L2/20-117

Unicode request for modifier-letter support

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Background

This request expands on Peter Constable's 2003 'Proposal to Encode Additional Phonetic Modifier Letters in the UCS' (https://www.unicode.org/L2/L2003/03180-add-mod-ltr.pdf), and illustrates characters that were requested in that proposal, but not illustrated and therefore not accepted at the time. Constable's notes (Section F of his proposal) included a good summary:

> In general, modifier letters are used in phonetic transcription to represent secondary aspects of articulation. Secondary articulations may involve aspects of simultaneous articulation that are considered to be in some sense less dominant to the basic sound (for instance, nasalized vowels are typically conceived in terms of their oral counterparts but with the additional secondary articulation of nasalization); or they may involve a transitional articulation of a type that might otherwise be considered a complete speech sound in its own right but for various reasons is interpreted by the linguist as a secondary element in a complex speech sound (for instance, diphthongs, or nasal onset of oral stop consonants). In some situations, the recommended transcription [by the International Phonetic Association] would not involve a modifier letter; thus, many of the proposed characters are not officially approved IPA notation. Nevertheless, the use of these modifier letters if fairly commonplace among linguists, even those that advocate the use of IPA.

It's notable that one of Constable's illustrations, of ⟨ᶿ⟩, came from the IPA *Handbook* despite not being officially part of the alphabet. Such usage goes back over a century, with ⟨ʃ̧ᶜ⟩ given as an example in the IPA chart of 1900, and that among the linguists such usage is 'commonplace among' is Peter Ladefoged, president of the IPA from 1986 to 1991, organizer of the 1989 Kiel convention that overhauled the alphabet, and long-time editor of the IPA *Journal* (JIPA).

Modifier IPA letters may also be used to indicate lightly or incompletely articulated sounds. Several instances of this are included in the illustrations below. All consonant and vowel letters are potential modifiers. Of the IPA suprasegmentals, only the length marks are attested. As far as I can tell, IPA tone letters and prosodic marks have not been used in this fashion.

Modifiers are semantically distinct from their base values and can contrast with them, as illustrated by ⟨ɽ⟩ vs ⟨ᵵ⟩ in the narrow transcription ⟨dɔːəᵵɽẓ⟩ in Figure 22. The productivity of usage is illustrated by the unexpected appearance of ⟨fᵑᵍ⟩ in Figure 36. Precomposed letters such as ⟨ᵊ⟩ may not need support: cf. the precomposed modifiers ⟨ᵊ ᵌ⟩ with the combining diacritic ⟨◌ᵊ ◌ᵌ⟩ in Gentium Plus font. The Script Ad Hoc Committee suggested that ⟨ᵊ ᵌ⟩ be added only if the IPA requests them. Likewise, ejectives seem to be fine with current support, e.g. ⟨kʼ⟩.

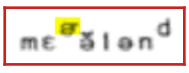


Figure 1. An example of modifier ⟨ᵊ⟩ in McDavid & O'Cain (1980: 121).

I haven't been able to attest any non-pulmonic consonants, though it is easy to imagine their use. For example, Constable's illustration of ⟨ᵍb⟩ for Igbo [g͡b] could be extended to ⟨ᵍ͡b⟩ for those Igbo dialects that realize *gb* as implosive [ɠ͡ɓ]. Likewise, click consonants described in the literature as having a lateral click release might be transcribed ⟨!ǁ⟩, since strict IPA ⟨!ˡ⟩ would suggest a lateral approximant release.

The lateral fricatives ⟨ꞎ ꞏ⟩ are covered by my extIPA request and are not repeated here.

I am only requesting characters I have been able to attest. For Unicode support of the current IPA to be complete, the following characters would be needed in addition to those in this request:

unattested: vowels ɐ ɶ, pulmonic consonants ɻ ʔ ʋ, all implosives (ɓ ɗ ʄ ɠ ʛ) and most clicks (ʘ ǀ ǁ ǂ).

Constable noted superscript variants of Americanist letters. I am requesting several of these as well, as well as conventions from the days of manual typewriters, as these are required to accurately digitize field notes. Unsupported superscript capitals are sometimes used alongside IPA.

Americanist notation

Americanist superscripts not already being proposed for IPA support are ⟨ᵅ ᵷ ᶻ ᶺ ᶭ ᵛ ᵟ ᵗ ᵚ ᵻ ᵻ ᴀ ᴅ ᴇ ᴏ ᵾ ᴡ ˣ ʸ⟩ and perhaps ⟨ᐞ ᵹ⟩.

Americanist transcription is so entrenched that respected sources such as Mithun's 2001 *The Languages of Native North America* and Golla's 2011 *California Indian Languages* continue to use it for basic transcription, with the IPA only for occasional clarification.

In Sapir's writings, a superscript consonant letter is used for a "weakly articulated consonant, echoed consonant, or consonantal glide" (Bright 1994 "Phonetic Key to Publications of Edward Sapir", in *The Collected Works of Edward Sapir*, Walter de Gruyter, p. 515). Similarly, V'ᵛ (where V and ᵛ are any vowel) is used for glottal interruption of a vowel "when the post-glottal portion is weakly articulated". This is also seen in Pike (1947) *Phonemics*, p. 203. More generally, any vowel may be superscript to indicate reduced prominence of the vowel (murmured, echoed) or "vocalic resonance of a preceding consonant", or after a long vowel for an "'over-long' vowel with glide-like rearticulation" (Bright, p. 516). These conventions often carry over to IPA usage.

The American Anthropological Association (*Phonetic Transcription Of Indian Languages*, 1916, p. 9) repeats these recommendations, and goes further: "If it is desired to distinguish between vocalic timbres and weakly articulated voiceless vowels on the one hand and vocalic glides and weakly articulated voiced vowels on the other hand, superior vowels (ᵃ) may be used for the former, inferior vowels (ₐ) for the latter." Two letters that are not supported in superscript are Greek ω (introduced on p. 10); η is used in some texts for nasalization of vowels, but unlike the ogonek I have not seen it superscript.

The following unitary consonant letters of Sapir's do not have Unicode support as diacritics: q (also needed for IPA), x̌ λ ɬ and its allograph ɬ, full cap (voiceless) Ɱ Y, though there is presumably little to no need for Ɱ. The lateral fricatives x̌ λ ɬ/ɬ are ubiquitous. The use of capitals for voiceless sonorants is still common in Americanist transcription, though in later years Sapir would use small caps, and others shifted in the same direction. Many of these would be unsupported, but I'm not sure Unicode support is required if there is no semantic difference between full and small caps.

Americanist small-capital ᴅ (ᴰ), commonly used for a tap (vs Sapir's ř for a flap), is not supported either. Similarly with X as a common alternative for ẋ. (I have always seen this as a full cap even where other letters are small cap, presumably to distinguish from minuscule x.) For Americanist authors who use Greek letters ⟨ᵀ ᵟ ᴠ ᵞ ᶻ⟩ for dentals or laminal alveolars, only ⟨ᵟ⟩ is supported.

Typewriter conventions

In the days of manual typewriters, it was common to create phonetic symbols by overstriking a letter with a hyphen or virgule. These may appear as superscripts for the same reasons as the IPA.

Modifier capitals

Capital letters are used alongside the IPA as wild cards for natural classes of sounds (e.g. C N P F S Z T K for 'consonant', 'nasal', 'plosive', 'fricative', 'sibilant', 'voiced sibilant', 'alveolar', 'velar' respectively), and are combined the same ways IPA letters are, including as modifier letters. E.g., a prenasalized consonant – or the set of all prenasalized stops – can be indicated as /ᴺC/, a fricated release as [Cᶠ], and voiceless and voiced sibilant affricates as /Tˢ, Dᶻ/.

Modifier capital letters are used in other conventions as well, such as tone marking.

Modifier letters, IPA

ᵆ U+A7D9 MODIFIER LETTER SMALL AE. Figures 47–50.

ᵇ U+A7DA MODIFIER LETTER SMALL CAPITAL B. Figure 19.

ᵊ U+A7DB MODIFIER LETTER SMALL REVERSED E. Figure 52.

ᵞ U+A7DC MODIFIER LETTER SMALL RAMS HORN. Figures 38–39.

ᵍ U+A7DD MODIFIER LETTER SMALL CAPITAL G. Figures 30–32.

ʰ U+A7DE MODIFIER LETTER SMALL H WITH STROKE. Figures 17–18.

ʮ U+A7DF MODIFIER LETTER SMALL HENG WITH HOOK. Figure 36.

ᵒ U+A7E0 MODIFIER LETTER SMALL O WITH STROKE. Figure 51.

ᵠ U+A7E1 MODIFIER LETTER SMALL Q. Figures 2–5.

ʳ U+A7E2 MODIFIER LETTER SMALL R WITH FISHHOOK. Figures 23–24.

ᵣ U+A7E3 MODIFIER LETTER SMALL R WITH TAIL. Figures 21–23.

ʴ U+A7E4 MODIFIER LETTER SMALL TURNED R WITH LONG LEG. Figure 37.

ᴿ U+A7E5 MODIFIER LETTER SMALL CAPITAL R. Figures 23 (87? waiting on ILL)

ᵗ U+A7E6 MODIFIER LETTER SMALL T WITH RETROFLEX HOOK. Figures 26–29.

ᵞ U+A7E7 MODIFIER LETTER SMALL CAPITAL Y. Figures 44–46.

ʸ U+A7E8 MODIFIER LETTER SMALL TURNED Y. Figures 33–35.

ᵠ U+A7E9 MODIFIER LETTER REVERSED GLOTTAL STOP WITH STROKE. Figures 6–10.

ˑ U+A7EA MODIFIER LETTER SUPERSCRIPT TRIANGULAR COLON. Figures 58–59.

ˑ U+A7EB MODIFIER LETTER SUPERSCRIPT HALF TRIANGULAR COLON. Figure 58.

Modifier letters, IPA-derived

not found: ⟨ɾ ɳ ɖ ɻ ɬ ʉ ɥ ɧ ɭ ʂ ʈ ʃ ʒ ʆ ɡ ʩ ʤ ʧ ɸ ɬ ɮ ʗ ʠ ɻ ɮ ʖ ʗ ɕ ʄ ɟ w ɤ ʣ ʤ ʦ ʨ [+ retroflex affrics]⟩.

ˡ MODIFIER LETTER SMALL REVERSED R WITH FISHHOOK. Figure 53.

ˤ MODIFIER LETTER SMALL SQUAT REVERSED ESH. Figure 53.

ᶯ MODIFIER LETTER SMALL N WITH CURL. Figure 54.

ᴾ MODIFIER LETTER SMALL CAPITAL P. Figures 19–20.

[add] MODIFIER LETTER SMALL CAPITAL TURNED R. Figure 25.

ᵚ Basic plane? MODIFIER LETTER SMALL CLOSED OMEGA. Figures 23, 40–43.

ʤ Basic plane? MODIFIER LETTER SMALL DEZH DIGRAPH. Figures 56, 57.

ʧ Basic plane? MODIFIER LETTER SMALL TESH DIGRAPH. Figures 55, 57.

Modifier letters, capital

unsupported basic Latin caps not found: ⟨ˢ ˣ ʸ ᶻ⟩.

ᶜ U+A7ED MODIFIER LETTER CAPITAL C. Figures 75–78.

ᶠ U+A7EE MODIFIER LETTER CAPITAL F. Figure 79.

ᑫ U+A7EF MODIFIER LETTER CAPITAL Q. Figure 80.

Modifier letters, Greek

unsupported Americanist not found: ⟨ᶻ ᵡ ᵛ ᵟ ᵞ⟩ and ᶯ ᶍ ᵨ ᶊ ᶲ

ᵅ MODIFIER LETTER SMALL GREEK ALPHA. Figure 63.

ᵘ U+A7EC MODIFIER LETTER SMALL GREEK MU. Figures 81–84.

ᶲ MODIFIER LETTER SMALL CAPITAL GREEK PHI. Figures 70–71.

ᵚ omega also in Dolgopolskij (2020 folder), contrants w actual w for labialization.

Modifier letters, Americanist and other

not found: ⟨ʛ ᵡ ᴅ ᵾ⟩.

[add] MODIFIER LETTER SMALL B WITH BAR. Figure 62.

ˠ MODIFIER LETTER SMALL L WITH STROKE. Figure 60.

ˡ MODIFIER LETTER SMALL L WITH BAR. Figure 61. [equivalent to preceding?]

ᶬ MODIFIER LETTER SMALL TURNED R WITH BAR. Figure 23 (86, waiting on ILL).

~~ß MODIFIER LETTER SMALL SHARP S. Figures 72–73.~~

ᴬ MODIFIER LETTER SMALL CAPITAL A. Figure 66.

ᴱ MODIFIER LETTER SMALL CAPITAL E. Figures 64–65.

ᴼ MODIFIER LETTER SMALL CAPITAL O. Figure 67.

ᴽ MODIFIER LETTER SMALL CAPITAL OU. Figure 74.

ᵂ MODIFIER LETTER SMALL CAPITAL W. Figures 68–69.

Comments on additional letters

ᵭ MODIFIER LETTER SMALL D WITH TAIL, ᵭ [no figure, between 87 and 88]

ʔ MODIFIER LETTER LATIN GLOTTAL STOP WITH STROKE, ʔ [ibid.]

ˣ MODIFIER LETTER CAPITAL X. FIGURE 88.

ˣ MODIFIER LETTER SMALL LATIN CHI. Figures 89–90.

ᵝ MODIFIER LETTER SMALL LATIN BETA. Figures 91–93.

Suggested annotations

U+1D78 MODIFIER LETTER CYRILLIC EN – add “Latin” to the set of scripts in the ScriptExtensions property, note use in IPA for superscript ⟨ʜ⟩ U+029C LATIN LETTER SMALL CAPITAL H. Resembles U+1D45 MODIFIER LETTER CAPITAL H in Latin script, except for not being a small cap. [also in extIPA proposal] Figures 11–16.

Basic Latin letters

Modifier q (ᵠ)

Used in romanized Akha for glottal stop and by Khoisanists for vowel pharyngealization. Also for an unreleased [q] in the conventions of Pike (1947) *Phonemics* (not illustrated).

probably pharyngealization. This is transliterated here by means of a superscript 'q', as in !*gwa*ᵠ*-xu* 'sky'. Concerning Lloyd's annotation of 'accompaniments', Traill (1995) has determined that her use of a following letter 'k' almost certainly represented the 'plain' click, i.e.the click characterized by inaudible velar (i.e. posterior) release; while her

'*ayin*' (/˜)	|nú/˜ ŏ	'old man'
	/˜aoᵠ	'cold, winter'

Figure 2. du Plessis (2009: 30), with a description of the symbol as a superscript 'q'.

noisy dorsal burst which occurs after the anterior click burst. But, it is a convention which helps to distinguish the clicks in !Xóõ from the /ǃq/ click in N|uu that has different timing characteristics. In using diacritics to transcribe /ᵏ!/ and /ᵠ!/, I suggest that these do not pattern phonetically as contour segments or clusters.

