

1. Maxakalí phonemes (Gudschinsky et al. 1970).

p	t	c	k	ʔ h	i	e	a	o	u
m	n	ɲ	ŋ		ĩ	ẽ	ã	õ	ũ

2. Allophones of Maxakalí stops.

	Basic allophones	Prevocalized allophones		Vocalic allophones
		Before a nonhomorganic consonant or utterance-finally	Before a nonhomorganic consonant or utterance-finally after a transition glide	Before a homorganic consonant
/p/	[p]	[ɣ(pʰ)]	—	[ɣ]
/m/	[m]	[ɣ̃m]	—	[ɣ̃(m)]
/t/	[t]	[ɔt]	[ə(t ~ tʰ)]	[ə]
/n/	[n]	[ɔ̃n]	[ə̃(n)]	[ə̃(n ~ ŋ)]
/c/	[tʃ ~ ʃ]	[i(ʃ ~ ʃ ~ tʰ)]	[i(ç)]	[i]
/ɲ/	[ɲ ~ ɲ̃]	[ĩ]	[ĩ]	[ĩ]
/k/	[k]	[uɰk]	—	[u]
/ŋ/	[(ŋ)g]	[ũŋk]	—	[ũ]

3. Examples.

3a. Prevocalized allophones before a nonhomorganic consonant or utterance-finally:

/p/	/nuʔcip/	[nuʔʃiɣp]	‘full of’
/t/	/tapet/	[tapeɔt]	‘paper’
/c/	/-cecka/	[ʃeĩʃka]	‘big’
/k/	/tihik/	[tihuɰk]	‘man’

3b. Vocalic allophones of coronals after a transition glide:

/t/	/mit/	[^m bijə]	‘sound of jaguar’s steps’
/c/	/pohoc/	[pohowi]	‘arrow’

3c. Vocalic allophones of stops before a homorganic consonant:

/p/	/-keppa/	[kæɣpa]	‘before’
/t/	/mattuuk/	[mbaətux]	‘toad’
/c/	/coc cecka/	[ʃoiʃæjʃkaʔ]	‘big tooth’
/k/	/kucakkuuk/	[kuʃaukuux]	‘capybara’

4. A problem.

[ĩ ~ i] /c/	[uɰ ~ u] /k/	[ɔ ~ ə] /t/	[ɣ ~ ɣ̃] /p/
[ĩ̃ ~ ĩ] /ɲ/	[ũ̃ ~ ũ] /ŋ/	[ə̃ ~ ə] /n/	[ɣ̃ ~ ɣ̃̃] /m/

5. Solution A: (partial) vocalization of primary stricture.

5a. Reighard (1972).

palatals [+hi, -bk]	velars [+hi, +bk]	alveolars [-hi, -lo, -bk]	labials [-hi, -lo, -bk, +lab]
<i>i</i>	<i>u</i>	* <i>e</i>	* <i>ø</i>

(a) [ə] is underlying [e]

(b) V → [+bk]
 [+lab]

V → [-lab] / ___ C
 [-stress]

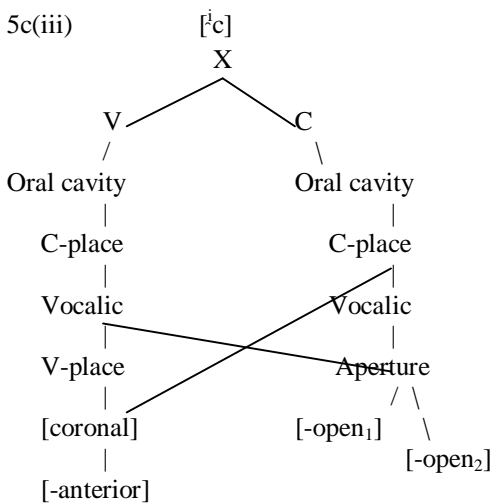
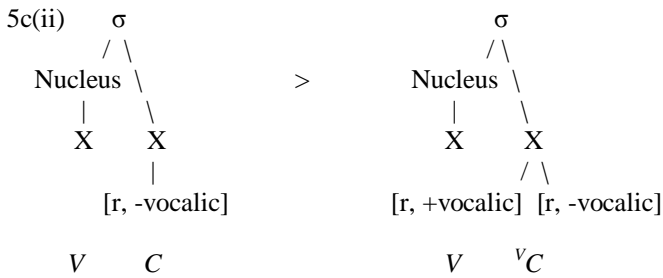
5b. Clements (1991).

(a) [ə] is unspecified for place.

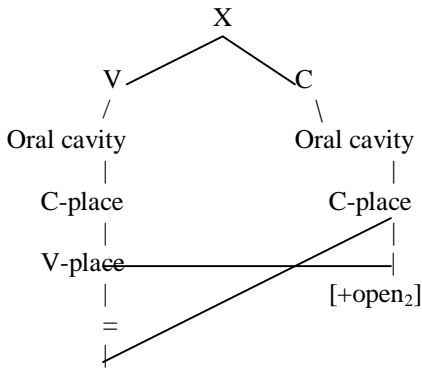
(b) Labials are [+hi]; expected prevowel is [u]; V → [-hi].
 [+lab]

5c. Wetzels and Sluyters (1995).

5c(i)	<u>Consonants</u>	<i>p</i>	<i>t</i>	<i>c</i>	<i>k</i>
	C-place	+labial	+coronal +anterior	+coronal -anterior	+dorsal
	<u>(Pre)vowels</u>	<i>ɤ</i>	<i>ə</i>	<i>i</i>	<i>u</i>
	V-place	+dorsal	—	+coronal	+dorsal
	Aperture	-open ₁ +open ₂	-open ₁ +open ₂	-open ₁ -open ₂	-open ₁ -open ₂

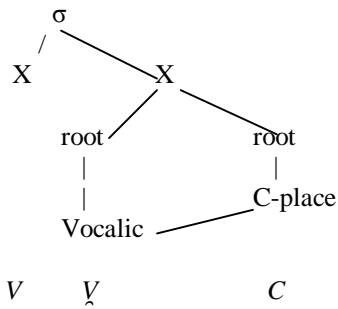


5c(iv) labial → dorsal / [+vocalic]



6. Solution B: forward segmentalization of secondary articulations (Wetzels 1993).

	<i>p/m</i>	<i>t/n</i>	<i>c/ɲ</i>	<i>k/ŋ</i>
C-place	[+lab]	[+cor, +ant]	[+cor, -ant]	[+dor]
V-place	[+dor]	[-dor, -cor]	[+cor, -ant]	[+dor]



7. Solution C: gestural account (cf. Browman & Goldstein 1992).

8. Applying Solution C to prevocalization in other languages.

8a. S-prevocalization in Brazilian Portuguese, cf. *arroz* [a'xo's ~ a'xoʃ] 'rice'

8b. Old English breaking: l, r, x, w → ʷl, ʷr, ʷx, ʷw / i(:), e(:), æ(:) ___ C, #.

<i>healf</i>	'half'	<i>neaht</i>	'night'
<i>bearn</i>	'child'	<i>hweowol</i>	'wheel'

8c. Middle English breaking.

x → ʷx / a(:), o(:) ___ C, #

ç > ʷç / e(:) ___ C, #

Old English	>	Middle English	Old English	>	Middle English
[ax]	>	[aux]	[eç]	>	[eiç]
[a:x]	>	[oux]	[e:ç]	>	[eiç] > [iç]
[o(:)x]	>	[oux]	<i>seah</i> > <i>seh</i>	>	<i>seigh</i> 'he saw'
<i>da:h</i>	>	<i>dough</i> 'dough'			

8d. Early Modern English pre-*r* breaking/lengthening & linking *r*.

Pre-*r* breaking of /i: e: o: u: at aʊ/ + *r*-loss

<i>beer</i>	<i>chair</i>	<i>more</i>	<i>sure</i>	<i>fire</i>	<i>tower</i>
bi:r	tʃe:r	mo:r	ʃu:r	faiɹ	taʊɹ
bi:ɹr	tʃe:ɹr	mo:ɹr	ʃu:ɹr	faiɹɹ	taʊɹɹ
biɹ	tʃeɹ	mɔɹ	ʃʊɹ	faiɹ	taʊɹ

Linking <i>r</i>	<i>fear</i> [fiə]	:	<i>fearing</i> [fiəɪŋ]
	<i>car</i> [ka:]	:	<i>car alarm</i> [ka:ɹələ:m]

References

- Browman, C. P., and L. Goldstein. 1992. Articulatory Phonology: An Overview. *Phonetica* 49:155-80.
- Clements, G. N. 1991. Place of Articulation in Consonants and Vowels: A Unified Theory. *Working Papers of the Cornell Phonetics Laboratory* 5:77-121.
- Gudschinsky, S. C., and H. and F. Popovich. 1970. Native Reaction and Phonetic Similarity in Maxakalí Phonology. *Language* 46:77-88.
- Reighard, J. 1972. Labiality and Velarity in Consonants and Vowels. *CLS* 8:533-43.
- Wetzels, L. 1993. Prevowels in Maxakalí: Where They Come From. *ABRALIN* 14:39-63.
- Wetzels, L., and W. Sluyters. 1995. Formação de raiz, formação de glide e 'decrowding' fonético em Maxakalí. *Estudos Fonológicos das Línguas Indígenas Brasileiras*. Ed. L. Wetzels. Rio de Janeiro: Editora UFRJ. 103-49.