The role of the lexicon in regular sound change
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The study of change and variation has yet to resolve the question of whether the word or the phoneme is
the basic unit of change. Chen and Wang (1975) reopened the traditional debate on the regularity of
sound change with the contention that change is phonetically abrupt and lexically gradual, rather than
phonetically gradual and lexically abrupt. Since then, many reports of lexical diffusion have been
published. Proponents of exemplar theory support lexical diffusion as a basic mechanism (Bybee 2002).
Although most textbooks on historical linguistics still endorse the Neogrammarian position, few if any
publications have reported empirical evidence for the regularity of sound change.
This paper draws upon the newly created Philadelphia Neighborhood Corpus [PNC] for evidence on the
lexical regularity or irregularity of sound change. The PNC assembles data on over a hundred years of
sound change, based on the forced alignment and automatic measurement (Rosenfelder 2012) of the
vowel systems of 359 speakers from 59 neighborhood studies carried out yearly from 1973 to 2010. The
(eyC) variable (raising of checked /ey/ along the front diagonal) displays linear incrementation across the
century.
To test the diffusionist hypothesis that words are added gradually in the process of change, the PNC data
set of 29,000 tokens of /eyC/ was divided into two halves by Date of Birth (before and after 1940) and
submitted to mixed model regression analysis with the lexicon of 1600 words as a random variable. Five
phonetic features of the onset remained as significant factors at the .0001 level in both halves, along with
Date of Birth. The coefficients were examined for the 47 words that were represented by at least 50
tokens. Figure 1 shows the regular advance of mean values in the first and second period (r² = .83). Figure
2 shows that the random coefficients remain substantially the same (r² = .66). No evidence appears of
words with the /eyC/ allophone not being selected by the raising rule. The (eyC) word with the lowest
coefficient in the first period has an expected value 90 units higher than the mean for /eyF/. This case of
regular sound change in progress shows (1) that the change affects all words containing the given
phoneme in the phonetically defined environment in accordance with Neogrammarian thinking; and (2)
that the differentiation of words beyond their phonetic composition or frequency is a normal associate of
this regular process. The mechanism that produces this result remains to be determined.

Figure 1. Mean front diagonal values for 47 most common words with checked
/eyC/ for speakers in the Philadelphia Neighborhood Corpus born before and after
1940. r² = .83.