

The Phonetics and Phonology of Secondary Articulations in Abkhaz

Bert Vaux, Harvard University

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Abkhaz employs as part of its rich consonantal inventory two secondary articulations, palatalization and labialization. Each of these secondary articulations behaves as a natural class with respect to rules and constraints of Abkhaz phonology, yet each also has a number of different phonetic and phonological manifestations. The purpose of this paper is to present the basic phonetic and phonological properties of these secondary articulations, and to develop a theory of representations for these articulations that captures their underlying unity and surface diversity. The data are drawn from my fieldwork with Zehni Pəsiypa, one of the last speakers of the previously unstudied C°əž'ə dialect of Abkhaz.

1. Introduction

Before launching into the technical details of my presentation, I'd first like to provide a brief sketch of the language from which I'll be drawing my data. Abkhaz has three main dialects: Bzyp, Abzhywa, and Sadz (cf. Chirikba 1996). The two literary dialects, Bzyp and Abzhywa, are relatively well-studied. Sadz, on the other hand, has been the subject of only one study, a useful article by Chirikba (1996). According to Chirikba, Sadz has two subdialects: Khaltsys and C°əž'ə. C°əž'ə was originally spoken on the Kudepsta River (Abkhaz *k'°ədəpsta*), just north of the present border of Abkhazia. After the exodus from Russia to Turkey in the 1860's, it was spoken until recently in three villages near the Turkish town of Bilecik in northwestern Turkey: Elmabahça, Künceğiz, and Hasandere.

(1)



According to Mr. Pəsiypa, Elmabahça currently has 20 speakers of Abkhaz, and Künceğiz has 65; Chirikba 1996 states that Elmabahça no longer contains any Abkhaz speakers. Mr. Pəsiypa's

mother hails from Elmabahça, and his father from Künceğiz; Mr. Pəsiypa himself moved to the United States some ten years ago, and is currently approximately forty years old.

C^oəž'ə contains two vowel phonemes, /a/ and /ə/. The phonemic status of ə is disputed, but will be assumed here for ease of exposition. The two vowels appear to be specified only for the feature [low]: /a/ is [+low], and /ə/ is [-low]. If unaffected by neighboring consonants, the vowels surface as [+low, -back, -ATR] [a] and [+high, +back, -round] [ɨ] respectively. However, each vowel typically acquires the remaining vocalic features {[high], [back], [round]} from the secondary articulations of an immediately preceding consonant, if one is present. For example, /a-q^j:ə/ 'shit' surfaces as [a-q^j:ɛ], with the schwa receiving the feature specifications [-back, -round, -high] from the preceding glottalized palatalized voiceless uvular stop.

C^oəž'ə contains the 63 consonant phonemes in (2).

(2)	<i>b</i>	<i>p</i>	<i>p'</i>				<i>v</i>	<i>f</i>	<i>m</i>			<i>w</i>
	<i>d</i>	<i>t</i>	<i>t'</i>	<i>dʒ</i>	<i>ts</i>	<i>ts'</i>	<i>z</i>	<i>s</i>	<i>n</i>	<i>r</i>	<i>l</i>	<i>j</i>
	<i>d^o</i>	<i>t^o</i>	<i>t'^o</i>	<i>dʒ^o</i>	<i>ts^o</i>	<i>ts'^o</i>	<i>z^o</i>	<i>s^o</i>				
				<i>dʒ</i>	<i>tʃ</i>	<i>tʃ'</i>	<i>ʒ</i>	<i>ʃ</i>				
				<i>dʒ^o</i>	<i>tʃ^o</i>	<i>tʃ'^o</i>	<i>ʒ^o</i>	<i>ʃ^o</i>				
				<i>dʒ^j</i>	<i>tʃ^j</i>	<i>tʃ'^j</i>	<i>ʒ^j</i>	<i>ʃ^j</i>				
	<i>g</i>	<i>k</i>	<i>k'</i>									
	<i>g^o</i>	<i>k^o</i>	<i>k'^o</i>									
	<i>g^j</i>	<i>k^j</i>	<i>k'^j</i>									
			<i>q'</i>				<i>κ</i>	<i>χ</i>				
			<i>q'^o</i>				<i>κ^o</i>	<i>χ^o</i>				
			<i>q'^j</i>				<i>κ^j</i>	<i>χ^j</i>				
								<i>ħ</i>				
								<i>ħ^o</i>				
								<i>y^o</i>				

