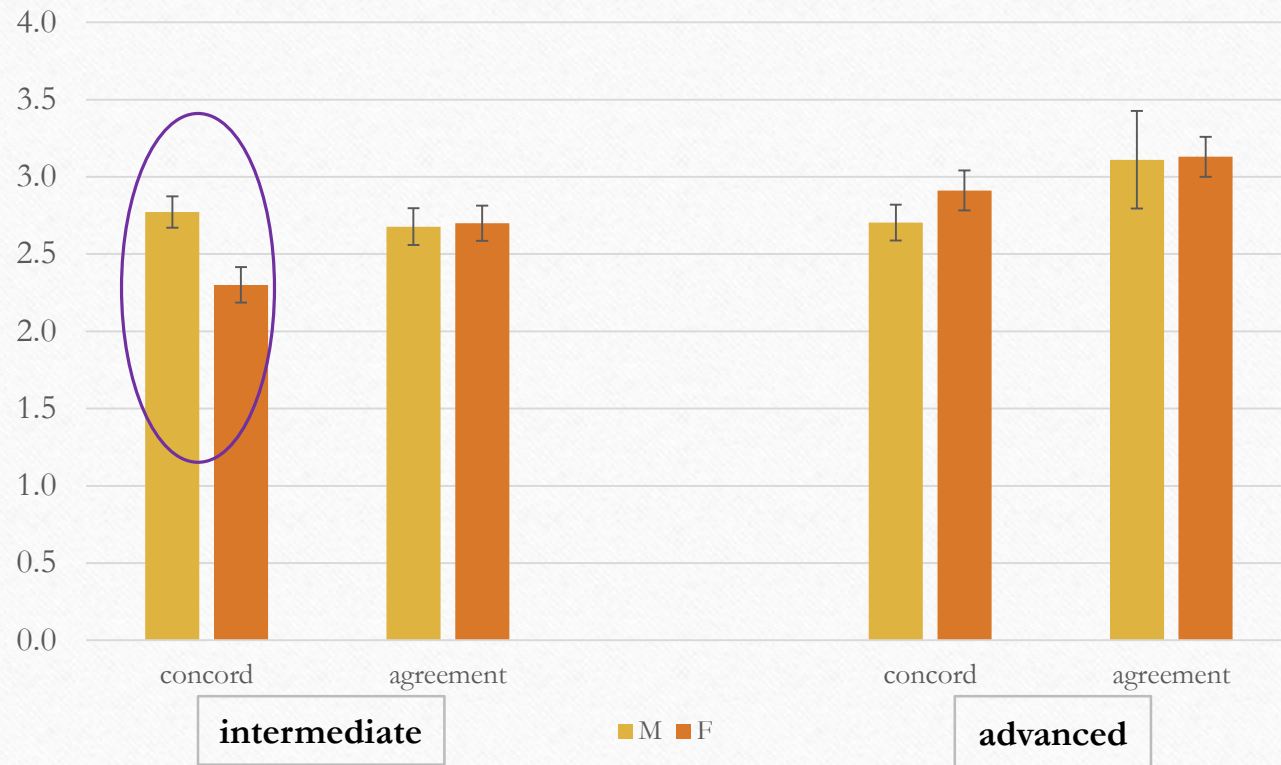
Results



both groups significantly preferred gender matching over gender non-matching stimuli ($p=.023$)

