L2/20-116

Expansion of the extIPA and VoQS

Kirk Miller, kirkmiller@gmail.com

Martin Ball, m.j.ball@bangor.ac.uk 2020 Apr 14

This is a request for additions to Unicode to support recent expansion of the extIPA (Extensions to the IPA for Disordered Speech), including superscript modifier letters for unusual releases of plosives, and the VoQS (Voice Quality Symbols). The JIPA articles on the 2015 revision of the extIPA and the 2016 expansion of the VoQS are publicly available online from Cambridge University Press. (See references.)

Thanks to Deborah Anderson of the Universal Scripts Project for her assistance.

As summarized in the JIPA article, *the motivation behind the original 1990 version of the extIPA symbols, and subsequent revisions to them, has been to supply transcriptional resources to those needing to describe disordered speech of all types. Symbols have been chosen following requests from speech-language pathologists and clinical phoneticians.*

As for the recent update, *at the Oslo conference of the International Clinical Phonetics and Linguistics Association (ICPLA) in 2010, a special panel on the transcription of disordered speech reviewed the extIPA symbols and the chart that displays them, with input also from the audience at the panel presentation (Ball et al. 2010). The results of this review, together with informal consultations with colleagues, led to a set of suggested changes. These were presented in a poster in June 2016 at the ICPLA conference in Halifax, Nova Scotia (Ball et al. 2016), and approved by the membership.*

The changes were presented as a motion at the Business Meeting (all ICPLA members present at conference) and approved *nem. con.*

Combining diacritics

◌᫁ U+1AC1 COMBINING LEFT PARENTHESIS BELOW LEFT. Figure 3.

◌᫂ U+1AC2 COMBINING RIGHT PARENTHESIS BELOW RIGHT. Figures 3, 5.

◌᫃ U+1AC3 COMBINING LEFT PARENTHESIS ABOVE LEFT. Figure 3.

◌᫄ U+1AC4 COMBINING RIGHT PARENTHESIS ABOVE RIGHT. Figure 3.

The Script Ad Hoc committee recommended that these diacritics be so named and assigned to the Combining Diacritical Marks Extended block, starting with U+1AC1.

Encoding order

Because the combining parentheses are intended to modify another diacritic, the combining parentheses should appear after that diacritic in the backing store, regardless of whether they precede it graphically. Thus,

Z̥᫂ Z + ◌̥ + ◌᫂

Z̥᫁ Z + ◌̥ + ◌᫁ *etc.*

Per the advice of the Script Ad Hoc committee, we recommend that page 333 of the Core Spec be amended to instruct users to use U+1ABB COMBINING PARENTHESES ABOVE and U+1ABD COMBINING PARENTHESES BELOW for paired parentheses, as is standard practice for Teuthonista (documented in TUS §7.9 figure 7-13), rather than combining the separate characters. Thus,

Z̥᪽   Z + ◌̥ + ◌᪽

For the above, *do not use*:

◌̥ + ◌᫃ + ◌᫄

◌᫃ + ◌̥ + ◌᫄

should we also note order for interdental diacritics in e.g. <r̪͆>?

Baseline letters

⅁ U+AB6C LATIN LETTER TURNED SMALL CAPITAL G. Figure 1.

ꓘ U+AB6D LATIN SMALL LETTER REVERSED K. Figure 2.

ᘓ U+AB6E LATIN SMALL LETTER REVERSED G. Figure 2.

ŋ U+AB6F LATIN SMALL LETTER REVERSED ENG. Figure 2.

𝼀 U+A7CB LATIN SMALL LETTER FENG DIGRAPH WITH TRILL. Figure 1.

ɮ U+A7CC LATIN SMALL LETTER LEZH WITH RETROFLEX HOOK. Figure 1.

ʎ U+A7CD LATIN SMALL LETTER TURNED Y WITH BELT. Figures 1, 6–8.

ʟ U+A7CE LATIN LETTER SMALL CAPITAL L WITH BELT. Figures 1, 9–11.

The Script Ad Hoc committee recommended that the first four characters be placed in the Latin Extended-E block and the remainder in Latin Extended-D starting at U+A7CB.

Modifier letters

ᴀᴀ U+A7CF MODIFIER LETTER SMALL CAPITAL AA. Figure 4.

ɬ U+A7D0 MODIFIER LETTER SMALL L WITH BELT. Figures 12–17.

ɮ U+A7D1 MODIFIER LETTER SMALL LEZH. Figure 14.

ꞎ U+A7D2 MODIFIER LETTER SMALL L WITH RETROFLEX HOOK AND BELT. See Comment.

ɮ U+A7D3 MODIFIER LETTER SMALL LEZH WITH RETROFLEX HOOK. See Comment.

ʎ U+A7D4 MODIFIER LETTER SMALL TURNED Y WITH BELT. See Comment.

ʟ U+A7D5 MODIFIER LETTER SMALL CAPITAL L WITH BELT. Figure 2.

