

Coronal classes and features in Dhivehi

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1. Introduction

- This paper presents a case study of Dhivehi, a lesser-known Indo-Aryan language spoken in the Maldivian islands, south and west of India.
- What do the phonological patterns in this language tell us about natural classes involving coronal consonants? What features predict and best represent those classes?
- Evidence from Dhivehi suggests that posterior coronals are complex segments consisting of primary coronal features plus secondary vocalic features, and not simple coronals marked by the feature [–anterior] as traditionally assumed.

2. Theoretical Background

- Phonological inventories can distinguish up to 4 coronal places of articulation among stops.
- Maximal 4-way coronal systems are common in Australian and some Dravidian languages.
- These inventories include: dental, alveolar, retroflex, and ‘palatal’ (i.e., some form of laminal postalveolar, either alveolo-palatal or palato-alveolar).
- Standard approaches to feature theory assume two binary features: [±distributed] and [±anterior] as shown in (1) (e.g., Chomsky & Halle 1968, Sagey 1986, and numerous others).

(1)

	$\underset{t}{t}$	t	$tʃ$	$\underset{t}{t}$
[coronal]	+	+	+	+
[distributed]	+	–	+	–
[anterior]	+	+	–	–

- I advocate the ‘secondary articulation’ approach sketched in (2).

(2)

	<u>t</u>	t	tʃ	ʈ
[coronal]	+	+	+	+
[distributed]	+	–	+	–
[back]			–	+

- Standard model: [±anterior] predicts the following natural classes:
 - [+anterior]: dental & alveolar
 - [–anterior]: palatal & retroflex
 - If front vowels and glides are [coronal] and [–anterior] (e.g., Lahiri & Evers 1991), then they should form a natural class with both palatal and retroflex consonants.
- Secondary Articulation model: [±back] predicts these natural classes:
 - [–back]: palatals & front vowels/glides
 - [+back]: retroflex & back vowels
 - Retroflexes do not form a natural class with palatals or front vowels/glides, and are incompatible with ‘palatalization’.

3. Dhivehi: Palatalization & Gemination (data from Cain 2000)

- Dhivehi has a 3-way coronal contrast: dental, palatal, retroflex.

(3) Inventory of Dhivehi consonant phonemes

LABIAL	DENTAL	PALATAL	RETRO	VELAR	GLOTTAL
p	t	tʃ	ʈ	k	
b	d	ɕ	ɖ	g	
^m b	ⁿ d		ⁿ ɖ	^ŋ g	
f	s		ʂ		h
v	z				
m	n	(ɲ)			
			r		
	l		ɭ		
		j			

- When noun stems ending in /i/ are followed by a vowel-initial suffix:
 - a. The vowel coalesces with a preceding segment, causing ‘palatalization’.
 - b. The preceding consonant is geminated (i.e., compensatory lengthening).
- Palatalization is manifested in two ways:
 - a. If the preceding consonant is labial or velar, palatalization produces an off-glide on the vowel of the preceding syllable (4).

(4) /j/ off-glide with gemination (VCi+V → VjCC+V)

Noun	Noun-INDEF	
Labials		
loobi	loojbb-ek	‘love’
a ^m bi	ajmb-ek	‘wife’
nijami	nijajmm-ek	‘navigator’
kurafi	kurajpp-ek	‘roach’
avi	ajvv-ek	‘sunlight’
Velars		
boki	bojkk-ek	‘bulb’
buraki	burajkk-ek	‘perch (fish)’
vaagi	vaajgg-ek	‘strength’
fula ⁿ gi	fulajng-ek	‘flying fish’

- b. If the consonant is dental, it becomes palatal (5).

(5) Palatalization of dentals with gemination (ti+V → tʃi+V)

Dentals		
eti	ettʃ-ek	‘thing’
rodi	roddʒ-ek	‘thread’
doodi	dooddʒ-ek	‘ray’
fani	fajɲ-ek	‘worm’
duni	duɲɲ-ek	‘bow’
duuni	duɲɲ-ek	‘bird’
ha ⁿ di	handʒ-ek	‘bluefin trevally’
fali	fajj-ek	‘oar’

- Palatalization and gemination are interdependent: the consonant can only geminate if /i/ vacates its timing slot; /i/ can only vacate its timing slot if it can pass its features to another segment (via palatalization).

- Thus, palatalization & gemination are both blocked if:
 - a. The preceding syllable is closed (consonant is already geminate) (6).

(6) No palatalization or gemination after closed syllables

nappi	nappi-j-ek	‘bad food’
bimbi	bimbi-j-ek	‘millet’
batti	batti-j-ek	‘light’
buddi	buddi-j-ek	‘mind’
bonti	bonti-j-ek	‘unopened frond’
kulli	kulli-j-ek	‘emergency’
dʒinni	dʒinni-j-ek	‘jinni’
fəŋgi	fəŋgi-j-ek	‘frond’

- b. The preceding consonant is retroflex (impervious to palatalization) (7).

(7) No palatalization or gemination after retroflex consonants

baɖi	baɖi-j-ek	‘gun’
faɭi	faɭi-j-ek	‘slice’
buri	buri-j-ek	‘tier’

4. The Natural Classes

- What do these patterns tell us about natural coronal classes?
- Coronals form a natural class consisting of dentals, palatals, and retroflexes: labials & velars are transparent to palatalization, but coronals are opaque.

