Coherence of phonological environment classes in a dialect transition area
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Because dialect transition areas display increased variability, they have much to reveal about how languages change and the internal structure of a language (Trudgill 1974). This paper reports on how consistent phonological environments are among obstruent classes on a neighboring /æ/ vowel. The Upper Midwest of the United States (WI, MN specifically) encompasses the western edge of the Inland North dialect region (Labov et al. 2006), and, as such, a good portion of the region is transitional. Speakers in this region have been observed to participate in /æ/ raising before voiced velars (/g, ɲ, ɲk/), making the BAG class of vowels resemble the BEG or MAKE classes (Zeller 1997). Moreover, the nucleus of /æ/ will often raise and the trajectory lengthens, pointing downward, before voiced alveolars (/d, n/; Labov et al. 2006). This affects the BAD class, in particular. However, while /æ/ is raised, it is often not fully merged the other word classes (Bauer & Parker 2008). These fluid and asymmetrical environments where the voiceless obstruents may or may not pattern with the voiced obstruents may be due to a general observation that vowels in voiced environments are articulated higher in vowel space than vowels in voiceless ones (Hillenbrand et al. 2001).

This paper treats all environments as unique so as to better understand whether distinctive features of voicing or place account for the observed variation within this transitional area. Evidence of place-voicing mismatches (e.g., /d/ and /p/ behaving alike) comes from a pretest examining the highly variable /æ/ in five different acoustic word classes: BAT, BAD, CAP, CAB, and BACK. Twelve speakers (6 old, 6 young) were examined from three Wisconsin cities distributed from west to east: Eau Claire, Wausau and Oconomowoc, respectively. While age was not significant for vowel height, geography was. Voicing-place differences show that there is variability even among younger speakers (Figure 1). The current study expands the pretest to include more speakers (70), more locations, and a greater time depth (DARE, WELS) in addition to contemporary recordings.

The expanded data of 1,874 tokens shows, first, that geography is a significant factor in the vowel patterns. Second, that CAP vowels are more raised and diphthongal than CAB vowels, thus patterning like BAD vowels, running against the Hillenbrand et al generalization. The present observation, then, is of an asymmetrical system where pre-voiced and pre-voiceless /æ/ vowels behave different by place of articulation. Situating these results within theories of Laryngeal Realism (Iverson & Salmons 1995 et seq.), Phonetic Enhancement (Stevens & Keyser 1989) and the Toronto School of Contrast (Dresher 2003), we argue that the asymmetries are phonetic enhancements preserving voicing contrasts (where fortis obstruents are less variable than lenis ones) and place contrasts (where place specifications vary along the contrast hierarchy). The phonological implications for dialects in transition and the role that a modular phonology-phonetics interface producing the observed results are discussed in greater detail.

Figure 1. CAP (A), CAB (B) and BAD (C) compared to BEET and BOT reference vowels as spoken by younger American English speakers from Eau Claire, Wausau and Oconomowoc, Wisconsin.