

Focus prosody in Japanese adjectival complex DPs: F0 and durational cues

Rina Furusawa¹, Le Xuan Chan², and Seunghun J. Lee^{1,3}

¹International Christian University (Japan), ²National University of Singapore (Singapore), ³IIT Guwahati (India)

Introduction: While F0 modification is reported as the most salient cue for focus in Japanese [1], F0 cues are also important for the realization of lexical pitch accents and the marking of prosodic phrase edges [2]. At the same time, F0 cues by themselves have been shown to lead to poor focus identification [3]. Together, these observations suggest that beyond F0, other cues may also play a central role in the realization of focus prominence. By examining Japanese complex DPs varying in pitch accents and focus positions, we explore the role of F0 and durational cues in the realization of focus prominence, and how these cues interact with lexical and phrasal prosody. Specifically, we ask two questions: 1) How is focus realized when an element is assigned both focus-induced and edge-marking prominence, and 2) To what extent do durational cues account for the mismatch between production and perception?

Methods: Target DPs consisting of two adjectives (Adj1/Adj2) and a head noun were elicited in a carrier sentence. To elicit focus, a negation phrase with a DP that differed minimally from the target DP was inserted, as in (1). This paper reports all-accented /aaa/ and all-unaccented /uuu/ combinations, with 4 focus conditions: Adj1-focus, Adj2-focus, Noun-focus, and a neutral no-focus control. 424 of 512 elicited tokens (8 sentences * 4 focus conditions * 2 accent combinations * 4 speakers * 2 repetitions) were analyzed after excluding tokens showing accentuation, i.e. unaccented words being realized as accented. F0 and duration data were analyzed using GAMMs and linear mixed-effects models respectively.

Results: Overall, focus-induced prominence utilizes both F0 (Fig. 1) and durational cues (Fig. 2), but these effects are much smaller for Adj1, indicating a conflict between focus and edge-marking prominence. In /aaa/ cases, focus was signaled by F0 peak expansion accompanied by pre- and post-focal compression, with lengthening of the focused element. These F0 and duration effects, however, were only significant for Adj2 and the head Noun, with Adj1-focus showing marginal effects of F0 and no effects of lengthening. In /uuu/ cases, focus was signaled by pre-focal compression and a F0 rise on the focused element. Lengthening was also found for focused elements, though this effect was only significant in Noun focus. As in the case of /aaa/, Adj1 showed marginal effects of F0 and no effects of lengthening.

Though in both /aaa/ and /uuu/ cases, no effects of lengthening for Adj1-focus were found, further analysis of the difference between Adj1 and Adj2 in these conditions yielded marginal effects ($p=.05/.09$) when compared to the neutral conditions. This indicates that durational cues are not completely absent in Adj1-focus but are seen in post-focal compression. As with the F0 analysis, however, these effects are only marginal.

Discussion & Conclusion: Rather than boosting prominence, focus conflicts with edge-marking prominence, resulting in smaller focus effects of both F0 and duration in Adj1, which is already assigned prominence by virtue of it being at the left edge of the prosodic phrase. This points to restrictions on the degree to which prosodic prominence can be realized, and also provides an explanation for the poor performance of raters in [3] who failed to reliably identify neutral no-focus sentences, presumably confusing them for initial-focus conditions. Taken together, this shows that focus might be more difficult to produce and perceive in the initial position. In addition, the overall poor performance of raters in [3] across all focus positions can also be explained by the lack of durational cues, which our study indicates is vital in focus realization. Though a follow-up perception study is needed to confirm this, we propose that manipulating duration in addition to F0 would result in higher rates of accuracy in focus perception.

- (1) *Gakko-de, ookii kuroi iruka janakute, ookii SHIROI iruka dake hakkiri mieta*
 ‘At school, I clearly saw **big WHITE dolphins** only, not big black dolphins’

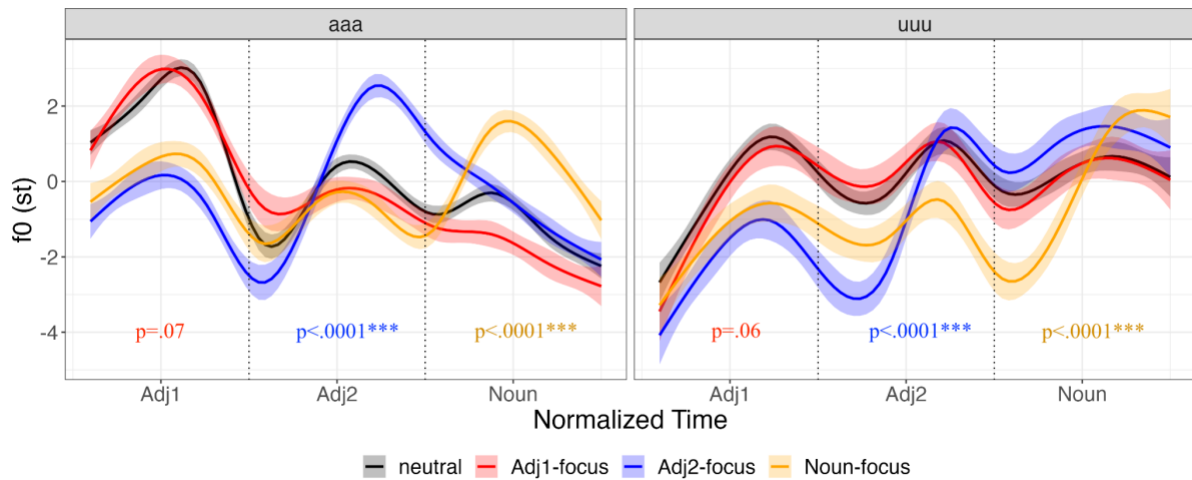


Fig. 1. F0 smooths over normalized time by accent (left: /aaa/, right: /uuu/). P-values indicate GAMM differences of each focus condition.

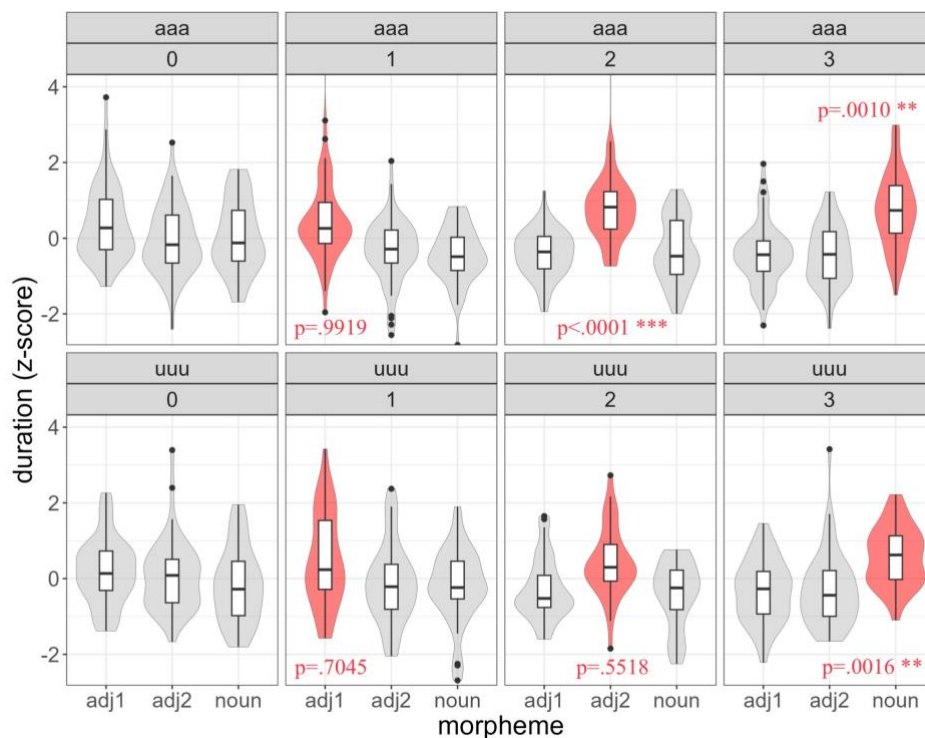


Fig. 2. Duration of each morpheme by accent and focus conditions; Focused elements indicated in red. P-values indicate comparisons with no-focus conditions.

References

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