Non-similar grammatical gender systems in the mental lexicon

Evidence for L1-L2 gender integration?

BUCLD 38

Rachel Klassen
Juana M. Liceras

Aim

to discover how L1 and L2 grammatical gender information is represented in the mind

➔ particular focus on bilinguals whose languages are mismatched in number of gender classes

	SPANISH (2 class)		GERMAN (3 class)	
the book	*el libro*	masculine	*das Buch*	neuter
the chair	*la silla*	feminine	*der Stuhl*	masculine
the pear			*die Birne*	feminine

Grammatical Gender: Monolinguals

Schriefers (1993) first found an effect of gender in L1 Dutch speakers performing a picture-word interference task.

➔ ***gender congruency effect***

shorter naming latencies with gender congruent stimuli than gender incongruent stimuli

congruent stimuli: facilitated response due to increased activation of a single gender node

incongruent stimuli: activation of two gender nodes increases competition in the selection process

Grammatical Gender: Monolinguals

The *gender congruency effect* seems to vary by naming condition (NP vs bare noun) and language typology.

gender effect in NP naming			
Dutch	✓	Italian	✗
German	✓	Spanish	✗

Opposite tendencies have been shown for bare noun naming.

ie. no gender effect for Dutch

Grammatical Gender: Monolinguals

These results have given rise to differing accounts of the representation and selection of grammatical gender.

- **syntactic hypothesis**
  - gender is a node linked to the lexical representation
  - only selected in NP production
- **lexical hypothesis**
  - gender is an intrinsic part of the lexical representation
  - always available upon noun retrieval

Grammatical Gender: Bilinguals

The *gender congruency effect* has been reported for bare noun and NP naming for:

- Czech-German & German-Czech bilinguals (Bordag, 2004)
- German-Dutch bilinguals (Lemhöfer et al, 2008)
- Italian-Spanish bilinguals (Paolieri et al, 2010)

No *gender congruency effect* has been found in NP naming for:

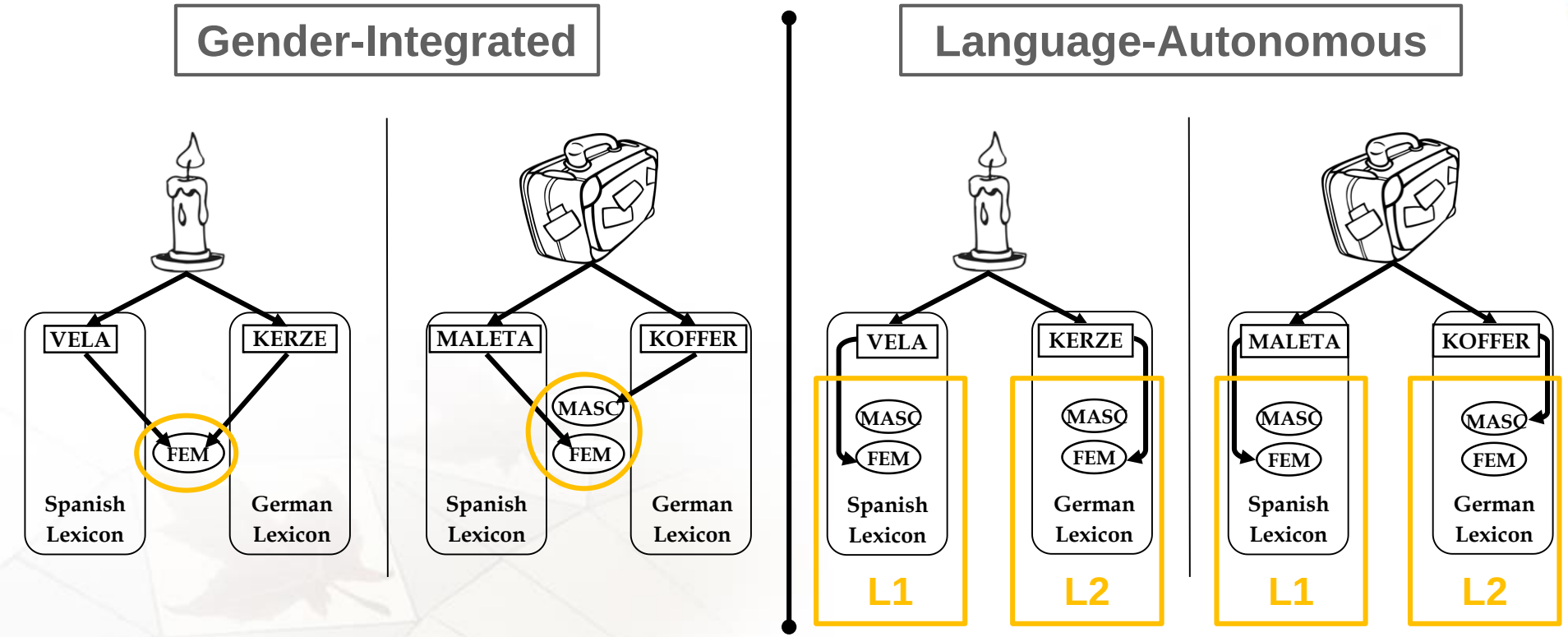
- Spanish-Catalan & Catalan-Spanish bilinguals (Costa et al, 2003)
- Italian-French bilinguals (Costa et al, 2003)

Grammatical Gender: Bilinguals

These conflicting results have led to the formulation of different hypotheses regarding the representation of gender in bilinguals:

- **gender-integrated representation hypothesis** (Salamoura & Williams, 2007)
  - the L1 and L2 have shared gender nodes
- **gender autonomous representation hypothesis** (Costa et al, 2003)
  - gender nodes are language-specific

Grammatical Gender: Bilinguals



adapted from Costa et al (2003)

The Present Study

In this study, L1 Spanish-L2 German speakers performed an L2 picture-naming task.

