

## The effect of L1 AP-initial boundary tones in Korean adaptation of Japanese plosives followed by a H or L vowel

Japanese is a pitch-accent language with H and L tones of lexical pitch-accent described in terms of F0 (e.g. *ame* LH ‘candy’ vs. *a'me* HL ‘rain’) and has a phonemic voicing contrast (e.g. *hake* ‘brush’ vs. *hage* ‘bald’). In contrast, Korean has no voicing contrast but the three-way phonation contrast (i.e. lenis, aspirated and fortis) in plosives which are all voiceless. In addition, Korean has no lexical pitch-accent in most of dialects such as Seoul Korean which has been considered as standard Korean except for the Kyungsang dialect in South Korea. Given the differences, the present study aims to explore how the H/L tonal distinction is made in Korean adaptation of Japanese plosives followed by a H or L vowel in both word-initial and word-medial positions. For this purpose, we conducted a perception experiment in which one hundred sixty native speakers of Seoul and Kyungsang Korean – eighty in each group (40 male and 40 female) – participated. As test words, two-, three- and four-syllable Japanese words were used with the plosives /b d g t k/ across the contexts, as shown in (1) (an accent is marked with “’” after an accented vowel). Both the original pitch contours in the test words and resynthesized pitch contours were used as Japanese stimuli, as in Figure 1.

For data analyses, we conducted a mixed-effect logistic regression model with Dialect (Seoul, Kyungsang), H/L and Dialect by H/L interaction as independent variables and the subjects’ categorization as a dependent variable. It is found that, no matter whether they command a pitch-accent Kyungsang or Seoul Korean, all subjects mostly perceived Japanese voiced plosives as lenis in both word-initial and word-medial positions with the preference for L in the former and no significant H/L difference in the latter. On the other hand, they mostly categorized word-initial Japanese voiceless plosives as aspirated with the significant effect of H at each level of syllable length and word-medial voiceless plosives as either aspirated or fortis with no H/L effect, regardless of dialect differences (see Figures 2 and 3 for Seoul subjects’ categorization).

Based on the results, we propose that the H/L tonal distinction is made, as enhancement, in Accentual Phrase (AP)-initial position at a prosody in Korean adaptation of Japanese plosives and that other acoustic properties are primarily parsed for cues to L1 laryngeal features at a segment level. That is, the difference in VOT between the word-initial Japanese voiceless and voiced plosives is primarily parsed for cues to the L1 feature [ $\pm$ s.g.] at a segment level with the enhancement of the AP-initial H and L tones by virtue of [ $\pm$ tense], as schematized in (2 a). To be specific, in their categorization of word-initial Japanese voiceless plosives as aspirated, long VOT ([+s.g.]) plays a primary role with the enhancement of the AP-initial H ([+tense]), as in (2a i), whereas the L1 feature [-tense] is activated as the enhancement of the AP-initial L tone by default with relatively short VOT primarily parsed for [-s.g.], as in (2a ii), when they perceived Japanese voiced plosives as lenis. As for our subjects’ categorization of word-medial Japanese plosives with no tonal effect, we propose that it is the difference in closure duration at a segment level that is parsed for cues to the feature [ $\pm$ tense], as in (2 b). Hence, long closure duration of word-medial Japanese voiceless plosives is parsed for cues to the L1 feature [+tense], and short closure duration of word-medial voiced plosives to [-tense].

To conclude, the present study has shown that L1 AP-initial boundary tones play a role as enhancement at a postlexical prosody level in Korean adaptation of Japanese plosives followed by a H or L vowel and that the L1 features in (3) are primarily involved at a segment level, regardless of whether they command a pitch-accent Kyungsang or Seoul Korean.

- (1) a. two-syllable words: *bate'* LH; *date* LH; *gaka* LH; *kabe* LH ; *tada* LH; *mago'* LH  
 b. three-syllable words: *bake'ru* LHL; *dokuga* LHH; *gogaku* LHH ; *kotoba'* LHH; *tadami* LHH; *nakaba'* LHH  
 c. four-syllable words: *bakamono* LHHH; *botebote* LHHH; *dakareru* LHHH; *gatagata* LHHH; *katagami* LHHH;  
*todoke'ru* LHHL (Note that the voiceless plosive /p/ is not in (1), because there are few Japanese words with /p/ in word-initial and word-medial positions except for loanwords and mimetics.)
- a. b.