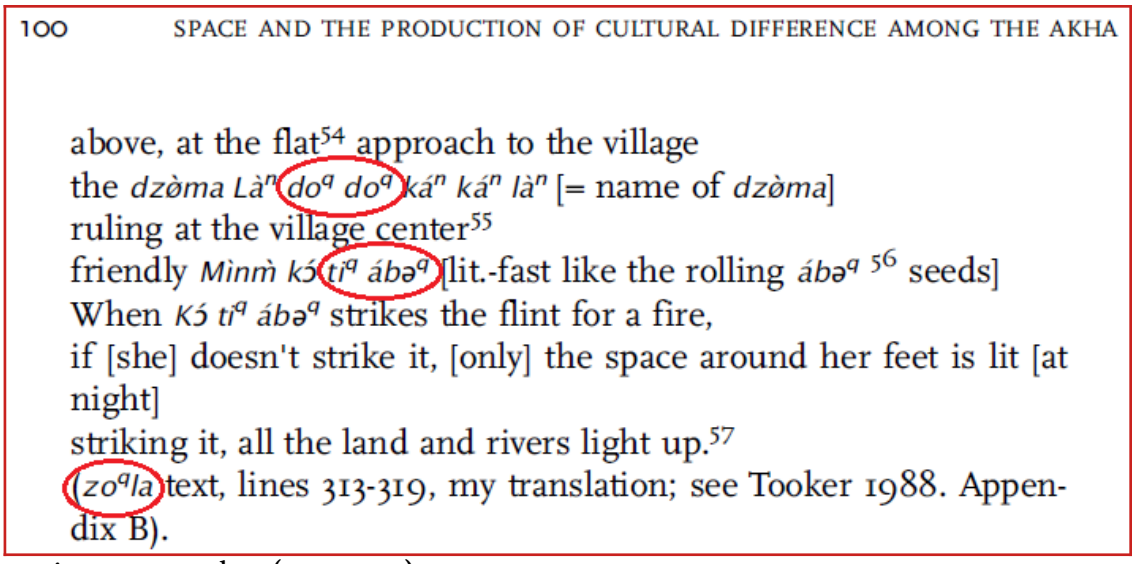
Accompaniment	Ladefoged and Traill (1994)	Orthography (Traill 1994)	Transcription (Sands)
Voiceless unaspirated	k! q!	! !q	ᵏ! ᵠ!
Voiced	g! ɢ!	!g !ɢ	ᵍ! ᴺᴳ!
Voiced aspirated	g!h ɢ!h	g!qh[16] ɢ!qh	ᵍᵏ!ʰ ᴺᵠ!ʰ

Figure 3. Sands (fc: 31), with the difference between superscript and baseline 'q'.

the anterior click burst, the dorsal burst and the vowel onset are very similar for the clicks shown in Figures 1.14 and 1.15. The center of gravity of the uvular-alveolar /ᵠ!/ click shown in Figure 1.15 is lower than that of the velar-alveolar /ᵏ!/ click shown in Figure 1.14 (1000 Hz vs. 1390 Hz). This is consistent with a uvular vs. velar place difference. Formant transitions also suggest a contrast of dorsal place.

[18] Nakagawa (2006: 197) notes timing differences between the anterior and dorsal bursts for uvular and velar accompaniments in G|ui that are greater than those I have seen in the corresponding accompaniments in !Xóõ but less than what is typically seen in N|uu clicks. G|ui clicks might be transcribed with a superscripted dorsal stop symbol after the click, e.g. /!ᵠ/.

Figure 4. Sands (fc: 32, incl. fn 18)



100 SPACE AND THE PRODUCTION OF CULTURAL DIFFERENCE AMONG THE AKHA

above, at the flat[54] approach to the village
the *dzòma Làⁿ doᑫ doᑫ káⁿ káⁿ làⁿ* [= name of *dzòma*]
ruling at the village center[55]
friendly *Mìnǹ kɔ́ tiᑫ ábəᑫ* [lit.-fast like the rolling *ábəᑫ* [56] seeds]
When *Kɔ́ tiᑫ ábəᑫ* strikes the flint for a fire,
if [she] doesn't strike it, [only] the space around her feet is lit [at night]
striking it, all the land and rivers light up.[57]
(*zoᑫla* text, lines 313-319, my translation; see Tooker 1988. Appendix B).

Figure 5. Tooker (2012: 100)

IPA and IPA-derived letters

Modifier reversed barred glottal stop, ʢ (ˤ)

Epiglottalization. Used in Khoisan and in Arabic dialectology. An additional source to those below is Miller-Ockhuizen (2003) *The Phonetics and Phonology of Gutturals: A Case Study from Ju|'hoansi*, p. 72 ff., and Esling informs me that he's made extensive use of this character in his 2019 book *Voice Quality*, which I don't have access to.

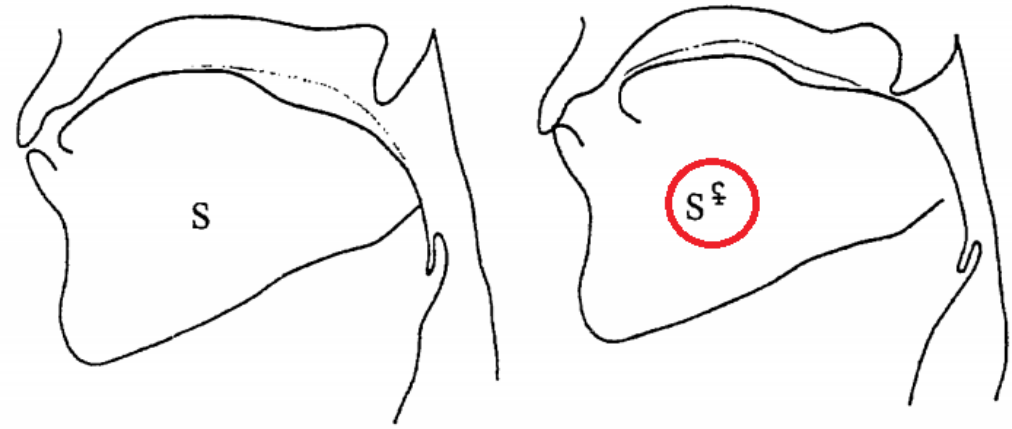


Figure 10.24 X-ray tracings of s and sˤ spoken by a Qatari Arabic speaker in the words **sad** 'to prevail' and **sˤad** (name of the letter).

Figure 6. Ladefoged & Maddieson (1996: 365)

Ejective stop. As was noted above, there is one ejective stop in N|uu (recently discovered in one word, *c'áʕè* 'be in pieces'), namely the *voiceless prepalatal ejective stop* /cʼ/ (3.9).

(3.9) *c'áʕè* 'be in pieces'

As for the VOT of aspirated plosives, no quantitative study has yet been conducted on the *glottal lag* (the duration between the release of the oral closure and the release of the glottal closure, i.e., the onset of voicing) of ejective stops in N|uu. From qualitative inspection of the tokens that are found in my data, an order of magnitude for the glottal lag of around 50 ms (similar to the estimate given for the VOT above) seems reasonable, though. Figure 3.7 shows spectrograms of typical realizations of *cáà* 'lie (recline)' and *c'áʕè* 'be in pieces'. Both /c/ and /cʼ/ show the slight affrication typical of prepalatal stops.

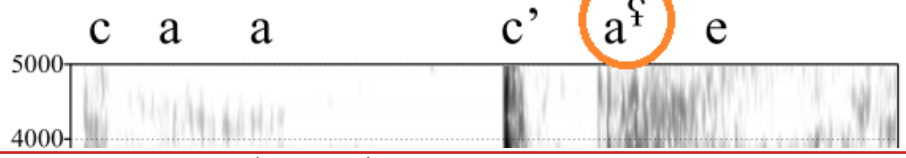


Figure 7. Exter (2008: 25)

Epiglottalized vowels. The epiglottalized vowel system consists of the segments /eʕ/, /aʕ/, /oʕ/, and /uʕ/ (3.25).

(3.25) *zéʕé* 'fly (verb)'
ᵑǂàʕà 'kick'
kóʕó 'swell'
/ʰùʕá 'arrow poison'

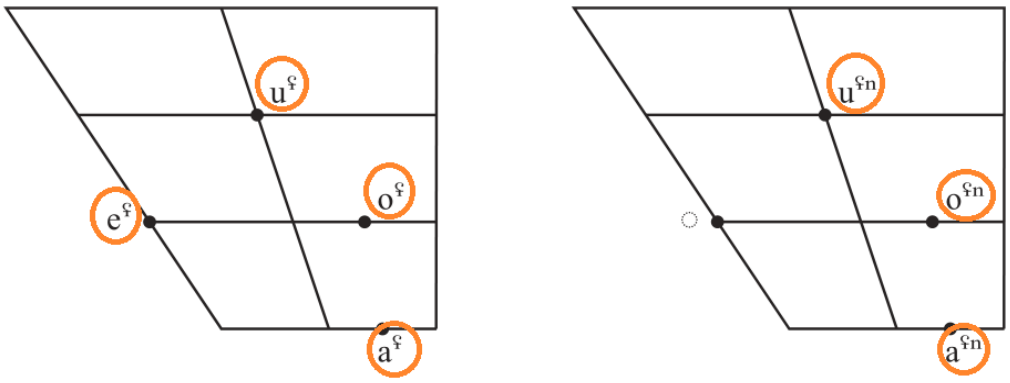


Figure 3.30 Schematic diagrams of the 'plain' (left) and nasalized (right) epiglottalized vowel inventories of N|uu. The dotted circle indicates a presumed accidental gap.

Figure 8. Exter (2008: 51)

Nasalized	i^{n}		a^{n}		u^{n}
Epiglottalized		$e^{ʕ}$	$a^{ʕ}$	$o^{ʕ}$	$u^{ʕ}$
Nasal epiglottalized			$a^{ʕn}$	$o^{ʕn}$	

Table 1: N|uu vowels

Overall, there are fewer contrasts among the nasalized and epiglottalized vowels than their modal counterparts. Our lexicon contains examples of epiglottalization on all vowels except [i], but [$e^{ʕ}$] and [$u^{ʕ}$] are much less common than [$a^{ʕ}$] and [$o^{ʕ}$] and [$u^{ʕ}$] is most likely an allophone of [$o^{ʕ}$]. Just three roots with [$e^{ʕ}$] have been elicited: [$ze^{ʕ}e^{ʕ}$] 'fly (v)', [$je^{ʕ}βe$] 'have arms crossed' and [$^{ŋ}ǂ^{h}e^{ʕ}βe$] 'close your skirt'. To the best of our

Figure 9. Miller et al. (2007: 104)

Table 9. Some terms referring to the cheek

Language	"cheek"	"cheekbone"
ǂ'Amkoe	[^{ŋ}/ʊ́^{ʕ}βí]	[^{ŋ}|ʊ́^{ʕ}βí (si) ɟà$^{n ʕ}$]
Ju|'hoan	*!omm*	*!úbíkxáí*

Figure 10. Sands & Honken (2014: 246)

Modifier small-cap ʜ (ʰ)

Voiceless epiglottalized release. (U+1D34 ᴴ is a full capital, U+1D78 ᴴ is Cyrillic ⁿ.)

The clicks transcribed [!kx'] and [g!kx'] in Ju|'hoansi are transcribed by Miller-Ockhuizen (2003) and Miller (2007) as having epiglottalized releases, [!^{ʜ}] and [!^{ʕ}]. Nakagawa (2006) transcribes the voiceless consonant of the pair as a cluster con-

Figure 11. Miller (2011: 421). A full-cap ᴴ has been substituted, but the description indicates that a small-capital was intended, as below.

last row of the table, each click may have several secondary accompaniments, such as in the series [| |^{h} ^{ŋ}| ^{g}| |^{ʔ} |^{χ} |^{ʜ}] (Miller, 2007; Miller et al., 2009), but only the basic primary values are represented here. This qualification can be seen

Figure 12. Esling (2010: 700). The ʰ has x height.

GLOTTALIZED	ts' tʃ'	ds' dʃ' dz' dʒ'		|ˀ ǂˀ !ˀ ‖ˀ	
UVULARIZED	$t^{χ}$ $tʃ^{χ}$	$d^{χ}$ $dz^{χ}$ $dʒ^{χ}$		|^{χ} ǂ^{χ} !^{χ} ‖^{χ}	g|^{ʁ} gǂ^{ʁ} g!^{ʁ} g‖^{ʁ}
EPIGLOTTALIZED	$t^{ʜ}$ $k^{ʜ}$	$g^{ʕ}$		|^{ʜ} ǂ^{ʜ} !^{ʜ} ‖^{ʜ}	g|^{ʕ} gǂ^{ʕ}g!^{ʕ} g‖^{ʕ}

Figure 13. Miller-Ockhuizen (2010: 44). Modifier ʜ (red) and ʕ (yellow).

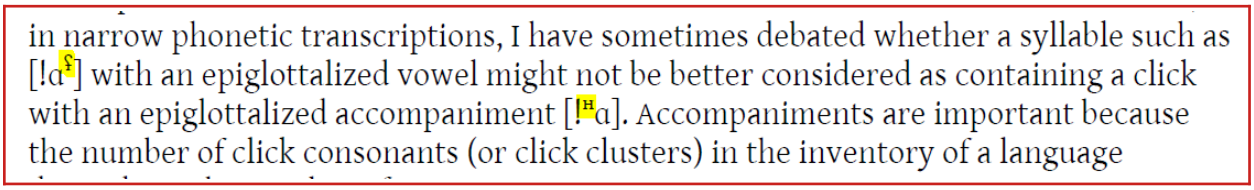

in narrow phonetic transcriptions, I have sometimes debated whether a syllable such as [!ɑˤ] with an epiglottalized vowel might not be better considered as containing a click with an epiglottalized accompaniment [!ᴴɑ]. Accompaniments are important because the number of click consonants (or click clusters) in the inventory of a language

Figure 14. Sands (fc: 23). The ᴴ clearly has x height.

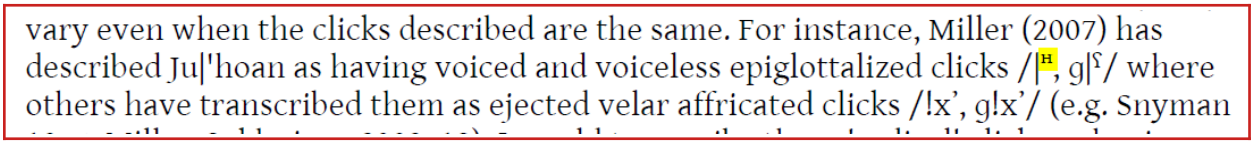

vary even when the clicks described are the same. For instance, Miller (2007) has described Ju|'hoan as having voiced and voiceless epiglottalized clicks /|ᴴ, g|ˤ/ where others have transcribed them as ejected velar affricated clicks /!x', g!x'/ (e.g. Snyman

Figure 15. Sands (fc: 34).

