



The role of discourse-level expectations in non-native speakers' referential choices

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We know (from the L2 literature)

- Pronoun interpretation and choice is a domain of persistent differences between native and non-native speakers (e.g., Sorace, 2011; Roberts et al., 2008).
- A popular account – the Interface Hypothesis – attributes these differences to (1) pronouns being a linguistic property at the *syntax-discourse interface*, and (2) *bilingual processing being less efficient* (Sorace, 2011).

We aim to

- identify the specific processing decisions responsible for these differences;
- provide an explicit account of *which processes* are less successfully employed by bilinguals.

We know (from the psycholinguistics literature)

- Native language processing, in children and adults, involves not only information integration, but also *anticipation/prediction/expectation* (e.g., Altmann & Kamide, 1999; Borovsky et al., 2012; De Long et al., 2005).
- Non-native speakers engage in predictive processing less strongly – at the lexical, morphosyntactic, and syntactic level (e.g., Grüter et al., 2012; Kaan et al., 2010; Martin et al., 2013).

→ We expect the same to be true at the discourse level.

→ If so, pronoun interpretation and choice will be affected.

We propose (=the RAGE hypothesis)

- Non-native speakers have reduced ability to generate expectations.
- RAGE is a critical contributor to native-nonnative differences in reference processing.
- The RAGE hypothesis is supported by recent studies of lexical, morpho-syntactic and syntactic L2 processing. Here we present evidence from discourse-level processing.

Discourse Processing & Story Continuations

- Semantic properties of the current sentence drive comprehenders' expectations about upcoming co-reference & coherence.
- Cues from both event structure (e.g., grammatical aspect) and information structure (e.g., referential form) influence referential choices.

Event Structure: With transfer events, one sentence's event structure guides the next sentence's co-reference patterns.

- Events described as completed (**perfective** aspect) favor the referent associated with the end state (the **GOAL**).
- Events described as ongoing (**imperfective** aspect) favor the referent associated with the start state (the **SOURCE**).

This has been shown in *English* (e.g., Kehler et al., 2008), *Japanese* (Ueno & Kehler, 2010) and *Korean* (Kim et al., 2013).

Referential Form: An overt pronoun (in English) favors co-reference with the preceding subject (e.g., Arnold, 2001; Rohde & Kehler, 2008; Stevenson et al., 1994).

- John_{source} handed/was handing a book to Bob_{goal}. He _____ / _____ (pronoun prompt) (free prompt)
- Sample story continuations
 - He took it and read it right away. He = Bob ('GOAL-continuation')
 - He really wanted Bob to have it. He = John ('SOURCE-continuation')

This Study

Participants

- L2 learners of English (n=48)
 - L1-Japanese (n=23)
 - L1-Korean (n=25)
- Native English speakers (n=39)

Tasks

- Knowledge-of-aspect task**
 - Do non-native speakers understand the semantics of grammatical aspect in English?
- Written story continuations**
 - Do non-native speakers use grammatical aspect to create discourse expectations?
 - Does referential form influence non-native speakers' choice of referent?

Predictions

- If non-native speakers have RAGE,
 - the aspect manipulation in the story continuation task should have weaker effects on discourse expectations, and therefore on the proportion of SOURCE-continuations;
 - this should not affect their sensitivity to referential form.

Table 1. L2 proficiency measures.

	Cloze test ¹⁾	Versant English ²⁾	Self-rating
L1 Japanese	0.54 (.36-.68)	49 (40-61)	6.2 (4-9)
L1 Korean	0.56 (.24-.80)	53 (34-80)	5.8 (2-8)

¹⁾ Brown (1980), ²⁾ Pearson (2011; www.versanttest.com)

I. Knowledge-of-Aspect Task

Participants read descriptions of complete vs. incomplete events, and then gave truth-value judgments on sentences like (3) (adapted from Gabriele, 2009).

- (3) Patrick is giving a towel to Ron. FALSE after Ron has received the towel.
TRUE when Ron has not yet rec'd the towel.

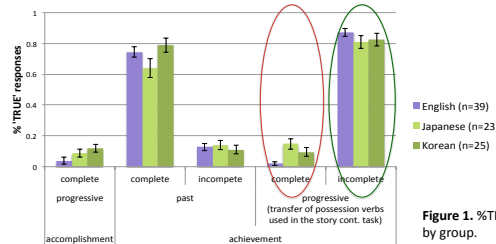


Figure 1. %TRUE responses by group.

- Learners understand perfective vs. imperfective aspect in English.
- Critically, they know that, in English, (transfer-of-possession) verbs with progressive marking: (i) indicate an incomplete event, and (ii) cannot have a resultative meaning.