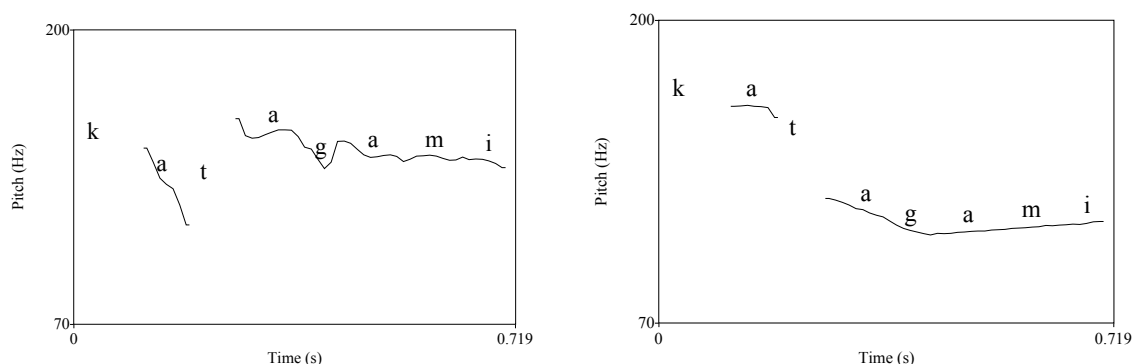


Figure 1. The alignment of F0 movements in the Japanese word *katagami* with (a) its original LHHH pitch and (b) a HLLL F0 manipulation.

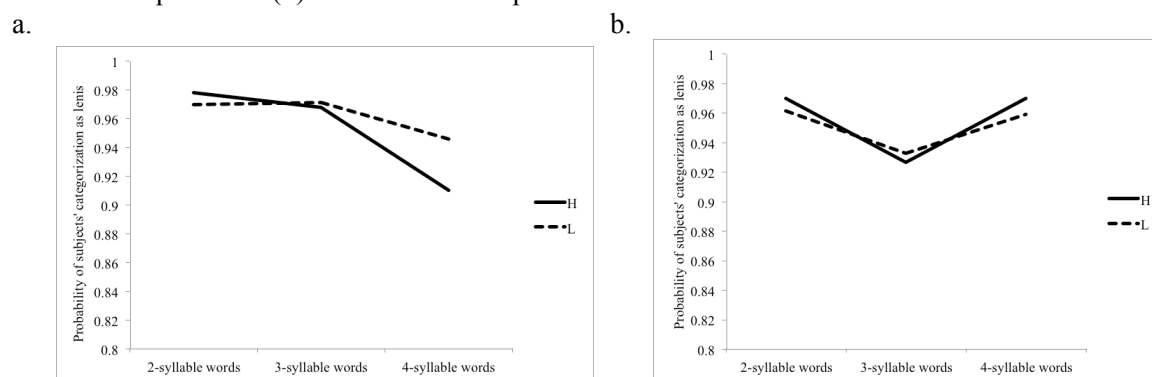


Figure 2. The probability of the Seoul subjects' categorization of Japanese voiced plosives as lenis (a) word-initially and (b) word-medially when a following vowel is H or L.

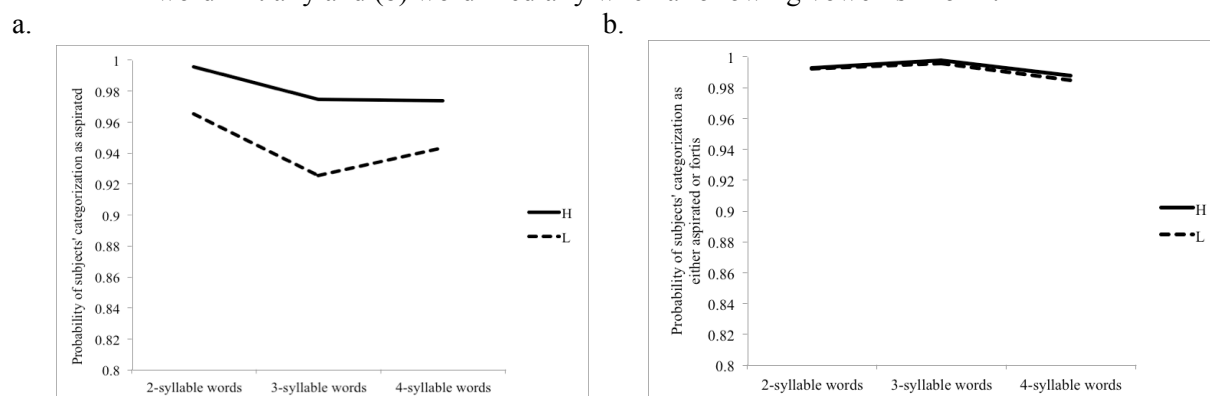


Figure 3. The probability of the Seoul subjects' categorization of Japanese voiceless plosives as aspirated (a) word-initially and as either aspirated or fortis (b) word-medially when a following vowel is H or L.

- (2) Koreans' categorization of Japanese voiceless and voiced plosives (a) in word-initial and (b) in word-medial position.

	Japanese (L2)	cue	Korean (L1)
a. i.	[-voice]	↔ long VOT with the enhancement of AP-initial H ([+tense])	↔ [+s.g., + tense]
ii.	[+voice]	↔ short VOT with the enhancement of AP-initial L ([-tense]) (by default)	↔ [-s.g., -tense]
b. i.	[-voice]	↔ long closure duration	↔ [+tense]
ii.	[+voice]	↔ short closure duration	↔ [-tense]

- (3) The laryngeal feature specification of Korean consonants

	lenis	aspirated	fortis
a. [s.g.]	-	+	-
b. [tense]	-	+	+