2. CONSONANTS

2.1. Consonant Phonemes

The consonant phonemes of Bongo are listed in Chart 1. Points of articulation are listed across the top of the chart and manner of articulation down the left side. Both alveopalatal and palatal consonants are considered to be systemically palatal, since there is no contrast between these two points of articulation.

	Bilabial	Alveolar	Palatal	Velar	Labiovelar	Glottal
Stops						
Voiceless	p	t	c	k	kp	
Voiced	b	d	j	g	gb	
Prenasalized	mb	nd	nj	ŋg	ŋgb	
Implosive	'b	'd	'j			
Nasals	m	n	ny	ŋ		
Fricative						h
Semivowels			y		w	
Liquids						
Flap		r				
Lateral		l				

CHART 1. Consonant Phonemes of Bongo

In Charts 1 and 2 and in phonetic and phonemic transcriptions throughout this study, the symbols [c] and [j] are used to represent the voiceless and voiced grooved alveopalatal affricates [tš] or [č] and [dž] or [J], respectively. ['j] represents an implosive grooved alveopalatal affricate [dž˓]. In both phonetic and phonemic transcriptions I have followed Santandrea's use of apostrophe plus consonant to indicate implosives, and also his use of /ny/ for the alveopalatal nasal [ɲ]. The alveolar flap [ř] is symbolized throughout as [r]. Labiovelar stops and prenasalized stops are written [kp], [gb], [mb], [nd], [nj], [ŋg], and [ŋgb] for convenience.

The system of stops in Bongo includes voiceless, voiced, and prenasalized stops at the bilabial, alveolar, palatal, velar, and labiovelar points of articulation. The voiced implosives are bilabial, alveolar and palatal. Nasals occur at all four major points of articulation: bilabial, alveolar, palatal, and velar. The only phonemic fricative is the voiceless glottal one. There are two semivowels: the palatal /y/ and /w/ which has been listed as a labiovelar since it has both an approximation of the lips, making it a bilabial sound, and of the back of the tongue and the soft palate, making it a velar sound. The system also includes two liquids: an alveolar flap and a lateral.

In Chart 2 consonant phonemes are listed according to articulatory and auditory distinctive features as defined by Chomsky and Halle (1968) and Schane (1973). The distinctive features of consonants and vowels are listed separately since they are dealt with in separate chapters. The number of features for uniquely distinguishing each consonant would not be reduced by combining the charts. In the separate charts the feature [syllabic] -- [-] for consonants and semivowels and [+] for vowels -- is left implicit.

	p	b	mb	'b	m	t	d	nd	'd	n	r	l	c
Consonantal	+	+	+	+	+	+	+	+	+	+	+	+	+
Sonorant	-	-	+	-	+	-	-	+	-	+	+	+	-
Continuant*	-	-	-	-	+	-	-	-	-	+	+	+	-
Nasal	-	-	+	-	+	-	-	+	-	+	-	-	-
Lateral	-	-	-	-	-	-	-	-	-	-	-	+	-
Anterior	+	+	+	+	+	+	+	+	+	+	+	+	-
Coronal	-	-	-	-	-	+	+	+	+	+	+	+	+
Back	-	-	-	-	-	-	-	-	-	-	-	-	-
Voiced	-	+	+	+	+	-	+	+	+	+	+	+	-
Implosion	-	-	-	+	-	-	-	-	+	-	-	-	-

	j	nj	'j	ny	y	k	g	ng	ŋ	kp	gb	ngb	w	h
Consonantal	+	+	+	+	-	+	+	+	+	+	+	+	-	+
Sonorant	-	+	-	+	+	-	-	+	+	-	-	+	+	-
Continuant*	-	-	-	+	+	-	-	-	+	-	-	-	+	+
Nasal	-	+	-	+	-	-	-	+	+	-	-	+	-	-
Lateral	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anterior	-	-	-	-	-	-	-	-	-	+	+	+	+	-
Coronal	+	+	+	+	+	-	-	-	-	-	-	-	-	-
Back	-	-	-	-	-	+	+	+	+	+	+	+	+	+
Voiced	+	+	+	+	+	-	+	+	+	-	+	+	+	-
Implosion	-	-	+	-	-	-	-	-	-	-	-	-	-	-

*The most frequent allophones of /p/ and /c/ are fricative, but these consonants are marked as [-continuant], since they are systemically stops.

CHART 2. Distinctive Features of Consonants

2.2. Phonetic Description of Consonants

A description of the consonant phonemes with their allophonic variations is given below.

2.2.1. Stops

/p/ [p], an unaspirated voiceless bilabial stop with egressive lung air, occurs in free variation with

[f], a voiceless labiodental fricative with egressive lung air, and also with

[pɸ], an unaspirated voiceless bilabial affricate with egressive lung air:

[pìrá]~[fìrá]~[pɸìrá] /pìrá/   'axe'

The predominant allophone is [f].

/b/ [b], a voiced bilabial stop with egressive lung air:

[bó'dū]   /bó'dù/   'wild pig'

/mb/ [mb], a voiced bilabial prenasalized stop with egressive lung air:

[mbágá]   /mbágá/   'mother'

/'b/ ['b], a voiced bilabial stop with ingressive pharynx air, in free variation word initially in certain words with

[ʋ], a lenis voiced labiovelar approximant with egressive lung air. This allophone is phonetically distinct from the semivowel [w]:

['búlū]~[ʋúlū]   /'búlù/   'mahogany tree'

/t/ [t], an unaspirated voiceless alveolar stop with egressive lung air:

[tútú]   /tútú/   'groundnut shell'

/d/ [d], a voiced alveolar stop with egressive lung air:

[dùm]   /dùm/   'sorghum porridge'

/nd/ [nd], a voiced alveolar prenasalized stop with egressive lung air:

[ndúdú]   /ndúdú/   'hedgehog'

/'d/ ['d], a voiced alveolar stop with ingressive pharynx air:

[mbò'dò]   /mbò'dò/   'frog'

/c/ [š], a voiceless alveopalatal grooved fricative with egressive lung air, in free variation with

[s], a voiceless alveolar grooved fricative with egressive lung air, before back or central vowels; and also in free variation with

[c], a voiceless alveopalatal grooved affricate with egressive lung air, before front vowels:

[ša]~[sa]	/ca/	'cow'[2]
[šìː]~[cìː]	/cìì/	'excrement'

The predominant allophone is [š] but /c/ is chosen as the phonemic symbol since the voiced counterpart of this phoneme is /j/.

/j/ [j], a voiced alveopalatal grooved affricate with egressive lung air:

[jí]	/jí/	'hand'

In one word only, in our data, [j] varies freely with [z], a voiced alveolar grooved fricative:

[kazavwɪ]~[kajavwɪ]	/kajavwɪ/	'square'

[z] also occurs in our transcription of [gàmzút] 'beer from honey', but the transcription has not been checked for phonetic accuracy.

/nj/ [nj], a voiced alveopalatal prenasalized grooved affricate with egressive lung air. The prenasalization has alveolar closure:

[njɔ́ny]	/njɔ́ny/	'mud'

/'j/ ['dʸ], a voiced palatalized alveolar stop with ingressive pharynx air, occurring word initially before back and central vowels, in complementary distribution with

['j], a voiced alveopalatal grooved affricate with ingressive pharynx air, occurring in all other environments. Word medially ['j] is in free variation with

[dʸ], a voiced palatalized alveolar stop with egressive lung air, and also with

[ž], a voiced alveopalatal grooved fricative with egressive lung air:

['dʸɔ́kɔ́]	/'jɔ́kɔ́/	'teeth'
['j̀]	/'jì/	'person'
[lé'jí]~[léží]~[lédʸī]	/lé'jì/	'beer'

/k/ [k], an unaspirated voiceless velar stop with egressive lung air:[3]

[kél]	/kél/	'eleusine'

/g/ [g], a voiced velar stop with egressive lung air:

[gòhí]	/gòhí/	'cough'

/ŋg/ [ŋg], a voiced velar prenasalized stop with egressive lung
      air:

      [ŋgánjá]   /ŋgánjá/   'crocodile'

/kp/ [kp], a voiceless labiovelar stop with egressive lung air:

      [kpúlí]   /kpúlí/   'lion'

/gb/ [gb], a voiced labiovelar stop with egressive lung air:

      [gbándā]   /gbándà/   'cassava'

/ŋgb/ [ŋgb], a voiced labiovelar prenasalized stop with egressive
       lung air. The prenasalization just has velar closure, rather
       than both bilabial and velar closure:

      [ŋgbáyá]   /ŋgbáyá/   'corn'

2.2.2. Sonorants and Fricatives

/m/ [m], a voiced bilabial nasal with egressive lung air:

      [mònò]   /mònò/   (variety of fruit)[4]

/n/ [n], a voiced alveolar nasal with egressive lung air:

      [níní]   /níní/   'maternal aunt'

/ny/ [ny], a voiced alveopalatal nasal with egressive lung air:

      [nyèrè]   /nyèrè/   'chief'

/ŋ/ [ŋ], a voiced velar nasal with egressive lung air:

      [ŋ̀ɔ̀ŋɔ̀]   /ŋ̀ɔ̀ŋɔ̀/   (species of fish)

/h/ [h], a voiceless glottal fricative with egressive lung air which
      takes on the quality of the following vowel. In [híbí] /híbí/
      'wet season', the [h] has the quality of a voiceless [i], and in
      [hàbà]   /hàbà/   'hippopotamus', it has the quality of a
      voiceless [a].