This research…

- brings further evidence to inform the representation of multiple gender systems
- extends existing research to the representation of gender systems mismatched in number of gender classes

Research Questions & Predictions

1. *How are non-similar gender systems represented in the mind of the bilingual? Do they interact or are their representations independent?*

Prediction

The gender systems interact (*gender-integrated representation hypothesis*)

Evidence

Gender congruency effect (L1-L2 congruent nouns named more quickly than L1-L2 incongruent nouns)

Research Questions & Predictions

2. *How is neuter, the gender not present in the L1, represented?*

Prediction

Neuter does not have the same representation as masculine and feminine

Evidence

Naming latencies that pattern differently compared to gender congruent and gender incongruent nouns

Research Questions & Predictions

3. *Is gender information always available or is it only selected in NP (or DP) production?*

Prediction

Gender information is always available (*lexical hypothesis*)

Evidence

Gender congruency effect in both bare noun and DP naming

Participants

19 L1 Spanish - L2 German speakers

- intermediate proficiency in German
- living in Spain

25 L1 German speakers

- living in Germany

L2 Picture-Naming Task

Materials

- 78 black & white line drawings depicting high-frequency inanimate concrete nouns (60 experimental stimuli)

Experimental Conditions

Congruent		Incongruent		Neuter	
Spanish	*German*	*Spanish*	*German*	*Spanish*	*German*
masc	masc	masc	fem	masc	neut
fem	fem	fem	masc	fem	neut

- nouns did not differ significantly in frequency by condition ($p=.185$) or by language ($p=.858$)

L2 Picture-Naming Task

Congruent Condition

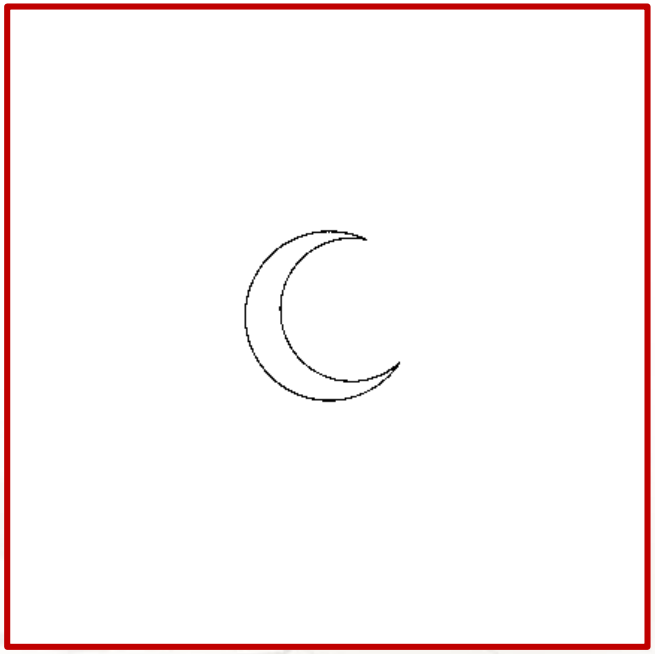
zapato [M] - Schuh [M]

"Schuh"

"der Schuh"

L2 Picture-Naming Task

Incongruent Condition



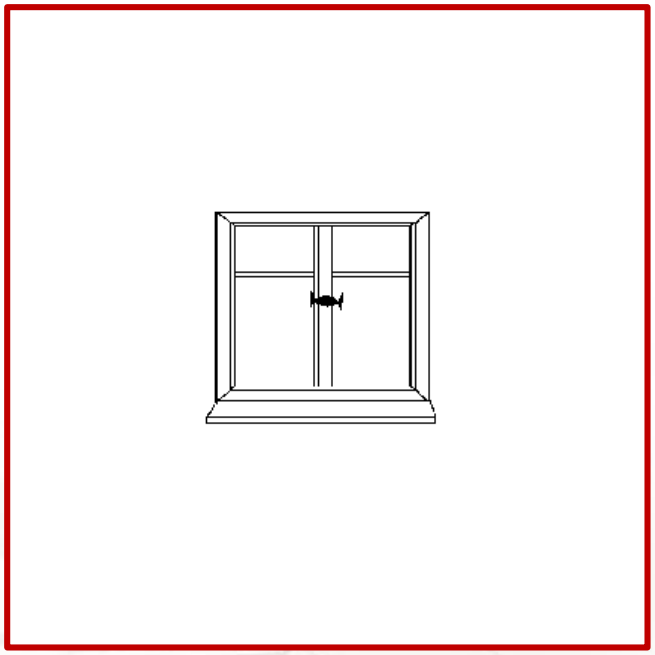
luna [F] - Mond [M]

"Mond"

"der Mond"

L2 Picture-Naming Task

Neuter Condition



"Fenster"

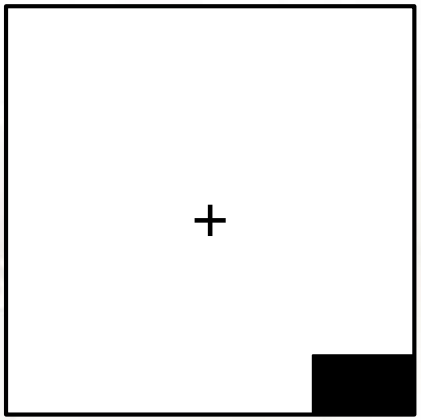
"das Fenster"

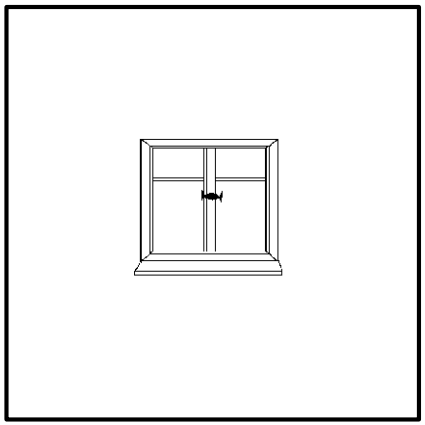
ventana [F] - Fenster [N]

L2 Picture-Naming Task

Custom Recording Device

- picture onsets were recorded by a photodiode in a small device attached to the lower right-hand corner of the display
  - right audio channel: changes in frequency (black vs white)
  - left audio channel: participants' responses