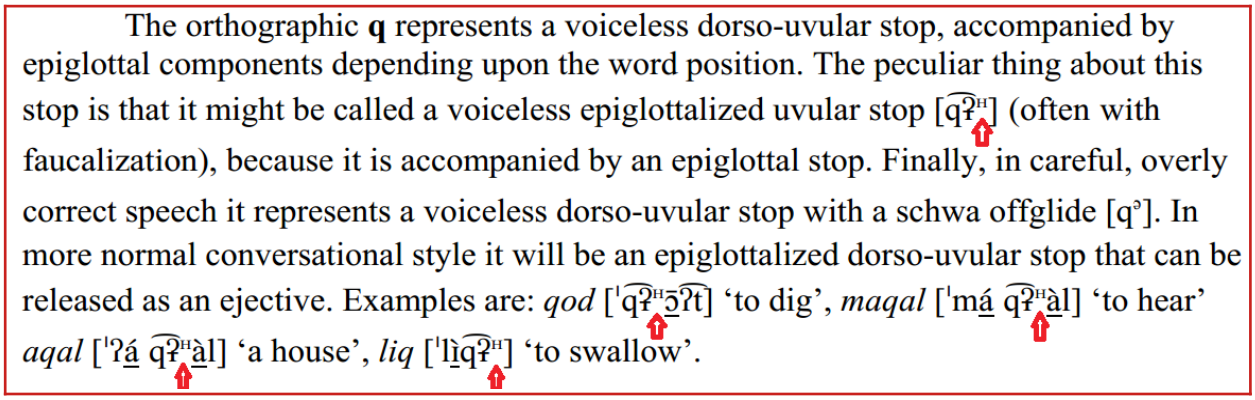

The orthographic **q** represents a voiceless dorso-uvular stop, accompanied by epiglottal components depending upon the word position. The peculiar thing about this stop is that it might be called a voiceless epiglottalized uvular stop [q͡ʡᴴ] (often with faucalization), because it is accompanied by an epiglottal stop. Finally, in careful, overly correct speech it represents a voiceless dorso-uvular stop with a schwa offglide [qᵊ]. In more normal conversational style it will be an epiglottalized dorso-uvular stop that can be released as an ejective. Examples are: *qod* [ˈq͡ʡᴴɔ̲ʔt] 'to dig', *maqal* [ˈmá̲ q͡ʡᴴà̲l] 'to hear' *aqal* [ˈʔá̲ q͡ʡᴴà̲l] 'a house', *liq* [ˈlɪ̲q͡ʡᴴ] 'to swallow'.

Figure 16. Edmondson, Esling & Harris (2008: ms p. 6)

Modifier h-bar, ħ (ʱ) [redesign in font]

Esling, a co-author of the article in the figure, also says "it would also be logical to use *ħ* as a superscript, since voiceless frication or trilling are common phonetic effects," and that a superscript ʱ would be useful for transcribing the very light final [ħ] often produced in the acquisition of Arabic by infants at around 12 months.

Note also extIPA request that all fricatives be supported as modifier letters for fricated release.

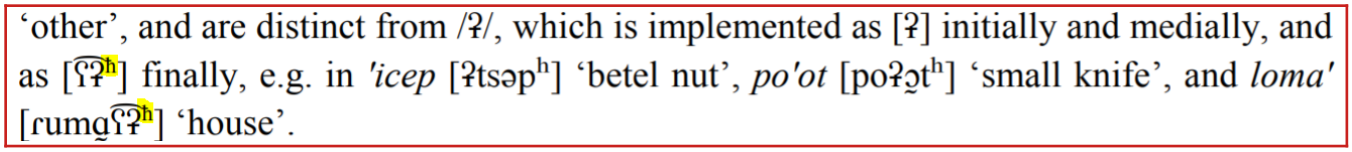

'other', and are distinct from /ʔ/, which is implemented as [ʔ] initially and medially, and as [ʔ͡ʡʰ] finally, e.g. in *'icep* [ʔtsəpʰ] 'betel nut', *po'ot* [poʔɔ̲tʰ] 'small knife', and *loma'* [rumɑ̲ʔ͡ʡʰ] 'house'.

Figure 17. Edmondson et al (2005: 384)

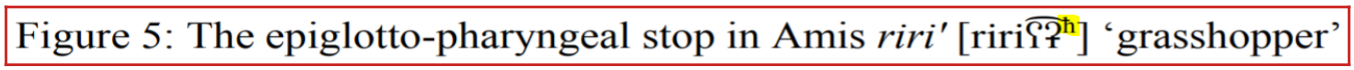


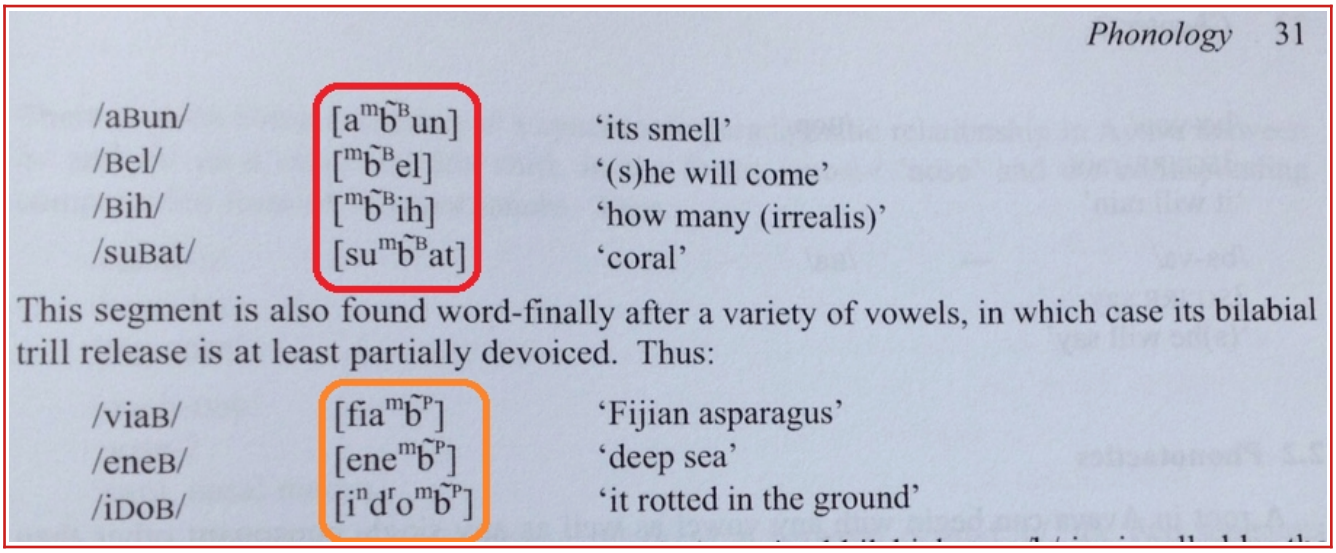
Figure 5: The epiglotto-pharyngeal stop in Amis *riri'* [ririʔ͡ʡʰ] 'grasshopper'

Figure 18. Edmondson et al (2005: fig. 5, p. 389).

Modifier small-cap ʙ and ʀ (ᴮ ᴿ)

Found for voiced and voiceless bilabial trilled release, such as [bᴮ] alongside [dʳ] for an alveolar trilled release. Attested from Avava (Vanuatu). Crowley & Lynch use superscript small-capital ʀ (ᴿ) for a voiceless bilabial trilled release, equivalent to Americanist superscript p-with-tilde ⟨ᵖ̃⟩ in [tᵖ̃] in

Everett & Kern (1997) *Wari'*. Brendon Yoder (p.c.) says a superscript ʙ would be useful for transcribing trilled release of Nias *mb*.



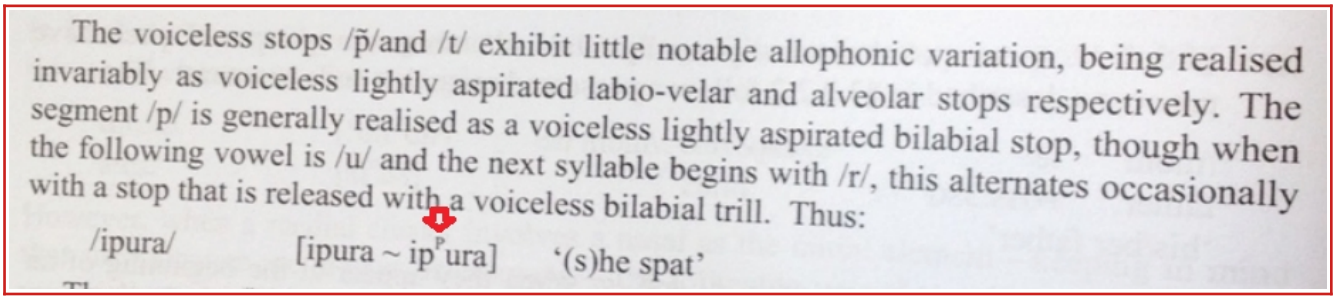
Phonology 31

/aBun/	[a^{mB}b̃^{B}un]	'its smell'
/Bel/	[^{mB}b̃^{B}el]	'(s)he will come'
/Bih/	[^{mB}b̃^{B}ih]	'how many (irrealis)'
/suBat/	[su^{mB}b̃^{B}at]	'coral'

This segment is also found word-finally after a variety of vowels, in which case its bilabial trill release is at least partially devoiced. Thus:

/viaB/	[fia^{mP}b̃^{P}]	'Fijian asparagus'
/eneB/	[ene^{mP}b̃^{P}]	'deep sea'
/iDoB/	[i^{n}d^{r}o^{mP}b̃^{P}]	'it rotted in the ground'

Figure 19. Crowley & Lynch (2006: 31). Red is the voiced trilled release, orange its voiceless allophone (also visible, alveolar *d*^{r}). On p. 30 the consonant is described as a "prenasalized voiced bilabial stop with a bilabial trilled release, which typically involves some rounding – or at least thrusting forward – of the lips." The tilde in this transcription indicates that rounding rather than nasalization.



The voiceless stops /p̃/and /t/ exhibit little notable allophonic variation, being realised invariably as voiceless lightly aspirated labio-velar and alveolar stops respectively. The segment /p/ is generally realised as a voiceless lightly aspirated bilabial stop, though when the following vowel is /u/ and the next syllable begins with /r/, this alternates occasionally with a stop that is released with a voiceless bilabial trill. Thus:

/ipura/	[ipura ~ ip^{P}ura]	'(s)he spat'

Figure 20. Crowley & Lynch (2006: 28). Modifier ᴘ for a voiceless trilled release.

Modifier fish-hook ɾ and retroflex ɽ (ʳ ᶭ)

Used in Penhallurick and similar dialect atlases for weak allophones of English /r/. The first two are also found in descriptions of Iwaidjan languages, where superscript ⟨ɾ⟩ and ⟨ɽ⟩ function as diacritics modifying the articulations of l and ɭ. The resulting phonemic segments /lʳ/ and /ɭᶭ/ are distinct from sequences /lɾ/ and /ɭɽ/. So far I have only been able to access papers with /ɭᶭ/, though the languages that have that also have /lʳ/ (e.g. Robern Mailhammer (p.c.) said that "the symbol [ɪ] used has been an l with either a tap or a retroflex tap superscript.")

paddle	*miri*	[míɻi]	*wijarldug*	Marrgu, Maung *miri*
place name: Cape Don	*Jamarldin.gi*	[ɟáma[ᵣiŋgi]		
place name: Eastern Side of Popham Creek	*Wumarij*	[wúmaɻiɟ]		
place name: Western Side of Popham Creek	*Wagali*	[wagali]		
proper name (Cunningham	*Ngurldun*	[ŋu[ᵣun]		

Figure 21. ⟨[ᵣ⟩ in Evans (1996: 2)

barn-door *n* the FLAP at the front of old-fashioned trousers VI.14.16. *pl* ba:nduəz La, *pl* baˡ:nduəˡz La*[old]*, *pl* baᵣ:ɳɖo:əᵣz He, baᵣ:ɳduəᵣ: W, *pl* bɑᵣ:ʈɳdɔ:əᵣʈz Sx

Figure 22. Upton, Parry & Widdowson (1994: 26). Contrast between ⟨ᵣ⟩ and ⟨ɾ⟩.

The following superscript IPA letters in
ʳ ˞ ˠ ˤ ᵀ ᴿ ᵝ ˢ ᶦ ᵚ ᵘ ᵊ

The following superscript IPA letters indicate weak articulation :
ʳ ˞ ˠ ˤ ᵀ ᴿ ᵝ ˢ ᶦ ᵚ ᵘ ᵊ

Figure 23. Penhallurick (1991: xviii). Modifier IPA diacritics used for weak articulation. The letters are ʳ˞ˠˤᵀᴿᵝˢᶦᵚᵘᵊ. The superscript rhotics *ɾ ɽ ʁ* and *ɻ*-bar are not supported by Unicode.

(b) ME ēr in ears (NPM) is represented as shown below.

ears : Gn 1 ʲjə:¹, jə:¹, jə.˞² 2 'i:-ə 3 iər 4 'i-ə:
5 'i:-əᵀ 6 'i:jə, jœ:ᵒ¹ 7 'i:-ä˞ 8 'i:-ə
9 'i:-ə˞ 10 ɻəᴿ², 'ijə⁷

Cl 1-2 'i:-ə 3 ɻə:⁵ 4 jə: 5 i:ə² 6 ɻəᵀ
7 'ijər²

Figure 24. Penhallurick (1991: 66). Modifier fishhook *ɾ* (red) is handwritten, as opposed to typewritten superscript *r* (yellow).

Modifier turned small cap ʁ ([add to font])

Figure 25. McDavid & O'Cain (1980: 126). Modifier uperscript U+1D1A ʁ in the word *Virginia*. Contrasts with combining ʁ (see proposal for combining letters).

Modifier retroflex ʈ (ᵗ)

Used for pre-stopped retroflex nasals and laterals, for example in the Arandic languages.

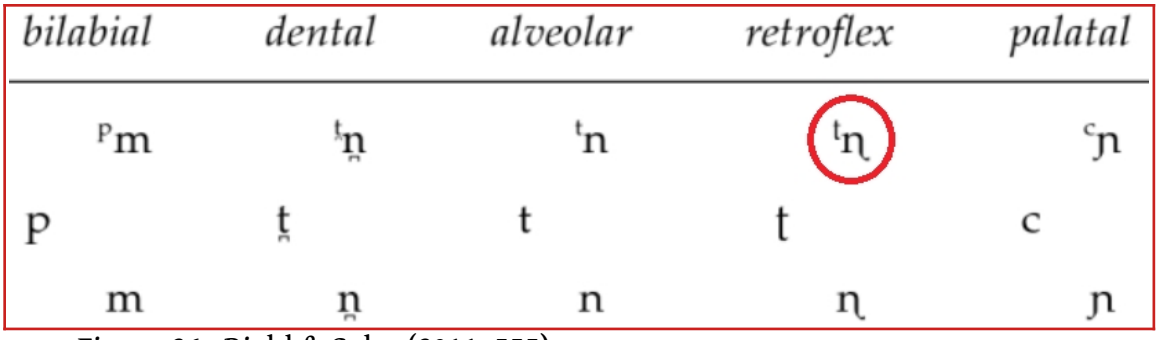


Figure 26. Riehl & Cohn (2011: 555)

	Labial	Dental	Alveolar	Retroflex	Palatal	Dorsal
Stop	p	t̪	t	ʈ	c	k
Nasal	m	n̪	n	ɳ	ɲ	ŋ
Pre-stopped Nasal	ᵖm	ᵗn̪	ᵗn	ᵗɳ	ᶜɲ	ᵏŋ
Lateral		l̪	l	ɭ	ʎ̮	
Tap			ɾ			
Continuant	w			ɻ		ɯ̟

Table 1: Kaytetye consonantal inventory.

