

[back to Title page](#)

Appendix

Languages in the Appendix

This appendix is based on the 1991 set of HyperCard stacks and additional material produced by members of the UCLA Phonetics Lab. In conjunction with the data cited in Vowels and Consonants and A Course in Phonetics it forms a database that includes several hundred of the estimated 800 possible speech sounds in the languages of the world. The aim is to present contrasting sounds so as to provide illustrations of the range of the linguistic phonetic abilities of mankind.

We are grateful to NSF for major support of this work. This material may be used in any way, provided that it is acknowledged. It should be cited as:

UCLA Linguistics Dept. 'Sounds of the World's Languages'. Web edition.
2001.

A CD with this material and other UCLA Phonetics programs is available
from:

Phonetics Software, Linguistics Department, UCLA, Los Angeles, CA
90095-1543.

[back to Title page](#)

Languages

[A](#)[B](#)[C](#)[D](#)[E](#)[F](#)[G](#)[H](#)[I](#)[J](#)[K](#)[M](#)[N](#)[O](#)[P](#)[R](#)[S](#)[T](#)[U](#)[V](#)[W](#)[Y](#)[Z](#)

[Agul](#)

[Akan](#)

[Angami](#)

[Arabic](#)

[Armenian](#)

[Assamese](#)

[Badaga](#)

[Bru](#)

[Bura](#)

[Chinatec](#)

[Dutch](#)

[Edo](#)

[Finnish](#)

[Gimi](#)

[Greek](#)

[Hebrew](#)

[Hmong](#)

[Ibibio](#)

[Idoma](#)

[Icelandic](#)

[Ijo](#)

[Isoka](#)

[Javenese](#)

[K'etchi](#)

[Kaititj](#)

[Korean](#)

[Malay](#)

[Marathi](#)

[Montana](#)

[Newari](#)

[Margi](#)

[Mazatec](#)

[Mid-Waghi](#)

[Nepali](#)

[Ngwo](#)

[Norwegian](#)

[Oro-Win](#)

[Polish](#)

[Russian](#)

[Sundanese](#)

[Temne](#)

[Toda](#)

[Tsonga](#)

[Tsou](#)

[Turkish](#)

[Ubykh](#)

[Vende](#)

[Wangurri](#)

[Yanyuwa](#)

[Yoruba](#)

[Zhu|õasi](#)

[Back to language index page](#)

Agul (Burkixan Dialect)

Voiced pharyngeal fricative	muɬ 'bridge'	muɬar 'bridges'
Voiceless pharyngeal fricative	muħ 'barn'	muħar 'barns'
Voiceless epiglottal fricative	mäh 'whey'	mähär 'wheys'
Voiceless epiglottal stop	jaʔ 'center'	jaʔar 'centers'
	säʔ 'measure'	säʔär 'measures'

Agul is a Nakho-Dagestanian language (Samurian subgroup of the Lezgian family) of the northeast Caucasus. It is spoken by approximately 12,000 people in southern Dagestan, USSR. The language contrasts voiced and voiceless pharyngeal fricatives with voiceless epiglottal stops and fricatives. These contrasts are shown here in word-final and intervocalic position. The recordings were made by the Russian linguist S. Kodzasov of one female speaker of the Burkixan dialect. The transcription [ä] is taken directly from Kodzasov's notes and is used to denote a slightly fronted vowel.



[Back to language index](#)

Akan			
[+ATR]	[-ATR]	[+ATR]	[-ATR]
sɪ̣ 'wash'	sɪ̥ 'say'	bɪ̣ 'break'	bɪ̥ 'get drunk'
wabɛ̣tu 'pull it out'	sɛ̥ 'to resemble'	ɔ̣wia 'he steals'	ɔ̥wia 'he crawls'
sɔ̣ 'to cure'			

Akan is a Kwa language of the Niger-Kordofanian family spoken by approximately 4.5 million people in Ghana. The major dialects include Fante, Asante and Akuapem; the latter two are called Twi. The relevant phonetic contrast illustrated here is between advanced tongue root [+ATR] vowels and their plain [-ATR] counterparts. These are transcribed as follows:

ɪ̣ = [+ATR] ɪ̥ = [-ATR]

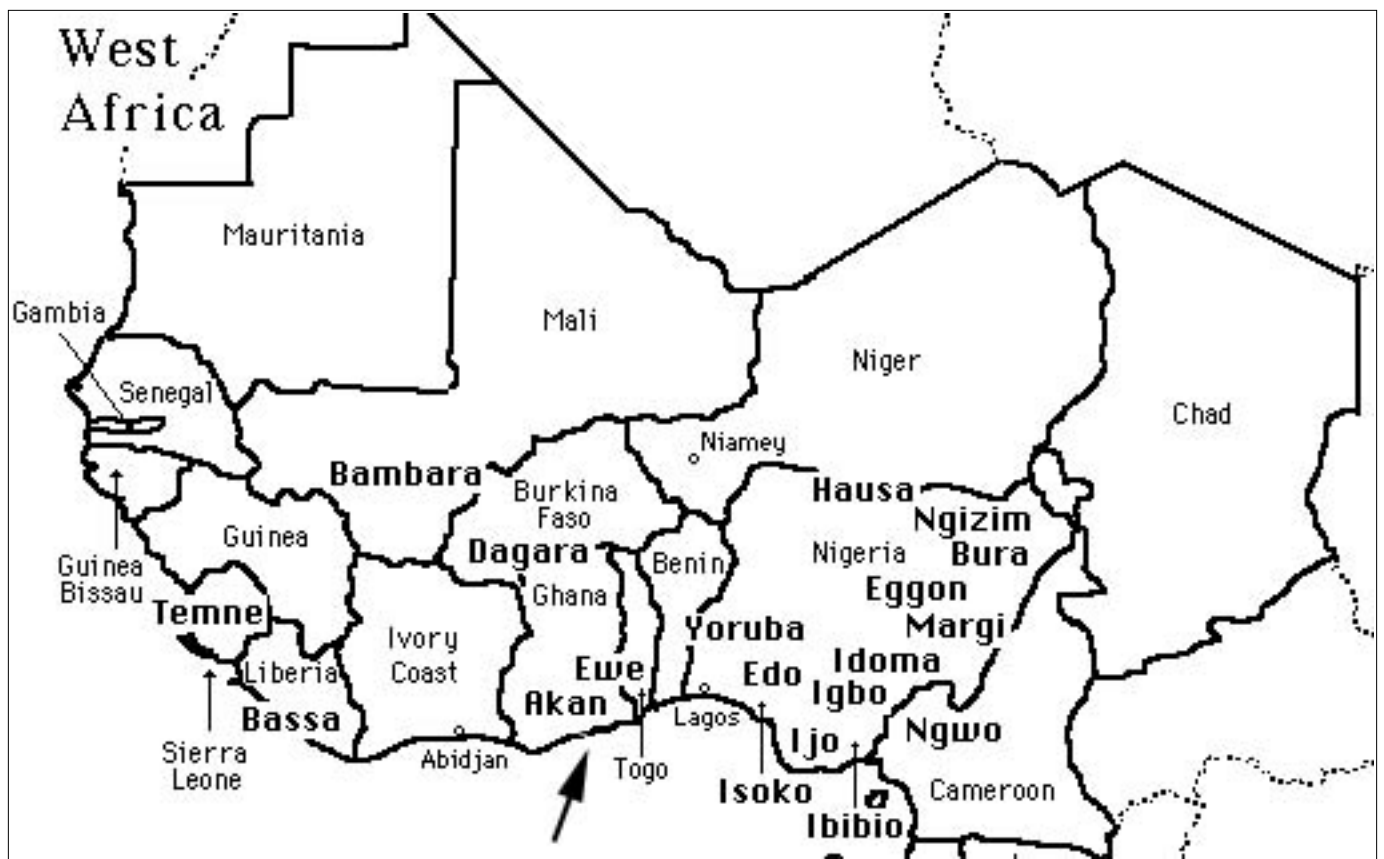
The contrast exists for the high and mid vowels. The low vowel [a] is [-ATR].

Two sets of X-rays accompany the sounds to illustrate tongue position of the contrasting vowels.

Xray 1 Xray 2

References

- Lindau, M. 1979. The feature expanded. *Journal of Phonetics* 7.163-76.
 Stewart, J.M. 1967. Tongue root position in Akan vowel harmony. *Phonetica* 16.185-204.



[Back to language index](#)

Angami (Khonoma dialect)

Voiced

me¹

mouth

ne¹

to push

nje³

thousand

ŋu²

to see

Voiceless

me⁴

to blow

ne⁴

to blow the nose

nje⁴

to plaster onto a wall

Voiceless (in frame)

a **me**⁴ sishuto

a **ne**⁴ sishuto

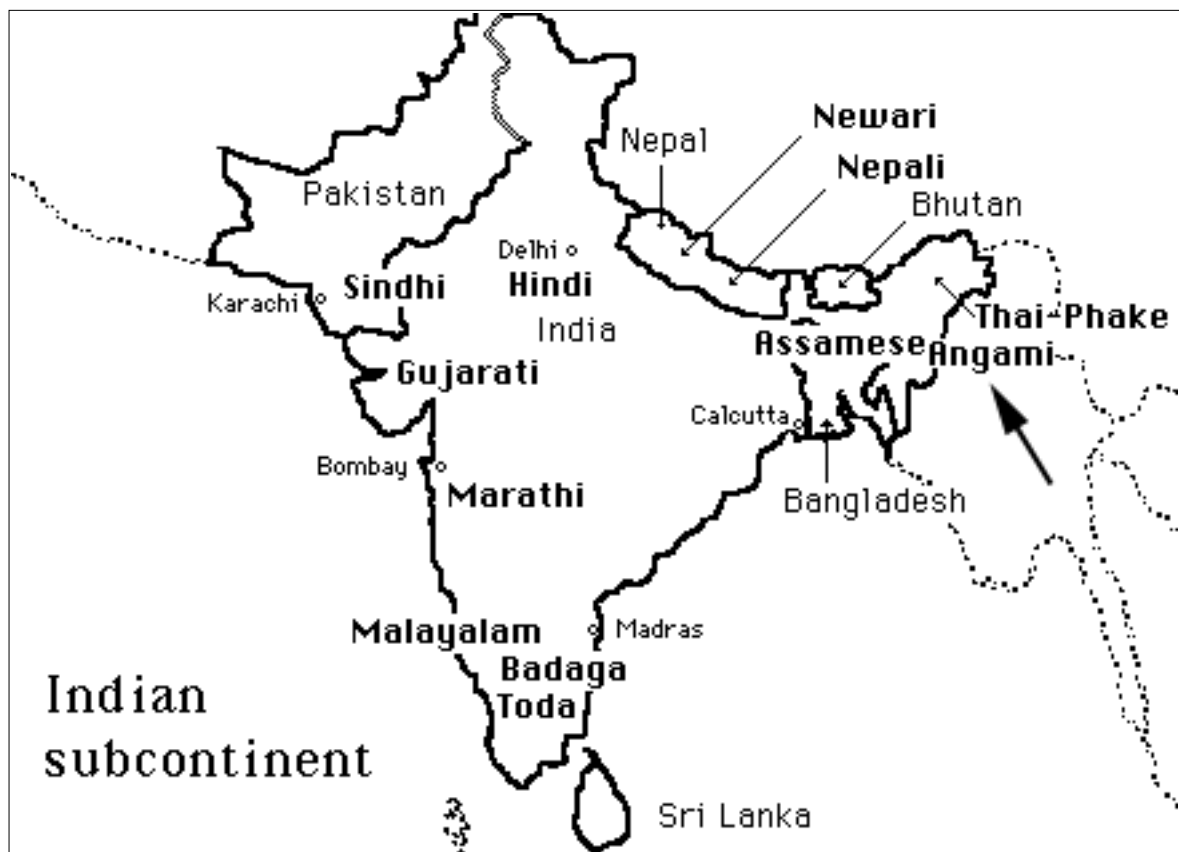
a **nje**⁴ sishuto

Angami (Khonoma dialect)

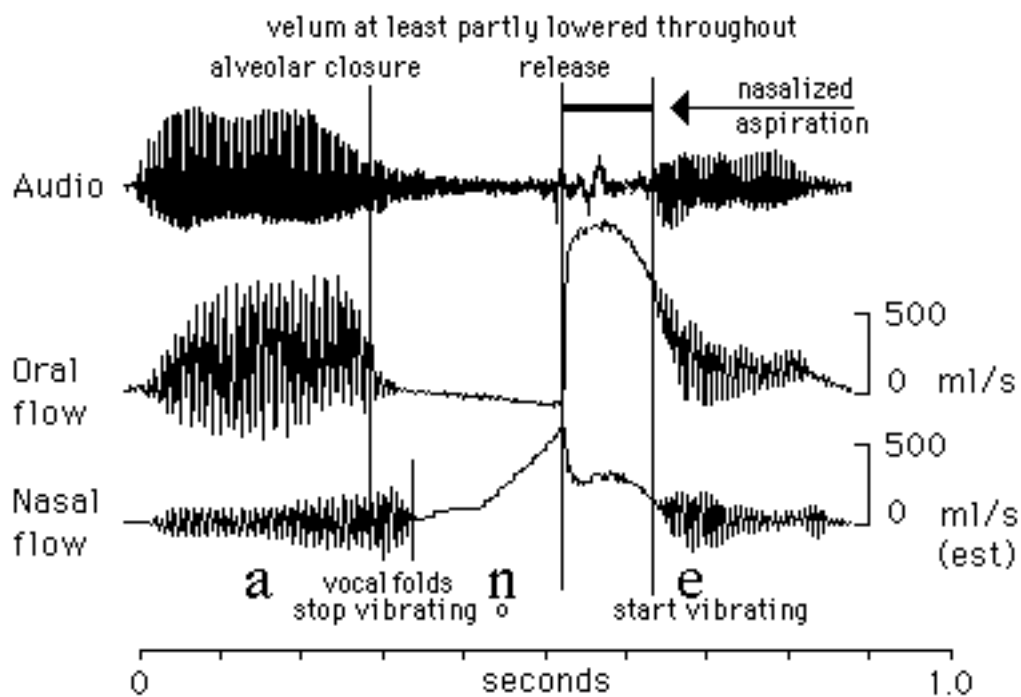
Angami is a Tibeto-Burman language spoken in the Naga Hills in the northeastern parts of India. There are several dialects, the most prominent being Chokri, Khonoma, and Kohima.

Nasals in Khonoma Angami are produced at four places of articulation, bilabial, alveolar, palatal, and velar. There is a contrast between voiced and voiceless nasals in the first three places of articulation. This is demonstrated in the first card. Aerodynamic records are available in the second card.

For further information, please see Blackenship, Barbara, Peter Ladefoged, Peri Bhaskararao, and Nichumeno Chase. 1993. Phonetic Structure of Khonoma Angami. *Linguistics of the Tibeto-Burman Area*. 16:2. 69-88.



Angami (Khonoma dialect)



Arabic

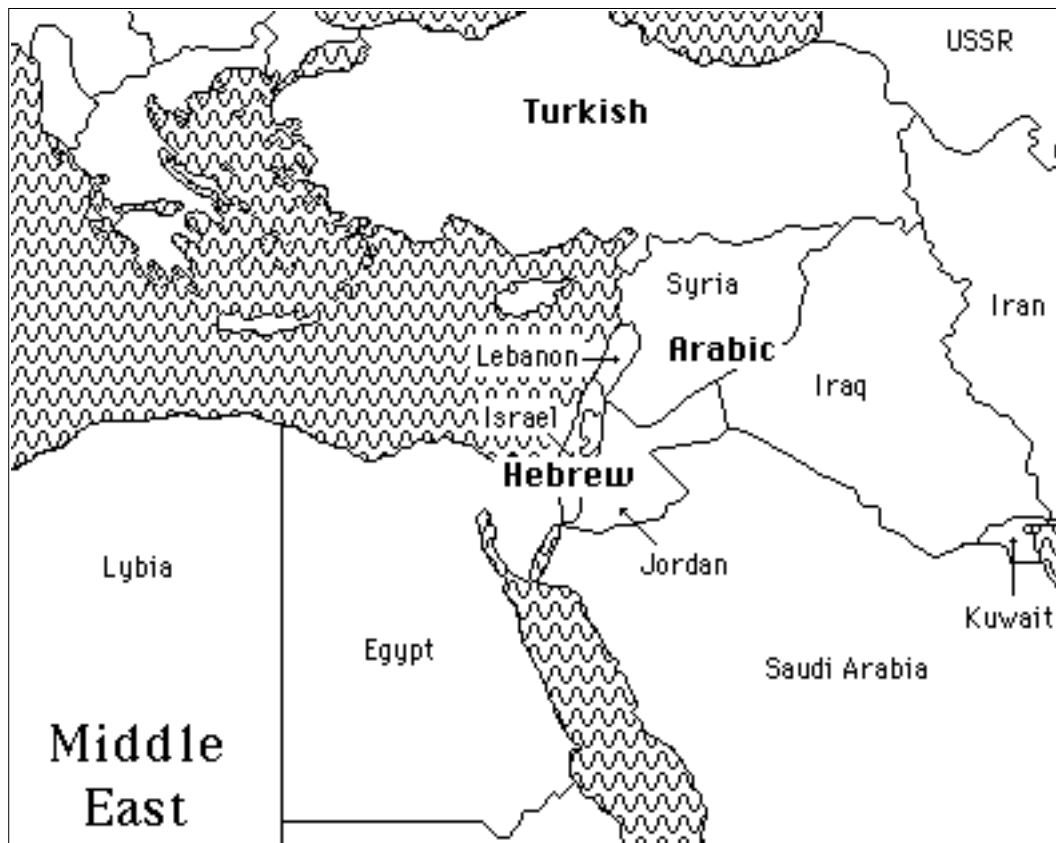
(Syrian dialect)

Initial		Medial	
tɪːn	'figs'	ʔatːal	'he massacred'
tʰɪːn	'mud'	ʔatʰːaf	'he gathered'
dal	'he pointed'	madːa	'table cloth'
dʰal	'he stayed'	madʰːa	'he wasted'
suːs	'licorice'	masːa	'he said "good night"'
sʰuːsʰ	'chick'	masʰːa	'he sucked'
zat	'he threw'	bazːaʔ	'he spat hard'
ðʰabatʰ	'he perfected'	naðʰːomlʰi	'he organized neatly'
raːsʰi	'he is anchored'	farːad	'he separated'
rʰaːsʰi	'my head'	harʰːab	'he fought'
Final			
tal	'hill'	dalːat	'she pointed'
tʰalʰ	'he peeped'	dʰalʰːat	'she stayed'

Arabic is an Afro-Asiatic language (Semitic branch) spoken by over 100

million people in the Middle East and Northern Africa. There are many dialects. The Northeastern variety spoken in Syria is illustrated here. Arabic contrasts plain and pharyngealized (“emphatic”) stops, fricatives, and liquids. Intervocally, contrasts involving geminates are also found. Note that in the Syrian dialect illustrated here, the pharyngealized counterpart to the voiced fricative

[z] is [ðˤ]



[Back to language index](#)

Armenian (Eastern dialect)					
Voiced	ab (a month)	sard 'spider'	bardz 'pillow'	ʃurdz 'environs'	bag 'portion'
Voiceless unaspirated	kap 'bond'	mut 'entrance'	barts 'difficult'	surtʃ 'coffee'	bak 'porch'
				votʃ 'phrase'	tak 'under'
Voiceless aspirated	kap ^h 'club'	mut ^h 'darkness'	barts ^h 'high'	votʃ ^h 'no'	tak ^h 'hot'
		zart ^h 'jewel'			

Armenian is an Indo-European language with approximately 5 million speakers. Eastern Armenian is spoken in Armenia, northern Iran, and Turkey.

