

## Diachronic Change, the Learner, and the Lexicon

Much of phonological theory seeks to account for the striking similarities we observe in the patterning of sound structures across the world's languages. One view locates universals in the way languages are transmitted: misheard and misarticulated over time, doing away with synchronic grammar altogether (an extreme version of Evolutionary Phonology). An opposing theory situates this commonality in a set of innate unlearned rules or constraints. Here I explore one such view for the interaction of synchrony and diachrony, namely, the contention that universal bans on particular synchronic outcomes are required to constrain blind diachronic processes, and that without this check, unattested systems would be predicted to arise quite frequently (Kiparsky, 2006).

The case study for this exploration is the sonority-to-stress system of Gujarati. Examining this system both before a hypothetical sound change and after will provide us with the means to assess Kiparsky's hypothesis that common sound changes would commonly produce systems that violate markedness: in this case a stress system that preferentially assigns stress to low (rather than high) sonority items (a reversed sonority-to-stress scale (RSS)).

I will assume for the moment (although both are potentially arguable) that 1) a sound change is possible (and likely) of the type  $a > \text{ə}$ , where all vowels regardless of context (phonetic or lexical) change quality, and 2) learners entertain complex hypotheses over their input data of the sort: 'stress is assigned to the penultimate syllable modulo considerations of the sonority hierarchy'.

The claim about the outcome of diachronic processes turns out to be a claim about learning. In order to assess such a claim we must carefully examine the data the learner is exposed to, as well as explicitly specify the type of learner. Working within a Bayesian framework, I show that 1) without the ability to assimilate a subset of data that directly contradicts a given hypothesis, the standard learner is unable to pick the RSS outcome, and 2) even modifying the learner to deal with conflicting input, the RSS outcome remains unlikely, dependent on data drawn from a particular set of non-uniform lexica.

What this work shows is that the claim that unattested (or extremely rare) systems must be actively prevented rests on a number of assumptions that must be more closely examined. To truly test such a claim it is necessary to consider the learner, the learning process, and the data available to the learner. By undertaking explicit computational studies such as this we can get a better understanding of what an Evolutionary Phonology account really predicts typologically. At that point we will be in a better position to explore the larger question of the interaction between synchrony and diachrony.