"Morphology as Lexical Organization" from Hermann Paul to Today

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Intro: Paul's and Bybee's models of "morphology as lexical organization"

There are numerous striking parallels between Paul's theory of Analogy and Bybee's Network Model of morphology (cf. Auer 2015:192).

But "Bybee explicitly rejects Paul's notion of analogy" (Auer 2015, fn. 13), and they come to some radically different conclusions about the essence of productive morphology.

How can two scholars with so much overlap in their basic premises arrive at such different conclusions?

Part I:
Similarities between Paul's and Bybee's models

Paul on lexical organization

"...individual words attract each other in the mind, giving rise to numerous larger and smaller groups. This mutual attraction is always based on a partial correspondence in sound or meaning or in both sound and meaning. The individual groups do not all exist separately side-by-side. Rather, there are larger groups which contain a number of smaller ones, and the groups intersect as well. We distinguish here two main types, which we will refer to as material and formal groups." (§75)

Bybee on lexical organization

FIG. 1. Sets of lexical connections yielding word-internal morphological structure.
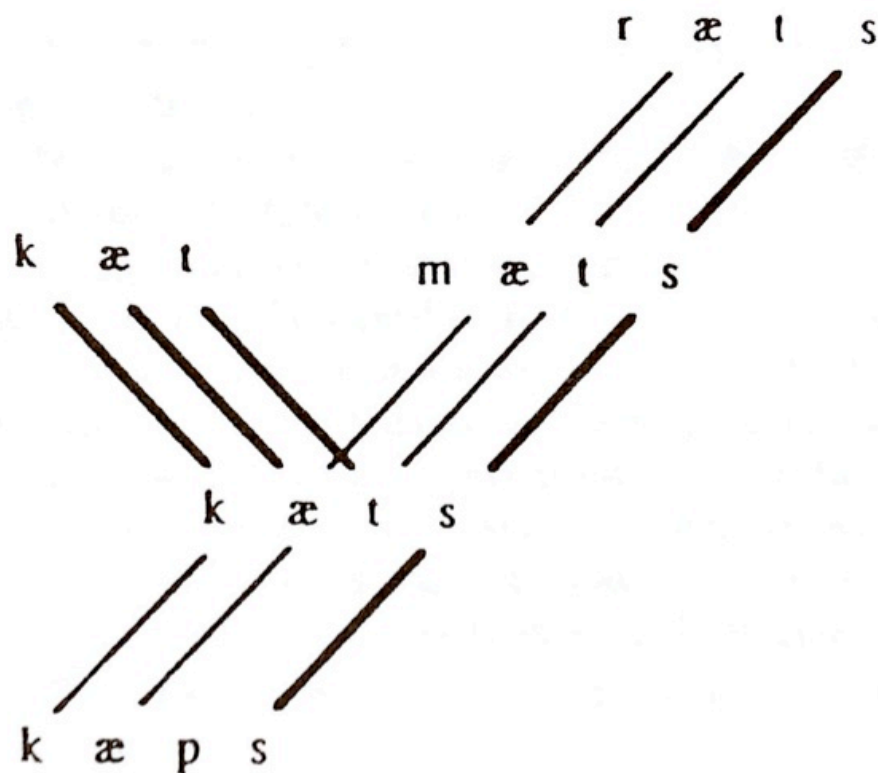
"Words entered in the lexicon are related to other words via sets of lexical connections between identical and similar phonological and semantic features." (1995:428)

Paul	Bybee
"group(ing)s" ≈	"connections"
material groups ≈	Northwest-Southeast connections
formal groups ≈	Northeast-Southwest connections

Paul's and Bybee's models are both...

...**whole-word-based (as opposed to morpheme- or lexeme-based)**, i.e. the phonological representations stored in the mental lexicon are of (exemplars of) fully inflected surface wordforms.

...**usage based**: "These groups of representations are a product of everything that has ever entered consciousness through listening to others, through one's own speech, and through thinking in linguistic forms." (§12)

Paul and Bybee also agree ...

...that the organized network of surface wordforms can give rise to emergent word-internal morphological structure and rule-like productive behavior.