Eastern Armenian has a three-way contrast between voiced, voiceless unaspirated, and voiceless aspirated stops and affricates. While this contrast occurs in many languages, it is unusual for it to be maintained in word-final position, as is the case in Eastern Armenian.

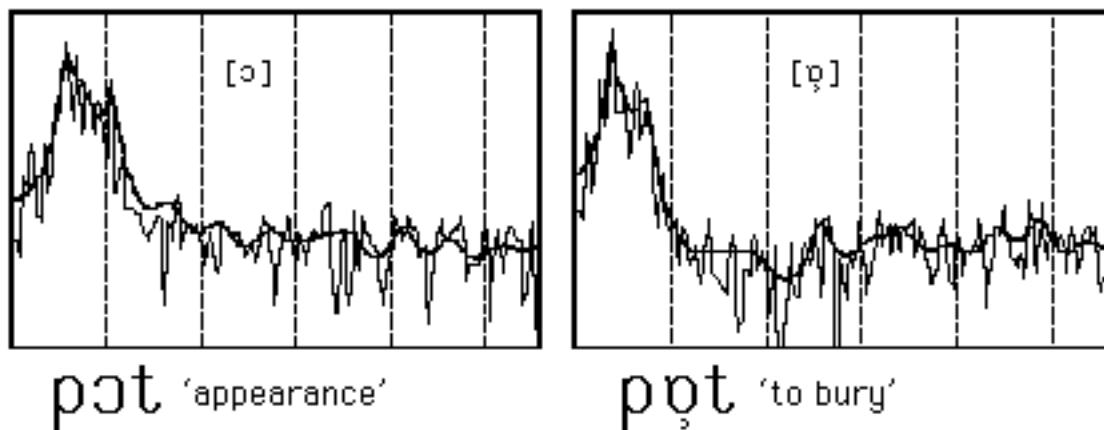


[back to language index](#)

Assamese	
Front	Back
pit 'to beat'	puti 'having buried'
petu 'intestine'	poti (girl's name)
pɛt 'stomach'	pɔt 'appearance'
pat 'to establish'	pɔ̃t 'to bury'

Assamese is an Indo-European language (Indo-Aryan branch) spoken by approximately 20 million people in India and Bangladesh.

Assamese has eight vowels. Of particular interest is the contrast between the lower-mid and low back vowels. Superimposed FFT-LPC spectra for these two vowels are included here for comparison.



The spectra show analyses of the two vowels [ɔ] and [ɔ̃]. The first is fairly similar to the IPA reference vowel [ɔ]; the second has a tongue position like that of [ɔ̃], but with a lip position more like that of [u]. The first and second formants are at slightly higher frequencies for [ɔ] – an unusual situation in that higher vowels normally have lower first formant frequencies. The considerable rounding in [ɔ̃] has caused both formants to be lower as well as a very sharp decrease in spectral energy immediately above the second



[back to languages index](#)

Badaga

Plain

iru

‘to be’

beː

‘mouth’

kaːsu

‘coin’

kattu

‘being aflame’

huː

‘flower’

noː

‘disease’

oːgu

‘to go’

Half-retroflex

ɨ̌

‘drag’

beː̌

‘bangle’

haː̌su

‘spread out’

kǎttu

‘corner’

duː̌

‘dust’

poː̌

‘scar’

oː̌ge

‘inside’

Full-retroflex

ɨ̌y̌u

‘seven’

beː̌̌

‘crop’

kǎː̌su

‘remove’

paː̌̌gu

‘to get used to’

hǔ̌

‘worm’

toː̌̌

‘cattle pen’

kǒː̌ga

‘a certain measure’

Badaga is a Southern Dravidian language (Tamil-Kannada branch) spoken by approximately 250,000 people in the Nilgiri hills in Southern India. There are several dialects, only the most conservative having the complete set of contrasts illustrated here.

Badaga has five vowels /i e a o u/, all of which can be contrastively half and fully retroflexed.

Half-retroflexed vowels are indicated by the diacritic for rhoticity: [a̠], fully retroflexed vowels with a subscript dot [a̠]



[back to language index](#)

Bruu (Western dialect)

Stiff vocal cords
Tense vocal tract walls

kiɬt

‘fear of crowds’

teh

‘to split open’

tah

‘to throw away’

kaiʔ

‘to pluck’

Slack vocal cords
Non-tense vocal tract walls

k*i*ɬt

‘sharpen a knife’

t*e*h

‘leech’

t*a*h

‘to slap’

k*a*iʔ

‘to cross’

Bruu is a member of the Katuic group of the Mon Khmer branch of the Austro-Asiatic family of languages. There are approximately 50,000 speakers in Laos and approximately 20,000 speakers in Thailand. The speaker in the recording here is from Buon Province, NE Thailand.

The interesting contrast here is one between slightly breathy and slightly laryngealized vowels. Vowels are articulated with stiff vocal cords and tense vocal tract walls (raised larynx) or with slack vocal cords and non-tense vocal tract walls (lowered larynx). The stiff vocal cord vowels are underlined with a solid line; slack vocal cord vowels are transcribed with a dotted line.

a = stiff vocal cords; tense vocal tract walls

a = slack vocal cords; non-tense vocal tract walls



[back to language index](#)

Bura (Pela dialect)

Modal

wáskí
'each'

jà
'to give birth'

náká wáskí
'give one to each'

si(t)a jà
'it is giving birth'

Laryngealized

ʔʷálá
'big'

ʔʲáhà
'doctor'

tʂa ʔʷálá
'it is big'

tʂa ʔʲáhà
'he is a doctor'

Labialization

bàrà
'to want'

ʔbáɬà
'to dance'

màrà
'to carve'

gàm
'ram'

bʷà
'part'

ʔbʷá
'to beat'

mʷàntà
'to move'

gʷà
'poison'

pàkà
'to search'

kálá
'to bite'

pʷàrà
'to escort'

kʷára
'donkey'

Laterals			
	Alveolar		Palatal
	Approximant	Fricative	Approximant
Voiced	là 'to build'	ɮábʷá 'to beat'	
Voiceless		ɬá 'cow'	ɕálá 'cucumber'

Labial-velars		
		Fricative
	Approximant	
Voiced	wáskí 'each'	wàrwár 'throat'
Voiceless	màdá 'groundnuts'	

Bura is an Afro-Asiatic language of the Chadic family (Biu-Mandara branch), spoken by approximately 250,000 people in Nigeria. The two major dialects are Pela (Hill Bura) and Hyilhawul (Plain Bura).

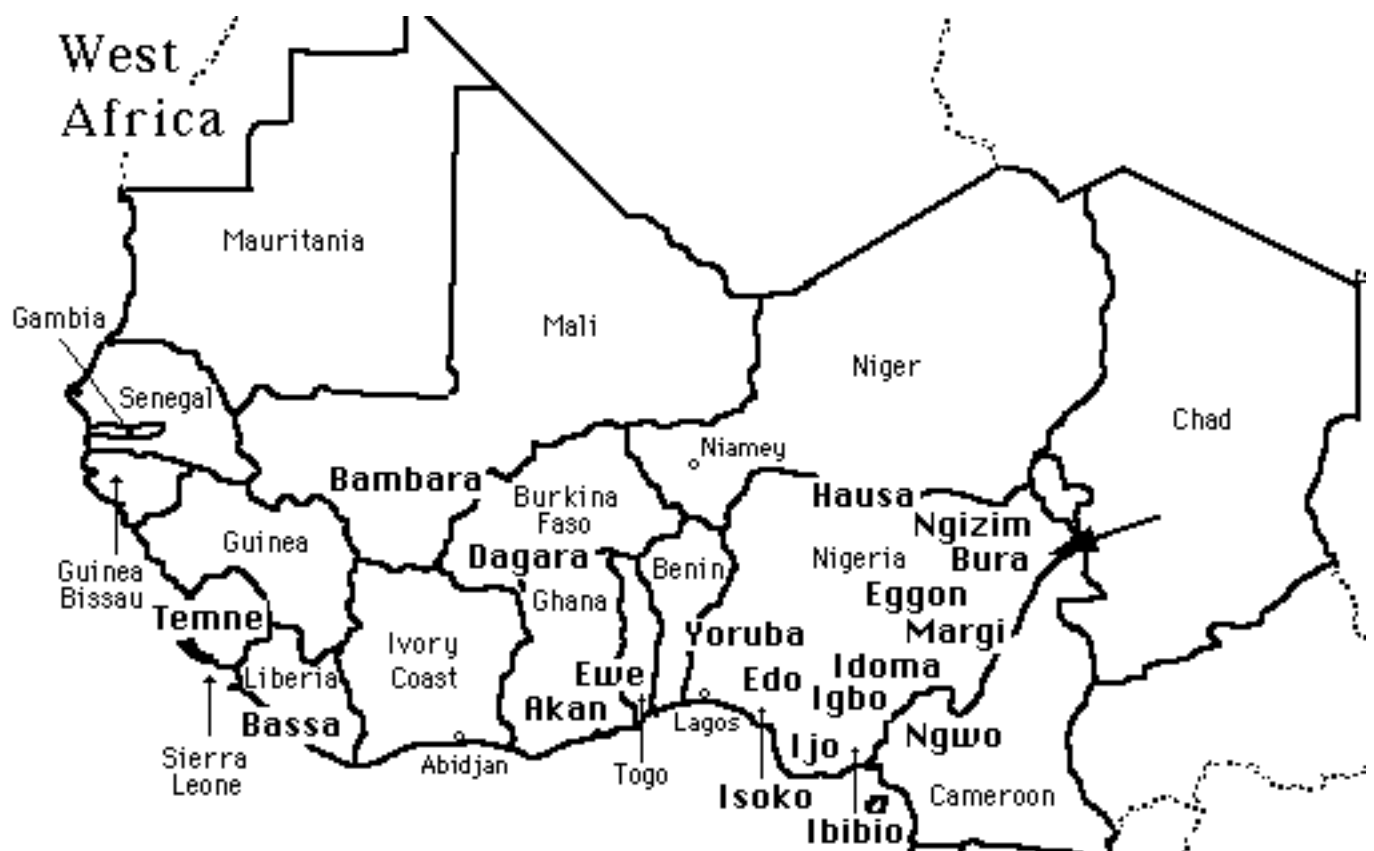
Bura is interesting for several reasons.

First, the language has what can be considered as either laryngealized semi-vowels or, as they are represented here, glottal stops with accompanying secondary articulations. These sounds are presented here in word-initial position as well as intervocally. Similar sounds also occur in other Chadic languages, including Hausa and Margi.

Bura also contrasts plain and labialized stops at the bilabial and velar places of articulation, including laryngealized bilabial stops and bilabial nasals.

Bura contrasts voiced and voiceless labial-velar approximants with a voiced labial-velar fricative.

Finally, Bura has five laterals: voiced alveolar approximant, voiced and voiceless alveolar fricatives, and voiced and voiceless palatal approximants. (Note: the voiced palatal approximant is not illustrated here.)

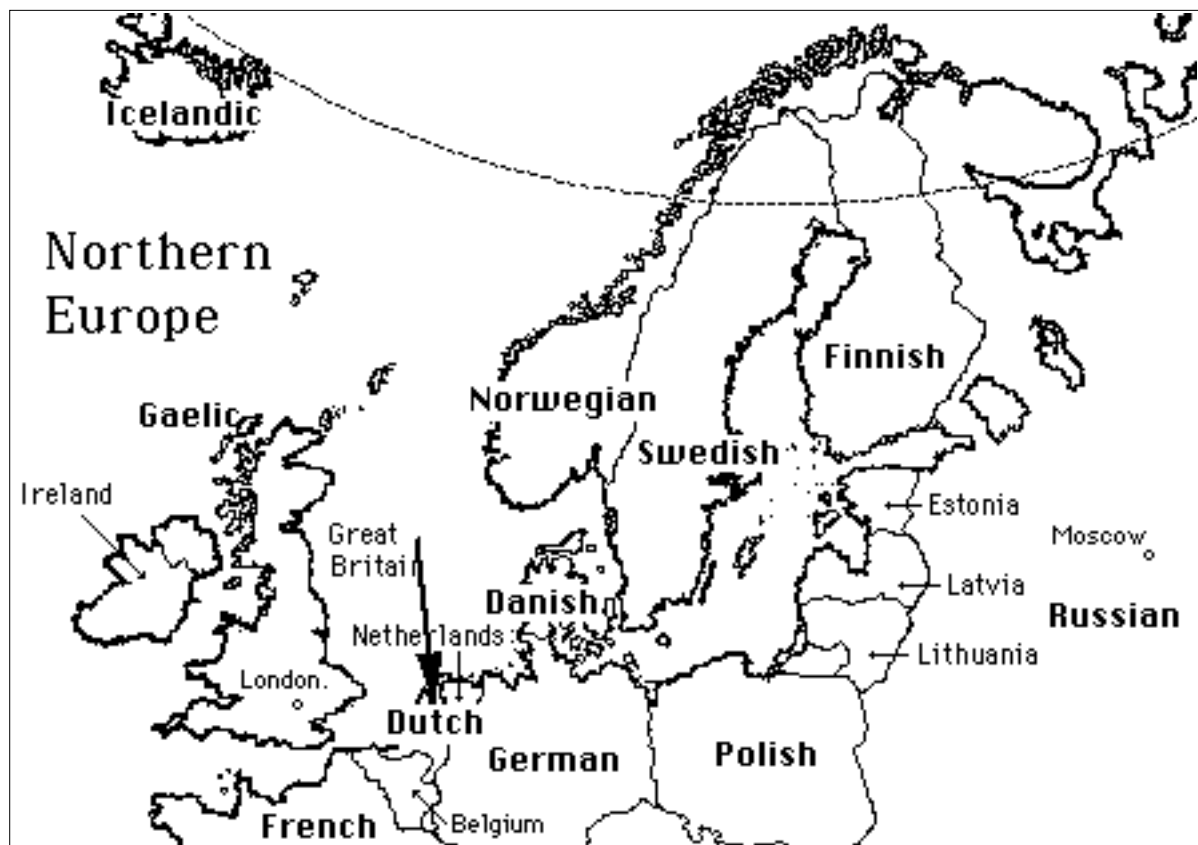


[back to language index](#)

Dutch (West Coast dialect)		
Front		Back
unrounded	rounded	
bit 'beet'	byt (game word)	but 'repent' [imper.]
bit 'bit'		
bet 'bit' [pt.]	pøt 'turpentine'	bot 'boat'
bæt 'bed'	pæ't 'ditch'	bɔt 'bone'
bat 'gain'		bat 'bath'
bɛit 'bites'	bʌyt 'prey'	baut 'leg'

Dutch is an Indo-European language (West Germanic branch) spoken by approximately 20 million people in the Netherlands and Belgium.

Dutch has 12 monophthongs and 3 diphthongs.