(8)

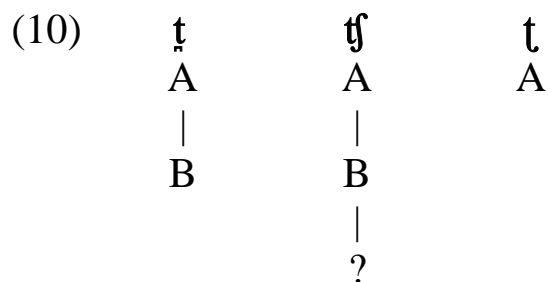
$\underset{A}{t}$	$\underset{A}{tʃ}$	$\underset{A}{ɖ}$
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- Dentals and palatals form a sub-class: $\underset{A}{t} \rightarrow \underset{A}{tʃ}$.

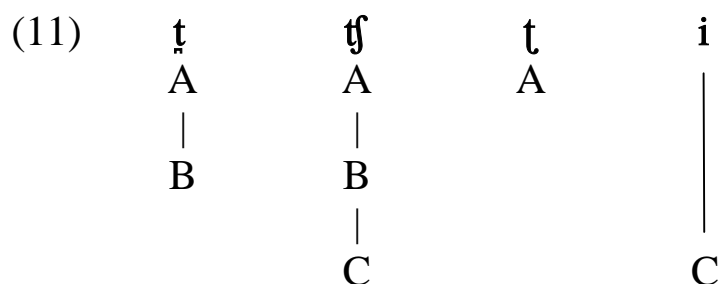
(9)

$\underset{A}{t}$	$\underset{A}{tʃ}$	$\underset{A}{ɖ}$
$\underset{B}{t}$	$\underset{B}{tʃ}$	

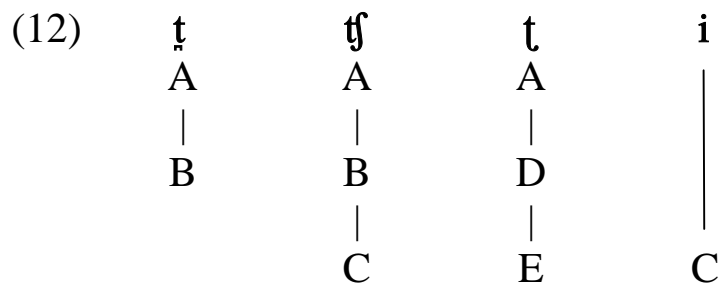
- Palatals are marked in relation to dentals: they are derived from dentals by the addition of some feature(s) from /i/ (they are dentals *plus something*).



- Palatals and /i/ form a class: the spreading of some feature(s) from /i/ to a dental yields a palatal. Thus, the palatal and /i/ share some feature(s), and this feature is what distinguishes palatals from dentals.

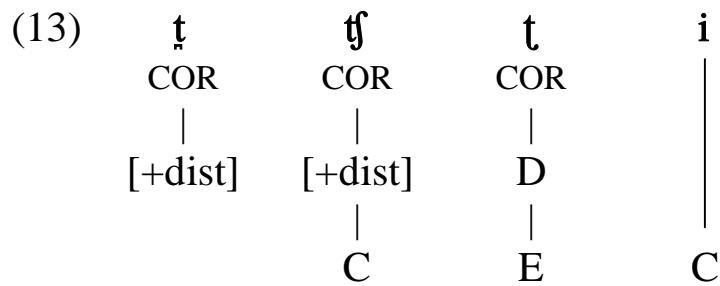


- The class that unites palatals and /i/ excludes retroflexes: retroflexes resist palatalization. They are neither members of B nor C, and must be marked by something else. Assuming binary features, they might be marked by the antagonist to B, say D, and/or the antagonist to C, say E.

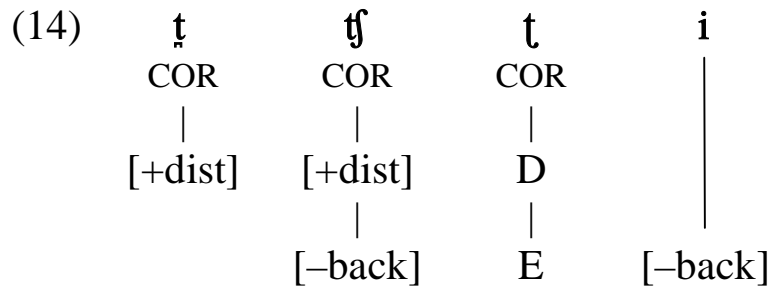


5. The Features

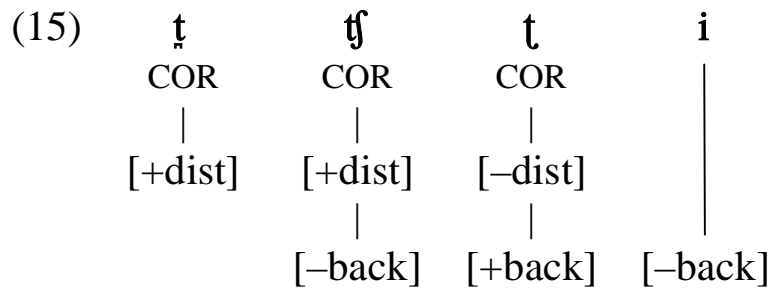
- What features correspond to A, B, C, D, and E?
- Class A corresponds naturally to the coronal articulator.
- The feature [+distributed] accurately predicts class B.



- Class C cannot be [–anterior] since this would include retroflexes.
- The feature [–back] accurately predicts class C.



- Class D cannot be [–anterior] since this would unite retroflexes with palatals (and potentially /i/).
- D could be [–dist]. This would reflect the fact that retroflexes are apical.
- E could be [+back]. This would reflect that fact that retroflexes are articulated with a retracted tongue body (e.g., Hamann 2003).



- If the palatalization feature is [–back], and retroflexes are inherently [+back], then we predict that retroflexes should block palatalization.

6. Retroflexion in Indo-Aryan

- Is there independent evidence for these features in other Indo-Aryan languages? Yes.

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