

An Ultrasonic Analysis of Allophonic /n/ Palatalization in Korean

Korean palatalization is known to be one of the uncommon palatalization phenomena where the morpheme boundary plays a role. For example, /mat+i/ ‘the elderly’, where a morpheme boundary exists between /t/ and /i/, becomes [maɕi] by palatalization process, while a monomorphemic word /mati/ ‘joint’ is realized as [madi] (*[maɕi]), with no palatalization. The present study investigates whether the boundary effect is also at play in allophonic /n/ palatalization in Korean using ultrasonic analysis, and claims that /n/ palatalization in heteromorphemic /n/ + [i] words is stronger than that in monomorphemic /n/ + [i] words.

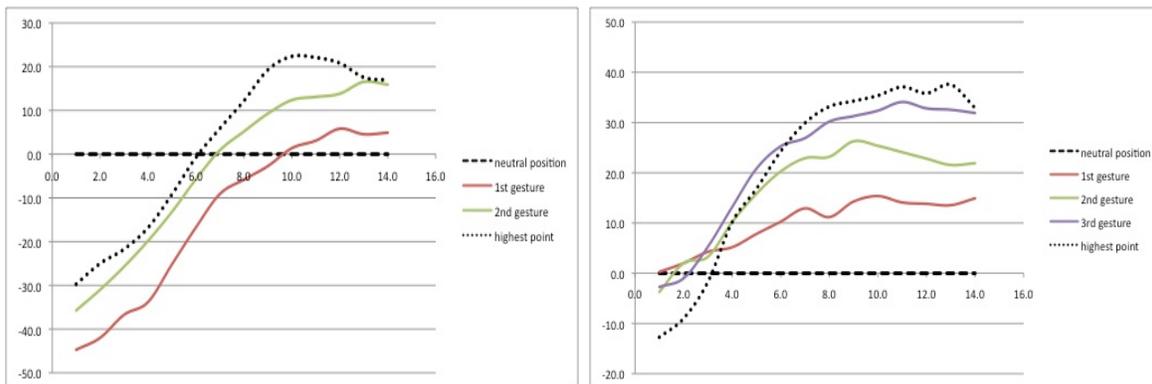
Previous experimental studies on /n/ palatalization in Korean show that there is difference in gestural timing between monomorphemic and heteromorphemic words having /n/ + [i] sequences. Based on the EMA and EPG analyses, Cho (1998, 2001) found that monomorphemic words showed more stable gestural overlap than heteromorphemic ones. These findings indicate that there is difference in palatalization according to the presence of morpheme boundary as well as /t/-to-/tʃ/ phonemic palatalization.

This study used ultrasound imaging and audio recordings to examine the difference in palatalization between two morphologically different words in Korean - monomorphemic words (e.g., [koni] “swan”) and heteromorphemic words (e.g., [muni] /mun # i/ “door + nominative”). 6 native speakers of Korean participated in the experiment. Stimuli included /n/ + [i] sequences in C₁V₁.C₂V₂(C₃) where C₂ is /n/. With E-primeTM to randomize prompts, 3 tokens of each item were collected.

To quantify the difference in palatalization, neutral subtraction measurements were used. Inspired by Gick *et al.* (2004), the tongue resting position for each speaker, which is shown during the pause between utterances, was extracted from ultrasound images, and this resting position was considered as neutral tongue position, reference to the tongue position when speakers produce palatalized [n]. With the neutral tongue position for each speaker, the measurement was done by subtracting the contour of neutral tongue position from that of tongue positions shown when speakers read out stimuli.

As shown in Figure 1, it is noticeable that tongue front gesture is involved when the speaker produces the heteromorphemic words [muni]. Greater degree of palatalization was

Figure 1: Speaker O1’s tongue contours of the front part of tongue in [koni] “swan” (left) and [muni] “door + nominative” (right). Thick square dotted lines indicate the speaker’s neutral tongue position, and thick round dotted lines are the tongue contours where the tongue reached the highest point in the mouth, which is closest to the palate (when the speaker produces [i]).



found in the heteromorphemic words. Moreover, the highest tongue position in the heteromorphemic word [muni] is higher than that in monomorphemic word [koni]. It appears that [i] in the heteromorphemic word [muni] triggers the greater palatalization than that in the monomorphemic word [koni]. The ultrasonic analysis in this study shows that greater palatalization occurs in heteromorphemic words than in monomorphemic ones, and also provides an unified explanation of boundary effect in Korean palatalization.

References

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