

The Role of Gesture in Scopal Ambiguity: A Comparison of Japanese and English

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Gestures can play a facilitative role in the interpretation of structural ambiguities (Guellaï et al., 2014; Prieto et al., 2013; Tubau et al. 2015) and are associated with spoken expression of negation, with research on Open Hand Prone gestures (Kendon, 2004), head shakes (e.g. Kendon, 2002; Calbris, 2011), and their interaction and synchronization (Harrison, 2014; Harrison & Larrivée, 2016). The current production study examines a context of negation in which the presence of quantification yields scopal ambiguities and asks to what extent gestural forms and timings are associated with intended interpretations.

In a quasi-experimental design, 23 native speakers of Japanese and 25 native speakers of English were familiarized with scopally ambiguous sentences containing negation and quantification, embedded in disambiguating contexts drawn from Syrett et al. (2014b). A target sentence examples is shown below with the quantifier and negator underlined.

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|-------------------|--------------|------------|---------------------------|
| (1) <u>すべての</u> | マグノリアの | 花は | 咲かないでしょう。 |
| <u>Subete</u> -no | magnolia-no | hana-wa | sak- <u>anai</u> -desyoo. |
| All-GEN | magnolia-GEN | flower-TOP | bloom-NEG-will |
- (2) All the magnolias won't bloom. (Syrett et al., 2014a)

Under one interpretation, the negator takes wide scope, indicating that some magnolias bloomed and some did not. In the alternative interpretation, the negator takes narrow scope, indicating that no magnolias bloomed. Speakers were instructed to produce the target sentences as unambiguously, given the context, and expressively as possible, and were video recorded. Analyses focused on the gestures produced while speaking: the articulator used (e.g. hand/head), the type of gesture (e.g. head shake / beat / open hand prone), and the length of the gesture stroke (in number of overlapping words).

Analyses of 317 gestures from English revealed a preponderance of head gestures as well as statistical relationships between the form, placement, and length of gestures and scopal interpretations, specifically, use of semantically congruent head shakes, alignment of gestures with the negator, and lengthening of gesture strokes where interpretations involved narrow-scope negation. Preliminary parallel analyses for Japanese suggest cross-linguistic similarities and differences. In line with English, head gestures also predominated in the Japanese corpus; some lengthening of gesture strokes was observed with interpretations involving narrow-scope negation, and gestures rarely aligned with the quantifier. In contrast to English, gesture frequency was overall higher in Japanese; prosodically motivated head beats were much more frequent than semantically congruent head shakes, and gestures relatively frequently aligned with the negator when it appeared at the end of the utterance, suggesting a key role for the prosody-gesture interface in Japanese.

Results will be discussed with reference to cross-linguistic expression of negation and related contexts in gesture, and with reference to scope of negation as reflected in gesture (see Harrison, 2010, 2013, 2014a, b). Moreover, the possible contribution of gesture in communication of specific interpretations of scopally ambiguous sentences will be evaluated in the context of mixed results regarding the robustness of prosodic cues for similar contexts in English (e.g. Syrett et al. 2014b).