L1 influence in L2 gender predictions: A visual world study

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Background

- Gender cues on determiners allow listeners to generate expectations about upcoming objects [1-3]. These predictions are *helpful*: they enable faster processing and resilience to environmental noise.
- But can conflicting cues lead listeners astray? In German, possessive pronouns contain two gender cues: the stem encodes the gender of the object's owner (*possessor agreement*) and a suffix marks the gender of an upcoming object (*possessee agreement*):

- Does cue conflict interfere with predictions in L1 (native) speakers?
- Does cue conflict also affect L2 (non-native) speakers? And does this depend on whether the L1 of non-native speakers has grammatical gender (**L1 Spanish**) or lacks it (**L1 English**)?

OUR RESULTS

- L1 German speakers used gender-marking in determiners and pronouns to predict upcoming objects, but predictions were slowed by cue conflict, consistent with interference.
- L2 speakers were not able to use gender-marking to predict upcoming objects, nor did they show any sensitivity to cue conflict.

Design

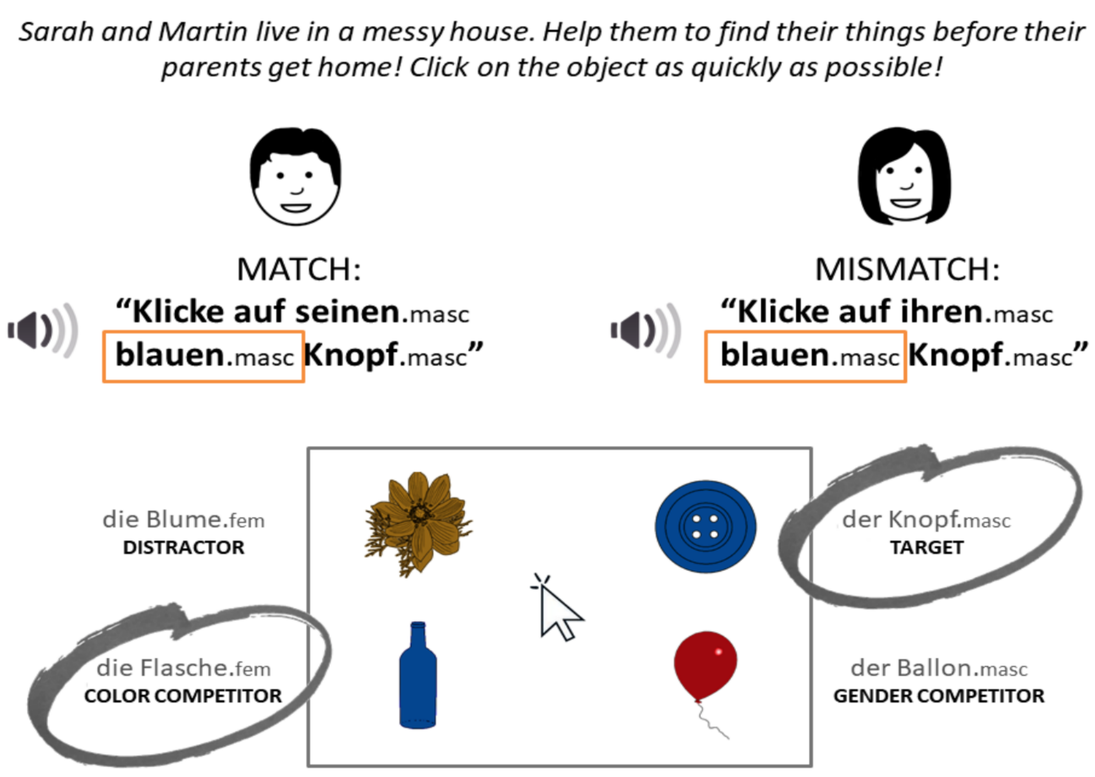
- **L1 German**: n = 74
- **L1 Spanish**: n = 53, mean self-rated L2 proficiency = 7.26/10 (1.05), mean age of acquisition = 20.3 yrs (8.50)
- **L1 English**: n = 55, mean self-rated L2 proficiency = 7.16/10 (1.26), mean age of acquisition = 18.8 yrs (6.67)

THE EXPERIMENT

- Auditory instruction with gender-marked determiner or possessive pronoun.
- Task: Click on the correct object (target) as quickly as possible.
- Critical window: Target first predictable in adjective window ("blue").
- Critical objects: Target and Color competitor.

3 CONDITIONS

- Determiner: Used to replicate previous findings.
- Pronoun gender MATCH: Possessor gender matched gender of the object.
- Pronoun gender MISMATCH: Possessor gender was different to gender of the object.



