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Diphthongization in the Refal Dialect of Lama

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1. Introduction

Lama, a Gur language spoken in Togo, has two attested dialects: Refal (Aritiba 1987) and Kantè (Ourso 1989a).¹ The most striking difference between the two Lama dialects is the (diachronic) diphthongization of mid vowels in Refal. While the Common Lama mid vowels **e*, **ɛ*, **o*, and **ɔ* have been retained in Kantè, they have undergone a startling array of diphthongizations in Refal. Refal has neither front mid vowels nor advanced mid vowels in roots, though the retracted mid back vowel **ɔ* is retained in certain environments.

This paper draws on my own reconstruction of Common Lama (Ulrich 1993), which is based on more than six hundred pairs of cognate noun and verb roots. This corpus was compiled by a comparison of the two aforementioned dissertations, with additional Kantè forms from Downing (1986), Kenstowicz (1989), Kenstowicz et al. (1988), Ourso (1988a, 1988b, 1989b), Yu (1991), and my own field notes.

2. Common Lama Reconstruction

Ulrich (1993) reconstructs the following consonant system for Common Lama:²

- (1)
<i>*p</i>	<i>*t</i>	(<i>*d</i>)	<i>*c</i>	<i>*k</i>	<i>*kp</i>	
<i>*f</i>	<i>*s</i>					<i>*h</i>
<i>*m</i>	<i>*n</i>		<i>*ñ</i>			
<i>*w</i>	<i>*l</i>	<i>*r</i>	<i>*y</i>			

Consonants have undergone only a few changes in the two dialects. In Kantè, **k* has been palatalized to *c* before mid front vowels.³ In Refal, **w* has become *v* before front and low vowels. And, synchronically, *s* is palatalized to *ʃ* before *y* (Aritiba 1987).

Ulrich (1993) reconstructs the following vowel system for Common Lama, where the underdot indicates retraction of the tongue root:

- (2)
<i>*i</i>	<i>*ḭ</i>	<i>*u</i>
<i>*ḭ</i>		<i>*ṵ</i>
<i>*e</i>		<i>*o</i>
<i>*ḛ</i>	<i>*ə̰</i>	<i>*o̰</i>
	<i>*a̰</i>	

Kantè retains this vowel system virtually intact:

(3)	i	ə	u
	ĩ	ə̣	ụ
	e		o
	ɛ		ɔ
	ɐ		

The only change is that the two non-low central vowels are aligned: both sound mid (at least to anglophone ears), but are phonologically high (Ourso 1988b, Ulrich in preparation).

Refal, on the other hand, has lost three of the Common Lama mid vowels and developed a retracted high central vowel:

(4)	i	ĩ	u
	ĩ	ị̃	ụ
		ə̣	ɔ̣
		ɐ̣	

Within roots, Refal also has nine glide + vowel diphthongs (5), three vowel + vowel diphthongs⁴ (6), and one glide + vowel + vowel triphthong (7):

(5)	yĩ	yị̃	wị̃	
		yə̣	wə̣	wɔ̣
		yɐ̣	wɐ̣	

(6)	iạ	iọ	iị
-----	-----	-----	-----

(7)	wịụ
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As might be expected, it is the missing mid vowels that were the source of most of these diphthongs and triphthongs.⁵ The correspondences are summarized as follows:

(8)	<i>Common Lama</i>	<i>Kantè</i>	<i>Refal</i>
	*e	e	yĩ, yə̣, iị, ị̃
	*ɛ	ɛ	yɐ̣, iạ, ị̃
	*o	o	yɔ̣, iọ, wị, ị̃, wịụ
	*ɔ	ɔ̣	wɔ̣, ɔ̣, wɐ̣, ɐ̣

3. Vowel Changes in Refal

After consonants other than y, the advanced mid front vowel *e has diphthongized to yĩ in root-final position (9) and to yə̣ in non-root-final (always preconsonantal) position (10):

- (9) a. K. lé-eu 'to weave' ~ R. lyí-ú 'tresser'
 b. K. kpê-en 'silos' ~ R. kpyí-n 'le grenier' (plural)
 c. K. rê-m 'sleep' ~ R. ryî-m 'le sommeil'
- (10) a. K. tèm 'finish!' ~ R. tyêm 'finir'
 b. K. lèk-ú 'arrow shaft' ~ R. lyèk-ú 'le manche de flèche'
 c. K. sén-dê 'bean' ~ R. jyên-dê 'le haricot'
 d. K. tèel-à 'windows' ~ R. tyèl-à 'la fenêtre' (plural)