Figure 27. Harvey et al. (2013)

relevant subset of the recorded data are considered. The target words contained the coronal nasals /n, ɳ, n̪, ɲ/, pre-stopped nasals /ᵗn, ᵗɳ, ᵗn̪, ᶜɲ/, and laterals /l, ɭ, l̪, ʎ̮/, all in a /#V_V/ context. The target coronal segments were preceded by word-initial /a/

Figure 28. Harvey et al. (2013)

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Australia, an alveolar [d͡l] and a dental [d̪͡l̪]. Martuthunira, a now extinct language of Western Australia, also prestopped its four laterals syllable-finally: [ᵗl̪], [ᵗl], [ᶜʎ̮], [ᵗɭ] (Dench 1995: 27).

Figure 29. François (2010: 426)

Modifier small-cap ɢ (ᴳ)

Used for pre-stopped uvular nasals and prevoicing of other uvular consonants. (A superscript is commonly used for prevoicing, e.g. in Laver 1994: 370.) For those who use superscripts for partial voicing, a /ɢ/ with final devoicing would be written ⟨ɢ$^{\text{ɢ̥}}$⟩. In addition, ⟨q$^{\text{ɢ}}$⟩ is an old IPA convention for unaspirated [q] to be used when ⟨q⟩ transcribes aspirated [q$^{\text{h}}$].

!Xóõ[24]	q, q$^{\text{h}}$, ɢ	q$^{\text{χ}}$’, $^{\text{G}}$q$^{\text{χ}}$’	Traill 1985

Traill (1985) transcribes dorsal affricates and fricatives in !Xóõ [k$^{\text{x}}$’, x] but is always careful to point out that both are ‘uvular’ actually. [$^{\text{G}}$q$^{\text{χ}}$’] is a ‘prevoiced uvular ejective affricate’ (Traill 1985: 152).

Figure 30. Wolfgang Kehrein (2002: p. 23 and fn 24). The two columns shown are ‘stop’ and ‘affricate’.

Voiced	ɡ!	!g	ᵑ!
	ɢ!	!ɢ	ᶰɢ!

Figure 31. Sands (fc: 31). Comparison of transcription conventions. (Excerpt from the table used to illustrate superscript q.)

[17] Note that the voiced uvulars are transcribed as prenasalized clicks here; I have not heard tokens of voiced or voiced aspirated uvular accompaniments without prenasalization, i.e. no [ᴳ!],[ᴳ!ʰ].

Figure 32. Sands (fc: 31, fn 17)

Modifier small turned y, ʎ (ᶺ)

Modifier ʎ is used for a palatal lateral affricate, often with voiceless or raising diacritics. Even with the potential availability of a dedicated character from the extIPA, such usage could continue under adherence to the regular IPA.

stops	p	ɸ	t̪	t	t̠	ʈ	c	k
lateral affr	-	-	t̪ˡ	tˡ	t̠ˡ	ʈˡ	cᶺ	kᶺ
laterals	-	-	l̪	l	l̠	ɭ	ʎ	ʟ
lateral frics	-	-	ɬ̪	ɬ	ɬ̠	ɭ̊˔	ʎ̝	ʟ̝

Figure 33. Kehrein (2002: 20). A summary of attested laterals, lateral fricatives and lateral affricates. Modifier ˡ ᶺ ˔ are circled in yellow. (According to p. 6, the ring diacritics for voicelessness are omitted to simplify the transcription.)

Archi	c cᶺ ʎ̥

Figure 34. Kehrein (2002: 18) A palatal lateral affricate [cʎ].

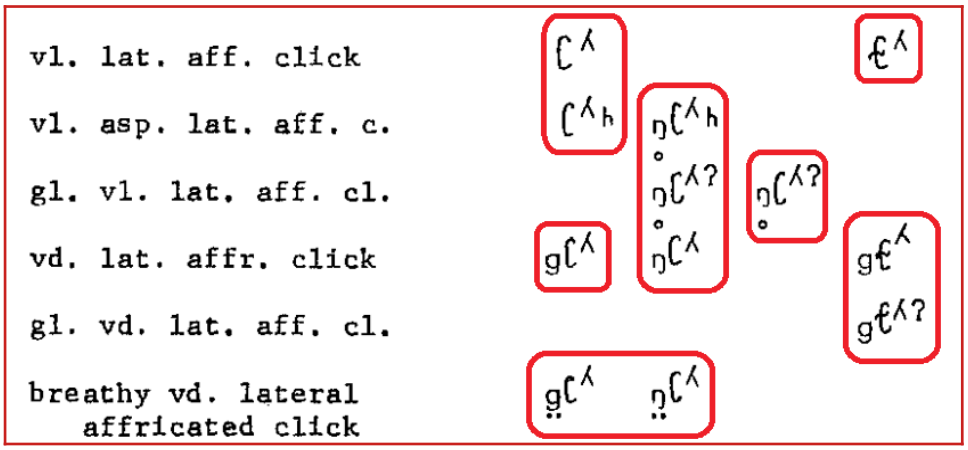


Figure 35. Lateral affricated palatal clicks in the UPSID, p. 170.

Modifier hook-top heng, ʩ (ʮ)

Used for theoretical allophones in Swedish. Note also extIPA request that all fricatives be supported as modifier letters for fricated release.

[11] Garlén (1984: 72) mentions that some second language learners have difficulties separating [f] from [ʩʃ].
[12] Thus, there is then no need, at this point, to introduce another IPA symbol [fʮ].

Figure 36. Riad (2013: 61, fn 11–12). ⟨ʩʃ⟩ and ⟨fʮ⟩.

Modifier turned r-leg, ɻ (ʯ)

Used for lateral-flap coloration of Japanese /r/.

before a vowel or approximant, or before /h/ or /s/, as e.g. /zéɴi/ [ᵈzéĩi] 'goodwill', /hoɴjaku/ [hoĩjaku] 'translation', /zeɴhaɴ/ [ᵈzeɣ̃haɴ] 'first half'. Before other consonants, it is homorganic with that following consonant, as e.g. /síɴpo/ [ɕímpo] 'progress', /síɴni/ [ɕíɲɲi] 'truly', /síɴɾi/ [ɕínd̠ʲi] 'truth'. /ś/ and /z/ are [ɕ] and [ʑ] before /i/. /z/ tends to be [ᵈz] initially ([ᵈʑ] before /i/) and after /ɴ/. /h/ tends towards [ç] and [ɸ] before /i/ and /u/ respectively. /hh/ is realized as [çç], [xx] or [ɸɸ] depending on the (normally identical) surrounding vowels. /j/ affects the preceding consonant as /i/ does, and is itself absorbed, thus: /mjakú/ [mʲakú] 'pulse', /tˢja/ [tɕa] 'tea', /sjó:/ [ɕó:] 'prize', /kanju:/ [kaɲu:] 'joining'.

Figure 37. Okada (1999: 118). The superscript has the height of superscript d in the first two lines of the text, rather than the x-height of a superscript turned-r.

I've also seen superscript ɻ in a poster presentation at a phonetic conference but can't track it down.
[a similar poster Thomas Magnuson 'A Pharyngeal Component in Kansai Japanese /r/ Variants?' at https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.596.175&rep=rep1&type=pdf , but that doesn't have the superscripts]

Modifier ram's horns, ɤ (ˠ)

Most instances of ˠ I've found are typos for ɣ (gamma). The following use ˠ for its intended value.

Similarly, Lanham and Macdonald (1979:40–1) identify fronted and glide-weakened MOUTH as a CE[15] variable and thus a defining feature of BrSAE. The most advanced values are [æ̟] for the onset, with a weak (unrounded) glide to [ə̯]. The vowel is corrected to a [äʊ]-like quality or even hypercorrected "towards backed [ɑʊ] or glide-weakened [ɑˠ] with hypercorrections most prominent among females in the Cape generally" (Lanham and Macdonald 1979:40). Importantly, and according to these

Figure 38. Bekker (2003: 165) *The Vowels of South African English*, PhD thesis. The source mistakenly used gamma (ɣ), which is why I refer to Bekker for its interpretation as ⟨ˠ⟩. P. 43 of Lanham & Macdonald (1979) supports Bekker, as the source used gamma for the full vowel letter ⟨ɤ⟩ as well, a not uncommon substitution in typewritten publications of the time. Regardless of whether the gamma was an intentional substitution in 1979, Bekker felt a need for superscript ram's horns in 2003.

stable, and invariably surfaces as back mid [o]. Lastly, back high /ɯ/ has the widest range of surface variants, ranging from high back to centralized mid front: /pipkɯp/ → [pipkɯˠp̚] or [pipkɪˠp̚] or [pipkɜˠp̚] 'nail'. In the processes of prevocalization and vocalization, other vowels may arise, as will be discussed in

Figure 39. Wetzels (2009: 244) "Nasal harmony and the representation of nasality in Maxacalí", in Calabrese & Wetzels (eds.) *Loan Phonology*. [ɤ] is a 'prevowel' derived from a coda /p/ or /m/ (p. 245).

also the 'baby gamma' in Dogopolskij? Contrasts w normal Latin gamma.

Modifier closed omega, ɷ (ᵚ)

Used in English dialectology.

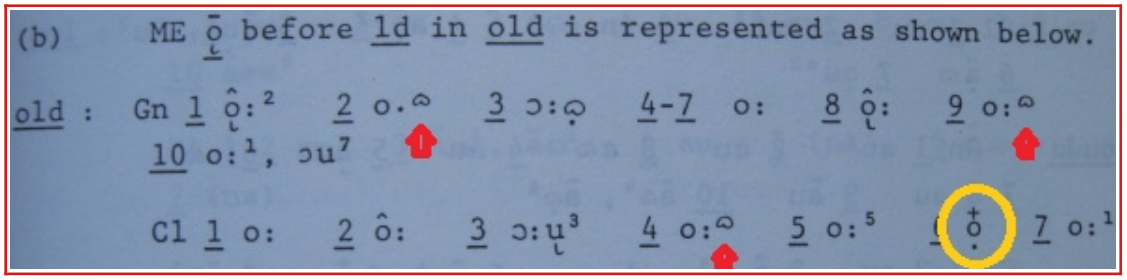
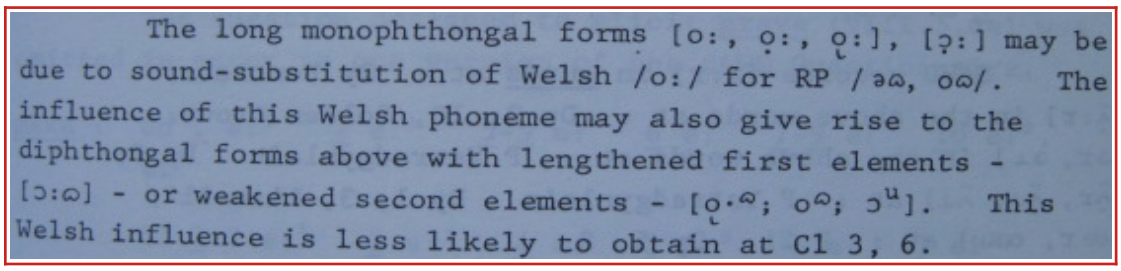
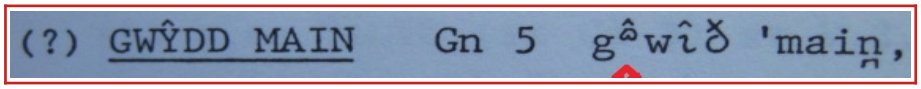


Figure 40. Penhallurick (1991: 79) *The Anglo-Welsh Dialects of North Wales*. [o:] with an offglide into [ɷ].



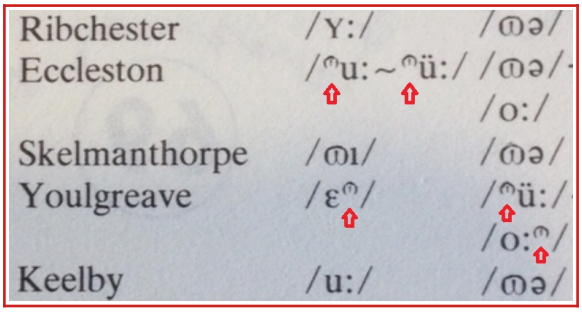
The long monophthongal forms [o:, o̝:, o̞:], [ɔ:] may be due to sound-substitution of Welsh /o:/ for RP /əʊ, oʊ/. The influence of this Welsh phoneme may also give rise to the diphthongal forms above with lengthened first elements - [ɔ:ʊ] - or weakened second elements - [o̞·ᵊ; oᵊ; ɔᵘ]. This Welsh influence is less likely to obtain at C1 3, 6.

Figure 41. Penhallurick (1991: 55), explaining the use of superscript ʊ in diphthongs.



(?) GWŶDD MAIN Gn 5 gˆʷîð 'main,

Figure 42. Penhallurick (1991: 258). Excrescent superscript ˆʷ. The circumflex indicates pharyngealization.

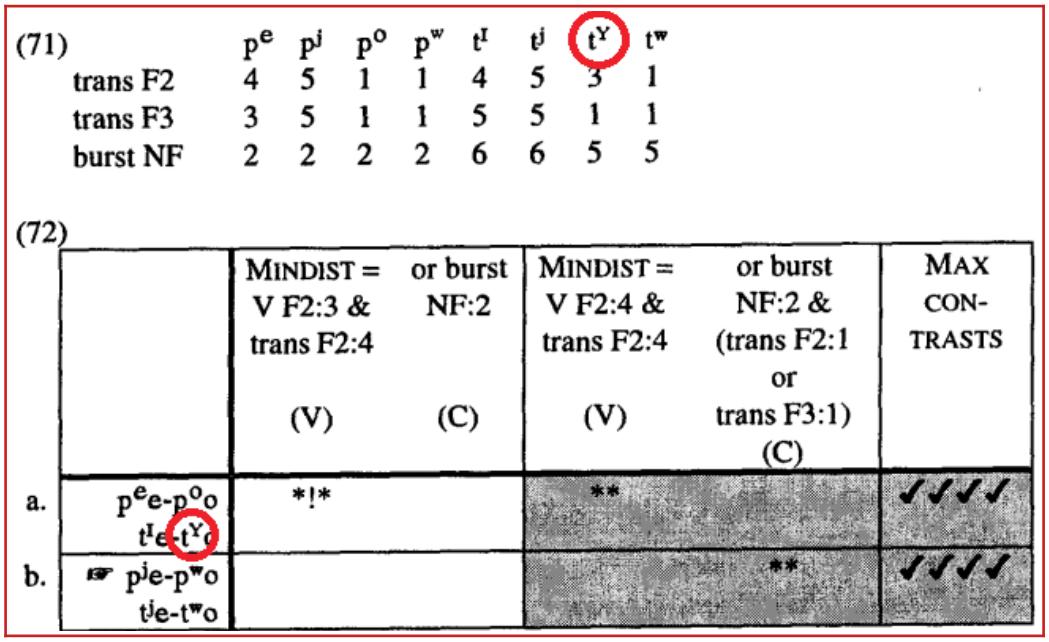


Ribchester	/ʏ:/	/ʊə/
Eccleston	/ᵊu:~ᵊü:/	/ʊə/
		/o:/
Skelmanthorpe	/ʊɪ/	/ʊə/
Youlgreave	/ɛᵊ/	/ᵊü:/
		/o:ᵊ/
Keelby	/u:/	/ʊə/

Figure 43. Anderson (1987: 102) *A Structural Atlas of the English Dialects*. The superscript is a bit faint, due to the thinness of the bottom curves, but is clearer in Note 8 on p. 119; the segments are /ᵊu: ~ ᵊü:/, /ɛᵊ/, /ᵊü:/, /o:ᵊ/.

