Diphthongization and contrast realization in Huave

Huave, a language isolate of Mexico, has an opposition between plain and palatalized consonants across nearly the entire consonant inventory. However, palatalization is only contrastive in codas (i.e. word-finally); in onsets it is allophonic, conditioned by the following vowel. This is notable in that the contrast is restricted to a position where it is harder, rather than easier, to perceive and maintain (see e.g. Ní Chiosáin and Padgett, to appear). In this paper, I discuss how Huave uses diphthongization as a phonological strategy to realize and enhance the plain-palatal distinction in codas. Seemingly disparate processes of diphthongization in Huave receive a unified analysis when understood as realization of secondary place features of the coda consonant on a preceding vowel nucleus.

The exceptions to this general analysis - consonants that fail to trigger phonological diphthongization - are precisely those whose palatality is realized as part of the consonant itself, i.e. consonants with inherent palatal place of articulation (as opposed to e.g. labials with secondary palatalization). While I propose a representational solution in the phonology, I also present acoustic evidence suggesting that the degree of phonetic, coarticulatory diphthongization among such inherently palatal consonants systematically varies in inverse proportion to the perceptibility of palatality on them. Coda contrast realization in Huave would then have both categorical and gradient components.

Diphthongization can be viewed as a contrast realization strategy in that the second half of the vowel nucleus must "match" the coda consonant for frontness or backness. If an underlying front vowel precedes a plain consonant, the surface form contains a diphthong whose second half is back – thus cueing the nonpalatality of the coda (1a). (The exact vowel quality is determined by more specific rules.) If an underlying back vowel precedes a phonologically palatalized consonant, the surface form contains a diphthong consisting of the back vowel plus a palatal offglide (1b). Final VC sequences of a front vowel with palatal consonant or back vowel with plain consonant, i.e. sequences where the two segments already "match," remain unchanged (1cd). Data are from the San Francisco del Mar dialect.

(1)	a.	/m**i**k$^{\mathbf{bk}}$/	m**io**k	'bat'
	b.	/p**u**k$^{\mathbf{pal}}$/	p**ui**k	'feather'
	c.	/nd**o**k$^{\mathbf{bk}}$/	nd**o**k	'fishing net'
	d.	/p**e**k$^{\mathbf{pal}}$/	p**e**k	'shoulder'

The basic analysis proposed here (and already implicit in the URs in (1)) is that coda consonants are secondarily specified for [back] or [pal]. High-ranking MAX constraints demand surface realization of these features, but their inability to be realized on either the consonant itself or on a CV transition result in their realization on the preceding vowel, triggering diphthongization. An example is schematized derivationally in (2a-c).

(2)

	/ o k^{pal} # /	---->	o _ k^{pal}	---->	o i k
Primary	[bk] [vel]		[bk] [vel]		[bk][pal][vel]
Secondary	[pal]		[pal]		

The analysis raises two issues of more general theoretical interest. First, I observe that both members of the plain-palatal opposition are phonologically active. Both actively trigger different kinds of diphthongization; it is not the case for instance that only palatalization is the marked, active feature while plain consonants are phonologically inert defaults. Huave is

briefly compared to other languages where a symmetrical opposition throughout the phonological inventory can be related to phonological activity and specification of feature values that are normally considered unmarked (e.g. Kaingang; Flemming 2004).

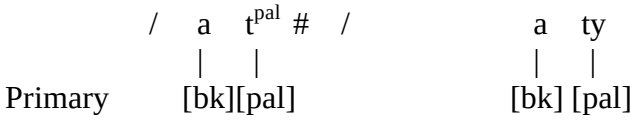
A second area of theoretical interest is that the secondary place features on consonants present interesting problems for feature linearization. The interaction of various constraints is required to derive the correct surface position of [back] and [pal]. In surfacing on the preceding vowel, they must linearize with respect to pre-existing features within arguably short vowel nuclei, and also with respect to laryngeal features. The linear position of secondary features shows additional alternations when codas resyllabify into onsets upon suffixation.

Lastly, the realization of the plain-palatal contrast is of theoretical relevance because of an exception to the generalization that the second half of a vowel nucleus always reflects the backness or frontness of the coda. Specifically, for those consonants where palatal is the primary rather than secondary place of articulation, no diphthongization occurs (3). The lack of diphthongization is demonstrated by phonetic data showing that coarticulatory fronting gestures on the latter part of the vowel are systemically different from those in diphthongs such as (1b). Intuitively, palatality does not need to be realized phonologically on the preceding vowel, because unlike with secondarily palatalized consonants, it is already realized automatically in the production of the consonant.

(3) a. /kat^{pal}/ katy ‘fish’ (NB <ty> represents a palatal stop [c])
b. /mas^{pal}/ max ‘canoe’ (<x> represents an alveopalatal fricative [ɕ])

A proposed phonological solution is to represent inherent palatals with [pal] as primary place of articulation, such that they do not bear secondary place features of the type that trigger diphthongization; compare (4) with (2). A crucial asymmetry is that while inherent palatals fail to trigger back-vowel diphthongization of the kind in (1b), there is no set of plain consonants that fail to trigger front-vowel diphthongization of the kind in (1a). This asymmetry is follows in the analysis from using [pal] as a primary consonant place feature, while there are no consonants with [back] as primary place (cf. e.g. Clements and Hume 1995 on unified place features for back vowels and velar consonants as [dorsal]). The phonetic motivations of this asymmetry are acknowledged as a problem for future research.

(4)



While Huave phonology does not enhance coda palatals with diphthongization, anticipatory coarticulation is inevitably present as an acoustic cue. Somewhat less inevitably (and therefore more interestingly), preliminary acoustic data indicate that such coarticulation is greater in duration and magnitude for plosives than for fricatives, presumably because cues to palatality are present during frication, whereas stops rely on transitions for their acoustic place cues. Data for palatal nasals is currently under analysis but is predicted to fall somewhere between stops and fricatives. The overall interpretation given to the data is that pressures for contrast realization and enhancement can manifest themselves in grammatically separate but functionally related processes in the phonology and phonetics of the same language. In addition, what is phonetic in one dialect can be phonological in another: the San Mateo del Mar dialect of Huave appears to have phonological diphthongization for items like (4), but only before plosives and nasals (Stairs and Stairs 1981).