Example (10d) shows that diphthongization affected long **ee* as well as short **e*.⁶

Note that it is root structure, not syllable structure, that conditions the different diphthongs. For instance, **e* has become *yə* in the root *tyəl-*, regardless of whether the root-final consonant is syllabified as an onset (11a) or a coda (11b):

- (11) a. K. tél-û 'baobab tree' ~ R. tyəl-û 'le baobab'
 b. R. tyəl-m-ọ 'petite quantité de la poudre du fruit de baobab'

Compare also (9c), in which *m* is the class 10 suffix, with (10a), in which *m* is part of the root.

After *y*, **e* has become *ï* root-finally (12) and *ɨ* non-root-finally (13):

- (12) K. yé-eu 'to quarrel' ~ R. yïí-ú '(se) quereller'
- (13) a. K. yép-ê 'to let' ~ R. yíp-ê 'laisser'
 b. K. yéłəm 'blind person' ~ R. yíləm 'l'aveugle'
 c. K. yèn-dê 'hippopotamus' ~ R. yìn-dê 'l'hippopotame'

The retracted mid front vowel **ɛ* has diphthongized to *yə* when final in a high-toned verb root (14), and when short and non-root-final (15):

- (14) a. K. lẹ-ẹu 'to let go' ~ R. lyá-ú 'lâcher'
 b. K. sẹ-ẹu 'to plant' ~ R. jyá-ú 'planter (arbre)'
 c. K. tẹ-ẹu 'to throw' ~ R. tyá-ú 'lancer'
- (15) a. K. tél-û 'to escape' ~ R. tyəl-û 's'évader...'
 b. K. pél-û 'to cut' ~ R. pyəl-û 'couper'
 c. K. nằmkpẹt-ẹr 'ground squirrel' ~ R. nằnkpỳạt-ẹr 'l'écureuil'

Between *h* and a consonant, **ɛ* has become *ɨə*:

- (16) a. K. hẹk-ú 'middle' ~ R. hịək-ú 'le milieu'
 b. K. hẹt 'cut (belly) open!' ~ R. hịật-ủ 'ouvrir le ventre (opérer)'
 c. K. hẹtặt 'make an incision!' ~ R. hịặt-ủ 'faire des incisions'

**ɛ* has been raised to *ɨ* elsewhere, i.e. when long (17a,b), when final in a noun root (17c,d,e), and when final in a low-toned verb root (17f,g):

- (17) a. K. c̣ẹl-ŭ ‘to turn over’ ~ R. ḳịl-ŭ ‘(se) tourner’
 b. K. ẉẹr-ŭ ‘placenta’ ~ R. ṿr-ŭ ‘le placenta’⁷
 c. K. əḳp̣ẹ ‘mouse’ ~ R. əḳp̣ị ‘toute petite souris...’
 d. K. ḥẹ-r ‘yam’ ~ R. ḥị-r ‘l’igname’
 e. K. ṣẹ-r ‘field mouse’ ~ R. ṣị-r ‘la souris (sauvage)’
 f. K. ṣẹ-ɛ̣ ‘to greet’ ~ R. ṣị-ŭ ‘saluer’
 g. K. ḥẹ ‘pick (fruit by hand)!’ ~ R. ḥị-ŭ ‘cueillir’

This development neutralized the contrast between Common Lama **e* and **i* in these environments.

Note that it is the underlying tone of the verb root that conditions diphthongization. A verb will have a single reflex of **e* throughout its conjugation, in spite of the fact that tones are neutralized in all forms but the imperative:

(18)	* <i>ẹ</i>	* <i>ẹ</i>		
	ḥị-ŭ	lỵạŭ	tỵạ-ŭ	infinitive
	ḥị	lỵạ		imperative
	ḥị	lỵạ		progressive
	ḥị-ă		tỵạ-ă	perfective
	(17g)	(14a)	(14c)	

The advanced mid vowel **o* has diphthongized to *yɔ* after coronals (19) and to *ɪɔ* after *kp* (20):

