

The influence of dominant language on gender processing in heritage speakers: evidence from eyetracking

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Main Goal

To demonstrate that experience with grammatical gender in the majority language gives heritage speakers an advantage in using gender to facilitate lexical retrieval in their heritage language.

Outline

- Heritage speakers & grammatical gender
- Methodology
- Participants & Results
- Implications

Gender agreement in HLs

- Heritage speakers consistently struggle with production and comprehension of gender agreement
 - Production: Alarcón 2011, Kupisch et al. 2013, Montrul et al. 2008, Montrul et al. 2013, Håkansson 1995
 - Comprehension: Polinsky 2008, Scontras et al. 2018
- Degree of transparency of gender marking system may play a role, at least in early bilinguals (Kupisch et al. 2002)

Gender agreement in HLs

- Work on HS of languages with grammatical gender whose ML also has grammatical gender also suggests non-target-like performance with respect to gender
 - Examples: HS of Russian with ML Norwegian (Mitrofanova et al. 2018); HS of Polish with ML Dutch (Janssen 2016), among others

Offline vs online methodology

- Modality of the task & explicitness of knowledge targeted in part determine heritage speaker performance
 - Alarcón 2011, Bowles 2011, Montrul et al. 2008, Montrul et al. 2014, a.o.
- In offline methods, HS have a disadvantage over L2 learners...
- ... In online methods, HS perform more like monolingual controls.
- Online methods measures unconscious responses and therefore are less vulnerable to interferences from factors related to lack of explicit language instruction and language attitudes.
 - Mostly studies done on HS of Spanish in the USA.
 - See Bayram et al. 2020 for further discussion.

Offline vs online methodology

- Tasks measuring linguistic knowledge in real time have deepened our understanding of HS ability to comprehend gender agreement.
- What can tasks measuring language processing in real time tell us about the effect of grammatical gender in the ML on processing gender in the HL?

Lexical retrieval & facilitative use of gender

- Use eye-tracking methods to observe whether HS can access and deploy grammatical gender information in real time to *facilitate lexical retrieval*.

m

ma

man

manz

manza

manzan

manzana

LA manzana

Previous findings

- Monolingual adults, monolingual children can do this (Lew-Williams & Fernald 2007, 2010; Gruter et al. 2012; Dussias et al. 2013).
- L2 learners... mixed bag (Lew-Williams & Fernald 2010; Gruter et al. 2012; Dussias et al. 2013)
- HS of Spanish with ML English can access and deploy gender information in real time but are slower to do so than monolingual speakers (Fuchs 2019).

Research question

Does the presence of a grammatical gender feature in the majority language affect heritage speakers' ability to use grammatical gender to facilitate lexical retrieval in their HL?

The strategy

Spanish-German bilinguals

- Why Spanish as the HL:
 - Previous work as control (Lew-Williams & Fernald 2007, 2010; Gruter et al. 2012; Dussias et al. 2013; Fuchs 2019)
- Why German as the ML:
 - Three grammatical genders
 - Not from the same immediate language family, gender systems non-overlapping
 - Determiners vary with gender like they do in Spanish
 - der Tisch* (m.)
 - das Buch* (n.)
 - die Blume* (f.)

Direct replication of Fuchs (2019); study is in Spanish, but the ML of participants is German.

Predictions

Option 1: Having a second (dominant) gender system in the ML hinders in accessing the gender system of the HL, making it more difficult to use gender in real time.

Option 2: Having experience with using gender information on articles to facilitate lexical retrieval in the ML boosts HSs' ability to do so in the HL.

Option 3: Gender in the ML has no effect on gender in the HL.

