

Formal/phonology,phonetics

Korean learners' perception of word boundaries in English

Native speakers segment continuous speech stream through various kinds of phonetic cues like allophonic variation, durational cues, word intonation, etc (Wells 1990, Goetry and Kolinsky 2000). It has been known that second language learners also learn new segmentation cues but what types of phonetic cues are relied upon differs according to target and native languages. A perception study showed that English-learning Japanese speakers did not perceive word boundaries as well as American speakers on the basis of word-initial aspiration (*keeps canning*), glottal stops (*an itch*), and both (Ito & Strange 2007). However, glottal stop cues (91% correct) were more available to Japanese listeners than aspiration (73% correct). Spanish listeners also perceived glottal stop cues better than aspiration (Altenberg 2005). Given that, this current study investigates an interesting question i.e. whether/how English-learning Korean listeners can utilize aspiration and/or glottal stop cues in distinguishing word boundaries in English.

We dealt with two questions; (a) whether Korean listeners adopt English aspiration and glottal stop cues in distinguishing English word junctures like native English speakers, and (b) whether Korean listeners have more difficulty relying on one of the two cues. Since Korean has highly aspirated stops (p^h , t^h , k^h) over lax or tense stops with shorter VOT (p , p' , t , t' , k , k'), aspiration is likely to play a role as a potential word boundary cue, while glottal stops are not expected to do so since there are no glottal stops in Korean. 30 English-learning Korean listeners participated in perception task of whether they can perceive word juncture as in (1). Each subject was forced to choose what they heard out of 2 written alternatives (e.g. *Lou spills* vs. *loose pills*; *see neither* vs. *seen either*). 42 pairs of phrases (84 stimuli) (identical to Altenberg 2005 and Ito & Strange 2007) were employed.

First, results showed that Korean listeners' overall perception was poorer than native Americans on all types as illustrated in (2). That is, although Korean learners were of advanced junior-college level, they did not fluently adopt allophonic cues for perception of word juncture in English. Interestingly, their perceptual patterns were very similar to Japanese ones (Ito & Strange 2007). This might be attributed to the fact that the VOT for word-initial stops (p,t,k) in Japanese and Korean considerably overlaps, ranging from 28 ms to 57 ms, while English /p,t,k/ has VOT ranging from 75 to 102 ms. The results in the present study indicates that, like Japanese learners, Korean learners have not readjusted or negatively transferred aspiration cue of their native sound system to the perceptual cues of the target language. Since well-known Korean consonants show three-way distinction system based on multiple perceptual cues like aspiration and tenseness, they might not be equipped with perceptual assimilation system. Further, this result is interesting in that Korean learners still have difficulty in distinguishing aspiration before word juncture (e.g. *chief's cool*) from aspiration after /s/ (e.g. *chief school*) like Japanese even though Korean has significantly longer VOT for highly aspirated stops in word-initial position (90-126 ms).

Second, as figure (3) reveals, unexpectedly, Korean listeners had more difficulty in employing aspiration cues than glottal stop cues like Japanese learners. This result indicates that Korea learners relied on glottal stop cues, which are not contrastive in phonological system more than on aspiration cues which are phonetically distinct. This novel result leads us to suppose that Korean learners may have utilized other cues related to glottal stops such as length of pause or weak release of the preceding consonants. Since negative transfer is not likely to happen in case there are no corresponding phonetic cues in Korean, learners may actively adopt other potential cues to segment speech stream of their target language. Furthermore, Korean listeners showed better performance when they heard double cues.

Lastly, Korean listeners showed significantly better perception of word boundaries in English on positive stimuli than on negative stimuli unlike Japanese listeners (+Aspiration 75.5% vs. -Aspiration 55.5%; + glottal stop 99.2% vs. -glottal stop 78.3%). This indicates that positive cues play a distinct role as perceptual cues for Koreans while it is not for Japanese listeners.

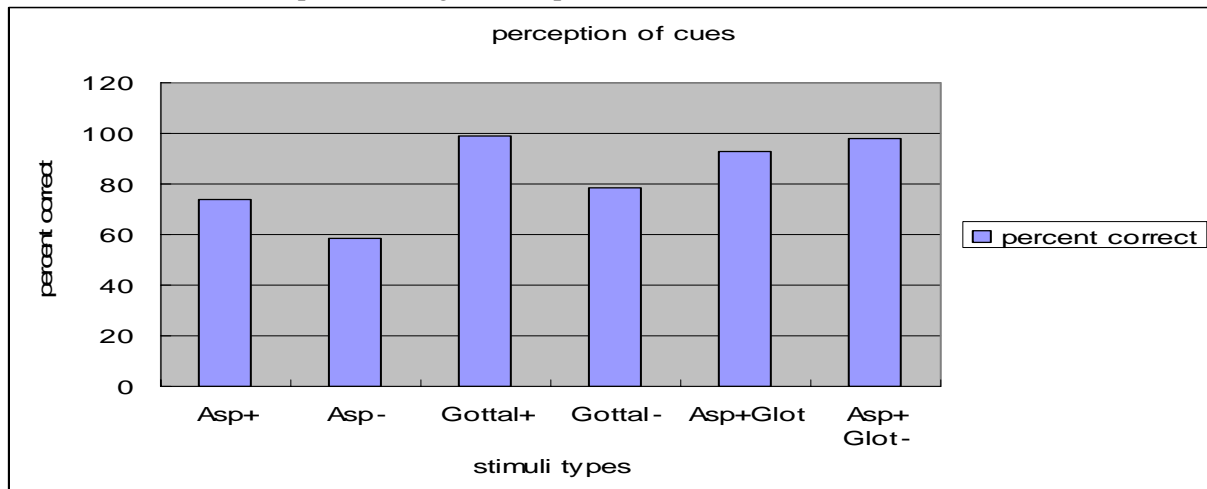
In sum, this study implies that allophonic cues in English makes a different influence on perception of word boundaries for Korean learners. It shows that Korean and Japanese listeners utilize aspiration and glottal stop cues for perception in a similar degree. Lastly, more difficulty of segmentation with aspiration cues over glottal stop cues for Korean, Japanese and Spanish learners indicates that the former might be more marked allophonic features than the latter in foreign language learning.

- (1) a. aspiration: Lou spills loose pills
 Keep sparking keeps parking
 chief school chief's cool
- b. glottal stops: see neither seen either
 why fill wife ill
 I learn I'll learn
- c. asp + glot.: grape in grey pin
 weep at we pat
 like old like cold (Altenberg 2005)

(2) Mean Percent correct scores (%)

	Korean subjects	American Subjects (Altenberg 2005, Ito & Strange 2007)	Japanese Subjects (Ito & Strange 2007)
Aspiration	66	96.2	73.1
Glottal stops	88.5	96.9	91.3
Double Cue	95.2	99.4	93.6
All	83.2	97	83.8

(3) Percent correct for aspiration vs. glottal stops vs. double cues



Selected references

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