

**The context-dependent VOT of Korean lenis plosives in young Seoul Koreans:  
The interaction of the laxness of lenis plosives with prosodic position**

Hyunsoon Kim (Hongik University, Seoul, Korea)

In a recent literature, Silva (2006) among others has reported that VOT after lenis plosives is as long as that after aspirated ones, especially in young Seoul Koreans. This has led to the proposals that lenis plosives are specified as [+spread glottis] (henceforth, [+s.g.]) like aspirated plosives and that H and L tones are underlyingly specified for aspirated and lenis plosives, respectively, in contemporary Seoul Korean. However, in their noninvasive external photoglottography, intra-oral air pressure, airflow and acoustic data, Kim et al. (2018) have found that lenis plosives are different from aspirated ones in glottal opening peak, airflow peak height and duration of aspiration as well as VOT both word-initially and word-medially in the context /\_a\_a/ and that the phonetic attributes are significantly reduced in word-medial lenis plosives, compared to those in word-initial lenis ones, whereas they are relatively consistent across the contexts in aspirated and fortis plosives in their young Seoul Korean subjects. In addition, according to Kim (2019), H/L tonal differences play a role as Accentual Phrase (henceforth, AP)-initial boundary tones, with no lexical specification, in young Seoul Koreans' categorization of Japanese plosives followed by a H or L vowel.

In order to further investigate whether or not VOT after lenis plosives is as long as that after aspirated ones across the contexts, we investigated VOT after the lenis (/p, t, k/), aspirated (/p<sup>h</sup>, t<sup>h</sup>, k<sup>h</sup>/) and fortis (/p', t', k'/) plosives in word-initial (/\_V<sub>1</sub>mV<sub>1</sub>/) and word-medial (/mV<sub>1</sub>\_V<sub>1</sub>/) position where V<sub>1</sub> is one of the eight Korean monophthongs /a, i, u, o, ε, æ, ʌ, i/. 144 test words (72 in /\_V<sub>1</sub>mV<sub>1</sub>/+ 72 in /mV<sub>1</sub>\_V<sub>1</sub>/) were embedded in the frame sentence /næka \_\_ palimhapnita/ 'I pronounce \_\_' and recorded five times at a normal speech rate by 10 native speakers (5 male and 5 female) of Seoul Korean, all of whom were in their early 20s. 7,200 tokens (144 test words x 10 subjects x 5 repetitions) were then analyzed using Pratt.

As in Figure 1, our phonetic data have revealed that the average VOT of word-initial lenis plosives is not as long as that of aspirated counterparts and that that of word-medial lenis plosives is almost similar to that of fortis counterparts. Statistical results have shown that lenis and aspirated plosives are significantly different ( $p < 0.001$ ) in VOT before all the vowels across the contexts except before the first vowel /a/ in /\_ama/ ( $p = 0.208$ ). While fortis plosives are significantly shorter in VOT than lenis and aspirated plosives before all the examined vowels ( $p < 0.001$  for fortis and lenis plosives;  $p < 0.001$  for fortis and aspirated plosives) in word-initial position, they are not statistically different from lenis plosives in VOT before all the examined vowels ( $p > 0.118$ ) in word-medial position. Fortis and aspirated plosives are significantly different in VOT in all the examined contexts ( $p < 0.001$ ). In addition, VOT is significantly reduced in word-medial lenis plosives, compared to that in word-initial ones before all the examined vowels ( $p < 0.001$ ).

The result – the significantly shorter VOT after lenis plosives than after aspirated ones before all the examined vowels across the contexts except in /\_ama/ – indicates that lenis and aspirated plosives are differentiated in VOT even in young Seoul Koreans in both word-initial and word-medial positions. Given that VOT is an acoustic correlate of glottal opening (e.g. Kim et al. 2018) and that H/L tones are not lexically specified in Seoul Korean (Kim 2019), we propose that Korean lenis and aspirated plosives are specified as [-s.g.] and [+s.g.], respectively, not only word-initially but also word-medially in contemporary Seoul Korean in line with Kim et al. (2005, 2010,

2018). As for the other result, that is, context-dependent VOT of lenis plosives, we suggest that it results from the interaction of the laxness of lenis plosives with prosodic position, that is, AP, following Jun (1993, 1998) and Kim et al. (2018) among others. To be specific, the Korean carrier sentence used in our experiment is phrased as one *Intonational Phrase* (henceforth, IP) with two or three APs in a lower prosodic domain, that is,  $IP[AP[næka] AP[ \_ palimhapnita]]$  or  $IP[AP[næka] AP[ \_ ] AP[palimhapnita]]$  in an autosegmental-metrical model of intonation (e.g. Pierrehumbert 1980; Beckman & Pierrehumbert 1986; Pierrehumbert & Beckman 1988). Given that word-initial lenis plosives in the present study are in AP-initial position and that word-medial ones are within an AP, we propose that the laxness of lenis plosives at a segmental level is interacted with prosodic position such that within an AP, VOT is significantly reduced in word-medial lenis plosives due to the laxness, compared to that in word-initial ones. With no consideration of the prosody as well as the laxness of lenis plosives, it would be hard to account for why VOT after lenis plosives is context-dependent, in that the plosives are lexically specified as [-s.g.] across the contexts.

To conclude, the present study has shown that the context-dependent VOT of lenis plosives in young Seoul Koreans results from the interaction of the laxness of lenis plosives with prosodic position, that is, AP, suggesting that the consideration of both segmental property and prosodic position can provide an account of different phonetic implementations of same segments.

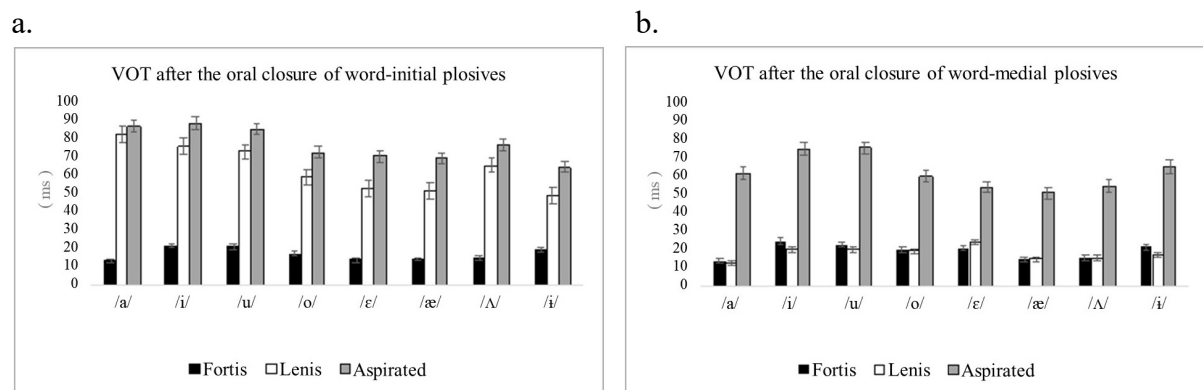


Figure 1. The average VOT after the oral closure of (a) word-initial and (b) word-medial fortis, lenis and aspirated plosives in the contexts  $/\_V_1mV_1/$  and  $/mV_1\_V_1/$ , respectively.  $V_1$  is one of the eight Korean monophthongs /a, i, u, o, ɛ, æ, ʌ, i/.

#### Selected references

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