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Methodology

Gender + Eye-tracking = **facilitative use of gender
in the Visual World Paradigm (VWP)**

Spanish -- Lew-Williams & Fernald (2007, 2010), Gruter et al (2012), Dussias et al. (2013)

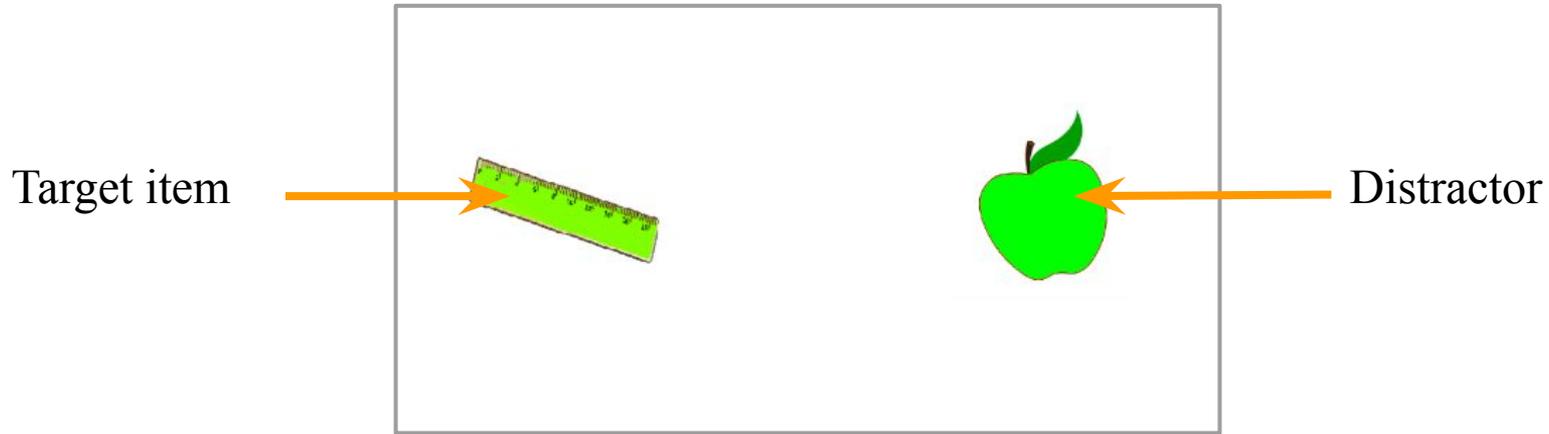
Dutch -- Loerts (2012), Loerts et al (2013), Bouwer et al (2018)

German -- Hopp (2013, 2016), Hopp & Lemmerth (2018)

Among others...

VWP basics

Task: to look at the item that is asked about as quickly as possible.



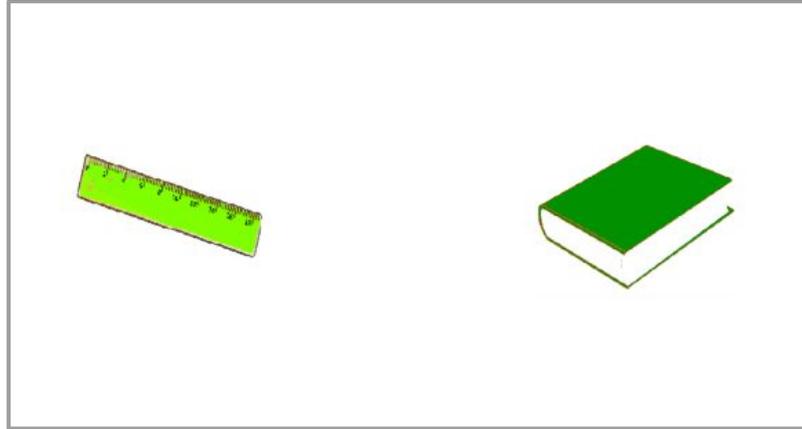
¿Dónde está la regla ?

