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 a book to Bob. (He)__ sentence-final Goal: 0 early cue aspect late prompt cue 0
(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, 2004, Rohde & Kehler, 2008).

Event structure is used to predict next noun:
- 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., Kehler et al., 2006), Japanese (Koike et al., 2011, 2016).

Pronoun/free prompt: Coreference with the preceding subject (here, the Source) increases with an overt pronoun prompt, compared to a free prompt (e.g., Kehler et al., 2006; Stevenson et al., 1994).

Non-native speakers may have Reduced ability to Generate Expectations (RAGE) (Grüter et al, 2016)

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

Prosody and intonation cue information structure. Contrastive intonation:
- Makes information more salient in memory (pug, Oinas-kukkonen et al. 2010) and can increase coreference for object pronouns (Bargh 2005).
- Predicts a Simple Salience effect:
  - Contrast on Source/Topic > More Source coreference
  - Contrast on Goal/Non-topic > More Goal coref & topic switch
- May affect discourse expectations related to a contrastive information structure
- Predicts a Topic Maintenance pattern:
  - Contrast on Source/Topic > More Source coreference
  - Contrast on Goal/Non-topic > Even MORE Source coreference & topic maintenance with contrastive alternative goals (Lin et al., 2014, using a similar story-continuation task; can also affect maintenance patterns in Japanese, Wong & Schwanenflugel 2010).

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? (X)
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 Hawaii’ 26 native speakers of Japanese (n=12) or Korean (n=14)
- Versant English M=51.80 [16.80]
- English self-rating M=6/10 (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 4:05, Ron is seen wetting and ready to shower.

Complete event
At 4:05, Ron disappears into the showers with the towel in his hand.

Incomplete event
At 4:05, Patrick grabs the towel for Ron and walks over to the side of the pool.
Later, Pāku says: at 4:05, Patrick was giving the towel to Ron.

Pāku’s statement is FALSE after a complete event, TRUE after an incomplete event

Native speakers judgments:
- “10% ‘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
- Understand that aspect denotes event structure (complete/incomplete)

Results: Proportion of Source Reference in Story Continuations

Brenda’s story: fed was feeding Anne soup. She went to the kitchen.

- 2 (aspect) × 2 (contrast on Source/Goal) design. Visual pronoun prompts. Participants typed continuations, starting with the pronoun 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 coreference and intonation; provides full prosodic description of stimuli.
1. L1ers and L2ers both use contrastive intonation with the Simple Salience pattern. Evidence against simple memory decay in L2ers.
2. Replicates the weaker effect of aspect in the L2 group from our written study (Kehler et al. 2014).
3. Supports the RAGE account; suggests that L1ers predict a coherence relation and coreference but that L2ers initiate a retrospective search at the conclusion subject (the prompt) for a referent. Contrastive intonation on an NP can serve as a cue in a retrospective 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)

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