ʪ U+A7D6 MODIFIER LETTER SMALL LS DIGRAPH. Figure 2.

ʫ U+A7D7 MODIFIER LETTER SMALL LZ DIGRAPH. Figure 2.

ʩ U+A7D8 MODIFIER LETTER SMALL FENG DIGRAPH. See Comment.

Properties

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1AC1;COMBINING LEFT PARENTHESIS BELOW LEFT;Mn;220;NSM;;;;;N;;;;;

1AC2;COMBINING RIGHT PARENTHESIS BELOW RIGHT;Mn;220;NSM;;;;;N;;;;;

1AC3;COMBINING LEFT PARENTHESIS ABOVE LEFT;Mn;230;NSM;;;;;N;;;;;

1AC4;COMBINING RIGHT PARENTHESIS ABOVE RIGHT;Mn;230;NSM;;;;;N;;;;;

AB6C;LATIN LETTER TURNED SMALL CAPITAL G;Ll;0;L;;;;;N;;;;;

AB6D;LATIN SMALL LETTER REVERSED K;Ll;0;L;;;;;N;;;;;

AB6E;LATIN SMALL LETTER REVERSED G;Ll;0;L;;;;;N;;;;;

AB6F;LATIN SMALL LETTER REVERSED ENG;Ll;0;L;;;;;N;;;;;

A7CB;LATIN SMALL LETTER FENG DIGRAPH WITH TRILL;Ll;0;L;;;;;N;;;;;

A7CC;LATIN SMALL LETTER LEZH WITH RETROFLEX HOOK;Ll;0;L;;;;;N;;;;;

A7CD;LATIN SMALL LETTER TURNED Y WITH BELT;Ll;0;L;;;;;N;;;;;

A7CE;LATIN LETTER SMALL CAPITAL L WITH BELT;Ll;0;L;;;;;N;;;;;

A7CF;MODIFIER LETTER SMALL CAPITAL AA;Lm;0;L;;;;;N;;;;;

A7D0;MODIFIER LETTER SMALL L WITH BELT;Lm;0;L;<super> 026C;;;;N;;;;;

A7D1;MODIFIER LETTER SMALL LEZH;Lm;0;L;<super> 026E;;;;N;;;;;

A7D2;MODIFIER LETTER SMALL L WITH RETROFLEX HOOK AND
     BELT;Lm;0;L;<super> A78E;;;;N;;;;;

A7D3;MODIFIER LETTER SMALL LEZH WITH RETROFLEX HOOK;Lm;0;L;<super>
     A7CC;;;;N;;;;;

A7D4;MODIFIER LETTER SMALL TURNED Y WITH BELT;Lm;0;L;<super>
     A7CD;;;;N;;;;;

A7D5;MODIFIER LETTER SMALL CAPITAL L WITH BELT;Lm;0;L;<super>
     A7CE;;;;N;;;;;

A7D6;MODIFIER LETTER SMALL LS DIGRAPH;Lm;0;L;<super> 02AA;;;;N;;;;;

A7D7;MODIFIER LETTER SMALL LZ DIGRAPH;Lm;0;L;<super> 02AB;;;;N;;;;;

A7D8;MODIFIER LETTER SMALL FENG DIGRAPH;Lm;0;L;<super> 02A9;;;;N;;;;;
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Suggested annotations

(work out wording, waiting on feedback for U+A7F8. Should I add Figure to support x-height?)

U+A7CF MODIFIER LETTER SMALL CAPITAL AA ~ <super> small cap U+A733 ꜳ LATIN LETTER AA ~ <super> small cap U+A732 Ꜳ LATIN CAPITAL LETTER AA.

U+A7F8 MODIFIER LETTER CAPITAL H WITH STROKE – actually small-cap in VoQS. Add point about case not being distinctive. Point to U+1D78 MODIFIER LETTER CYRILLIC EN (next).

U+1D78 MODIFIER LETTER CYRILLIC EN – add "Latin" to the set of scripts in the ScriptExtensions property, note use in IPA. Resembles U+1D45 MODIFIER LETTER CAPITAL H in Latin script, except for not being a small cap. [repeated in modifier-letter proposal]

U+0418 CYRILLIC CAPITAL LETTER I – note VoQS usage.

Comment on range of modifier letters

Modifier extIPA letters are described in Ball et al. (2018), p. 162, §3.5, para 2:

> *The next four lines* [of the 'other sounds' chart, Figure 2] *illustrate how existing extIPA symbols can be used to transcribe a range of unusual plosive release types: lateral fricated release, lateral and median release, interdental aspiration, and linguolabial affricates.*

The 'other sounds' chart (Figure 2) provides ⟨kᵸ tˡˢ dᵡ⟩ as specific examples, followed by 'etc.' to show this is to be taken as a productive pattern. The Script Ad Hoc Committee asked for clarification of what exactly the 'etc.' was intended to cover. Martin Ball, primary author of the article in question, responded (2020 Feb 26),