- (19) a. K. só-ou ‘to lift up’ ~ R. ʃỵɔ̣-ŭ ‘basculer’
 b. K. əló-or ‘transvestite’ ~ R. ɛ̣lỵɔ̣r ‘personne de sexe masculin qui adopte les comportements de femmes’
 c. K. tòoṭə̣ ‘estimate the weight!’ ~ R. tỵɔ̣ṭ-ŭ ‘soupeser’
- (20) a. K. kpòṣə̣ ‘bark!’ ~ R. kp̣ɔ̣ṣ-ŭ ‘aboyer’
 b. K. kpónṭă ‘leopard’ ~ R. kp̣ɔ̣nṭă ‘le lion’
 c. R. kp̣ɔ̣ḷ-ŭ ‘assembler’

Example (19c) shows that diphthongization affected long **oo* as well as short **o*. After *h*, *k*, and *p*, **o* has become *ẉị* root-finally (21) and *ẉị* non-root-finally (22):

- (21) a. K. hó-ou ‘to become liquid’ ~ R. hẉịŭ-ŭ ‘être trop liquide’
 b. K. kó-ou ‘to cry’ ~ R. kẉịŭ-ŭ ‘crier’
 c. R. hẉịŭ-r ‘le bourgeon’
- (22) a. K. kóm-ŭ ‘kapok tree’ ~ R. kẉịṃ-ŭ ‘le kapokier’
 b. K. hóm ‘to wake up’ ~ R. hẉịṃ ‘se réveiller’
 c. K. ɔ̣por-ă ‘dance...’ ~ R. ɔ̣pẉịr-ă ‘chants et danses...’

Between *w* and a consonant, **o* has become *ɨ*:

- (23) a. K. wól 'daughter-in-law' ~ R. wɨl 'la bru'
 b. K. wòs-ɨ 'to wake someone up' ~ R. wɨs-ɨ 'réveiller'
 c. K. wònk-ò 'donkey' ~ R. wɨnk-ò 'l'âne'

The retracted mid back vowel **ɔ* has diphthongized only when short and only after *h* and *k*, to *wɔ* root-finally (24) and to *wə* non-root-finally (25):

- (24) a. K. kò 'sister' ~ R. kwò 'personne de sexe féminin plus âgée'
 b. K. kò 'accept!' ~ R. kwó-ɨ 'être content, satisfait'
 c. K. hò-ɔr 'heart' ~ R. hwò-ɔr 'le coeur (affectif)'
 (25) a. K. àkòm 'visitor' ~ R. àkwàm 'l'étranger'
 b. K. hòm 'to pull' ~ R. hwàm 'tirer (vers soi)'
 c. K. kòtə 'knock!' ~ R. kwàt-ɨ 'frapper...'

After *w*, we find similar reflexes, but without a second *w*, namely *ɔ* root-finally (26) and *ə* non-root-finally (27):

- (26) a. K. wó-ɔ 'to spread (a mat)' ~ R. wó-ɨ 'étaler (une natte)'
 b. K. àwò-r 'place' ~ R. àwò-r 'la place'
 (27) a. K. wók-ɨ 'fool' ~ R. vák-ɨ 'l'idiot'
 b. K. wóp-ə 'to roast' ~ R. wáp-ə 'faire cuire au feu de braises'
 c. K. wos-ɨ 'to boil' ~ R. vəs-ɨ 'bouillir'

Common Lama **o* is retained elsewhere, i.e. when long (28a,b) or when preceded by a consonant other than *h*, *k*, or *w* (28c,d,e):

- (28) a. K. wòɔr 'praise!' ~ R. wòɔr-ɨ 'féliciter'
 b. K. kòs-ù 'flute' ~ R. kòs-ù 'instrument à vent...'
 c. K. yór-ò 'Indian millet' ~ R. yór-ò 'variété de fonio...'
 d. K. mòs-əm 'thought' ~ R. mòs-əm 'le fait de penser'
 e. K. àcəmkpò-ɔr 'bachelor' ~ R. àcənkpò-ɔr 'le célibataire'

4. Generalizations

While the Refal developments may seem bewildering at first, we can make a number of generalizations. First, Common Lama front and back mid vowels tended to diphthongize in Refal. All front mid vowels changed, usually to diphthongs. All advanced mid vowels changed to diphthongs (or triphthongs). And some retracted back mid vowels changed to diphthongs.