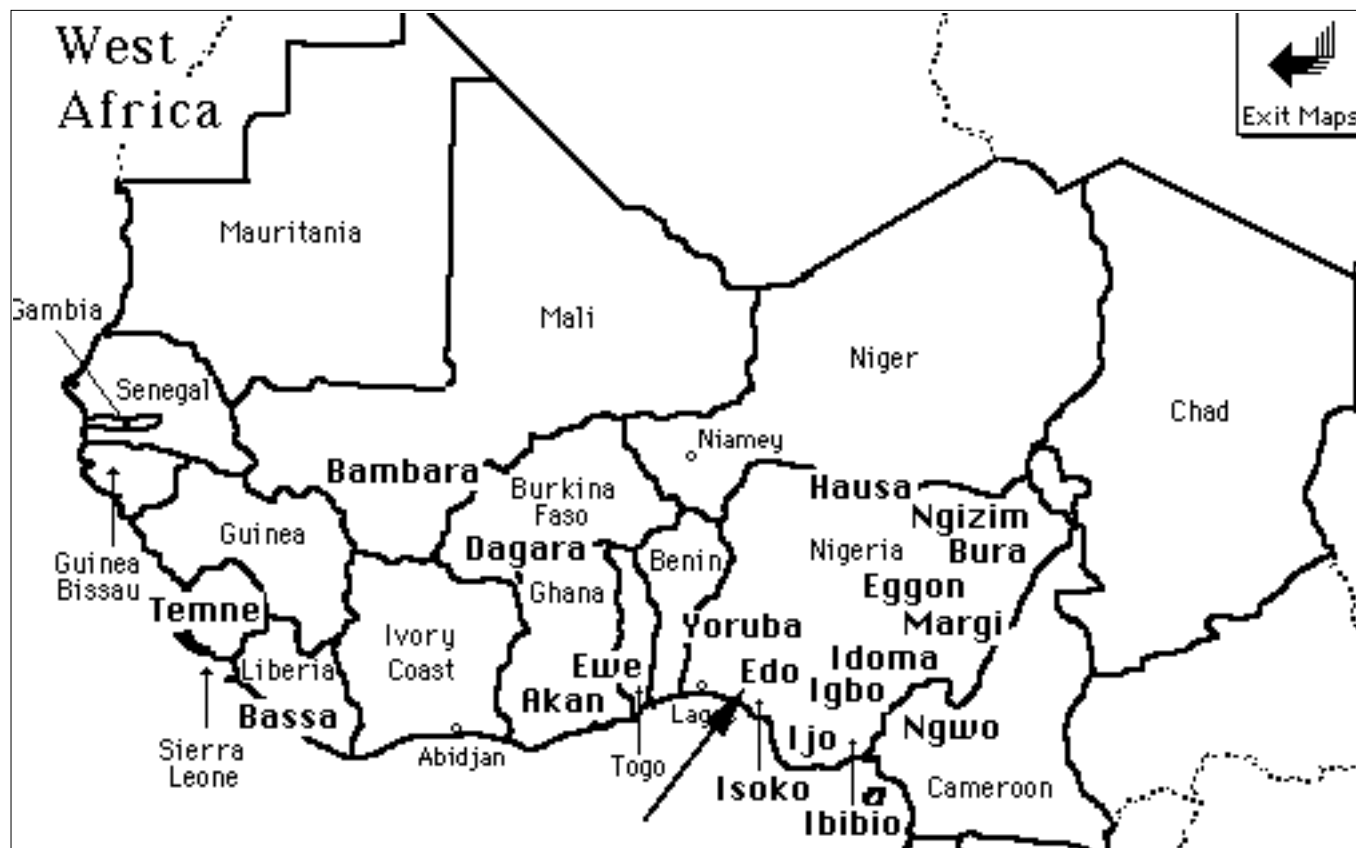


[back to language index](#)

Èdo		
Alveolar lateral	álázi	(kind of monkey)
Voiced alveolar approximant	ájába	'rubber'
Voiced alveolar fricative	aɹá	'caterpillar'
Voiceless alveolar approximant	àɹà	(part of burial ceremony)

Èdo is a Niger-Kordofanian language (Kwa group) spoken by approximately 1 million people in Bendel State, Nigeria. The language is also called Bini.

Èdo has a four-way contrast among alveolar liquids: voiced alveolar lateral, voiced alveolar approximant, voiced alveolar fricative, and voiceless alveolar approximant.



[back to language index](#)

Finnish (Eastern dialect)

tule

‘come’ [imper.]

tule

‘blow’ [imper.]

tule

‘maybe coming’ [neg.]

tule

‘maybe blowing’ [neg.]

tule

‘comes’

tule

‘blows’

tule

‘maybe comes’

tule

‘maybe blows’

Short trill

Long trill

puran

‘I undo’

purra

‘to bite’

ympyræ

‘circle’

ymmaerræ

‘understand’ [neg.imp.]

Finnish is a Uralic language spoken primarily in Finland by approximately 5 million people.

Length is contrastive in Finnish both for consonants and vowels.

The set of disyllabic words given here illustrates the full range of possible combinations of short and long consonants and vowels.

Also illustrated here is short /r/ and long (geminate) /rr/. This contrast is unusual in that both /r/ and /rr/ can be trills. Short /r/ is usually realized as an alveolar trill with two taps (as illustrated in the examples here) or as a single tap. Long /rr/ is usually realized as an alveolar trill with three or four taps.



[back to language index](#)

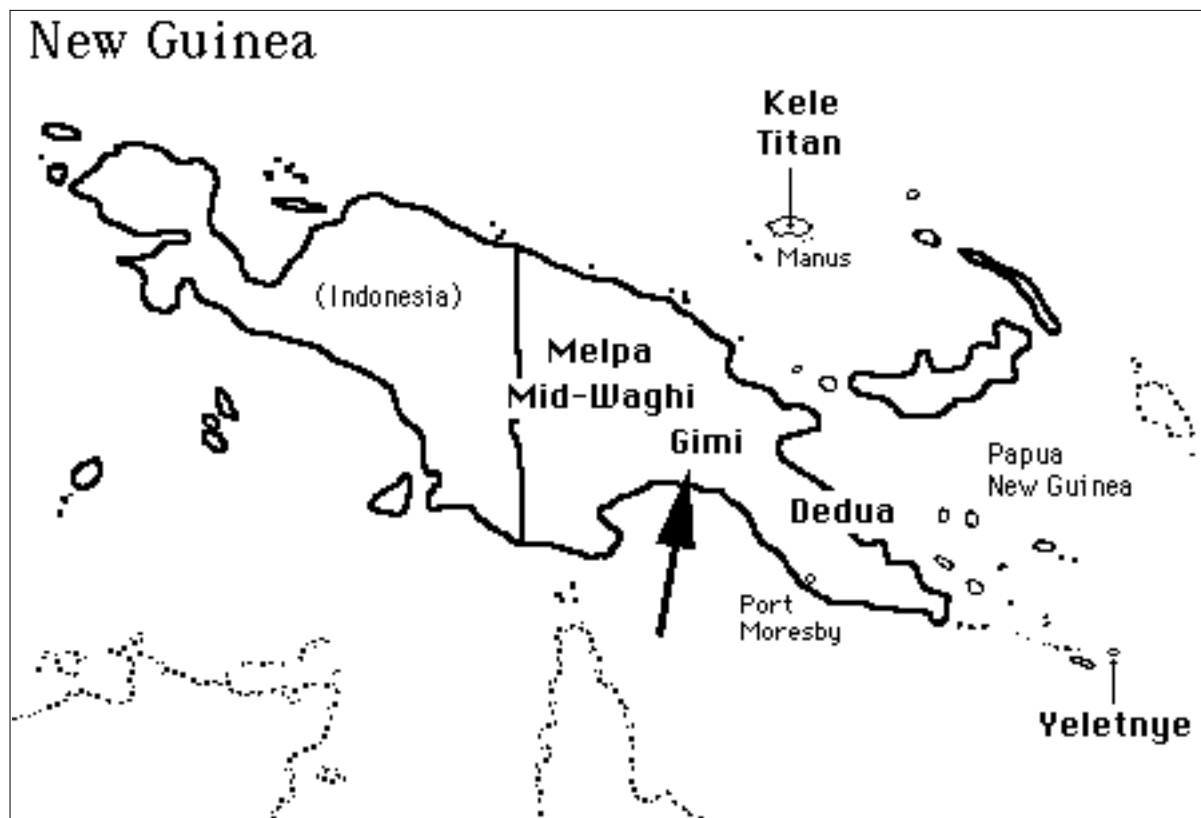
Gimi

Voiceless glottal fricative	rahoʔ	‘truly’
Glottal stop	haʔo	‘shut’
Voiced glottal approximant	ha*oʔ	‘many’
(Vowel transition)	hao	‘hit’

Gimi is an Indo-Pacific language (East New Guinea Highlands subbranch) spoken in Eastern Highlands province of Papua New Guinea. There are approximately 22,000 speakers.

The consonant system of Gimi includes a glottal stop and another segment (symbolized here by [*]) which functions phonologically as its voiced counterpart. Thus, it has been suggested that Gimi has a ‘voiced glottal stop’. Phonetically, [*] is indeed voiced and involves some glottal activity. It is, however, not a stop, but an approximant, as indicated by the diminution of energy between otherwise adjacent vowels.

Here, intervocalic /ʔ/ and /*/ are contrasted with intervocalic /h/ and an example of a vowel-to-vowel transition.



[back to language index](#)

Greek

Voiceless

Voiced

Initial

θiki
'box'

ðiki
'trial'

Intervocalic

laθi
'errors'

laði
'oil'

Palatal

Velar

Voiceless

çeri
'hand'

xɔma
'soil'

Voiced

jeri
'old men'

ɣɔma
'eraser'

Greek is an Indo-European language spoken by approximately 11 million people primarily in Greece.

Greek contrasts voiced and voiceless interdental fricatives /θ ð/.

It also contrasts voiced and voiceless back fricatives /x ɣ/, which are palatal [ç j] before front vowels and velar [x ɣ] before back vowels. The voiced palatal allophone may lack noticeable turbulence, in which case it should be described as the palatal approximant [j].



[back to language index](#)

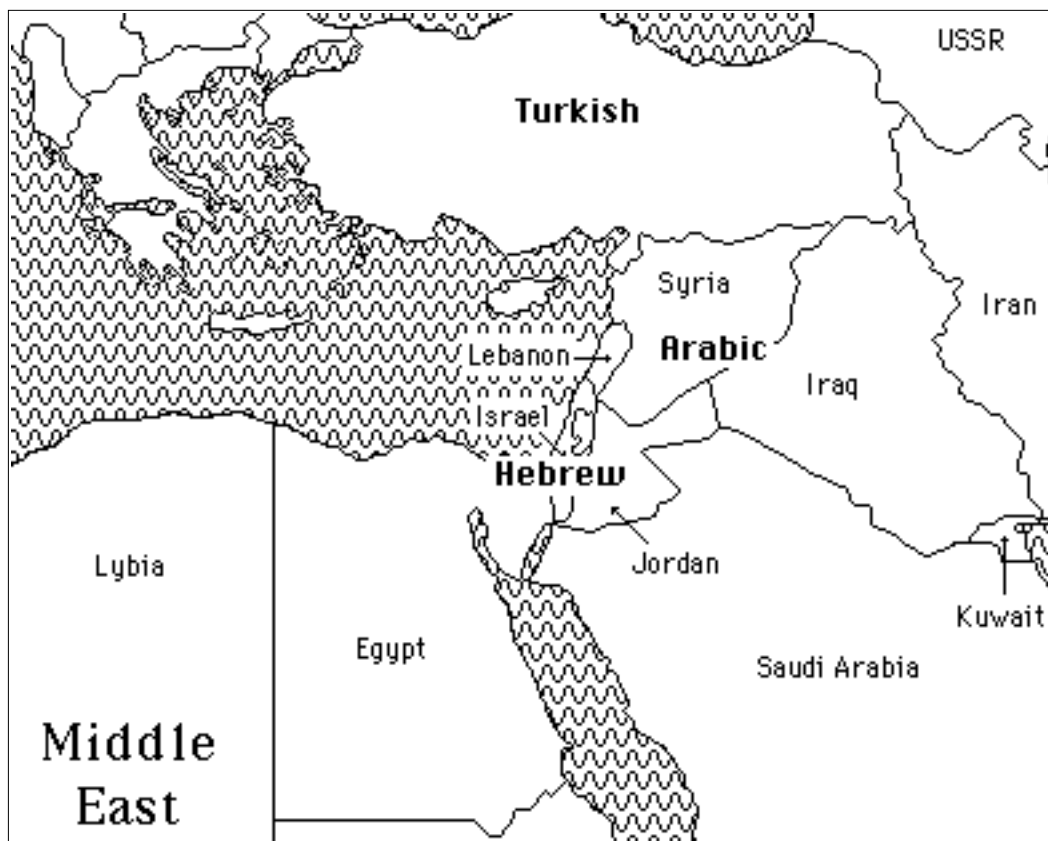
Hebrew (Oriental dialect)

	Uvular	Pharyngeal	Glottal
Initial	· χ imia 'chemistry'	ħor 'hole'	hem 'them'
		ʕor 'skin'	ʔor 'light'
Medial	· ma χ ar 'he sold'	naħar 'snored'	nahar 'river'
		naʕar 'made a donkey noise'	ʃaʔon 'noise'
Final	· la χ 'for you' [fem.]	laħ 'humid'	lah 'for her'
		naʕ 'moved'	

Hebrew is an Afro-Asiatic language (Central Semitic group) spoken by approximately 4 million people in Israel.

The Oriental dialect of Modern Hebrew contrasts seven back consonants, including two velar stops [k g], a uvular fricative [χ], a voiceless pharyngeal fricative [ħ], a voiced pharyngeal approximant [ʕ], a glottal stop [ʔ], and a glottal fricative [h]. Illustrated here are the uvular, pharyngeal, and glottal consonants.

Note that intervocalic [h] is voiced in the example [nahar].



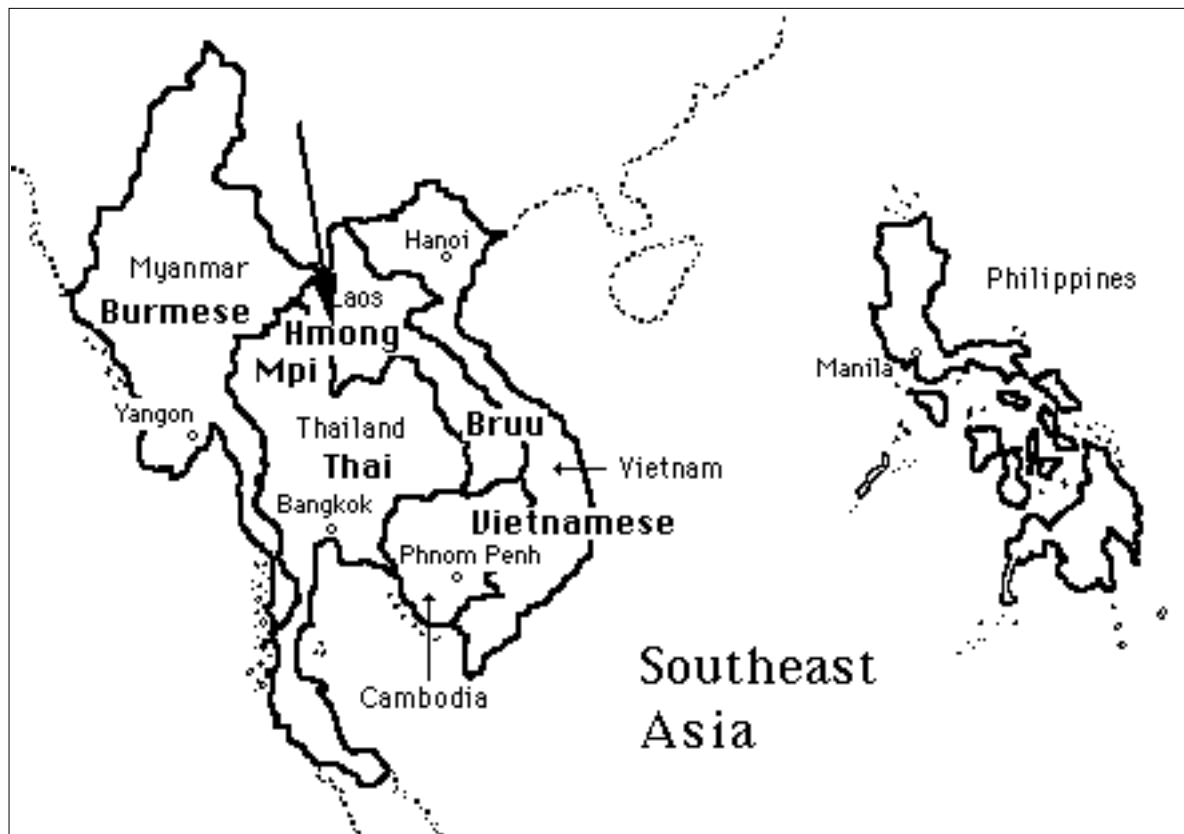
[back to language index](#)

Hmong (Daw [White Meo] dialect)

High level	pO 55 'ball-like'	High falling	pO 42 'female'
Mid level	pO 33 'pancreas'	Mid rising	pO 35 'to throw'
Low level	pO 22 'thorn'	Low breathy	pO 32 'paternal grandmother'
		Checked	pO? 31 'to see'

Hmong is an Sino-Tibetan language (Miao-Yao group) spoken in Thailand, Laos, and China by approximately 3 million people.

Hmong has seven tones. Three – high, mid, and low – are level tones spoken with normal phonation. Two – high falling and mid rising – are contour tones, also with normal phonation. The sixth tone is low with breathy phonation. The seventh is characterized by glottal stop termination, and may involve creaky voice.