/y/ [y], a voiced palatal semivowel with egressive lung air:

      [yángá]   /yángá/   'spotted rat'

/w/ [w], a voiced labiovelar semivowel with egressive lung air:

      [wár]   /wár/   (species of fish)

/r/ [r], a voiced alveolar flap with egressive lung air:

      [ráká]   /ráká/   'shoe'

      [r̃], the voiced alveolar trill with egressive lung air is used
      in slow, deliberate speech.

/l/ [l], a voiced alveolar lateral with egressive lung air:

[lábá]   /lábá/⁵   'bridge'

2.2.3. Other Allophones

    In addition to the allophones described above, in fast speech consonants may be labialized when they are followed by rounded vowels. That is, the lip-rounding of a rounded vowel becomes labialization of the preceding consonant if: 1) it is an /u/ followed by a vowel, or 2) it is an /ɔ/. In the first case the entire /u/ becomes /ʷ/. For example:

    [túe]~[tʷéi]   /túe/   'grandfathers, forefathers'

    [mui]~[mʷi]   /mui/   'five'

In the second case the roundedness becomes [ʷ], leaving an unrounded /a/. For example:

    [ŋgɔ̀ːr]~[ŋgʷàːr]   /ŋgɔ̀ɔ̀r/   'two'

    [kɔkɔl]~[kʷakʷal]   /kɔkɔl/   (species of bird)

    Prenasalized stops are sometimes pronounced as syllabic nasal plus stop in utterance initial position:

    [m̩bèrè]   /mbèrè/   'doleib (a species of palm)'

Utterance medially a syllable break may be perceived between the nasal and stop components:

    [mã gú mán.dán.dán]   /má àgú mándá ndán/
    'I bought groundnuts today.'

2.3. Consonant Contrasts

    In the following sections, the examples of contrasts between consonants are grouped together according to phonetic similarity.

2.3.1. Between Bilabials and Between Bilabials and Other Corresponding Phonemes

    In this section bilabial consonant phonemes are contrasted with each other and with the corresponding alveolars. In addition to these, the labiovelar consonants are contrasted with both the bilabial consonants in this section and with the velars in section 2.3.4.

/p/ and /b/:

/pò'dù/   'fire'   /bó'dù/   'wild pig'

/p/ and /'b/:

| /pádá/ | (species of plant) | /'bàtá/ | 'hare' |
| /ɨpí/ | 'to send' | /ɨ'bì/ | 'to give' |

/p/ and /m/:

| /pìrá/ | 'axe' | /mìrá/ | (variety of yam)' |
| /ɨpí/ | 'to send' | /àmí/ | 'to make' |

/p/ and /kp/:

| /púlí/ | (stones around fire) | /kpúlí/ | 'lion' |
| /ɨpí/ | 'to send' | /ákpí/ | 'to help' |

/p/ and /gb/:

| /pútú/ | 'heel' | /gbùtù/ | (variety of sorghum) |
| /àpɔ'dé/ | 'to scrape (bark)' | /ágbɔdɔ̀/ | 'to gather' |

/p/ and /w/:

| /pìlègù/ | (species of bird) | /wɪlele/ | (species of animal) |

/p/ and /t/:

| /pútú/ | 'heel' | /tútú/ | 'groundnut shell' |
| /apa/ | 'sharp' | /átá/ | 'to see' |

/b/ and /'b/:

| /bú/ | 'banana' | /'bù/ | 'egg' |
| /kúbù/ | (species of plant) | /tù'bù/ | 'bushbuck' |

/b/ and /m/:

| /bó'dù/ | 'wild pig' | /mó'dù/ | 'illness' |

/b/ and /kp/:

| /bí/ | 'hair' | /kpí/ | 'still, yet' |

/b/ and /gb/:

| /bɔkɔ̀/ | 'brother's wife' | /gbɔkɔ/ | 'cane rat' |

/b/ and /w/:

| /báŋgá/ | 'roof' | /wànà/ | (type of poison) |
| /ɨbú/ | 'to build (house)' | /ɨwù/ | 'to carry' |

/b/ and /d/:

/bɔ̀kɔ̀/	'brother's wife'	/dɔ̃kɔ̀/	'basket'
/kíbí/	'drum'	/kídí/	'vein'

/mb/ with /p/, /b/, /m/ and /kp/:

/mbò'dò/	'frog'	/pò'dù/	'fire'
		/bó'dù/	'wild pig'
		/mó'dù/	'illness'
		/kpó'dó/	(species of nut)

/mb/ and /'b/:

/mbárá/	(species of tree)	/'bárá/	'ribs'

/mb/ and /w/:

/mbárá/	(species of tree)	/wár/	(species of fish)
/mbágá/	'mother'	/wànà/	(type of poison)

/mb/ and /gb/:

/mbèlà/	(species of fish)	/gbèlà/	(man's name)

/mb/ and /ŋgb/:

/kɔmbɔ/	(salt substitute)	/kɔ̀ŋgbɔ́/	(species of bird)

/mb/ and /nd/:

/kamba/	'honey'	/kándá/	'tortoise'

/'b/ and /m/:

/'bɔ́nɔ́/	'in front of'	/mɔ̀nɔ́/	'another'
/ɨ'bì/	'to give'	/àmí/	'to make, do'

/'b/ and /kp/:

/'bírù/	'bat'	/kpìrà/	(type of medicine)
/á'bé/	'to shoot'	/ákpè/	'to kick'

/'b/ and /gb/:

/'bèlé/	'near'	/gbèlà/	(man's name)

/'b/ and /w/

/'báná/	'skin'	/wànà/	(type of poison)

/'b/ and /'d/:

/'bù/	'egg'	/'dù/	'thigh'
/hɪ'bu/	'oil'	/hí'dú/	'fish spear'

/m/ and /kp/:

/mìrá/	(variety of yam)	/kpìrà/	(type of medicine)
/àmí/	'to do, make'	/ákpì/	'to open'

/m/ and /gb/:

/mándá/	'groundnut'	/gbándà/	'cassava'

/m/ and /w/

/múl/	'khasham al banāt (species of fish)'	/wúúl/	'wild dog'

/m/ and /n/:

/mɔ̀kɔ́/	'war'	/nɔ̀kɔ́/	'maternal uncle'

2.3.2. Between Alveolars and Between Alveolars and Corresponding Palatals

In this section the alveolar consonant phonemes are contrasted with each other and with the corresponding palatals.

/t/, /'d/, /l/, and /r/:

/tɔ́tɔ́/	(species of animal)	/tɔ́'dɔ̀/	'salt'
/tɔ̀lɔ̀/	(liquid of egg or fruit)	/tɔ́rɔ̀/	'up'

/t/ and /d/:

/tútú/	'grindstone'	/dùdù/	'grave (noun)'
/átá/	'to see'	/àdá/	'to tie'

/t/ and /n/:

/'bàtá/	'hare'	/'báná/	'skin'

/t/ and /c/:

/tùr/	'foreigner'	/cur/	(species of fish)
/kùtú/	'pot'	/kùcù/	(man's name)

/d/ and /'d/:

/dù/	'for'	/'dù/	'thigh'
/kùdá/	'thirsty'	/kù'dá/	'pool of water'

/d/ and /n/:

/dɔ́kɔ̀/	'basket'	/nɔ́kɔ́/	'maternal uncle'

/d/   and /r/:

/dɔ̀/	'on, place'	/rɔ́/	'name'

/d/   and /l/:

/kàdà/	'sun'	/kálá/	'kob (antelope)'

/d/   and /j/:

/dí/	'cold (weather)'	/jí/	'hand'
/àdɔ̀/	'to cultivate'	/ájɔ́/	'to say, tell'

/d/   and /'j/:

/dɔ́kɔ̀/	'basket'	/'jɔ́kɔ́/	'teeth'
/hèdí/	'urine'	/lé'jì/	'beer'

/nd/   with /t/, /l/, /r/, and /n/:

/gbándà/	'cassava'	/'bàtá/	'hare'
		/'bálá/	'edible leaves'
		/'bárá/	'ribs'
		/'báná/	'skin'

/nd/   and /d/:

/kándá/	'tortoise'	/kàdà/	'sun'

/nd/   and /'d/:

/ndù/	'how, how many?'	/'dù/	'thigh'

/nd/   and /nj/:

/kándá/	'tortoise'	/gánjá/	'iron, money'

/'d/   and /n/:

/mbò'dò/	'frog'	/mònò/	(variety of fruit)

/'d/   and /r/:

/'dù/	'thigh'	/rúú/	'mud hut, room'

/'d/   and /j/:

/'dì/	'what?'	/jì/	'hand'

/'d/   and /'j/:

/'dì/	'what?'	/'jì/	'person'
/á'dú/	'to sleep'	/á'jù/	'to give birth'

/n/   and /r/:

/'báná/	'skin'	/'bárá/	'ribs'

/n/ and /l/:

| /náù/ | 'there is...' | /láù/ | 'clothing' |
| /'báná/ | 'skin' | /'bálá/ | 'kudra (leaves)' |

/n/ and /ny/:

| /ánéné/ | 'to lick' | /ányéné/ | 'to allow' |

/n/ and /nj/:

| /ná/ | 'with' | /njá/ | 'not' |

/r/ and /l/:

| /ráŋgá/ | 'vulture' | /làŋgbà/ | 'burning' |
| /lúr/ | (species of fish) | /dúl/ | (species of animal) |

/r/ and /y/:

| /ráŋgá/ | 'vulture' | /yáŋgá/ | 'spotted rat' |
| /'bárá/ | 'skin' | /ŋgbáyá/ | 'corn' |

/l/ and /y/:

| /léé/ | 'paternal aunt' | /yé/ | 'they' |
| /mbàlà/ | 'arm' | /màyà/ | 'breast' |

2.3.3. Between Palatals and Between Palatals and Corresponding Velars

In this section the palatal consonant phonemes are contrasted with each other and with the corresponding velars.

