

Conditions on the variable interpretation of |U| in Japanese

This paper shows how studying a particular case of variation can shed light not only on the structural object which varies but also on the language where this variation occurs. Here, the object in question is the element |U| and the language is Japanese.

The element |U| belongs to the set of elements (minimal structural units) used in Element Theory, an alternative to standard feature-based theories of segmental structure. Elements are well known to be subject to variation, partly because they represent broad phonological categories rather than precise phonetic qualities, and partly because they are associated with speech signal patterns rather than properties of articulation. In the case of |U|, its acoustic pattern may be phonetically interpreted either as labiality or as velarity, depending on its level of prominence in the speech signal: labial if strong, velar if weak (Backley and Nasukawa 2009). In most languages this difference between strong |U| and weak |U| is lexically distinctive, though the presence of the same element in labials and velars also makes it possible to group the two together as a natural class (Backley 2011).

Here we claim that the behaviour of |U| in Japanese deserves special attention. It has been observed that labiality is a weak property in this language, as illustrated by the variable appearance of rounding in some vowels and the restricted distribution of labial consonants. And we attribute these patterns to the inherent weakness of the element |U| in Japanese, which causes (i) labial obstruents to be absent from certain contexts and (ii) the typically rounded segments *u*, *w* to be realised as unrounded [ɯ], [ɰ] respectively. Yet it seems that if the right structural conditions are met, it *is* possible for |U| to be interpreted as labiality: we argue that the appearance of labiality/rounding in Japanese is dependent on |U| co-occurring with (i.e. being supported by) another element from the same sub-group of ‘dark’ elements – specifically, either |L| or |A|.

The set of six elements {I U A H L ?} in Element Theory naturally divides into two sub-groups dubbed ‘light’ {I H ?} and ‘dark’ {U A L}, the difference referring to acoustic properties: in dark elements acoustic energy is concentrated in the lower portions of the spectrum whereas in light elements it is distributed across a wider spectral range.

(a) labiality/rounding absent			(b) labiality/rounding present		
<i>u</i>	[ɯ] (*[u])	U	<i>o</i>	[o] (*[ɤ])	U A
<i>w</i>	[ɰ] (*[w])	U	<i>m</i>	[m]	U L
<i>k</i>	[k]	U H ?	<i>b</i>	[b]	U L ?
			<i>p</i>	[pp]	U H ? - U H ?

Comparing the sounds in (a) with those in (b), it emerges that |U| is realised in its strong form (labial/round) if accompanied by |A| (in *o*) or |L| (in *m* and *b*) or another |U| (in geminate *p*). In the absence of a co-occurring dark element, however, strong |U| cannot be interpreted and the relevant expression is realised as a velar(ised) segment, as shown in (a). In this way, typological variation may be accounted for by referring to variation at the most basic levels of segmental structure.

Backley, Phillip (2011). *An Introduction to Element Theory*. Edinburgh: EUP.

Backley, Phillip and Kuniya Nasukawa (2009). Representing labials and velars: a single ‘dark’ element. *Phonological Studies* 12: 3–10.