Second, all Refal reflexes of Common Lama mid vowels are retracted. Note, however, that no two mid vowels were neutralized in any environment, although **e*/**i* and **ɔ*/**ə* were neutralized in certain environments. Reflexes of advanced mid vowels tend to be higher than reflexes of retracted mid vowels: *yə*, *wɨ* vs. *yə*,

wā. We see, thus, an interaction between the dimensions of tongue height and tongue root advancement: earlier non-high vowels are realized as retracted vowels, and earlier retracted vowels are realized as lower (often low) vowels.

Third, triphthongs developed from advanced mid vowels after certain consonants; **e* became †*yīi* after *y*, **o* became *wīu* after *h, k, p, w*. (I use a dagger to mark unattested forms intermediate between Common Lama and contemporary Refal.) Fourth, the vocalic portions of diphthongs (and triphthongs) tended to be bleached (and sometimes lowered) preconsonantly: *yī* > *yə*, †*yīi* > †*yī*, *wīu* > *wī*, *wə* > *wā*. (And perhaps also **e* > †*yē* > *yā*.) Fifth, glides within diphthongs were absorbed into homorganic glides in onsets: †*yīi* > †*ī*, †*yī* > †*ī*, *wə* > *ə*, *wā* > *ā*.

Sixth, all conditioning factors were internal to the root. The only exceptions to this generalization involve vowel-final roots that are invariably followed by the same suffix. While most nouns have both a singular and a plural marked by different noun class suffixes, some nouns have only one form. In most such cases, the initial consonant of the class suffix suffices to condition the preconsonantal (i.e. non-final) reflex of a Common Lama mid vowel:⁸

- (29) a. K. lê-m ‘water’ ~ R. lyê-m ‘l’eau’
 b. K. lê-n ‘intelligence’ ~ R. lyê-n ‘l’intelligence’
 c. R. kwâ-tê ‘le plafond’

5. Diphthongization Cross-Linguistically

Donegan (1978) makes the following generalizations about diphthongization processes. First, diphthongization applies preferentially to long vowels as opposed to short vowels.⁹ Second, diphthongization yields falling diphthongs (that is, diphthongs in which the syllabic element precedes the non-syllabic element), even from short vowels. Third, falling diphthongs (which are typically heavy, like long vowels) may become rising diphthongs (which are typically light, like short vowels) due to timing requirements (e.g. in closed syllables). Fourth, diphthongization is typically context-free.

However, the diphthongizations that have taken place in Refal contradict every one of these generalizations. In Refal, diphthongization applies preferentially to short vowels. Advanced mid vowels diphthongized regardless of length, but retracted mid vowels diphthongized only if short. Long retracted mid vowels were raised (17a,b) or retained (28a,b).

In every attested case in Refal, diphthongization has yielded rising diphthongs (that is, diphthongs in which the non-syllabic element precedes the syllabic element), even from long vowels. Donegan suggests that apparent cases of diphthongization yielding rising diphthongs involve an intermediate step of falling diphthongs, which subsequently undergo a shift of syllabicity. But considering the multiplicity of diphthongs in Refal, the absence of clear-cut cases of falling diphthongs casts some doubt on such a suggestion. Moreover, note that rising diphthongs result regardless of timing in Refal: we find (light) rising diphthongs even in open syllables.

Finally, diphthongization is context-sensitive, at least for retracted vowels. **e* diphthongized only if root-final in a high-toned verb or if non-root-final; elsewhere it was raised to *i*. **o* diphthongized only if preceded by *h*, *k*, or *w*; elsewhere it was retained.

The Refal developments so consistently run counter to Donegan's generalizations that they raise the question: Are there two types of diphthongization, one deriving falling diphthongs from long vowels, and another deriving rising diphthongs from short vowels?

6. Alternative Interpretations

Two alternative interpretations of the synchronic Refal data immediately suggest themselves. What I have treated as a sequence of an onset consonant plus a diphthong (30a) could be analyzed as an onset cluster plus a vowel (30b) or as a palatalized or labialized consonant plus a vowel (30c):

- (30) a. [k]_O[wɔ]_R [p]_O[yɔ]_R
 b. [kw]_O[ɔ]_R [py]_O[a]_R
 c. [k^w]_O[ɔ]_R [p^y]_O[a]_R

I will argue briefly against the interpretations in (30b) and (30c).¹⁰

Aritiba (1987) treats the sequences in question as containing onset clusters, as in (30b). However, if they are clusters, then they are the only tautosyllabic clusters in the language. Clusters of obstruent plus glide are the most highly preferred type of onset cluster cross-linguistically (Vennemann 1988), so their existence as the only clusters might not disturb us. However, sequences of liquid plus glide make very poor onsets, and these are amply attested in Refal, as in (29a,b) above. Note also that Aritiba does not discuss Kantè, and thus he may not have taken into consideration the vowel correspondences that suggest treating the sequences in question as simple onsets plus diphthongs.