/c/ and /j/:

| /cìì/ | 'excrement' | /jí/ | 'hand' |

/c/ and /'j/:

| /cìì/ | 'excrement' | /'jì/ | 'person' |
| /ácú/ | 'to fall' | /á'jù/ | 'to give birth' |

/c/ and /ny/:

/ceke/	(species of thorny plant)	/nyèrè/	'chief'
		/nyàkà/	'field'
/maca/	'rhinoceros'	/mànya/	(species of buffalo)

/c/ and /y/:

| /ceke/ | (species of thorny plant) | /yèkì/ | 'who' |
| /ácú/ | 'to fall' | /àyù/ | 'to die' |

/c/ and /k/:

| /cúr/ | (species of fish) | /kúr/ | 'nut' |
| /ácú/ | 'to fall' | /ákù/ | 'to speak' |

/j/ and /'j/:

| /jí/ | 'hand' | /'jì/ | 'person' |
| /ájɔ́/ | 'to say, tell' | /á'jɔ́/ | 'to make (net)' |

/j/ and /ny/:

/jeke/	'well, good'	/nyèrè/	'chief'
		/nyàkà/	'field'
/dıjı/	'from (someone)'	/hıny(ı)/	'scorpion'6

/j/ and /y/:

| /já/ | 'we' | /yá/ | 'they' |
| /ŋgájá/ | 'girl' | /ŋgbáyá/ | 'corn' |

/j/ and /o/:

| /jóhí/ | 'a cold' | /gòhí/ | 'cough' |
| /rújù/ | 'flour' | /kùgù/ | 'laugh' |

/nj/ with /c/, /j/, and /'j/:

/njíì/	'green'	/cìì/	'excrement'
		/jí/	'hand'
		/'jì/	'person'

/nj/ with /ny/, /y/, and /ngb/:

/ánjá/	'to throw (net)'	/anya/	'to stop, wait'
		/àyá/	'to jump'
		/áŋgbá/	'to hit'

/nj/ and /ng/:

| /gánjá/ | 'iron, money' | /káŋgá/ | 'ostrich' |

/'j/ and /ny/:

| /'jala/ | (species of white bird) | /nyala/ | (variety of fruit) |

/'j/ and /y/:

| /á'jù/ | 'to give birth' | /àyù/ | 'to die' |

/ny/ and /y/:

| /nyàkà/ | 'field' | /yakar/ | 'pumpkin' |

/mánya/	(species of buffalo)	/máyà/	(variety of yam)

/ny/ and /n/:

/anya/	'to stop, wait'	/áŋá/	'to bite'

/y/ and /w/:

/yáŋgá/	'spotted rat'	/wànà/	(type of poison)
/àyù/	'to die'	/àwú/	'to hear'

2.3.4. Between Velars, Between Labiovelars, and Between Velars and Other Corresponding Phonemes

In this section the velar and labiovelar consonant phonemes are contrasted with each other. Contrasts are also given between /k/ and /h/, /ŋ/ and /n/, and with some bilabial consonants.

/k/ and /g/:

/kèl/	'straw'	/gèl/	(species of tree)
/ákù/	'to speak'	/àgú/	'to buy'

/k/ and /n/:

/rìkì/	'sorghum bread'	/jìŋì/	'Dinka'

/k/ and /kp/:

/kùlí/	(species of snake)	/kpúlí/	'lion'
/ráká/	'shoe'	/àkpà/	'to sow by scattering'

/k/ and /gb/:

/kɔkì/	'cattle or goat egret'	/gbɔkì/	'upper leg'
/gbɔkɔ/	'cane rat'	/gbógbó/	'windpipe'

/k/ and /w/:

/káŋgá/	'ostrich'	/wànà/	(type of poison)
/ákù/	'to speak'	/àwú/	'to hear'

/k/ and /h/:

/kɔgɔ/	'leopard'	/hɔgɔ/	'back (noun)'
/nyàkà/	'field'	/màhá/	(species of tree)

/g/ and /n/:

/gɔ/	'neck'	/nɔɔ/	'baby termite'
/àgà/	'to chop'	/áŋá/	'to bite'

/o/   and /kp/:

| /gɩra kɔ̀mɔ̀/ | 'pupil of eye' | /kpɩ̀rà/ | (type of medicine) |
| /àgà/ | 'to chop' | /àkpà/ | 'to sow by scattering' |

/o/   and /ob/:

| /gùtù/ | 'shoulder' | /gbùtù/ | (variety of sorghum) |
| /kóngó/ | (species of redheaded bird) | /kɔ̀ngbɔ́/ | (species of bird) |

/o/   and /w/:

| /gù/ | 'hole' | /wɩ̀ɩ́1/ | 'brains' |
| /àgú/ | 'to buy' | /ɛ̀wú/ | 'to hear' |

/ŋo/   and /k/:

| /àŋgɔ̀/ | 'to write' | /àkɔ́/ | 'to sweep' |

/ŋo/   and /g/:

| /ŋgɩa/ | 'grave posts' | /gɩá/ | 'roots' |

/ŋg/   and /ŋ/:

| /tíŋgí/ | (food like honey) | /tɩ̀ŋɩ̀/ | (animal like hartebeest) |

/ŋo/   and /ŋob/:

| /ráŋgá/ | 'vulture' | /laŋgba/ | 'burning' |

/n/   and /kp/:

| /áɲá/ | 'to bite' | /àkpà/ | 'to sow by scattering' |

/n/   and /ob/:

| /ŋɔ̀ɔ̀/ | 'baby termite' | /gbɔ́/ | 'compound' |

/n/   and /w/:

| /wànà/ | (type of poison) | /mauwawara/ | 'gnat' |

/n/   and /ŋ/:

| /ŋɔ̀ŋɔ̀/ | (species of fish) | /nɔ́kɔ́/ | 'maternal uncle' |
| /ŋgɔ́ŋɔ́/ | 'fly' | /ŋgɔ̀nɔ̀/ | 'chicken' |

/kp/   and /ob/:

| /kpúlúlú/ | 'owl' | /gbúlúgú/ | (species of bird) |

/kp/   and /w/:

| /kpúlúlú/ | 'owl' | /wúú1/ | 'wild dog' |

/gb/ and /w/:

| /gbándà/ | 'cassava' | /wànà/ | (type of poison) |

/ngb/ with /p/, /k/, /g/, and /gb/:

/ŋgbùtú/	'deafness'	/pútú/	'heel'
		/kútú/	'shelter'
		/gùtù/	'shoulder'
		/gbùtù/	(variety of sorghum)

/ngb/ with /kp/, /'b/, and /n/:

/áŋgbá/	'to hit'	/àkpà/	'to sow by scattering'
		/à'bà/	'to create, make pot'
		/áŋá/	'to bite'

/ngb/ and /m/:

| /ŋgbáyá/ | 'corn' | /máyá/ | (variety of yam) |

/ngb/ and /b/:

| /laŋgba/ | 'burning' | /lábá/ | 'bridge' |

/ngb/ and /w/:

| /karaŋgba/ | (emetic herb) | /mangɪrawa/ | 'monitor' |

2.4. Extrasystemic Phoneme

Glottal stop /ʔ/ is considered to be an extrasystemic phoneme in Bongo, since it is significant in only one word. A non-phonemic glottal stop varies freely with silence at the beginning of an utterance that begins with a vowel.

[átá]~[ʔátá]   /átá/   'to see'

However, in the word for 'no', the presence of the glottal stop intervocalically distinguishes it from the word for 'yes' and must, therefore, be marked.

[ɔ́ɪ]~[ʔɔ́ɪ]   /ɔ́ɔ́/   'yes'

[ʔɔ́ʔɔ́]~[ɔ́ʔɔ́]   /ɔ́ʔɔ́/   'no'

3. VOWELS

3.1. Vowel Phonemes

Bongo has ten vowels divided between two harmony sets, as shown in Chart 3.

	[+ATR] Vowels				[-ATR] Vowels		
	Front	Central	Back		Front	Central	Back
High	i	ɨ	u		ɪ		ʊ
Low	e		o		ɛ	a	ɔ

CHART 3. Vowel Harmony Sets

The two harmony sets are labelled as [+ATR] (Advanced Tongue Root) and [-ATR] (non-Advanced Tongue Root), which appears to be the articulatory difference between the sets. 'Open' vowel symbols are used for the [-ATR] set because there is some relative openness but this is not the significant feature. A fuller description of vowel harmony in Bongo is given in section 5; but for the present discussion we can make the following general statement:

1) Vowels of only one set can occur in a morpheme,

2) The [+ATR] set is dominant, so that a word with [-ATR] vowels becomes [+ATR] if a [+ATR] suffix is added, but if a [-ATR] suffix is added, a [+ATR] root does not change.

