

Glottalization as a higher-order prosodic cue in a socially diverse sample of Southern speech

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Effective communication involves the speaker signaling that one intonational phrase (IPU) has ended, and a new IPU is beginning, or that a word is especially important. To accomplish this, select segments may be strengthened via glottalization, or a partial closing of the glottis during articulation (Garrellek 2013). Glottalization of word-initial vowels in particular has been suggested to serve as an acoustic correlate of prosodic structure in that these segments are glottalized frequently at prosodically significant points, such as at the start of IPUs and intermediate phrases (ip), and on pitch-accented words (Dilley, Shattuck-Hufnagel, & Ostendorf 1996; Garrellek 2013; Pierrehumbert 1995). As the focus of such work was not the potential impact of social factors, data supporting this assertion come from ostensibly homogenous speaker groups. However, research on general glottalization rates (i.e. explored without regard to prosody) has suggested that social factors are important to consider, as Western U.S., and younger female speakers have been shown to glottalize at particularly high rates (Eddington & Channer 2009). This study thus examines the role of word-initial vowel glottalization with regard to prosody in a socially diverse sample of speech from the U.S South. Results indicate that despite great variability in the data, there are measurable patterns of glottalization across speakers that serve as higher-order prosodic cues.

Building on previous work which has analyzed radio news speech recorded in Boston (Dilley et al. 1996; Garrellek 2013), and lab speech recorded in California (Garrellek 2013), this study utilizes the *Linguistic Atlas of the Gulf States (LAGS)*, an extensive sociolinguistic corpus recorded from 1968-1983 (Pederson et al. 1986) consisting of highly conversational speech, to determine how patterns of glottalization are employed across a socially diverse population. The data examined here was produced in 1972 by 10 speakers (5 M; $\mu=63.7$ years; ~36 hours of speech first fully transcribed by Renwick & Olsen 2016) in one well-sampled *LAGS* speaker region consisting of five contiguous counties in southeast Georgia. Speakers varied widely in terms of such social factors as age, gender, county of birth, education level, socioeconomic status, worldview (determined in conversation with *LAGS* fieldworkers), and ethnicity. In addition to analyzing a socially diverse speech sample, this work adds to the existing body of glottalization research by examining speech from a different era, region, and register than those that have been documented.

A preliminary set of 508 tokens of commonly used vowel-initial words was annotated for glottalization (+/-), as determined by examination of the waveform and spectrogram, as well as perceptually when necessary. Glottalization manifests as irregularity in the pitch period, and a drop in f_0 and amplitude (Redi & Shattuck-Hufnagel 2001), and was analyzed according to these criteria. Words were also marked for prosodic phrase position (most prominent \rightarrow least prominent: start of IPU, start of ip, and mid-phrase), and phrasal pitch accent (+/-). Much individual variation was observed, with speakers glottalizing at different rates ranging from glottalization in 30.8% to 57.1% ($\mu=46.3\%$) of tokens. Despite these individual differences, however, one clear pattern was observed in each speaker's glottalization patterns. Glottalization rates closely mirror prosodic phrase prominence for each speaker, with the highest rates always occurring at the start of IPUs or ips, and the lowest occurring on mid-phrase segments, thus indicating that the rate of glottalization of word-initial vowels serves as a cue to prosodic prominence across a diverse group of speakers.

References

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