	mean rating
match	2.84
mismatch	2.74

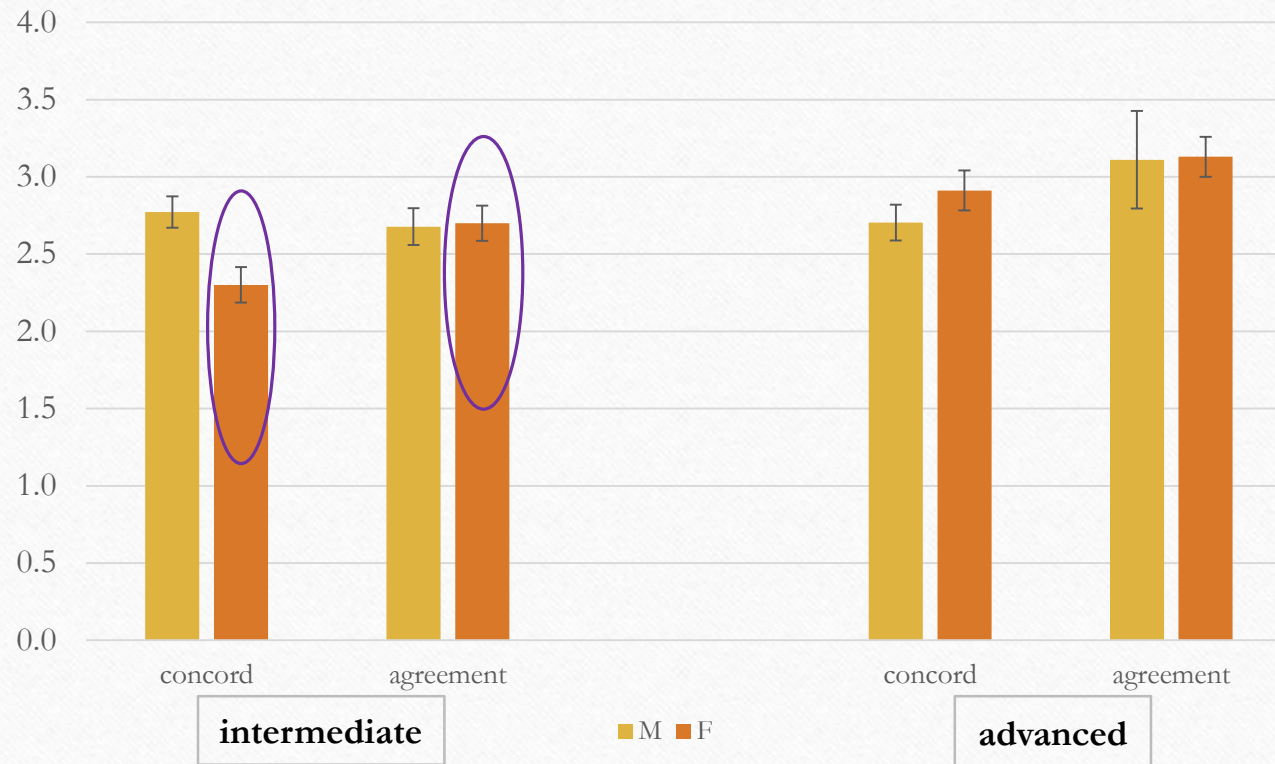
Results: Gender



advanced: no effect of gender

intermediate: significantly higher ratings for M than F nouns in concord ($p=.001$)

Results: Structures



advanced: no effect of structure

intermediate: significantly higher ratings for F nouns in agreement than concord ($p=.001$)

no interaction between match and structure

- the intermediate group rated agreement higher than concord regardless of match/mismatch

Acceptability Judgment Task

DISCUSSION

- *analogical criterion vs masculine as default*
 - both groups showed some sensitivity to the analogical criterion in that gender matching stimuli were rated higher than gender non-matching stimuli
 - masculine stimuli rated higher than feminine stimuli for concord in intermediate group, which is suggestive of a masculine as default strategy for the lower Spanish proficiency participants
- *concord vs agreement*
 - no significant preference for concord or agreement stimuli in advanced group
 - intermediate group preferred agreement stimuli over concord stimuli (though this was the case with both gender matching and gender non-matching stimuli)

Sentence Completion Task

Sentence Completion Task

TASK

- complete code-switched sentences by writing the Spanish determiner (concord) or the Spanish colour adjective (agreement)
 - concord: D_{SP} + N_{EN} (**el/la** book_{libro-M})
 - agreement: DP_{EN} + es_{is} + **Adj_{SP}** (the book_{libro-M} es _____)
- opacity of gender marking on the Spanish translation equivalent noun was also manipulated:
 - gender-transparent nouns: masculine **-o** / feminine **-a**
 - gender-opaque nouns: ending in **consonant** or **vowel other than -o / -a**

rojo/a	(red)
amarillo/a	(yellow)
blanco/a	(white)
negro/a	(black)

Sentence Completion Task

POST TASK

- following the sentence completion task, participants provided the Spanish translations for each of the English nouns

