Studies in the Linguistic Sciences Volume X Number X

REVIEW

JOAN BYBEE: *PHONOLOGY AND LANGUAGE USE*. CAMBRIDGE, CAMBRIDGE UNIVERSITY PRESS, 2001. 238 <u>???</u>

Daniel Silverman Department of Linguistics, and Beckman Institute for Advance Science and Technology University of Illinois dan@uiuc.edu

In this book, author Bybee argues that many aspects of phonological patterning may be understood by investigating the usage patterns of speakers themselves. She especially investigates the effects of token and type frequency on phonological representation and phonological change. For Bybee, linguistic categories and their clumping into larger units emerge as a consequence of patterns' frequency of occurrence and co-occurrence. To illustrate with an example from syntax, speakers' conception of a simple DP emerges from the frequency with which they encounter determiners next to nouns. When elements frequently pattern together, they are likely to emerge as an independent functional unit of language. This emergent approach to categorization and structure places Bybee's ideas in the company of connectionist and exemplar-theoretic models of learning, and indeed, she argues that the organizing principles of phonological knowledge are indistinct from those operating in other domains of learning.

According to Bybee, if sound changes are the result of phonetic processes that apply as a consequence of actual use, then those words that are used more frequently are more likely to undergo phonetic processes such as assimilation, lenition, and elision. She provides many case studies—most from English and Spanish, as well as a detailed discussion of French liaison—illustrating how sound changes may begin with words and phrases of the highest frequency, and then may gradually diffuse through the lexicon. For example, frequent words like "camera" and "every" have lost their medial schwas, whereas less common words with parallel structure retain these schwas: "mammary," "homily." While frequent words are more likely to lead the way in certain phonetic reductions and assimilations, they are also more likely to resist morphological leveling processes. For example, high frequency irregular past tense verbs like "kept" have resisted the regularization that may be affecting less frequent past tense forms such as "wept" \rightarrow "weeped."

These patterns of change are consistent with Bybee's conception of the lexicon. Not an unordered list consisting of idiosyncratic information, the lexicon for Bybee is fully specified with phonetic detail, and is highly structured, with interconnections among phonetically and semantically parallel structures. The more similar that lexical entries are in terms of their structural properties, then (1) the more likely that the morphological structures of these words will emerge, and (2) the more likely that the words will be subject to the same phonological processes. For example, repeated exposure to words like "played," "spilled," "spoiled," "banned," etc. presents listeners with both phonological and morphological information about the past tense marker [d]. Through repeated exposure, the phonetic and semantic properties of the past tense marker emerge, in the form of strengthened associative links across words.

Given that repeated patterns are of many shapes and sizes, the phonological units that emerge may consist of articulatory routines of varying length and complexity. Again, some of the clearest evidence for such proposals comes from patterns of sound change. In Japanese, for example, the single tongue blade gesture in the sequence $[\int i]$ is argued to historically derive from an [s-i] sequence of gestures, which, due to the frequency of their co-occurrence, gradually merged in terms of tongue position, culminating in the single articulatory gesture in evidence today: the common recurrence of the [si] sequence led to its re-conceptualization—and re-actualization—as a unitary articulatory event. This analysis likens assimilations to other well-rehearsed motor routines for which repetition leads to compression. In this case, two gestures have become one, but in other cases, the routinized articulatory units may be more complex.

In addition to "nature's laboratory" of linguistic diachrony, Bybee often appeals to contrived experimental contexts in search of evidence for a usage-based phonology. For example, speaker knowledge of phonotactic regularities is claimed to be an emergent consequence of frequency of type occurrence, rather than based on abstract categorical criteria for licitness. She cites studies that indeed show that listeners' acceptability of sound sequences that are embedded in nonce forms correlates highly with these sequences' type frequency in real words, and with their overall similarity to real words. Hardly an all-or-nothing determination, acceptability judgments of nonce word well-formedness are gradient, showing that more familiar strings are more acceptable to listeners, and less familiar strings are less acceptable.