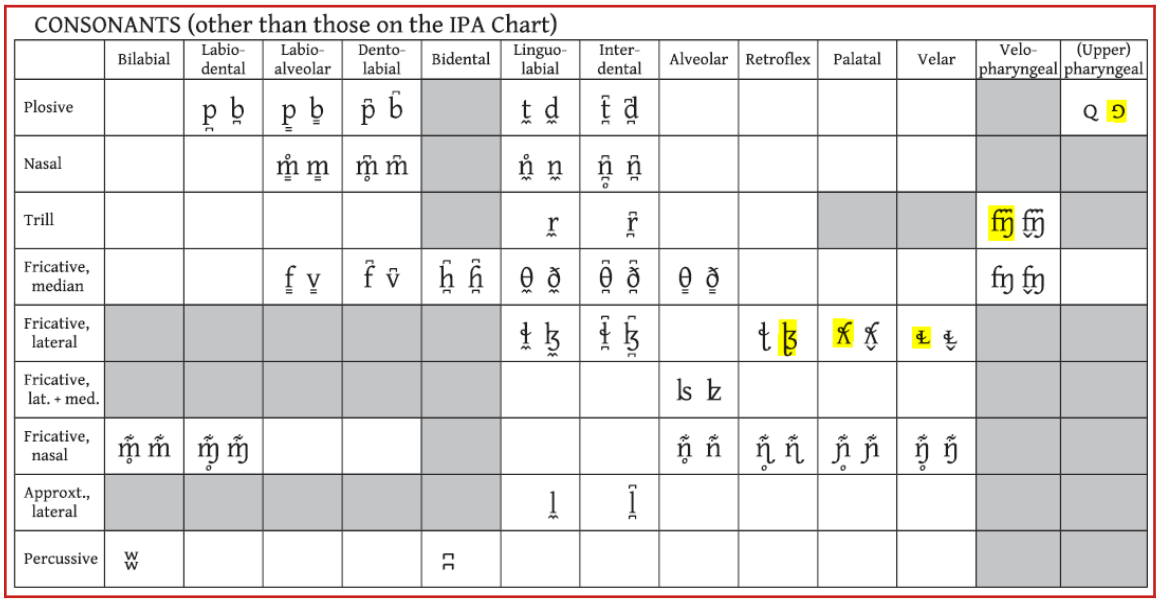
> *As regards the Unicode Committee's query concerning superscript symbols from the extIPA chart and the JIPA article describing them: My view is that the different fricative rows of the consonant chart should be supported in superscript form to allow the transcription of fricated release, as provided for in the 'other sounds' chart and summarized in the accompanying text.*

We therefore request the fricative letters of the extIPA chart (Figure 1) that do not already have modifier characters in Unicode: alveolar ⟨ᶴ, ᶶ⟩ and ⟨ˢ, ᶻ⟩, retroflex ⟨ᶵ, ᶽ⟩, palatal ⟨ᶭ⟩, velar ⟨ᵸ⟩ and velo-pharyngeal ⟨ᶯ⟩. The velar and the four alveolars are illustrated in the figures below. As the extIPA is an extension of the IPA, all IPA fricatives should have modifier variants. The two IPA fricatives that are not yet supported, ⟨ʰ⟩ and ⟨ʱ⟩, are illustrated in a separate request.

At this time, there does not appear to be a need for modifier variants of the pharyngeal plosives, velo-pharyngeal trill or percussives highlighted in Figure 1, nor of the velodorsal stops in Figure 2.

Figures

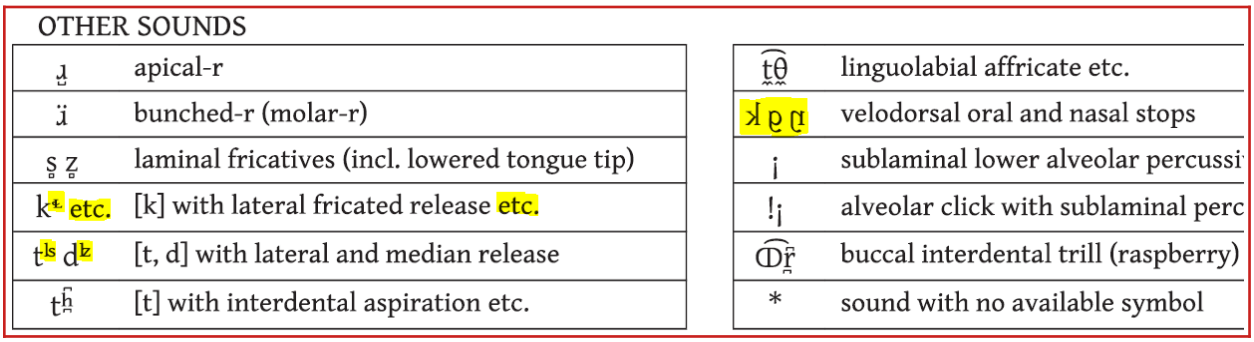
ExtIPA and VoQS charts



CONSONANTS (other than those on the IPA Chart)