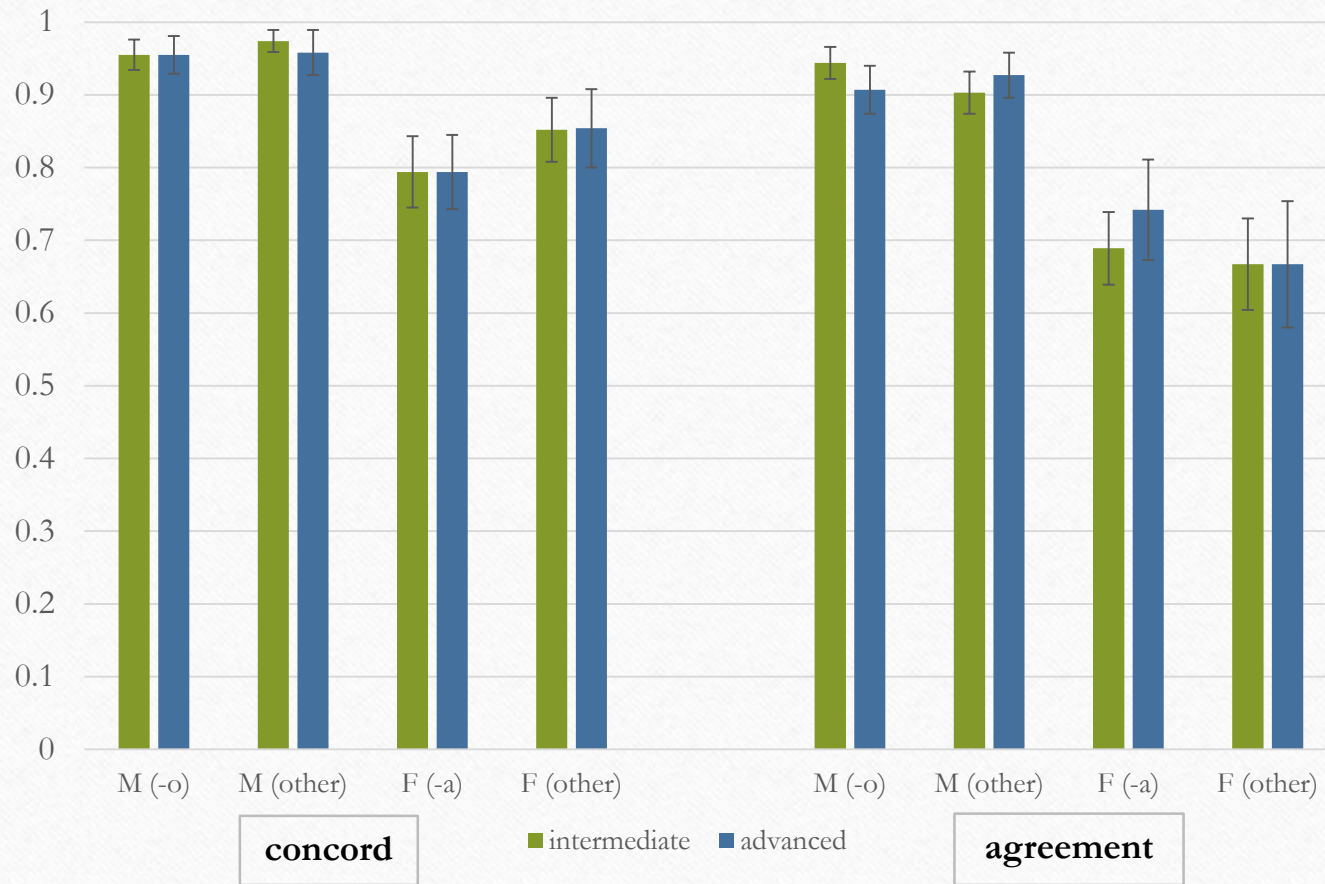
ANALYSIS

- responses were coded as whether or not they adhered to the analogical criterion
- items for which participants provided unanticipated Spanish translations were discarded

PARTICIPANTS

- 81 English-dominant Spanish-English adult bilinguals living in Trinidad & Tobago
 - intermediate: 54
 - advanced: 27