3) The [+ATR] counterpart for each [-ATR] vowel is the one which is most similar in articulation, i.e. /i/ for /ɪ/, /e/ for /ɛ/, /ɨ/ for /a/, /u/ for /ʊ/, and /o/ for /ɔ/.

In the following discussion counterpart vowels are often referred to together, e.g. i/ɪ.

In Chart 4 the features which distinguish Bongo vowels are presented. They are [high], [back], [ATR], and [round]. All vowels are [+syllabic], [-consonantal]. Both central and back vowels are marked [+back] since the body of the tongue is retracted from the neutral position for both.

	i	ɪ	e	ɛ	ɨ	a	u	ʊ	o	ɔ
High	+	+	-	-	+	-	+	+	-	-
Back	-	-	-	-	+	+	+	+	+	+
ATR	+	-	+	-	+	-	+	-	+	-
Round	-	-	-	-	-	-	+	+	+	+

CHART 4. Distinctive Features of Vowels

3.2. Phonetic Description of Vowels

The five [+ATR] vowels of Bongo with their allophonic variations are described first and then the five [-ATR] vowels.

/i/ [i], a high front unrounded [+ATR] vowel with egressive lung air:

    [bíhí]   /bíhí/   'dog'

/e/ [e], a mid front unrounded [+ATR] vowel with egressive lung air:

    [lélé]   /lélé/   'red stone'

/ɨ/ [ɨ], a high central unrounded [+ATR] vowel with egressive
    lung air. The oral cavity is as narrow in the pronunciation of
    /ɨ/ as it is for /i/:

    [rɨkɨ]   /rɨkɘ̀/   'sorghum bread'

/u/ [ʉ], a centralized high back rounded [+ATR] vowel with egressive
    lung air, occurring following /r/ and /j/, in complementary
    distribution with

    [u], a high back rounded [+ATR] vowel with egressive lung air,
    occurring elsewhere:

    [rújʉ̄]   /rújù/   'flour'
    [hílū]   /hílù/   'hyena'

/o/ [o], a mid back rounded [+ATR] vowel with egressive lung air:

    [mbò'dò]   /mbò'dò/   'frog'

/ɩ/ [ɩ], a high front unrounded [−ATR] vowel with egressive lung
    air:

    [kɩdɩ]   /kɩdɩ/   'elephant'

/ɛ/ [ɛ], a mid front unrounded [−ATR] vowel with egressive lung
    air:

    [kɛ́tɛ́]   /kɛ́tɛ́/   'waterpot'

The phoneme /a/ has three allophones conditioned by their
environments: [a<], [a>], and [a]. There is a fourth allophone of
/a/, [ʌ], which varies freely with the other three allophones in
certain environments. A description of these allophones of /a/, along
with their environments, is given below.

/a/ [a<], a slightly fronted low central unrounded [−ATR] vowel with
    egressive lung air, occurring contiguous to palatals:[7]

    [mà<yà<]   /màyà/   'breast'

    [a>], a slightly backed low central unrounded [−ATR] vowel with
    egressive lung air, occurring contiguous to velars:

    [ká>gá>]   /kágá/   'tree'

[a], a low central unrounded [-ATR] vowel with egressive lung
air, occurring when there is a palatal on one side of the vowel
and a velar on the other. This allophone also occurs in all other
environments not covered above:

[yáŋgá⁾]   /yáŋgá/   'spotted rat'

[lábá]   /lábá/   'bridge'

Preceding nasals and in unstressed syllables, the three
allophones above vary freely with [ʌ], a slightly raised low
unrounded central [-ATR] vowel with egressive lung air:

[ŋgánjá⁽]~[ŋgánjʌ́]   /ŋgánjá/   'crocodile'

[rá⁾ká⁾]~[rá⁾kʌ́]   /ráká/   'shoe'

/u/ [u], a high back rounded [-ATR] vowel with egressive lung air:

[kùtú]   /kùtú/   'pot'

/ɔ/ [ɔ], a mid back rounded [-ATR] vowel with egressive lung air:

[kɔ̀gɔ̀]   /kɔ̀gɔ̀/   'leopard'

3.3. Vowel contrasts

3.3.1. Between Front Vowels and Between Front Vowels and Corresponding Central Vowels

/i/ and /ɨ/:
/kìdì/   (species of snake)   /kìdì/   'elephant'
/kír/   (species of plant)   /kìr/   'star'

/i/ and /e/:
/kíbí/   'drum'   /kèbí/   'rope'

/i/ and /ə/:
/jí/   'hand'   /jʌ́/   'we'
/í'bì/   'to give'   /ʌ́'bʌ́/   'to shoot, sting'

/ɨ/ and /e/:
/hílílɨ́/   'breeze'   /hilele/   'vulture'
/mbùrɨ̀/   (variety of yam)   /mbùré/   'giant eland'

/ɨ/ and /ə/:
/mìndɨ̀/   'dirty'   /mendí/   (type of con-
                                                        genital disease)
/hɨ́/   'inside, belly'   /hʌ́/   'you (pl)'

/e/ <u>and</u> /ɛ/:

| /ɨméré/ | 'to fear' | /mbɛ̀rɛ̀/ | 'doleib' |
| /lélé/ | 'red stone' | /àlélé/ | 'to cut up (food)' |

/i/ <u>and</u> /ɨ/:

| /'jígɨ̀/ | 'ointment' | /jɨ́ŋɨ́/ | 'Dınka' |
| /yèkì/ | 'who' | /rɨ̀kɨ̀/ | 'sorghum bread' |

/ɪ/ <u>and</u> /ɨ/:

| /níkí/ | (one day removed in time) | /rɨ̀kɨ̀/ | 'sorghum bread' |
| /kící/ | 'hot' | /ŋɨ́cɨ́/ | 'slave' |

/e/ <u>and</u> /a/:

| /'bé/ | 'house' | /'bá/ | 'where' |
| /bèŋgè/ | (species of fish) | /báŋgá/ | 'roof' |

/ɛ/ <u>and</u> /a/:

| /àyɛ́/ | 'to drink' | /àyá/ | 'to jump' |
| /mbɛ̀là/ | (species of fish) | /mbàlà/ | 'arm' |

3.3.2. Between Central Vowels and Between Central Vowels and Corresponding Back Vowels

/ɨ/ <u>and</u> /a/:

| /rɨ̀kɨ̀/ | 'sorghum bread' | /ráká/ | 'shoe' |
| /ŋɨ́cɨ́/ | 'slave' | /ŋgácà/ | (species of tree) |

/ɨ/ <u>and</u> /u/:

| /tɨ́ŋɨ́/ | (food like honey) | /kúŋgú/ | 'baboon' |

/ɨ/ <u>and</u> /ʊ/:

| /gɨ̀gɨ̀/ | 'lizard' | /gùgù/ | (species of ant) |

/a/ <u>and</u> /o/:

| /káŋgá/ | 'ostrich' | /kóŋgó/ | (species of red-headed bird) |

/a/ <u>and</u> /ɔ/:

| /àdà/ | 'to count' | /àdɔ̀/ | 'to cultivate' |

/ŋgáŋá/   (species of tree)   /ŋgɔ́nɔ́/   'fly'

3.3.3. Between Back Vowels and Between Front Vowels and Corresponding Back Vowels

/u/ and /ʋ/:

/mùl/	'darkness'	/múl/	'khasham al banāt (species of fish)'
/kúŋgú/	'baboon'	/kúŋgú/	'street'

/u/ and /o/:

/kútú/	'shelter'	/kótú/	'one'
/kúŋgú/	'baboon'	/kóŋgó/	(species of red-headed bird)

/u/ and /ɔ/:

/kútú/	'shelter'	/kɔ́tɔ́/	'lower back'

/ʋ/ and /o/:

/tù'bù/	'bushbuck'	/tó'bó/	'fat'
/ndúm/	'tomorrow'	/ndòm/	'fight'

/ʋ/ and /ɔ/:

/gù/	'hole'	/gɔ̀/	'neck'
/kúr/	'nut'	/kɔ́r/	'shea butter tree'

/o/ and /ɔ/:

/mònò/	(a variety of sour fruit)	/mɔ̀nɔ́/	'another'
/tó'bó/	'fat'	/tɔ́'bɔ̀/	'poison'

/i/ and /u/:

/titi/	(species of fish)	/tútú/	'groundnut shell'
/híbí/	'wet season'	/hi'bu/	'oil'

/ɩ/ and /ʋ/:

/kìr/	'star'	/kúr/	'nut'
/tɩbɩ/	'unripe'	/tù'bù/	'bushbuck'

/e/ and /o/:

/kèbí/	'rope'	/kóbì/	'buffalo'
/mìnyé/	'smell'	/kínyó/	'thorn'

/e/ and /ɔ/:

/kété/   'waterpot'   /kɔtɔ/   'lower back'

4. DISTRIBUTION OF CONSONANTS AND VOWELS

The distribution of consonants and vowels and the interpretation of ambivalent sequences or segments is presented according to syllable patterns, occurrence in syllable and word positions, and cooccurrence restrictions.