< ' > = glottalization

< ° > = labialization

< ^j > = palatalization

What is traditionally transcribed as <y^o> is phonemically a [+round] voiced pharyngeal fricative, but phonetically a [+round, -back] glide, IPA [ɣ]. [ILLUSTRATE ON COMPUTER]

In word-initial position the voiced stops are typically slightly imploded, and the non-glottalized voiceless stops are heavily aspirated. [DEMONSTRATE WITH SPECTROGRAMS AND COMPUTER RECORDINGS]

In word-final position, voiced stops are typically devoiced and aspirated.

Unlike the literary dialects, C^oəž'ə possesses a phonemic length contrast in consonants, as illustrated in (3).

- (3) *a-fə-rá* ‘get angry’ : *a-š:ə-rá* ‘build a fence around’
á-χ°a ‘ashes’ : *á-χ°:a* ‘worm’
á-la ‘eye’ : *a-l:á* ‘dog’

Geminates are pronounced as singletons in initial position, e.g. *la-k* ‘dog-indefinite’.

In many cases C°əž’ə has a geminate corresponding to a singleton in the literary dialects, as shown in (4).

(4)	C°əž’ə	Abzhywa	gloss
	<i>a-f’:á</i>	<i>a-f’á</i>	blood
	<i>a-f:á</i>	<i>a-fá</i>	lightning
	<i>a-l:á</i>	<i>a-lá</i>	dog
	<i>a-dz:á</i>	<i>a-dzá</i>	water
	<i>a-k°:á</i>	<i>a-k°á</i>	rain
	<i>a-b’:ə-rá</i>	<i>a-b’-rá</i>	get angry at someone
	<i>á-χ°:a</i>	<i>á-χ°a</i>	worm
	<i>a-χ°:á</i>	<i>a-χ°á</i>	food, hair
	<i>a-χ’:á</i>	<i>a-χ’á</i>	gold
	<i>a-χ:á</i>	<i>a-χá</i>	bullet

There are also many cases where an Abzhywa geminate corresponds in C°əž’ə to a sequence of three units of the same segment, e.g. Abzhywa *á-tf’i:a-ra* ‘laugh (v)’ : C°əž’ə *á-tf’iətf’i:a-ra*.

Certain consonants can be syllabic in C°əž’ə, as exemplified in (5). [PLAY RECORDINGS]

(5)	underlying form	surface form	gloss
	<i>mts’-k’</i>	[<i>mts’k’</i>]	fly.that.hangs.around.dogs’ eyes-indefinite
	<i>y°-bá</i>	[<i>ybá</i>]	2 (cardinal)
	<i>ʒ’-k’</i>	[<i>ʒ’k’</i>]	spleen-indefinite

2. Labialization

With this background in hand, the first secondary articulation I’d like to consider is labialization. [PLAY PLAIN VS LABIALIZED CONSONANT PAIRS]

A number of phonological processes and constraints clearly indicate that the labialized consonants form a phonological class in Abkhaz. For instance, all of the labialized consonants resist combination with palatalization; thus, *k* for example can be palatalized /*kʲ*/ or labialized /*kʷ*/ but not palatalized and labialized simultaneously */*kʲʷ*/. (However, palatalization and labialization can cooccur phonetically, as in (6ii); in these cases, the phonetic onset of palatalization appears to begin before labialization.) I assume that the phonological class of labialized consonants is characterized by a [+round] secondary articulation. However, we

represent labialization with <°> rather than <^w> because this unitary phonological class in fact has four distinct phonetic manifestations, summarized in (6):

(6) surface form	segments affected
i. [+round, +back]	dorsals ($g^{\circ} k^{\circ} k'^{\circ} q^{\circ} b^{\circ} \chi^{\circ}$)
ii. [+round, -back]	pharyngeals (y°, h°), certain coronals
iii. [+round, +dist]	[+cont] coronals ($s^{\circ}, z^{\circ}, ts^{\circ}, dz^{\circ}, f^{\circ}, \zeta^{\circ}$)
iv. [-round, +back, +cons]	dental stops ($t^{\circ}, t'^{\circ}, d^{\circ}$; the result is a coarticulated dental-labial stop with a [+back] secondary articulation)

One of the distinctions in (6) is reflected in the orthography: class (6i) employs the grapheme <y> to represent the secondary articulation, whereas classes (6ii-iv) employ the grapheme <ə>. We can say that <y> represents the class of [+round, +back] segments, and <ə> represents all other phonemically [+round] consonants.