"[...] connections among items have the effect of yielding an internal morphological analysis of complex words, [...]. Even though words entered in the lexicon are not broken up into their constituent morphemes, their morphological structure emerges from the connections they make with other words in the lexicon." (1995:429)

Part II: Differences

A key question…

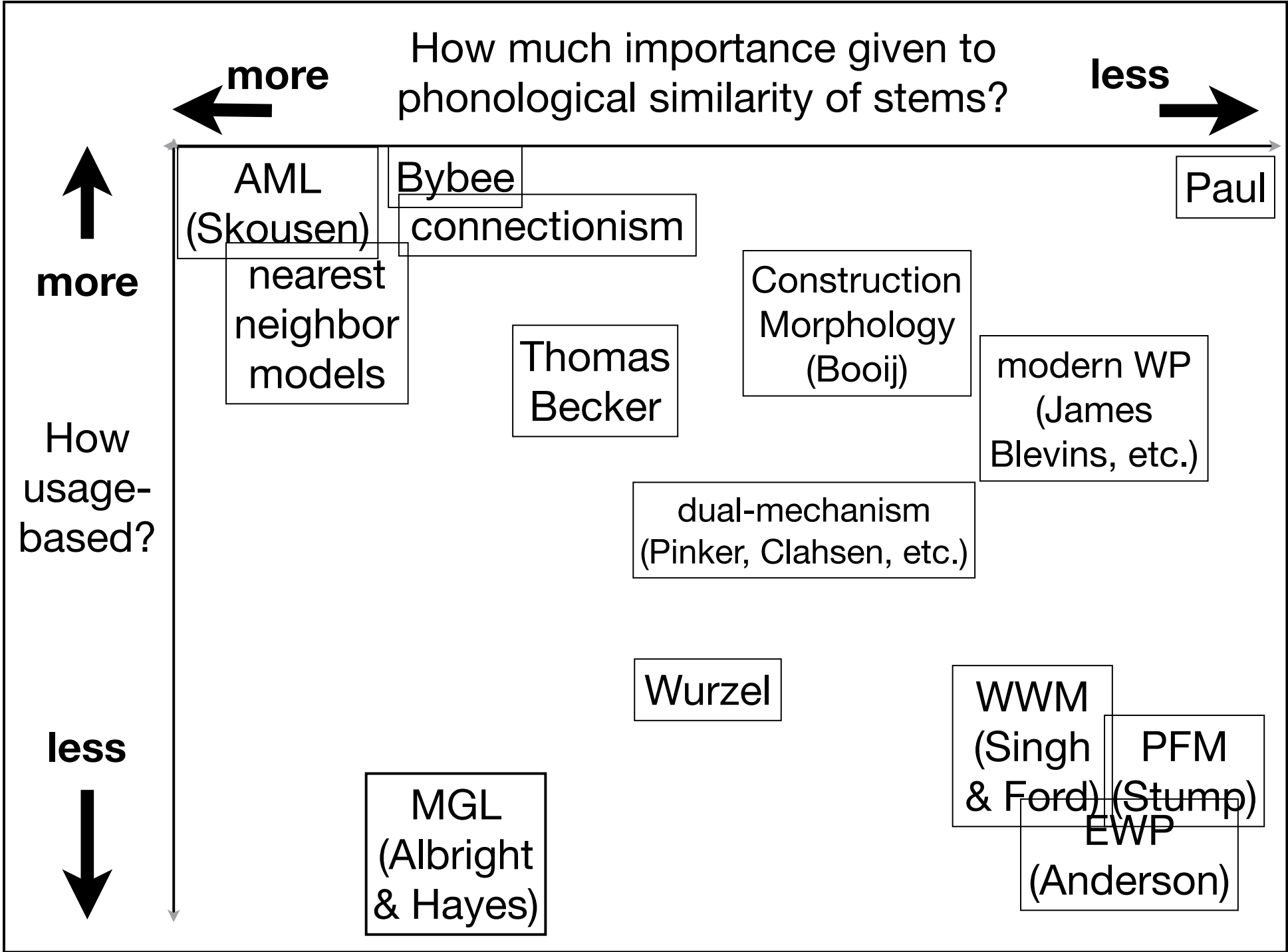…about the nature of morphology that is orthogonal to all the points of agreement between Paul and Bybee:

Is it the exception or the norm in morphology for the inflectional properties of a lexical item to be independent of the phonological make-up of the stem?

Or in Bybee's terms: Are **open schemas** the exception or the norm in inflectional morphology?

On this question...

...Paul and Bybee could hardly be further apart.

How much importance given to phonological similarity of stems?

more ←

less →

more ↑

less ↓

How usage-based?

AML (Skousen)

Bybee connectionism

Paul

nearest neighbor models

Construction Morphology (Booij)

Thomas Becker

modern WP (James Blevins, etc.)

dual-mechanism (Pinker, Clahsen, etc.)