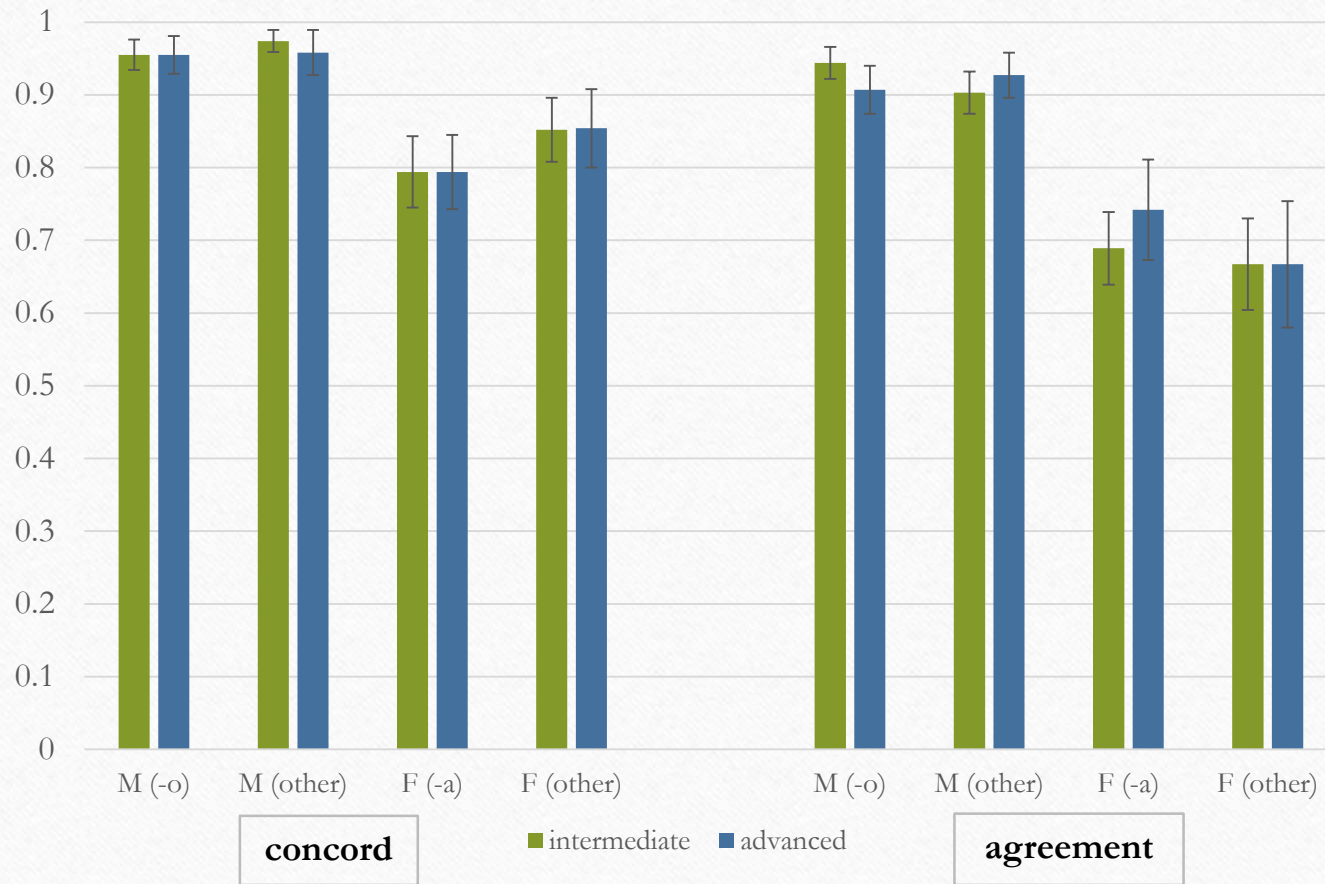
Results



the adherence to the analogical criterion is well above chance for both groups across conditions and structures

