L2 Listeners Show Anticipatory Looks to Upcoming Discourse Referents

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Do L2 listeners have proactive biases (expectations) about who will be mentioned next in a discourse?

- **Native-language processing:** Incrementally updated, proactive biases about upcoming information at all levels of linguistic representation, including discourse (e.g., Van Berkum et al., 2007; Rohde & Horton, 2014)
- **L2 processing:** Mixed evidence for lexical and syntactic anticipation (e.g., Foucart et al., 2014; Ito et al., 2016; Kaan, 2014)
- **L2 referential processing:** Reduced use of discourse-level cues and potentially greater reliance on sentence-level information (Cheng & Almor, 2016; Grüter et al., 2016; Roberts et al., 2008)

→ *None of these studies have used methodologies capable of capturing proactive biases **before** a referential expression is encountered.*

Event structure and pronoun interpretation

(1) Emily$_{Source}$ brought/was bringing a drink to Melissa$_{Goal}$. She _____

Native speakers:

- General bias for Goal reference following transfer-of-possession events (Stevenson et al., 1994)
- More Source continuations following imperfective vs. perfective aspect (English: Kehler et al., 2008; Japanese: Ueno & Kehler, 2010; Korean: Kim et al., 2013); ERPs show enhanced integration difficulty for Source-referring following perfective vs. imperfective aspect (Ferretti et al., 2009).

L2 learners:

- No aspect effect on coreference for Japanese and Korean learners of English, despite reliable association of perfective/imperfective with completed/incomplete events (Grüter et al., 2016; Schafer et al., 2015)

→ *Reduced Ability to Generate Expectations ('RAGE') in discourse*

➢ 3 Predictions:

Following a transfer-of-possession event with perfective (vs imperfective) aspect and *prior to* the encounter of a referential expression,

1) Native speakers will look to the Goal more than to the Source;
2) L2 learners' looks will not be modulated by aspect.

If L2 learners have no proactive referential biases,

3) they will look at the Source and Goal equally until the linguistic signal disambiguates reference.

Participants

- L1 English (N = 54), mean age: 23 years (18-49)
- L2 English (N = 35), mean age: 28 years (18-46); first exposure to English M = 11 yrs (3-21); various L1s (19 Chinese, 4 Japanese, 2 Spanish, 2 Indonesian, 8 other)
  - Versant English Test (Pearson, 2011; www.versanttest.com), overall score (range 20-80): M = 60 (39-80); corresponds to CEFR range of A2-C2 (median & mode = B2)
  - LexTALE English (Lemhöfer & Broersma, 2012; www.lextale.com): accuracy M = 71% (SD = 16); Pearson correlation between Versant and LexTALE: $r_{(30)} = .78$, $p < .001$
  - Overall good performance on independent task assessing understanding of grammatical aspect in English (see Grüter et al., 2016, for task)

Materials and Design

- Linguistic stimuli: 2-sentence items, manipulating **Aspect** in the context sentence, and pronoun **Reference** in the continuation; broad focus intonation
- Visual World Paradigm (SMI RED, 250Hz); 3 AOIs (Fig.1): Source (Donald), Goal (Melissa), Theme (drink)
- 5 items/condition (Latin square) = 20 experimental items; 40 non-transfer fillers

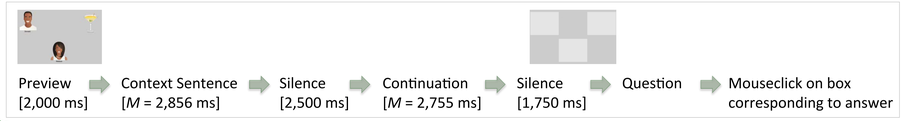

Fig.1. Trial structure

Context: **Donald brought/was bringing Melissa a fancy drink.**
Continuation: **He/She obviously liked hosting parties.**

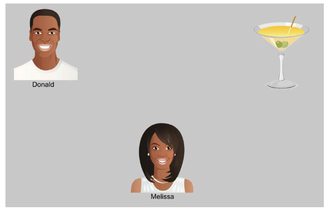

Fig.2. Visual scene

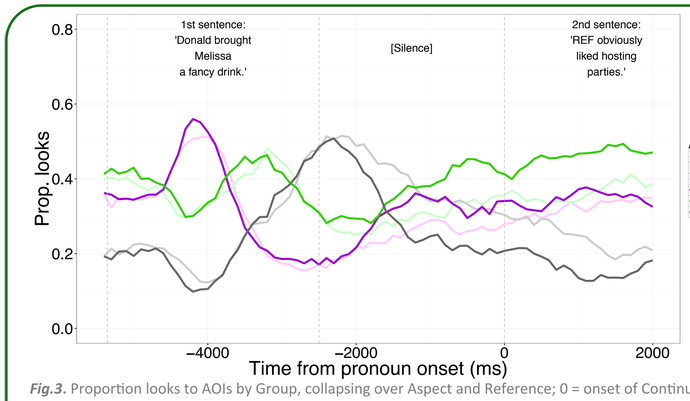

Fig.3. Proportion looks to AOIs by Group, collapsing over Aspect and Reference; 0 = onset of Continuation

