How does focus-induced prominence influence realization of edge tones and segmental anchoring in Seoul Korean – A preliminary report

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In Seoul Korean, the intonational tune comprises edge tones assigned to Accentual Phrases (#LH...LH#) and a boundary tone associated with the final syllable of the Intonational Phrase [1, 2]. Accentual Phrases often have two rises (#LH…LH#) at their edges. Unlike many European languages, Korean does not have an accentuation system that involves a placement of pitch accent on a stressed syllable; instead, phrasing is used, with focus triggering the insertion of a prosodic boundary and optionally dephrasing post-focal elements [1, 5, 6]. While this has been proposed as the phonology of focus in Korean [1, 3, 5], however, relatively little is known about the phonetic effects of focus on tunes and tone-segment alignments in Seoul Korean, particularly in shorter sentences with fewer Accentual Phrases. This study therefore investigates how focus affects the tune of short intonational phrases in Seoul Korean.

Production experiment: The production experiment involved 14 young adult native speakers of Seoul Korean, 7 females and 7 males. Participants read sentences containing two monosyllabic target words with codas of differing sonority: ***pam*** ('chestnut; night') and ***pap*** ('cooked rice'). The phrasal position of the target words was varied to observe the interaction between focus effects and position, with the target words appearing in one of three positions: IP-initial, IP-medial, and IP-final. The target word was followed by ***twiɛ(ta)*** ('behind') in the IP-initial and medial contexts, so that the focus occurred either on the target word (focal condition) or on ***twiɛ(ta)*** (prefocal condition), as shown in the example sentence. In IP-final position, the focus occurred either on the target word (focal condition) or on the preceding word ***ʌnni*** (‘sister’) (post-focal condition). The sonorant portions of all words in the sentence were segmented, and f0 was measured at nine equidistant time points within each word using the Straight algorithm. Three generalized additive mixed models (GAMM) were fitted to the data, one for each of the phrasal contexts, to investigate how the tune and tone-segment alignment patterns may differ between the focused and unfocused conditions in the three prosodic positions.

Table 1: An example set of target words in carrier phrases with varying focus and boundary conditions. Target words are underlined and focused elements are in bold.

Phrase	Prefocal	Focal	Postfocal
Initial	*ani. # pam* ***twi****ɛta nwa. #* No. Put it **behind** the chestnut.	*ani. #* ***pam*** *twiɛta nwa. #* No. Put it behind the **chestnut**.	--- ---
Medial	*ani. # ʌnni pam* ***twi****ɛ. #* No. **Behind** sister’s chestnut.	*ani. #* ***ʌnni pam*** *twiɛ. #* No. Behind sister’s **chestnut**.	*ani. #* ***ʌnni*** *pam twiɛ. #* No. Behind **sister**’s chestnut.
Final	--- ---	*ani. # uri ʌnni* ***pam****. # twiɛta nwa. #* No. My sister’s **chestnut**. Put it behind.	*ani. # uri* ***ʌnni*** *pam. # twiɛta nwa. #* No. My sister’s **chestnut**. Put it behind.

Results: The resulting plot smooths and difference plots are shown in Fig. 1 below. In the IP-initial context (Fig.1a), the difference in f0 predicted by the GAMM between the focal *vs.* prefocal conditions on the target words was mainly observed during the following ***twiɛta*** 'behind' and not during the target words themselves. The f0 peak during the following syllable occurred earlier with a larger magnitude in association with a H tone for phrase-initial focus. In contrast, in the IP-medial context (Fig.1b), focus effects on the target words were phonetically evident primarily during the target words with a lowered f0 trough in the focused condition in association with a L tone (although marginal for *pap)*. In the IP-final context (Fig.1c), the focus effect on target words was evident during the target words in association with a

L% (boundary) tone being realized later when focused. The study also observed that the preceding word ***ʌnni*** ('sister') showed the clearest effects of focus in the experiment, with both the initial trough and following peak undergoing substantial scaling. Finally, although the coda's sonorancy showed some microscopic difference (see upper vs. lower panels of Fig.1a), the general tonal targets were realized in a similar fashion under focus.

Discussion: Overall, these findings provide valuable insights into the phonetic realization of focus in Seoul Korean and emphasize the importance of understanding the complex interplay between focus and prosodic structure in shaping the language's intonational contours. Furthermore, the observed differences in tune and tone-segment alignment patterns across various prosodic positions and tonal and segmental contexts have significant implications for developing models of intonational phonology in Seoul Korean. Future research can expand on these results by investigating how these patterns generalize across target words and sentences of varying lengths.

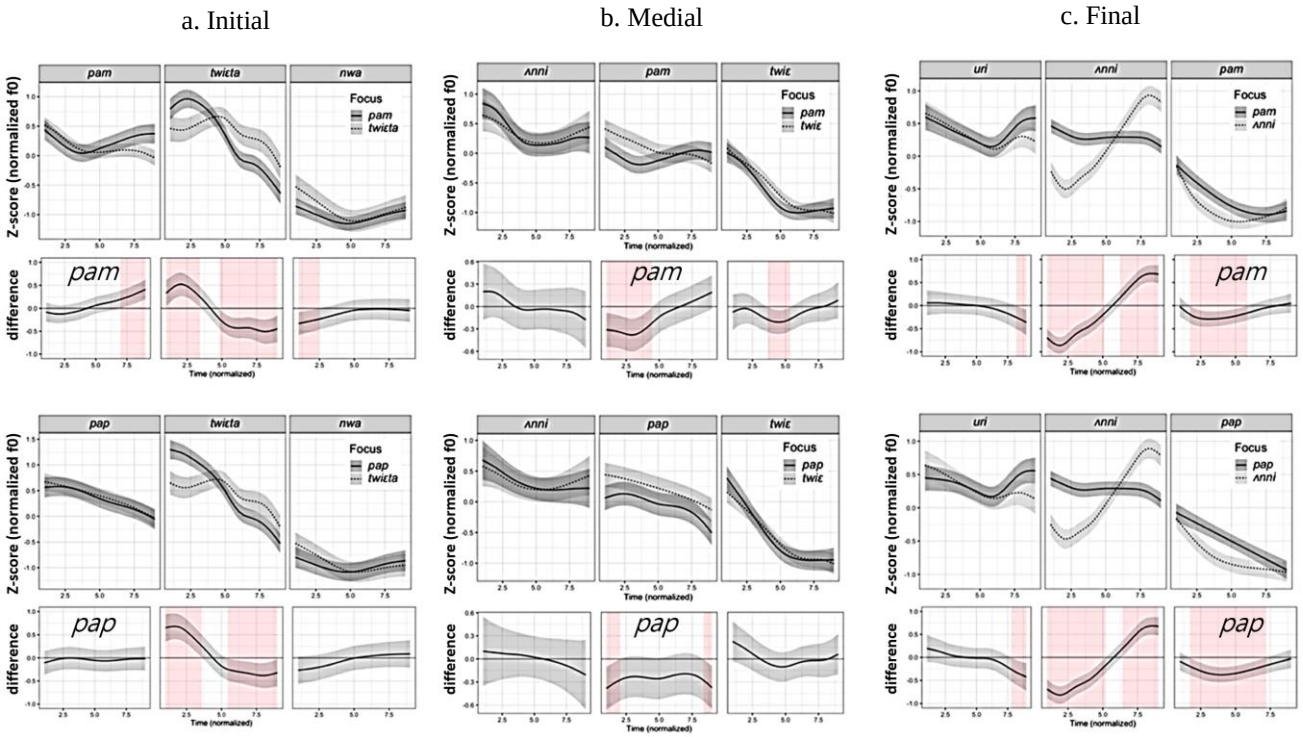

Figure 1: Visualization of non-linear smooths (above) and difference plots (below) in (a) phrase-initial, (b) phrase-medial and (c) phrase-final positions. Grey ribbons represent pointwise 95%-confidence intervals of f_0. Pink vertical bars in the difference plots signify which portions of the two smooths significantly differ from one another.

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