Wurzel

WWM (Singh & Ford)

PFM (Stump)

EWP (Anderson)

MGL (Albright & Hayes)

For Paul…

…all potentially productive morphological paradigms (= solvable proportional equations) are **defined <u>exclusively</u> by their pattern of "formal elements"** (≈inflections); the phonological make-up of the "material elements" (≈stems) is factored out.

"once [foreign language learners] have constructed a fairly large number of forms [...], the construction can proceed even without the word that has served as a paradigm entering consciousness. Previously constructed forms of other words now play their part, and the result is that **only the formal element that is common to all the forms enters consciousness while the various material elements mutually inhibit each other**. At this point, the relationship of the speaker to the inflectional forms [...] is roughly the same as that achieved in the natural acquisition of one's native language." (§80)

Paul on the emergence of <u>syntactic</u> rules

"In natural first-language acquisition, the rule as such is not given, but rather merely a number of model sentences. Over time, we hear a number of sentences that are constructed in the same way and that therefore band together into a group. **While the memory of the specific content of the individual sentences may fade more and more, the common element is reinforced again and again through repetition, and thus the rule is abstracted unconsciously from the model sentences.**" (§79)

Compare:

"the basis of analogy is relational similarity [...]. Providing the two structures share [...] relational similarity, *object commonality* – similarity between a particular element of one structure and the corresponding element of the other structure – is not required for an analogy to be made. [...] consider the hypothetical utterances *I kiss Mummy* and *Daddy threw the ball*. Although the two utterances have no morphemes in common, they share relational similarity [...] this relational similarity allows the child to form an analogy between the two utterances and move towards a wholly abstract *SVO* construction schema." (Ambridge et al. 2006:175)

Two opposing (usage-based) notions of "analogy"

"The process of analogy is very like the process of schematization [...]; it is just that analogies are more abstract. [...] When an analogy is made, the objects involved are effaced; the only identity they retain is their role in the relational structure." (Tomasello 2003:164)

VS.

"To evaluate the [...] hypothesis that all morphology is analogical, we implemented a purely analogical model, which evaluates novel [English past-tense forms] based solely on their similarity to existing verbs." (Albright & Hayes 2003:119)

A widespread criticism of Paul's model

"proportional groupings [...] can be supported by phonological similarity. [...footnote:] Some inconsistencies in Paul's examples for this case have been pointed out by Hermann (1931:73–80)" (Auer 2015:194)

Paul is clearly <u>wrong</u> on this point, but he is <u>not</u> inconsistent.

Hermann's critique

"As an example of material-formal proportional groups, [Paul] cites on p. 107 *Tag : Tages : Tage = Arm : Armes : Arme = Fisch : Fisches : Fische*. In §77, he explains that groups band together more tightly the greater their correspondence in meaning and sound make-up. If that is so, then the words have been chosen without the necessary diligence. As counterparts to *Arm*, he should, for example, have taken not *Tag* and *Fisch* but rather any other examples that belong more closely together." (1931:75, my trans.)

Paul in §77:

"[...] grouping is carried out more easily and becomes more firmly established where the correspondence in meaning and sound is greater [...]"

But for Paul, only sound-meaning **correlations** are relevant to **morphological** grouping. Sound correspondences that do not correlate with meaning are potentially relevant to phonological alternations but are **"inhibited"** in morphological production.

Moreover...

"As soon as a form can, based on its shape, belong to more than one class [i.e. as soon as "the corresponding forms from different classes [...] have an **analogous** shape"], it is also possible to use that form as a basis for constructing the other related forms according to different proportions. Which of the various applicable proportions wins out **depends only on the dominance relationships among them**." (§81)