Modifier small-cap ʏ (ᶸ)

Used when measuring the formants leading into a consonant adjacent to [ʏ] (here an allophone /ɪ/ preceding /u/). Also for diphthongs like [øᶸ] in Swedish and [ɛᶸ] in some English dialects.



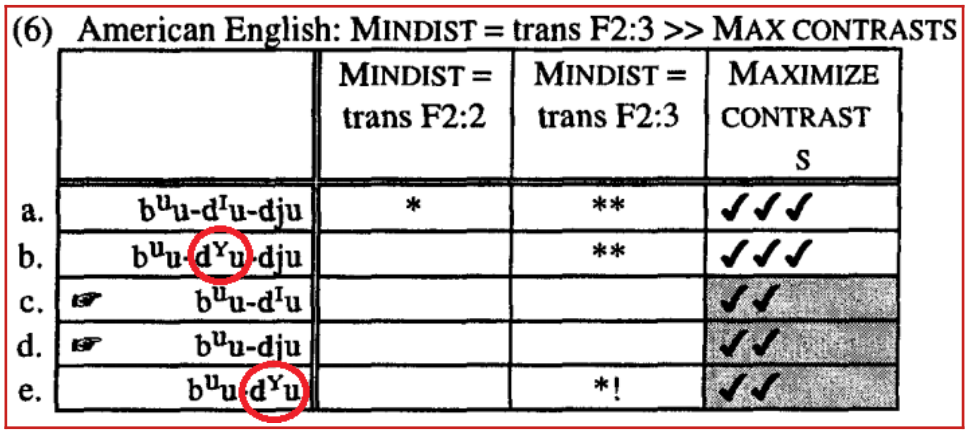
(71)

	p^e	p^j	p^o	p^w	$t^ɪ$	t^j	$t^ʏ$	t^w
trans F2	4	5	1	1	4	5	3	1
trans F3	3	5	1	1	5	5	1	1
burst NF	2	2	2	2	6	6	5	5

(72)

		MINDIST = V F2:3 & trans F2:4 (V)	or burst NF:2 (C)	MINDIST = V F2:4 & trans F2:4 (V)	or burst NF:2 & (trans F2:1 or trans F3:1) (C)	MAX CON-TRASTS
a.	p^e-p^o $t^ɪ$-$t^ʏ$	*!*		**		✓✓✓✓
b.	☞ p^j-p^w t^j-t^w				**	✓✓✓✓

Figure 44. Edward Flemming (2002: 103) *Auditory Representations in Phonology.* Routledge Outstanding Dissertations in Linguistics.



(6) American English: MINDIST = trans F2:3 >> MAX CONTRASTS

		MINDIST = trans F2:2	MINDIST = trans F2:3	MAXIMIZE CONTRASTS
a.	$b^{u}u\text{-}d^{I}u\text{-}dju$	*	**	✓✓✓
b.	$b^{u}u\text{-}d^{Y}u\text{-}dju$		**	✓✓✓
c. ☞	$b^{u}u\text{-}d^{I}u$			✓✓
d. ☞	$b^{u}u\text{-}dju$			✓✓
e.	$b^{u}u\text{-}d^{Y}u$		*!	✓✓

Figure 45. (Flemming 2002: 123)

while others are rising; some are closing, while others are centering: /eː/ > [eːᴵ], /ɛː/ > [ᵉɛː], /ʉː/ > [ᵋʉ], /øː/ > [øːʏ], /uː/ > [ᵒuː], /oː/ > [oːᵋ] (/iː/, /yː/ and /aː/ are monophthongs) (Elert, 2000, 42).

Figure 46. Therese Leinonen (2010: 20) *An Acoustic Analysis of Vowel Pronunciation in Swedish Dialects.* Doctoral thesis, University of Groningen.

Modifier æ ligature (ᵉᵃ)

Appears in diphthongal offglides and ms abbreviations.

fonetiske typer: en æ-agtig vokal og en diftong $ä\text{ː}^{ɛ}$, $ä\text{ː}^{ə}$. Nu forholder det sig ifølge Poul Andersen (FØF p. 138 ff.) således i østfynsk, at diftongiske manifestationer som $ɛ\text{ː}æ$, $ɛ\text{ː}^{æ}$ o.l. modsigelsesfrit kan tolkes som repræsenterende *æ*ː-fonemet, strukturelt ææ, idet der ikke findes sproglig opposition mellem et dobbelt *æ*-fonem med

Figure 47. Akademisk Forlag. (Denmark, 1974: 199) *Dialektstudier*, vol. 3. Contrast between [ɛːæ] and [ɛːᵉᵃ].

$ɑ^{e}$ː	*fje* s. Fjed	*me*ᵉᵃ præp. med (KA)
	le s. Led	*sde*ᵉᵃ s. Sted (KA)
	sbe s. Sped	*se*ᵉᵃ s. Sæd, Vognbund

Figure 48. Andersen (1958: 138) *Fonemsystement i østfynsk: på grundlag af dialekten i revninge sogn.*

$ɑ^{æ}$ː	*veˈːəd* præp. ved det	*sdeˈːəd* s.bn. Stedet
		meˈːæd præp. med det
	sdeˈːlːd s.bn. Stellet	*sdeᵉᵃlˈəd* s.bn. Stellet
		dɛælˈəd s.bn. Dællet

Figure 49. Andersen (1958: 139). Contrast between [ᵉᵃ] (red) and [æ] (yellow).

æ: superscript-æ represents:
ær. Ex. þær 3^3, kiærleikz 3^4, kiærn 123^2. written in full: kiærn 42^2.
As for the occurrence of superscript-æ in the older MSS, the remarks given above about superscript-ö hold here too, except that superscript-æ seems to represent ræ exclusively.

Figure 50. Homan (1975: 151), explaining ᵉ in Icelandic mss. (The italics are a convention for the abbreviations spelled out in full.)

Modifier o-slash, ø (ᵒ)

Appears in diphthongs in Scanian.

The picture is similar in the rounded counterpart /y/. Ingers has in 1962 in Hjärsås noted an older form [by:] besides a younger [bᵒyː] for *by* 'village'. From Loshult, Sigvard Bengtsson in 1931 reports three diphthongised realisations, which in IPA would be approximately [bᵒyʲ] 'village', [²ˈnᵒyʲa] 'new.PLUR' and [sᵒyʲn] *syn* (a certain legal procedure). An etymologically near-lying [²ˈsᵒyʲnas] 'be visible' is found in Vankiva in the neighbouring hundred Västra Göinge, where it has been noted by Nils Nilsson in 1932.

Figure 51. Martin Persson (forthcoming thesis on Scanian dialectology).

Modifier reversed e, ɘ (ᵊ)

Appears in diphthongal offglides.

(48) Eᵊ *h*ɔt də kuəxə gɛᵊə
Il avoir-Pfkt.3.sg. le gâteau mangé.
« Il mangeait / a mangé le gâteau… »

Figure 52. Caudal (2011: 27) "Contribution aspectuelle des temps et de la phrase", in Hancil (ed.) *Perspectives théoriques et empiriques: Sur l'aspect en anglais*.

Modifier reversed fish-hook, ɻ (ʴ) & with tail, ɻ (ʵ)

Used for transitional vowels under *erhua* in Chinese phonology.

A comparison of Figure 14.5c and Figure 14.6c shows the F-pattern of [ɻ-ɚ] is similar to the F-patterns of [i-ɚ], [y-ɚ], and [a-ɚ], except for a much shorter duration of the formants for [ɻ] at the onset of [ɻ-ɚ], suggesting [ɻ] suffixed with [ɚ] (Figure 14.5c) turns into [ʴɚ]. The superscript [ʴ] indicates that [ɻ] of [ɻ-ɚ] is transient. Similarly, [ɻ̩] suffixed with [ɚ] (Figure 14.5d) turns into [ʵɚ]

Figure 53. Lee & Zee (2014: 384) "Chinese Phonetics", in Huang et al. (eds.) *The Handbook of Chinese Linguistics*, Blackwell. Though the vowels have unexpected

ascenders in this font, they are clearly ɣ and ʯ, as demonstrated by context and by the Unicode encoding of the electronic version of the book.
(TIPA has separate encodings for these short and long allographs, recognizing the two typographic styles, though of course that would not be needed for Unicode.)

Modifier curly-tail n, ɳ (ⁿ)

A common Sinological convention for alveolo-palatal consonants.

> One striking feature of Maonan is that pre-nasalized stops and pre-glottalized stops are found to be in complementary distribution in the tonal system, with pre-nasalized stops *ᵐb-*, *ᵐbj-*, *ⁿd-*, *ⁿdj-*, *ᶯ̇d-*, *ᵑg-* and *ᵑgw-* only occurring in high tones, while glottalized stops *ˀb-*, *ˀbj-*, *ˀd-* and *ˀdj-* only occurring in low tones, as shown

Figure 54. Lu (2008: 93) *A Grammar of Maonan*.

I have only found *ɳ* as a superscript, but superscript ʂ ɖ ɭ might be expected as well. Some Sichuanese and Yunnanese dialects, for example, have post-stopped [ɳᵈ] (Chan 1987 "Post-stopped nasals in Chinese", *UCLA Working Papers in Phonetics* 68, p. 97).

Modifier t-esh, d-ezh ligatures, ʧ ʤ (ʧ ʤ)

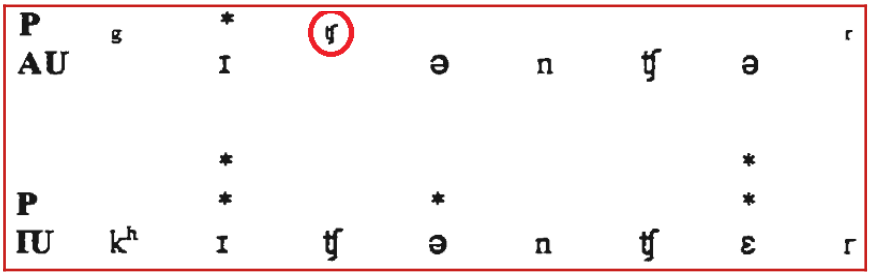


Figure 55. Perry (2000: 90). The top line, ⟨ᵍɪʧənʧəʳ⟩, is the recorded utterance; below it is the target phrase *kitchen chair*.

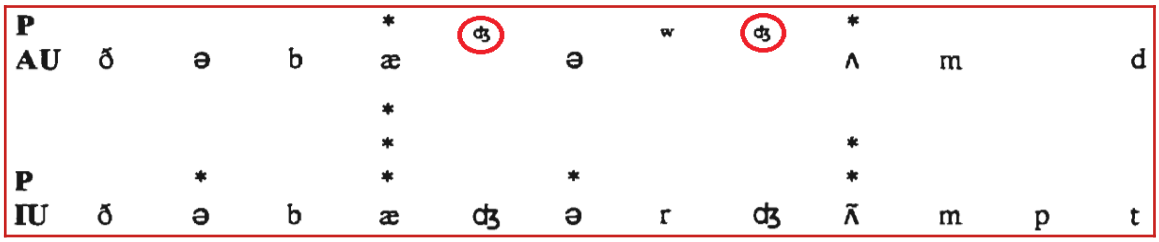


Figure 56. Perry (2000: 91). ⟨ðəbæʤəʷʤʌmd⟩; the target phrase is *the badger jumped*.

C: SLP: (1) exaggerates speech. Subject: (1) [oʷ] instead of [ɔ] in *your*. (2) omits [ɹ] in *your*. (3) [ʃ] instead of [ʧ] in *watch*. (4) [n] instead of [ð] in *the*. (5) [ᵍ] instead of [kʰ] in *kitchen*. (6) [ʧ] instead of [ʧ] in *kitchen*. (7) [ə] instead of [ɛ] in *chair*. (8) [ʳ] instead of [r] in *chair*.

C: SLP: (1) exaggerates speech. Subject: (1) [ʤ] instead of [ʤ] in *badger*. (2) [ʷ] instead of [r] in *badger*. (3) omits [p] in *jumped*. (4) [d] instead of [t] in *jumped*. (5) [v] instead of [f] in *off*. (6) [o] instead of [ə] in *the*.

Figure 57. Perry (2000: 90, 91), specifying the contrast of [ʧ ʤ] and [ʧ ʤ].

Modifier length signs, ː and ˑ (ː ˑ)

Used for narrow transcription of voice-onset time (length of aspiration).

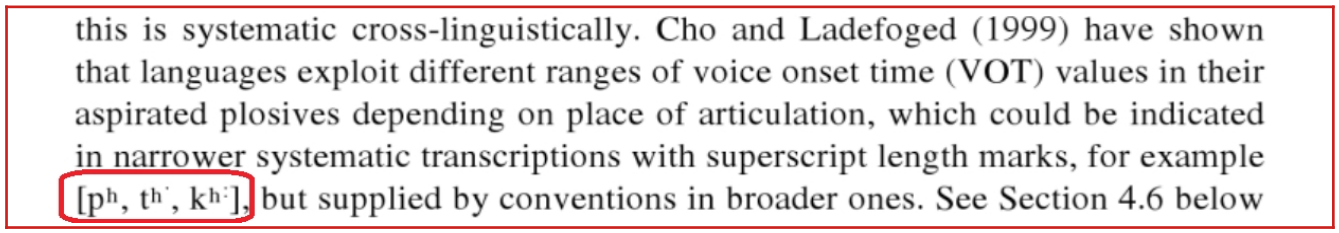

this is systematic cross-linguistically. Cho and Ladefoged (1999) have shown that languages exploit different ranges of voice onset time (VOT) values in their aspirated plosives depending on place of articulation, which could be indicated in narrower systematic transcriptions with superscript length marks, for example [pʰ, tʰˑ, kʰː], but supplied by conventions in broader ones. See Section 4.6 below

Figure 58. Heselwood (2013: 146), with half-long ˑ and long ː. Heselwood distinguishes [ʰ], [ʰˑ] and [ʰː]. If the length signs were to lose their superscript formatting, they would imply the consonant was geminate rather than that the aspiration was extended.

