Less of this, more of that:

Trading relations in production of word-final voicing contrast in American English.

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Trading relations between cues are well established in speech perception: when one cue to a contrast is weakened or ambiguous, it may be compensated for by a stronger perceptual contribution from another cue (Repp, 1982). There is evidence which suggests that secondary cues to a contrast affect perceptual decisions more when primary cues are unavailable or ambiguous (Abramson and Lisker, 1965; Whalen et al., 1990). It seems plausible that speakers may also attempt to capitalize on this property of speech perception when producing speech. Specifically, speakers may compensate for acoustic correlates produced with relatively ambiguous values by producing other correlates with more “prototypical” or even exaggerated values.

Despite the intuitive appeal of this hypothesis, reports of trading relations between acoustic correlates in production have been scarce. Purnell et al. (2005 a,b) observed that younger speakers of Wisconsin English appeared to maintain a trading relations between glottal pulsing and vowel duration in cuing word-final voicing distinction. Purnell et al. (2005) discussed these findings in the context of German substrate effect, suggesting that the observed trading relations may not be present in other varieties of American English.

The present study reports on the trading relations between durational cues to word-final voicing distinction in general Mid-Western dialect of American English. Twenty native speakers were recorded in West Lafayette, Indiana. Word-final fricatives, stops, and affricates were examined with respect to durational cues to the voicing distinction: preceding vowel duration, closure duration, frication duration, and voicing duration. The results show that duration of laryngeal voicing is not as distinctive for word-final fricatives as it is for stops and affricates. However, fricatives maintain a greater distinction between voiced and voiceless categories via the duration of the frication portion and the duration of the preceding vowel than do stops or affricates. Stop consonants, on the other hand, are frequently unreleased word-finally. For stop consonants, the release portion duration (when present) does not differentiate between voiced and voiceless categories. Moreover, unreleased voiced stops are preceded by longer vowels than released voiced stops. Finally, affricates maintain the smallest degree of difference between voiced and voiceless categories in most of the examined durational parameters.

The results demonstrate that both the relative availability and average values of a given acoustic correlate affect the phonetic realization of other correlates: Correlates that are not reliably present or reduced in contractiveness are compensated for by enhanced contractiveness in other correlates. Affricates arguably have the greatest cue redundancy among English obstruents: All durational correlates to voicing are typically present. Thus, individual correlates may not need to be enhanced because several “back-up” correlates are present.

Among the questions for further inquiry raised by these findings is whether trading relations are a common feature of phonological contrasts with multiple phonetic correlates or they require special conditions to emerge, such as sound change due to language contact or other triggers.