At several points in her presentation, Bybee considers structuralist/generative alternatives to her functional/usage-based theory. For example, she considers the approaches of Kirchner (1998) and Hayes (1999), who both propose that a formal grammar might actually incorporate phonetically natural tendencies in the form of optimality-theoretic constraints. Bybee sees these researchers' approach as an improvement over the non-phonetically informed formalism of Prince and Smolensky (1993) and Chomsky and Halle (1968), but she correctly points out that much of what is phonetically natural in language is a consequence of diachronic change; there is little empirical motivation to conclude that learners take note of phonetic naturalness while formulating their synchronic grammar. For example, according to Bybee, syllables tend to be open not because of a *CODA constraint, and not because children have access to the phonetic reasons behinds their rarity. Instead, according to Bybee, open syllables are the diachronic result of gestural reduction in this context that gradually affects final consonants, and in some cases eliminates them. While I disagree that coda attrition has its origins in gestural reduction—it more likely originates from the perceptual consequences

of releasing a consonant into another consonant, as opposed to releasing it into a vowel her appeals to diachrony are empirically well-motivated. Indeed, she may have been better off simply ignoring approaches that have no bearing on the issues that she is investigating. Practitioners of the generative theory focus their attention on formalizing a synchronic grammatical statement, and have rarely expressed an interest in how actual language use might influence changes in structure and representation over time.

This discussion of open syllables is characteristic of another shortcoming of the book. While Bybee correctly suggests that much in phonology can be explained by appeals to phonetic naturalness such as articulatory reductions, she is not very forthcoming regarding the specific phonetic mechanisms involved. For example, in a discussion of the common Spanish s \rightarrow h change in preconsonantal position, she correctly suggests that "part of the reduction perceived by hearers results from the masking of the alveolar features of /s/ by the following consonant" (p.140ff.). All well and good, but she elaborates no further. One of the most compelling aspects of John Ohala's work on explanations for phonological patterning is the rigor with which he pursues his phonetically-based hypotheses. Indeed, Ohala is a kindred spirit of Bybee's, and many arguments here would be stronger if she had considered Ohala's research in more detail, in particular, his hypothesis that listeners, not speakers, are the source of many sound changes.

The lack of rigor in her discussions of phonetic detail is also evident in some of the rather imprecise terminology that Bybee employs. She argues, for example, that items with high token frequency have greater *lexical strength*, and so resist *analogical change*. Such items also have *weaker connections* to related forms, and are less likely to serve as the basis for productive processes. There is much terminology here (italicized by me), but none of it is carefully defined. Such notions appeal to me on an intuitive level, but unless rigorous definitions are provided, their use might serve to alienate readers who rightfully expect new terminology to be properly defined. The same can be said with regard to the term "similarity." However intuitively appealing a similarity-based approach to categorization might be, Bybee offers no suggestions regarding how similarity might be determined. I suspect she would look askance at overly simplistic approaches such as distinctive feature theory, but she offers no alternative of her own. I would have been satisfied had Bybee simply addressed the problems with the notion of similarity, without necessarily offering a real solution.

These flaws force me to wonder for whom exactly this book is intended. It is far too technical for lay readers, yet lacks the detail that linguists expect from specialist volumes. But even with these criticisms in mind, *Phonology and language use* is a very valuable volume, and an enjoyable read as well. By emancipating phonology from the self-imposed intellectual ghettoization it has endured since 1968, Bybee is doing the field a great service.

REFERENCES

CHOMSKY, Noam, and Morris HALLE. 1968. *The sound pattern of English*. New York: Harper and Row.

HAYES, Bruce. 1999. Phonetically-driven phonology: the role of optimality theory and grounding. *Functionalsim and formalism in linguistics, volume I: general papers*. Edited by Michale Darnell et al., 243-86. Amsteredam: Benjamins.

KIRCHNER, Robert. 1998. An effort-based approach to consonant lenition. UCLA, Ph.D. dissertation in Linguistics.

PRINCE, Alan, and Paul SMOLENSKY. 1993. Optimality theory: constraint interaction in generative grammar. Rutgers University MS.