Shtreets of Philadelphia

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Several studies have reported a broad change in North American English toward retraction of /s/ followed by /tr/, leading to /s/ in the word street to be produced as [ʃ] (Labov 1984; Durian 2007; Lawrence 2000). Variation in the pronunciation of (str) has been reported (Labov 1984) for Philadelphia speakers in the Philadelphia Neighborhood Corpus [PNC] (Labov and Rosenfelder 2011), but no study has thoroughly investigated this variable across time in the PNC.

This study uses acoustic techniques to analyze the (str) variable using data from the PNC as well as from Impact of Higher Education on Local Phonology [IHELP] (NSF grant #561958), an ongoing project investigating the speech of Philadelphia high-schoolers. Using FAVE-aligned (Rosenfelder et al. 2011) acoustic data from sociolinguistic interviews, all initial sibilant tokens longer than 40ms were extracted. A mean center of gravity measurement was taken from a spectrum created from the middle 50% of each sibilant. A total of 33,374 tokens were measured from 143 speakers, 2,169 of which were tokens of (str). All speakers with less than five (str) tokens were excluded.

We follow Rutter (2011) in analyzing speakers' peak COG measurement for (str) only in relation to their other sibilants, in order to control for individual variation in sibilant frequency range and different recording equipment across interviews. All (str) tokens were z-score normalized with reference to all of the speaker's measurable initial sibilant tokens. We compare the average z-score of (str) tokens across speakers and phonological contexts.

We found a robust change over time, with the normalized average COG of /s/ in (str) decreasing overall. The steepest rate of change occurs before 1950. The change has not gone to completion, as some of the youngest speakers have z-scores that approach those of the oldest speakers. Few of the older speakers and many of the younger speakers have an average (str) production that is closer to their average production of /ʃ/ than their average production of /s/. This points to a likely reanalysis by some speakers of /s/ in (str) as /ʃ/.

A linear regression model selected date of birth as a highly significant predictor. Following /aw/ was also highly significant, favoring lower normalized COG (more retracted) (str). Years of education and income, evaluated over the portions of the data where this information is available, were found to be significant, although the latter was associated with a very small effect size. Sex was not significant in any model.

Although the usefulness of acoustic evaluation of variation in vowels has been well established, this type of analysis has been less commonly applied to consonants. This study provides evidence for the change over time of a consonantal variable, showing that acoustic measurements of even imperfectly aligned data can be successful in evaluating variation of phonetic detail in consonants.

References

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