[back to language index](#)

Ibibio

**High tone
followed by**

**Low tone
followed by**

High

ákpá

‘expanse of ocean’

àkpá

‘first’

Falling

ákpân

‘square woven basket’

àkpô

‘rubber tree’

Low

ákù

‘priest’

àkpà

(small ant)

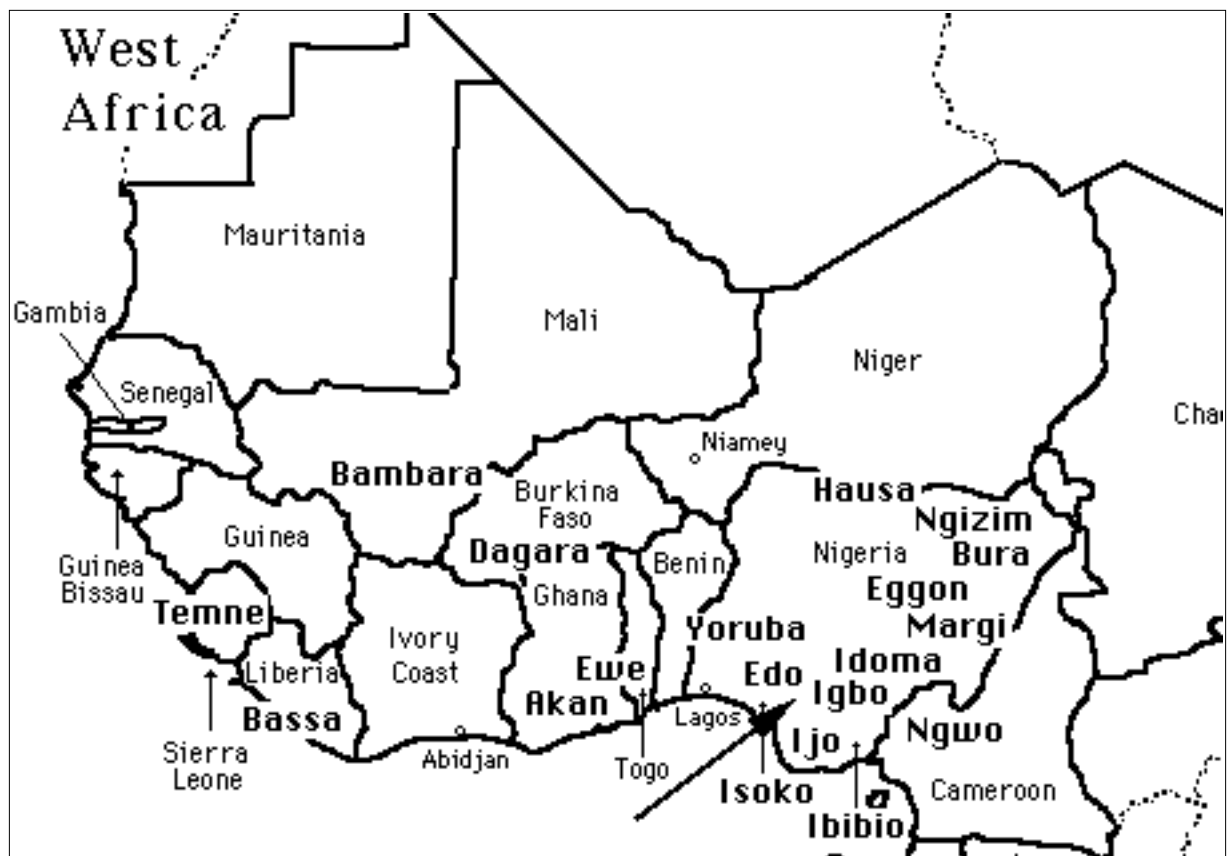
[back to language index](#)

Idoma

Labial	àpà 'lizard'	àbà 'palm nut'	áma 'bell'
Labial-velar	àk̠pà 'bridge'	àg̠bà 'jaw'	aŋ̠màa 'painted body marks'
Velar	àka 'wheel'	àga 'ax'	ɔŋáɟi 'Western rainbow'
Labialized	òkʷò (tree)	àgʷa 'swimming'	àŋʷà 'fortune-telling instrument'

Idoma is Niger-Kordofanian language (Kwa subgroup) spoken by approximately 300,000 people in Benue State, Nigeria.

Idoma contrasts labial-velar oral and nasal stops with labial, velar, and labialized stops.



[back to language index](#)

Icelandic (Southern dialect) Diphthongs

Long diphthongs

hei:ʔ	‘hot’ [fem.sg.]
læy:ʔ	‘free’ [masc.sg.]
sai:ʔ	‘sweet’ [fem.]
sau:ra	‘wound’ [gen.pl.]
sou:ʔ	‘sod’

Short diphthongs

heiht	‘hot’ [neut.]
læyʔs	‘free’ [masc.sg.gen.]
saiht	‘sweet’ [neut.]
saurra	‘sore’ [gen.pl.]
souht	‘fetched’

Medial stops

k ^h ɔhpar	mæhtir	pɛhkʲa	sahka
‘small pot’ [n.pl.]	‘may’ [2s.pt.sub.]	‘to know’	‘sinker’
k ^h ɔppar	mættir	lɛkkʲa	sakka
‘young seal’ [n.pl.]	‘distressed’ [m.n.pl.]	‘to lay’	‘dampness’ [og.sg.]
k ^h o:par	mæxtir	pɛ:kʲa	sakka
‘copper’	‘meet’ [2s.pr.sub.]	‘to cover’	‘to blame’
	mæhtnir		sahkna
	‘meet’ [3p.pr.ind.]		‘to regret’
			sakna
			‘saga’ [g.pl.]

Final stops

kʰahp
'zeal'

viht
'wide'

tøhk
'dark' [f.n.sg.]

kapp
'hoax'

vitt
'breadth'

tøkk
'dew'

ka:p
'opening'

pit
'bite' [1s.pr.]

thø:k
'grasps'

Fricatives

Labiodental

fau:
'to get'

Alveolar

θau:
'then'

Alveolar sibilant

sau:
'saw'

Palatal

çau:
'by, with'

Icelandic is an Indo-European language (North Germanic branch) spoken primarily in Iceland by approximately 250,000 people. There are two dialects, Northern and Southern.

Icelandic has five diphthongs, which occur both long and short, depending on syllable structure. Diphthongs preceding 'pre-aspirated' or geminate consonants are short, while those preceding 'short' (nongeminate) consonants are long.

Icelandic also contrasts 'pre-aspirated', geminate, and 'short' stops in medial and final positions. Again, vowel length plays a part in the contrasts.

Also illustrated are the voiceless fricatives /f θ s ç/.

Note: [s] sometimes has a more back or rounded articulation and might be transcribed [ʂ].



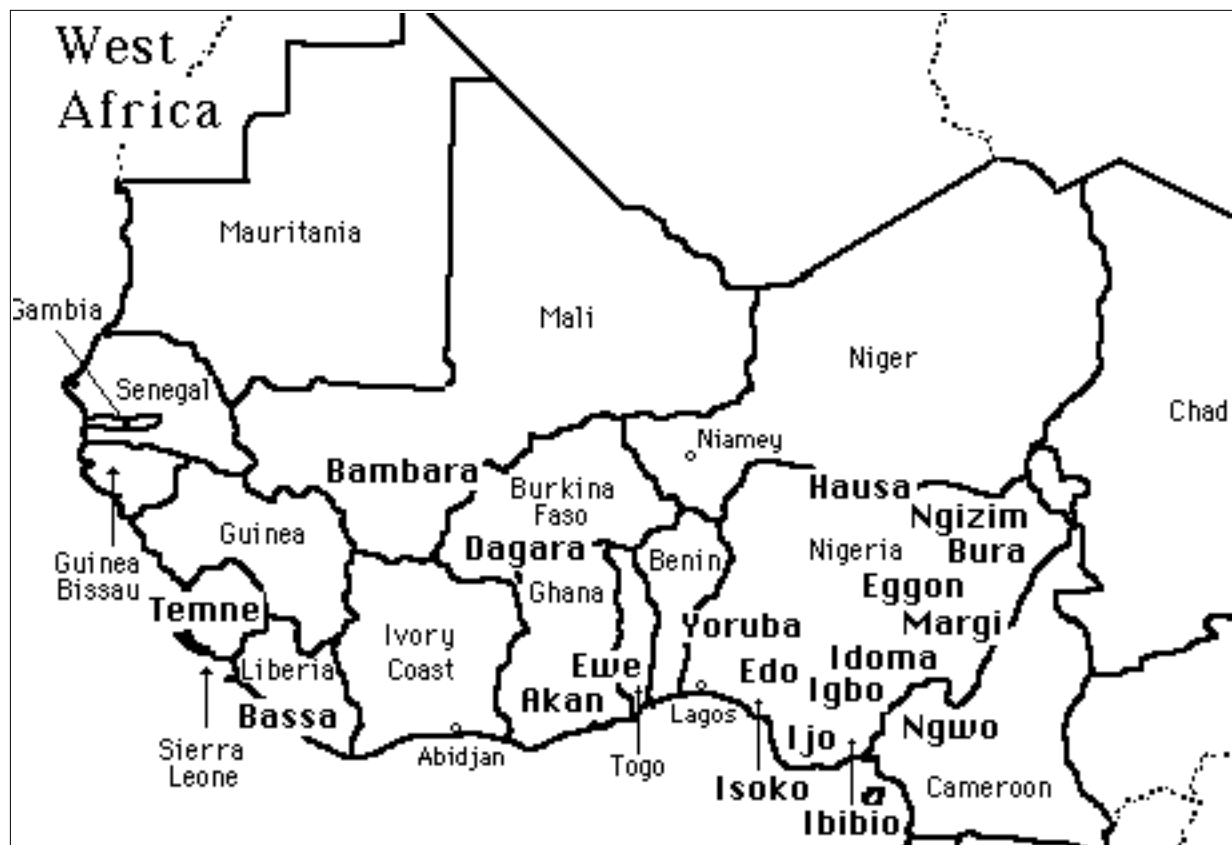
[back to language index](#)

Ijo (Kalabari dialect)					
	+ATR			-ATR	
Plain	sí 'twenty'	ɓuru 'yam'		firi 'work'	ɓuru 'be rotten'
	jé 'thing'	odo 'yellow'	áká 'tooth'	ékí 'to peel'	okó 'so'
Nasalized	sĩ 'remove'	sũ 'sing'		sĩ 'tree'	fũ 'salt'
	dzě 'another'		ká 'to tear'	sěĩ 'to shave'	tố 'think'

Ijo is a cluster of Niger-Kordofanian languages (Kwa group) spoken in Rivers State, Nigeria. Kalabari, spoken by approximately 300,000 people, is a dialect of Eastern Delta Ijo.

Ijo contrasts advance tongue root [+ATR] and retracted tongue root [-ATR] high and mid vowels. The low vowel [a] is neutral with regard to [ATR]. Vowels may also be either plain or nasalized.

High tones are marked with an acute accent.



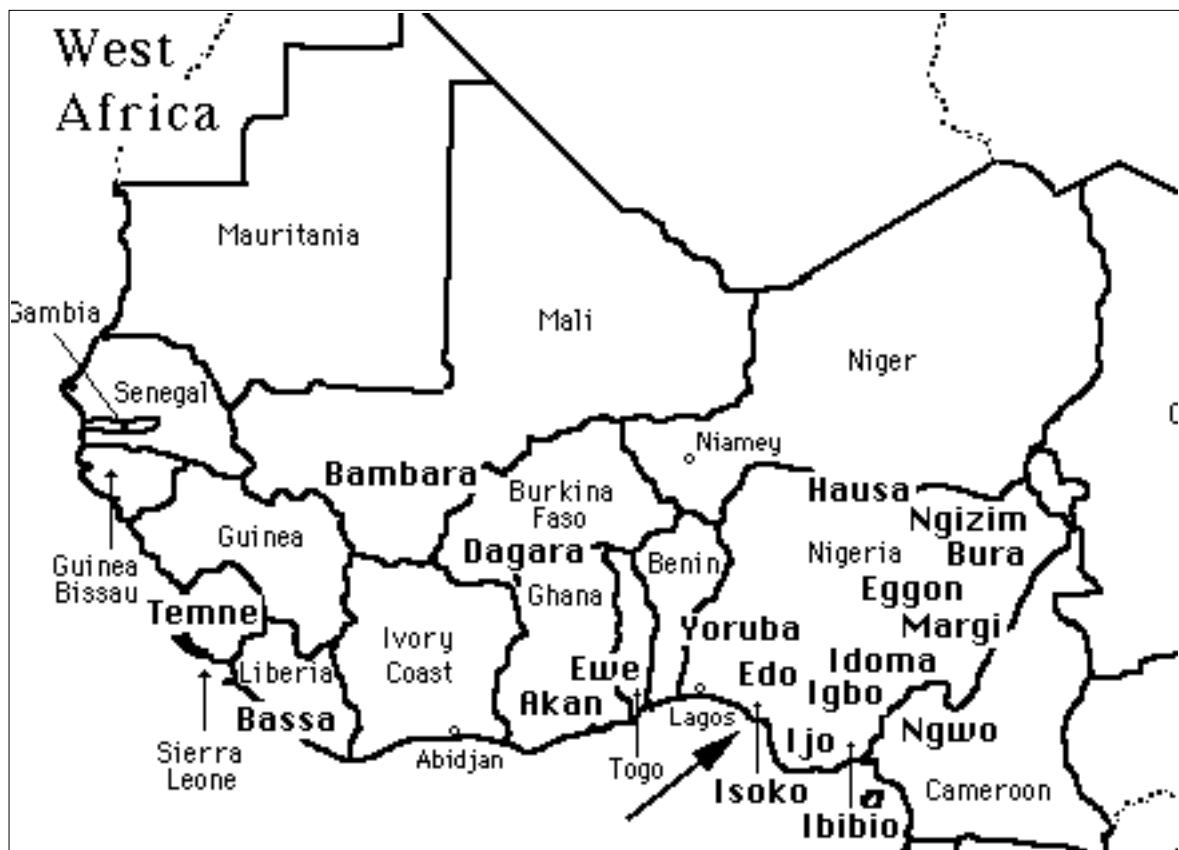
[back to language index](#)

Isoko		
	Voiceless	Voiced
Labiodental fricative	òf é 'razor'	éV é 'how'
Labiodental approximant		éV é 'breath'
Labial-velar	òM é 'laugh'	éW é 'hoe'

Isoko is a Niger-Kordofanian language (Kwa group) spoken by approximately 300,000 people in Bendel State, Nigeria.

Isoko contrasts voiced labiodental fricative /v/ with voiced labiodental approximant /ʋ/.

The phonemic inventory of the language also includes voiceless labiodental and labial-velar fricatives /f ɱ/, and voiced labial-velar approximant /w/.



[back to language index](#)

Javanese

Modal voice

paku	'nail'
tamu	'guest'
tsariʔ	'piece'
titiʔ	'little'
kali	'river'

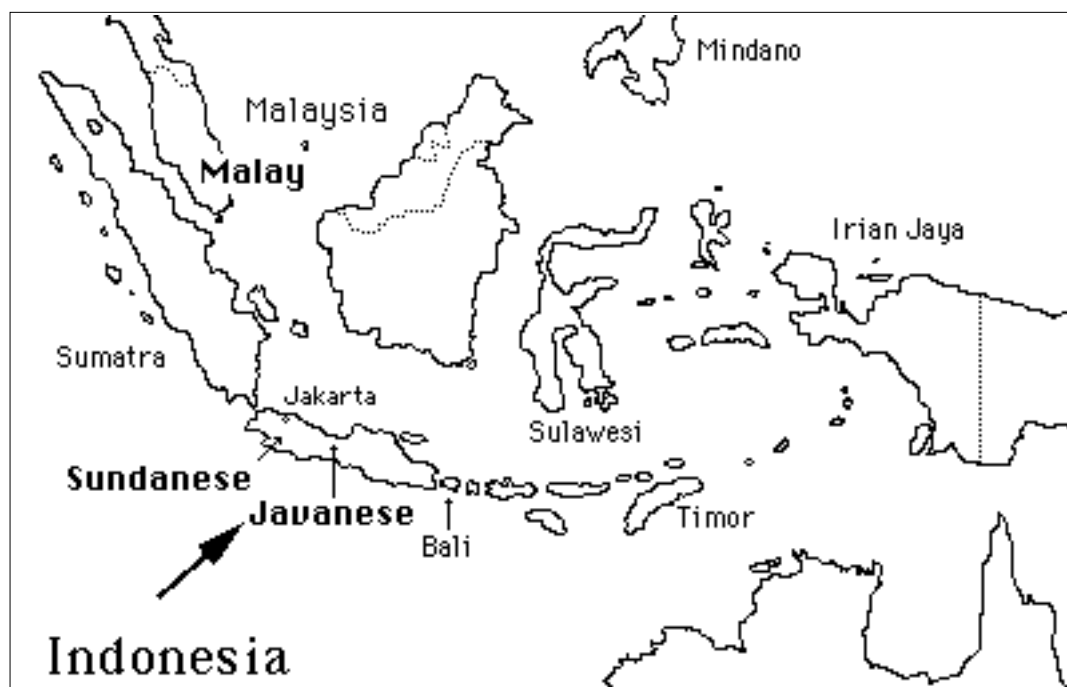
Slack voice

ɓaku	'standard'
ɗamu	'blow'
ɗzarit	(type of women's clothing)
ɗisiʔ	'first'
gali	'to dig'

Javanese is an Austronesian language (Western Malayo-Polynesian branch) spoken by approximately 70 million people on the island of Java in Indonesia. The speaker of the words illustrated here comes from Surabaya, in East Java.

Javanese has contrasting pairs of modal and slack voice homorganic stops at the bilabial, dental, retroflex, and velar places of articulation. There is also an affricate pair.

Slack voice is represented here by the use of the standard voiced symbols with an added subscript [ɓ]. Note that in addition to a lowered F1 in stops with slack voice (which is due to larynx lowering), the phonation of the following vowel is affected, showing a more breathy quality.



[back to language index](#)

K'ekchi		
	Velar	Uvular
Plain	ka 'grindstone'	qa 'our'
Ejective	k'a 'bitter'	q'a 'bridge'

K'ekchi is a Mayan language (Eastern branch) spoken in Guatemala and in neighboring areas of Belize and El Salvador. There are approximately 280,000 speakers total.

The four words here are from recordings provided by Ava Berinstein.

K'ekchi contrasts velar plosives and ejectives with uvular plosives and ejectives.

Spectrograms of the four words illustrated show that the bursts occurring on the release of the stop closure are particularly clear for the ejective stops.

Of the 12 speakers that were recorded, all exhibited a much lower locus of energy concentration in the burst for the uvular stops than for the velar stops. However, F2 was lower at the onset of the vowel for only 9 out of the 12 speakers. For these 9 speakers there was also a noticeable lowering of F2 throughout most of the vowel.

There was no significant VOT difference for the plosives; the mean VOT was 52 ms for the velars and 56 ms for the uvulars.

Neither was there any significant difference in the length of the glottal closure after the release of the ejectives; these were measured as 97 ms for the velars and 92 ms for the uvulars.