The unambiguous syllable patterns in Bongo are V, CV, and CVC.

V   /á.tá/   'to see'

CV   /gɔ̀/   'neck'

CVC   /gèl/   (species of tree)

There are no unambiguous consonant clusters within a syllable nor any unambiguous vowel clusters within a syllable in slow speech.

V syllables occur only word initially while CVC syllables occur primarily word finally, but can occur word initially or word medially. For example:

/'bíl.ná/   (variety of sorghum)

Words can have from one to six syllables. The six syllable words are adjectives which have prefixes and reduplicated stems. Single morpheme words do not exceed four syllables. One, two, and three syllable words are most common.

4.1. Consonants

4.1.1. Distribution in Word and Syllable Positions

All consonants occur initially in a CV or a CVC syllable when that syllable is word initial or follows a V or CV syllable. Following a CVC syllable, only nasals or stops occur syllable initially in our data. Only liquids and nasals occur syllable and word finally, i.e., as the second consonant in CVC syllables. Examples of liquids and nasals word initially, medially, and finally:

	Initially		Medially		Finally	
/l/	/lɔgɔ̀/	'hoe'	/kpúlí/	'lion'	/bél/	'walking stick'
/r/	/rújù/	'flour'	/'bírù/	'bat'	/bèèr/	'swamp'
/m/	/méhì/	'meat'	/hɔ̀mɔ̀/	'nose'	/dùm/	'sorghum porridge'

/n/   /ná/   'with'   /mìnì/   'water' /ndán/   'today'

/ny/ /nyàkà/   'field'   /bínyá/   'goat' /mòny/   'sorghum'

/ŋ/   /ŋící/   'slave'   /ŋ ɔ́ŋɔ́/   'fly'   /ayeŋ/   'to sift'

Examples of other consonants word initially and medially:

Initially   ### Medially

/p/   /pò'dù/   'fire'   /àpɔ́/   'to scrape'

/b/   /bíhí/   'dog'   /lábá/   'bridge'

/mb/ /mbágá/   'mother'   /màmbíríù/   'hornet'

/'b/ /'bírù/   'bat'   /ndí'bà/   'chin'

/t/   /tɔ́'bɔ̀/   'poison'   /gùtù/   'shoulder'

/d/   /dìlù/   'dikdik'   /kàdà/   'sun'

/nd/ /ndán/   'today'   /gbándà/   'cassava'

/'d/ /'dù/   'thigh'   /pò'dù/   'fire'

/c/   /cìì/   'excrement'   /ŋící/   'slave'

/j/   /jí/   'hand'   /rújù/   'flour'

/nj/ /njɔ́ny/   'mud'   /ŋgánjá/   'crocodile'

/'j/ /'jì/   'person'   /á'jí/   'thing'

/y/   /yáŋgá/   'spotted rat'   /màyà/   'breast'

/k/   /kágá/   'tree'   /gbɔ̀kì/   'upper leg'

/g/   /gùtù/   'shoulder'   /kágá/   'tree'

/ŋg/ /ŋgánjá/   'crocodile'   /báŋgá/   'roof'

/kp/ /kpúlí/   'lion'   /ákpà/   'to kick'

/gb/ /gbɔ̀kì/   'upper leg'   /gbógbó/   'windpipe'

/ŋgb/ /ŋgbáyá/   'corn'   /gbèèŋgbè/   'sweet potato'

/w/   /wár/   (species of   /kíhìwà/   'porcupine'
                    fish)

/h/   /hɔ̀mɔ̀/   'nose'   /bíhí/   'dog'

   In our data, there are only two occurrences of /'d/ word initially; all other occurrences are word medial.

4.1.2. Distribution with Respect to Vowels

   Chart 5 shows which vowels follow the different consonants. An x indicates that there is at least one word in which that vowel follows the consonant in question.

Several of the gaps in the chart are due to the fact that the phonemes involved are not common ones. The vowel /ɨ/ rarely occurs and the consonants /ŋ/, /j/, and /'j/ are also rare. There are, however, some significant restrictions in distribution. The consonant /ŋ/ is never followed by a front vowel. /w/ is followed only by high vowels and /a/. /y/ is never followed by a high front vowel. In the basic form of stems, /nj/ is followed only by [-ATR] vowels, and /ŋgb/ is followed only by low [-ATR] vowels.

	/i/	/ɪ/	/e/	/ɛ/	/ɨ/	/a/	/u/	/ʊ/	/o/	/ɔ/
/p/	x	x				x	x		x	
/b/	x	x	x	x		x	x	x	x	x
/mb/	x	x		x		x			x	
/'b/	x	x	x	x		x	x	x	x	x
/m/	x	x	x	x		x	x	x	x	x
/t/	x	x	x	x	x	x	x	x	x	x
/d/	x	x		x		x	x	x	x	x
/nd/	x	x		x		x	x	x	x	x
/'d/	x			x		x	x	x	x	x
/n/	x	x		x		x		x	x	x
/l/	x	x	x	x	x	x	x	x	x	x
/r/	x	x	x	x	x	x	x	x	x	x
/c/	x	x		x	x	x	x	x		
/j/	x		x	x	x		x	x		
/nj/		x		x		x		x		x
/'j/	x		x		x	x		x		x
/ny/		x	x	x		x			x	
/y/			x	x		x		x		
/k/	x	x	x	x		x	x	x	x	x
/g/		x	x	x	x	x	x	x	x	x
/ng/	x		x	x	x	x	x	x	x	x
/ŋ/					x	x				x
/kp/	x	x	x	x	x	x	x		x	x
/gb/		x		x		x	x	x	x	x
/ngb/			x			x				x
/w/		x				x	x	x		
/h/	x	x	x	x		x			x	x

CHART 5. Vowels Following Consonants

/i/	/ɩ/	/e/	/ɛ/	/ɨ/	/a/	/u/	/ʋ/	/o/	/ɔ/	
				x	x		x			/p/
x	x	x		x			x	x		/b/
					x					/mb/
x	x	x		x	x	x	x	x	x	/'b/
	x	x	x	x	x	x	x	x	x	/m/
x	x		x	x	x	x	x	x	x	/t/
x	x	x		x	x	x	x			/d/
x	x	x	x		x	x	x	x	x	/nd/
x		x		x	x	x	x	x	x	/'d/
x	x		x		x	x	x	x	x	/n/
x	x	x	x	x	x	x	x	x	x	/l/
x	x	x	x	x	x	x	x		x	/r/
	x			x	x	x	x			/c/
	x				x	x	x			/j/
	x				x					/nj/
		x		x	x		x			/'j/
x	x	x			x	x		x	x	/ny/
					x					/y/
x	x	x	x	x	x		x		x	/k/
x	x	x	x	x	x		x	x	x	/g/
x		x	x	x	x	x	x	x	x	/ng/
			x	x	x				x	/ɲ/
	x				x					/kp/
	x				x		x	x		/gb/
			x		x				x	/ngb/
	x			x	x					/w/
x	x		x		x			x	x	/h/

CHART 6. Vowels Preceding Consonants

    Chart 6 shows which vowels precede the different consonants. Again, there are several gaps due to the fact that certain consonants are not common word medially. We do notice that /ɲ/ follows mostly back vowels and never high vowels. There is only one word in which /ɲ/ is preceded by a front vowel, /ayeɲ/ 'to sift'. /p/ is never preceded by a front vowel, but that may be because there are not many examples of word medial /p/. The only low vowel that precedes /c/ is

/a/. No back rounded vowels precede /w/. Both /kp/ and /gb/ are rare word medially. In the basic form of stems, /nj/ is preceded only by the [-ATR] vowels /ɪ/ and /a/. Again, in basic forms, the only vowel preceding /mb/ is /a/ and /ŋgb/ is preceded only by low [-ATR] vowels.

4.1.3. Interpretation of Semivowels and Ambivalent Phonetic Sequences

The semivowels [w] and [y] are interpreted as consonants when they occur syllable initially and are followed by a vowel. In these cases the closure on the [w] and [y] is greater than for the corresponding vowel phones [u] and [i]:

CV   [wá.ŋá]   /wáŋá/   (type of poison)   [ye.ge]   /yege/ 'locust'

CVC [wár]   /wár/   (species of fish)

In the examples above, the following vowel phone is quite distinct phonetically from the [w] or [y]. Even when the following vowel is high, the semivowel is more closed than the vowel. For example:

CVC   [wúːl]   /wúúl/   'wild dog'

V.CV [ɪ̀.wù]   /ɪ̀wù/   'to carry'

The phonetic affricates in Bongo include: a bilabial affricate [pɸ], voiceless and voiced alveopalatal grooved affricates [tš] and [dž], an implosive affricate [džˤ] and a prenasalized affricate [ndž]. Since all of the affricate sounds occur word initially where there are no unambiguous consonant clusters, I interpret each as a single unit. They are allophones of the phonemes /p/, /c/, /j/, /'j/ and /nj/, respectively:

[pɸìrá]	/pìrá/	'axe'
[tšìː]	/cìì/	'excrement'
[dží]	/jí/	'hand'
[džˤì]	/'jì/	'person'
[ndžá]	/njá/	'not, none'

Likewise, the voiced palatalized alveolar stop [dʸ] and the implosive counterpart [dʸˤ], occur syllable initially where there are no unambiguous consonant clusters. These phones are, therefore, interpreted as allophones of /j/ and /'j/, respectively:

[lé.dʸī]	/léjì/	'beer'
[dʸˤɔ́kɔ́]	/'jɔ́kɔ́/	'teeth'

Similarly, the labiovelar stops [kp] and [gb] are interpreted as single units since they can occur word initially:

[kpóĺf]   /kpóĺf/   'lion'

[gbɔ́]   /gbɔ́/   'compound'

Implosives are formed with a glottal closure as initiator for the ingressive pharynx air mechanism, and are ambiguous also. They are interpreted as unit segments because they occur word initially:

[bˤʋ̀]   /'bʋ̀/   'egg'

[dˤì]   /'dì/   'what'

[jˤì]   /'jì/   'person'

[dʸˤɔ́kɔ́]   /'jɔ́kɔ́/   'teeth'

Bongo has the following prenasalized stops and affricates: [mb], [nd], [nj], [ŋg], and [ŋgb]. These could be interpreted either as single units or as sequences of nasal plus stop. Since they can occur word initially, they are interpreted as single consonants even though this analysis results in five additional consonant phonemes.

