Title:
The company that word-boundary sounds keep: The effect of contextual frequency on word-final /s/ in a sample of Mexican Spanish

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Abstract:
A basic tenet of usage-based models of language is that the frequency with which words occur in spontaneous speech has an effect on the mental representation of language. A corollary is that the frequency with which words co-occur is also registered in memory. Referring to the sound change of /t/, /d/ deletion in American English, Bybee (2002:261) proposes that: "Words that occur more often in the context for change change more rapidly than those that occur less often in that context." Other studies have also provided support for the proposal that frequency of usage contributes to differential rates of sound variation. Brown (2004) finds that word-initial /s/ in the colonial Spanish of northern New Mexico and southern Colorado is reduced more often in words that occur more frequently in the context that most favors reduction in that variety, even when phonological context is controlled for. Brown (2009) reports similar results for the influence of contextual frequency with word-final /s/ in Cali, Colombia and Brown (2015) also provides support from an analysis of word-initial /d/ in the speech of early Spanish-English bilinguals in New Mexico.

This paper analyzes the influence of contextual frequency by examining Mexican Spanish spoken in Salinas, California. Sociolinguistic interviews were conducted with the participants in a sound studio using a solid-state recorder and a lapel-mounted microphone. The duration in milliseconds and the center of gravity in Hertz of word-final /s/ in the speech of five men and five women are analyzed with the phonetics software Praat (Boersma and Weenink 2015). The speakers belong to a homogeneous social group: all held a Bachelor's degree or were in the process of obtaining one at the time of recording and were between the ages of 20 and 27 (mean = 23.4 years, standard deviation = 1.95). The decision to limit sociodemographic variability was based on the desire to control for these variables in order to focus the study on the usage-based variables analyzed.

The following predictor variables are measured: the linguistic variables of preceding and following phonological contexts, lexical frequency of the word with /s/, and frequency with which words with /s/ occur in the phonological context most favorable to reduction of word-initial /s/ in this variety, referred to as Frequency in a Reducing Context (FRC) or Frequency in a Favorable Context (FFC) for reduction in the literature. In addition, speaking rate, prosodic stress, and sex of the speaker were measured and coded for as possible confounding factors.

In order to code the tokens, a sequential set of at least 100 tokens of /s/, taken from at least 10 minutes into each interview, was marked in Praat and the duration in milliseconds was extracted using a script. Next, the script extracted the exact middle 50% of the tokens of /s/ and applied a Pass Hann filter to eliminate the lowest 750 Hertz from the signal before measuring the center of gravity in Hertz, as the transitions between /s/ and surrounding sounds and any voicing present in /s/ can skew the center of gravity. Lexical frequency and FRC were measured in a combined corpus of Mexican and Mexican-American Spanish (Lope Blanch 1971; Lope Blanch 1976; Lope Blanch 1990; Brown 2012). Tokens of /s/ whose FRC was based on relatively few words in the combined corpus were excluded (N = 168). Specifically, tokens were eliminated if their FRC was calculated on fewer than the first quartile (38 words) of the total number of words (7,967 words) upon which all FRC scores were calculated. It is assumed that there must be a large enough number of occurrences of a word in the frequency corpus for
FRC to have the potential of exerting an influence. This coding process resulted in 898 tokens of word-final /s/ for the analyses.

Two mixed effects linear regressions were performed, one for duration and one for center of gravity, with speaker and lexical item entered as random effects. The results show that FRC is a significant predictor of both duration and center of gravity of word-final /s/ in this variety of Spanish. Interestingly, the results also show that lexical frequency does not exert a significant effect. These results corroborate previous studies that suggest that FRC is a better predictor than lexical frequency of word-boundary sound reduction. These results support Bybee's assertion that words that occur more frequently in phonological contexts conducive to reduction are reduced more often, even when the phonological context is controlled, because the mental representation of words are malleable cognitive entities which respond to usage-based factors.

References: