Sonority from an articulatory perspective

The sonority hierarchy is a central concept in phonology, one that is, arguably, not theory-dependent. It captures a robust typological generalization about preferred syllable structures cross-linguistically. This generalization is present, in slightly different formulations, in every phonological model. Equally robust, however, are the exceptions to this generalization, which are often hard to interpret and consequently hard to account for. Famous "troublemakers" in this category are, for example, Tashlhiyt Berber (see Dell and Elmedlaoui 2002) or Salish (Bagemihl 1991; Shahin and Blake 2004). Consonant sequences in these languages defy syllabification algorithms and principles of syllable organization based on sonority. Such data have challenged and catalyzed research, and depending on their accessibility, they have inspired new directions of study, improving our understanding of the syllable as a unit of information, processing, and production.

The goal of this talk is to consider what sonority-based syllabic organization may mean when examined from an articulatory perspective. I propose that we have good reason to believe, based on results of experimental studies of consonant sequences in a variety of languages, that the sonority hierarchy and syllable organization more generally can be best understood in their relation to articulatory timing. I will argue that the organizational role that has been attributed to the sonority hierarchy follows from language-specific properties of articulatory timing. This idea is not new. It is explicitly stated by Mattingly (1981, 1998) in the concept of "parallel transmission" of information. Parallel transmission captures the essential properties of the speech signal that are crucial for maximum intelligibility and maximum speed in communication. We have now gained sufficient empirical knowledge to evaluate whether timing patterns of articulatory gestures can be related to syllabic organization via the concept of parallel transmission. The sonority hierarchy, as we know it, is shown to have limited predictive power. It certainly captures one way of maximizing parallel transmission. But other options are available and attested in the world's languages, and are predicted by aspects of articulatory timing.

The argument presented here relies on the comparison of three case studies of syllabification: Georgian, Slovak, Tashlhyit. All three languages allow sequences of consonants, but their organization into syllables differs in terms of their behavior as syllable nuclei vs. syllable margins (ex. 1). Georgian allows only vowels as nuclei, Slovak allows vowels and liquids, and in Tashlhyit vowels and all consonants can be syllabic. The three languages consequently differ in their tolerance of complex onsets. I compare their syllabification patterns in terms of the traditional sonority hierarchy, then I discuss the same patterns in terms of properties of their articulatory timing, as known from work by Chitoran et al., 2002; Chitoran & Goldstein 2006; Goldstein et al., 2007; Pouplier and Beňuš 2011; Ridouane 2008; Ridouane & Fougeron 2011; Hermes et al. 2011; Ridouane et al. 2014.

Examples:

(1) Syllabification patterns cf. the nature of the nucleus (nuclei in bold) and of the onset:

a.	Georgian – Vs only; complex onsets:	rb**e**.n**a**	'to run'
		t'k'b**i**.l**i**	'sweet'
b.	Slovak – Vs, syllabic liquids; complex onsets:	mr**a**k	'darkness'
		m**r**k	'wink'
		sm**r**k	'sniff'

c. Tashlhyit – Vs, syllabic consonants; no complex onsets:

s.m**u**n 'accompany' caus.

t**s**.m**u**n 'accompany' 3fs. caus.

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