Where is the ruler

Mismatch condition

F

M



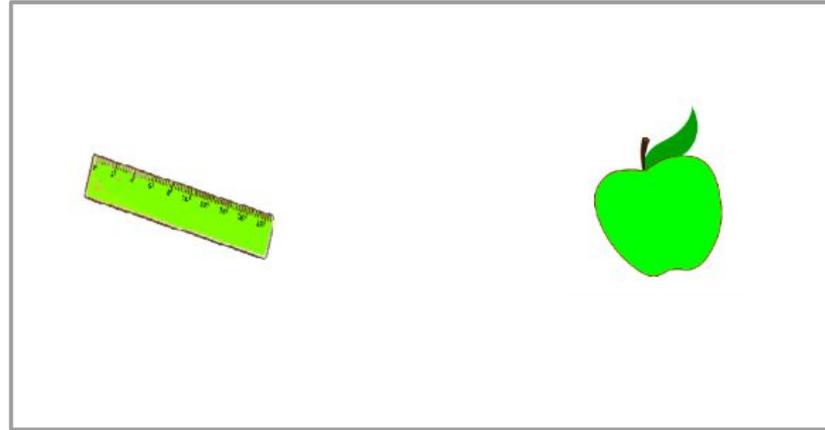
¿Dónde está **la**... ?

Where is the.F ...

Match condition

F

F



¿Dónde está **la**... ?

Where is the.F ...

How it works

- **Dependent measure:**
time of first fixation after the onset of the gender-marked article (reaction time).

Predictions

Predictions:

If speaker can use gender facilitatively → first fixation on target item will be faster for mismatch condition than match condition

If speaker cannot use gender facilitatively → first fixation on target item will be about equal for mismatch and match conditions

Experimental materials

42 lexical items (chosen based on norming study)

102 displays

- 4 different colors
- Controlled for:
 - Different phoneme at the onset of the lexical item
 - No lexical item started with a vowel
 - 2+ syllables
 - Canonical -o/-a endings
 - Randomized side of target item
 - Congruency of gender of German equivalent noun

Experimental materials

- auditory recorded by male speaker of Spanish, recently immigrated from Colombia
- spliced to ensure consistent timing and no co-articulation effects

Procedure

Pre-tasks

- LEAP-Q (Marian et al. 2007)
- Vocabulary task (for proficiency assessment & data cleaning)

Eye-tracking task

- 2 x 54 trials
- Unlimited break

Total time: 30-45 minutes

Participants were compensated for their time

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Participants

11 adult HS of Spanish, dominant language in German (<8 years in Spanish-speaking country)

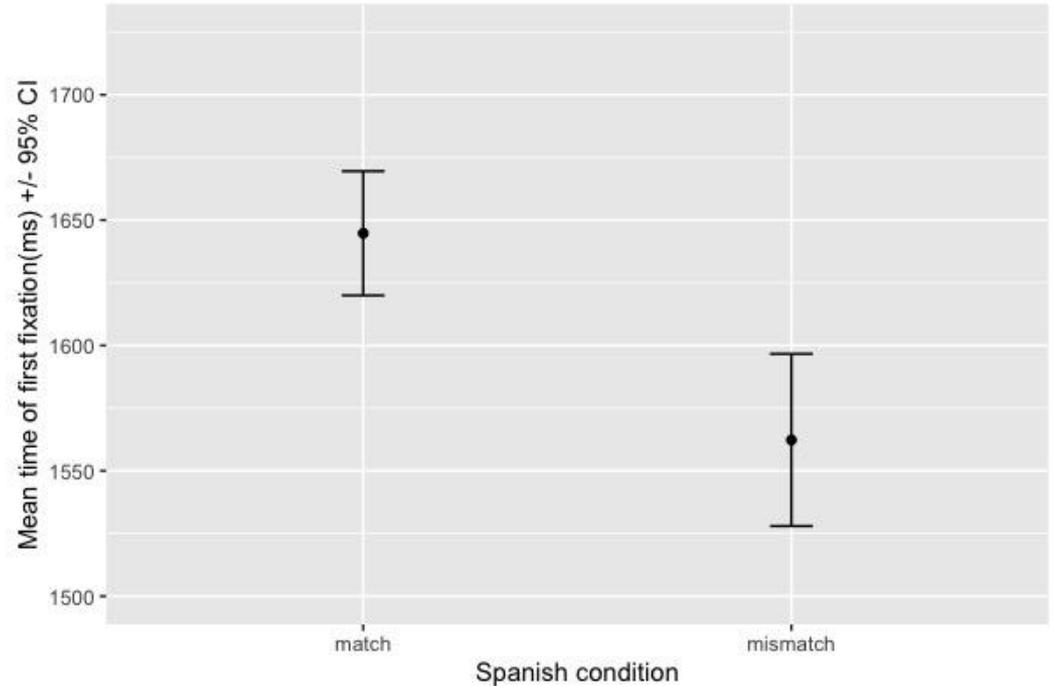
14 adult speakers of Spanish, recently immigrated to Germany, spent 18+ years in Spanish-speaking country

