

Longitudinal Development of L3 Grammatical Gender:

A Virtual Eye-Tracking Study

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Research Questions

- To what degree does previous Romance grammatical gender knowledge **transfer** at the initial state of L3 acquisition for a new gendered L3?
- Does the role of **cross-linguistic influence** from previously known languages change throughout early stages of L3 development?

Introduction

Research to date on third language (L3) acquisition places a strong focus on the initial state (or initial stages) of the L3 grammar, primarily focusing on the preliminary construction of the grammar at the onset of L3 exposure (see Puig-Mayenco et al. (2020) for summary). Less focus has been placed how the L3 grammar continues to develop beyond this initial construction, and the role of cross-linguistic influence (CLI) from previously known languages in this process.

Findings of previous work on L3 gender have varied in their findings related to evidence of CLI from a gendered L1/L2, (e.g. Brown, 2020; Długosz, 2021; Ecke, 2022). However, it has generally agreed that online experimental measures such as response time and eye-tracking serve as more informative measures of grammatical sensitivity than offline measures such as grammaticality judgement, particularly for low-proficiency learners.

In a longitudinal study, this author followed L3 German learners with previous knowledge of English and a Romance language, examining their development of the German grammatical gender system across their first semester of German instruction, and comparing them to a control group of L2 German learners with L1 English. The full project examined grammatical gender processing across multiple modalities, and here I present the results of the forced choice listening tasks aspect of the project.

Using a virtual eye-tracking program, trilingual participants were tested on their use of and sensitivity to spoken German grammatical gender cues across their first semester of German instruction, once at the onset of German learning, and again after completing the semester.

The examination of the same participants from a near “initial state” point in the L3 acquisition process through to a “beginner” proficiency level allows for the distinction between “initial state transfer” as described by wholesale initial transfer models of L3 such as the Typological Primacy Model (Rothman, 2010), and later cases of developmental CLI such as those predicted by Fernández-Berkes and Flynn’s model of Grammatical Mapping in L3 Fernández-Berkes & Flynn (2023).

Methods

- Participant completed the study in two separate sessions, one at the beginning of their first semester of German and one at the end of that semester.
- Virtual data collection via Gorilla Experiment Builder.
- Forced choice listening task:** Participants were presented with four images, heard a German sentence, and chose the image that matched the sentence.
- In the key condition, the spoken sentence contained a **grammatical gender error** on the definite determiner, and a distractor image that matched the erroneous gender was included.
- Data was collected on participant’s **response accuracy**, **response time**, and **fixation duration** using virtual eye-tracking software.
- Participants also completed other tasks and background questionnaires, including the LEAP-Q (Marian et al., 2007) and a grammatical gender assignment task.

Participants

44 participants (25 F, 14 M, 5 M; age \bar{X} = 19.8, SD = 2.44)

- Trilingual Participants** (N = 29)
 - L1/L2 English/Romance (either order). Romance AoA \bar{X} = 12.61
 - All B1 or higher in their Romance language.
 - Romance languages: Spanish, French, Italian, & Portuguese.
- Bilingual Participants** (N = 15)
 - L1 English/L2 German, no knowledge of any other languages.



Figure 1: Example of protocol.

Conclusion

While trilingual participants were found to be significantly faster and more accurate at the task overall, neither language background group demonstrated any evidence of sensitivity to the spoken grammatical gender errors at either experimental session. Participants demonstrated no evidence of initial state transfer of grammatical gender, suggesting that any differences in grammatical gender development found in previous studies such as Brown (2020) were the result of later CLI or developmental differences rather than initial state transfer of gender. These findings, however, raise new questions regarding the later L3 developmental process, and the differentiation between post-initial state CLI and the unique development of a new grammatical feature.

Future Research

This experiment was part of a larger research project where upcoming research will address additional questions related to L3 grammatical gender acquisition such as:

- Modality and early gender processing
- Acquisition of gender agreement vs. gender concord

Key Result

- Trilingual participants show faster and more accurate responses in general.
- However, all participants show no sensitivity to German gender errors, even after 3-4 months of German instruction.
- These findings show no evidence of initial state transfer of grammatical gender from L1/L2 Romance, and raise questions about the role of CLI in the later stages of L3 gender development.