	Bilabial	Labio-dental	Labio-alveolar	Dento-labial	Bidental	Linguo-labial	Inter-dental	Alveolar	Retroflex	Palatal	Velar	Velo-pharyngeal	(Upper) pharyngeal
Plosive		p̪ b̪	p̟ b̟	p̪͡f b̪͡v		t̼ d̼	t̪ d̪						ʠ ʛ
Nasal			m̟̊ m̟	m̪̊ m̪		n̼̊ n̼	n̪̊ n̪						
Trill						r̼	r̪					ʩ ʭ	
Fricative, median			f̟ v̟	f̪ v̪	h̪ ɦ̪	θ̼ ð̼	θ̪ ð̪	θ̟ ð̟				ɸ̞ β̞	
Fricative, lateral						ɬ̼ ɮ̼	ɬ̪ ɮ̪		ɬ ɮ	ʎ̝ ʟ̝	ʟ̠ ʟ̠̝		
Fricative, lat. + med.								ɬ̟͡s ɮ̟͡z					
Fricative, nasal	m̥̃ m̃	m̥̃ʲ m̃ʲ						ñ̥ ñ	ɳ̊̃ ɳ̃	ɲ̊̃ ɲ̃	ŋ̊̃ ŋ̃		
Approxt., lateral						l̼	l̪						
Percussive	ʬ				ɡ̪								

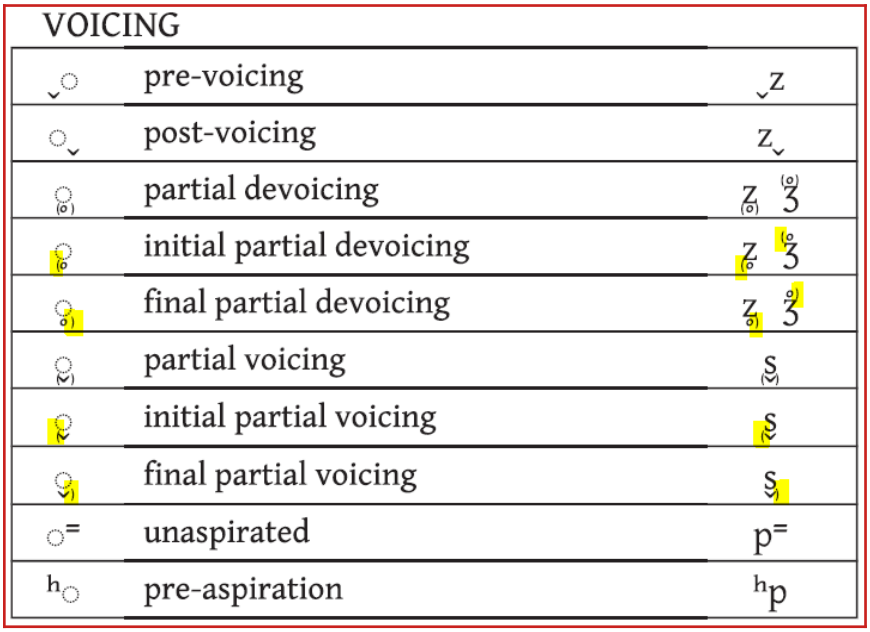
Figure 1. Ball et al. (2018), p. 160, main consonant chart. Unsupported characters are ⟨ɔ⟩ and ⟨ɮ̥, ʎ̝, ʟ̠̝⟩ (see p. 161, § 3.2, para 1), and ⟨ʩ⟩ (see p. 161, § 3.2, para 3).



OTHER SOUNDS

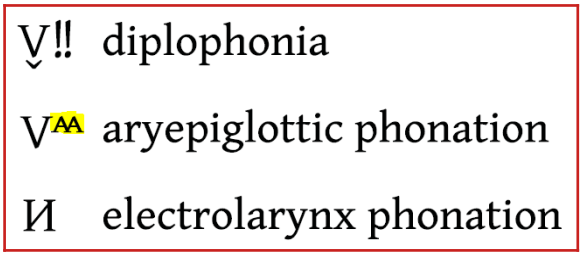
ɻ̪	apical-r	t͡θ̼	linguolabial affricate etc.
j̈	bunched-r (molar-r)	ɻ ɳ̢ ɽ̢	velodorsal oral and nasal stops
s̪ z̪	laminal fricatives (incl. lowered tongue tip)	¡	sublaminal lower alveolar percussi
kˡ̠ etc.	[k] with lateral fricated release etc.	!¡	alveolar click with sublaminal perc
tˡˢ dˡᶻ	[t, d] with lateral and median release	ʗ̪	buccal interdental trill (raspberry)
tʰ̪	[t] with interdental aspiration etc.	*	sound with no available symbol

Figure 2. Ball et al. (2018), p. 160, Other Sounds. The full letters ⟨ɻ, ɳ, ɽ⟩ are not supported. These are described on the top of p. 161. In addition, modifier variants of the new laterals are illustrated as consonant releases. Although both lateral+medial fricatives are given in the chart, as ⟨tˡˢ, dˡᶻ⟩, only one example of the plain laterals is given, ⟨kˡ̠⟩, with the word "etc." added to show this is intended as a general pattern for fricated release of plosives.