no significant effect of gender marking (transparent vs opaque) on the noun

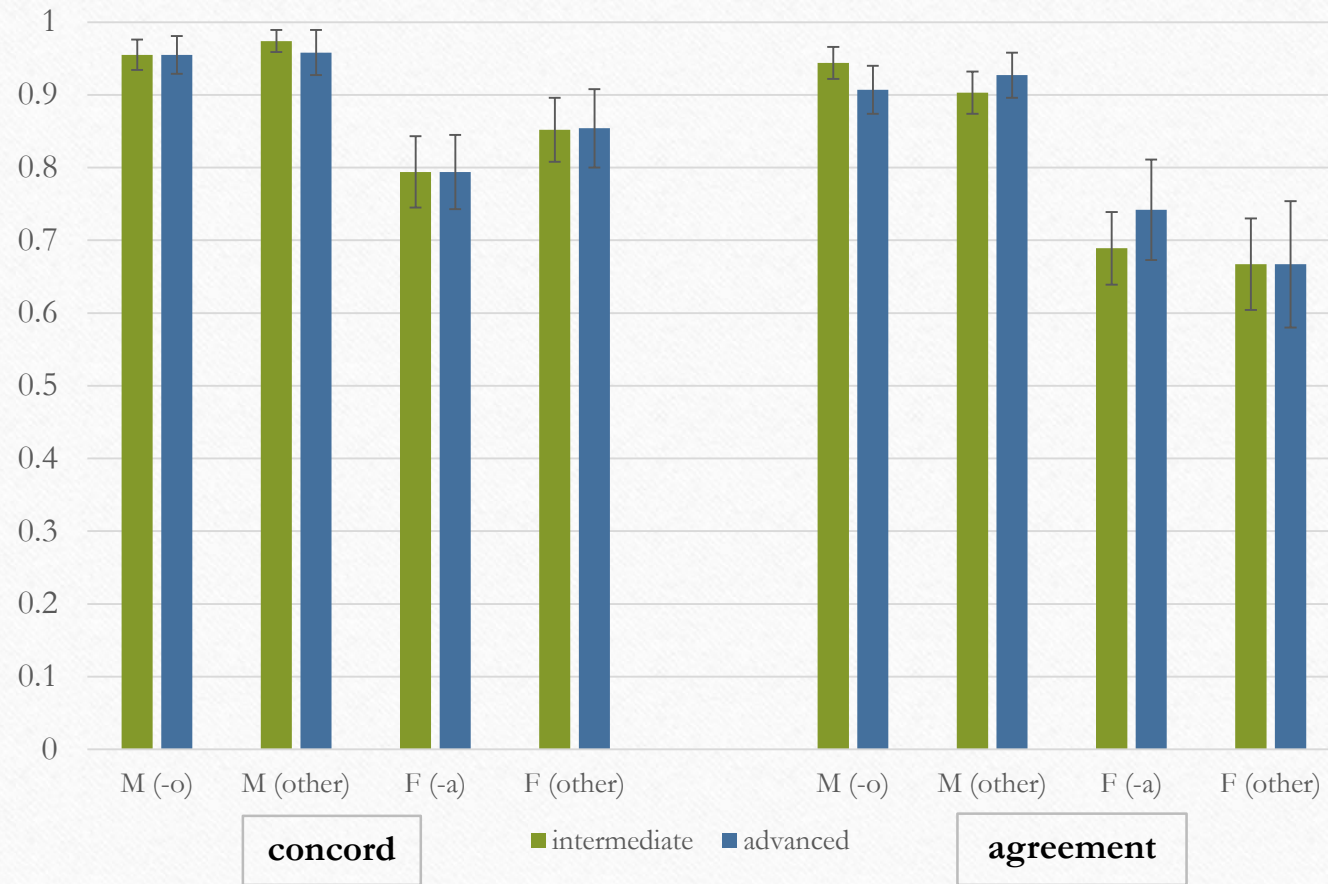
Results: Gender



both groups adhered significantly more to the analogical criterion with M nouns than F nouns with both structures ($p < .000$)

	mean
M	0.94
F	0.76

Results: Structures



significantly more adherence to the analogical criterion with concord than agreement for both groups ($p < .000$)

	mean
concord	0.89
agreement	0.81

Sentence Completion Task

DISCUSSION

- *analogical criterion vs masculine as default*
 - both groups showed sensitivity to the analogical criterion
 - however, the significantly higher adherence to the analogical criterion with masculine nouns than feminine nouns provides some evidence of a possible masculine as default strategy
- *concord vs agreement*
 - significantly more adherence to the analogical criterion with concord than agreement for both groups

Gender in concord vs agreement: *Summary*

- These data show that there is a contrast between concord and agreement structures in code-switched interpretation and production data
 - *acceptability judgment task (interpretation)*: while there was no significant difference between structures for the advanced group, the intermediate group rated **agreement stimuli higher than concord stimuli**
 - *sentence completion task (production)*: both groups adhered **significantly more** to the analogical criterion **with concord than agreement stimuli**

