# Diachronic Phonology with Contrastive Hierarchy Theory

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In 1931, Roman Jakobson proposed that diachronic phonology must look not only at individual sound changes, but at changes in the contrastive structure of the phonological system (Jakobson 1972 [1931]): 'Once a phonological change has taken place, the following questions must be asked: What exactly has been modified within the phonological system? … has the structure of individual oppositions [contrasts/ BED] been transformed? Or in other words, has the place of a specific opposition been changed…?' Attempts to carry out this program have been hampered by the lack of a precise way to characterize 'the structure of individual oppositions' within a phonological system. I will show that Contrastive Hierarchy Theory gives us the concrete implementation of contrastive structure that Jakobson's diachronic program requires, and I will present a number of case studies that show the potential of this theory to advance illuminating and empirically testable accounts of phonological change.

In Contrastive Hierarchy Theory (CHT), aka Modified Contrastive Specification (Dresher, Piggott, & Rice 1994, Dresher 2009, Hall 2011, Mackenzie 2013, Dresher, Harvey, & Oxford 2018, etc.), contrastive features are assigned hierarchically by branching trees on a language-specific basis. CHT adopts the Contrastivist Hypothesis (Hall 2007), which posits that only contrastive features are computed by the phonology; non-contrastive features are added in a post-phonological component by enhancement and other phonetic principles. Due to the variability of feature hierarchies, a given phonological inventory may in theory be represented by several different hierarchies; however, CHT is constrained by the need to account for all phonological activity using only contrastive features. It is an empirical question whether this can always be done: a language could potentially exhibit more phonological activity than can be supported by any set of contrastive features (the 'Oops, I Need That Problem'; Nevins 2015).

One of the cases I will discuss (see further Dresher 2018) is the evolution of the West Germanic vowel system, which provides an interesting illustration of a CHT approach; the main ingredients have already been supplied by structuralist phonologists working with similar ideas. Following Twaddell (1948), Benediktsson 1967, Antonsen (1972), and more recently Lass (1994), Ringe (2006), and Purnell & Raimy (2015), we can represent the short/lax vowels of early West Germanic as in (1). The feature [low] makes the first division; */a/ is the only [+low] vowel. Evidence for this is that */a/ caused the lowering of */i, u/ to *[e, o], showing it had a height feature; there is no evidence it had any other features. The evidence for [front] is that */i/ fronted /u, o/ to *[y, ø] by *i*-umlaut. Crucially, */u, o/ retained their roundness when fronted; as there is no [rounded] feature in (1), *i*-umlaut at this stage must have been a late phonetic rule, as proposed by Kiparsky (1932) and Twaddell (1938). At that point, the [–low, –front] features of */u, o/ were enhanced by {[+rounded]}, where { } indicates a non-contrastive feature.

In at least some dialects of later West Germanic, [rounded] became a contrastive feature, as evidenced, for example, by the phonemicization of */y, ø/ in early Old English. Still assuming five short/lax vowels, it is possible to promote [rounded] to the contrastive phonology, as in (2). However, another feature must be demoted to make room for it: in this case, [low] is no longer contrastive. Unlike the earlier stage in (1), I am aware of no evidence that later */ɑ/ requires a [+low] feature. This connection between contrast and activity is no coincidence, but is a prediction of CHT.

(1) West Germanic short/lax vowels I
    [low] >> [front] >> [high]
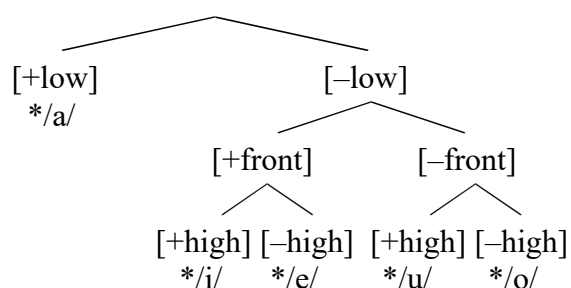
(2) West Germanic short/lax vowels II
    [front] >> [rounded] >> [high]
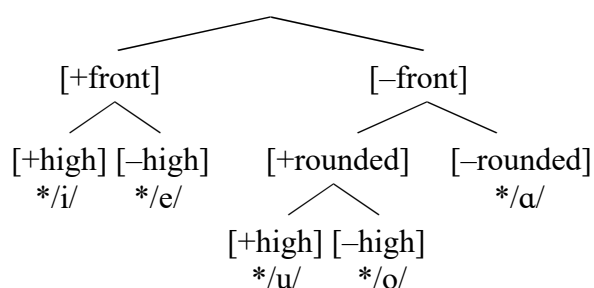
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