

Place assimilation as a function of phonological contexts, not of syllable position

In articulatory studies [1, 3, 4, 6], gestural reduction of the first stop in C_1C_2 sequences (arguably known as the site of an assimilation process) optionally occurs, and listeners' perceived assimilation is hypothesized to be attributed to these reduced stops (e.g., /tk/ to /kk/; /kt/ to [kt]/*[tt]). To the extent that place assimilation in Korean (e.g., /pk/ to [kk]) is attributed to perception of a variably reduced C_1 in C_1C_2 sequences [2, 3], we still need to understand whether that reduction represents context-independent reduction in coda [3], or whether the reduction is specific to the assimilation context [1, 3, 7]. In the current study, we examine two things—i) gestural reduction in different lexical syllable positions (coda vs. onset) and ii) gestural reduction in coda followed by C_2 with different degrees of constriction (constricted vs. unconstricted contexts)—with the goal to address the issue of the potential basis for gestural weakening on the one hand and for anticipatory place assimilation on the other, so that we can uncover what causes gestural reduction in the assimilation context.

Using Electromagnetic Midsagittal Articulator [5], movement of the lips, tongue tip, and posterior tongue body was measured. We recorded data from eight native speakers of Seoul-Korean. In production experiment I, the stimuli contained one single stop in the intervocalic position for three places of articulation, differing in their syllable position (i.e., /a#pa/, /a#ta/, /a#ka/ for lexical onset vs. /ap#a/, /at#a/, /ak#a/ for lexical coda ('#' for a morpheme boundary)). In production experiment II, the stimuli contained labials and dorsals (nontarget of place assimilation) in different phonological contexts—constricted environment (i.e., /ap#ka/, /ak#pa/, and /ak#ta/ sequences) compared to unconstricted environment (i.e., /ap#ha/ and /ak#ha/ sequences). Each target word appears in its own distinct natural sentence at two speech rates (fast and comfortable). For experiment I, a total of 756 tokens were available for analysis (256 for labials, 248 for coronals, and 252 for dorsals). For experiment II, a total of 605 tokens (237 for labials and 368 for dorsals) were available. Two measures were employed, namely constriction duration and spatial magnitude using Matlab-based procedures [8].

At the .05 significance level, the results of analyses of variance separately for each speaker for experiment I indicated that, for constriction duration, weaker gestures were attained in coda in 50% of speakers regardless of the place of articulation, although with inter-speaker variation. For constriction degree, a similar tendency consistently held true in 62.5% of speakers for labials, 50% for coronals, and 50% for dorsals. For experiment II, relative articulatory strength of C_1 (nontarget of place assimilation) depending on the constriction degree of a following segment showed that, for constriction duration, reduction of labials in the pre-/t/ context was not attained for any of the speakers, compared to the unconstricted context (i.e., pre-/h/). Reduction of dorsals in the constricted contexts (i.e., pre-/p/ and pre-/t/) occurred in 25% of speakers. A similar tendency was also observed in spatial magnitude—reduction was attained in 25% of speakers for labials and in 12.5% for dorsals.

The current study reveals that reduction conditioned by phonological contexts is more consistent with the phonological status of dorsals, which never become a target of place assimilation under any circumstances. Reduction as a function of syllable position wrongly predicts that dorsals can be targets, which is never attested for Korean. Therefore, we conclude that Korean provides empirical evidence of place assimilation attributed to phonological context effects [1, 3, 7], not syllable positional effects [3].

Selected references:

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