

Postalveolarization of the Cantonese /s/: An Acoustic Study

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Previous studies have shown that the Cantonese /s/ gets postalveolarized in some phonetic environments. While [1] said that the postalveolarization occurs mostly before [y] but not before central rounded vowels [œ ø], [2] found substantial postalveolarization before [y, œ, u] but less before [ou ɔ øy]. [3] examined the /s/ before /a e i o y/ and discovered varying degree of postalveolarization. It is hypothesized that /s/ before rounded vowels gets postalveolarized to different degrees due to coarticulation, and the postalveolarization degree increases over time, until /s/ is realized as [ʃ]. This hypothesis predicts that Cantonese /s/ may eventually develop a categorical allophonic split between [ʃ] and [s], conditioned by vowel roundedness [4]. However, few acoustic studies have examined the postalveolarization of Cantonese /s/. It remains unclear whether /s/ is still undergoing increasing postalveolarization before rounded vowels or it has already developed an allophonic split. It is also unclear whether the postalveolarization of /s/ differ in Hong Kong Cantonese (HKC) and Guangzhou Cantonese (GZC) [5]. This study recruited 9 HKC speakers and 9 GZC speakers, with 5F 4M each. Participants completed a production task with 20 target words interspersed with fillers, each produced three times. Altogether 1078 valid tokens were analyzed acoustically using center of gravity (CoG) measurements. The results (Fig. 1) show that CoGs by speakers of the same gender and the same Cantonese variety exhibited significant differences between rounded and unrounded vowel contexts, indicating a substantially high degree of postalveolarization among rounded vowel contexts. Both Cantonese varieties followed a similar trajectory, with no significant regional differences between CoGs by gender and with the same vowel roundedness context. Also, no significant CoG differences were found before different rounded vowels (Fig. 2), while CoGs before rounded vowels were all significantly lower than those before unrounded vowels. This suggests that the Cantonese /s/ before rounded vowels has similar postalveolarization process in both varieties, having developed an allophonic split. However, regional difference exists. While GZC shows a two-category pattern with no significant differences among either rounded or unrounded vowel contexts, HKC exhibits significant within-category differences among the unrounded vowel contexts. Post-hoc analysis showed that CoGs before [i] are significantly higher than those before [a] and [ɐ], consistent with the coarticulatory findings by [3].

This study supports the hypothesized developmental pathway of Cantonese /s/. Additionally, the differences of /s/ before unrounded vowels in two varieties may suggest that /s/ before unrounded vowels has also been undergoing postalveolarization. The /s/ before [i] in HKC may still be increasing in postalveolarization to be more aligned with the /s/ before other unrounded vowels, shaping the overall pattern closer to the GZC two-category split eventually. These results can advance our understanding of the development of this /s/ sound change.

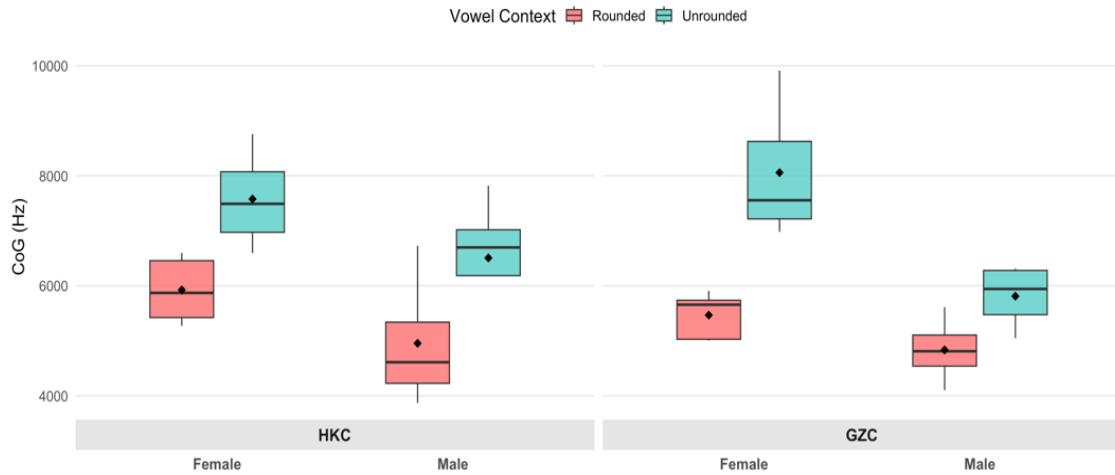


Fig. 1. CoG grouped by Variety, Gender and Roundedness

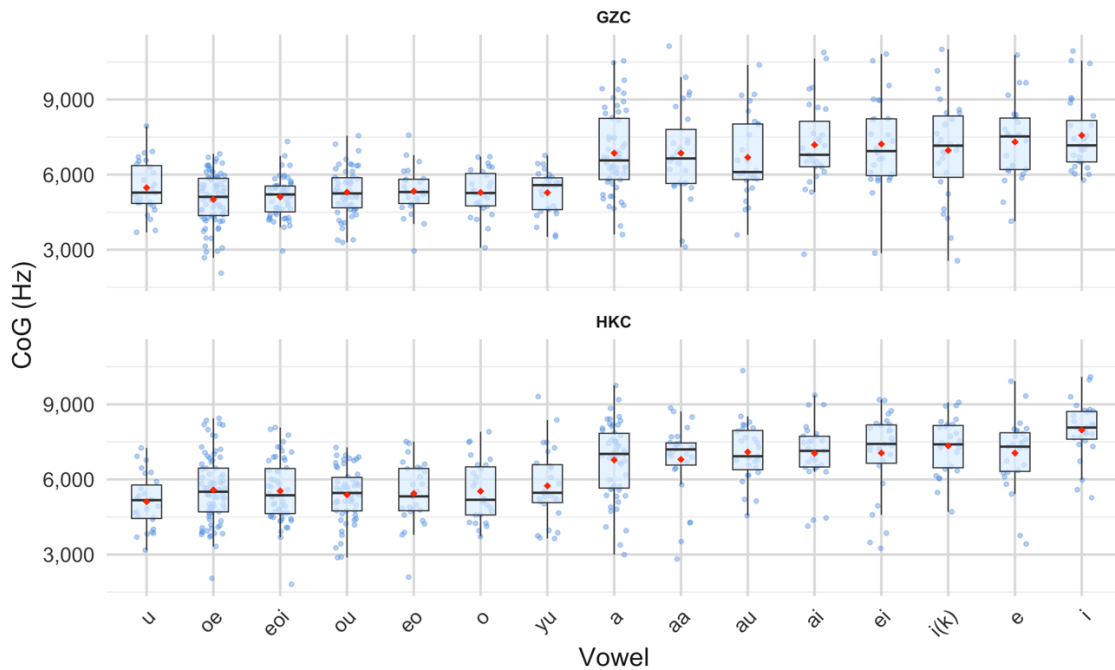


Fig. 2. CoG of /s/ followed by different vowels

References

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