

From articulation to lexicalization: A context frequency explanation of Spanish initial fricative reduction across time.

In the spoken Spanish of New Mexico, /s/-weakening occurs in word-initial position, a position generally considered to be more resistant to reductive processes (Bybee 2001:204). New Mexican /s/-initial reduction can result in aspiration ([h]*emana* for *semana*) or deletion ([ø]*entado* for *sentado*). Variation is widespread among speakers, is not limited to specific words, and occurs in about 16% of all /s/- tokens (Brown, 2005). In addition, /s/- variation in New Mexico is not solely due to articulatory pressures, but reduction also reflects usage patterns, including contextual frequencies and perhaps word frequencies, as has been observed in other reduction phenomena (Bybee 2002, Jurafsky et al. 2001, Raymond et al. 2006). Whether additional factors in /s/- weakening are influential has not been established.

Parallels exist between variation of /s/- in New Mexico and the historical development of another word-initial voiceless fricative in Spanish, /f/->[h]>[ø] (Ferguson, 1990; Méndez Dosuna, 1996). Traditionally, Hispanic linguists provide a lexical explanation for this diachronic sound change, where reduction was ubiquitous in certain contexts but was followed by reintroductions of exceptions deemed “(semi)-learned,” e.g., *fe* (“faith”). The circularity of labeling exceptions as learned while identifying them as learned from their phonology is a recalcitrant problem (Penny 1990).

The current study was a corpus-based analysis of a synchronic and a historical corpus. From the first corpus we examined /s/- realizations in spoken New Mexican Spanish from 22 speakers. A dataset of 2,483 /s/- tokens and 344 types was used for analysis. From the second corpus, we examined *f*- words from a 15th century Spanish text, written during a period in which /f/~h/, /ø/ variation and orthography had not stabilized. The historical text contains about 66,000 words. A dataset of 2,884 *f*- and *h*-initial words (derived from Latin *f*-) and 529 types (including 60 types that varied between *f* and *h*, e.g., *fabla/habla*, “speaks”) was used for analysis. An ANOVA was conducted on the /s/- and *f*- datasets and also logistic regression on the /s/- words using Goldvarb (Rand & Sankoff 2001).

We found a significant effect of following vowel context, with greater reduction rates before non-high vowels ($p = .009$). There was also a marginally significant ($p = .065$) effect from the frequency of occurrence in the corpus of a word after a non-high vowel (frequency in a favorable context, FFC, Brown 2006), with greater FFC resulting in greater reduction. There was no interaction of /s/- or *f*- with these two variables and no effect of word frequency. Additional logistic regression analyses on /s/- words showed a significant contribution of preceding phonological context, but no significant contribution to reduction from word or phone predictabilities.

These results indicate that the historical and synchronic reduction environments appear to be highly similar, resulting in similar articulatory effects in both periods. This finding argues against ad hoc lexical explanations for the /f/->[h]>[ø] sound change. The effect of FFC suggests that the pattern of /s/- reduction is not solely articulatory. Rather, the phonological contexts in which /s/- words occur affects their realizations.

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