L2 processing is affected by RAGE: Evidence from reference resolution

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Native-language processing involves not only information integration, but also anticipation, or prediction, for both adults and children. An open question, which our study seeks to address, is to what extent adult non-native speakers use predictive processing.

Recent work on grammatical gender reveals a dissociation in L2 performance on tasks requiring information integration vs. those requiring anticipation: L2ers perform like native speakers on comprehension tasks involving (ungrammatical) gender-mismatch between nouns and post-nominal adjectives, i.e., disruption of information integration at the adjective; however, on tasks assessing whether gender cues allow anticipation of upcoming information, even highly proficient L2ers differ from native speakers. Based on such observations, we propose that non-native speakers have Reduced Ability to Generate Expectations (RAGE) during language processing. Here we present evidence from a different realm of language processing—reference resolution—in support of this hypothesis.

A story-continuation task (adapted from [10]) was completed by 20 advanced L2 learners of English (12 L1-Japanese, 8 L1-Korean) and 24 native speakers; they wrote continuations following a context sentence that described a transfer-of-possession event (see (1)). A 2x2 design varied aspect in the context sentence (perfective/imperfective) and prompt type in the continuation (pronoun/free). Trained judges identified the intended referent of the subject of the continuation, coding for SOURCE (of the context sentence; see (2)), GOAL (3), ambiguous, or other. Previous work shows that native speakers’ coreference expectations on this task are modulated by verbal aspect: Transfer-of-possession events yield more GOAL-continuations when marked by perfective compared to imperfective aspect. This effect has been tied to end-state salience: perfectives describe completed events compatible with end-state focus (here focus on the GOAL), whereas imperfectives describe ongoing events with no salient end-state. End-state salience (perfective) guides native speakers’ expectations about who will be mentioned next, in this case favoring re-mention of the end-state referent (GOAL). If, in accordance with the RAGE hypothesis, non-native speakers are less able to engage in predictive processing, the effect of aspect on reference resolution should be reduced in the L2 group, yielding a significant aspect-by-group interaction.

To test this meaningfully, we first need assurance that participants comprehend aspect. They thus also participated in a truth-value judgment task (adapted from [13]). Results from this task (Fig.1) indicate clear discrimination between imperfective and perfective aspect, with no significant between-group differences. Results from the story-continuation experiment (Fig.2), by contrast, show differential performance by the two groups, critically reflected in the predicted aspect-by-group interaction (F(1,42)=6.53, p<0.05), driven by the influence of aspect on proportion of GOAL-continuations/SOURCE-continuations (for prompts of both types) by native but not non-native speakers. Moreover, L2ers showed an unexpected overall GOAL-bias, potentially reflecting a recency bias, similar to that previously observed with L1 children. This may point toward processing limitations as an underlying explanation for RAGE: If processing resources are exhausted by information integration, little is left for anticipatory processing. In consequence, non-native speakers generate fewer expectations that may affect reference resolution, relying instead on more superficial heuristics, such as recency, when interpreting ambiguous pronouns.
(1) Patrick gave/was giving a towel to Ron. (He) ________________
(2) He made sure to give him a clean dry one. (SOURCE-continuation for (1), i.e., he = Patrick)
(3) He said “Thank you.” (GOAL-continuation for (1), i.e., he = Ron)

Figure 1. Proportion of ‘true’ responses by condition and group.

Figure 2. Proportion of SOURCE-continuations (out of the total SOURCE- plus GOAL-continuations) by group (L1, L2) and prompt type (pronoun, free).

References