The change in (1b) does not apply following uvulars, pharyngeals, and labialized coronal stops ($d^{\circ} t^{\circ} t'^{\circ}$); in this situation the phonetic quality of the diphthong is approximately [ij]¹.

One might suspect that the distinction between *s* and *š* would be lost when labialized, since according to (6iii) both s° and f° are [-anterior]. In fact, the two are phonetically distinct; the auditory impression is that [s°] is palatalized whereas [f°] is not. I attribute this impressionistic difference to the fact that s° is [-distributed] whereas f° is [+distributed].

Note that the labialized segments in (6iv) are not [+round]. The manifestation of labialized coronals as doubly-articulated coronal-labial stops is paralleled in the related language Ubykh (Colarusso 1988:152) as well as many other languages (cf. Sagey 1986:224).

The central problem raised by the phonetic variations in (6) is how to account for the four distinct manifestations of the underlying [+round] secondary articulation. I suggest that since surface representations must be fully specified for all relevant features, the secondary articulation, which is underlyingly specified only as [+round], receives its other feature specifications from the primary articulation with which it is associated. This process is analogous to Kuipers' (1960) interpretation of vowel coloring in Kabardian and Abkhaz, and straightforwardly accounts for the behavior of most of the consonants in (6); labialized dorsals, for example, will surface as [+back] because the plain dorsal consonants are [+back] in Abkhaz. However, the behavior of pharyngeals in (6ii) raises two problems: we do not necessarily expect pharyngeals to be [-back], and we do not expect labialized consonants to surface as [-back], since the secondary labial and palatal articulations are phonologically incompatible in Abkhaz.

I account for the former problem by drawing parallels with other languages wherein pharyngeals trigger fronting, and I then consider the possibility that the features responsible for pharyngeal activity and fronting ([RTR] and [-back] respectively) share some common muscular basis.

Pharyngealization = retraction of tongue root or where the constrictor muscles of the pharynx reduce its diameter (Laver 326-7) or lateral compression of the faucal pillars and some raising of the larynx (Catford 1977:193)

¹ It is possible that certain other consonants also block the change in (1b); however, the set listed here is all that we can be certain of at the moment.

Faucal pillars = pair of muscles which link the soft palate to the larynx, whose function is to lower the velum or raise the larynx. They run vertically down the side walls of the pharynx, and in contraction narrow the side-to side dimension of the pharynx. (Laver 328)

Problem: pharyngealization generally centralizes front vowels (Laver 327)

**Pharyngealization in Caucasian languages “tends to impart a somewhat “fronted” [advanced] quality to back vowel, both in terms of auditory impression and formant shifts in spectrograms” (Catford 1977:182)

Laver 1994:330: An apparent contradiction thus exists between the auditory effects of pharyngealization in Arabic (where it supports the articulatory evidence that the tongue body and blade are retracted), and its effects in Caucasian languages (where the auditory effect gives an impression of fronting of the tongue body). There are several possible explanations. One is that pharyngealization in Arabic is chiefly a matter of an articulatory adjustment of the body of the tongue towards the back wall of the pharynx, but that pharyngealization in Caucasian languages is achieved principally by an adjustment of the root of the tongue. If this movement of the tongue root is associated with a raising of the larynx, then the consequence for the tongue body could well be a rotational adjustment upwards and forwards, resulting effectively in the articulatory (and hence auditory and acoustic) fronting of vocoids. Another possibility is that retraction of tongue root combined with vocal tract shortening by raising the larynx results in an acoustic adjustment which is analogous to the acoustic correlate of fronting of the tongue body.

The latter problem requires an ordering of the constraint on combining secondary articulations relative to the rule that spreads the features of the primary articulation to the secondary articulation.