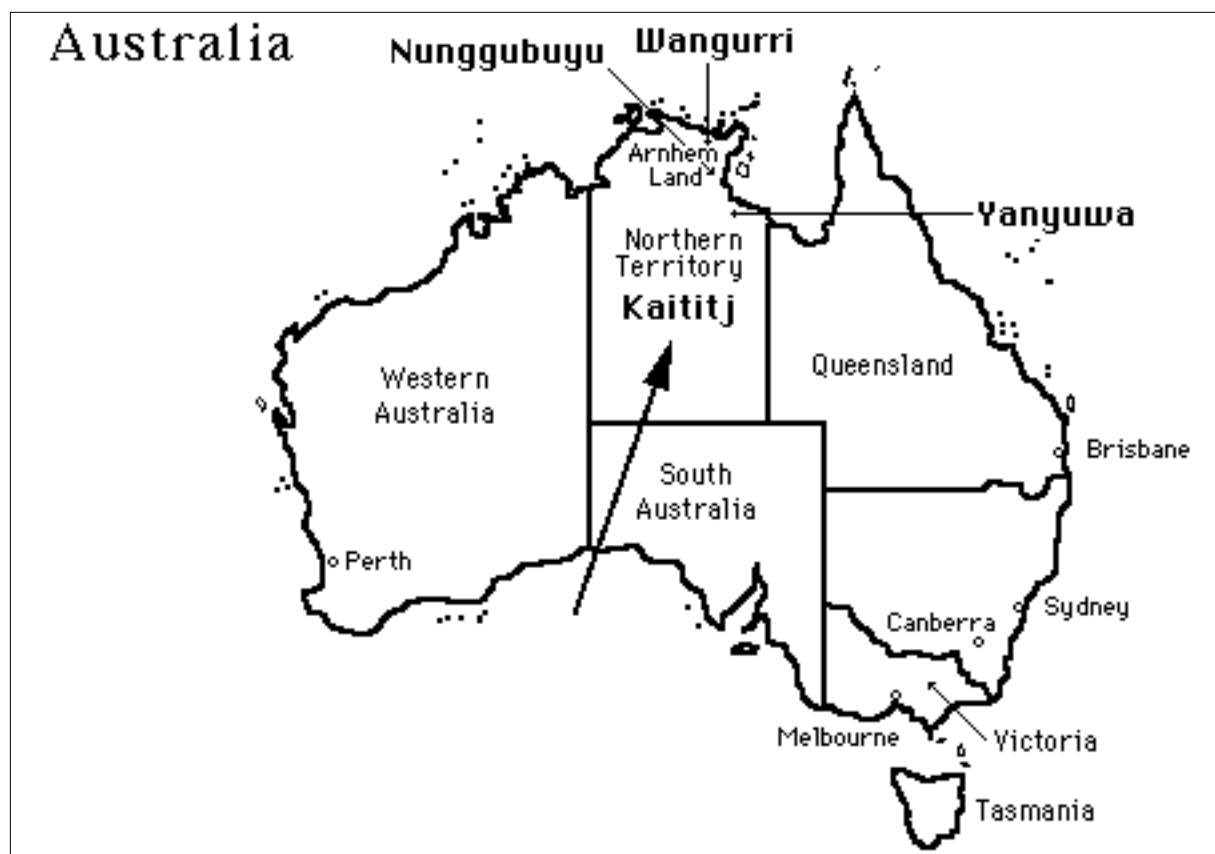
[back to language index](#)

Kaititj			
	Initial	Medial	Final
Laminal dental	ḷinṑ 'armpit'	aḷuṑ 'burrow'	iḷbaḷ 'smoke'
Apical alveolar	ḷubiḷ 'thigh'	aḷuṑk 'chase'	irmal 'fire saw'
Apical post-alveolar		kaḷat 'sacred board'	aldimaḷ 'west'
Laminal post-alveolar		aḷilk 'smooth'	kuraḷ 'star'

Kaititj is an Australian language (Arandic group of the Pama-Nyungan branch) spoken in Northern Territory, Australia, by fewer than 200 people.

Kaititj (like other Australian languages) contains a large number of contrasting simple voiced lateral approximants, with laminal dental, apical alveolar, apical post-alveolar, and laminal post-alveolar articulations.

(Note: the apical and laminal post-alveolars occur initially in words such as /ḷaḷiṑk/ 'hit' and /ḷukuṑk/ 'light (fire)', but were not recorded by the speaker.)



[back to language index](#)

Korean (Seoul dialect)		
Unaspirated	Fortis	Aspirated
pul 'fire'	p [*] ul 'horn'	p ^h ul 'grass'
tal 'moon'	t [*] al 'daughter'	t ^h al 'mask'
kin 'weight of measure'	k [*] in 'rope'	k ^h in 'large'
tʃa 'ruler'	tʃ [*] a 'salty'	tʃ ^h a 'tea'
sal 'flesh, fat'	s [*] al 'uncooked rice'	

Korean is a language spoken chiefly on the Korean peninsula in east Asia. Its speakers number a total of over 65 million. Korean is often classified as a language isolate, but many scholars argue that it is related to the Altaic family. The recordings here are of the Seoul dialect.

Korean contrasts unaspirated, aspirated and fortis stops in the bilabial, dental and velar places of articulation. The palato-alveolar affricate [tʃ] also contrasts this way. The sole fricative in the language, [s], also uses this feature distinctively.

p	p [*]	p ^h
Unaspirated	Fortis	Aspirated



[back to language index](#)

Malay (Pattani dialect)

Short

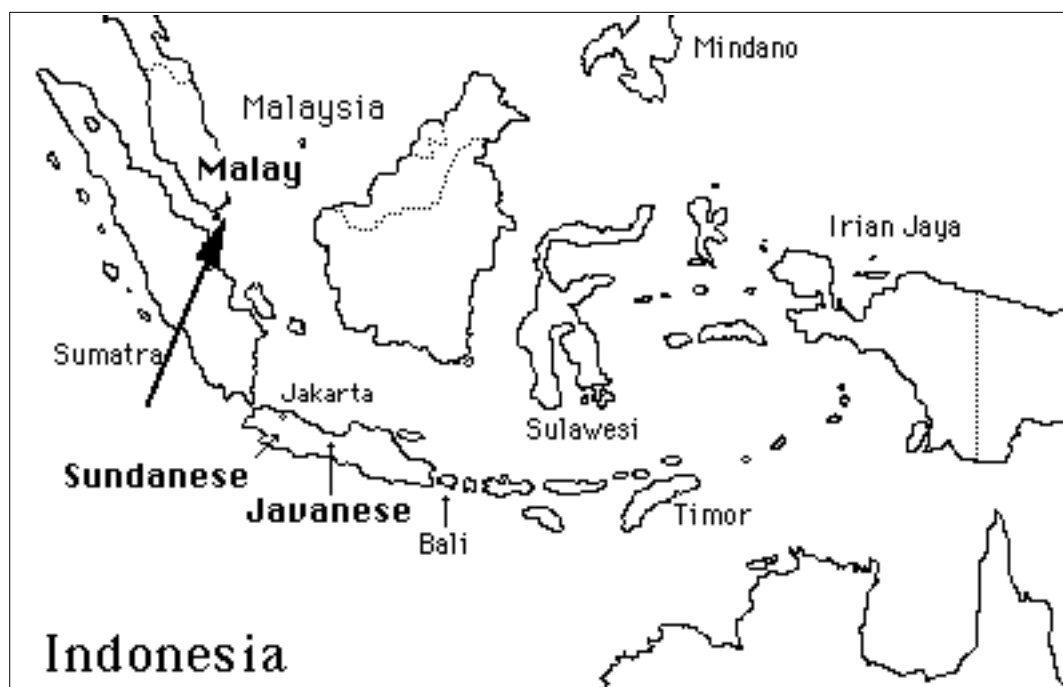
Long

lamaʔ	‘late’	lɜamaʔ	‘to make late’
make	‘to eat’	mɜake	‘to be eaten’
siku	‘elbow’	sɜiku	‘hand tool’
butɔ	‘blind’	bɜutɔ	(kind of tree)
kitɔ	‘us’	kɜitɔ	‘to us’

Malay is an Austronesian language (Sundic branch of Western-Malayo-Polynesian). The Pattani dialect is spoken in southern Thailand by approximately 1 million people. This dialect is quite different from Standard Malay, but similar to the Malay spoken in the Malaysian states of Kelantan and Trengganu.

Pattani Malay contrasts short and long consonants word-initially. Long voiced consonants are typically three times as long as their short counterparts. Voiceless unaspirated stops, which can exhibit a difference in duration only in running speech, may be distinguished instead by intensity of the burst, rate of formant transitions, F_0 perturbations, and greater amplitude of the following vowel.

These recordings were made by Arthur Abramson, and are described by him in: Abramson, A. (1986) ‘The perception of word-initial consonant length: Pattani Malay. JIPA, 16: 8-16.



[back to language index](#)

Marathi

Modal nasal

maar

‘beat’

Breathy nasal

m^haar

‘a caste’

n^haan

‘bath’

Marathi is an Indo-Aryan language spoken in Maharashtra, India, and in neighboring states by approximately 50 million people.

Marathi exhibits breathy voiced nasals. There are phonetic differences between different groups of languages in how this breathy voiced phonation type is realized. (Compare, for example, the breathy voiced sounds of Newari and Tsonga.)



Montana Salish

plain

ejective

páʔas 'face is pale'

p'áʔáp 'grass fire'

tám 'it's wrong'

t'áq'ən 'six'

tsáqʷəlʃ 'western larch'

ts'áʔt 'it's cold'

tʃájʔqən 'cut hair'

tʃ'áwən 'I prayed'

kʷáteʔ 'quarter(money)'

kʷ'áʔtʃ'qən 'lid,cover'

qáxeʔ 'aunt'

q'áq'ʔuʔ 'vein'

qʷátsqən 'hat'

qʷ'ájəʔqs 'priest'

Montana Salish, also called Flathead, is the only Salishan language spoken in Montana. There are now less than a hundred native speakers, but the language is being taught to younger members of the tribe.

Montana Salish has a number interesting consonant clusters and several ejectives including a contrast between velar and uvular ejectives and plosives. There are also voiced and voiceless laterals



[back to language index](#)

Newari

Modal voice

maa

‘garland’

na

‘take it’

naa

‘it melts’

Breathy voice

ṃaa

‘to be unwilling’

ṇa

‘knead it’

ṇaa

‘knead’

Newari is a Tibeto-Burman language (Tibetic subgroup) spoken by approximately 500,000 people, primarily in Nepal.

Newari has two series of nasals differing in phonation type. Recorded here are minimal pairs illustrating modally and breathy voiced bilabial and alveolar nasals.



[back to language index](#)

Margi

Stop

cácíkà
'whooping cough'

ʃáʔdí
'hump'

kàngá
'drum'

gàlí
'spear'

Fricative

jámbál
'sword'

xá
'big water pot'

ɣàfú
'arrow'

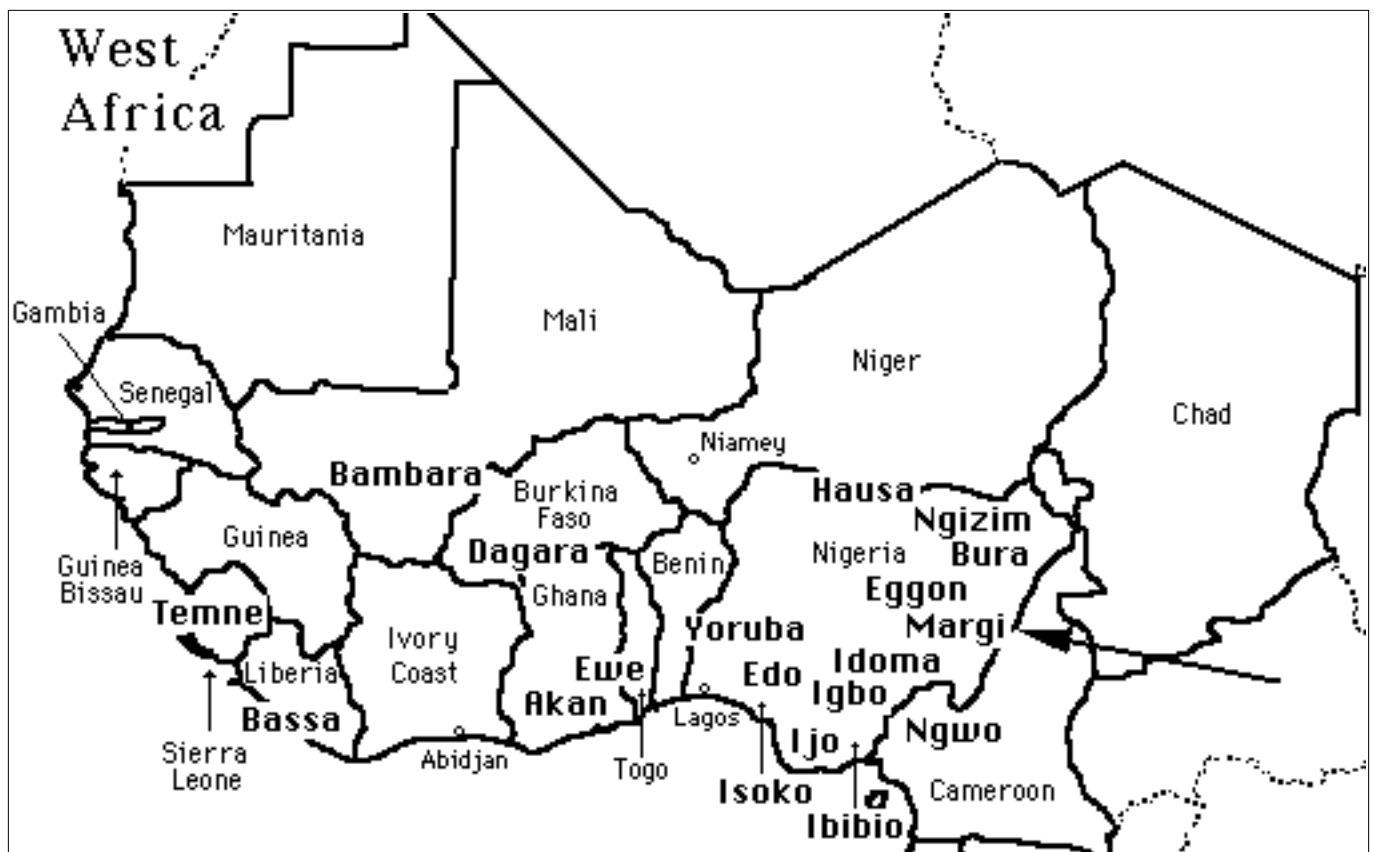
Approximant

jà
'give birth'

Margi is an Afro-Asiatic language (Chadic branch) spoken in Borno and Gongola states, Nigeria, by approximately 200,000 people.

Margi contrasts both palatal and velar stops and fricatives. The set of palatals is particularly interesting as the language also has a voiced palatal approximant.

(Note that the voiceless palatal fricative exists, but was not recorded adequately.)



Mazatec

(Jalapa dialect)

Modalni²?ja²

‘house’

kã²

‘twenty’

Creakyja²

‘he carries’

kã²

‘alone’

Breathyka²ma²ɲa²

‘gather together’

ɲã²

‘mine’

Modalt^hæ¹

‘seed’

nĩ²mã²

‘bumble bee’

Creakyndæ¹

‘buttocks’

kã²

‘dead’

Breathyndæ¹

‘horse’

mã²

‘he wants’

Mazatec is an Otomanguean language (Popolocan branch) spoken by approximately 8,000 people in Tuxtepec, Oaxaca, Mexico.

Mazatec distinguishes three different phonation types: modal, creaky, and breathy. In addition, vowels may be plain or nasalized, resulting in a six-way contrast for any particular vowel quality.

Note also that there are three tones in Mazatec, indicated here with superscript numerals: high (3), mid (2), and low (1).

For more information see:

Ladefoged, Peter; Ian Maddieson; Michel Jackson (1988). Investigating phonation types in different languages. In: *Vocal Physiology: Voice Production, Mechanisms and Functions*, ed. by O. Fujimura, New York: Raven Press, 297-317.



[back to language index](#)

Mid-Waghi

Laminal dental

al_ɲ al_ɲ

‘again and again’

Apical alveolar

alala

‘to speak improperly’

Velar

aLaLe

‘dizzy’

Mid-Waghi is an Indo-Pacific language spoken in the Western Highlands Province of Papua New Guinea by approximately 45,000 people.

Like Melpa, Mid-Waghi contrasts voiced laterals at three places of articulation: dental, alveolar, and velar. The dental lateral is laminal; the alveolar is apical.

[back to language index](#)

Nepali

pal	'rear'
pʰal	'throw away'
bal	'burn'
bʱal	'forehead'

Nepali is an Indo-Aryan language (East-Central subgroup) spoken by over 16 million people in Nepal, India, and Bhutan.

Breathy voice is used contrastively in Nepali, as it is in many other Indo-Aryan languages. This contrast is illustrated here with the bilabial voiced and voiceless stops.

This recording includes five male speakers and one female speaker.



[back to language index](#)

Ngwo

**Laminal
dentialveolar**

èdzě

(dance)

**Laminal
palatoalveolar**

d͡ʒé

(fruit)

Palatal

éjě

'postpone'

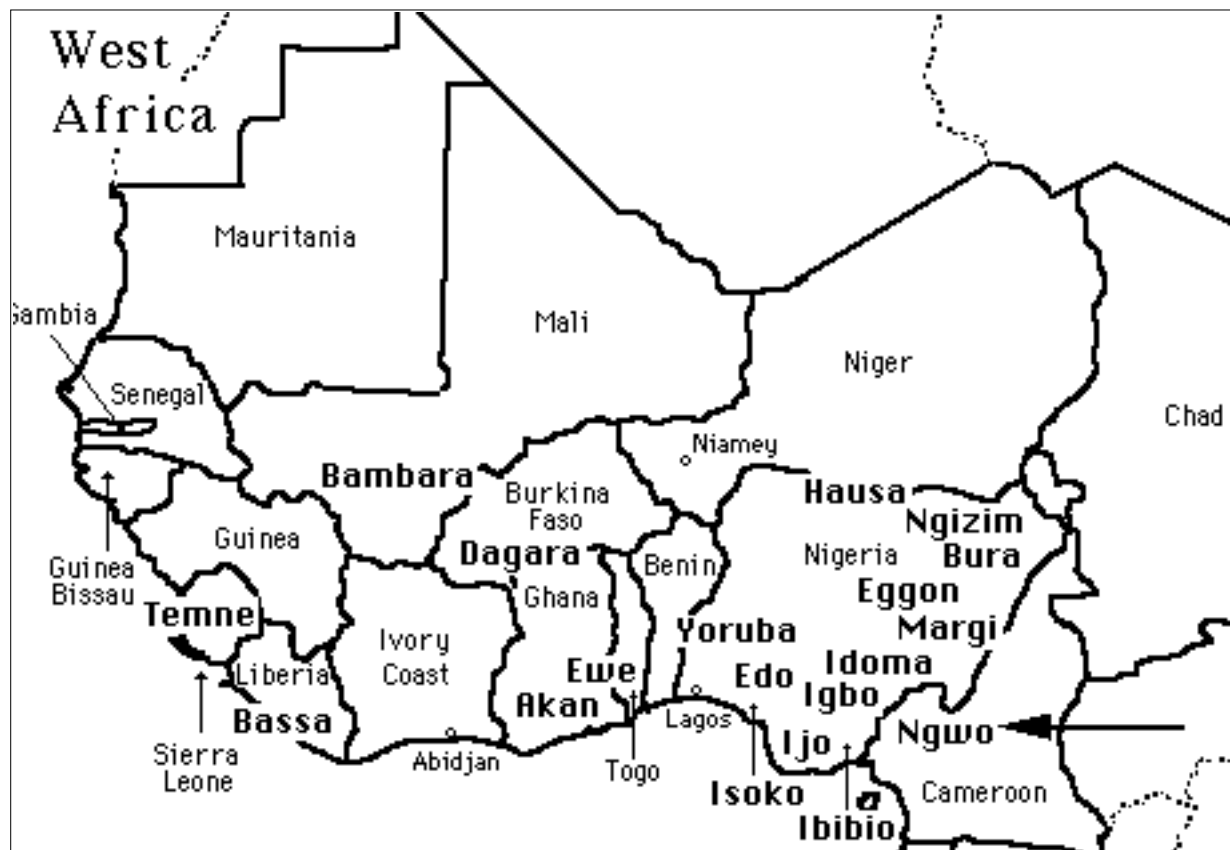
Velar

ēgě

'grass' [pl.]

