

Korean Perception of Japanese Pitch-Accents: A Case of Native Speakers of Seoul Korean

Hyunsoon Kim

Hongik University, Seoul Korea (hyunskim@hongik.ac.kr)

The purpose of the present study is to examine whether native speakers of Seoul Korean are sensitive to pitch variation in vowels after voiced and voiceless Japanese consonants, given the tonogenesis account that the tone difference -H and L in vowels after aspirated and fortis consonants and after lenis ones, respectively- is lexically specified in Korean (e.g., M.-R. Kim & Duanmu 2004). It has been assumed in a standard tonogenesis model that vowels after voiceless consonants are assigned with H and those after voiced ones with L due to the difference in F₀. In line with this, M.-R. Kim & Duanmu (2004: 78) have proposed that “the consonant-tone interaction in Korean is a standard case of voiceless-H and voiced-L.” That is, vowels after lenis plosives are lexically marked as L because Korean lenis plosives are underlyingly voiced with the specification of the features [+voice, -aspirated]. Vowels after aspirated and fortis ones are proposed to be lexically marked as H because aspirated and fortis ones are voiceless with the specification of [-voice, +aspirated] and [-voice, -aspirated], respectively. Lenis consonants are assumed to be devoiced in word-initial or AP-initial position with the original feature value [+voice] changed into [-voice], but the underlying lexical tone L remains unchanged in following vowels. Thus, it is the tone specification that differentiates lenis consonants from fortis ones.

Given that speech perception is greatly affected by the grammar of the native language (e.g., Polivanov (1931, 1974), Trubetzkoy (1939), Hyman (1970), Werker et al. (1981), Best (1994), Dupoux, et al. (1999), Best, et al. (2001)), we can assume that if the consonant-tone interaction is lexically specified, as in the tonogenesis account, then native speakers of Seoul Korean would be sensitive to F₀ difference between voiceless and voiced Japanese consonants, and thus perceive vowels after a voiceless Japanese consonant as H and those after voiced ones as L in all the positions of words. In order to investigate whether native speakers of Seoul Korean sensitive to the H/L distinction in vowels after voiced and voiceless Japanese consonants, we conducted perception experiments where eighty native speakers (40 male and 40 female) of Seoul Korean in their early 20s participated.

Eighteen Japanese words with /b, d, g, t, k/ in word-initial and word-medial positions were put in /korewa __desu/ ‘This is ___’ and randomized.¹ A male native speaker of Tokyo Japanese in his early 30s recorded the test words five times in a soundproof room. The best recorded test words were selected and then pitches were manipulated in two ways, as follows: HL and LH for six two-syllable words; HLL and LHH for six three-syllable words; and HLLL and LHHH for six four-syllable words. The manipulated pitch patterns are allowed in Tokyo Japanese (e.g., Shibatani 1990), and the pitch manipulations of all the test words were examined and confirmed by the Japanese male speaker who recorded the test words and is a trained phonetician. The total number of stimuli was 36 (18 words x 2 pitch variations) and two repetitions of the stimuli were randomized at 4 ms interval. The 72 tokens (36 stimuli x 2 repetitions) were presented three times to each participant. One participant thus received a total of 216 trials. The experiment was run using Praat’s ExperimentMFC facility for perception experiments. All of our subjects have not had any hearing impairments and never learned Japanese. In a quiet room, each subject was asked to listen to the prepared stimuli, using a headphone and write them down in the Korean orthography. After the perception experiments, all the responses of the subjects were stored in excel for data analyses.

The results of our perception experiments showed that the subjects are not sensitive at all to pitch variation in vowels after voiced and voiceless Japanese consonants in word-initial position and also after word-medial voiced Japanese consonants as well. For example, the word-initial voiced consonants /b, d, g/ were perceived as the lenis voiceless consonants /p, t, k/ by our subjects, no matter whether a following vowel has L or H. The statistic results showed that the comparison of LH vs. HL is not significant. The same is true of the other three- and four-syllable words. This indicates that the

difference in H and L has nothing to do with our subjects' perception of word-initial voiced Japanese consonants. Our subjects' perception of the word-initial voiceless Japanese plosives /k, t/ also showed that it has nothing to do with H. For example, the Japanese two-syllable words beginning with /k, t/ were perceived as the aspirated /k^h, t^h/, regardless of whether the Japanese words begin with H or L. The statistic results revealed that the comparison of LH vs. HL is not significant.

Given the results of our perception experiments, we may reconsider some assumptions in the tonogenesis account (M.-R. Kim & Duanmu 2004). First, by assuming that Korean lenis stops are underlyingly specified for the feature [+voice] and aspirated and fortis ones for [-voice] and that vowels after the former have L and those after the latter have H, M.-R. Kim & Duanmu (2004) have proposed that Korean is one of the tonogenesis languages. However, the assumption that Korean lenis stops are underlyingly voiced is neither phonetically nor phonologically supported (e.g., C.-W. Kim 1965; Silva 1992; Jun 1993, 1994; Cho et al. 2002; H. Kim 2009). Second, F0 is assumed to play the primary role in the three-way phonation contrast of Korean consonants in the tonogenesis account. But F0 is a phonetic effect caused by glottal tension during oral closure or constriction of consonants (e.g., C.-W. Kim 1965; H. Kim, Honda & Maeda 2005; H. Kim, Maeda & Honda 2010).

It is thus concluded that the lexical specification of the H/L distinctions in Korean is not empirically supported by the present perception experiments.

Selected references

- Best, Catherine T. (1994) "The Emergence of Native-Language Phonological Influences in Infants: a Perceptual Assimilation Model," *The Development of Speech Perception: the Transition from Speech Sounds to Spoken Words*, eds. by J. C. Goodman and H. C. Nusbaum, 167-224. Cambridge, MA: MIT Press.
- Cho, T., Jun, S.-A., & Ladefoged, P. (2002). "Acoustic and aerodynamic correlates of Korean stops and fricatives," *Journal of Phonetics* 30, 193-228.
- Jun, Sun-Ah (1993) *The Phonetics and Phonology of Korean Prosody*. Doctoral dissertation, The Ohio State University.
- Jun, Sun-Ah (1994) "The Status of the Lenis Stop Voicing Rule," *Theoretical Issues in Korean Linguistics*, ed. by Young-Key Kim-Renaud, 101-114. Stanford: CSLI.
- Kim, Chin-Wu (1965) "On the Autonomy of the Tensity Feature in Stop Classification (with the Special Reference to Korean Stops)," *Word* 21, 339-359.
- Kim, Hyunsoon, Shinji Maeda and Kiyoshi Honda (2010) "Invariant Articulatory Bases of the Features [tense] and [spread glottis] in Korean: New Stroboscopic cine-MRI Data." *Journal of Phonetics* 38, 90-108.
- Kim, Mi-Ryong and San Duanmu (2004) "Tense and Lax Stops in Korean," *Journal of East Asian Linguistics* 13, 59-104.
- Shibatani, M. (1990) *The languages of Japan*. Cambridge: Cambridge University Press.
- Trubetzkoy, Nikola S. (1939) *Grundzüge der Phonologie*. Göttingen: Vandenhoeck & Ruprecht. (English edition: *Principles of Phonology*. tr. C.A.M. Baltaxe. Berkeley and Los Angeles: University of California, 1969.)

¹ Note that there are no native Japanese words with /p/ in word-initial and word-medial positions except for loanwords.