VOICING		
◌ᵕ	pre-voicing	zᵕ
◌ᵕ	post-voicing	zᵕ
◌̥	partial devoicing	z̥ ʒ̥
◌̥	initial partial devoicing	z̥ ʒ̥
◌̥	final partial devoicing	z̥ ʒ̥
◌̬	partial voicing	s̬
◌̬	initial partial voicing	s̬
◌̬	final partial voicing	s̬
◌⁼	unaspirated	p⁼
ʰ◌	pre-aspiration	ʰp

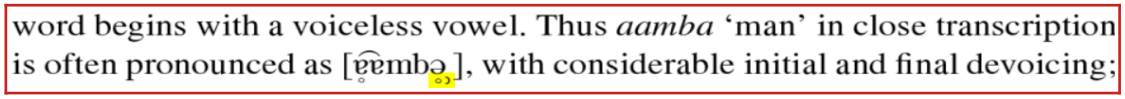
Figure 3. Ball et al. (2018), p. 160, Voicing Diacritics. The unpaired combining parentheses are not supported.



V̬!!	diplophonia
Vᴬᴬ	aryepiglottic phonation
И	electrolarynx phonation

Figure 4. Ball et al. (2017), p. 169. The new VoQS modifier letter for aryepiglottic phonation, ⟨Vᴬᴬ⟩. It is an x-height small capital.

ExtIPA diacritic use outside speech pathology



word begins with a voiceless vowel. Thus *aamba* 'man' in close transcription is often pronounced as [ɐ̥ɐmbɐ̬], with considerable initial and final devoicing;

Figure 5. Bowern (2012: 83). A textual example of a single combining parenthesis in non-disordered speech.

Baseline lateral fricatives ƛ ɬ outside speech pathology

The lateral fricative characters occur in non-disordered speech, at least as elements of affricates. The palatal is phonemic and the velar allophonic in Hadza and Sandawe (Hadza affricates /tƛ, tƛʰ, tƛ'/, Sandawe /dʡ, tƛ, tƛ'/, plus allophone [kɬ'] in both).

Ejectives (cf. 2), fricatives (cf. 3) and prenasalized stops (cf. 2), each only contrast at three places of articulation, while affricates (cf. 3) contrast at only two places of articulation.

(3)

	Labio-dental	Alveolar	Palato-alveolar
Prenasalized affricate		nts ndz	ndʒ
Central affricate		ts dz	dʒ
Lateral affricate			tƛ
Ejective central affricate		ts'	tʃ'
Ejective lateral affricate			tƛ'
Central fricative	f	s	ʃ
Lateral fricative		ɬ	

= tƛ (tʡ)

= tƛ'

Figure 6. Sands (2013: 39). The palatal lateral fricative ⟨ƛ⟩ used as a component of the corresponding affricates. The barely legible form created by the publisher was clarified in a margin note by the author before she distributed copies to colleagues.

1.3.2 Vocalic variation

Vowel height harmony takes place across morpheme boundaries within a phonological word. Mid vowels */e o/* are raised to [ɪ] and [ʊ] before a high vowel */i u/*, e.g. */haŋl 'akwe + pʰi/* [haŋl'akwɪpʰi] 'are gullets', */hik'o + pʰi/* [hik'ʊpʰi] 'are wooden-tipped arrows'. Vowel harmony can spread to earlier syllables, e.g. */loʔo + pʰi/* [lʊʔʊpʰi] 'are long horns', but cf. */tƛ'oma + pʰi/* [tƛ'omapʰi] 'are heads'.

Final vowels often become voiceless [ɪ̥ e̥ ḁ o̥ ʊ̥] in final position, particularly when preceded by a glottal stop or any other voiceless stop.

Figure 7. Sands (2013: 42).

dlaa [cƛ'aʔa] [verb] to sing. *dlaâmo. Dlaate onebee* 'let us sing' (IMP.2pl for HORT.1incl)

