

Prosody and information structure in discourse processing: Evidence from Korean, English, and Japanese/Korean learners of English

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Successful language processing critically depends on choosing appropriate referential expressions during language production and determining the intended reference of linguistic expressions in comprehension. Consider a discourse that begins with sentence (1). If this sentence is followed by the subject pronoun *He*..., reference to either John or Bob is grammatically permissible. Past research has demonstrated that referential choices such as this one are sensitive to a wide array of influences (see Arnold, 2010 for a review). Some of these relate to linguistic form, e.g. the fact that *He* is pronoun and not a fuller NP, and is in parallel position to the preceding syntactic subject. Others relate to processing complexity, such as how recently a potential antecedent has been mentioned. Another factor is our knowledge of typical events: when a transfer-of-possession event such as (1) is complete (*handed*), continuations are likely to discuss what happened next or the result of that event, and so reference to Bob, the Goal of the transfer event, is preferred (Kehler et al, 2008). Yet if the event is ongoing (*was handing*), continuations are more likely to elaborate on or explain the event, increasing the likelihood of reference to John, the Source. Reference thus presents a rich area for investigation of how multiple factors of form, meaning, and processing complexity interact to influence processing decisions. We can further ask whether they do so in a similar fashion across languages that differ in linguistic form, and for native speakers versus learners of a language. This talk presents a series of experiments that explore such questions in referential processing by native speakers of English, native speakers of Korean, and Japanese- and Korean- speaking learners of English.

1. John_{Source} [handed/was handing] a book_{Theme} to Bob_{Goal}.
2. John-ka_{Source} Bob-eykey_{Goal} chayk-ul_{Theme} [kenneycwuessta/kenneycwukoissessta].

Japanese and Korean (J/K) differ from English in a number of properties relevant to referential processing. English has a relatively fixed word order that places topics in subject position and employs multiple prosodic distinctions to convey distinctions in given, new, and contrastively focused information. J/K allow null pronouns in addition to overt pronouns, have relatively flexible word orders that can be used to convey information structure but less rich prosodic systems, and make use of morphological marking to mark distinctions such as topichood. Therefore, to the extent that referential processing is strongly dependent on specific associations to forms (e.g., Kaiser & Trueswell, 2008), we might predict significant differences between J/K and English. In contrast, J/K and English speakers might be similar with respect to the event structures they build for processing language. To the extent that reference builds on expectations for discourse coherence, e.g., expectations for results versus explanations, we should therefore predict similar referential patterns for the three languages.

Following previous research by Kehler et al (2008) on English and Ueno & Kehler (2010) on Japanese, we tested sentences like (1) on native and non-native speakers of English, and (2) on native Korean speakers. In one set of experiments, each group of participants received a written context sentence that provided the beginning of a story, which presented either a completed event (*handed*) or an incomplete one (*was handing*). The participants then wrote a continuation of that story by adding a second, complete sentence (free prompt), continuing a sentence that

began with a subject pronoun (overt pronoun prompt), or, in Korean, continuing a sentence that began with a prompt indicating a null pronoun. We were particularly interested in the referent for the sentential subject of the continuation: Would it be the Source or the Goal? Previous research had established an association between more reduced expressions and reference to the current topic (Gundel et al, 1993), but it was less certain whether the null versus overt pronoun manipulation would affect referential patterns in Korean.

The native speaker results demonstrated the expected effect of event-structure for each language: significantly more Source references for continuations of incomplete versus completed events. Quite similar effects of the prompt manipulation were found for Korean and English: more Source references with more reduced expressions (overt and null pronouns), and more Goal references with fuller expressions (produced with free prompts). Moreover, there was no effect of overt versus null pronoun prompts in the Korean experiment; both strongly favored Sources.

Korean also differs from English in morphological marking of information structure. The Korean marker *-nun* marks a phrase as a topic when it is on an unstressed phrase in sentence-initial position, and provides a contrastive meaning on stressed phrases (Sohn, 1999). We therefore examined how morphological marking and contrastive prosody affect reference. To test effects of morphology alone, we asked whether spoken Korean sentences like (2) with broad prosodic focus would elicit more continuations with Source reference when the Source NP carried *-nun* instead of a nominative marker. We tested prosodic effects in conditions with *-nun* + contrastive stress on the Source versus the Goal. If contrastive prosody merely increases the salience of the focused NP (perhaps it is retained better in memory (Birch & Garnsey, 1995)), there should be more reference to the focused NP in both Source- and Goal-focus conditions. But if expectations for discourse coherence drive reference, and contrastive focus highlights a reference set with alternatives, the focused conditions should result in more continuations that express contrast, especially ones in the Goal-focus condition in which the current topic (the Source) is *maintained* and selections from the Goal reference set are placed in focus. The results showed that morphology alone had no effect on continuation patterns, and contrastive focus on the Goal *decreased* subsequent reference to it, consistent with the coherence-driven account.

Turning to learners, we might expect them to have weaker knowledge of form-based cues, but native-like use of the complete/incomplete event distinction and discourse coherence. However, processing decisions occur incrementally, as a sentence unfolds. A referential decision is forced at the point of a prompt to continue a story. Critically, though, we hypothesized that event structure results in *expectations* about discourse coherence, and that these expectations are not required for structuring the incoming material. We therefore predicted that such expectations would be less likely in non-native speakers, and so non-native speakers would show weaker effects of event-structure than native speakers. The results supported the predictions: the non-native speakers showed robust effects of the prompt manipulation but weaker effects of the complete/incomplete distinction than seen in native speakers.

Taken together, these experiments found that native speakers of Korean and English showed strikingly similar patterns for referential processing, which were arguably driven by discourse expectations for how an upcoming sentence would relate to the current one. These coherence expectations were shaped by distinctions in information structure such as contrastive focus and by the ongoing or completed state of events. J/K learners of English demonstrated distinct referential processing patterns. They showed native-like awareness of the link between pronouns and topic maintenance, but were less sensitive to the event structure, presumably due to the decreased processing efficiency of learners and the timing at which decisions are made.