However, there is evidence in Bongo for interpreting prenasalized stops as a sequence of nasal plus stop:

1) In words with prenasalized stops word medially, a syllable break is sometimes perceived between the nasal and stop components. Therefore,

[mán.dá]   'groundnut'   could be interpreted as having
                                             the same word shape as
['bíl.ná]   (variety of sorghum),   namely CVC.CV.

The fact that the nasal phone closes the first syllable agrees with the fact that only liquids and nasals can close syllables and words in Bongo. (See section 4.1.1.)

2) Word initially, following consonant final words or utterance initially, the nasal component of the prenasalized stop is sometimes syllabic. Therefore,

[ń̩.dú]   'language'   could be interpreted as having
                                             the same word shape as
[á.lá]   'to get',   namely V.CV.

Furthermore, when a word initial prenasalized stop is preceded by a word ending in a vowel within the same pause group, the nasal component loses its syllabicity and closes the syllable of the preceding word, so that it is phonetically like the word medial prenasalized stops.

/má àkù ńdú Bongo/ is phonetically [má kùn.dú Bongo]
'I speak the Bongo language.'

/má àgú mándá ńdán/ is phonetically [mǎ gú mán.dán.dán]
'I bought groundnuts today.'

On the other hand, the fact that the tone of a syllabic nasal is the same as the tone of the vowel in the following phonetic syllable is further evidence for the interpretation I have chosen, i.e. the prenasalized stops are unit phonemes.

4.2. Vowels

4.2.1. Distribution in Word and Syllable Positions

All ten vowels in Bongo, occur word medially and finally and syllable medially. Examples were found for all vowels except /e/ in word and, therefore, syllable initial position.

	Word and Syllable Initially	Word Medially	Word and Syllable Finally	Syllable Medially
/i/	/icucu/ 'only a few'	/'bírù/ 'bat'	/ɬpí/ 'to send'	/kír/ (species of plant)
/ɪ/	/íríírí/ 'heavy'	/bínyá/ 'goat'	/hí/ 'in'	/'bílná/ (variety of sorghum)
/e/		/kèbí/ 'rope'	/hígé/ 'rat'	. /bél/ 'walking stick'
/ɛ/	/énéné/ 'good'	/pìlègù/ (species of bird)	/kɪrɛ/ 'arrow'	/ayɛŋ/ 'to sift'
/ɨ/	/ɨlé/ 'to dig'	/rɨkɨ/ 'sorghum bread'	/'jígɨ/ 'ointment'	/tɨngɨ/ (food like honey)
/a/	/álá/ 'to get'	/ndán/ 'today'	/bínyá/ 'goat'	/wár/ (species of fish)
/u/	/ulumul/ 'very deep'	/kpúlí/ 'lion'	/bó'dù/ 'wild pig'	/dùm/ 'sorghum porridge'
/ʊ/	/ʊdɔrɔ/ (species of fish)	/bù'dɔ̀/ 'husband'	/dɪlù/ 'dikdik'	/dúl/ (species of animal)
/o/	/òò bɔ́rɔ̀/ (discourse closure)	/bó'dù/ 'wild pig'	/kíló/ (species of bird)	/ndóm/ 'fight'
/ɔ/	/ɔ́rɔ̀/ 'to cease'	/dɔr(ɨ)/ 'year'	/bù'dɔ̀/ 'husband'	/kɔ́r/ 'shea butter tree'

4.2.2. Interpretation of Vowel Clusters and Long Vowels

First member of cluster	Second member of cluster or vowel length				
	i/ɩ	e/ɛ	ɨ/a	u/ʊ	ɔ/ɔ
i/ɩ	x	x	x	x	
e/ɛ	x	x		x	
ɨ/a	x		x	x	
u/ʊ	x			x	
ɔ/ɔ	x			x	x

CHART 7. Vowel Clusters and Vowel Length Within a Morpheme

In Chart 7 the vowel clusters and long vowels which occur within a morpheme are indicated.[9] There are other vowel clusters which occur only across morpheme boundaries. In the examples below, a hyphen indicates a morpheme boundary within a word. (See section 5.2.5 for discussion of the /ɛ-ɔ/ sequence.)

/eɔ/	/njɨ́ lélé-ɔ̀/	'it is not a red stone'
/ɛɔ/	/njá kɛ́tɛ́-ɔ̀/	'it is not a waterpot'
/ue/	/tú-é/	'grandfathers'

All vowel clusters within a morpheme in Bongo have a high vowel as the first or second member of the cluster. Chart 7 shows that any vowel can be followed by i/ɩ and u/ʊ. Also, i/ɩ can be followed by e/ɛ or by ɨ/a.

Usually any vowel followed by i/ɩ or u/ʊ sounds like a phonetic glide, e.g. [aʸ] or [aʷ]. These might be treated as filling either the complex nucleus of a single syllable (CV), a sequence (CVV), or a vowel plus semivowel (CVC).

When i/ɩ or u/ʊ are followed by another vowel, the two vowels are both syllabic in slow speech and both have tones. Furthermore, there are a few cases of /ɛ/ and /a/ followed by /ʊ/ in which both vowels are syllabic in slow speech. Thus, it might seem best to consider these sequences as belonging to separate syllables. Long vowels also have two tones as if they were sequences of two identical vowels.

However, I interpret all three of the complex vowel types (clusters, glides, and length) as sequences of two vowels in a single syllable (CVV) for the following reasons:

1) All three can have a falling tone which indicates a single syllable not CV.V.

2) In fast speech (see 2.2.3) the first member of a 'cluster, a 'glide' or a long vowel may be labialized in the same way, e.g. /túé/ becomes [tʷé], /mui/ becomes [mʷi], and /ŋɔɔ/ becomes [ŋʷa]. This is true even across morpheme boundaries, for example /tú-é/ 'grandfather-pl'.

This interpretation requires the addition of CW and CWC syllable types, but not CV.V or CV.VC sequences, which would require both an additional syllable type (VC) and the occurrence of syllables consisting of a single vowel other than word initially.

Examples of the different vowel sequences which occur as 'vowel clusters' are:

/ie/		/ɨdíɛ̀/	'to break'
/iu/		/liu/	(man's name)
/ɩa/		/gɩà/	'roots'
/ɩu/		/màmbɩrɩù/	'hornet'
/ui/		/kului/	'python'
/ʋa/		/kʋa/	'madida'
/ɐʋ/	[gɛ̀.ʋ̀]	/gɛ̀ʋ̀/	'village, town'
/aʋ/	[lá.ʋ̃]	/láʋ̀/	'clothing'

The following exemplify 'vowel glides':

/ɐɩ/		/yɛ̀ɩ̀/	'boat'
/aɩ/		/amaɩ/	'to come'
/aʋ/	[kpáʷ]	/kpáʋ̀/	'all'
/oi/		/kúrói/	(man's name)
/ou/		/póù/	'early'
/ɔɩ/		/tɔ́ɩ́/	'near'

Examples of vowel length:

/i/	/híí/	'guinea worm'
/ɩ/	/kɩ́ɩ́/	'ten'
/e/	/léé/	'paternal aunt'
/ɐ/	/gbɛ́ɛ̀ŋgbɛ̀/	'sweet potato'
/a/	/dáá/	'water well'
/u/	/lúúlè/	'tortoise'
/ʋ/	/túʋ́/	'grandfather'
/ɑ/	/tòò/	(species of thorny plant)
/ɔ/	/tɔ́ɔtɔ̀/	'different'

When suffixes beginning with a vowel are added to words with a final long vowel, that long vowel is shortened. This is congruent with a seemingly general restriction in Bongo limiting vowel sequences to two vowels. The change in vowel quality in 'grandfather' in the second example below is due to vowel harmony.

/lóó/ + /-í/ ˜ /léí/ 'your paternal aunt'

/túú/ + /-é/ ˜ /túé/ 'grandfathers'

Length is significant lexically in a few examples and, therefore, would have to be marked in a practical orthography.

| /tɔ́tɔ́/ | (species of animal) | /tɔ́ɔtɔ́/ | 'different' |
| /mɔ̀nɔ́/ | 'another' | /mɔ̀nɔ́ɔ̀/ | 'perhaps' |

Many monosyllabic words have long vowels in all contexts. Most open syllable monosyllabic words have vowel length when spoken in isolation. In this latter case, the length is nonphonemic. There are also other examples of nonphonemic length. Often the vowels of stressed syllables are slightly lengthened and, as an intonational feature, the vowel in the peak syllable of an utterance is often lengthened.