A Bybeean network with Paulian inhibition

"only the formal element that is common to all the forms enters consciousness while the various material elements mutually inhibit each other" (§80)
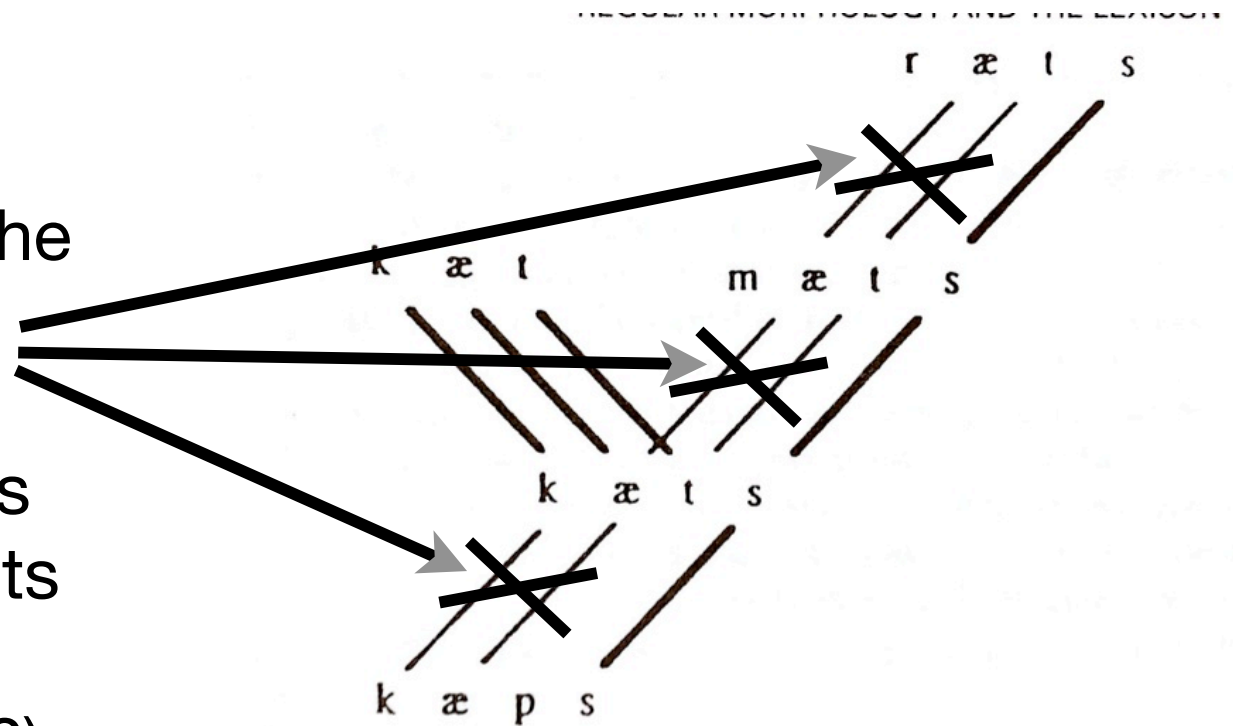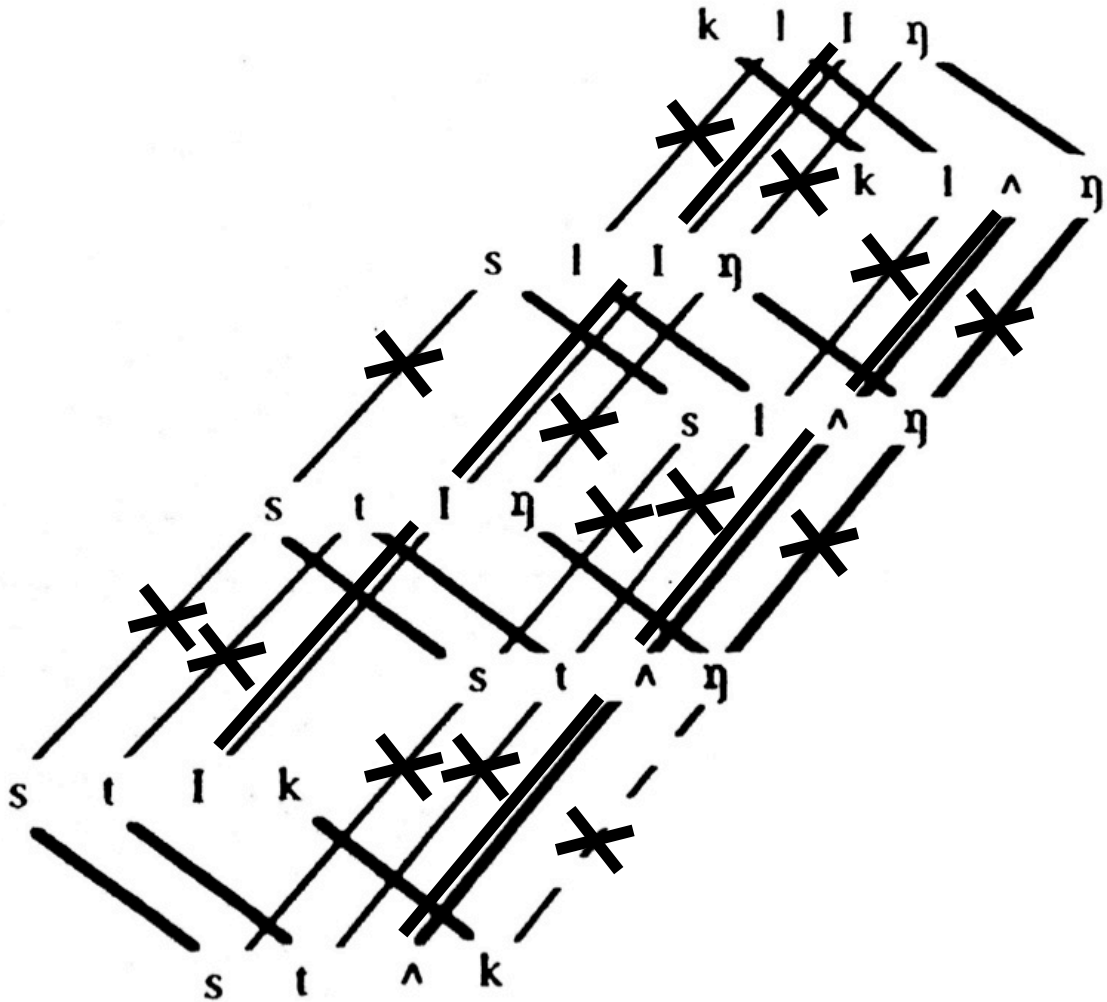