A more likely interpretation might be that the sequences in question involve consonants with a secondary palatal or labial articulation, as in (30c). The occurrence of the putative *w* primarily after *h* and *k*—two eminently labializable consonants—could be seen as supporting such an analysis. Note, however, that Aritiba considers and rejects this possibility, always treating the glide as a separate segment. He indicates palatalization of **s* by using the symbol *ʃ* in addition to writing a following *y*, which suggests that *y* is not simply a diacritic for palatalization. A palatalization analysis would also entail the existence of a four-way contrast *t/ʃ/c/cʰ*:

- (31) a. K. tɛ̃m-ɛ̃ 'gourd plant' ~ R. tɛ̃m-ɛ̃ 'plante rampante...'
 d. K. tɛ̃m 'finish!' ~ R. tɛ̃m 'finir'
 c. K. cɛ̃pɔ 'mighty person' ~ R. cɛ̃pɔ 'le puissant'
 d. K. cɛ̃m-ɛ̃ 'hen' ~ R. cyɛ̃m-ɛ̃ 'la poule'

These putative contrasts—while not inconceivable—are at least a bit suspect.

Moreover, palatalization would have taken place in an odd array of contexts. Consider the forms in (32):

(32)	<i>CL</i>	<i>Kantè</i>		<i>Refal</i>	
a.	*sì-	sí-íu	'to wear'	sí-ú	'porter un vêtement'
b.	*sì-	sí-íu	'to enter'	sí-ú	'entrer'
c.	*sé-	sé-eu	'to run'	ʃyí-ú	'courir'
d.	*sẹ-	sẹ-ẹu	'to greet'	sí-ú	'saluer'
e.	*sé-	sẹ-ẹu	'to plant'	ʃyá-ú	'planter (arbre)'
f.	*sà-	sá-áu	'to cook'	sá-ú	'faire cuire'
g.	*só-	só-ou	'to lift up'	ʃyó-ú	'basculer'

The palatalization of a consonant could not be predicted from the quality of the following vowel in contemporary Refal, since the putative palatalized and non-palatalized consonants contrast before *i* (32b,c,d) and before *a* (32e,f). Looking at the Common Lama vowels, palatalization would be predictable, but not according to the usual pattern. Palatalization would never have been triggered by following high front vowels (32a,b), typical triggers of palatalization. On the other hand, palatalization would have been triggered always by **e* (32c), and sometimes by **ɛ* (32e, but not 32d).¹¹ And the palatalization of a consonant before a mid back rounded vowel (32g) is baffling by any account.

Finally, note that there is one case of diphthongization in word-initial position. In Common Lama, words could not begin with non-low vowels. But in one word, an initial **w* has been lost before a diphthong (33a):

- (33) a. K. wẹ̀d̥d̥ 'throw away!' ~ R. yàd-ú 'jeter'
 b. K. wẹ-ẹu 'to give way' ~ R. vyá-ú 'céder la place à'

The sequence of *v* plus diphthong in (33b) apparently represents the regular development. Thus, we cannot say that the outcome of an attempt to palatalize *w* is *y*. Rather, we must say that, in one word (33a), the segment *w/v* has been deleted before the following segment *y*.

Thus, both the onset cluster and the secondary articulation interpretations run into problems. The diphthong interpretation appears preferable on several counts. First, it most simply reflects the correspondences between the two Lama dialects: diphthongs in Refal correspond to monophthongs in Kantè. Second, it avoids positing universally disfavored onset clusters such as *ly* and *ry*. Third, it reflects the fact that *y* may follow any consonant, but may precede a limited set of vowels; this is what is expected if *y* forms a constituent with the following vowel and not with the preceding consonant. Fourth, it conforms with Aritiba's judgment that postconsonantal glides are separate segments, not secondary articulations on the preceding consonant. Fifth, it avoids positing palatalization in an ill-motivated set of contexts.

