Second Language Perception of English Stops by Korean-Speaking Child Learners: Effects of Position and Lexical Knowledge

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The Speech Learning Model (SLM) [1] posits that "sounds in the [first language (L1)] and [second language (L2)] are related perceptually to one another at a position-sensitive allophonic level, rather than at a more abstract phonemic level" (p. 239). According to this proposal, the position of a category within a word affects the difficulty of perceiving it [2] and it is positional allophones rather than abstract phonemes that play a role in L2 category perception. Although position effects have been observed in a few L2 studies on category perception [3, 4, 5], most studies have tested only advanced adult L2 learners (L2ers). Furthermore, it remains unknown whether L2 categories are mapped onto L1 positional allophones or L1 phonemes. The current study addresses these gaps in the research by testing beginning-level L1-Korean child L2ers to determine (a) whether their perception of the voicing contrast in English stops depends on word position, (b) whether they rely on L1 allophones or L1 phonemes, and (c) whether lexical knowledge effects can be detected.

Stops in Seoul Korean show a three-way contrast between lenis (e.g. /k/), aspirated (e.g. /k^{h}/), and fortis (e.g. /k'/) variants at the phonemic level. Importantly, although there is no voicing contrast, voiced allophones (e.g. [g]) are used between sonorants. In the coda position, all stops are neutralized to lenis consonants. [6] Depending on which L1 category Korean L2ers of English associate with L2 sounds, we can imagine two possible scenarios for the word-medial voicing contrast (e.g. [pɪ$\underline{k}$i] vs. [pɪ$\underline{g}$i]): either L2 sounds (e.g. [k], [g]) are respectively mapped onto L1 positional allophones (e.g. [k], [g]) as stated by the SLM, in which case L2ers should have no difficulty with the contrast, or L2 sounds (e.g. [k], [g]) are mapped onto L1 phonemes (e.g. /k/), in which case L2ers should have trouble perceiving the contrast. However, both scenarios make the same predictions for word-initial stops (e.g. [$\underline{k^{h}}$oʊt] vs. [$\underline{g}$oʊt]), where the aspiration cue is expected to facilitate perception of the voicing contrast (e.g. English [$\underline{k^{h}}$] and [g] perceived as Korean [$\underline{k^{h}}$] and [k] or as /k^{h}/ and /k/), and for word-final stops (e.g. [bæ$\underline{k}$] vs. [bæ$\underline{g}$]), where perception of the contrast should be difficult due to the neuralization in Korean.

Method: Forty 9-year-old L1-Korean L2ers of English with beginning-level proficiency in Seoul, Korea completed a two-talker AX discrimination task in English containing either real words (RW group, *n*=21) or nonsense words (NW group, *n*=19). Participants were asked to judge whether the sounds in each word pair were the same or different. Nine real word pairs and nine nonsense word pairs were selected for use in these tasks. Each pair consisted of one word containing a voiceless stop (/p, t, k/) and another containing a voiced stop (/b, d, g/). The contrasting categories appeared in word-initial (*k*=3), word-medial (*k*=3), or word-final position (*k*=3), depending on the condition. The word order in each pair was manipulated to produce four stimuli. Each task consisted of 36 critical trials and 36 fillers in total.

Results (Figure 1): The participants' responses were converted to *d′* scores and analyzed using a mixed ANOVA with *Group* (RW; NW) as a between-subjects factor and *Position* (word-initial; word-medial; word-final) as a within-subjects factor. The analysis revealed a main effect of *Group* ($p<.001$) and a significant interaction between *Position* and *Group* ($p<.001$). In post hoc analyses, both groups showed a significant effect of *Position* ($p<.05$): Whereas the NW group's *d′* scores were significantly higher for the word-initial contrast than for the word-medial contrast ($p<.05$) and the word-final contrast ($p<.01$), the RW group's *d′* scores were significantly lower for the word-initial contrast than for the other two contrasts ($p<.05$). This finding indicates that the perception of an L2 category is affected by its position in the word. In particular, the NW group's performance suggests that, contra the SLM, beginning-level child L2ers map L2 sounds onto L1 phonemes. Furthermore, the difference observed between the RW and NW groups provides

evidence of lexical knowledge interference effects in L2 category perception. The RW participants may have experienced increased processing load due to activating L2 lexical representations along with L2 phonological representations, which could have inhibited their ability to distinguish the target sounds.

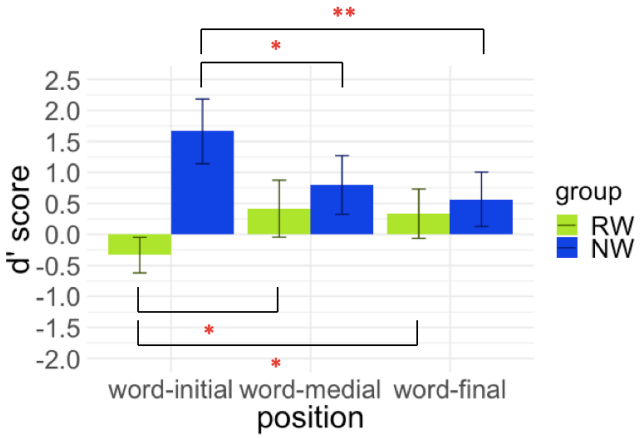

Figure 1. Mean *d'* score per position and group. Error bars show standard errors. Significance level: *p<.05; **p<.01.

References

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