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Contrastive intonation in native vs non-native coreference processing

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Goals and Motivation
- Use contrastive intonation to test effects of memory, expectations, salience, and information structure in coreference processing by native speakers of English and Japanese- & Korean-speaking learners of English.

Coreference Processing: Background

Previous research, with written stimuli:
1. John handed/was handing a book to Bob
   - (sentence-final) Goal
   - early cue

2. a. He took it and read it right away.
   - He = Bob (“Goal-continuation”)
   - b. He really wanted Bob to have it.
   - He = John (“Source-continuation”)

Expectancy/prediction plays a critical role in native-language (L1) processing of coreference: Semantic properties of the current sentence drive L1ers’ expectations about upcoming coreference & coherence. (e.g., Arvan, 2001; Kask & Kehler, 2008).

Event structure is used to predict next mention:
- Completed events (perfective aspect) favor the end-state referent (the Goal).
- Ongoing events (imperfective aspect) favor the start-state referent (the Source).

This has been shown in English (e.g., Keller et al., 2006), Japanese (Sano & Kehler, 2010) and Korean (Kim et al., 2011, 2016).

Pronoun/free prompt: Coreference: When the preceding subject (here, the Source) increases with an overt pronoun prompt, compared to a free prompt (e.g., Kask & Kehler, 2008; Stevenson et al., 2009).

Non-native speakers may have reduced ability to Generate Expectations (RAGE) (Grütter et al. 2010)
- Japanese/Korean L1ers of English show:
  - Similar effect of prompts to L1ers.
  - Similar retroactive processing/integration to L1ers.
  - No significant effects of event structure manipulation.
  - Weaker predictive processing than L1ers.

Intonation: Background & Predictions

- Predicts a Simple Salience effect:
  - Contrast on Source/Topic -> Simple Salience
  - Contrast on Goal/Non-topical -> Less Source salience

- Predicts a Topic Maintenance pattern:
  - Contrast on Source/Non-topical -> Simple Salience
  - Contrast on Goal/Non-topical -> More Source salience

L1 versus L2 Processing

Aspect: Driven by expectations
1. Predict an L1/L2 difference (√ RAGE)

Contrastive intonation: Can be retroactive
2. Will L2ers show weak use of any early cue, e.g. because of memory decay? (√)
3. Contrastive intonation can be used retroactively in a search for a referent/topic. Will L2ers use contrastive intonation but not aspect? (√)
4. For L1 & L2: Simple Salience

Topic Maintenance? (Simple Salience)

Participants & Knowledge-of-Aspect Test

Participants
- L1: 47 native speakers of English
- L2: International/exchange students at U. of Hawai‘i
  - 26 native speakers of Japanese (n=12) or Korean (n=14)
  - Korean: M=51.80 (16-80)
  - English self-rating M=64/120 (3-8)

Knowledge-of-aspect task
Do L2 participants understand the semantics of grammatical aspect in English? Participants read descriptions of complete vs. incomplete events and gave true/false judgments on statements about them.

Patrick and Ron are at the pool together. [picture of towel] This is the towel that Patrick will give to Ron. At 1:00, Ron is done swimming and ready to go. Patrick and Ron are at the pool together. [picture of towel] This is the towel that Patrick will give to Ron. At 1:00, Ron is done swimming and ready to go. Patrick and Ron are at the pool together. [picture of towel] This is the towel that Patrick will give to Ron. At 1:00, Ron is done swimming and ready to go.

Introduction to our experiment:
1. Patrick grabs the towel and walks over to the side of the pool.
2. Ron is done swimming and ready to go.
3. Patrick hands the towel to Ron.

Results: Proportion of Source Reference in Story Continuations

- Complete event
  - At 1:00, Patrick hands the towel to Ron.
  - Later, Patrick says at 3:45, Patrick is giving the towel to Ron.
  - Patrick’s statement is FALSE after a complete event,
    TRUE after an incomplete event

Native speakers judgments:
“15% ‘true’ after complete event, “90% true after incomplete event”
L2 participants in this study (n=24)
18.7% ‘true’ after complete event, 86.7% ‘true’ after incomplete event
- Under what aspect does event structure (complete/incomplete)

Spoken Stimuli with Contrastive Intonation (L+H* L-H%)

- 2 (aspect) x 2 (contrast on Source/Goal) design. Visual noun prompts.
- Participants typed continuations, starting with the prompt prompt.
- Acoustic analyses & ToBI annotation by 2 trained coders.
- Latin square design; 20 items (5/cond) + 40 fillers.
- Dep. Meas.: Reference of pronoun, annotated by 2 trained coders.

Conclusions and Work in Progress

- Extends the limited previous research on contrastive intonation; provides full prosodic description of stimuli.
- L1ers and L2ers both use contrastive intonation with the Simple Salience pattern. Evidence against simple memory decay in L2ers.
- Replicates the weaker effect of aspect in the L2 group from our written study (Grütter et al. 2014).
- Supports the RAGE account; suggests that L1ers predict a coherence relation and coreference but that L2ers initiate a retroactive search at the continuation subject (the prompt) for a referent. Contrastive intonation on an NP can serve as a cue in a retroactive referent search, but aspect cannot (since the verb is not part of the search domain).
- The strength of coreference cues may depend on their availability at times when relevant processing decisions are made – times that may not always be the same in native vs. non-native processing.

Work in progress:
- Relation between coherence relations and coreference in these data
- Accented vs. unaccented pronoun prompts
- Online measure of anticipatory coreference processing (Visual World)