4.2.3. Vowel Elision

Certain Bongo nouns with open syllables have final vowels which can be elided. In all such nouns the final vowel is an /i/ or /ɪ/ and the preceding consonant is a liquid or a nasal. For example, /lém(í)/ 'sister' can be said with or without the final vowel when combined with the suffix, /-má/ 'my':

/lémímá/ or /lémmá/ 'my sister'

With some of these words, such as /mìn(ì)/ 'water', there is a tendency for the form without the final vowel to occur utterance finally and the form with the final vowel to occur nonfinally.

| /má ɨwù mìn/ | 'I carry water' |
| /kɔ́'dɔ́ mìn/ | 'water calabash' |

but

| /mìnì na medi/ | 'it's raining' |
| /mìnì kídí/ | 'cold water' |

However, both forms are common in

| /mìn(ì) njá/ | 'there is no water' |

More investigation is necessary to determine the factors which condition this elision.

The following nouns in our data have final vowels which can elide:

/mìn(ì)/	'water'
/pìr(ì)/	'word'
/hìny(ì)/	'scorpion'
/dɔr(ì)/	'year'
/kùn(ì)/	(species of animal)
/dil(i)/	'shadow'
/lém(í)/	'sister'
/mbíl(í)/	'ear'

The elidable vowel is marked by parentheses, since other nouns with final i/ı and preceding sonorant occur in the non-elided form. For example:

/kpúlí/	'lion'
/kùlí/	(variety of yam)
/hólì/	'bird'
/púrí/	'wound'
/mbùrì/	(variety of yam)

5. VOWEL HARMONY

The Bongo vowel harmony system is common to many other Sub-Saharan African languages. That is, all vowels in a given morpheme must belong either to the set of [+ATR] vowels, or to the set of [-ATR] vowels.

5.1. The System

In the data checked for the [ATR] feature, there are no morphemes with a combination of [+ATR] and [-ATR] vowels. This vowel harmony can extend beyond the morpheme, and in some cases beyond the word. (See section 5.2.)

[-ATR] vowels are much more frequent in roots than [+ATR] vowels. However, the [+ATR] vowels prove to be the more dominant set; that is, when vowel harmony is in operation, [-ATR] vowels change to [+ATR] ones, but [+ATR] vowels do not change to [-ATR] ones. For example:

/mbágá/ 'mother'   + /-í/ 'your' becomes /mbígíí/ 'your mother',

but

/gbógbó/ 'windpipe' + /-má/ 'my' stays /gbógbómá/ 'my windpipe'

All examples of vowel harmony across morpheme boundaries are regressive, as can be noticed in the above examples.

5.2. Extent of Vowel Harmony

In Bongo, vowel harmony operates in several different types of constructions and at different grammatical levels, as described below.

5.2.1. Compound and Complex Nouns

In complex and compound words vowel harmony operates regressively to change [-ATR] vowels to their [+ATR] counterparts when the second morpheme has [+ATR] vowels. For example:

/bù'dù/   'man' + /jí/   'hand' join to form the compound

   /bù'dùjí/   'thumb (man of the hand)'.

/ájí/   'thing' + /mòny/ 'sorghum' join to form the compound

   /í'jímòny/   'food'.

On the other hand, when the first morpheme has [+ATR] vowels, they remain unchanged when joined to a second morpheme, whether the vowels of the second morpheme are [-ATR] or [+ATR]:

/bí/ 'hair' + /dò/   'head' becomes /bídò/   'hair on head', and

/bí/ 'hair' + /tárà/ 'lip' becomes /bítárà/   'mustache or
                                                    beard'

The derivational prefix /'bí-/ 'possessor of a certain quality or thing' can be attached to nouns or adjectives. When attached to a word with [-ATR] vowels, it remains [-ATR], but when it is attached to a word with [+ATR] vowels, its vowel changes to the [+ATR] counterpart.

/kú'já/	'prostitution'	/'bíkú'já/	'prostitute'
/tɔ'bɔ̀/	'poison'	/'bítɔ'bɔ̀/	'evil spirit'
/tó'bó/	'fat'	/'bító'bó/	'fat person'

The prefix /gì-/ 'diminutive' can be attached to nouns indicating persons or animals to specify youth or immaturity. It, too, has a [-ATR] vowel when attached to words with [-ATR] vowels and [+ATR] vowel when attached to words with [+ATR] vowels.

/bù'dù/	'man'	/gìbù'dù/	'boy'
/má/	'child'	/gìmá/	'small child'
/ŋgɔ̀nɔ̀/	'hen or rooster'	/gìŋgɔ̀nɔ̀/	'chick'

/bínyá/	'goat'	/gìbínyá/	'baby goat'
/kìdì/	'elephant'	/gìkìdì/	'baby elephant'
/bíhí/	'dog'	/gìbíhí/	'puppy'
/kúngú/	'baboon'	/gìkúngú/	'baby baboon'

5.2.2. Genitive Constructions

The genitive construction for inalienable possession, used primarily with kinship terms and body parts, has the word order possessed plus possessor. Vowel harmony in Bongo extends throughout the construction, whether the possessor is a pronominal suffix or a noun.

When the possessive pronominal suffix /-má/ 'my', containing a [–ATR] vowel is added to a noun, the vowels of the noun do not change; but the suffix /-í/ 'your', containing a [+ATR] vowel, changes the [–ATR] vowels of a possessed noun to [+ATR].

		'my'	'your'
/mbíl(í)/	'ear'	/mbíl(í)má/	/mbílíí/
/tárà/	'lip'	/táràmá/	/tírìí/
/bù'dò/	'husband'	/bù'dòmá/	/bù'dòí/
/lém(í)/	'sister'	/lém(í)má/	/lémíí/
/dò/	'head'	/dòmá/	/dòí/

The following examples, with the nouns /kògò/ 'leopard' and /kúngú/ 'baboon', as possessor show how vowel harmony is in operation in the possessive phrase.

/hògò kògò/	'leopard's back'
/hògò kúngú/	'baboon's back'
/mbílí kògò/	'leopard's ear'
/mbílí kúngú/	'baboon's ear'

The other genitive construction in Bongo is the alienably possessed one in which the particle /'bí/ occurs between the possessed item and the possessor. This construction has not been checked for vowel harmony.

5.2.3. Other Noun Phrases

When other noun phrase constructions were checked for vowel harmony, it was found that vowel harmony does not extend over them.

In quantitative noun phrases, both the noun and number retain their original vowels.

/kìdì kíí/ 'ten elephants'   /kìdì kótú/ 'one elephant'

/kɔ̀gɔ̀ kíí/ 'ten leopards'   /kɔ̀gɔ̀ kótú/ 'one leopard'

/kúngú kíí/ 'ten baboons'   /kúngú kótú/ 'one baboon'

In descriptive noun phrases, both the noun and the following adjectives retain their original vowels.

/kìdì títígɔ̀/ 'strong elephant'   /kìdì tó'bó/ 'fat elephant'

/kɔ̀gɔ̀ títígɔ̀/ 'strong leopard'   /kɔ̀gɔ̀ tó'bó/ 'fat leopard'

/bíhí títígɔ̀/ 'strong dog'   /bíhí tó'bó/ 'fat dog'

/kúngú títígɔ̀/ 'strong baboon'   /kúngú tó'bó/ 'fat baboon'

In prepositional phrases, however, vowel harmony is in operation. The [+ATR] vowels of the noun change the [-ATR] vowels of the preposition to [+ATR] ones. Consider the prepositions /dɔ̀/ 'on', /hí/ 'in, belly', /na/ 'with' (used with nouns to mean accompaniment or instrument) and /nɔ́/ 'with' (used with pronouns), in constructions with various nouns and pronouns.

/dɔ̀ kɔ̀gɔ̀/   'on a leopard' /dò kúngú/   'on a baboon'

/dɔ̀má/   'on me'   /dòi/   'on you'

/hí húgà/   'in a tin can' /hí rúú/   'in a room'

/ná kɪra/   'with an arrow' /nɨ́ bél/   'with a walking stick'

/nɔ́má/   'with me'   /nói/   'with you'

Note in the following examples that vowel harmony extends through the prepositional phrase, but not back to the noun that the prepositional phrase modifies.

/kúngú   dɔ̀   hɔ̀gɔ̀   kɔ̀gɔ̀/   'a baboon on a leopard's back'
/kɔ̀gɔ̀   dò   hògò   kúngú/   'a leopard on a baboon's back'

5.2.4. Verb Plus Object

The word order of a simple transitive clause is subject, predicate, object (SVO). Vowel harmony extends over the verb and object, that is, a direct object with [+ATR] vowels will cause the vowels of a verb with [-ATR] vowels to become [+ATR], for example /á'bé/ 'shoot, sting':

/á'bé   kɔ̀gɔ̀/   'to shoot a leopard'
/ɨ́'bé   hédì/   'to urinate (lit. shoot urine)'
/gù átá kìdì/   'Gu (man's name) sees an elephant.'
/gù ɨ́tɨ́ kúngú/   'Gu sees a baboon.'

