Perceptual motivations of sibilant harmony
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It has been suggested that consonant harmony may arise from phonologized speech errors and coarticulation (e.g. Hansson 2001). However, there has been little investigation into whether consonant harmony could be affected by listener-driven factors (see e.g. Hansson 2008 for an overview). While Gallagher (2012) has found that experimental results on perceptual similarity reflect properties of ejective harmony, such perceptual effects have not been studied more broadly in other types of consonant harmony. The present study examines the perception of sibilant contrasts in different contexts, in order to investigate whether perceptual factors could be driving the typologically common properties of sibilant harmony, including its often regressive directionality and the fact that more similar segments are more likely to interact harmonically (see e.g. Rose and Walker 2004, Hansson 2001). If consonant harmony patterns are in part determined by misperceptions or perceptual adaptations, then we expect harmonic contrasts to be perceived differently in typologically common harmony contexts than in non-harmony contexts. Since sibilant harmony is cross-linguistically the most common type of consonant harmony (Hansson 2001) and is easily tested on English listeners, who do not have sibilant harmony in their native language to affect their judgements, it offers an ideal way to examine these potential effects.

This paper reports on an experiment consisting of a forced choice categorization task using sibilant continua. Natural stimuli produced by a trained phonetician were manipulated in the Matlab program STRAIGHT (Kawahara et al. 2008) to create an 11-step continuum between [s] and [ʃ]. Stimuli were of the form CVCV, where one of the consonants was along a continuum between [s] and [ʃ] and the other was one of the following: highly similar sibilants [s] and [ʃ], less similar sibilants [z] and [tʃ], or non-sibilants [n] and [m]. Three vowel contexts were tested, CaCa, CiCi, and CuCu, in order to evaluate whether results are consistent across vowels that are known to cause differences in sibilant perception. Participants listened to the stimuli and were asked to categorize the ambiguous consonant by selecting either “s” or “sh”. Previous continuum studies with strictly adjacent consonants across word boundaries have shown that sibilant categorization curves change in the presence of another sibilant compared to a non-sibilant (Fleischer et al. 2013), and the current experiment tests whether such changes also occur in longer-distance sibilant contexts. As such, results are analyzed to determine the extent to which the categorization as [s] or [ʃ] of ambiguous continuum sounds depends on the position of the ambiguous consonant in the word, the surrounding vowel and, most importantly, the context consonant.

Pilot results suggest that there are overall more [s] responses in sibilant contexts than in non-sibilant [n, m] contexts. Interestingly, this result held both when [s] responses were assimilatory, specifically when the context consonant was [s], and when they were dissimilatory, namely when the context consonant was [ʃ] or [tʃ]. The latter result is particularly interesting given that Abrego-Collier (2013) found an opposite pattern with liquids, with more [r] responses in [r] contexts and more [l] responses in [l] contexts compared to a neutral context. As such, this result could point to a fundamental perceptual difference between sibilants, which tend to harmonize, and liquids, which tend to dissimilate. Thus, this study provides crucial new results for understanding the motivations behind sibilant harmony and potentially harmony versus dissimilation more generally.
References