Altmann & Kamide (1999) Incremental interp. at verbs: Restricting the domain of subsequent reference. *Cognition*.
 Arnold (2001) The effects of thematic roles on pronoun use and frequency of reference. *Discourse Processes*.
 Borovsky, Elman & Fernald (2012) Knowing a lot for one's age: Vocabulary skill and not age is associated with anticipatory sentence interpretation in children and adults. *J. of Exp. Child Psych.*
 Brown (1980) Relative merits of four methods for scoring cloze tests. *MLA*.
 De Long, Urbach & Kutas (2005) Probabilistic word pre-activation during language comprehension inferred from electrical brain activity. *Nature Neuroscience*.
 Gabriele (2009) Transfer and transition in the SLA of aspect. *SSLA*.
 Grüter, Lew-Williams & Ferrald (2012) Grammatical gender in L2: A production or a real-time processing problem? *SLR*.
 Kaan, Dallas & Wijnen (2010) Syntactic predictions in second-language sentence processing. In Zwart & de Vries. *Structure preserved*. Benjamins.
 Kehler, Hayes & Barner (2011) Pragmatically-driven biases in children's pronoun interpretation. *CUNY2011 poster*.
 Kehler, Kertz Rohde & Ilman (2008) Coherence and coreference revisited. *Journal of Semantics*.
 Kim, Grüter & Schafer (2013) Effects of event-structure and topic/focus-marking on pronoun ref. in Korean. *CUNY2013 poster*.
 Martin, Thierry, Kuipers, Boutonnet, Foucart & Costa (2013) Bilinguals reading in their second language do not predict upcoming words as native readers do. *JAL*.
 Roberts, Gullberg & Indefrey (2008) Online pronoun resolution in L2 discourse: L1 influence and general learner effects. *SSLA*.
 Rohde & Kehler (2008) The bidirectional influence between coherence establishment and pronoun interp. *CUNY2008 poster*.
 Sorace (2011) Pinning down the concept of 'interface' in bilingualism. *Linguistic Approaches to Bilingualism*.
 Stevenson, Crawley & Kleinman (1994) Thematic roles, focusing and the representation of events. *LCP*.
 Ueno & Kehler (2010) The interp. of null and overt pronouns in Japanese: Grammatical and pragmatic factors. *CogSci 32*.

II. Written Story Continuations

Patrick gave/was giving a towel to Ron. He _____ (pronoun prompt) / _____ (free prompt)

2 (aspect) x 2 (prompt type) Latin square design; 5 items/condition + 20 fillers (2 x 10 verbs: bring, feed, give, mail, pass, push, roll, serve, take, throw)

Annotation for co-reference (by two trained coders)

He made sure to give him a clean dry one. (SOURCE)
 He said "Thank you!" (GOAL)
 He did not notice the puddle of water on the floor. (ambiguous: 4/4% of L1/L2 data)
 The towel was still warm from the drying machine. (other: 13/12% of L1/L2 data)

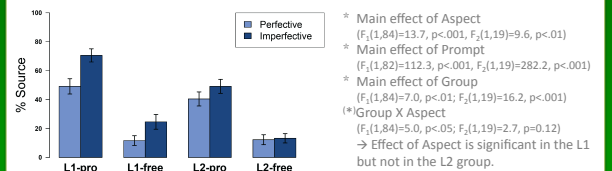


Figure 2. % SOURCE-reference by group and prompt type.

- The effect of aspect on the proportion of SOURCE/GOAL continuations was weaker in the L2 group, consistent with the RAGE hypothesis.
- The L2ers showed an overall GOAL bias, suggesting recency may play a stronger role in non-native processing (see Kehler et al., 2011, for similar findings from native-speaking children).

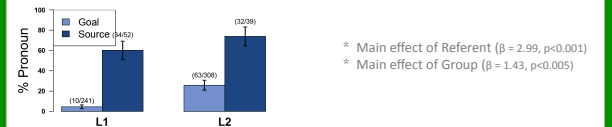


Figure 3. % pronouns in the free-prompt condition, by Group and Referent-role. (Raw numbers in parentheses.)

- L2ers, like L1ers, produced more pronouns for SOURCE than GOAL referents, indicating sensitivity to cues affecting form choice.

Conclusions

- The RAGE hypothesis is supported for discourse-level processing.
- L2ers made appropriate form (pronoun/name) choices (Fig.3), and showed native-like sensitivity to the prompt manipulation (pronoun/free, Fig.2), however, their referent choices were less affected by event-structure cues in the previous sentence than those of L1ers (Fig.2).
- Referent choices reflect incrementally updated expectations about where a discourse is going (e.g., Arnold, 2001), while form-related choices are made at the point the forms are used.
- A critical difference between L1 and L2 processing may thus lie in the point at which referential choices are made: native speakers' choices are influenced by proactive expectations about next mention, while non-native speakers' choices reflect reactive decisions at the point they are forced to make them, strongly guided by the most recently received information.