Ngwo is a Bantu language (Mamfe group) spoken in central western Cameroon. There are approximately 30,000 speakers.

Ngwo has palatal stops and laminal postalveolar affricates in a stop system which includes [d], [dz], [d͡ʒ], [ɟ], and [g]. The recordings here illustrate the laminal dentalveolar, laminal palatoalveolar, palatal, and velar stops.

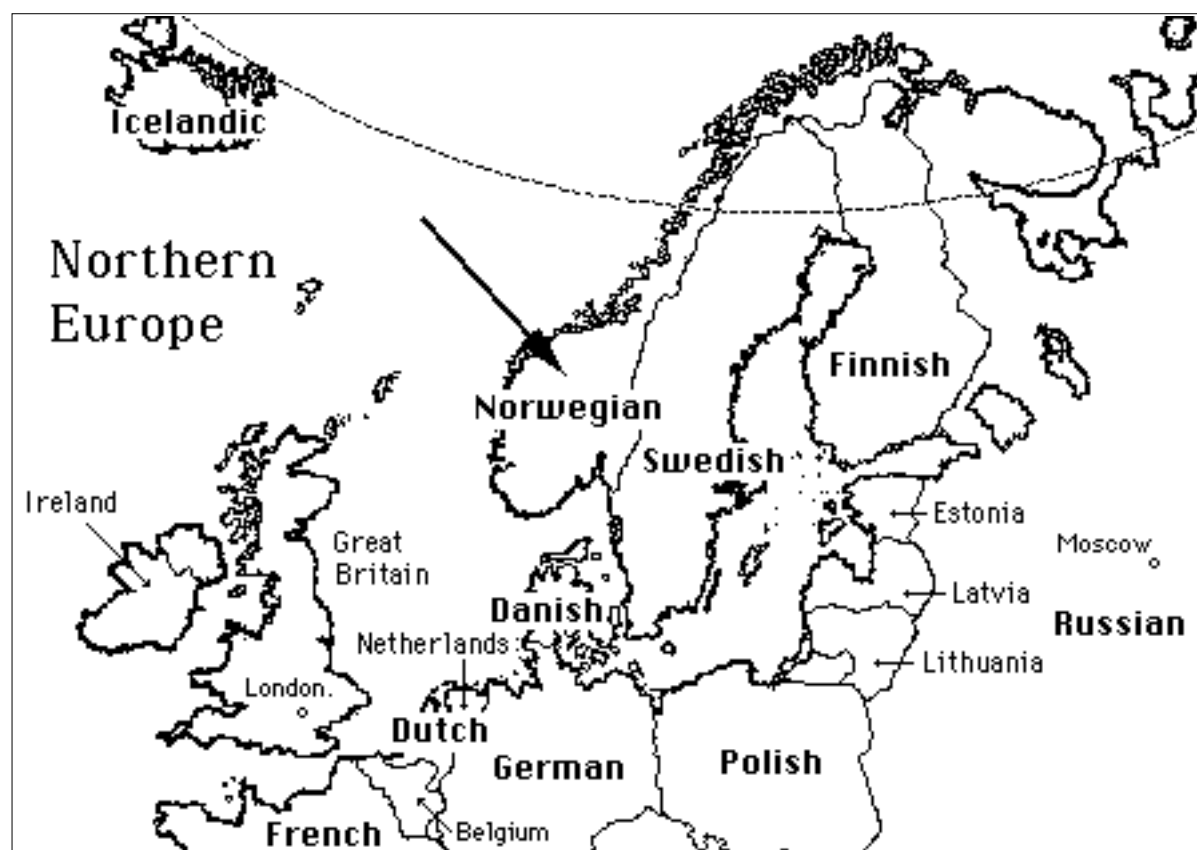


[back to language index](#)

Norwegian (Oslo dialect)				
	Front		Central	Back
	Unrounded	Rounded	Rounded	Rounded
High	bi: 'next to'	by: 'city'	bʊ: 'shack'	bu: 'live'
Mid	be: 'pray'	bø: 'farm'		bɔ: 'open fire'
Low	bæ: (an insult)			bɒ: 'prayed'

Norwegian is an Indo-European language (North Germanic branch) spoken by approximately 4 million people in Norway.

Norwegian has nine long vowels, including four high, three mid, and two low vowel phonemes. Especially notable is the three-way contrast among high rounded vowels in the front-back dimension.



[back to language index](#)

Oro Win

tʰɔtʰɔk inan	I walk on logs
kotʰɔk inan	I start a motor
katʰɤ na	it is an owl
tʰuntʰɤ na	it is a helicopter
tʰum	small boy

[The last item 'small boy' slowed down](#)

Oro Win is a Chapakuran language spoken in Brazil, and possibly in Bolivia. There are only four known speakers in Brazil. Oro Win has a bilabial trill, preceded by a dental stop, forming a single unit. This sound is not known to occur in any other language except the related language Wari'. There are about 24 words in a dictionary of Wari' that have this sound, and probably about the same number in Oro Win. Some of these are new words, and are probably onomatopoeic, but others are not. (See: Ladefoged, P., & Everett, D. (1996). "The status of phonetic rarities." *Language*, 72(4), 794-800),



[back to language index](#)

Index for the Polish sounds

[Sibilants](#)

[Affricates](#)

[Word-internal consonant clusters](#)

[Word-initial consonant clusters](#)

[Word-final consonant clusters](#)

[Clusters across word boundaries](#)

Polish			
	Alveolar	Retroflex	Alveolopalatal
Initial	sali 'room' [gen.]	ʂali 'scale' [gen.]	ɕali 'sown'
	zalef 'bay'	ʐali 'complains'	ʑali 'gasped'
Medial	kasa 'case'	kaʂa 'groats'	kaɕaɕ 'burglar'
	skaza 'flaw'	gaʐa 'gauze'	kaʐa (name) [gen.]

Polish is an Indo-European language (West Slavic branch) spoken in Poland by approximately 36 million people.

Polish contrasts six sibilants at three places of articulation: alveolar, retroflex, and alveolopalatal.

Retroflex [ʂ ʐ] are produced with the lips rounded and with a small sublingual cavity which results from the tongue being slightly retracted from the teeth (hence 'flat postalveolar').

Alveolopalatal [ɕ ʑ] are palatalized postalveolar, produced with slightly spread lips.

In addition, Polish contrasts the sequence stop plus fricative [tʂ] with the affricate [tʂɕ]. This contrast is illustrated here for word-initial position.

Also exhibited here are some of the additional consonant sequences possible in the language. Examples of words and phrases are given for clusters occurring initially, medially, and finally. In addition, several sequences across word boundaries (sandhi clusters) are illustrated.

Word-internal consonant clusters

uʂtʂkɲɛ

'he will nibble'

zastɛmpstɕɔ

'replacement'

vɨmsknɔɲtɕ

'sneak out'

zmavʂtʂɕi

'wrinkles'

kɔɲɔmbɔɲi

'unruly'

vestɕɲɛ

'he will sigh'

vɔɲtɕplivɨ

'dubious'

bɛzvzɕlɛɲɲi

'absolute'

Word-initial consonant clusters

d̲z̲d̲z̲i̲st̲i̲	‘rainy’	ʂ̲t̲ʂ̲f̲a̲n̲i̲	‘cunning’
m̲n̲ɔ̲j̲i̲	‘multiple’	l̲ɔ̲n̲i̲t̲ɕ̲	‘shimmer’
x̲t̲ɕ̲e̲t̲ɕ̲	‘want’	p̲s̲t̲ʂ̲i̲t̲ɕ̲	‘make gaudy’
ʂ̲t̲ʂ̲e̲k̲a̲t̲ɕ̲	‘bark’	v̲z̲d̲w̲u̲j̲	‘along’
b̲z̲d̲u̲b̲a̲	‘nonsense’	f̲s̲k̲ʂ̲e̲ɕ̲	‘resurrect’ [imp.sg.]
p̲w̲t̲ɕ̲ɔ̲v̲i̲	‘sexual’	ʂ̲d̲z̲b̲w̲ɔ̲	‘blade (of grass)’

Stop + Fricative

t̲ʂ̲i̲ ‘three’

Affricate

t̲ʂ̲i̲ (question particle)

t̲ʂ̲t̲ʂ̲i̲ ‘idle’

Word-final consonant clusters

dɔjɕtɕ

‘reach’

taɕm

‘ribbon’
[gen.pl.]

pãjstɕ

‘state, country’
[gen.pl.]

pɕestempstɕ

‘transgression’
[gen.pl.]

Consonant clusters across word boundaries

zmʲɛɕx mɟlistɨ

‘misty dusk’

vojɕk ʐɔɟbwo

‘a little bit of the army’

kunɟt vɔdwuzaw

‘the art prolonged’

tɛkst bɔdurnɨ

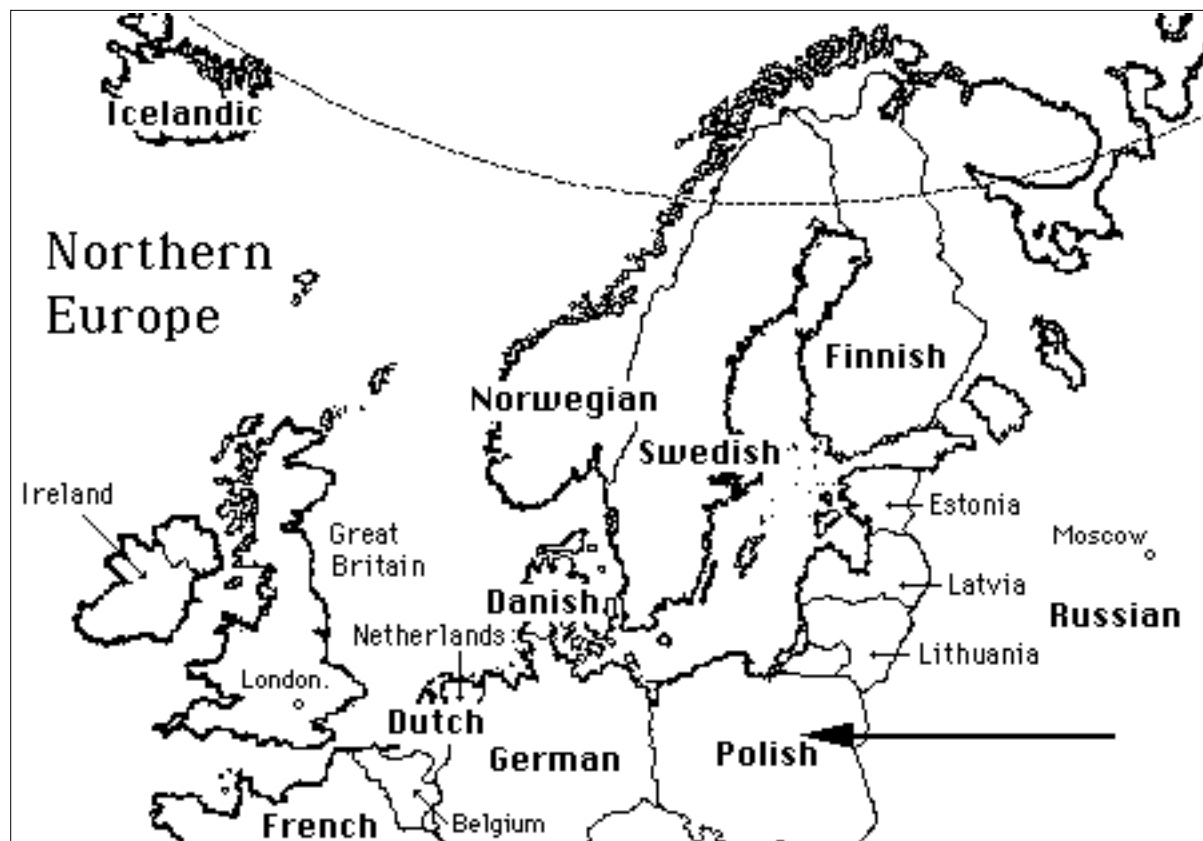
‘silly text’

varstɕ pstrɨx

‘gaudy layers’ [genitive pl.]

mʲejsts vɔɟlɛndnɨx

‘relative places’ [genitive pl.]



[back to language index](#)

Russian

Plain		Palatalized	
forma	'form'	f ^j erma	'farm'
vɪtʲ	'to howl'	v ^j itʲ	'to weave'
sok	'juice'	s ^j ok	'he lashed'
zof	'call'	z ^j of	'yawn'
pakt	'pact'	p ^j atʲ	'five'
bɪl	'he was'	b ^j il	'to strike'
tot	'that'	t ^j otʲə	'aunt'
domə	'at home'	d ^j omə	(name)
kufətʲ	'to eat'	k ^j uv ^j etkə	'dish'
mal	'little'	m ^j al	'crumple'
nos	'nose'	n ^j os	'he carried'
lof	'catch'	l ^j ɛf	'lion'
rasə	'race'	r ^j asə	'priest's frock'

<

Russian is an Indo-European language (Balto-Slavic branch) spoken in the former USSR by over 150 million people.

Russian contrasts plain and palatalized consonants. Contrasting pairs are illustrated here in word-initial position.



[back to language index](#)

Sundanese

**No
nasalization**

pihak

‘sides’

tuʔus

‘dry’

**Nasal
spreading**

mĩhãk

‘take sides’ [act.]

nũʔũs

‘dry’ [act.]

ɲĩãr

‘seek’ [act.]

ɲãĩãn

‘wet’ [act.]

**Nasal spreading
blocked**

ɲĩwat

‘elope’

ɲũliat

‘stretch’ [act.]

ɲĩsər

‘displace’ [act.]

ɲãtur

‘arrange’ [act.]

Nasal spreading

ɲĩãr

‘seek’ [act.]

ɲãĩãn

‘wet’ [act.]

**Infixation &
nasal spreading**

ɲãlĩãr

‘seek’ [pl. act.]

ɲãrãĩãn

‘wet’ [pl. act.]

**Nasal spreading
blocked**

ɲũliat

‘stretch’ [act.]

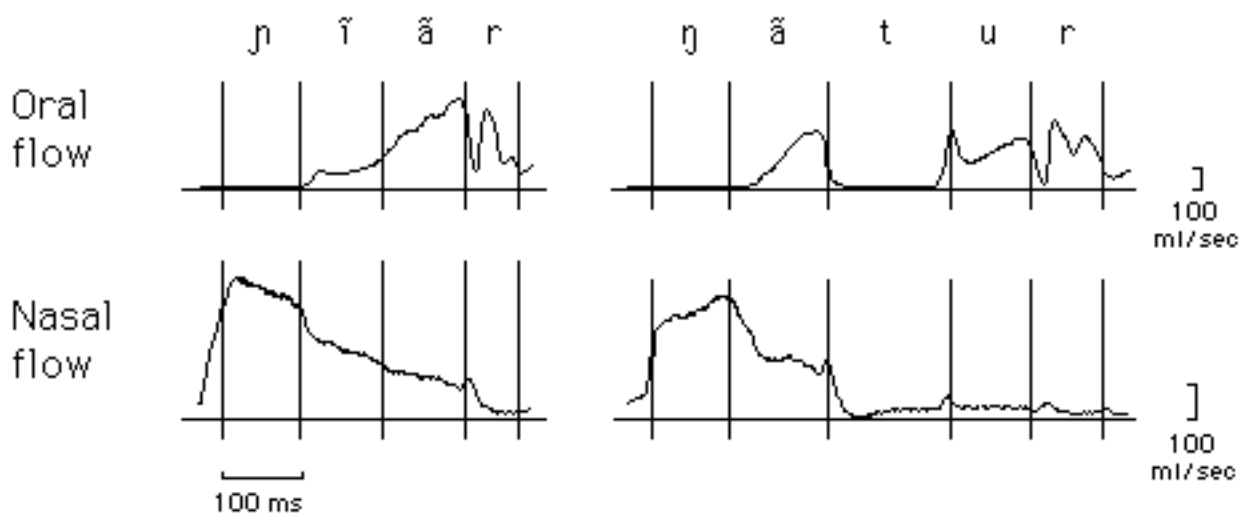
mãrios

‘examine’ [act.]

Sundanese is an Austronesian language (West Malayo-Polynesian branch) spoken by approximately 25 million people in eastern Java.

Nasalization in Sundanese is illustrated here. The language has a rule of 'nasal spread' whereby a sequence of vowels and nonsupralaryngeal consonants become nasalized when following a nasal consonant.

Flow traces for two words, one where nasalization spreads and one where it is blocked, are provided.



