

The role of accentual phrasing and focus position in determining the scope of phrase-final lengthening in Korean

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Phrase-final lengthening, i.e., longer acoustic and articulatory durations at the end of phrases as opposed to phrase-medial positions, is a well-established phenomenon. However, what defines the scope of the effect is unclear. Evidence from Greek and English suggest that prominence is a determining factor. In Greek, phrase-final lengthening and boundary tones are initiated further away from the boundary the earlier the lexical stress occurs within the phrase-final word [6,7]. A similar effect of non-final stress being related to an earlier initiation of phrase-final lengthening is found in English ([8,9]). Nonetheless, this work has mainly focused on languages with lexical stress, in which phrasal prominence is marked by pitch accents associated with stressed syllables ([6-9]). Here, we turn to Korean, a language without lexically marked prosody. In Korean, Accentual Phrases (APs) serve as the basic prosodic units, and are marked by particular pitch contours (see [3,5]). In terms of prominence, focus in Korean is marked by prosodic phrasing, with the focused linguistic element consistently starting, i.e., (left-)heading, an AP or a higher phrase ([1,2]). In addition, AP boundaries following the prominent element often undergo dephrasing up to the end of the Intonational Phrase (IP). The data presented here are part of a larger Electromagnetic Articulography (EMA) study on the kinematic profile of prosodic boundaries in Korean. Here, we report on the scope of IP-final lengthening in Korean as a function of the final AP's length and focus location.

To examine the scope of IP-final lengthening, the test word /nɛ.maŋ.mi.nam/ was placed either in IP-final or IP-medial positions (Table 1). To vary AP length, the test sentences consisted of two APs, with either 4 or 7 syllables (σ), yielding the following combinations: [4- σ -AP1 + 7- σ -AP2], [7- σ -AP1 + 4- σ -AP2]. Focus location was also varied, with focus being either on AP1 or AP2. The combination of AP length and focus location gave 8 conditions in total and each condition was repeated 8 times. The test sentences were created to yield a typical LHLH AP tonal pattern of Seoul Korean, and to avoid any tonal effects coming from laryngeal configurations of the segments ([3,5]). Data from 3 Seoul Korean speakers (2 female) in their 20s have been analyzed to date. Ten receiver coils were attached to the participants' tongue dorsum, tongue center, tongue tip, upper/lower incisors, upper/lower lips, left/right ears, and nose. The formation (F) and release (R) durations of the consonant (C) gestures were measured using custom software (Tiede, Haskins Laboratories). Dorsal C gestures (i.e., /ŋ/) were not included in the analysis due to their coarticulation with the neighboring vowels. Retrieved data were checked for their prosodic production using K-ToBI ([4]), and were analyzed by linear mixed effects analysis using R.

Boundary had a significant main effect on the release of the onset C and both the formation and release of the coda C of the final syllable (C4-R: $\chi^2(1)=29.3$, $p<0.001$, C5-F: $\chi^2(1)=66.7$, $p<0.001$; C5-R: $\chi^2(2)=75.0$, $p<0.001$) (Fig. 1a). Additionally, an interaction effect between boundary type and AP length was found on the formation duration of the onset C of the final syllable (C4-F) ($\chi^2(1)=4.5$, $p<0.05$), which underwent IP-final lengthening only when AP2 was 7-syllable long (Fig. 1b). Finally, a marginally significant interaction between boundary type and focus location was observed on the same duration (C4-F) ($\chi^2(1)=3.4$, $0.05<p<0.07$). When the focus was on AP2, C4-R was longer IP-finally than IP-medially. A closer look at individual differences indicated that these interaction effects were mainly driven by one out of three speakers.

Overall, our results suggest possible effects of AP's length and focus location on IP-final lengthening in Korean. Analysis of more data is underway, which should further clarify the

direction of these effects, if any. Regardless, this work will add to our understanding of the intricate relationship between prosodic levels (e.g., AP and IP) and functions, such as phrasal prominence and boundaries, in a language that does not employ lexical-level prominence.

Table 1. Example stimulus sentences with the [7-σ-AP1 + 4-σ-AP2] construction. Each sentence was preceded by a prompt sentence (read silently by the participant) to aid appropriate placement of focus. Test words are in bold, and focused words are underlined.

Focus	Boundary	Stimulus sentence
AP1	IP-final	[[tɛinte*a] _{AP}] _{IP} [[minamigomobuga] _{AP} [nɛmaŋminam] _{AP}] _{IP} [[santækhangaɟja] _{AP}] _{IP} Really? Uncle <u>Minam</u> is the handsome guy from Nemang? Is it decided?
	IP-medial	[[tɛinte*a] _{AP}] _{IP} [[minamigomobuga] _{AP} [nɛmaŋminam] _{AP} [santækhangaɟja] _{AP}] _{IP} Really? Uncle <u>Minam</u> chose the handsome guy from Nemang?
AP2	IP-final	[[tɛinte*a] _{AP}] _{IP} [[minamigomobuga] _{AP} [nɛmaŋminam] _{AP}] _{IP} [[santækhangaɟja] _{AP}] _{IP} Really? Uncle Minam is the handsome guy from <u>Nemang</u> ? Is it decided?
	IP-medial	[[tɛinte*a] _{AP}] _{IP} [[minamigomobuga] _{AP} [nɛmaŋminam] _{AP} [santækhangaɟja] _{AP}] _{IP} Really? Uncle Minam chose the handsome guy from <u>Nemang</u> ?

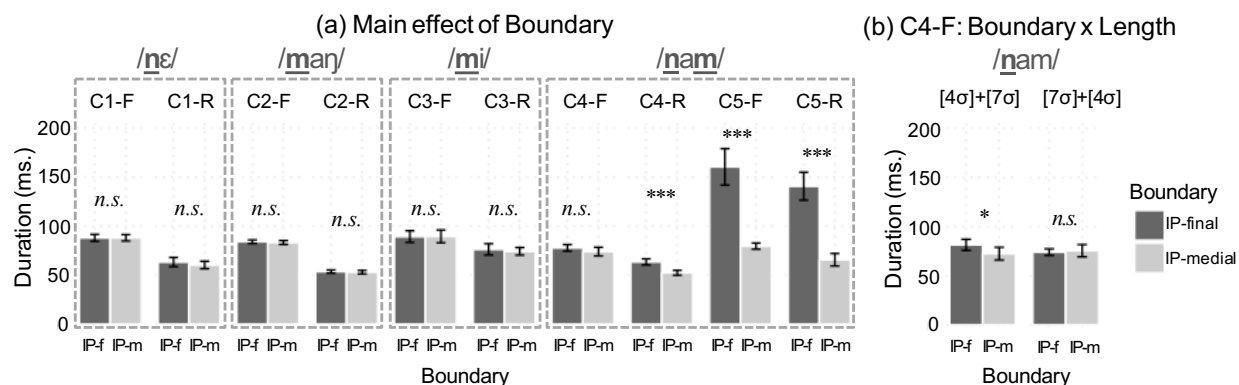


Figure 1. (a) Main effect of boundary on formation (F) and release (R) duration for each consonant (C) gesture presented in orthographic order of the test word (C1 to C5, respectively). (b) Boundary x length interaction on C4 formation duration. (***, *, n.s. refer to $p < 0.001$, $p < 0.05$, $p > 0.09$, respectively.)

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