

**Prosodic paths to sound change: The effects of phrasal boundaries on
/s/-retraction in American English**
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An ongoing sound change in American English is /s/-retraction, the process by which /s/ is articulated approaching /ʃ/ in the context of /r/. Speakers vary significantly in the degree of retraction observed, with all individuals exhibiting coarticulatory effects of /r/ in /sCr/ clusters and some individuals displaying an apparent sound change, with /s/ reanalyzed as /ʃ/ in /str/ clusters (Mielke et al., 2010; Baker et al., 2011). The present study seeks to better understand the actuation of this sound change through an examination of the manipulation prosodic position of sibilants in these environments.

Thirty native speakers of American English (20 male, 10 female, aged 18-22) read a series of sentences in which the target words were either intonational phrase initial or medial. The carrier sentences controlled for syllable count, syntactic position of the target, and adjacent phonological material. The target segments were /s/, prevocalic and preceding /{p,t,k}r/, and /ʃ/. Target words were controlled for frequency following SUBTLEX_{US}.

The results of this study demonstrate that the center of gravity (CoG) of /s/ is lower when adjacent to a prosodic boundary. Linear mixed effects models with maximal random effects structure (Barr et al., 2013) confirm the significant main effect of prosodic position ($p < 0.01$). These findings are consistent with Jang (2011) for Korean sibilants, demonstrating a cross-linguistic tendency for CoG dampening in IP-initial positions. This initially appears to contrast with the findings of Cho (2004) for English vowels that cues of coarticulation are diminished in phrase-initial positions; however, this main effect is observed across phonological contexts, including prevocalic /s/, suggesting that the observed CoG dampening is a result of prosodic strengthening rather than a coarticulatory effect of /r/.

Additionally, while there was not a significant group-level effect for the interaction of prosodic position and the following segment, the inclusion of by-subject random slopes for that interaction, which significantly improves model likelihood, illustrates that individuals vary with respect to the effects of prosodic conditioning of /s/-retraction in different phonological contexts. Additional linear models fitted to individual participants demonstrate this inter-speaker variation, with most speakers showing no significant difference in the CoG of /sCr/ clusters in different prosodic positions (Figure 1a–b). However, a small number of participants show a near categorical distinction in the CoG of /sCr/ clusters in initial versus medial positions (Figure 1c–d).

These findings suggest a possible role of prosodic position in the actuation of sound change (Blevins, 2006). In much the same way that frequency modulates sound change, prosodic position provides an ideal locus for target reinterpretation. Individuals who exhibit a large degree of coarticulatory variance may exhibit even greater degrees of retraction in phrase-initial positions due to the compounded effect of prosodic strengthening and coarticulatory biases. Possible target reanalysis may be even more likely in these positions given the expected hyperarticulation of phrase-initial segments. Thus, articulations of /s/ with substantially lower CoG in a phrase-initial position may be reinterpreted as /ʃ/ precisely because of the prominence of their prosodic positions.

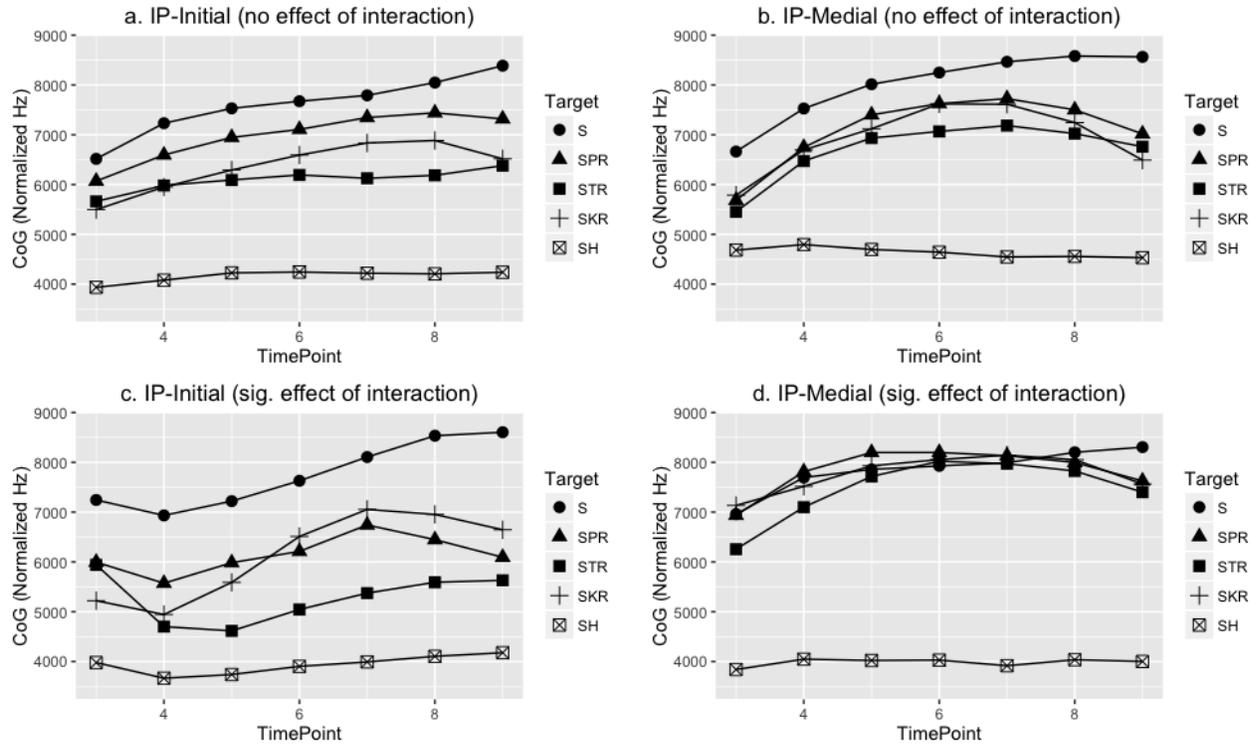


Figure 1: Two individuals typifying the variation in the effect of prosodic position \times phonological context.

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