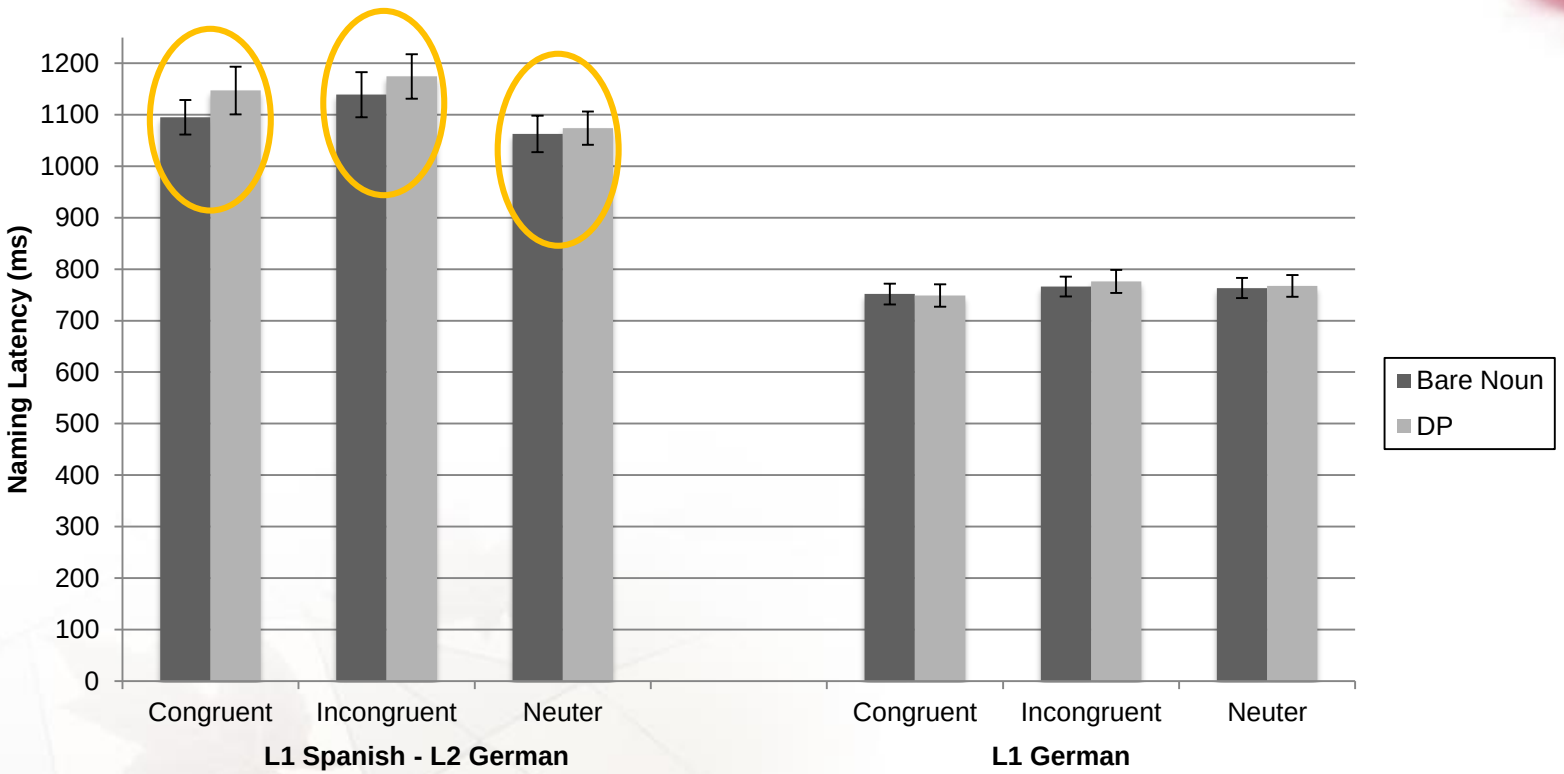




Procedure

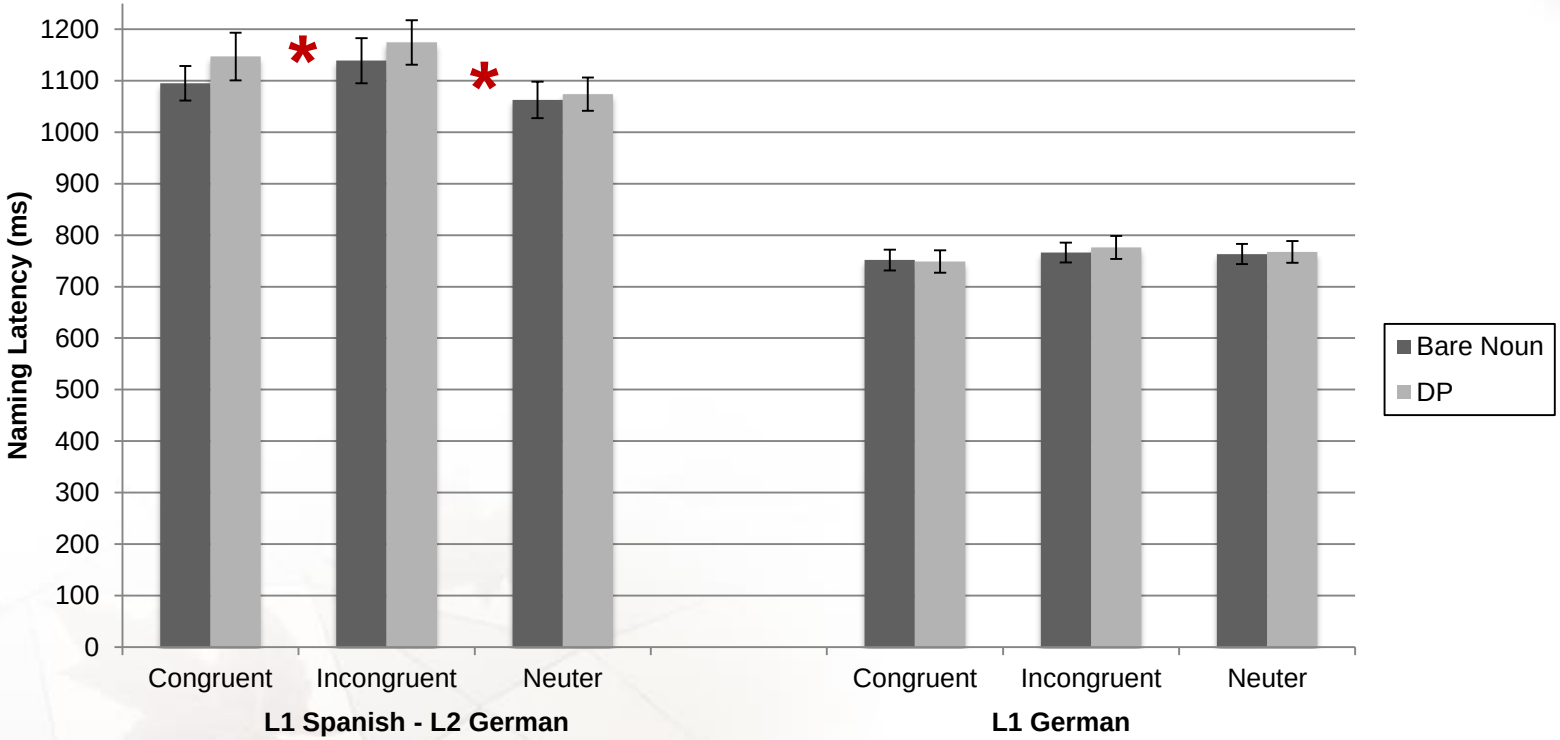
1. **Familiarization**
   - each participant received a booklet with the pictures and the target German nouns to study prior to the task
2. **L2 picture-naming task**
   - participants named (orally) each picture as quickly and accurately as possible in German, producing either the corresponding bare noun or DP (ie. "*Bett*" or "*das Bett*")
3. **L1 naming task**
   - Spanish-German speakers named the pictures in Spanish to ensure that they were activating the anticipated L1 nouns
4. **Language background questionnaire & German proficiency test**