	Age	Age of leaving Spanish-speaking countries	Accuracy on oral production task	Education level
Heritage (n = 11)	28.09 (6.04)	1.41 (3.02)	0.831 (0.16)	Some college (n=3) College (n=4) Masters (n=3) Unknown (n=1)
Control (n = 14)	26.79 (5.79)	24.07 (5.64)	0.985 (0.03)	Some college (n=3) College (n=5) Some post-grad (n=1) Masters (n=2) PhD (n=3)

Results

Control speakers fixated on target items **faster in mismatch condition**.

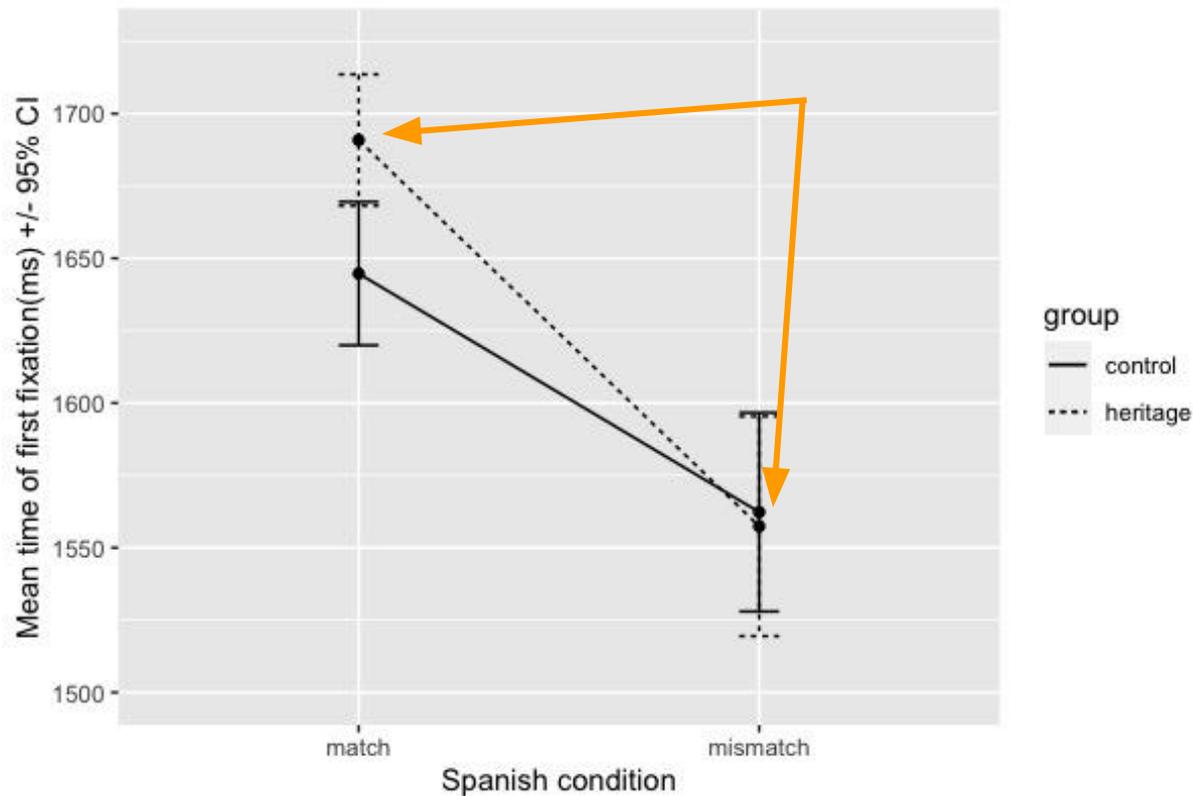
Replicated previous findings (Lew-Williams & Fernald 2007, 2010, Gruter et al. 2012, Fuchs 2019).



Mean time of first fixation on the target item (with 95% CI) across match and mismatch of the control group.

Results

Heritage speakers also fixated on target items faster in mismatch conditions, replicating Spanish HS results in Fuchs (2019).

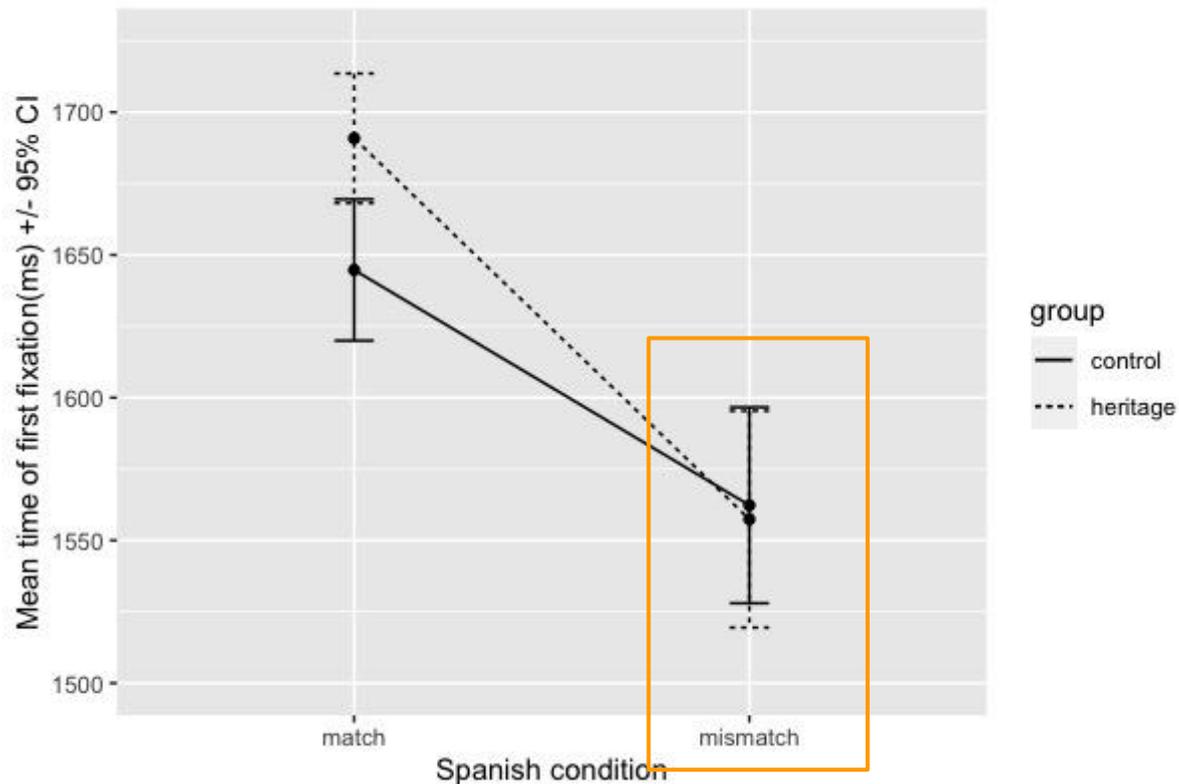


Mean time of first fixation on the target item (with 95% CI) across match and mismatch, compared across the control and heritage groups.

