

Tone, autosegmental phonology, and the partial ordering of phonological elements

This paper, in keeping with Hale and Reiss's notion of "substance-free phonology" (e.g. Hale & Reiss 2000), argues that much autosegmentally-inspired discussion of precedence is based on the fundamental error of considering temporal properties of actual phonetic events rather than a more abstract notion of order. The argument is based primarily on the phonological status of tone.

Tone has been treated in two quite distinct ways in phonological theories – as a feature and as a phoneme. The feature treatment is most clearly represented by Jakobson, Fant & Halle (1952; JFH). The phoneme treatment is most clearly represented by the traditional Chinese analysis of syllables as consisting of an "initial" (=onset), a "final" (=rime), and a tone (e.g. Chao 1968). The JFH view is based on an idealization of the stream of speech – later made formally explicit in SPE (Chomsky & Halle 1968) – as a *totally ordered* string of phonemes, each of which is a bundle of unordered features. This idealization is what requires us to treat tones as analogous to features. The only temporal relation that can be (but must be) defined in phonology is linear precedence between whole bundles of features. Duration or real time is irrelevant: in effect, phonemes are idealized as points. By comparison, the Chinese traditional view of tone implies a different idealization, formally speaking a *partial ordering*. A precedence relation is defined between initial and final, but *not between final and tone*. Like JFH, though, the Chinese idealization involves no necessary reference to duration or real time; the relation between tone and final is not simultaneity (which implies real time), but absence of precedence (which need not).

There are many well-known tonal phenomena (two tones to one syllable, one tone to two syllables, etc.) that are incompatible with the JFH/SPE idealisation; these gave rise to autosegmental phonology. The original "autosegment" notion attempts to escape from the idealization of a totally ordered abstract phonology: it gropes towards defining tones as phonological elements that are comparable to consonants and vowels but do not participate in the same precedence relations. Yet by focusing on temporal overlap and non-synchronization rather than on abstract precedence or its absence, autosegmental phonology soon came to deal with *phonetic* properties of tonal contours that are like the phonetic manifestations of features, and encountered the set of issues that have occupied it ever since. Any distinction between "autosegment" and "feature" has been lost.

If we hang on to the idea that autosegments are phonological elements with atypical precedence relations, then multiple association of tones to syllables and syllables to tones can be treated as involving partial ordering (or undefined precedence). Interestingly, this allows us to revert to something like the SPE conception of the relation between phonology and phonetics: phonology is formal, abstract and symbolic (i.e. "substance-free"); concrete physical events, including temporal overlap and non-synchronization, are the business of phonetics. This division of labor renders "feature geometry", which has thrown up many of the paradoxes of precedence that have been discussed for 25 years, largely unnecessary: feature geometry arises from the attempt to treat in the phonology matters that are properly in the domain of phonetics. Instead, physical events can be treated in terms of a physical model involving continuous mathematics – for example, something like Browman and Goldstein's Articulatory Phonology – as Chomsky and Halle originally proposed. We do not, of course, have to maintain the SPE assumption that the physical model is universal, but can adopt the more recent idea that phonetics can be language-specific.

In short, by treating tones as autosegments, defining autosegments as phonological elements with undefined precedence relative to the segmental string, and treating temporal overlap and non-synchronization in the phonetics, we can combine the original insights of autosegmental phonology with the empirical precision of Articulatory Phonology and the formal rigor of SPE.

References

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