[back to language index](#)

Temne

Apical dental

t̪òr

‘descend’

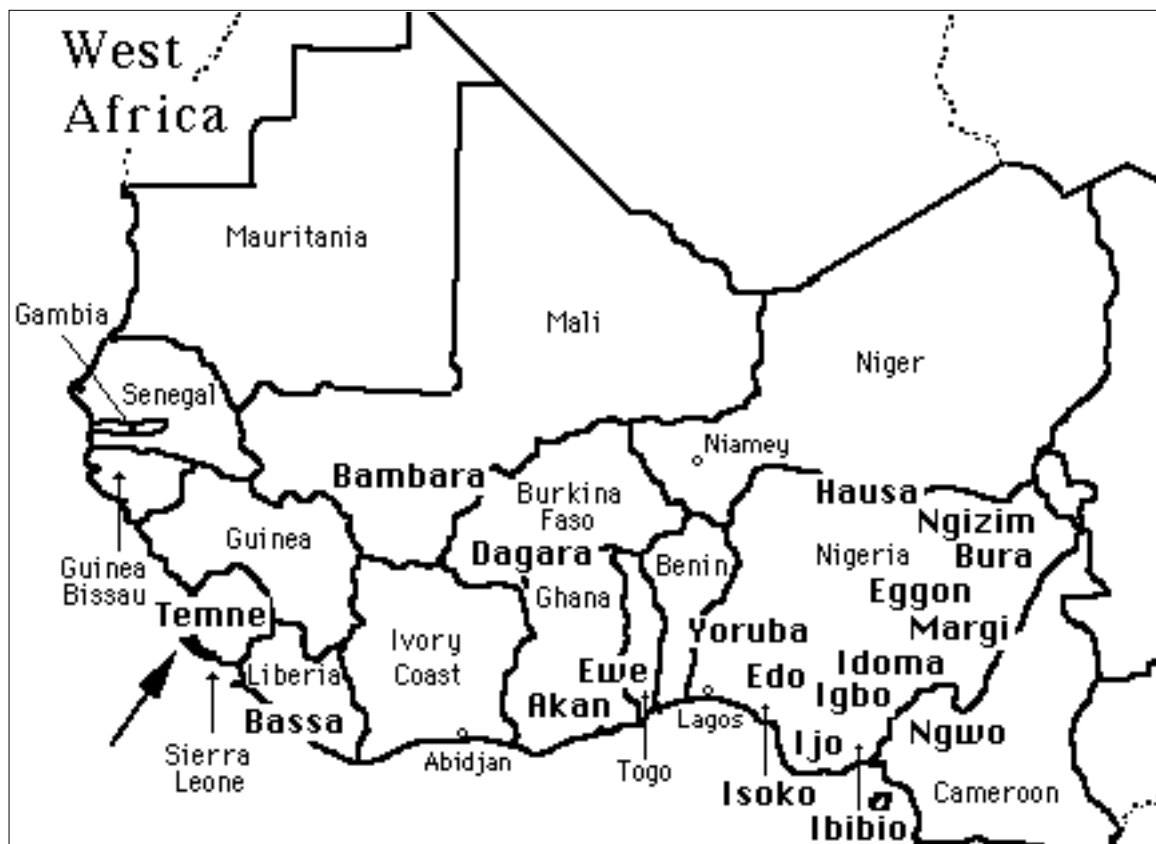
Laminal alveolar

t̪ʰór

‘farms’

Temne is Niger-Kordofanian language (West Atlantic group) spoken in central Sierra Leone. There are approximately 1 million speakers.

Temne contrasts stops in the dental/alveolar region. While dental stops are typically laminal in the world’s languages, in Temne they are apical, with the alveolar stop being laminal. The laminal alveolar is affricated.



[back to language index](#)

Toda		Fricatives
Labiodental	pɔf	'swelling'
Dental	pɔθ	'roof beam'
Dental sibilant	kɔʂ	'money'
Velarized alveolar sibilant	pɔsʷ	'milk'
Postalveolar sibilant	pɔʃ	'language'
Retroflex sibilant	pɔʂ	(clan name)
Velar	pɔx	'blood'

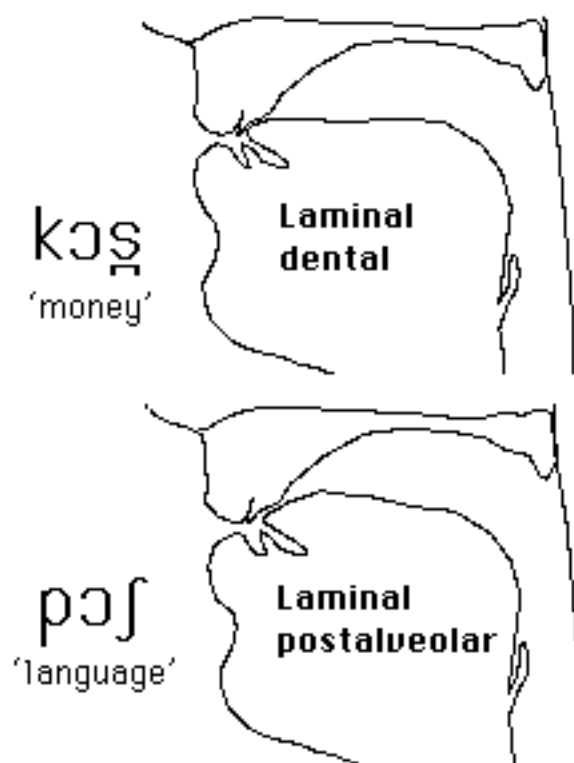
Toda is a Southern Dravidian language (Tamil-Kannada branch) spoken in India by approximately 1000 people.

Toda is interesting for several reasons. First of all, the language has (central) fricatives at seven places of articulation, including four sibilants. (Click on the button below to see midsagittal sections of estimated tongue positions for the sibilants.) The fricatives are illustrated in word-final position.

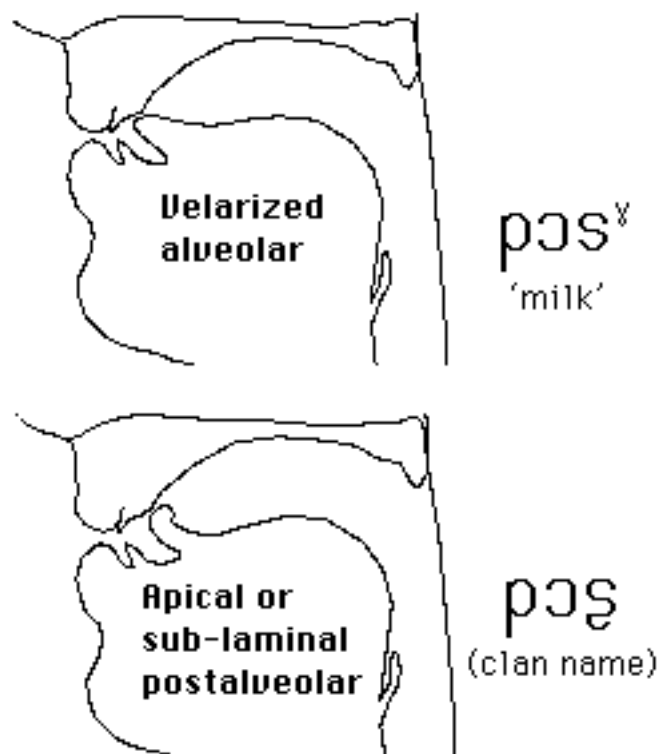
Toda has four laterals, two voiced, and two voiceless. Note that both the voiceless laterals are fricative.

Toda also has three rhotics, including dental and postalveolar trills. The third rhotic is sometimes trilled, sometimes flapped, but its exact description is undetermined.

Estimated tongue positions



Sibilants



Laterals

	Dental	Retroflex
Voiced	kaɭ 'bead'	paɭ 'bangle'
Voiceless	kaɤ 'learn' [imper.]	aɭ̥ 'rice in ghee'

Rhotics

Dental Trill

kar
'border'

tu:r
'knife'

e:r
'throw'

par
'fate'

kaṛ
'juice'

tu:ṛ
'bunch of leaves'

e:ṛ
'male buffalo'

peṛ
'day after new moon'

Postalveolar Trill

kaṛ
'calf pen'

puṛ
'beating'

meṛ
'lap'



[back to language index](#)

Tsonga

Plain

màkálá

‘embers’

ménó

‘teeth’

nòngá

‘tributary’

Breathy

ṁàká

‘matter’

ṁéhó

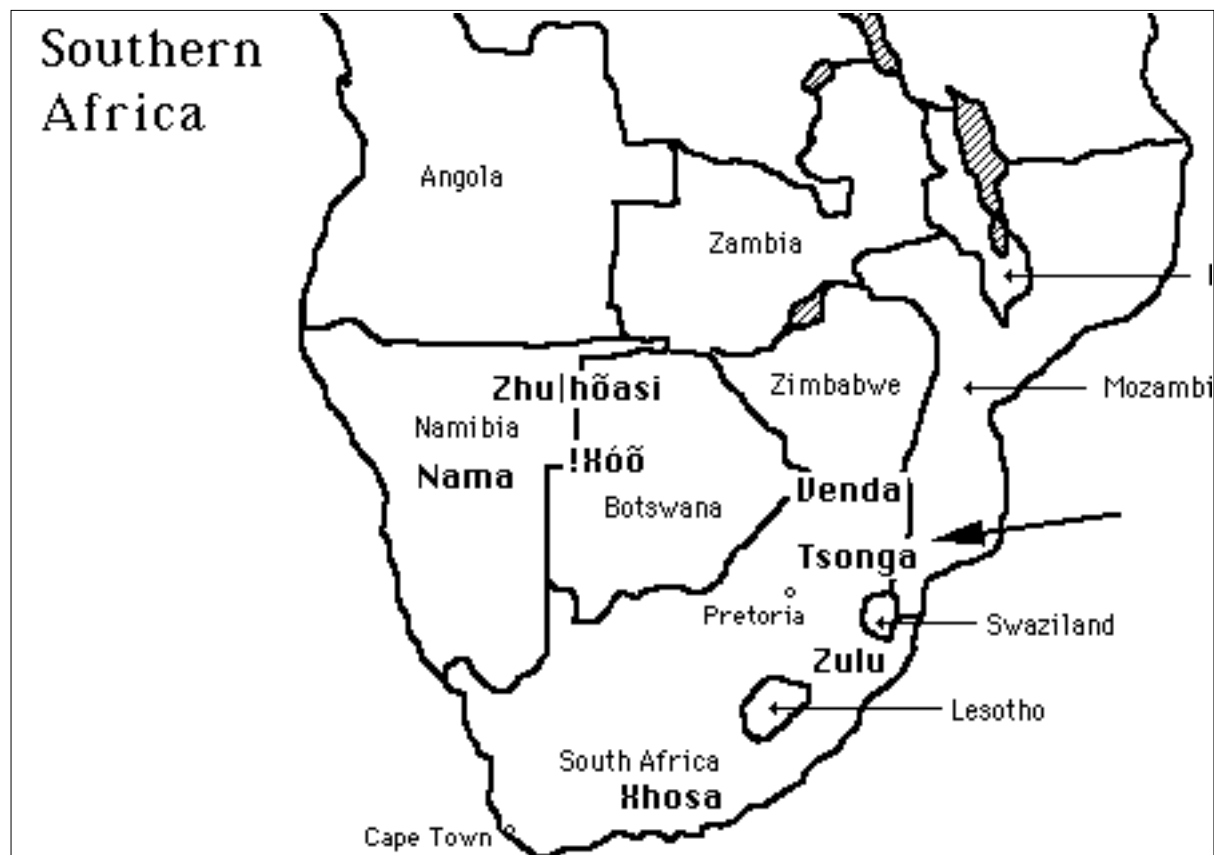
‘wind’

ṁòngó

‘antelope’

Tsonga is a Southern Bantu language spoken in Mozambique, South Africa, and Swaziland. There are two and a half million speakers in all.

Tsonga contrasts plain and breathy nasals. Note that the breathy voice nasal depresses the tone on the following vowel.



[back to language index](#)

Tsou (Tfuea dialect)

fuxmɔja
'red'

fʔuhu
'back'

fʔtsuju
'egg'

hiɸsi
'thin'

hʔisi
'ashes'

Tsou is an Austronesian language (Tsouic branch) spoken in southern Taiwan by approximately 3000 people. The speaker here is from the village of Punguu.



[back to language index](#)

Turkish (Istanbul dialect)

kis 'cyst' (colloq.)	kys 'sulky'	kws 'turn down' [imper.]	kus 'vomit' [imper.]
kes 'cut'	køs 'dumb looking'		kos (island name)
		kas 'muscle'	

Turkish is an Altaic language (Southern Turkic group) spoken by approximately 56 million people in Turkey and surrounding countries. There is also a substantial Turkish-speaking population in Germany.

Turkish has eight vowels, which may be distinguished in the following way: four are high [i y ʊ u], four front [i y e ø], and four rounded [y ø u o].



[back to language index](#)

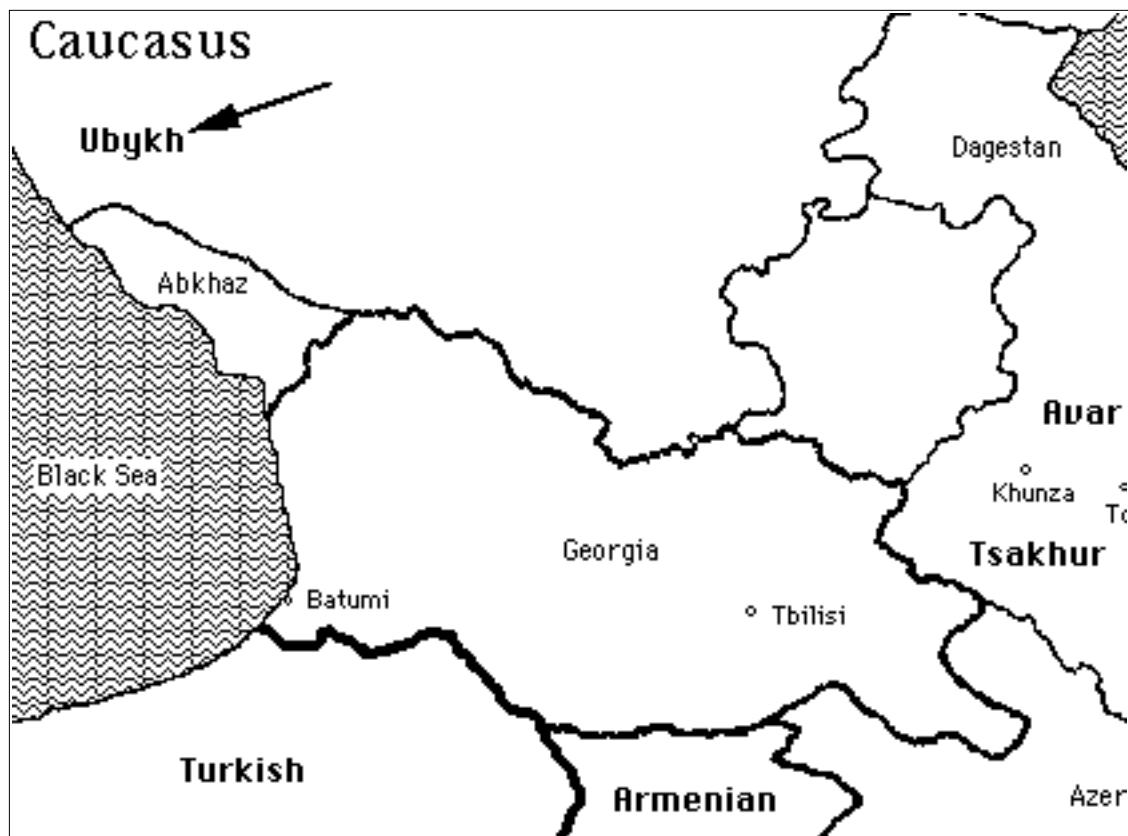
Ubykh

	Denti- alveolar	Alveolar + postalveolar	Apico- postalveolar	Lamino- postalveolar
Plain voiceless	s̤aːba 'why'	ʂa 'three'	ʃa 'my head'	ʈaʈa 'mother-in-law'
Plain voiced	za 'one'	ʂaʂa 'kidney'	ʒa 'firewood'	ʈawa 'shadow, shade'
Rounded voiceless		aʂʷa 'white'		ʈʷa 'sea'
Rounded voiced		aʂʷan 'it boils'		aʈʷan 'it roasts'

Ubykh is a North Caucasian language (Abkhazo-Adygan branch) formerly spoken in Circassia, in the northwest Caucasus. As of 1989, there is only one true native speaker left. The recording here is of this speaker, Tefvik Esenç, made by J. C. Catford.

Ubykh is well known for its large consonantal inventory (80 segments by some analyses). This inventory includes 12 sibilant fricatives, which exhibit a rare four-way system contrasting voiced and voiceless "hissing" dentalalveolar [s]; "hissing-hushing" [ʂ], with features both of alveolar and postalveolar sibilants; apical postalveolar [ʃ]; and laminal postalveolar [ʈ]. In addition, the "hissing-hushing" and laminal postalveolar sibilants may occur with a secondary, labialized articulation.

The sound [ʂ] resembles [ʃ] and [ʈ] in that it has a postalveolar articulation. Like alveolar [s], however, the characteristic sublingual cavity associated with [ʃ] and [ʈ] is absent in [ʂ].



[back to language index](#)

Venda

βinga	'to marry'	viya	'to slaughter'
βenga	'to hate'	venngo	'hatred'
βaJa	'to read'	vaya	'to scratch'
βona	'to see'	vota	'to burn'
βutu	'humanity'	vuJa	'to open'

Venda is a Southern Bantu language spoken in South Africa and Zimbabwe. There are approximately 0.5 million speakers.

Venda exhibits a four-way contrast among labial fricatives involving the features [voice] and [place]. Contrasted here are the voiced bilabials and labiodentals, and the voiceless bilabials and labiodentals.

