

"Asymmetry between Encoding and Decoding of Wh-scope in Japanese"
(Wh-scope/Subjacency/Prosody/Processing)

Prosody-scope correlation has been reported in the literature for Wh-questions in Tokyo Japanese ([1][2] below), whereby Wh-scope domain correlates with the focus prosodic domain (**FPD**). The two alternative Wh-scope readings in (1) contrast in the end position of FPD wherein the Wh-focus receives pitch prominence, followed by post-focal pitch-range reduction. The end of FPD is marked by post-COMP F0 rise at the matrix verb (e.g., “tasikame” in (1)) for subordinate Wh-scope ((1a), preferred) while FPD continues through the matrix Q-COMP for matrix Wh-scope ((1b), possible but dispreferred).

The dispreferred status of the matrix Wh-scope reading has been discussed from syntactic and extra-syntactic viewpoints [3], and what exact prosodic cues enable the matrix Wh-scope has been under debate [4]. We suspect part of the complication stems from the speaker-listener asymmetry in the use of prosodic cues encoding/decoding the Wh-scope domain, which may contribute to the varied, unstable and often weak status of the judgments concerning Subjacency violation.

A prosody-syntax correlation can be beneficial to the resolution of syntactic ambiguity in parsing. But sometimes the critical distinction of prosodic cues is encoded too late in the sentence for listeners. We attempt to show that listeners can be sensitive to the prosodic cues less critical to speakers but occur sufficiently early in parsing. This results in speaker-listener asymmetry in the use of prosodic cues in on-line processing.

Two native subjects participated in our **production** study using 12 potentially ambiguous Wh-questions embedded in 2 distinct contexts permitting distinct scope readings. The F0 and duration were measured at various positions in each utterance. The discriminant analyses (the group factor was the intended scopal interpretation) suggest that the major cue contributing to the scopal intention for both **speakers** was **the matrix verb F0** — the pitch peak of the matrix verb was higher when the subordinate Wh-scope was intended, as expected by the prosody-scope correlations introduced above.

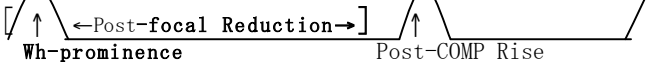
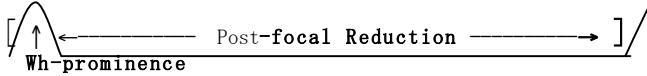
These utterances were then used in a forced-choice **comprehension** study on 28 subjects. Overall, there was a preference towards subordinate Wh-scope interpretation, and the multiple regression analyses (% matrix interpretation of all listeners for each utterance as the dependent factor) revealed that the most contributing cue in **listeners’** decision was **the F0 of the Wh-phrase itself** ($p < .005$), not the matrix verb — the higher pitch of the Wh-phrase led the listeners to the matrix Wh-scope interpretation more frequently.

To confirm the above results, another **comprehension** study was conducted on 10 selected subjects (for whom both scopal readings were available). Two selected sentences from the previous recordings (originally produced with the intention of the subordinate scope) were resynthesized — the F0 peak height of the Wh-phrase and that of the matrix verb were raised and lowered, respectively and independently, in 5~7 steps. The discriminant analyses for each subject revealed that **three out of ten subjects** consistently relied on the F0 information on **Wh-phrases** and **six subjects** relied on F0 cues of **both Wh-phrases and matrix verbs**, whereas one subject constantly focused on the F0 information on the matrix verbs only.

The results suggest that speakers and listeners may abide by different principles/strategies. For **speakers**, the most straightforward way to encode the Wh-scope would be to (or not to) mark the end of the subordinate FPD with Post-COMP Rise, which effectively distinguishes between the two scopal readings. In on-line processing, however, the **listeners** need to learn (with the pitch height of the Wh-peak) at which COMP the Wh-COMP dependency is meant to be resolved **before the first (subordinate) COMP is encountered** (cf. [5]). For this, waiting until the matrix verb would be too late for the on-line decision. Such a discrepancy between speakers' and listeners' strategies in the realization of prosody-scope correspondence is suspected to play a partial role in the controversy over the Subjacency effect in Japanese.

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Data:

- (1) hokenzyo-wa [kanzyatati-ga nani-o tabeta-ka] tasikametandesu ka?
 health.dept.TOP patients-NOM **what-ACC** ate-COMP_{Wh} confirmed -COMP_{Wh}
- a. Subordinate Wh-scope:
Local FPD
- 
- b. Matrix Wh-scope:
Global FPD
- 

Subordinate reading: "Did the health dept. confirm [**what**₁ the patients had eaten **t**₁]?"

Matrix reading: "**What**₁ did the health dept. confirm [*whether* the patients had eaten **t**₁]?"

References:

- [1] Deguchi, M. & Y. Kitagawa (2002) "Prosody and Wh-questions," NELS32, 73-92.
- [2] Ishihara, S. (2003) *Intonation and Interface Conditions*, MIT dissertation.
- [3] Kitagawa, Y. & J. D. Fodor (2003) "Default Prosody Explains Neglected Syntactic Analyses of Japanese," *Japanese/Korean Linguistics* 12, 267-279.
- [4] Hirotsani, M. (2004) *Prosody and LF: Processing of Japanese Wh-questions*, UMass. dissertation.
- [5] Miyamoto, E. and S. Takahashi (2002) "The Processing of Wh-phrases and Interrogative Complementizers in Japanese," *Japanese/Korean Linguistics* 10, 62-75.