

Tonal alignment, syllable structure and coarticulation: Toward an integrated model

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The finding of consistent tone-segment alignment in many languages in recent research raises questions about the temporal organization of speech sounds in general. In this paper we explore the possibility that tonal alignment patterns can lead to the discovery of general principles of temporal organization in speech. Based on a recent finding about the segmentability of approximants in English and Mandarin, we propose a general model of temporal organization, in which the syllable is the basic time structure that specifies the alignment of consonants, vowels, tones and phonation registers. All these sounds are unified under the term *phone* defined as a collection of *unidirectional* articulatory movements toward a simple or composite target. The phones are temporally organized by the syllable under three principles: co-onset of initial C and V, sequential offset of coda C, and full synchronization of tone and phonation register with the syllable. Under the time structure model, true coarticulation, in the strict sense of co-occurrence of separate phones, occurs only between initial C and V; and there is no anticipatory C to V coarticulation, no crossconsonantal Vto-V coarticulation, and no carryover coarticulation of any kind.

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