Results

Heritage speakers also fixated on target items faster in mismatch conditions, replicating Spanish HS results in Fuchs (2019).

No difference in speed of HS and controls in the mismatch conditions, unlike for Spanish HS in Fuchs (2019).



Mean time of first fixation on the target item (with 95% CI) across match and mismatch, compared across the control and heritage groups.

Predictions

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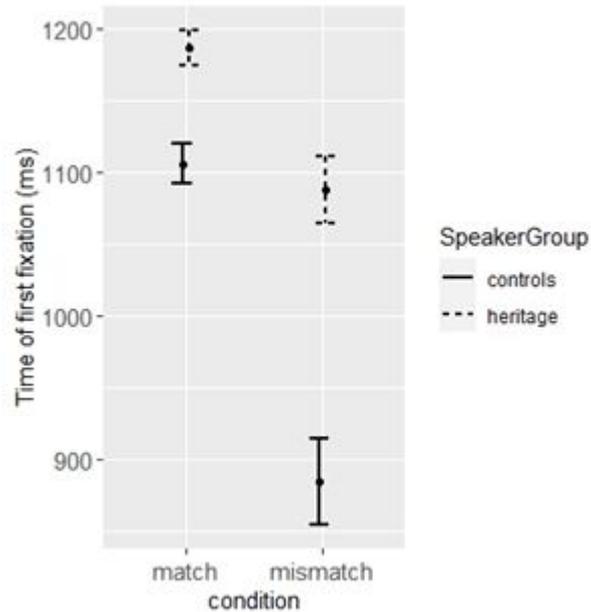
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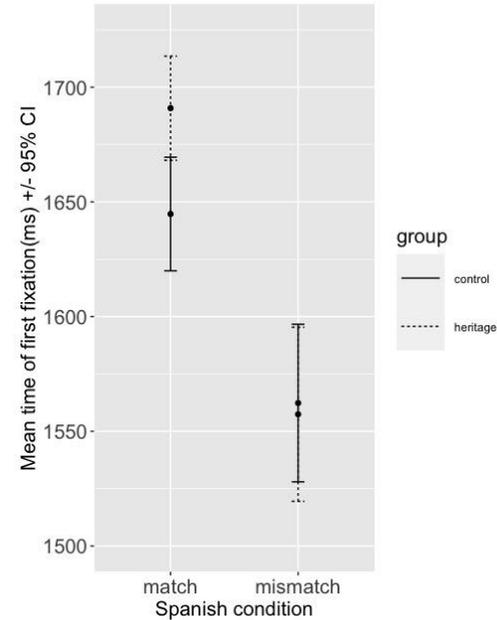
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Compare to Spanish-English bilinguals



ML English (Fuchs 2019)



Present study

Why this advantage?

Recall German also has articles inflecting for gender:

der Tisch

das Buch

die Blume

So Spanish-German bilinguals practice using gender on pre-nominal articles in their ML as well as HL.

Research questions & predictions

Option 1: Having a second (dominant) gender system in the ML hinders in accessing the gender system of the HL, making it more difficult to use gender in real time.

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Summary

- Results replicate previous findings:
 - Control speakers can use gender facilitatively.
 - Heritage speakers can also use gender facilitatively.
- Results suggest heritage speakers whose ML has grammatical gender and articles inflected for gender have an advantage in accessing gender information in real time over those heritage speakers whose ML does not have grammatical gender.
- Further evidence that we need to use methods to measure heritage speakers' language processing in real time to assess their linguistic knowledge.

Thank you!

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