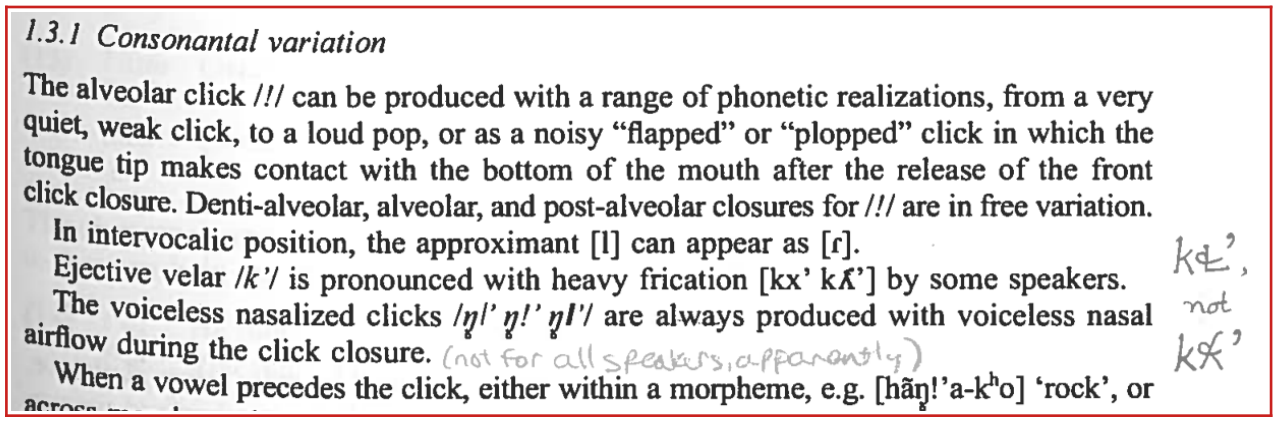
dladlaa, -ko *(dla~dlaa)* ['cƛ'acƛ'a'ʔa] [not a long *a*] a singer (s.o. good at singing, whether or not they're known, or sing often.)

dladlaangu *(dla~dlaa-ngu)* ['cƛ'acƛ'a'ʔaŋg̊u] an ever better singer. positive connotation.

dladlafengu *(dla~dlaa-fe-ngu)* ['cƛ'acƛ'aʔa'feŋg̊u] s.o. who only sings, doesn't work or help out. negative connotation.

Figure 8. Miller et al. (forthcoming). First entry under dictionary heading **Dl**, from the ms distributed in 2016.

Attempts to use the letter ⟨ɬ⟩ in published descriptions of Hadza have so far failed due to a lack of Unicode support, though this will hopefully change with the forthcoming dictionary.



1.3.1 Consonantal variation

The alveolar click /!/ can be produced with a range of phonetic realizations, from a very quiet, weak click, to a loud pop, or as a noisy "flapped" or "plopped" click in which the tongue tip makes contact with the bottom of the mouth after the release of the front click closure. Denti-alveolar, alveolar, and post-alveolar closures for /!/ are in free variation.

In intervocalic position, the approximant [l] can appear as [ɾ].

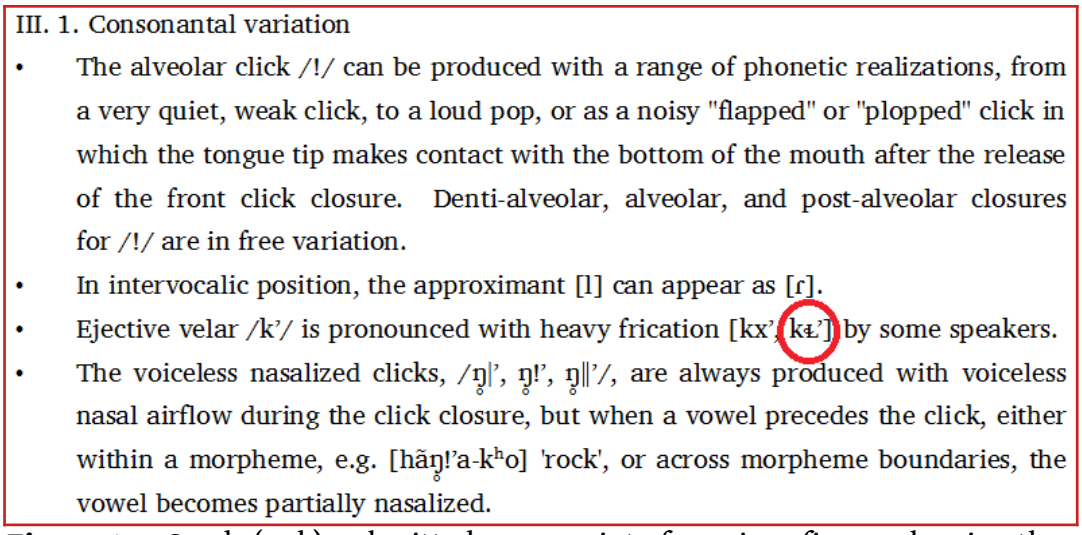
Ejective velar /k'/ is pronounced with heavy frication [kx' kʎ'] by some speakers.