ϕima	'measure'	fina	'to fold a shirt'
ϕeJa	'finish'	feJa	'to die for'
ϕanza	'to chop'	fara	'to catch'
ϕoJa	'be healed'	foJa	'to stand in a line'
ϕungga	'make noise'	fungga	'to kindle, light'

Southern Africa



[back to language index](#)

Wangurri

Bilabial

ŋamaʔ

‘mother’

Laminal dental

baṇa

‘over there’

Apical alveolar

gaṇaʔ

‘enough’

**Apical
postalveolar**

maŋa

‘shark’

**Laminal
postalveolar**

gaŋawu

(species of tree)

Velar

naŋa

‘see’

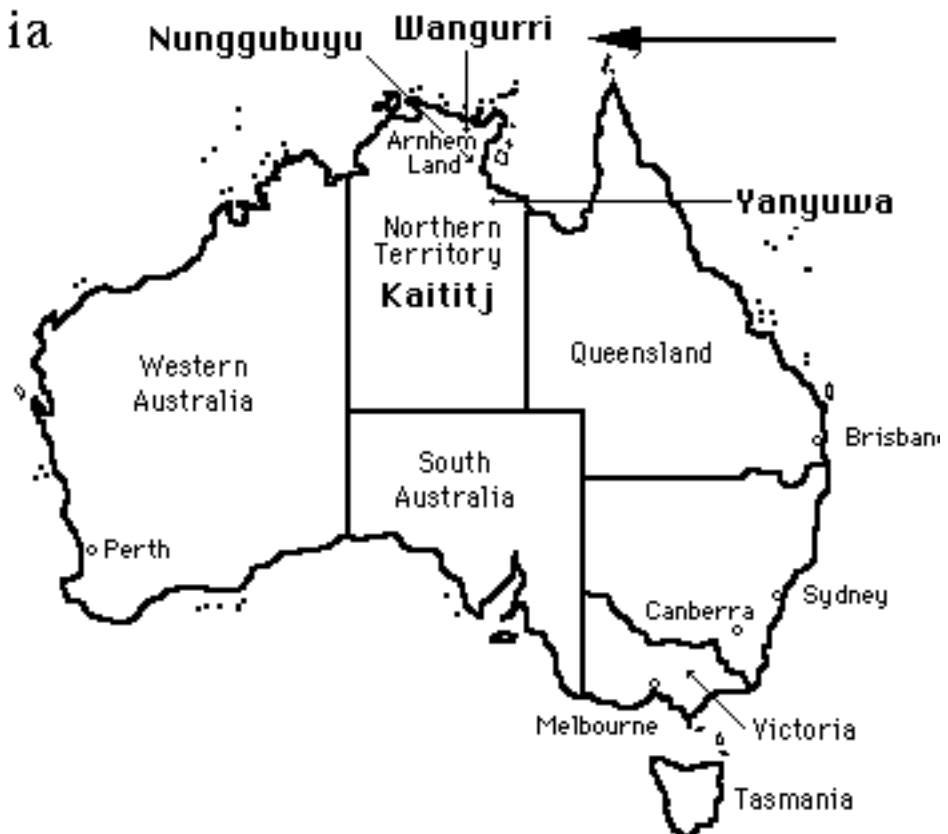
Click on  and  to hear these nasals in relative isolation

Wangurri is a dialect of Yolngu, an Australian language (Pama-Nyungan branch), spoken by 150 people in Wangurri, Eastern Arnhem Land.

Wangurri exhibits six contrastive places of articulation for nasals: bilabial, laminal dental (dentialveolar), apical alveolar, apical postalveolar (retroflex), laminal postalveolar (palatoalveolar), and velar.

Spectrograms show that the apical retroflex and the laminal postalveolar are clearly distinguished from all the others by the F2 and F3 transitions into the nasal. Incomplete data, however, prevents any further conclusions.

Australia



[back to language index](#)

Yanyuwa

Oral stops

Bilabial	wubuwingu	'for a small female one'
Laminal dental	wuḍurumaya	'laugh!'
Apical alveolar	wuduru	'full of food'
Apical retroflex	wuḍuɭa	'in the stomach'
Palatoalveolar	wuḍuɭa	'into the grass'
Front velar	gugu <u>l</u> u	'sacred'
Back velar	wuḡuḡu	'grandparent'

Yanyuwa is an Australian language spoken by approximately 150 people in Borroloola, Northern Territory and Doomadgee, Queensland.

Yanyuwa exhibits seven places of articulation, including a contrast between front velar stops and both palatoalveolar (laminal postalveolar) and back velar stops. We illustrate here the contrasting oral and nasal stops in intervocalic position.

These recordings are from our own fieldwork in conjunction with Jean Kirton. The terms used here differ somewhat from those used by Kirton and Charlie (1978).

Most notable is our use of "laminal dental" in place of their "apical dental". While "apical dental" suggests contact between the tip of the tongue and the upper front teeth, we would also note the contact between the blade of the tongue and the front part of the alveolar ridge.

We have also used the term "front velar" in place of their term "palato-velar".

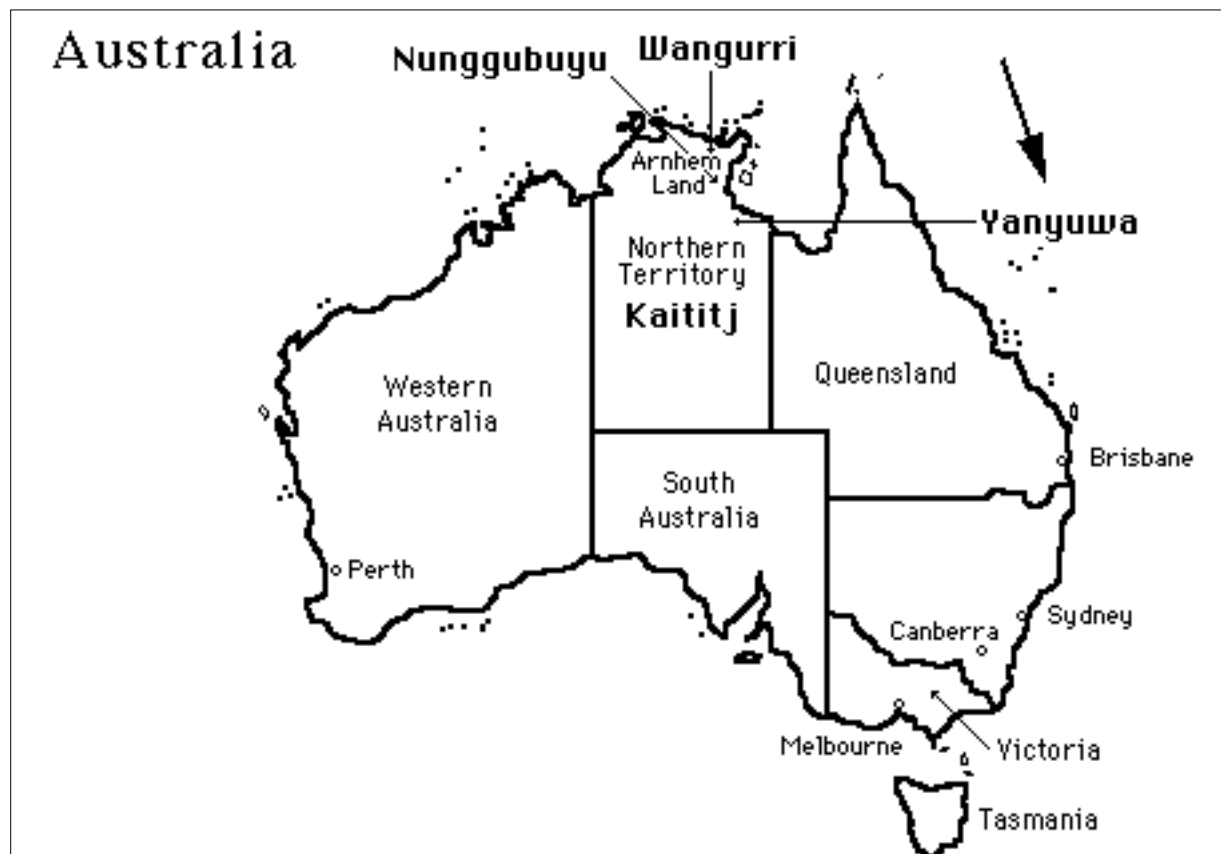
In addition, the velar stops appear to us to be made slightly further back than those in other languages although they are in no way equivalent to uvulars.

Reference

Kirton, J. & B. Charlie. 1979. Seven articulatory positions in Yanyuwa consonant. Papers in Australian linguistics 5. Canberra: Pacific Linguistics.

Nasals

Bilabial	umu(w)adala	'in the canoe'
Laminal dental	wuṇuṇu	'cooked'
Apical alveolar	wunala	'kangaroo'
Apical retroflex	waṇura	'white egret'
Palatoalveolar	ṇaṇalu	'tea'
Front velar	luwaṇu	'strip of turtle fat'
Back velar	waṇulu	'adolescent boy'

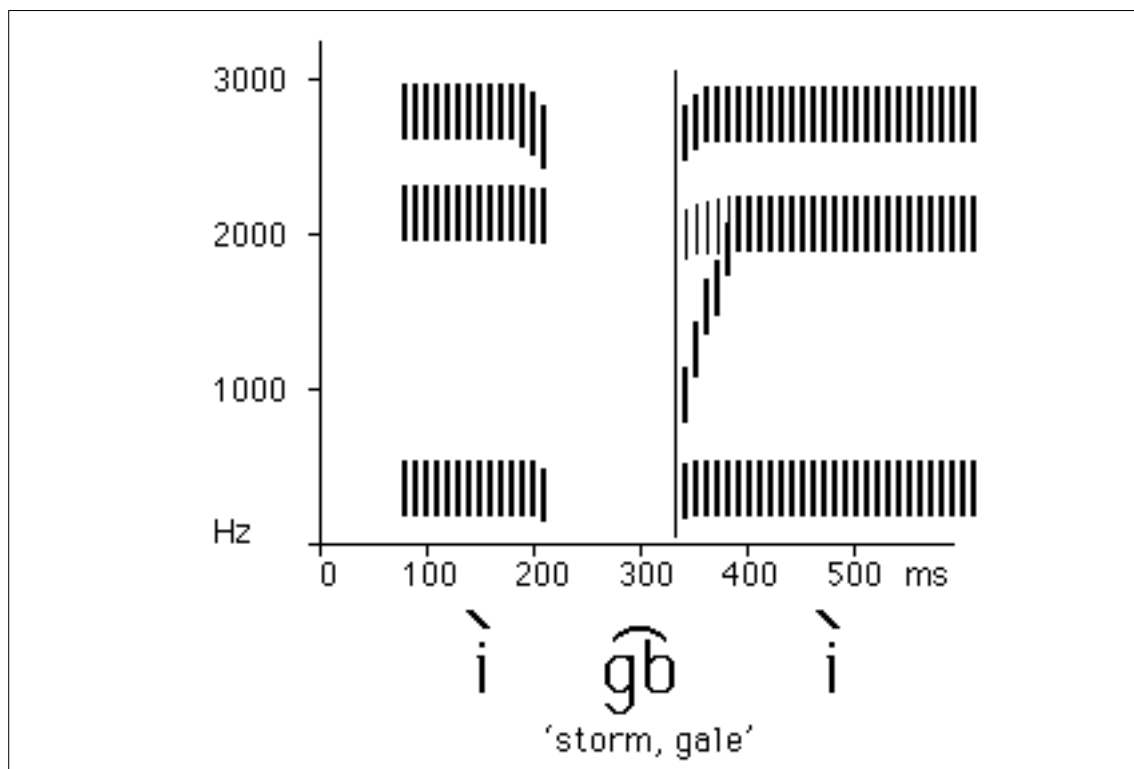


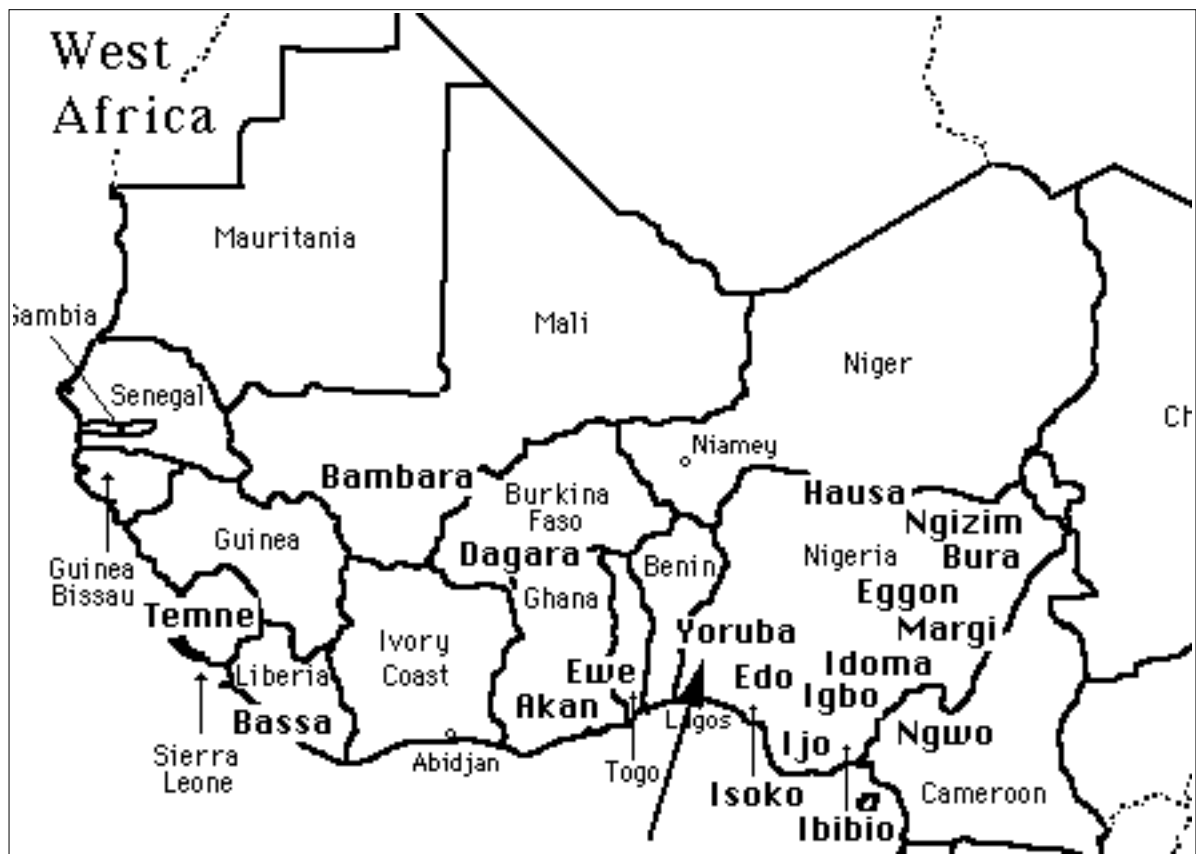
[return to language index](#)

Yoruba

Yoruba is a Niger-Kordofanian language (Kwa group) spoken principally in southwestern Nigeria. There are approximately 20 million speakers.

The sound illustrated here is a voiced labial-velar stop. The accompanying spectrogram demonstrates the different acoustic characteristics of the onset to and offset from this sound. The onset has similarities to a velar stop whereas the offset is similar to a bilabial release.





[back to language index](#)

Zhulhõasi

Zhulhõasi is a Khoisan language (IXǃ group) spoken in Northern Namibia.

Zhulhõasi contrasts dental, alveolar, alveolar lateral, and palatal clicks, each with up to 12 different accompaniments. The 12 alveolar clicks are illustrated here.

The last four of these 12 accompaniments contain voiced onsets followed by one of the voiceless onsets. (Note, though, that in the word for 'leopard' the usually voiced /g/ was not voiced on this occasion.)

Obstruent clusters with mixed voicing, that is, where the first segment is voiced and the second voiceless, are rare in the world's languages, but commonly occur in IXǃ languages, not only on click accompaniments but also with other consonants.

Zhulhõasi also contrasts four series of stops at three places of articulation.

Along with voiced, voiceless unaspirated, and voiceless aspirated stops, the language also has a series best described as voiced plus voiceless aspirated.

(The voiced alveolar stop /d/ occurs in words such as /da/ 'skin', which were unfortunately not adequately recorded by any of our speakers .)

	Bilabial	Alveolar	Velar
Voiced	ba 'father'		gaba 'walk pigeon-toed'
Voiceless unaspirated	pabu 'puff adder'	ta 'wild orange'	kabi 'inspect a trap'
Aspirated	p ^h ep ^h e 'glutton'	t ^h a 'bee sting'	k ^h aba 'to descend'
Voiced + voiceless aspirated	bp ^h e 'to spit out'	dt ^h a 'blanket'	gk ^h aro 'bed'

Voiced + Voiced	tsam 'to stalk'	t̚sa 'to fetch'
Voiced + Aspirated	ts^he 'week'	t̚sa^tt̚sa 'to sprinkle'
Voiced + Aspirated	dtsh^hau 'woman'	d̚ʃ^hii 'to carry straddled on shoulder'
Voiced + ejective	ts'a 'sleep'	t̚ʃ'am (bird [coracias garrulus])
Voiced + ejective	dtsh'oo 'hartebeest'	d̚ʃ'i 'to be wet'

Alveolar click with		
Voiced velar stop	g!à	'rain'
Voiced + Voiced	klábí	'roll up a blanket'
Voiced + Aspirated	k!^hání	'palm tree'
Voiced + Voiced	ŋ!àmà	'road'
Voiced + Aspirated	ŋ!^hānà	'walking stick'
Voiced + Voiced	k!ʔàbú	'rifle'

Alveolar click with		
Voiced affricated velar stop	k!ʰára	'cough up from throat'
Affricated velar ejective	k!ʰàm	'tighten a bowstring'
Voiced velar stop & aspirated velar stop	gk!ʰaní	'tie'
Voiced velar stop & voiceless affricated stop	gk!ʰaré	'cut open an animal'
Voiced velar stop, then affricated ejective	gk!ʰàrú	'leopard'
Voiced velar nasal & voiceless aspirated nasal	ŋŋ!ʰàm	'spider'

