

VC Coarticulation and Historical Vowel Breaking

Vowel breaking is a well-known sound change whereby single vowels diphthongize in specific environments. This process is well attested historically in a variety of Germanic languages and is characteristic of Old English. Lass (1994) explains Old English breaking as the insertion of [u] in front of consonants such as /x/ and /w/. This process results from the inherent 'backness' of these consonants, "which would naturally prompt insertion of a 'transition' vowel of back quality as an assimilatory response to the front-to-back movement". The fact that Old English breaking also takes place in front of /l/ and /r/ suggests that these consonants could be considered 'back', in reference to the likely velarized quality of /l/ and /r/. Lass proposes a subsequent process of diphthong height harmony which turns the inserted [u] vowel into the central, schwa-like vowel that he assumes to be the standard pronunciation of the Old English diphthongs spelled 'ea' and 'eo'. Examples of Old English breaking and diphthong height harmony include *bearn* [bæarn] 'child', *eald* [æald] 'old' and *eorþe* [εarðe] 'earth', compared with the Old High German cognates *barn*, *alt* and *erde*, respectively.

The study presented here elaborates on the 'assimilatory' nature of the process proposed by Lass by investigating equivalent VC sequences in present-day American English. The results suggest that vowel breaking can be explained as the result of the transitional movement of the articulators from the position for a vowel to that of the following back consonant. The acoustic realization of this transitional element shows values that can be identified as corresponding to a central vowel of the 'schwa' type, which would suggest that the two-step process (breaking and harmony) proposed by Lass (1994) can be simplified as one single process of coarticulatory nature.

An experiment was designed that investigated the presence of a schwa-like element in V+/l/ and V+/r/ sequences in American English as a function (i) of the phonetic/phonological nature of the preceding vowel and (ii) of speaking rate. Acoustic measurements (F1, F2, F3 and duration) were obtained for the transitional element from five speakers. The data were analyzed using factorial repeated measures ANOVAs with context and rate as independent variables and with F1, F2, F3 and duration as dependent variables. The results suggest (i) that this vocalic element is highly variable in terms of its formant values and duration depending on context and rate, (ii) that its formant values and duration differ enough from those of canonical schwa for it to be considered as such, and (iii) that its presence should be attributed to a dynamic phonetic process of coarticulation rather than to an abstract phonological process of insertion or epenthesis.

In the light of these results, we conclude that vowel breaking can be best understood as a dynamic process of transitional coarticulation in a VC sequence, rather than as a discrete phonological process of vowel insertion plus diphthong height harmony, as suggested by Lass (1994). This view of breaking is in agreement with the dynamic nature of synchronic speech production and perception and thus should be preferable to an abstract categorical account as an explanation for a historical sound change.

REFERENCES

Lass, R. (1994). *Old English. A Historical Linguistic Companion*. Cambridge: Cambridge University Press.