The mismatch between diphthongization in Refal and Donegan's generalizations calls for further investigation of rising diphthongs in other languages, including those in other West African languages. If rising diphthongs in

other languages turn out to be derived unambiguously from short vowels, then diphthongization will have to be recognized as comprising two complementary types: one applying preferentially to long vowels and yielding falling diphthongs, and the other applying preferentially to short vowels and yielding rising diphthongs.

Notes

1. My study of Lama began in a field methods class at the University of Illinois in 1987. I am grateful to the participants in that class, and especially to Méterwa Ourso, who served as consultant. I also thank Larry Hyman, David Odden, John Ohala, Nike Qla, Edwin Pulleyblank, Nathalie Schapansky, Pat Shaw, and others at BLS and UBC for their comments.
2. To facilitate comparison, I have modified the transcriptions of Ourso and Aritiba. Following Ourso and Ulrich (1990), I consistently represent tongue root retraction with an underdot, regardless of whether it is contrastive on that vowel in that dialect. Following Ourso (1989a), I represent the palatal nasal as $\tilde{n}$ and the retroflex stop—derived from underlying r (Ourso and Ulrich 1990)—as d . In all other cases, I have retained the original symbols. The following is a chart of the orthographic symbols used in the three works.

Aritiba (1987)	i	ɪ	—	—	—	a	o	ɔ	u	ɔ	—	ə	ɨ	ɪ	ɬ	ɲ	ɐ̃	ɐ̃'
Ourso (1989a)	ɨ	ɪ	e	e	a	a	o	o	u	u	ə	ɜ	—	—	d	ɲ	v	ɐ̃
Ulrich	i	ɪ	e	ɛ	a	ɑ	o	ɔ	u	ʊ	ə	ɐ̃	ɨ	ɪ	d	ɲ	ɐ̃	ɐ̃'

While Ourso (1989a) leaves low tones unmarked (except when followed by a floating high tone, which is then unmarked), I have attempted to indicate tone explicitly on every syllable. Where I omit tones, it is because they are absent or illegible in my sources. I have otherwise followed the practice of the original author, marking tone on the first vowel of each syllable for Kantè (after Ourso 1989a) and on every vowel for Refal (after Aritiba 1987).

3. Palatalization of k before high front vowels had apparently already taken place in Common Lama (Ulrich 1993).
4. Like the glide + vowel sequences in (5), the tautomorphic vowel + vowel sequences in (6) correspond to single vowels in Kantè. Moreover, the two vowels always bear the same tone. I therefore treat both types of sequence as diphthongs. Note that the distinction between $yɑ$ and $ɪɑ$ poses problems for the now-customary treatment of glides simply as non-syllabic vowels. Edwin Pulleyblank (personal communication) informs me that a similar distinction is found in Vietnamese.
5. The diphthong $yɨ$ is attested in only six roots, none of which have attested Kantè cognates. It may turn out to be a reflex of $*e$, but there is insufficient evidence to say.

6. Diphthongs are usually short, even when derived from long vowels. However, there are a few examples of long rising diphthongs:

- (i) a. R. tyòdòl-û 'tenir un vase dans la paume'
- b. K. cār 'trade!' ~ R. cyàār-û 'faire du commerce'

Unfortunately, all such forms either lack Kantè cognates, like (ia), or exhibit irregular correspondences, like (ib).

7. The lack of diphthongization in Refal indicates that the long vowel in Kantè is conservative, though the vowel has apparently been shortened in Refal. Cf. also (28b) below.

8. In a few cases, the root-final reflex is found:

- (i) a. K. ré-en 'strength' ~ R. ryî-n 'la force'
- b. R. jyî-n 'la plaie'

9. Hayes (1990) promotes this generalization to an absolute principle, and bases a theory of phonological representations upon it.

10. For further discussion, see Ulrich (to appear).

11. Bhat (1978) claims that there are languages in which palatalization is triggered by mid front vowels but not high front vowels—but only when the consonant to be palatalized is velar. In Lama, the original place of articulation of the putatively palatalized consonant is immaterial. Ohala (to appear), on the other hand, argues that palatalization in some languages is triggered by mid front vowels but not high front vowels regardless of the original place of articulation of the consonant. Note, however, that mid front vowels would not always trigger palatalization in Refal (32d), so the picture would still not be neat.

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