Naming Latencies: L2 German



- shortest latencies for nouns in the neuter condition, followed by congruent and incongruent nouns

Naming Latencies: L2 German



- naming latencies were significantly different:
  - between the congruent and incongruent conditions ($p<.001$)
  - between the incongruent and neuter conditions ($p<.001$)

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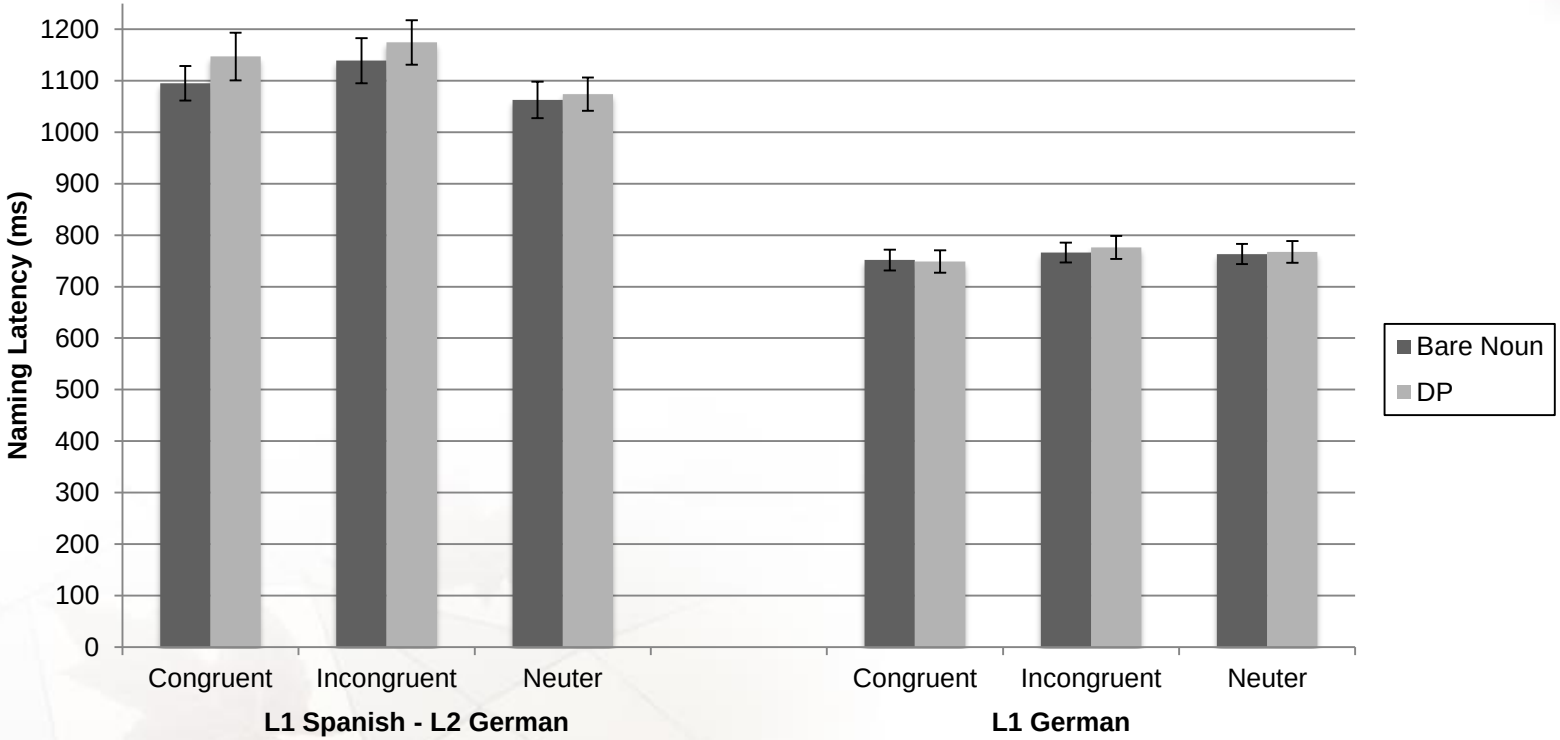
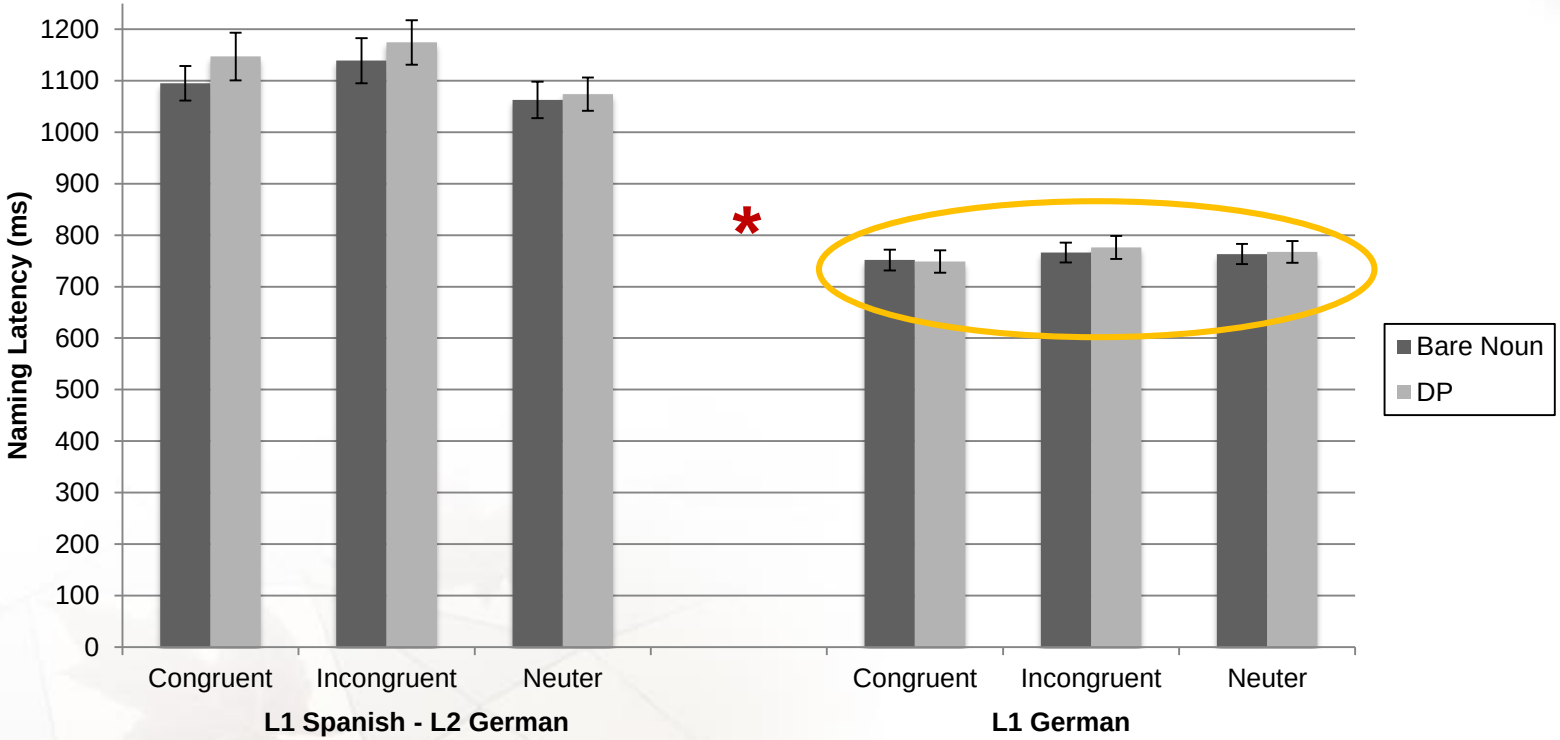
Naming Latencies: L2 German



