The structural basis of lexical diffusion: The case of diatonic stress shift

English diatonic stress shift [1-2] refers to the steady increase of homographic Noun/Verb (N/V) pairs with divergent stress (e.g., **per**mit vs. per**mit**). It has featured prominently in the debate on lexical diffusion [3-5] and has been claimed to affect lower-frequency words first [6]. The current study shows, however, that the change shows no detectable effect of lexical frequency once the phonology of English stress is taken into account.

Background The stress system of English has been stable since Early Modern English [7], precisely when diatonic stress shift began [1-2]. It is widely recognized in all theories of English phonology that English tends to stress nouns and verbs differently [8] and the syllable structure is especially important. According to [9], for instance, a bisyllabic noun $\boldsymbol{\sigma}1\boldsymbol{\sigma}2$ stresses $\boldsymbol{\sigma}1$ if $\boldsymbol{\sigma}1$ has a long vowel or has at least one coda consonant; otherwise $\boldsymbol{\sigma}2$ is stressed if $\boldsymbol{\sigma}2$ has a long vowel. By contrast, a bisyllabic verb $\boldsymbol{\sigma}1\boldsymbol{\sigma}2$ stresses $\boldsymbol{\sigma}2$ only if it has a long vowel or a coda cluster. Thus, it predicts that *ambush* is not eligible for stress shift but *contract* is, a point that fails to be recognized in previous research. Furthermore, no N/V pair is predicted to stress $\boldsymbol{\sigma}1$ in the noun but $\boldsymbol{\sigma}2$ in the verb; indeed, no such pair has ever been observed [10].

Using some 150 prefixed words, Phillips [6] notes that the change tends to affect less frequent words first, but [10] fails to replicate her findings. No previous study has recognized the effect of syllable structures in stress assignment. For instance, the prefix *dis-* in *di**sease*** and *dis**charge*** is syllabified onto different syllables, which directly affect their stress assignment, nullifying their grouping in a homogenous prefix class. Moreover, the examination of frequency and structural factors needn't be confined to 150 words but should use all available data.

Current Study Using CELEX, we identified a total of 668 bisyllabic English N/V words. Because of the individual and dialect variation in word stress, we consulted the Merriam-Webster dictionary and regarded a pair as diatonic stressed if multiple stress patterns are listed—which indicates that the stress shift has occurred at least for some US English speakers. Lexical frequencies are obtained from SUBTLEX-US [11].

A theory such as [9] predicts some N/V pairs to diverge in stress but not others. A Fisher's exact-test shows that this provides a statistically significant classification of shifted and unshifted words (Table 1). A logistic regression takes the binary prediction of stress divergence (yes vs. no according to [9]) and lexical frequency as independent variables to predict the dependent binary variable of whether an N/V pair has indeed shifted stress. Table 2 shows that only the structural prediction, but not lexical frequency, reaches statistical significance.

Lexical diffusion appears to spread in a sporadic fashion [12-13], with the phonological grammar, not frequency, as the dominant force of change.

(492 words)

	N/V with different stress	N/V with same stress
Diffrent N/V stress predicted	62	140
Same N/V stress predicted	23	443

Table 1. Contingency table for 668 bisyllabic N/V pairs. The structural theory [9] has considerable statistical power in identifying pairs that do and do not show diatonic stress. (Fisher's exact test: $p<0.0001$, odds ratio = 8.50)

Predictor	Coef.	S.E.	*p*
(Intercept)	-3.470	0.688	<0.001***
log(frequency)	0.089	0.111	0.422
structure	3.159	0.855	<0.001***
log(frequency) x structure	-0.179	0.141	0.204

Table 2. Coefficients, standard errors, and significance for a logistic regression model using a stress theory of English [9] and lexical frequency on 668 bisyllabic N/V pairs.

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