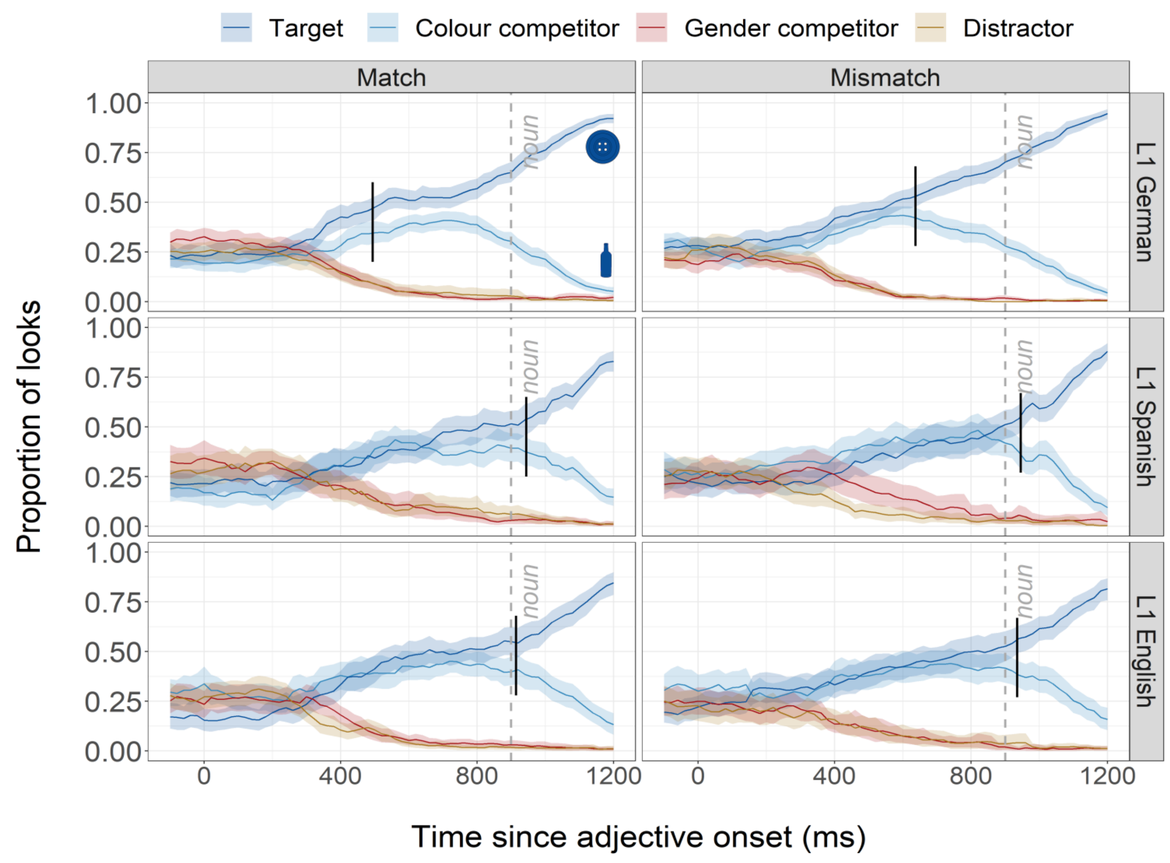
Bibliography

[1] Hopp (2012) *Second Lang Research* [2] Lew-Williams & Fernald (2010) *JML* [3] Hopp & Lemmerth (2017) *Studies in SLA* [4] Sheridan & Reingold (2012) *Visual Cog*

Results

Predictive looks to target vs. color competitor in the adjective time window compared using hierarchical logistic regression models:

- **Pronoun condition:** L1 Germans showed a predictive target advantage in both match and mismatch conditions. There was evidence of cue conflict: predictive advantage was larger in match (42% vs. 29%) than mismatch conditions (45% vs. 33%). Cue conflict in the mismatch condition seemed to slow down predictions in L1 Germans: the onset of predictions are marked in black (more detail in next section)
- **Pronoun condition:** L2 Germans did not show a predictive target advantage in either match or mismatch conditions. Cue conflict did not appear to play a role: L1 Spanish (33% vs. 29%) and L1 English (36% vs. 35%).
- **Determiner condition:** L1 Germans showed a predictive target advantage (42% vs 31%), but L2 speakers did not (35% vs. 34%). This partly replicated previous results [1-3].



Does cue conflict delay prediction?

To derive the onset of predictions we used a bootstrapping method adapted from [4]:

- Mean fixations to target vs. competitor computed for each 20ms time bin in match and mismatch conditions separately. Predictive onset = earliest significant t-value in a run of 10 consecutive significant values.
- Onsets for match and mismatch conditions, and their difference, were resampled 1000 times. Inference made on bootstrap distributions to control for type 1 error.

Results:

- German L1s were 143 ms slower to predict the object when the two gender cues were conflicting, 95% CI [-120, 340 ms]. The probability that interference slowed prediction was 84%.
- German L2s were not affected by cue conflict, regardless of their L1.