- naming latencies did not differ significantly between naming conditions (p=.065)

Naming Latencies: L1 German



- no significant differences in latencies by gender condition (p=.329)
- naming latencies for L1 German speakers significantly shorter than L2 German speakers (p<.001)

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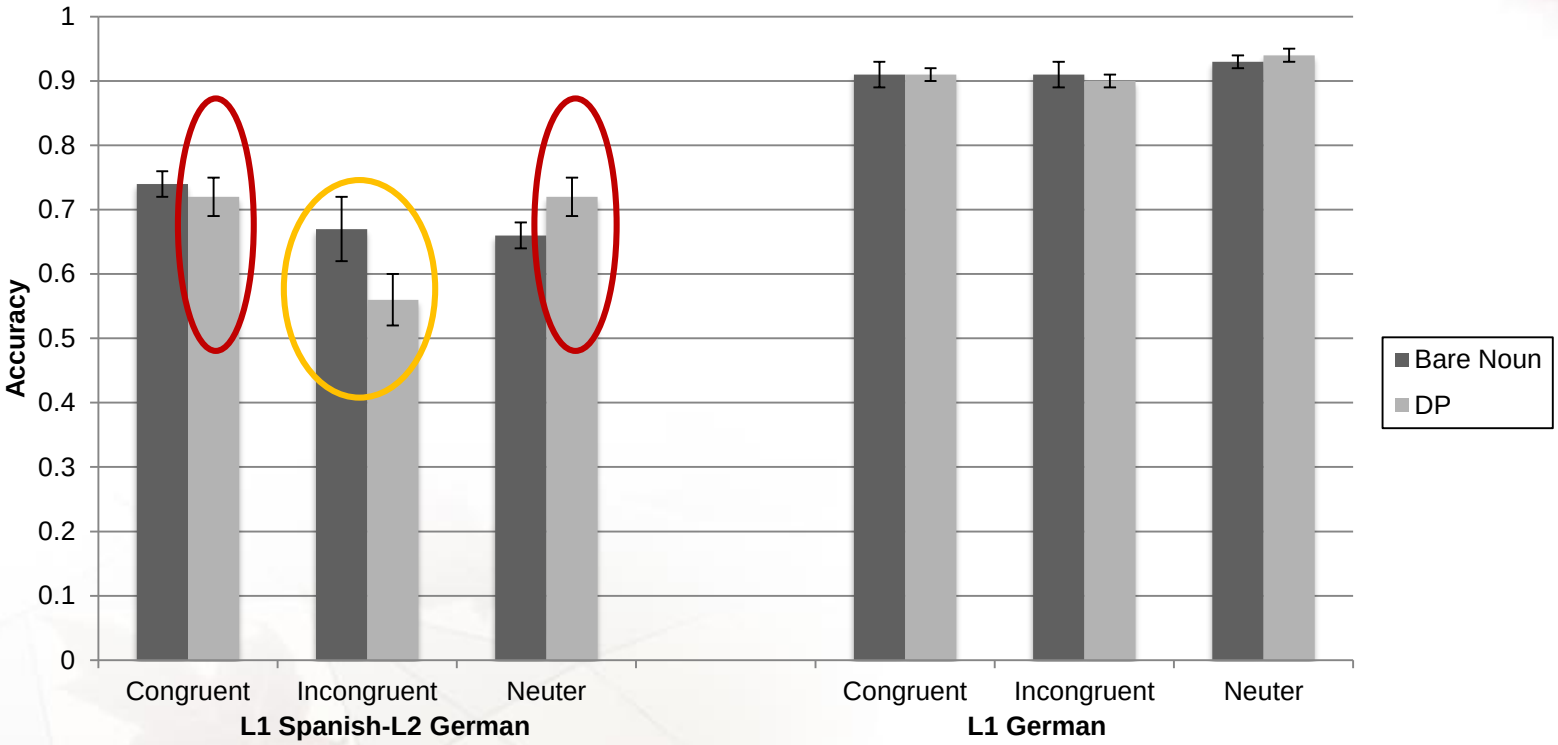
Accuracy Rates: L2 German