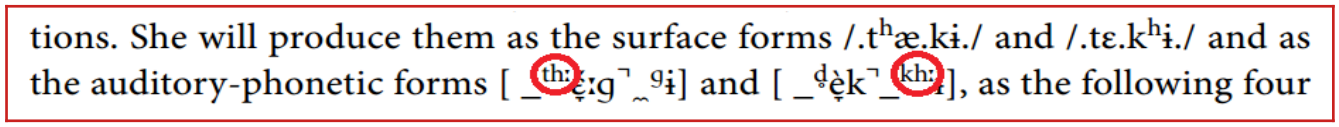
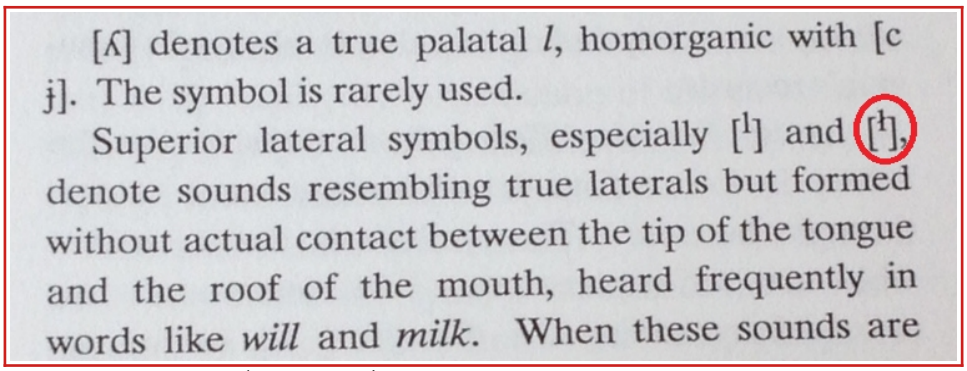

tions. She will produce them as the surface forms /.tʰæ.kɨ./ and /.tɛ.kʰɨ./ and as the auditory-phonetic forms [_th:ɻ̩:g¬ˌᵍɨ] and [_ᵈɻ̩k¬_kh:ɻ], as the following four

Figure 59. Boersma & Hamann (2009: 34) "Loanword adaptation as first-language phonological perception", in Calabrese & Wetzels (eds.) *Loan Phonology*. [ʰː] in the second line is distinguished from [ʰ] in the first line.

Americanist and typewriter notation

Modifier el-slash, ɬ (ɬ), and el-bar, ɬ (ɬ)

Used for weak sounds or fricated release. These are allographs in APN, but the base letters have separate Unicode points.


[ʎ] denotes a true palatal *l*, homorganic with [c ɟ]. The symbol is rarely used.

Superior lateral symbols, especially [ˡ] and [ˡ̵], denote sounds resembling true laterals but formed without actual contact between the tip of the tongue and the roof of the mouth, heard frequently in words like *will* and *milk*. When these sounds are

Figure 60. Kretzschmar (1993: 124) *Handbook of the Linguistic Atlas of the Middle and South Atlantic States*, University of Chicago Press. LAMSAS is a project of U Georgia.

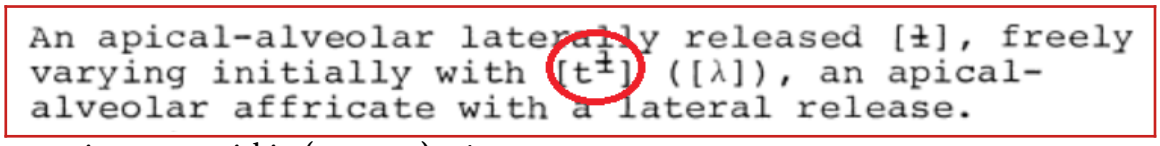

An apical-alveolar laterally released [ɬ], freely varying initially with [t^{ɬ}] ([λ]), an apical-alveolar affricate with a lateral release.

Figure 61. Pitkin (1984: 32) *Wintu Grammar*.

Modifier b-bar, ƀ (add to font)

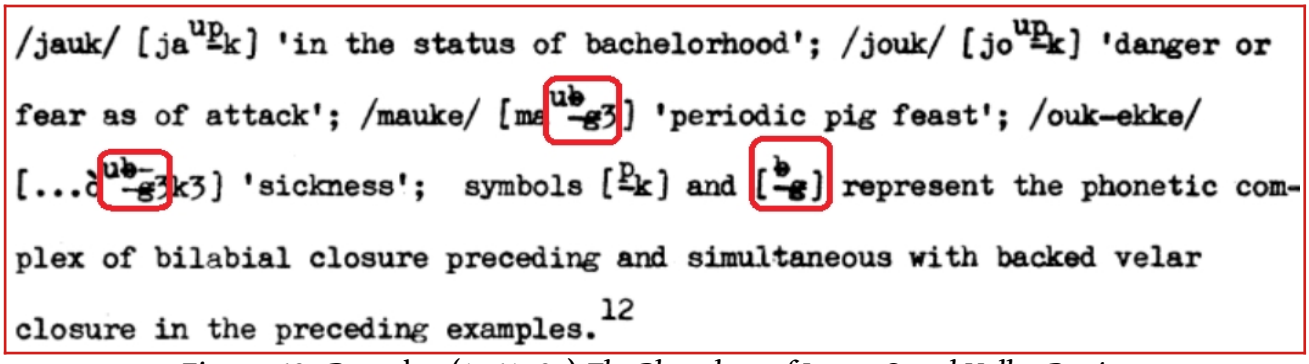
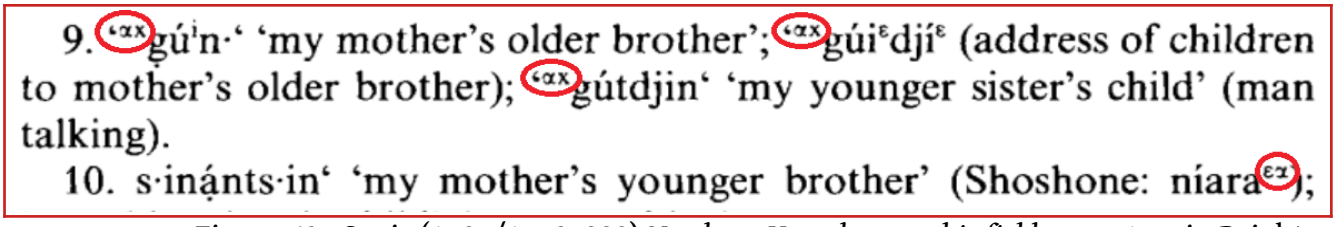

/jauk/ [ja$^{up}_{-k}$] 'in the status of bachelorhood'; /jouk/ [jo$^{up}_{-k}$] 'danger or fear as of attack'; /mauke/ [ma$^{uƀ}_{-g}$ʒ] 'periodic pig feast'; /ouk-ekke/ [...$^{uƀ}_{-g}$kʒ] 'sickness'; symbols [$^{p}_{-k}$] and [$^{ƀ}_{-g}$] represent the phonetic complex of bilabial closure preceding and simultaneous with backed velar closure in the preceding examples.[12]

Figure 62. Bromley (1961: 29) *The Phonology of Lower Grand Valley Dani*.

Modifier alpha (ᵅ)

In Sapir, for Ute and Shoshone.


9. ᶜᵅˣgú'n·‘ ‘my mother’s older brother’; ᶜᵅˣgúiᵋdjíᵋ (address of children to mother’s older brother); ᶜᵅˣgútdjin‘ ‘my younger sister’s child’ (man talking).

10. s·inąnts·in‘ ‘my mother’s younger brother’ (Shoshone: níaraᵋᵅ);

Figure 63. Sapir (1929/1992: 883) *Northern Ute ethnographic field notes, 1909* in Bright (ed.) *The Collected Works of Edward Sapir X*. In italic typeface, used throughout this volume, the alpha remains distinct from *a* without requiring special font accommodation as the IPA does.

Modifier small-capital ᴀ (ᴬ), ᴇ (ᴱ), ᴏ (ᴼ)

Small-cap ⟨ᴀ⟩ has, besides its voiceless value, an obscure value “as in English *but*”. More generally, ⟨ᴀ ᴇ ᴏ⟩ are used for obscure vowels with [a e o] coloring and may be superscribed for fleeting obscure vowels. (Same for ⟨ɪ ᴜ⟩, but they’re already supported by Unicode.) Modifier ᴀ and ᴇ are also found in Chinese extension to the IPA.

Modifier ⟨ᴀ⟩ and ⟨ᴇ⟩ vary in size between texts and between tokens within a text. Often they are not reduced in size at all and look like superscript capitals, which are not defined in the phonetic keys provided. For example, in Frachtenberg’s 1922 chapter on Siuslaw, superscript ⟨ᴇ⟩ is consistently a small capital, apart from small-print in a table where all superscripts are misaligned or oversized. However, in his chapter on Coos in the same volume, ⟨ᴇ⟩ is raised above the baseline with little to no reduction in size; only in a few cases (e.g. p. 317, 340 – illustrated, 344, 359) is in formatted correctly. Semantically, though, these are clearly small caps as defined by the pronunciation key in the volume. Obscure ⟨ᴏ⟩ is also superscripted occasionally. Though visually

it is difficult to tell it's a small cap, a problem shared with ⟨ᴡ⟩ (see next entry) and ⟨ᴢ⟩, the semantics indicates that it is.

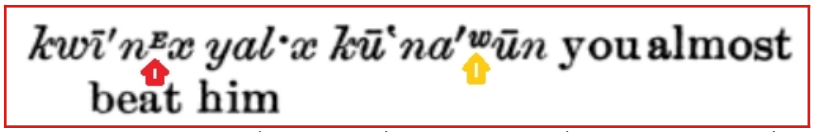


Figure 64. Frachtenberg (1922: 458) "Siuslawan (Lower Umpqua)", in Boas (ed.) *Handbook of American Indian Languages*, part 2. ⟨ᴱ⟩ (red) is the same size as lower-case ⟨ʷ⟩ (yellow). Its sharp angles distinguish it from the ⟨ᵋ⟩ used for glottal stop.

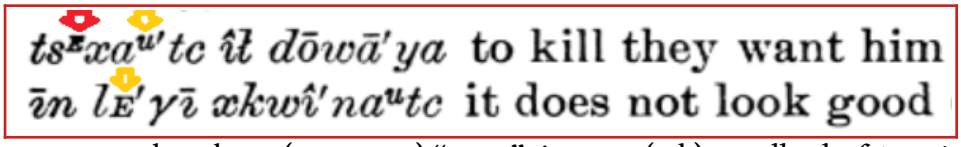


Figure 65. Frachtenberg (1922: 340) "Coos", in Boas (ed.) *Handbook of American Indian Languages*, part 2. ⟨ᴱ⟩ (red) vs. ⟨ᴇ⟩ and a lower-case superscript (yellow).

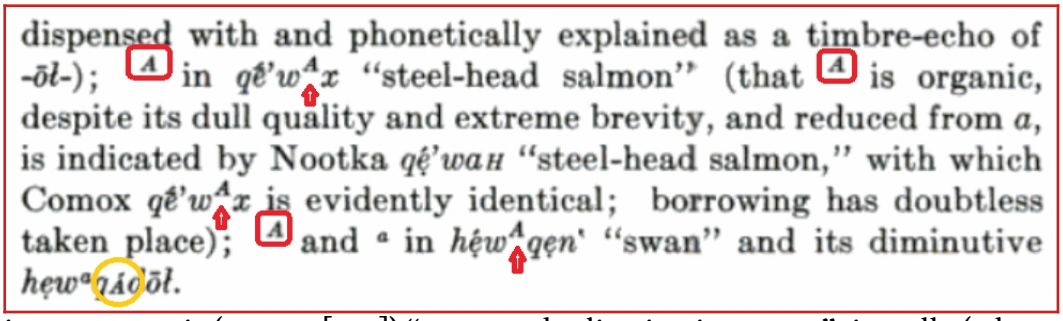

dispensed with and phonetically explained as a timbre-echo of -ōł-); ᴬ in qē'wᴬx "steel-head salmon" (that ᴬ is organic, despite its dull quality and extreme brevity, and reduced from *a*, is indicated by Nootka qę̓'waʜ "steel-head salmon," with which Comox qē'wᴬx is evidently identical; borrowing has doubtless taken place); ᴬ and ᵃ in hę̓wᴬqęn' "swan" and its diminutive hę̓wᵃqáōł.

Figure 66. Sapir (1994: 4 [384]) "Noun Reduplication in Comox", in Golla (ed., 1994)*The Collected Works of Edward Sapir VI: American Indian Languages 2*. Although the size is inconsistent between the letter in isolation and in a word, the intent is clearly a small-cap: brief/fleeting vowels are superscribed, and the corresponding full vowel in Comox (yellow) can be seen to be a small-cap ⟨ᴀ⟩.

Figure 67. Frachtenberg (1922: 447) "Siuslawan (Lower Umpqua)", in Boas (ed.) *Handbook of American Indian Languages*, part 2. Plain *o* does not occur in these Siuslaw texts, but obscure (small-cap) ⟨ᴏ⟩ occurs in loans. Modifier small-cap ⟨ᵒ⟩ has a heavier typeface than superscript *ū* in the same line.

Modifier small-capital w (ᵂ)

Voiceless labialization in Sapir; equivalent to ⟨ᵚ⟩ in IPA.

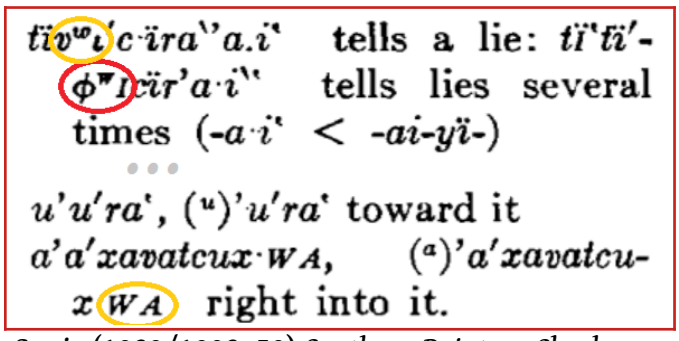
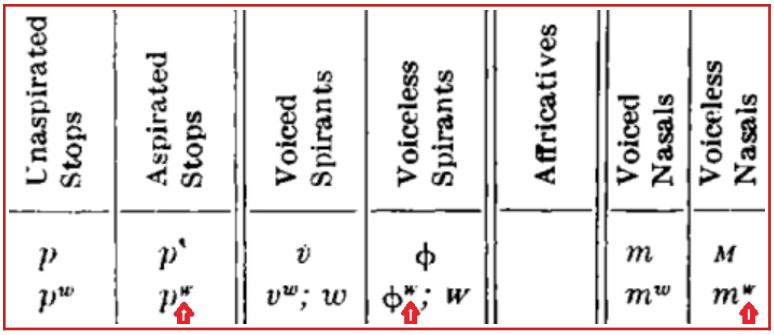


Figure 68. Sapir (1929/1992: 59) *Southern Paiute, a Shoshonean Language*, in Bright (ed.) *The Collected Works of Edward Sapir X*. The superscript voiceless *w* is small-cap, as can be seen not just by comparing it to the l.c. ⟨ʷ⟩ in the line above it, but to the semantically parallel small-cap voiceless ⟨ᴡ⟩ below (yellow; a few intervening lines have been removed). Small-cap glossing elsewhere has the same letter size.



Unaspirated Stops	Aspirated Stops	Voiced Spirants	Voiceless Spirants	Affricatives	Voiced Nasals	Voiceless Nasals
p	*p'*	*v*	*ɸ*		*m*	*M*
p^w	*p'^w*	*v^w; w*	*ɸ^w; ʍ*		*m^w*	*M^w*

Figure 69. Sapir (1929/1992: 63). Unaspirated [pʷ] contrasts with aspirated [pʷ]. The difference is not very apparent in roman type face, even in Sapir, but this is true for other small-cap letters in the Americanist tradition such as ᴢ. The difference from IPA is that they are plain small caps rather than petit caps. This has not, however, been differentiated in Unicode, where ʙ ɢ ɪ ʟ ɴ ʀ ʏ apparently cover both IPA petit-cap and Americanist small-cap notation.

