

Long-distance assimilatory effects in English sibilants

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Phonological patterns of consonant harmony – long-distance assimilation of consonants – have been proposed to arise due to inherent difficulties of articulating or planning featurally similar sounds (Gafos 1999; Hansson 2001; Rose & Walker 2004). For example, the common process of sibilant harmony (*safa* → *ʃafa*) is presumably grounded in long-range coarticulation or speech errors involving the two relatively similar consonants. One prediction of this view is that phonetic difficulties of this kind should manifest in languages regardless of whether they have phonological harmony processes. Very few instrumental investigations of this prediction, however, have been conducted, with some providing conflicting results (e.g. Kochetov & Radišić 2009 and Ozburn 2016 on sibilant harmony). The current study takes a closer look at spectral properties of English voiceless sibilant fricatives as a function of their co-occurrence in non-adjacent syllables.

Ten native speakers of Canadian English read pairs of nonsense words with /s/ and /ʃ/ in homorganic (*soppa soppa*, *shoppa shoppa*) and hetero-organic contexts (*soppa shoppa*, *shoppa soppa*). Centre of gravity of fricative noise (COG, in Hz) was measured at the fricative midpoint. COG is typically higher for /s/ than /ʃ/. One speaker, whose production of /s/ COG was highly variable, was excluded. The data were analyzed using Repeated Measures ANOVAs with factors Consonant (/s/ or /ʃ/), Position (C₁ or C₂), and Context (homorganic, hetero-organic). The results revealed that COG of both consonants was significantly affected when they occurred as C₁ in a hetero-organic context. This was manifested in lower values for /s/ before /ʃ/ ([s] *oppa shoppa*) and higher values for /ʃ/ before /s/ ([ʃ] *oppa soppa*). In addition, COG was lower in the hetero-organic context for /s/ as C₁ compared to the same consonant as C₂ ([s] *oppa shoppa* vs. *shoppa* [s] *oppa*), while positional differences for /ʃ/ were not significant. These differences are evident in Fig. 1 below, which also shows considerably greater variability in the hetero-organic context.

Overall the results are indicative of gradient regressive harmony targeting both sibilant fricatives, while affecting the anterior /s/ to a greater extent. Both the regressive directionality and the place effect are hallmarks of consonant harmony (Hansson 2001; Rose & Walker 2004), and thus the results are interpreted as evidence for the articulatory source of the phenomenon.

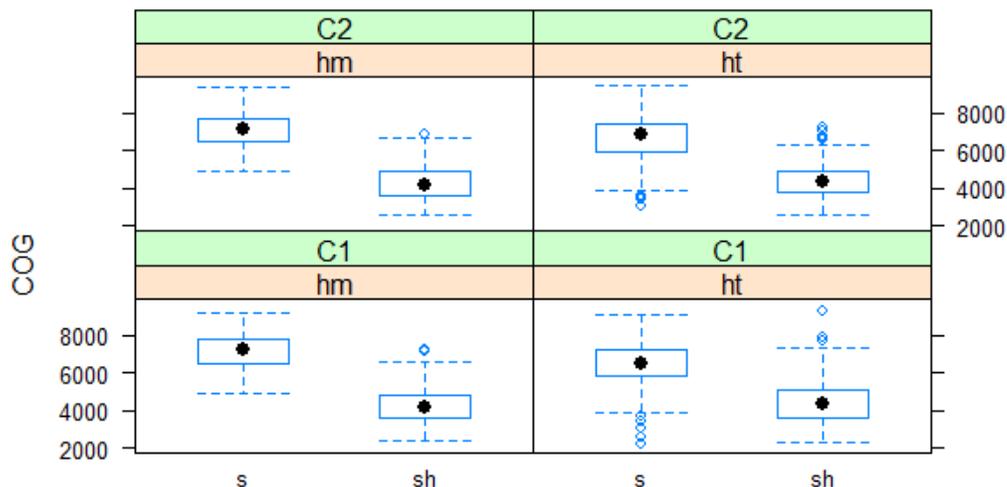


Figure 1. Mean COG (Hz) by consonant ('s' & 'sh'), context (hm & ht), and position (C₁ & C₂)

References

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