Results

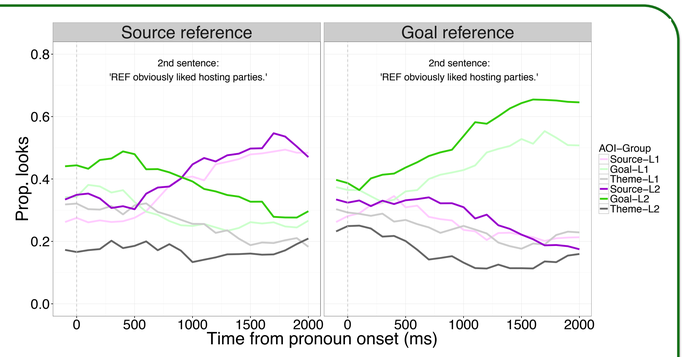

Fig.5. Proportion looks to AOIs by Group and Reference (collapsing over Aspect)

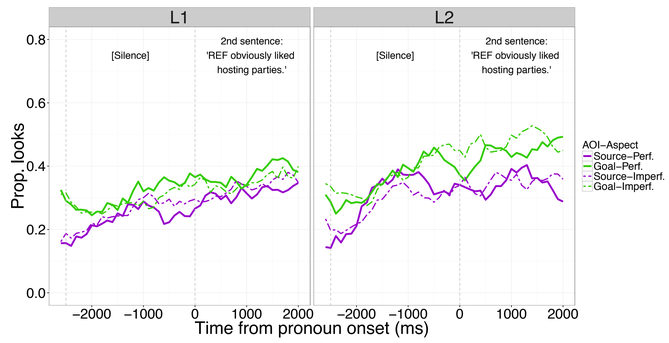

Fig.4. Proportion looks to AOIs by Aspect and Group (collapsing over Reference)

Mixed-effect linear regression (lmerTest) propGoal ~ Aspect * Reference * Group * Window

Outcome measure: proportion looks to Goal / (looks to Goal + looks to Source), calculated by-subjects and by-items over two broad time windows: SILENCE (-1640 to 200) & CONTINUATION (200 to 2000)[#)]

- Intercept (by-subj: b = .55, $p < .001$; by-item: b = .54, $p < .001$) → **overall Goal bias**
- Main effect of Reference (by-subj: b = .11, $p < .001$; by-item: b = .10, $p < .001$)
- Reference x Window interaction (by-subj: b = .18, $p < .001$; by-item: b = .19, $p < .001$)
- **Aspect x Group** interaction (by-subj: b = .07, p = .02; by-item: b = .06, p = .04) no other effects significant

→ Follow-up models within each group show **significant effects of Aspect in the L1** (by-subj: b = -.04, p = .02; by-item: b = -.04, p = .06) **but not the L2 group** (by-subj: b = .03, p = .23; by-item: b = .02, p = .43).

→ Adding Proficiency as a predictor did not improve model fit

[#)] Notes on modeling decisions:

- -1640 = minimal distance between looks to 3 AOIs in L2 group, taken as approx. end of signal-driven looks
- Mean proportions well within .3-.7 range, with comparable variance across conditions, and normally distributed. (Models were also run with empirical logits (Barr, 2008) calculated over the same data, with the same overall pattern of results; empirical logits were less normally distributed than proportions.)
- Fixed effects contrast coded and centered; models include maximum random effect structure allowed by the data

Conclusions

- Aspect modulated native speakers' looks (**prediction 1 ✓**); the effect is small and diffuse over time.
- Aspect did not modulate L2 learners' looks (**prediction 2 ✓**); given the small effect in the L1 group, this should be interpreted with caution.
- *Both* groups showed a *proactive* overall Goal bias (**prediction 3 ✗**), consistent with the semantics of transfer-of-possession verbs. (This bias to NP2 was not found in non-transfer filler items.)

→ L2ers appear to create discourse expectations based on verb semantics, but not grammatical aspect. This may indicate differential weighting of sentence- and discourse-level cues in L2 vs L1 processing.

Acknowledgments: Many thanks to Amanda Blake, Amber Camp, Victoria Lee, Wenyi Ling, Ivana Matson, Eric, Stepans, and Maho Takahashi for assistance with various aspects of this experiment. This research is supported by the National Science Foundation (BCS-1251450 to T. Grüter & A. Schafer).

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