Modifier small-capital phi (ᵠ)

Small-capital phi and its superscript are used in the Americanist/IPA transcription of LAMSAS (U Georgia) for lowercase IPA /ɸ/, parallel to the use of small-capital gamma ⟨ʀ⟩ for lowercase IPA /ɣ/. These distinctions are similar to Americanist small-capital ⟨ᴜ⟩ for IPA ⟨ʊ⟩, which already have superscript support in Unicode (⟨ᵘ⟩ and ⟨ᵚ⟩).

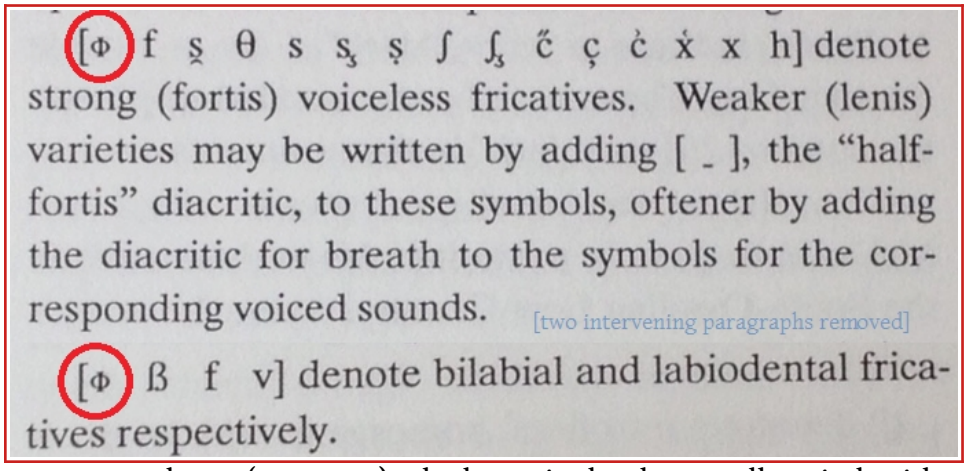

[Φ f ʂ θ s ʂ̻ ʂ ʃ ʃ̻ c̑ ç ċ ẋ x h] denote strong (fortis) voiceless fricatives. Weaker (lenis) varieties may be written by adding [̲], the "half-fortis" diacritic, to these symbols, oftener by adding the diacritic for breath to the symbols for the corresponding voiced sounds. [two intervening paragraphs removed] [Φ ß f v] denote bilabial and labiodental fricatives respectively.

Figure 70. Kretzschmar (1993: 124). The letter is clearly a small capital, with x-height. [Two intervening paragraphs on voiced fricatives have been removed from the image.]

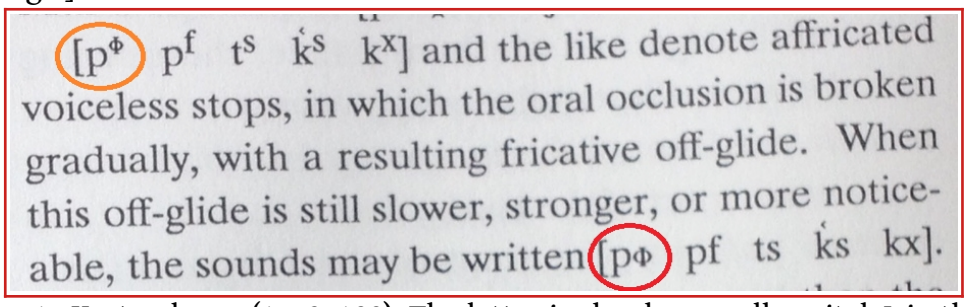

[p$^{\Phi}$ p^{f} t^{s} ḱ^{s} k^{x}] and the like denote affricated voiceless stops, in which the oral occlusion is broken gradually, with a resulting fricative off-glide. When this off-glide is still slower, stronger, or more noticeable, the sounds may be written [pΦ pf ts ḱs kx].

Figure 71. Kretzschmar (1993: 122). The letter is clearly a small capital Φ in the last line (red), and a small capital superscript ᵠ in the first (orange), with the height of superscript *s* rather than of superscript *f*.

Modifier eszett (ᵦ) [dubious – bad typography. Ask LAMSAS? see if repeated in other docs. Better to find 2 docs.]

⟨ß⟩ is used in place of IPA [β] in LAMSAS (Kretzschmar et al. 1994), perhaps as a stylized small capital similar to ⟨ʀ⟩ for [ɣ] and ⟨Φ⟩ for [ɸ], which are also conventions at LAMSAS. It appears superscribed in the labial affricate (second figure below).

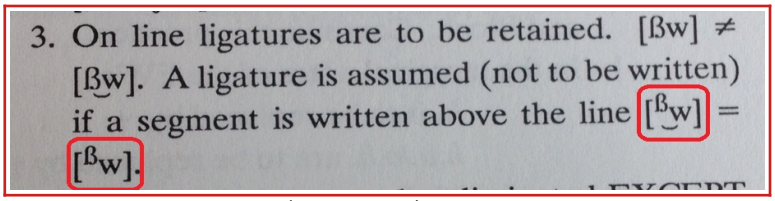

3. On line ligatures are to be retained. [ßw] ≠ [ß͡w]. A ligature is assumed (not to be written) if a segment is written above the line [^{ß}͡w] = [^{ß}w].

Figure 72. Kretzschmar et al. (1994: 135), explaining that the superscribing is semantically distinctive, and that its loss would be equivalent to the loss of a tie bar.

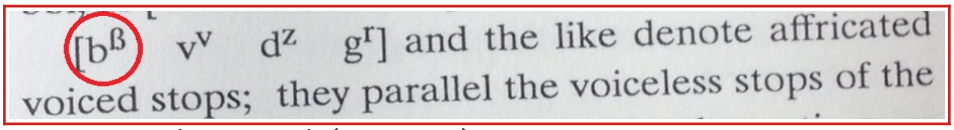

[b^{ß} v^{v} d^{z} g^{ɾ}] and the like denote affricated voiced stops; they parallel the voiceless stops of the

Figure 73. Kretzschmar et al. (1994: 122)

Modifier small capital o-u ligature, ȣ (ᵸ)

This is used in Americanist notation for U+1D15 small-capital ȣ as an offglide. The existing U+1D3D ᵸ is a full capital Ȣ. (The UPA submission to Unicode was for a small-cap Ȣ, but it was adopted as full-cap like the other UPA modifiers. Americanist notation is instead a small cap.)

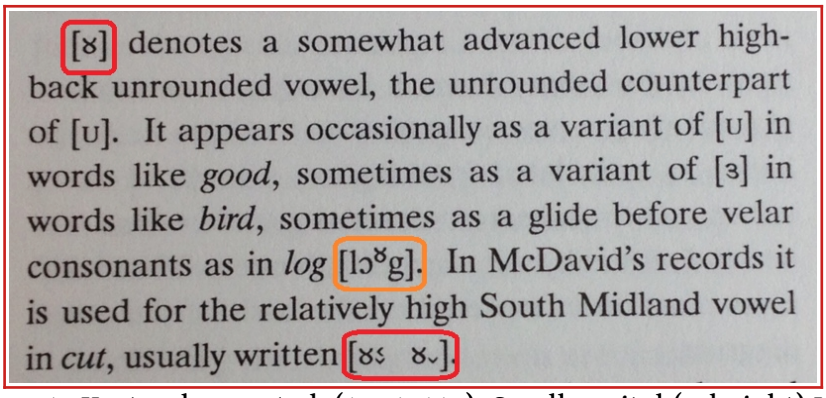

[ȣ] denotes a somewhat advanced lower high-back unrounded vowel, the unrounded counterpart of [ʊ]. It appears occasionally as a variant of [ʊ] in words like *good*, sometimes as a variant of [ɜ] in words like *bird*, sometimes as a glide before velar consonants as in *log* [lɔᵸg]. In McDavid's records it is used for the relatively high South Midland vowel in *cut*, usually written [ȣˢ ȣˬ].

Figure 74. Kretzschmar et al. (1994: 117). Small capital (x-height) U+1D15 ȣ (red) and superscript small capital ᵸ (orange).

Capital letters

Modifier capital C (ᶜ) [why not T for tone?]

Most common among unsupported letters is Nᶜ or ᶜN for a post- or pre-stopped nasal.

Initial prenasalized stops are presented in grammars and language sketches variously as combinations of a syllabic nasal and a consonant (N.C), as consonant clusters (NC), as complex unitary stop phonemes (ᴺC), or as post-stopped nasals (Nᶜ). These descriptions vary with respect to transcription convention,

Figure 75. Ratliff (2015: 39). The semantic distinction between ⟨NC⟩, ⟨ᴺC⟩ and ⟨Nᶜ⟩.

Le occlu-costrittive non-sonore possono esser interessate dagli stessi fenomeni descritti per le occlusive (non-sonore), nelle medesime condizioni (parziale laringalizzazione della vocale accentata precedente, [ˈVʔC], [VᶜˈCV]; cf. § 2.2).

Figure 76. Miotti (2015: 382)

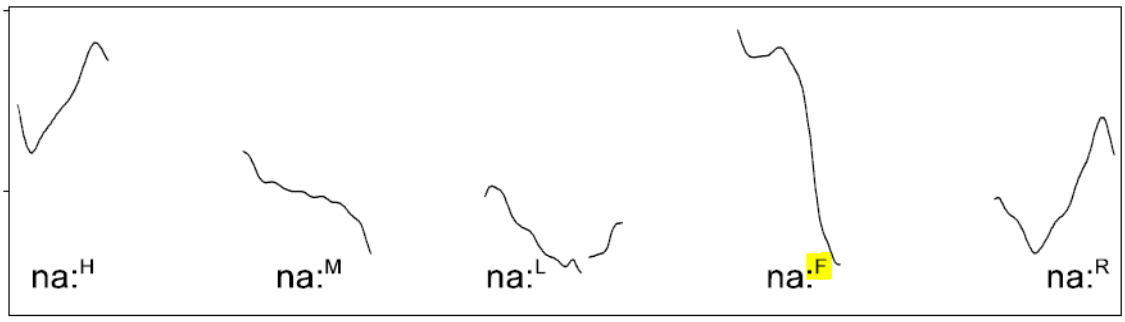
Throughout the chapter, we have discussed the two types of partially nasal segments attested phonologically – prenasalized segments and prestopped nasals – in parallel, despite much greater documentation of ᴺCs than ᶜNs cross-linguistically. While we have acknowledged the paucity of information on the ᶜN cases, we have not addressed the source of this imbalance. This imbalance raises several questions. First,

Figure 77. Riehl & Cohn (2011: 572)

prenasalized consonants. Ratliff (2015) describes the various historical developments of original prenasalized consonants in the languages of Mainland South East Asia, noting that across languages these consonants are now variably ᶯC, NC, ᴺC, Nᶜ, or plain voiced C. Overall, then,

Figure 78. Keating, Wymark & Sharif (ms p. 8)

Modifier capital F (ᶠ)



Figur 9.9 De fem toner i thai

9.5.3 Notation
Der er flere forskellige måder at notere toner på i litteraturen. En ser således ud: ᴴpa – høj, ᴹpa – midt, ᴸpa – lav, ᶠpa – faldende, ᴿpa – stigende ('rising'). Meget almindeligt

Figure 79. Grønnum (2005: 201, 202). Modifier capitals as tone letters.

Modifier capital Q (ᵠ)

Occasionally used for *sokuon* (phonemic gemination) in Japanese.

[If this should be a superscript small-cap Q, that is also unsupported by Unicode.]

below). The first part of the sustained stop closure in the second and third words above corresponds to the second mora of the trimoraic words. While /haᵠka/ is written with two kanji along with many Sino-Japanese words (Kango) in similar forms (more typically with four morae, as in /haᵠkaku/

Figure 80. Fujimura & Williams (1999: 473)

Other Greek letters

Modifier mu (ᵘ)

〈μ〉 is a wild card for 'mora', whereas superscript 〈ᵘ〉 marks a moraic boundary. The distinction is analogous to 〈σ〉 for 'syllable' vs 〈$〉 for a syllable boundary[dbl check usage], and I've always seen the moraic boundary symbol as a superscript. If the formatting were lost, the mu would suggest an additional unspecified mora within the string of segments.

∗[ˈhɑ.ət] is ruled out for its monomoraic full-voweled syllable. With a (potentially) bimoraic stem as in (19b) /vɛʁ̥+nt/, the suffix is forced into a syllable of its own to avoid a trimoraic syllable ∗[vɛᵘɻ̥ᵘnᵘt] while still having a mora itself [ˈvɛʁ̥ət] (the underdot marks the syllable boundary that the [ʁ̥] straddles). That a diphthong does not break apart, as with (20a) /pɑ̆ᵘuᵘ+nt/, follows from

Figure 81. Hiller (2003: 204)

(19) The high short allophone of /o/

norr /norᵘ/ [ˈnɔrː] 'north' Norrtälje /norᵘ+tɛlj-e₂/ [nɔ²ˈʈɻːjɛ] or [nʊ²ˈʈɻːjɛ]

Norrtull /norᵘ+tʉlᵘ/ [nɔˈʈɵlː] or [nʊˈʈɵlː]

Figure 82. Riad (2014: 32)

Nearly all consonants occur as both a long and a short phoneme. We assume that contrastive quantity resides with the consonants, whereas length in vowels is purely allophonic, and driven by Stress-to-Weight, an undominated constraint in Swedish (see chapter 8). We represent the phonemic length here with a raised mora (e.g. /kɑtᵘ/ [katː] 'cat').[1] Phonetically this always comes out as increased duration relative to the non-moraic variant. This is worth emphasizing, since Swedish (and Norwegian) differ from most other varieties of Germanic by having a direct quantitative correlate to a moraic consonant. The two consonants /h/ and /ç/ are

Figure 83. Riad (2014: 45)

(28) Main articulations of the Central Swedish consonants

		labial, labiodental	dental, alveolar	alveolar, palatal	velar
oral stop	s.g.	p pᵘ	t tᵘ		k kᵘ
	voice	b bᵘ	d dᵘ		g gᵘ
fricative	s.g.	f fᵘ	s sᵘ	ç	
fric./retroflex			ʂ ʂᵘ		
fric./approx.	voice	v vᵘ		j jᵘ	
nasal stop		m mᵘ	n nᵘ		ŋ ŋᵘ
lateral			l lᵘ		
apical trill			r rᵘ		

Figure 84. Riad (2014: 45). ⟨lᵘ⟩ is a moraic [l]; baseline ⟨lμ⟩ would instead be non-moraic [l] followed by some mora. ⟨lᵘ⟩ is thus similar to ⟨l̩⟩, but moraic rather than syllabic.

Modifier kappa, omicron, pi, tau (& iota) (... ᵀ)

Used in scribal abbreviations. See also combining alpha (separate request).

ὁ κ(αί), a collocation mostly used for aliases, written as o^{κ}, is a classic

ABBREVIATIONS AND SYMBOLS 173

example. A more drastic abbreviation of this sort is τo^{κ}, representing τὸ κ(αθ' ἄνδρα); on the face of it, one could also resolve τ(ὸ καί), but the context guards against misunderstandings. Indicative of the extent of

commonest abbreviations of this kind is κοι (or $\kappa^{o\iota}$) for κ(άτ)οι(κος), κ(αθ)οι(κικός), and the like. This practice is attested as early as the

$\zeta^{\tau} = \zeta(\upsilon\gamma o\sigma)\tau(\acute{\alpha}\tau\eta\varsigma)$. Sometimes we find two letters superscript, as in $\nu\alpha\upsilon^{\pi\gamma} = \nu\alpha\upsilon\pi(\eta)\gamma(\acute{o}\varsigma)$. Naturally, not everything is straightforward;

Overwritten nonsequential vowels also occur, but they come from the end of the words and serve to indicate inflexions (Bell 1951, 431); $\iota\nu\delta^{o} = \iota\nu\delta(\iota\kappa\tau\acute{\iota}\omega\nu)o(\varsigma)$ is the commonest such example.

