How Gender, Handedness, and L1 Processing Strategy Influence L2 Grammatical Processing

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Introduction

- Second language models:
  - Learners progress from lexical processing of grammatical errors to grammaticalizing the rule and relying on automatic syntactical processing
  - New research suggests that native-like performance in an L2 as well as native performance in L1 is not as uniform as previously believed (Tanner and Van Hell 2014).
  - New way to categorize individual differences: individuals can show a more N400 dominant response, indicating a reliance on lexical information or a P600-type response, indicating a reliance on syntactic information (Tanner, Inoue, and Osterhout 2014).
  - Which is more dominant?
    - Response dominance index, or RDI, which identifies on a continuous scale how the subject responds to grammatical errors (Tanner et al., 2013, 2014)
    - What individual differences affect an individual's RDI?

Hypotheses

- Women will have larger RDI values (Chavez 2001, Gu 2002, Kissau 2006).
- People with left-handed family members (FS+) will produce more N400-like responses to grammatical errors, resulting in a lower RDI value (Bever et al. 1989).
- Positive correlation of RDI values in L1 English and L2 French

Method

Participants
- 20 L1 English speakers in their second year of French (L2) instruction
- ERP Task
  - Participants read grammatically well-formed and ungrammatical sentences in their L1 and L2
  - Every man has two eyes. (grammatical)
  - Every man have two eyes. (ungrammatical)
- Response dominance index (RDI; Tanner et al., 2013, 2014)
- N400 effect size and P600 effect size were calculated by the mean amplitude difference between grammatical and ungrammatical conditions in the 300-500ms and 500-900ms post-stimulus waveform, respectively
- RDI = P600 effect size – N400 effect size
- RDI was calculated for English and French grammatical errors

Results

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  - New way to categorize individual differences: individuals can show a more N400 dominant response, indicating a reliance on lexical information or a P600-type response, indicating a reliance on syntactic information (Tanner, Inoue, and Osterhout 2014).
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Discussion

- Some participants showed primarily an N400 effect and others showed primarily a P600 effect (cf. Tanner & Van Hell 2014).
- Women showed greater P600 dominance than men to L2 errors - consistent with prior evidence that females learn a second language more quickly and achieve higher proficiency than male learners (Chavez 2001, Gu 2002, Kissau 2006).
- No relationship between FS and RDI was found – inconsistent with prior research (Tanner & Van Hell 2014)
- English RDI was unrelated to their French
  - Early in the learning process, an individual's ERP response dominance in their native language does not predict the dominance for their second language
  - Would this change with learning?
  - Native-like L2 RDI more like L1 RDI?
  - However L2s are learned under different environments than a native language
    - Preclude the RDIs from being related?
    - Always becomes more P600-like in L2?
    - L2 instruction typically emphasizes grammar explicitly, whereas native language learning is a more implicit process.

Future Directions

- Does the relationship between L1 and L2 RDI change over time as individuals become more proficient in their L2?
- What factors go into a person's RDI in their L1?
- What, if any, is the relationship between FS and RDI?

References