# Korean alveolar fricatives: Spectrographic evidence from running speech

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Seoul Korean features an uncommon distinction between the non-fortis fricative /s$^{h}$/ and the fortis fricative /s*/, both voiceless in word-initial positions. Previous studies show that /s$^{h}$/ is typically followed by aspiration, while /s*/ exhibits glottalization in about 50% of cases. Additionally, they differ in acoustic properties such as center of gravity (CoG), frication duration, and F1 values and duration of the following vowel.

The present study adresses the differences in the two fricatives using data from the *Seoul Corpus*, a corpus of running speech, as opposed to previous production studies which only considered single words or syllables. We also include younger speakers than in previous research, which is important due to a perceptual shift in those born after 1960.

As some /s$^{h}$/ tokens were surprisingly found to be phonetically voiced, we conducted two separate analyses. The first focused on 653 phonetically voiceless /s$^{h}$/ and /s*/ tokens, finding that 87% of /s$^{h}$/ tokens were aspirated, while 58% of /s*/ tokens were glottalized. The two fricatives significantly differed in frication duration, CoG, and vowel duration, with the frication duration effect being more pronounced for male speakers. The second analysis examined 151 phonetically voiced /s$^{h}$/ tokens, none of which showed aspiration. These tokens had significantly shorter frication duration, lower CoG (similar to values of /z/ or /ʒ/), and a slightly lower F0 of the following vowel compared to the phonetically voiceless tokens.

Challenges with distinguishing frication noise from aspiration noise based on spectrogram and waveform reading and the intentional exclusion of VOT measurements are discussed.