The voiceless nasalized clicks /ŋ̊ǀ' ŋ̊!' ŋ̊ǁ'/ are always produced with voiceless nasal airflow during the click closure. (not for all speakers, apparently)

When a vowel precedes the click, either within a morpheme, e.g. [hãŋ̊!'a-kʰo] 'rock', or

kɬ', not kʎ'

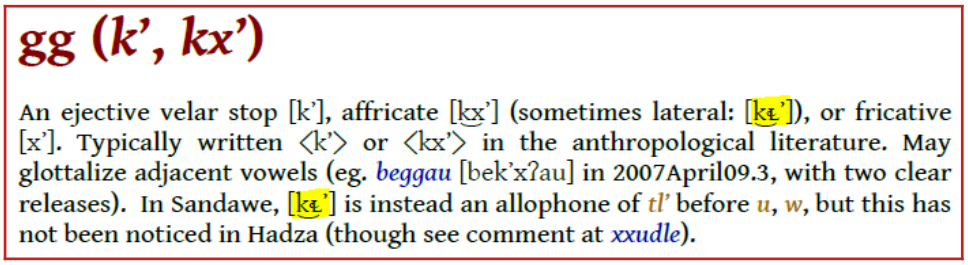
Figure 9. Sands (2013: 41): The velar letter ⟨ɬ⟩ was mistakenly replaced by palatal ⟨ʎ⟩ by the publisher. The submitted manuscript had used ⟨ɬ⟩ (see next figure). The author manually corrected the letter in a margin note before distributing copies to her colleagues.



III. 1. Consonantal variation

- The alveolar click /!/ can be produced with a range of phonetic realizations, from a very quiet, weak click, to a loud pop, or as a noisy "flapped" or "plopped" click in which the tongue tip makes contact with the bottom of the mouth after the release of the front click closure. Denti-alveolar, alveolar, and post-alveolar closures for /!/ are in free variation.
- In intervocalic position, the approximant [l] can appear as [ɾ].
- Ejective velar /k'/ is pronounced with heavy frication [kx', kɬ'] by some speakers.
- The voiceless nasalized clicks, /ŋ̊ǀ', ŋ̊!', ŋ̊ǁ'/, are always produced with voiceless nasal airflow during the click closure, but when a vowel precedes the click, either within a morpheme, e.g. [hãŋ̊!'a-kʰo] 'rock', or across morpheme boundaries, the vowel becomes partially nasalized.

Figure 10. Sands (n.d.), submitted manuscript of previous figure, showing the intended velar lateral affricate.



gg (k', kx')

An ejective velar stop [k'], affricate [kx'] (sometimes lateral: [kɬ']), or fricative [x']. Typically written ⟨k'⟩ or ⟨kx'⟩ in the anthropological literature. May glottalize adjacent vowels (eg. *beggau* [bek'x?au] in 2007April09.3, with two clear releases). In Sandawe, [kɬ'] is instead an allophone of *tl'* before *u*, *w*, but this has not been noticed in Hadza (though see comment at *xxudle*).

Figure 11. Miller et al. (forthcoming). Explanation of dictionary heading **Gg**.

Superscript alveolar lateral fricatives (ᵻ ᵴ)

These superscript variants are sometimes found in normal IPA usage.

Many Mon-Khmer, Berber and Salish languages possess extremely unusual consonant clusters as, for instance, initials in Khasi [bt, dkʰ] (Schmidt 1904, Rabel 1961, Henderson 1976a, b), Semai [gpgh, tˢttˢʔ, kdkrld] (Diffloth 1976a, b), Kammu [tˢʰkb] (Svantesson 1983), Moses-Columbia Salish [xtᶩ, tᶩʼkʷ, kʼtˢ] (Czaykowska-Higgins & Willett 1997), Lillooet [qʼʔ] (van Eijk 1997) or obstruent-only words such

Figure 12. ⟨tᶩ⟩ in Kehrein & Golston (2004: 348).

(48) 'Deaffrication' in ARCHI (Kibrik 1994: 306)[41]

a. notᶩʼ+ˈtˈor > noɬˈdor 'house' *nom. plu.*

(51) Stop/affricate alternations in SAHAPTIN 'consonantal ablaut' (Rigsby & Rude 1996: 672)

kʼ < qʼ:	kʼuxskʼuxs	'ankle'	qʼúχɬ	'knee' (Warm Springs only)
tˢʼ < tᶩʼ:	kútˢʼk	'a smaller piece'	kútᶩʼk	'a piece, chunk'

Figure 13. Kehrein (2002: 38, 39).

Correspondences of Proto-Athapaskan obstruents in SLAVEY SLAVE (Rice 1989: 89)[38]

Proto-Athapaskan	Slave	
	initial	final
*t, *d, *tʼ	t, d, tʼ	t
*tᶩ, *dᶚ, *tᶩʼ, *ɬ, *ɮ	tᶩ, dᶚ, tᶩʼ, ɬ	ɬ

(41) Diachronic spirantization of stops and affricates in SLAVEY SLAVE

	stops		affricates			
strong: [stop]	t, d, tʼ	k, g, kʼ	t̪ᶿ, d̪ᶿ, tᶿʼ	tˢ, dᶻ, tˢʼ	tᶴ, dᶾ, tᶴʼ	tᶩ, dᶚ, tᶩʼ
weak: [cont]	t	x	θ̪	s	ʃ	ɬ

Figure 14. Kehrein (2002: 34), with affricate ⟨dᶚ⟩.

lateral	-	l̪	l	l̠	l̲
nasal stop	p^m	$t̪^n$	t^n	$t̠^n$	$t̲^n$
lateral stop	-	$t̪^ɬ$	$t^ɬ$	$t̠^l$	$t̲^ɬ$

Figure 15. Kehrein (2002: 20). The laterals of Adynyamathanha, with superscript ɬ̪ ɬ ɬ̲. The intervening retroflex sound would presumably have used superscript retroflex ɬ̠ if the inline letter had been available at the time.