Gender in concord vs agreement: *Summary*

- These data show that there is a contrast between concord and agreement structures in code-switched interpretation and production data

interpretation: concord < agreement

production: concord > agreement

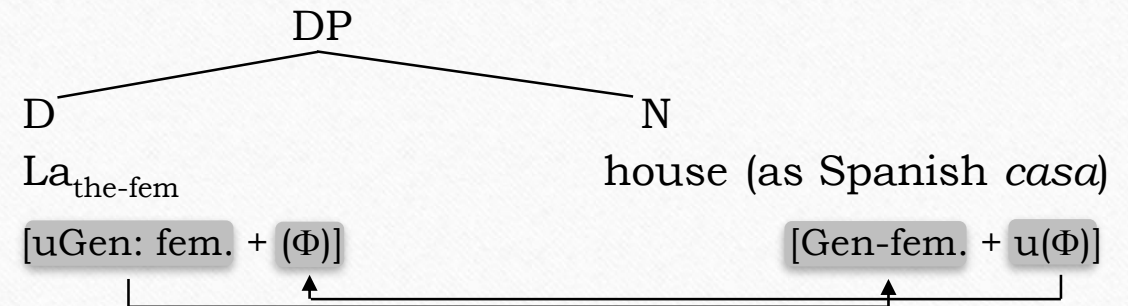
- We propose two processing constraints to account for this pattern of results:
 2. directionality in the double-feature valuation mechanism
 3. lexical access in concord vs agreement structures

Processing Constraint #2:

directionality in the Double-Feature Valuation Mechanism

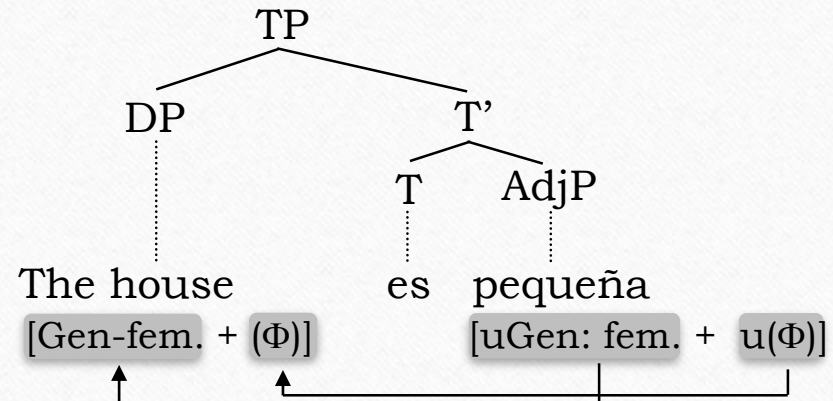
concord

- *house* subsumes the features of the translation equivalent *casa*
- unvalued Gender feature on D is valued to the right, and the unvalued Agreement feature on N is valued to the left



agreement

- translation equivalent of *house (casa)* is retrieved and concord takes place to form DP *la casa*
- *the house* is assigned the features of *la casa*
- unvalued Gender and Agreement features on Adj are valued to the left

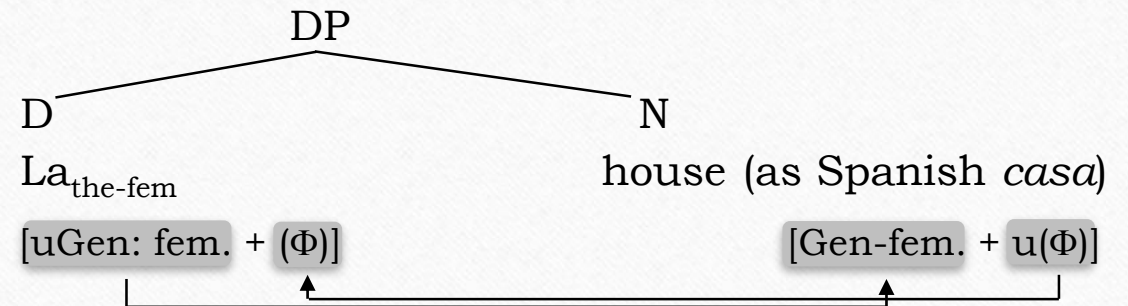


Processing Constraint #2:

directionality in the Double-Feature Valuation Mechanism

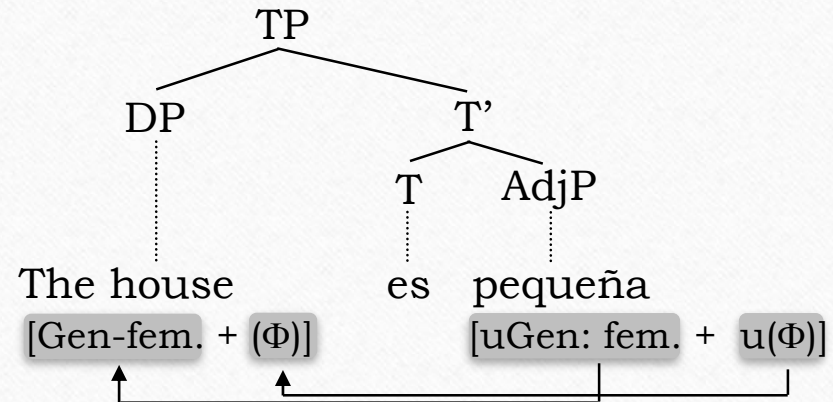
concord

- features are valued in two different directions
 - uGender feature on D: to the right
 - uAgreement feature on N: to the left



agreement

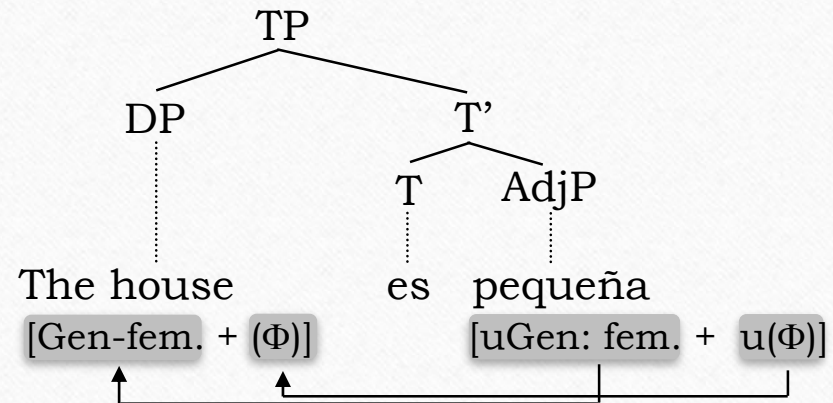
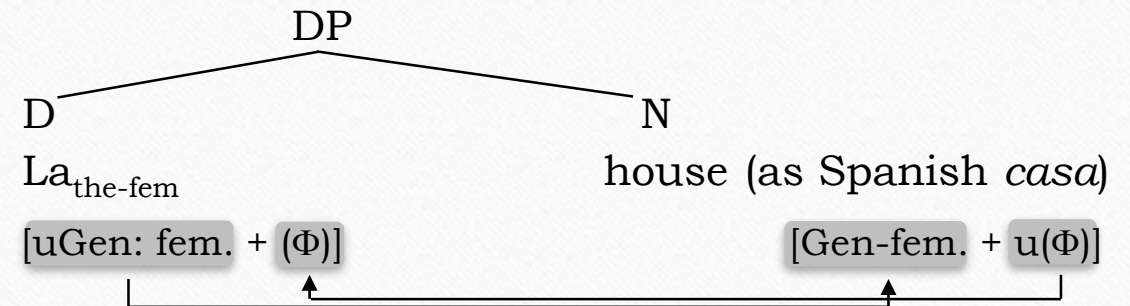
- features are valued in one direction
 - uGender feature on Adj: to the left
 - uAgreement feature on Adj: to the left



Processing Constraint #2:

directionality in the Double-Feature Valuation Mechanism

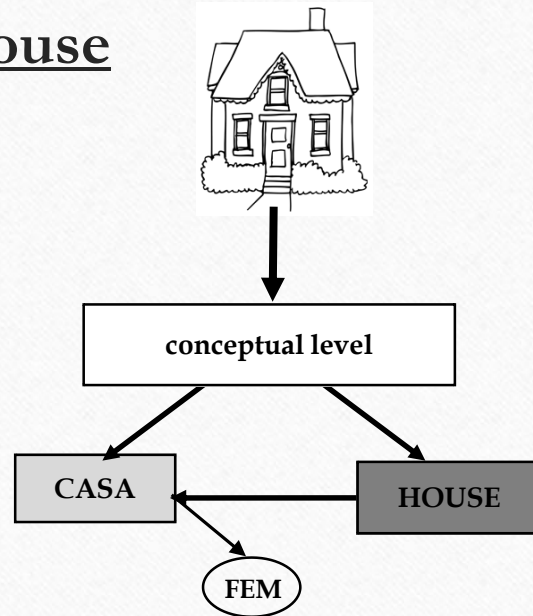
- concord is more problematic than agreement in that the features are valued in two different directions
- directionality in the feature valuation process is the dominant factor in determining the level of difficulty in interpreting and processing these structures for the lower proficiency bilinguals



