The Diachronic Test: Fixed-Rankings Versus Stringency Relationships
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The following statement from [3] exemplifies an implicational universal (IU):

“If a language allows a syllabic segment with sonority value x, than all segments with sonority values greater than x… are also potential syllabic nuclei.”

IUs in Optimality Theory (OT) can be treated in one of two ways [5]. The first is with fixed-constraint relationships and the second is with stringency relationships. The most important difference between the two approaches is that the markedness constraints used with fixed-constraints are, by definition, non-permutable. Conversely, the stringency approach requires markedness constraints to be defined such that the violation marks assigned by the most stringent constraint harmonically bind the violation marks incurred by constraints of lesser stringency. These harmonically bound constraints are freely permutable.

The paper finds that the two approaches to IUs do not fare equally well with diachronic data. To illustrate this point the paper considers the development of an epenthetic /u/ in the Germanic (Gmc.) reflexes of Proto-Indo-European (PIE) syllabic sonorants. Examples are given in (1).

In OT, language change is generally assumed to involve the re-ranking of a constraint to another position in the constraint hierarchy [4]. Maintaining this assumption, I argue that sound changes should be diachronically coherent. That is, there should only be a single way for one stage of a language to develop into another one. In my analysis, a diachronically coherent account can only be maintained for a model of OT with fixed-constraint relationships. As exemplified in (2), simple constraint re-ranking can account for the data in (1).

I argue that the stringency analysis is diachronically incoherent because so many constraints cannot be crucially ranked. For PIE, the following two rankings in (3) both predict the same outcome. There are twelve more rankings that predict the correct Gmc. output. Thus, twenty-four possible historical paths can be shown which explain the same development from PIE to Gmc. With so many paths to choose from, why should language change have the principled heterogeneity that it does? The implication would be that 24 people could undergo an identical sound change on the surface, each having a unique language-internal structural development.

For further evaluation, I assay the two approaches to IUs quantitatively by adopting a technique fashioned after [1]. I differ from this paper in that I define variation broadly as typological variation (and not something language specific). Results from this technique are compared with those reported by [2]. The fixed-ranking method makes the seemingly correct prediction that unmarked structures are more probable than marked structures synchronically and that switches from one typology to another are equally probable. The same results are not obtained with the stringency approach. On the contrary, this approach makes predictions that are unequivocally false. For example, it predicts that languages with syllabic obstruents should be more probable than languages with syllabic sonorants. I conclude that, despite the apparently equal descriptive power of the two approaches to IUs for synchronic analyses, these approaches are not diachronically tantamount. Only fixed-constraint rankings predict language changes which are diachronically coherent and typologically plausible.
Figures:

(1) IE *nns - > Gmc. *uns ‘us’
    IE *wulx- > Gmc. *wulx- ‘wolf’

(2) t₁: PIE *σ[OBS] >> DEP >> *σ[NAS] >> *σ[LIQ]

(3) t₁: PIE either: (a) *σ[OBS] >> DEP >> *σ[OBS, NAS, LIQ] >> *σ[OBS, NAS] or: (b) *σ[OBS] >> DEP >> *σ[OBS, NAS] >> *σ[OBS, NAS, LIQ]

References: