

Recursive structure constructed by phonological primes

Kuniya Nasukawa (Tohoku Gakuin University)
nasukawa@mail.tohoku-gakuin.ac.jp

In phonological theories which use phonological primes together with a device for controlling dependency relations between representational units (Kaye, Lowenstamm & Vergnaud 1990; Kaye 1990, 1995; Harris 1994, 1997; Charette 1991; Scheer 1995, 2004, 2012; and others), it is not only the primes themselves but also syllable nuclei which are phonetically interpretable. A nucleus may be phonetically realized even it has no melodic features specified. An unspecified nucleus can be silent if the relevant conditions are met (e.g. being prosodically licensed as a result of being properly governed: Kaye 1990, Harris 1994); otherwise, it must be phonetically realized. A nucleus without any specified primes is typically pronounced as a central vowel of some kind, its precise quality being determined on a language-specific basis (Harris 1994: 109). In English, for example, an unspecified nucleus is pronounced as a mid central ə (schwa), in Fijian *i* and in Japanese *u*. In this approach, these vowels are seen as providing an acoustic baseline onto which specified melodic primes are superimposed. Cross-linguistically, this baseline tends to have a quality which varies within the range ə~i~u.

Vowel epenthesis in the nativization of loanwords also indicates the quality of a language's unspecified (or 'empty') nucleus. In English, for example, ə is inserted word-initially in loanwords which have a word-initial NC sequence in the source language, since word-initial NC is ill-formed in English, e.g. Mpumalanga əm.pu.mə'laŋgə; mbeki əm'beki; Ndola ən'dəʊlə; nguni əŋ'gu:ni. The epenthetic vowel used to break up impossible sequences also differs from language to language: in Fijian it is *i* and in Japanese *u*. (e.g., *pu:ri:zu* for 'please'; *su:ri:mu* for 'slim'; *ku:ri:i:n* for 'clean' in Japanese). But interestingly, this type of vowel epenthesis also regularly involves one of the central vowels ə, *i*, or *u* (*e*, *o* and other vowels are marginally possible, which will be discussed in a different context).

According to Kaye, Lowenstamm & Vergnaud (1990), Charette (1991), Harris (1994, 2005), Harris & Lindsey (1995, 2000) and Backley (2011), it is assumed that the quality of the central vowel for any given language is made simply on the basis of parametric choice. Thus, no explicit explanation is given for why these vowels in particular are associated with the featureless nucleus.

This paper attempts to account for this parametric choice in a non-arbitrary way by proposing that the nucleus itself is one of the three vowel primes [mass], [dip] and [rump] (Harris 2005, Backley 2011). These primes are monovalent and independently interpretable, functioning as the building blocks of segmental structure. It is proposed that, for a given language, one of these vowel primes determines the quality of the melodically empty nucleus: in its acoustically weak form, [mass] is phonetically realized as ə in English, [dip] as *i* in Fijian and [rump] as *u* in Japanese. Accordingly, I claim that [mass], [dip] and [rump] constitute the head of nuclear expressions in English, Fijian and Japanese, respectively. This helps to explain why the unspecified vowel is always one of only three possibilities, rather than more than four.

In addition, this paper exhibits that primes can be freely merged to create phonological compounds. Take, for example, an expression which combines [dip] and [mass]. If it is labeled as one belonging to the [dip] set then it is phonetically interpreted as the mid front vowel *ɛ*, whereas if it belongs to the [mass] set it has the interpretation *e* (Nasukawa 2014, 2017) Furthermore, these sets can be dominated by another set of the same kind: the set in which [dip]([dip][mass]) is dominated by [dip]([dip][mass]) is interpreted as a long vowel *ɛɛ*. The phonetic value of a prime compound is thus determined by the specific elements it contains and also the head-dependency relations (labeling) between those primes.