3. Palatalization

With palatalization we again confront a unitary phonological class with diverse phonetic manifestations. [PLAY CONTRASTS OF PLAIN AND PALATALIZED CONSONANTS]

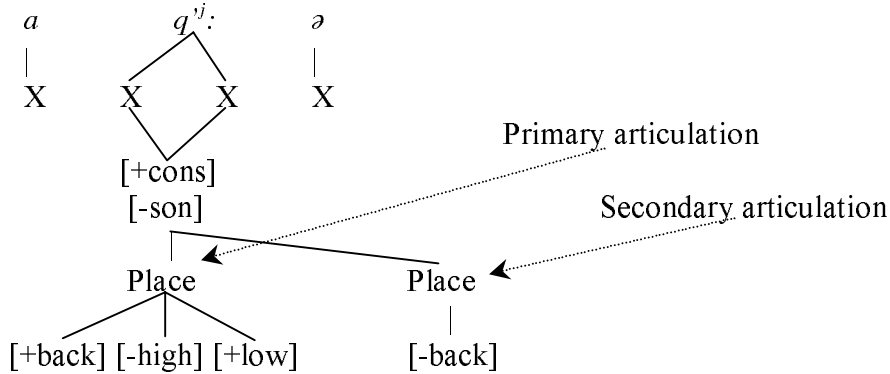
The unitary nature of the class of palatalized consonants is reflected in the orthography, which marks all such segments with a .

In phonological terms, palatalization is characterized by a dorsal, [-back] secondary articulation. This articulation translates straightforwardly into a palatal secondary articulation on the phonetic level, except in the case of the palatalized glottalized uvular stop q' , which surfaces as [+back]. It differs from its non-palatalized counterpart q' , however, in triggering the appearance of [-back] on an adjacent vowel, as we have already seen.

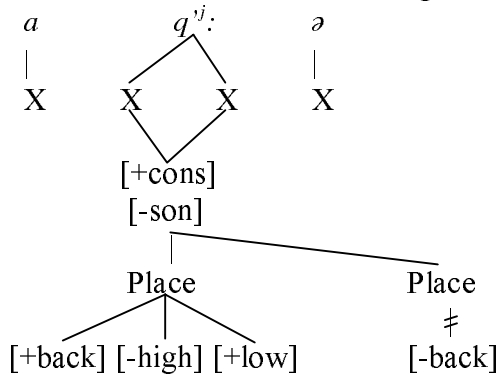
Colarusso (1975) suggests that this segment is actually [+ATR, +back], but this analysis loses the unifying definition of palatalized segments as being [-back], and fails to account for the fact that the palatalized uvular stop appears to spread [-back] to a following vowel.

I suggest instead that the palatalized uvular stop is underlyingly dorsal, [-ATR, -high, +back], with a [-back] secondary articulation. The basic problem with the palatalized uvular stop is then that the [+back] specification of the uvular primary articulation is incompatible with the [-back] specification of the secondary articulation. In order to resolve this incompatibility, the [-back] component is delinked. It is then free to attach to a following vowel if one is present, thereby accounting for the fronting mentioned above.

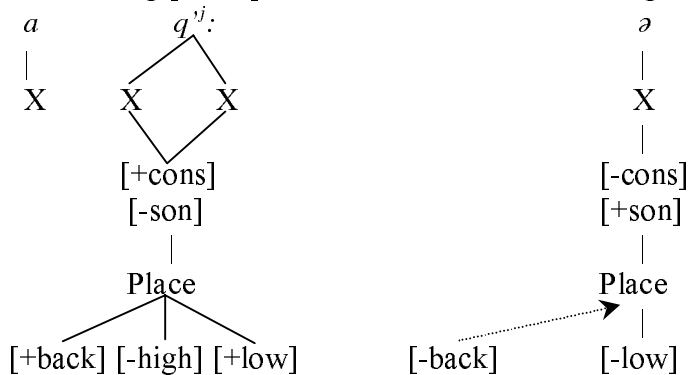
(7) a. underlying form /a-q^j:ə/ 'shit'



b. * $[+back, -back] \rightarrow$ delinking of the secondary articulation



c. floating [-back] feature associates to following vowel



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