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AN UNEXPECTED GEOGRAPHIC REVERSAL IN COARTICULATION EFFECTS ON THE RAISING OF SHORT-A IN NORTH AMERICA

The nature and direction of recent sound changes in any given North American English dialect is heavily determined by the organization of the short-a class (Labov 1991). The recently completed *Atlas of North American English* yields data on short-a patterns in all urbanized areas of North America through the acoustic analysis of the vowel systems of 402 speakers, and has mapped for the first time the distribution of short-a patterns for North America as a whole. The Mid-Atlantic states show a lexical split into tense and lax classes, the Inland North tenses and raises all short-a words as a whole, Eastern New England raises only and all vowels before nasals, Southern dialects show breaking and lowering of the nucleus followed by a palatal glide, and the Midland and West display a continuous range from low front to upper mid allophones.

Within these major types of short-a distributions, expected conditioning effects of the preceding and following segments on the stressed short-a nucleus are found, with correlated lowering of F1 and raising of F2 along the front diagonal. Following front nasals are associated with the most extreme raising, (with vowels before velar nasals relatively lower), and following voiceless stops the least. Complex codas and following syllables produce lower F2, and initial obstruent-liquid clusters are correlated with the lowest F2 and highest F1. The effects of place of articulation on raising of /æ/ usually follow the order (from most to least) of palatal, apical, labial and velar. In general, these allophonic distributions can be understood as the result of co-articulation effects predictable from the relations of loci and transitions to formant trajectories, duration of the nucleus, and physiological linkages among the articulators. It is therefore to be expected that the ordering of effects among the features of manner, place and voicing will be preserved within the ranges determined by different phonological patterns. But in a large geographic area, including all of Canada and much of the North Central states, the relative effect on raising short-a of a following velar and following coronal stop are sharply reversed. In this region, short-a before /g/ in *bag, tag, flag,* etc. is consistently higher and fronter than short-a before /d/ in *bad, mad, sad,* etc. This reversal of co-articulatory effects does not extend to the voiceless series, where short-a before */k/* shows the least raising of all.

The area favoring the raising of short-a before /g/ includes the region where this allophone merges with /ey/ (Zeller 1997), but extends considerably beyond it. It appears that the merger of /æg/ with /eyg/ is a consequence of the general raising of /æ/ before /g/.

The causes of this opposition in the relative effects of velar and coronal voiced stops are at present unknown. This finding does indicate that the diversification of dialects in the course of sound change can have a profound effect upon aspects of phonology that previously had been thought to be under the control of universal articulatory mechamisms.

References:

Labov, William 1991. The three dialects of English. In P. Eckert (ed.), New Ways of Analyzing Sound Change. New York: Academic Press. Pp. 1-44.

Zeller, Christine 1997. The investigation of a sound change in progress: /æ/ to /e/ in Midwestern American English Journal of English Linguistics 25:142-155.