- lowest overall accuracy in incongruent condition
- neuter nouns as accurate as congruent ones in DP naming

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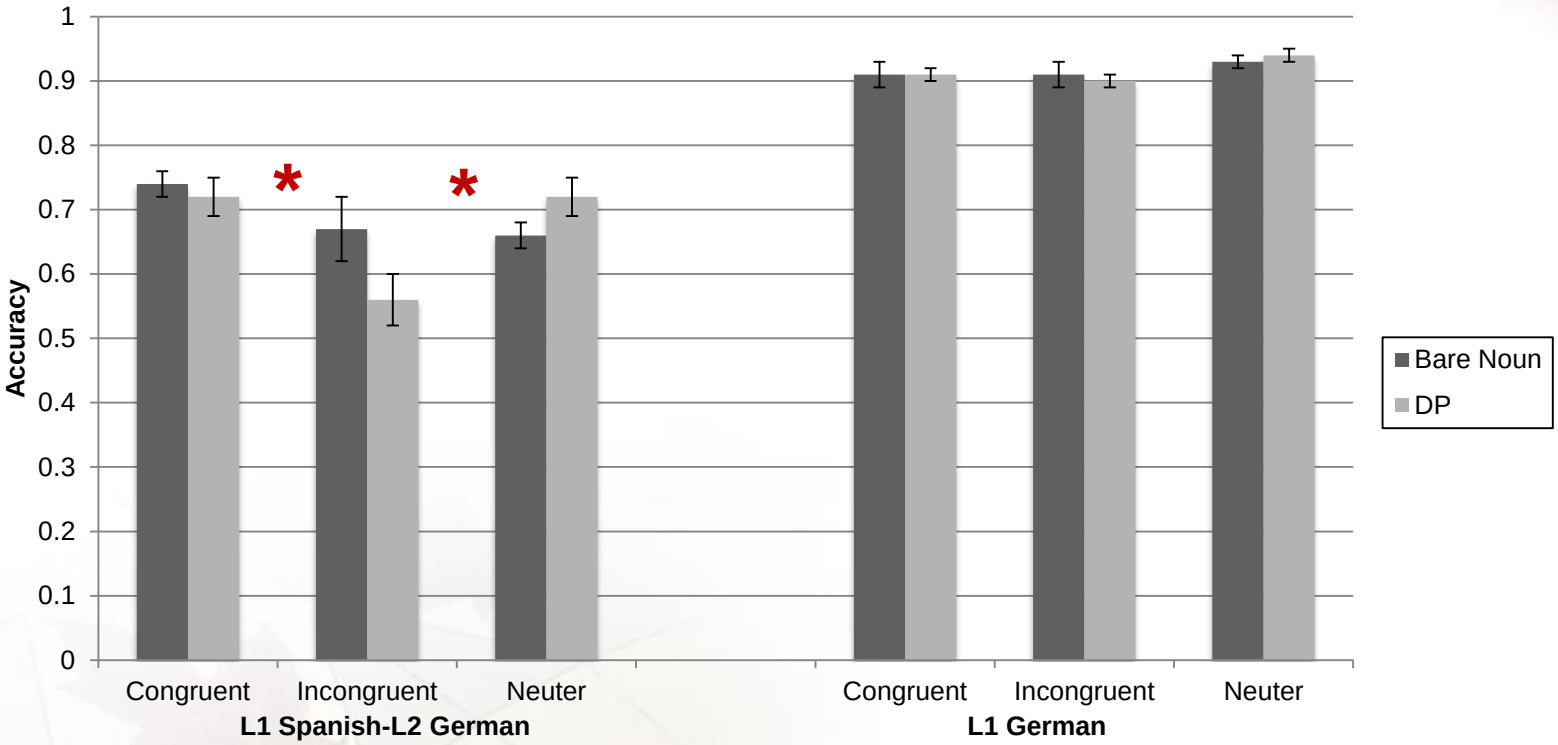
Accuracy Rates: L2 German



- accuracy rates were significantly different:
  - between the congruent and incongruent conditions ($p<.001$)
  - between the incongruent and neuter conditions ($p=.003$)