Table 2. Navajo stops in an IPA transcription.

	labial	alveolar	palato-alveolar
plain	p	t^h t t'	
laterally released		$t^ɬ$ t^l $t^ɬ$'	
affricated		ts^h ts ts'	$tʃ^h$ tʃ tʃ'

Figure 16. McDonough & Ladefoged (1993: 152). The consonant at the left is phonemically /t^{lh}/, phonetically [$t^ɬ$].

vl. lateral affric. click

vl. asp. lateral affr. click

glottalized vl. lat. aff. cl.

voiced lat. affric. click

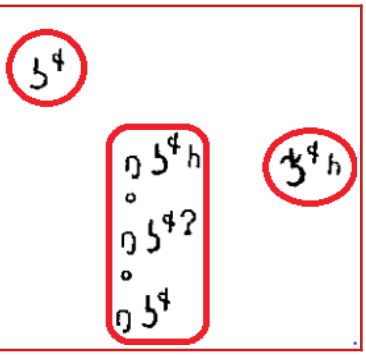


Figure 17. Lateral affricated alveolar clicks in the UPSID. Maddieson (1981: 167).

References

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ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1]
Please fill all the sections A, B and C below.
Please read Principles and Procedures Document (P & P) from http://std.dkuug.dk/JTC1/SC2/WG2/docs/principles.html **for guidelines and details before filling this form.**
Please ensure you are using the latest Form from http://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html**.**
See also http://std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html **for latest *Roadmaps*.**

A. Administrative

1. **Title:** *Expansion of the extIPA and VoQS*
2. Requester's name: *Kirk Miller, Martin Ball*
3. Requester type (Member body/Liaison/Individual contribution): *individual*
4. Submission date: *2020 March 24*
5. Requester's reference (if applicable):
6. Choose one of the following:
   This is a complete proposal: *x*
   (or) More information will be provided later:

B. Technical – General

1. Choose one of the following:
   a. This proposal is for a new script (set of characters):
      Proposed name of script:
   b. The proposal is for addition of character(s) to an existing block: *x*
      Name of the existing block: *Combining Diacritical Marks Extended, Latin Extended-E, Latin Extended-D*
2. Number of characters in proposal: *22*
3. Proposed category (select one from below - see section 2.2 of P&P document):
   A-Contemporary x B.1-Specialized (small collection) B.2-Specialized (large collection)
   C-Major extinct D-Attested extinct E-Minor extinct
   F-Archaic Hieroglyphic or Ideographic G-Obscure or questionable usage symbols
4. Is a repertoire including character names provided? *yes*
   a. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document? yes
   b. Are the character shapes attached in a legible form suitable for review? *yes*
5. Fonts related:
   a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard? *Kirk Miller*
   b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.): *SIL (Gentium release)*
6. References:
   a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? *yes*
   b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached? *yes*
7. Special encoding issues:
   Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)? *yes*

8. Additional Information:

Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also see Unicode Character Database (http://www.unicode.org/reports/tr44/) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

1 Form number: N4502-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05, 2009-11, 2011-03, 2012-01)

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? *no*
   If YES explain
2. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)? *yes*
   If YES, with whom? *Members of the International Clinical Phonetics and Linguistics Association. One author (Ball) is a member of the user community.*
   If YES, available relevant documents:
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included?
   Reference:
4. The context of use for the proposed characters (type of use; common or rare) *phonetic*
   Reference:
5. Are the proposed characters in current use by the user community? *yes*
   If YES, where? Reference: *see References section*
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? *preferred*
   If YES, is a rationale provided?
   If YES, reference:
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)? *no*
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? *no*
   If YES, is a rationale for its inclusion provided?
   If YES, reference:
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? *no*
   If YES, is a rationale for its inclusion provided?
   If YES, reference:
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to, or could be confused with, an existing character?
    If YES, is a rationale for its inclusion provided?
    If YES, reference:
11. Does the proposal include use of combining characters and/or use of composite sequences? *yes*
    If YES, is a rationale for such use provided? *yes*
    If YES, reference: *(see refs)*
    Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?
    If YES, reference:
12. Does the proposal contain characters with any special properties such as control function or similar semantics? *no*
    If YES, describe in detail (include attachment if necessary)
13. Does the proposal contain any Ideographic compatibility characters? *no*
    If YES, are the equivalent corresponding unified ideographic characters identified?
    If YES, reference: