

Orthographic Mediation of Korean Domain-Initial Denasalization in Heritage and L2 Learners

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Introduction: Previous research has shown that orthographic effects in second-language (L2) learning are complex and depend on factors such as the congruency of sound-orthography mappings, the auditory distinctiveness of the contrast, and learners' proficiency (see a review in [1]). The present study investigates an incongruent sound-orthography mapping arising from a positional alternation in Korean, as acquired by heritage and non-heritage Korean speakers whose first language is English. English phonemically contrasts nasals and voiced oral stops, whereas Korean lacks underlying voiced stops. However, due to domain-initial denasalization in Korean [2,3,4,5], word-initial nasals are often produced as voiced oral stops while medial nasals remain nasal, creating a mismatch between orthographic representation and surface phonetic realization for word-initial nasals (e.g., 나사 /nasa/ [dasa] 'screw'). Given the robust auditory distinction between nasals and voiced oral stops in English, this study examines whether learning of Korean initial denasalization is mediated by orthography and whether such mediation differs across learner groups. To address this question, we compare heritage Korean speakers exposed to more naturalistic input to non-heritage L2 learners whose exposure is largely classroom-based.

Method: Two groups of Korean speakers (20 heritage and 20 non-heritage) participated in an imitation experiment. Participants heard Korean words and non-words containing initial and medial nasals (e.g., /nale*i/ [dale*i] 'weather', /nael/ [dael] nonword vs. /hana/ [hana] 'one', /huna/ [huna] nonword) and word-medial lenis stops (e.g., [kidaɾɕɭjo] 'to wait', [kudaɾɕɭjo] nonword) and were asked to imitate each stimulus as closely as possible. Orthographic input was provided to half of the participants with the corresponding Hangul spellings to the audio input (Mixed condition), while the other half saw a fixation cross (Audio condition). Acoustic analyses of the model talker's stimuli using A1-P0 (negatively correlated with nasality) on post-stop vowels revealed strong nasality after medial nasals, whereas the vowels following initial nasals exhibited nasality patterns comparable to those of the vowels after medial lenis stops (used as an oral reference) (Fig.1), confirming that word-initial nasals and following vowels in the stimuli were substantially denasalized.

Results: Results are shown in Fig. 2. For heritage speakers, orthographic input inhibited accurate imitation of denasalized word-initial nasals. In the Audio only condition (top left panel), initial nasals (red) were imitated with substantial denasalization close to the oral reference; however, in the Mixed condition (top right panel), they were produced with less denasalization. This inhibitory effect of orthography was stronger for realwords than for non-words (x-axis), suggesting a greater influence of orthographic information when lexical knowledge was available. In contrast, non-heritage speakers showed a different imitation pattern. Across both the Audio and Mixed conditions (bottom panels), initial nasals were generally much less denasalized and closer to medial nasals, indicating a tendency to map denasalized initial nasals onto the underlying nasal category. This reduction in the surface contrast between initial and medial nasals was particularly pronounced for real words, where prior lexical exposure is available. For non-words in the audio condition, however, non-heritage speakers more closely imitated the model talker's productions, though still with less denasalization than heritage speakers. Taken together, these results suggest that orthography mediates the imitation of Korean domain-initial denasalization, but in different ways for heritage and non-heritage learners. The findings indicate that orthographic information can bias learners toward underlying phonological representations or surface phonetic detail depending on language experience and lexical knowledge.

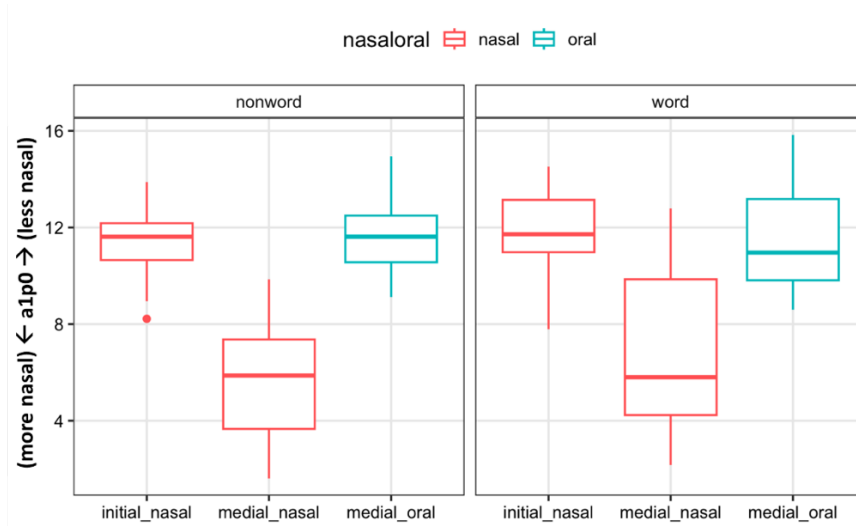


Fig. 1. A1-P0 measured on the vowel immediately following initial nasals, medial nasals, and medial lenis (oral) stops produced by the model talker (a female Korean speaker in 20s).

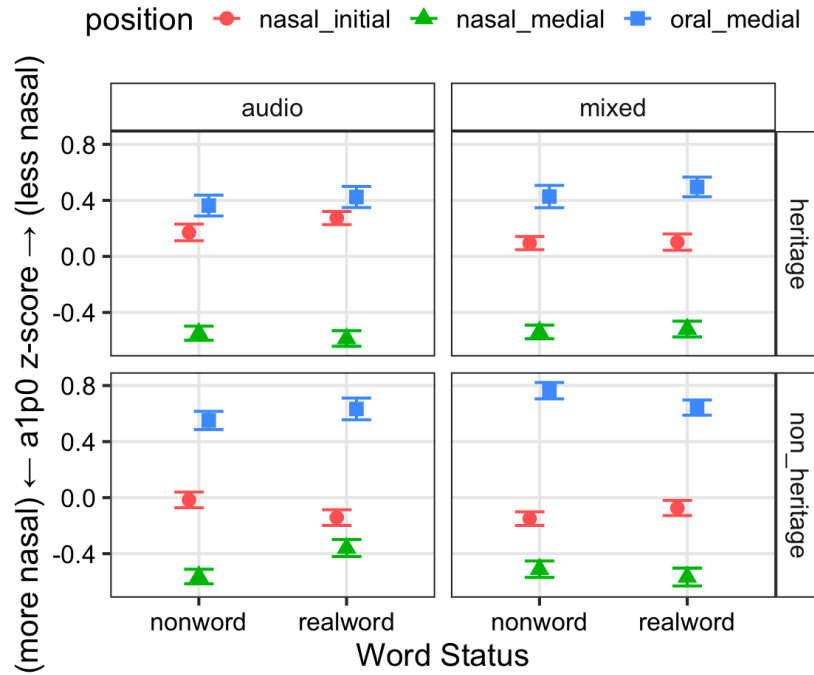


Fig. 2. A1-P0 z-score measured on the vowel immediately following initial nasals (red), medial nasals (green), and medial lenis (oral) stops (blue) in the imitated productions, plotted as a function of lexicality (x-axis: non-word vs. word), participant group (rows: heritage vs. non-heritage), and condition (columns: Audio vs. Mixed).

Reference

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