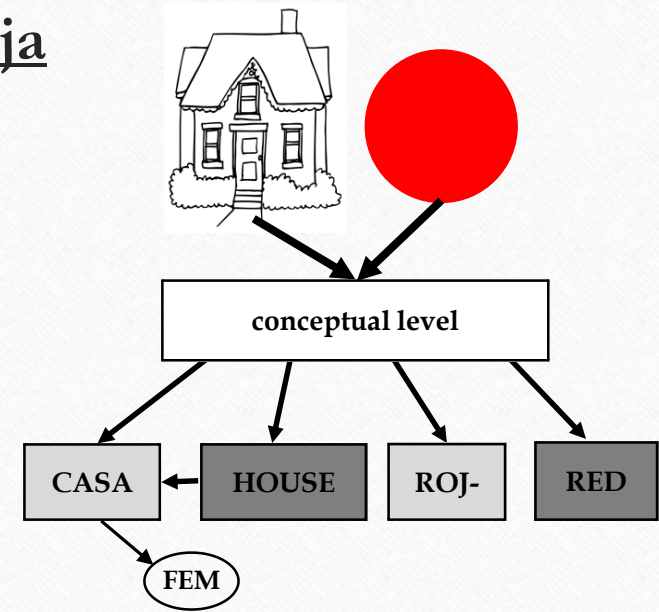
Processing Constraint #3: *lexical access*

- concord and agreement structures differ with respect to the number of lexical categories that are required in order to process/produce concord and agreement structures

La house



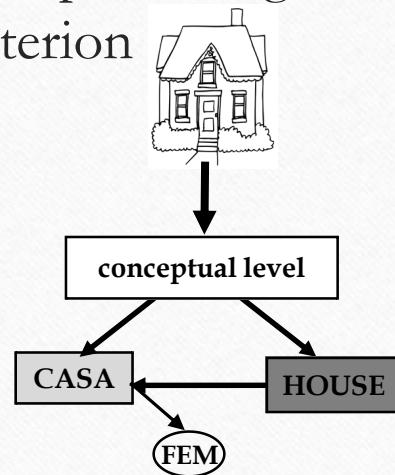
La house es roja



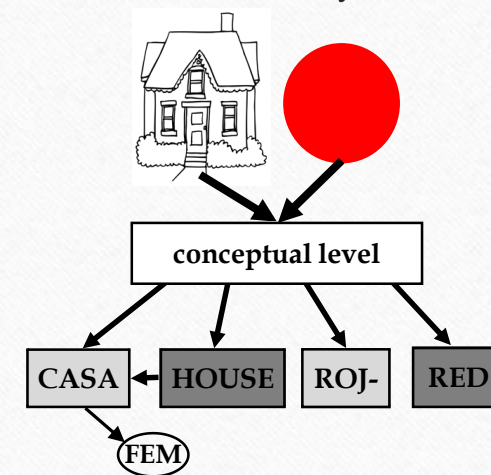
Processing Constraint #3: *lexical access*

- there is only one lexical category in concord structures (N) while there are two lexical categories in agreement structures (N & Adj) and thus agreement structures are more complex than concord ones with respect to lexical access
- in contrast to interpretation and processing, the number of lexical categories the bilingual is required to access seems to be the determining factor in the level of difficulty when producing concord and agreement structures that abide by the analogical criterion

La house



La house es roja



Conclusions

- MP and DM constraints alone are insufficient to account for the contrasting pattern of results with respect to bilinguals' use of grammatical gender in code-switching
- We have proposed three processing constraints to address each of these contrasts:
 1. DPs in spontaneous production vs interpretation data: *Grammatical Features Spell-Out Hypothesis*
 2. interpretation of concord vs agreement structures: *directionality in the double-feature valuation mechanism*
 3. production of concord vs agreement structures: *complexity in lexical access*

Thank you!

¡Gracias!