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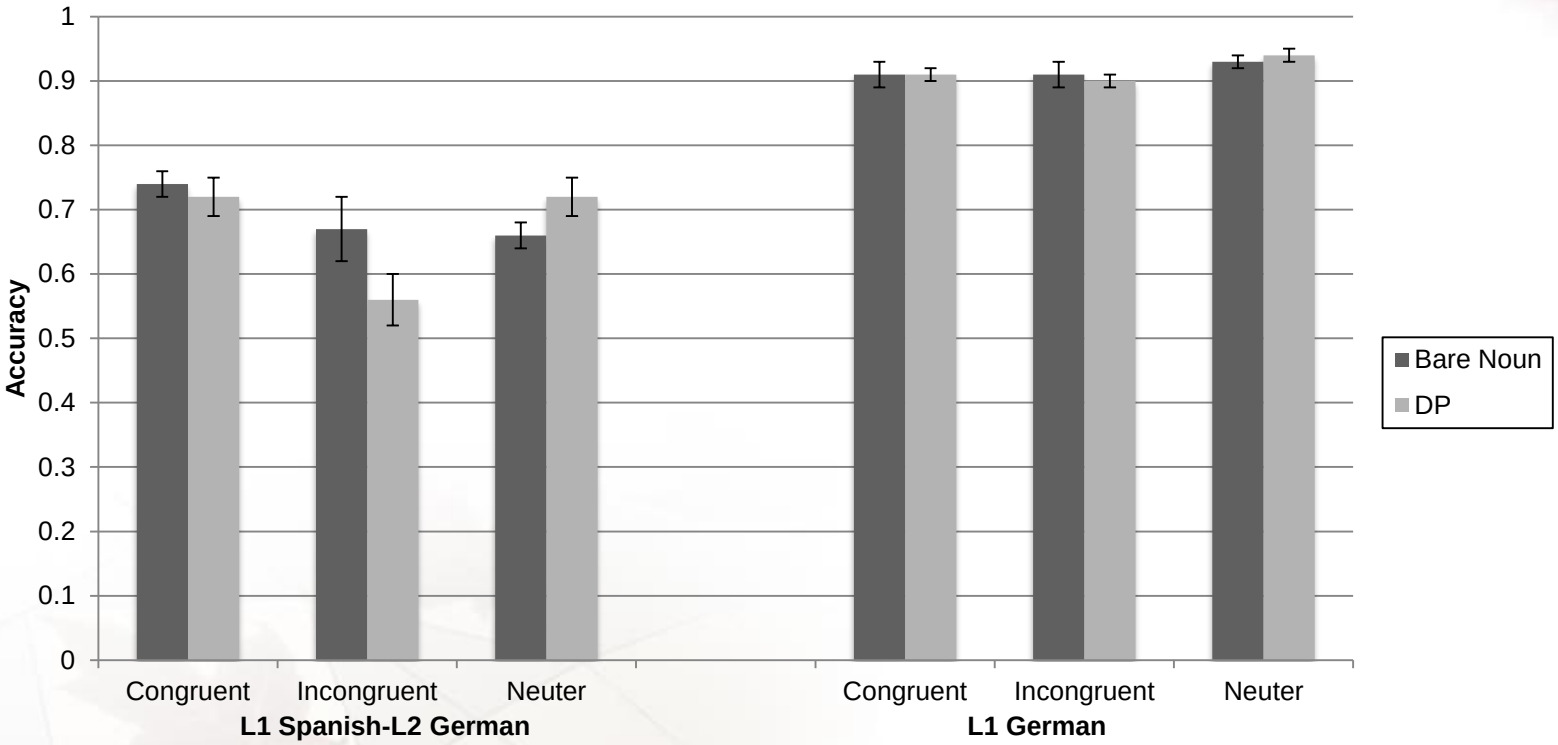
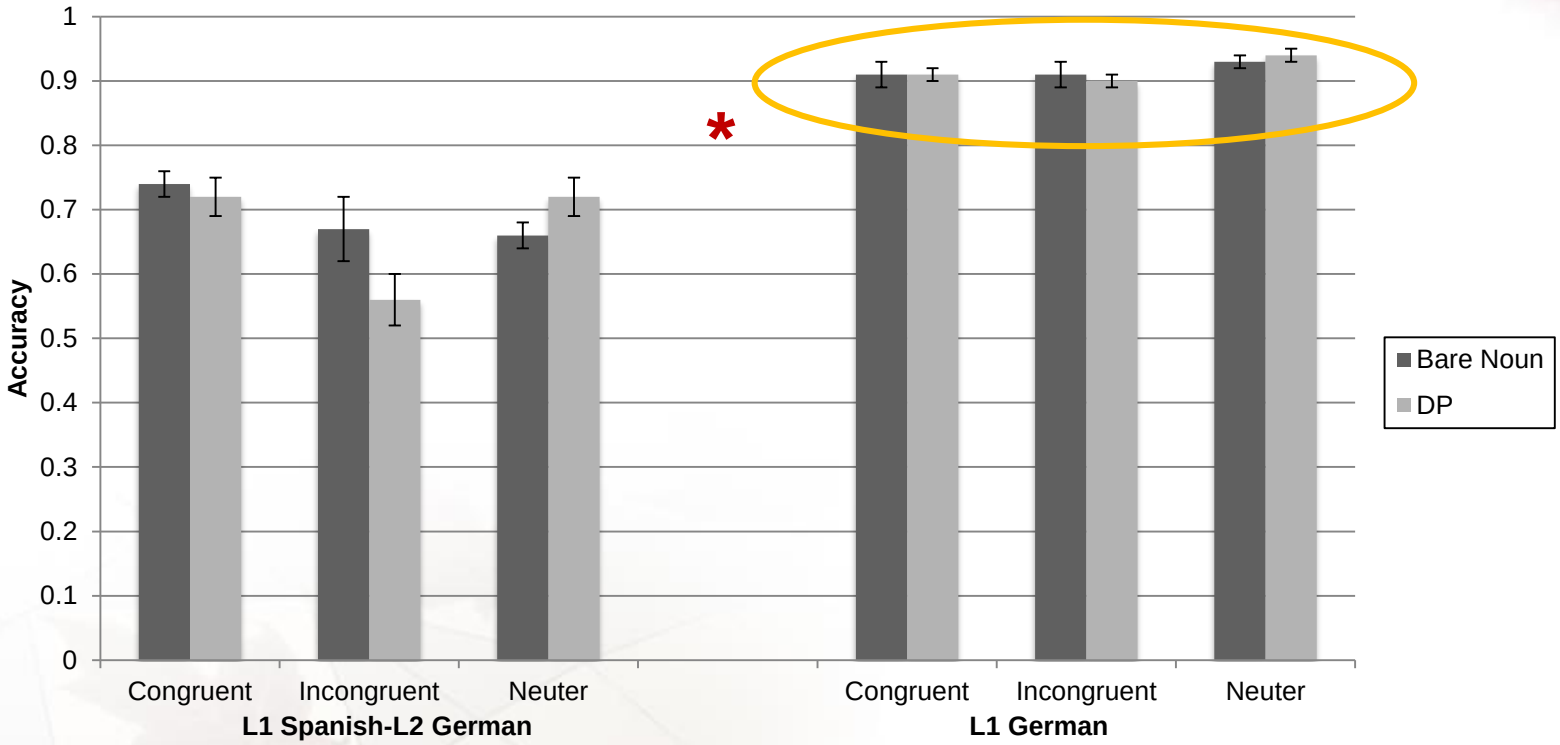
Accuracy Rates: L2 German



- accuracy rates did not differ significantly by naming condition (p=.403)

Accuracy Rates: L1 German



- no significant differences in accuracy by gender condition (p=.267)
- L1 German speakers performed significantly better than L2 German speakers (p<.001)

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Gender Congruency Effect

Results show two significant effects of gender in naming latencies of the L1 Spanish-L2 German speakers

	bare noun	**DP**
Condition	*Mean (ms)*	
gender congruent	1094.83	1147.00
gender incongruent	1139.02	1174.33
neuter	1062.62	1073.92
gender effect (congruent-incongruent)	**-44.19**	**-27.33**
gender effect (neuter-incongruent)	**-76.40**	**-100.41**

Conclusions

1. *How are non-similar gender systems represented in the mind of the bilingual? Do they interact or are their representations independent?*

The facilitation effect for the gender congruent nouns over the incongruent ones suggests that the L1-L2 gender systems are integrated.

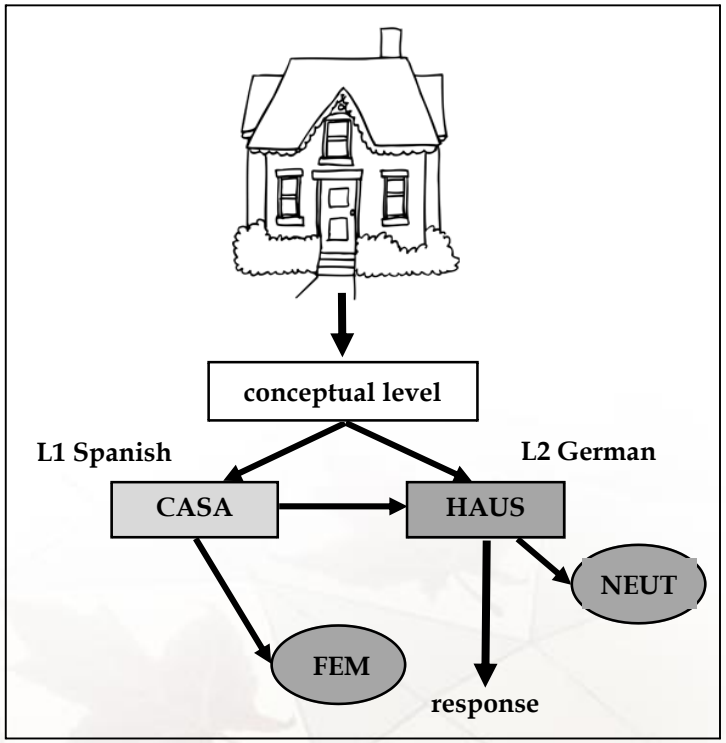
gender-integrated representation hypothesis

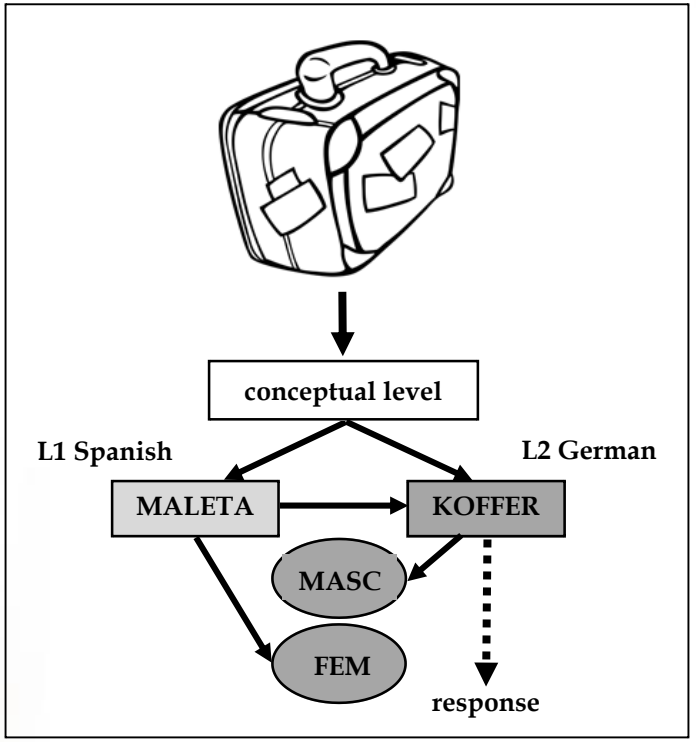
Conclusions

2. *How is neuter, the gender not present in the L1, represented?*

The facilitation effect for the neuter nouns over the incongruent ones indicates a unique representation for the gender not present in the L1.

Neuter





- the activation of the neuter gender node (with no equivalent in the L1) inhibits the process significantly less than the activation of two shared gender nodes

Conclusions

3. *Is gender information always available or is it only selected in NP (or DP) production?*

No significant effect of naming condition on naming latencies indicates that gender information is always available upon noun retrieval.

lexical hypothesis

Summary

This study has shown that the L1 and L2 gender systems interact, even those mismatched in number of classes.

It has also brought new evidence to light regarding the unique representation of the L2 gender not present in the L1: neuter.

In future studies it would be relevant to further investigate the representation of L2 genders not present in the L1 and to expand these results to other languages mismatched in gender classes.

Thank you!

Gracias!

Danke!