Figure 85. Bagnall (2011: 172–174). [Scribal conventions (use Latin o). Move to a separate Greek proposal. Need digitalize in plain text.]

Additional superscript letters for review

Modifier small-cap ʀ (ᴿ) and turned ʁ (ʶ) [waiting on ILL]

(good to have on record for future proposals)

Used in Penhallurick and similar dialect atlases for weak allophones of English /r/. ɹ is used, along with a modifying superscript variant, for fricative [ɻ] in Penhallurick (1991). I have not found superscript ʴ or ᴿ in that volume, apart from the list of superscript letters below, but they are used in the data it was drawn from, which is published in volume 3 of D.R. Parry (director, U. of Swansea) & Penhallurick (ed.) *Survey of Anglo-Welsh Dialects*. [I do not have access.] ᴿ might be found in Bright, if that is not a full capital (small cap R for uvular trill vs full cap R for voicelessness).

The following superscript IPA letters in
ɾ ɾ ɹ ɻ ɽ R ʁ s ɪ ɷ u ə

The following superscript IPA letters indicate weak articulation :
ɾ ɾ ɹ ɻ ɽ R ʁ s ɪ ɷ u ə

Figure 86. Penhallurick (1991: xviii). Modifier IPA diacritics used for weak articulation. The letters are ʳɾɹɻʴʀʁˢɪʷᵘᵊ.

šip "he flew away." Before front vowels, the velar friction of /x/ is often accompanied by a voiceless uvular trill: ʔa[$x^{R}x^{R}$]i·č "child."

Figure 87. Bright (1957: 8)

Modifier ɖ (ᵈ)

Linguists differ on whether they transcribe the Australian stop series as voiceless ⟨p t̪ t ʈ c k⟩ or voiced ⟨b d̪ d ɖ ɟ g⟩. Thus both ⟨ᵗ⟩ and superscript ⟨ᵈ⟩ are needed. For example, Nukunu /n̪ᵗ/ and /ɲᶜ/ have been transcribed phonetically as [n̪ᵈ] and [ɲʲ] (Hercus 1992 *A Nukunu Dictionary*, cited in Butcher 1999 "what speakers of Australian Aboriginal languages do with their velums and why", *Proceedings of the XIVth International Congress of Phonetic Science*), though that particular language does not have a retroflex. Similarly, Acehnese has voiced post-stopped (orally released) nasals transcribed ⟨mᵇ nᵈ ɲʲ ŋᵍ⟩ in Long & Maddieson (1993: 142) "Consonantal evidence against Quantal Theory", *UCLA Working Papers in Phonetics* 83, but lacks a retroflex series. Chan (1987) comments that such notation is quite common, and uses it herself ("Post-stopped nasals in Chinese", *UCLA Working Papers in Phonetics* 68). Lack of attested ⟨ᵈ⟩ is thus an accidental gap.

Modifier barred glottal stop, ʔ̵ (ᵷ)

I have yet to find ⟨ᵷ⟩ in print. John Esling (p.c.) says "One of the only reasons epiglottal stop (ʡ) in general may not yet appear widely in the literature is because we only identified it phonetically (as a pharyngeal stop, a.k.a. aryepiglottic closure) 20 years ago." Indeed, he has used the transcriptions ⟨ʕ͡ʔ⟩ and ⟨ʜ͡ħ⟩ for Amis, with a tie bar that he notes in print is not accurate, and says he could imagine using modifier letters (ʕˀ and ʜʰ) instead.

Modifier capital X (ˣ)

(good to have on record for future proposals)

X	&Xmod;	F1BF	PUA-11	MODIFIER CAPITAL LETTER X

Figure 88. MUFI (2015: 121).

Modifier Latin chi (ˣ)

Baseline Greek χ and Latin χ are both encoded, due to casing in both (Latin χχ). It may be that the superscript can be handled by the font. check proposal 12270 for justification.
Add contrasting texts with superscript Greek chi and beta.

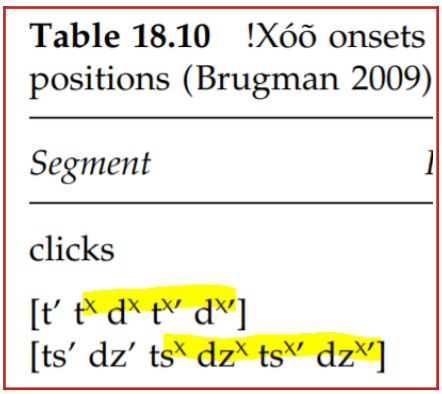


Table 18.10 !Xóõ onsets positions (Brugman 2009)

Segment	*I*
clicks	
[tʼ tˣ dˣ tˣʼ dˣʼ]	
[tsʼ dzʼ tsˣ dzˣ tsˣʼ dzˣʼ]	

Figure 89. Miller (2010: chapter 'Representation of Clicks', table 18.10)

re-analyzes the fricative as uvular [χ] and the velarized clicks [ǀx !x ǁx ǂx] as uvularized clicks [ǀˣ !ˣ ǁˣ ǂˣ], based on the raised F1 values in vowels following these sounds. The place difference accounts for the different BVC patterns, as the

Figure 90. Miller (2010: chapter 'Representation of Clicks'). Miller uses Latin chi both inline and as a modifier letter.

Modifier Latin beta (ᵝ)

A proper IPA superscript beta is used in Laver. Modifier Greek beta is at U+1D5D ⟨ᵝ⟩, and Greek beta *β* is more commonly used in IPA transcriptions than the dedicated IPA Latin beta, but since the latter has been added to Unicode (at U+A7B5) it would be consistent to have a superscript Latin ⟨ᵝ⟩ as well. Latin ⟨ᵝ⟩ is attested both in affricates and diphthongs. Another use is a restored ('missing') β in transcriptions of Avestan and Old Persian manuscripts (Skjærvø 2007 Avestan and Old Persian Morphology, in Kaye (ed.) *Morphologies of Asia and Africa*, p. 859).

Baseline Greek β and Latin β are both encoded, due to casing in both (Latin Ƥβ). It may be that the superscript can be handled by the font. check proposal 12270 for justification.

Der er et skel mellem diftonger og diftongerede vokaler selvom det ikke kan trækkes på rent lydligt grundlag. Således er fx de høje og halvhøje lange svenske vokaler, som i ◖['viːla 'meːna 'fyːra 'øːgon d̪u̪ᵝː bu̪ᵝː] *vila, mena, fyra, ögon, du, bo* 'hvile, mene, fire, øjne, du (pron), bo,' diftongerede. [iː] og [yː] har tiltagende indsnævring mellem fortungen og den hårde gane og kan tilmed ende i et frikativt [j̊]. [u̪ᵝː] og [uːᵝ] har tiltagende runding, jf. 6.1.3 og fodnote 3. [eː] og [øː] ændrer sig i retning mod en halvlav mellemtungevokal, [ɐ]. De fleste lange vokaler i skånsk er ligeledes diftongerede, tilmed kraftigt, jf. stockholmsk og skånsk ◖['sku̪ᵝːa 'skɛ͡ʉla] *skola* 'skole.' Engelsk langt /iː/

Figure 91. Grønnum (2013: 102)

Table 19.2e *Numbers of languages exploiting differences of place of articulation, aspectual and co-ordination categories on single post-affricated voiced oral stops in 317 languages*

Labial	Lab-dnt	Dental	Dent/Al	Alveol	Post-al	R'flex	Palatal	Velar	Uvular	**Total**
[bᵝ	bᵛ	d̪ᶞ	d̪ᶞ ~ dᶻ	dᶻ	dʒ	ɖʐ	ɟʲ	gʸ	ɢʶ]	

labial [ɸ] [β]

Figure 92. Laver (1994: Table 19.2e and p. 245). The latter shows that Laver uses Latin β and ɸ, with their serifs, rather than Greek β and ϕ.

tilslører det forhold at fonetisk er der tale om fire høje vokaler, [iː], [yː], en
et mellemtungevokal [ʉ̟ᵝː] (=/uː/), og det indrundede [uᵝː] (=/oː/); [oː] = /ɔː/:

iː yː ʉ̟ᵝː uᵝː

jeg [round] til fremrundede vokaler. Men måske kunne de svenske indrundede vokaler, /uː/([ʉ̟ᵝː]) og /oː/([uᵝː]), karakteriseres som [+round, +lab].

Figure 93. Grønnum (2005: 362, 396). Both the baseline and superscript betas have the bottom serif expected of Latin script.

Properties

```
.....;MODIFIER LETTER SMALL AE;Lm;0;L;<super> 00E6;;;;N;;;;;
.....;MODIFIER LETTER SMALL REVERSED E;Lm;0;L;<super> 0258;;;;N;;;;;
.....;MODIFIER LETTER SMALL RAMS HORN;Lm;0;L;<super> 0264;;;;N;;;;;
.....;MODIFIER LETTER SMALL O WITH STROKE;Lm;0;L;<super>
    00F8;;;;N;;;;;
.....;MODIFIER LETTER SMALL CAPITAL Y;Lm;0;L;<super> 028F;;;;N;;;;;
.....;MODIFIER LETTER SMALL CAPITAL B;Lm;0;L;<super> 0299;;;;N;;;;;
.....;MODIFIER LETTER SMALL CAPITAL G;Lm;0;L;<super> 0262;;;;N;;;;;
.....;MODIFIER LETTER SMALL H WITH STROKE;Lm;0;L;<super>
    0127;;;;N;;;;;
.....;MODIFIER LETTER SMALL HENG WITH HOOK;Lm;0;L;<super>
    0267;;;;N;;;;;
.....;MODIFIER LETTER SMALL CAPITAL H;Lm;0;L;<super> 029C;;;;N;;;;;
.....;MODIFIER LETTER SMALL Q;Lm;0;L;<super> 0071;;;;N;;;;;
.....;MODIFIER LETTER SMALL R WITH FISHHOOK;Lm;0;L;<super>
    027E;;;;N;;;;;
.....;MODIFIER LETTER SMALL R WITH TAIL;Lm;0;L;<super> 027D;;;;N;;;;;
.....;MODIFIER LETTER SMALL TURNED R WITH LONG LEG;Lm;0;L;<super>
    027A;;;;N;;;;;
.....;MODIFIER LETTER SMALL CAPITAL R;Lm;0;L;<super> 0280;;;;N;;;;;
.....;MODIFIER LETTER SMALL T WITH RETROFLEX HOOK;Lm;0;L;<super>
    0288;;;;N;;;;;
.....;MODIFIER LETTER SMALL TURNED Y;Lm;0;L;<super> 028E;;;;N;;;;;
.....;MODIFIER LETTER REVERSED GLOTTAL STOP WITH
    STROKE;Lm;0;L;<super> 02A2;;;;N;;;;;
.....;MODIFIER LETTER SUPERSCRIPT TRIANGULAR COLON;Lm;0;L;<super>
    02D0;;;;N;;;;;
.....;MODIFIER LETTER SUPERSCRIPT HALF TRIANGULAR
    COLON;Lm;0;L;<super> 02D1;;;;N;;;;;
.....;MODIFIER LETTER SMALL REVERSED R WITH FISHHOOK;Lm;0;L;<super>
    027F;;;;N;;;;;
.....;MODIFIER LETTER SMALL SQUAT REVERSED ESH;Lm;0;L;<super>
    0285;;;;N;;;;;
.....;MODIFIER LETTER SMALL N WITH CURL;Lm;0;L;<super> 0235;;;;N;;;;;
.....;MODIFIER LETTER SMALL CAPITAL P;Lm;0;L;<super> 1D18;;;;N;;;;;
.....;MODIFIER LETTER SMALL CAPITAL TURNED R;Lm;0;L;<super>
    1D1A;;;;N;;;;;
.....;MODIFIER LETTER SMALL CLOSED OMEGA;Lm;0;L;<super>
    0277;;;;N;;;;;
.....;MODIFIER LETTER SMALL DEZH DIGRAPH;Lm;0;L;<super>
    02A4;;;;N;;;;;
.....;MODIFIER LETTER SMALL TESH DIGRAPH;Lm;0;L;<super>
    02A7;;;;N;;;;;
.....;MODIFIER LETTER CAPITAL C;Lm;0;L;<super> 0043;;;;N;;;;;
.....;MODIFIER LETTER CAPITAL F;Lm;0;L;<super> 0046;;;;N;;;;;
.....;MODIFIER LETTER CAPITAL Q;Lm;0;L;<super> 0051;;;;N;;;;;
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.....;MODIFIER LETTER SMALL GREEK ALPHA;Lm;0;L;<super> 03B1;;;;N;;;;;
.....;MODIFIER LETTER SMALL GREEK KAPPA;Lm;0;L;<super> 03BA;;;;N;;;;;
.....;MODIFIER LETTER SMALL GREEK MU;Lm;0;L;<super> 03BC;;;;N;;;;;
.....;MODIFIER LETTER SMALL GREEK OMICRON;Lm;0;L;<super>
    03BF;;;;N;;;;;
.....;MODIFIER LETTER SMALL GREEK PI;Lm;0;L;<super> 03C0;;;;N;;;;;
.....;MODIFIER LETTER SMALL GREEK TAU;Lm;0;L;<super> 03C4;;;;N;;;;;
.....;MODIFIER LETTER SMALL CAPITAL GREEK PHI;Lm;0;L;<super>
    [PROPOSED POINT];;;;N;;;;;
.....;MODIFIER LETTER SMALL GREEK OMEGA;Lm;0;L;<super> 03C9;;;;N;;;;;
.....;MODIFIER LETTER SMALL B WITH BAR;Lm;0;L;<super> [PROPOSED
    POINT];;;;N;;;;;
.....;MODIFIER LETTER SMALL L WITH STROKE;Lm;0;L;<super>
    0142;;;;N;;;;;
.....;MODIFIER LETTER SMALL L WITH BAR;Lm;0;L;<super> 019A;;;;N;;;;;
.....;MODIFIER LETTER SMALL TURNED R WITH BAR;Lm;0;L;<super>
    [PROPOSED POINT];;;;N;;;;;
.....;MODIFIER LETTER SMALL SHARP S;Lm;0;L;<super> 00DF;;;;N;;;;;
.....;MODIFIER LETTER SMALL CAPITAL A;Lm;0;L;<super> 1D00;;;;N;;;;;
.....;MODIFIER LETTER SMALL CAPITAL E;Lm;0;L;<super> 1D07;;;;N;;;;;
.....;MODIFIER LETTER SMALL CAPITAL O;Lm;0;L;<super> 1D0F;;;;N;;;;;
.....;MODIFIER LETTER SMALL CAPITAL OU;Lm;0;L;<super> 1D15;;;;N;;;;;
.....;MODIFIER LETTER SMALL CAPITAL W;Lm;0;L;<super> 1D21;;;;N;;;;;
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