Analysis

A series of mixed effects regression analyses were performed in order to examine how the dependent variables of **response accuracy**, **response time**, and **fixation duration** on the target image were effected by a variety of independent variables including **session** (the first or second experimental meeting), **language background** (bilingual or trilingual), **sentence type** (presence/absence of a gender error), and **response accuracy** (whether or not they ultimately answer the question correctly) among other variables.

	Response Accuracy	Response Time	Fixation Duration
Response Accuracy	N/A	★	★
Session *			
Language Background	★	★	×

Table 1: Significant predictors across of mixed models.

Results

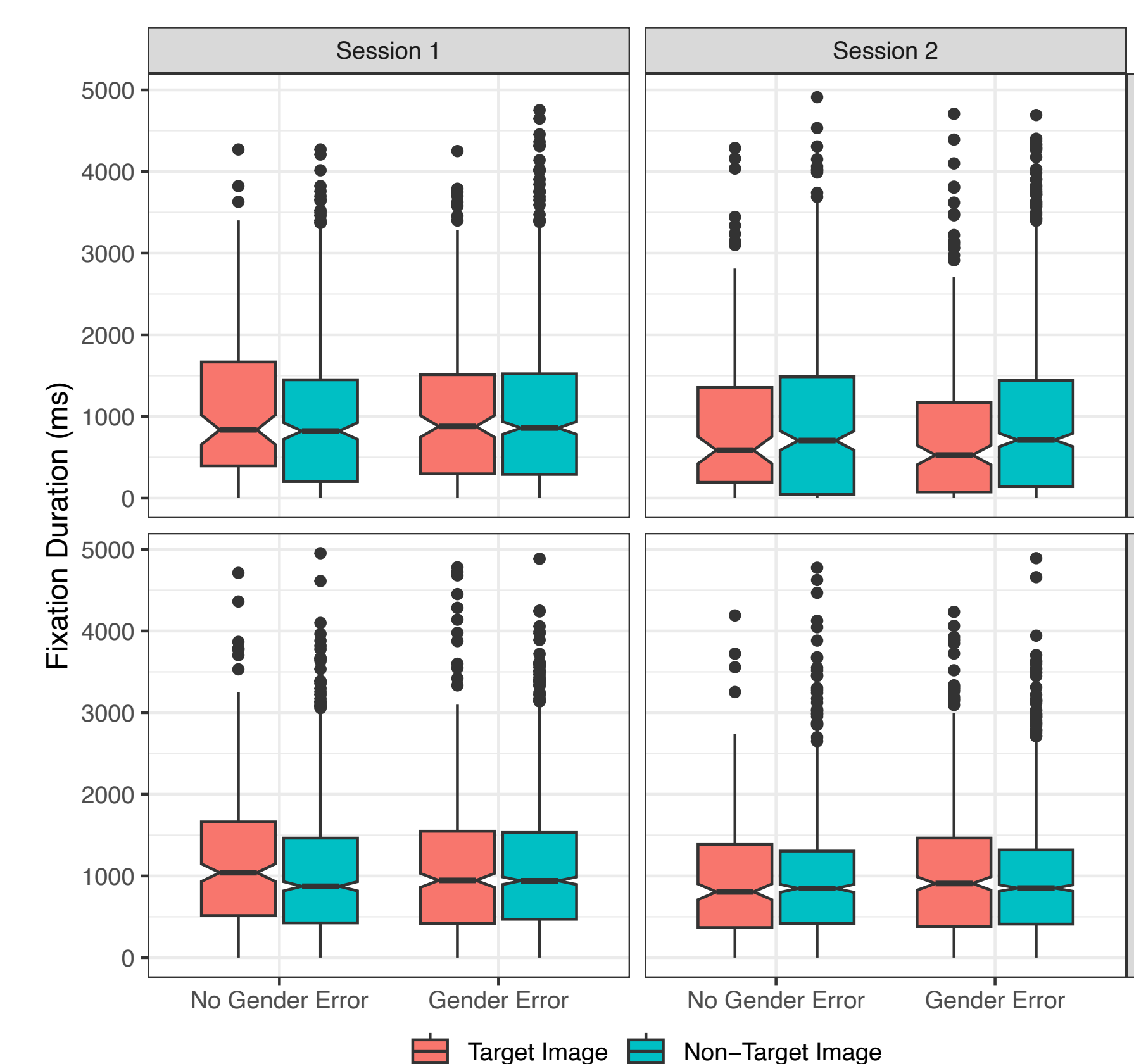


Figure 2: Fixation duration results. No significant evidence of sensitivity to grammatical gender errors found.

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