FIG. 1. Sets of lexical connections yielding word-internal morphological structure.

Bybeean vs. Paulian networks for the English *string–strung* class

Formal groups are based exclusively on correspondences in the formal element: present /ɪ/; past /ʌ/.

For purposes of morphological productivity, material elements are **inhibited** on the formal axis.

Schemas for the English *string–strung* class

Bybee: $\left[C \ (C) \ (C) \ \wedge \ \left\{ \begin{array}{l} \text{velar} \\ \text{nasal} \end{array} \right\} \right]_{\text{past}}$

"the initial consonants, the vowel, and the final consonants determine the likelihood of membership in this verb class. **The quality of the vowel is the weakest determinant**, [...]" (Bybee and Moder 1983:263).

Paul: $[X\textsc{i}Y]_{\text{present}} \ \text{<->} \ [X\Lambda Y]_{\text{past}}$

For Paul, the ɪ–ʌ root-vowel pattern – the "formal element" – would be the **<u>only</u>** defining characteristic of this inflectional class.

Product-oriented modifications vs. proportional analogy (1)

"In a 'product-oriented' modification, the process Y by which the new word is formed is not well-defined, nor is the shape of the source word [...]. However, the product, Z, is well-defined. In our present example, the past form for a verb of the *string/strung* type must end in /ʌ/ followed by a nasal or a velar; but the vowel of the base does not necessarily have to be /ɪ/. In this case, the relevant relations are among the past forms of the different verbs (*strung, slung, swung, wrung, hung* etc.) rather than those between base and derived forms." (Bybee and Moder 1983:255)

Product-oriented modifications vs. proportional analogy (2)

"the postulation of product-oriented modifications allows for morphological innovations that would be impossible if proportional analogy were the only means of creating new forms, becuase innovations such as *strike/struck* and *sneak/snuck* have no pre-existing model with appropriate vowels in the base form" (Bybee and Moder 1983:255)

Product-oriented modifications vs. proportional analogy (3)

"The minor importance of the vowel [in determining the likelihood of membership in the *string/strung* verb class] argues against a description of past-tense formation for these verbs as a process by which a particular vowel /ɪ/ is changed into another vowel, as proposed by Chomsky & Halle (1968) [...] It also argues against the view that new verbs entering the class do so on the basis of strict proportional analogy" (Bybee and Moder 1983:263).

Prototypes and gradient similarity

"each category has a PROTOTYPE or best exemplar, [...] there can be both PROTOTYPICAL members of categories, with a number of relevant attributes and more marginal members with perhaps only one attribute that puts them in the category. [...] morphological classes may have the structure of natural categories in this sense.

   Indeed, the verbs of the *string/strung* class seem to form a class with the structure of a natural category." (Bybee and Moder 1983:257)

Closing quotes: Paul's place in the current Word-and-Paradigm revival

"morphology and syntax [...] are continually shaped by the dynamic temporal relations that effect language change both within each system and between them. This description, of course, recalls the insights of Hermann Paul concerning "historical" approaches to language analysis" (Blevins et al., in press).

"The pattern-based nature of morphology on WP assumptions encourages the exploration of analogy as an explanatory resource for systemic organization. Analogically guided inferences can be seen as shaping morphological change" (ibid).

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