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The Role of Coarticulation in Canadian Raising

Available literature on Canadian Raising is largely focused on the details of its phonology. With the exception of Thomas (1991), there has not been a great deal of speculation on its actuation. However, Joos (*Language* 18 (1942): 141-144) and Chambers (*Canadian Journal of Linguistics* 18.2 (1973): 113-135), as well as others, generally believe it to have arisen from the articulatory distance between the low onset /a/ and the high glides /j/ and /w/, and the difficulty of navigating that distance when temporal constraints are posed by the shortening of vowels before voiceless segments that is common in English. The speculations of Joos and Chambers are very much in line with undershoot theory as used in Moon and Lindblom (*Journal of the Acoustical Society of America* 96.1 (1994): 40-55). The present work intends to examine Canadian Raising as produced by speakers from southeast Michigan in relation to undershoot theory to see if this is a plausible explanation for the actuation of Canadian Raising. For this study, 3 female and 3 male speakers from the greater Detroit area were recorded in informal settings, responding to questions designed to elicit monosyllabic answers containing the diphthong /aj/.

According to undershoot theory, the less time a speaker has to make a sound, the farther the sound actually produced will be from its canonical target. Moon and Lindblom used the word length effect to shorten vowels in predictable ways to observe undershoot, but as noted above the effect on vowel length of the voicing of following segment also produces a predictable control on vowel length. Therefore, one would expect that there would be greater undershoot in words where /aj/ or /aw/ is followed by a voiceless consonant than in words where a voiced consonant or word boundary follows. This is precisely the context in which raising occurs.

Current literature on Canadian Raising treats it purely as a question of vowel quality, and indeed, according to the anecdotal evidence of Joos, that may be the case for the Ontario speakers that he observed. Impressionistically, the Michigan speakers also seem to be producing two distinct variants of /aj/, and the distinction made in the diphthong between the words “writer” (raised) and “rider” (not raised), suggests that raising is phonological. However, the data indicates that for some speakers, vowel duration is still important. When the first formant, measured at its highest point, is plotted against the duration of the vowel, it reveals a direct relationship between the two quantities and a continuum of variants of the onset that are sensitive to duration. The shorter the diphthong, the lower the first formant, and the more raised the onset of the diphthong. This is wholly consistent with the predictions of undershoot theory.

The strong coarticulatory component mixed in with the phonology of Canadian Raising hints at interesting conclusions about the actuation of sound change as described in Weinreich, Labov, and Herzog (In W. Lehmann and Y. Malkiel (eds.), *Directions for Historical Linguistics*. Austin: U. of Texas Press, 1968). The present research demonstrates that the effects of the actuation process can linger long after the change is well established, blurring the distinction that the above authors made between the processes of actuation and transmission.

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