Note in this last pair of sentences that vowel harmony does not extend to include the subject. This is even true when the basic form of the verb has [+ATR] vowels, for example: /ɨ'dù/ 'to spear':

/gù ɨ'dù kìdì/   'Gu spears an elephant.'

/gù ɨ'dù kúŋgú/   'Gu spears a baboon.'

   Likewise, the vowels of the subject do not act progressively on the vowels of the verb.

/kúŋgú átá kìdì/   'A baboon sees an elephant.'

5.2.5. Negation of a Noun

   In the construction, /njá/ + noun + /-òò/, meaning 'it is not a _____', vowel harmony extends regressively from the noun to /njá/. However, the suffix /-òò/ does not operate according to vowel harmony rules, at least as presently understood. First, notice that when /-òò/ is suffixed to a consonant final noun containing [-ATR] vowels, they do not change, but when it is suffixed to a vowel final word, there is assimilation, but not vowel harmony.

/bèèr/	'swamp'	/njá bèèróò/	'It is not a swamp.'
/wúúl/	'wild dog'	/njá wúúlóò/	'It is not a wild dog.'
/bíhí/	'dog'	/njɨ bíhéò/	'It is not a dog.'
/kìdì/	'elephant'	/njá kìdéò/	'It is not an elephant.'
/lélé/	'red stone'	/njɨ léléò/	'It is not a red stone.'
/mbèrè/	'doleib'	/njá mbèrèò/	'It is not a doleib.'
/rɨkɨ/	'sorghum bread'	/njɨ rɨkɨɨ/	'It is not sorghum bread.'
/hàbà/	'hippopotamus'	/njá hàbáà/	'It is not a hippopotamus.'
/kúŋgú/	'baboon'	/njɨ kúŋgóò/	'It is not a baboon.'
/hílù/	'hyena'	/njɨ hílóò/	'It is not a hyena.'
/kùtú/	'pot'	/njá kùtɔɔ/	'It is not a pot.'
/mbò'dò/	'frog'	/njɨ mbò'dóò/	'It is not a frog.'
/kɔgɔ/	'leopard'	/njá kɔgɔɔ/	'It is not a leopard.'

   The suffix /-òò/ following a vowel final noun would require a three vowel sequence, which never occurs in Bongo. Therefore, one vowel must be assimilated into another or deleted. Also, one tone must be assimilated. In the case of tones the rule is that if either tone is high, the resulting tone will be high. So, whatever tone the noun final vowel may have had, the high-low tone sequence remains.

   The vowel assimilations, however, do not follow a simple rule. Rather we find the following collection of rules:

$$\left\{ \begin{matrix} i \\ e \end{matrix} \right\} + 6\grave{o} \rightarrow 6\grave{o} \quad \text{and} \quad \left\{ \begin{matrix} \iota \\ \varepsilon \end{matrix} \right\} + 6\grave{o} \rightarrow \acute{\varepsilon}\grave{o}$$

$$\left\{ \begin{matrix} u \\ o \end{matrix} \right\} + 6\grave{o} \rightarrow 6\grave{o} \quad \text{and} \quad \left\{ \begin{matrix} \upsilon \\ \mathfrak{o} \end{matrix} \right\} + 6\grave{o} \rightarrow \acute{\mathfrak{o}}\grave{\mathfrak{o}}$$

$$\dot{i} \quad + 6\grave{o} \rightarrow \acute{i}\grave{i} \qquad\qquad a \qquad + 6\grave{o} \rightarrow \acute{a}\grave{a}$$

Front vowels merge with the first /o/, resulting in a low front vowel of the same harmony set, i.e. either /e/ or /ɛ/. Back vowels merge with the first /o/, resulting in a low back vowel of the same harmony set, i.e. /o/ or /ɔ/.[10] There is a physiological reason for the second /o/ to also become /ɔ/ when following /ɔ/.[11] It seems surprising, however, that both o's of the suffix /-óò/ are replaced by the central vowels /ɨ/ and /a/. Perhaps it can be said that /-óò/ is replaced by a central vowel of the same harmony set because the central vowels are most neutral and dominate any vowel assimilation.

5.2.6. Equative Clauses and Conjunctions

In the equative clause construction, pronoun subject plus noun complement, vowel harmony extends regressively from the complement to the pronoun subject, i.e. if the complement contains [+ATR] vowels, the vowels of the pronoun will also be [+ATR].

/má hàbà/	'I am Hippopotamus (person's name).'
/má kínjí/	'I am Fish.'
/mɨ́ bíhí/	'I am Dog.'
/mɨ́ lé'jì/	'I am Beer.'

Vowel harmony was also documented when the conjunction, /ùkpá/ 'then', began a clause beginning with a pronoun subject. A pronoun with a [+ATR] vowel caused the vowels of the conjunction to become [+ATR].

/ùkpá-má.../	'then I ...'
/ùkpɨ́-í.../	'then you...'

Other constructions were not investigated with regard to vowel harmony.

6. TONE AND INTONATION

6.1. Number and Function of Tones

Phonetically on words in isolation, Bongo has three etic level tones: high ['], mid [‾], and low [`], as well as falling tone, [ˆ]. Phonemically, however, I posit two level tones: high /′/ and low /`/, for the reasons stated below.

1) In monosyllabic words, contrasts exist for just high and low tones. Tone contrast in open syllables:

    /'bú/   'hunger'   /'bù/   'egg'

Tone contrast in closed syllables:

    /kél/   'eleusine'   /kèl/   'straw'

This is also true in syllables with long vowels:

      /tíí/[12]   'red ants'   /tìì/   'pounded sesame'
      /wúúl/   'wild dog'   /wùùl/   'brains'

2) In a tone frame with preceding high tone, the following four etic tone patterns occur in disyllabic nouns: high-high, high-mid, mid-high, and mid-low.

    [ńjá kágá]   'not a tree'
    [ńjá fádā]   'not a fada tree'
    [ńjá tāgá]   'not evening'
    [ńjá kādà]   'not the sun'

3) In a frame with preceding low tone, the following four etic tone patterns occur on disyllabic nouns: high-high, high-mid, low-high, and low-low.

    [dɔ̀ kágá]   'on a tree'
    [dɔ̀ fádā]   'on a fada tree'
    [dɔ̀ tàgá]   'on the evening'
    [dɔ̀ kàdà]   'on the sun'

4) The tones of a following frame do not affect the tones of the words in a substitution list.

5) On a long vowel, low tone is a falling tone etically when the preceding tone is high, that is, there is a high-mid-low sequence.

    [ńjá wúúl]   'not a wild dog'
    [ńjá beèr]   'not a swamp'

[dɔ̀ wǔ́ʋl]   'on a wild dog'

[dɔ̀ bɛ̀ɛ̀r]   'on a swamp'

Because of the limited distribution of different tone levels and combinations on monosyllabic and disyllabic words, I posit the following two phonemic tones:

/'/ ['], high tone, occurring in all tonal environments.

/'/ [¯], mid tone, occurring following a high tone in complementary distribution with

['], low tone, occurring elsewhere.

That is, high tone has no allotones. Low tone has two allotones, mid and low, with mid tone occurring after high tone and low tone occurring in all other environments.

Therefore, the above examples of disyllabic nouns and of long vowels in tone frames are written emically as follows:

/njá kágá/   'not a tree'   /dɔ̀ kágá/   'on a tree'
/njá pádà/   'not a _fada_ tree'   /dɔ̀ pádà/   'on a _fada_ tree'
/njá tàgá/   'not evening'   /dɔ̀ tàgá/   'on the evening'
/njá kàdà/   'not the sun'   /dɔ̀ kàdà/   'on the sun'
/njá wǔ́ʋl/   'not a wild dog'   /dɔ̀ wǔ́ʋl/   'on a wild dog'
/njá bɛ̀ɛ̀r/   'not a swamp'   /dɔ̀ bɛ̀ɛ̀r/   'on a swamp'

Falling tones occur only on long vowels or on vowel 'clusters' or 'glides', i.e. on CVV(C) syllables. When the tonal fall is not due to a preceding high tone, as in

[ɲjá bɛ̄ɛ̀r]   /njá bɛ̀ɛ̀r/   'not a swamp'

it is analyzed as a high tone followed by a low tone, V̂V.

[taà] /táà/ 'when'   [kpaʋ̀] /kpáʋ̀/ 'all'

6.2. Tonal Contrasts

Contrasts between high and low tones on monosyllabic words are exemplified above. In disyllabic words, contrasts are found for high and low tones on both the first and second syllables.

Contrasts on both first and second syllables:

/kídí/   'vein'   /kídì/   'cold (adj)' /kìdì/   (species of
                                                           snake)
/hírú/   'saliva' /hírù/   'flower'   /hìrù/   'liver'

Contrasts on second syllable:

/àdá/	'to tie'	/àdà/	'to count'
/átá/	'to see'	/átà/	'to put'

Contrast between high-high and low-low:

/máyá/	(species of yam)	/màyà/	'breast'

Contrast between high-low and low-high:

/lírù/	(species of tree)	/lìrú/	(species of bird)

There is one pair of trisyllabic words differing only by tone on the second and third syllables:

/kílíngbá/	'bone'	/kílìngbà/	(species of tree)

Non-minimal contrasts can be found for high and low tones on the first, second, and third syllables.

Contrast on first syllable:

/hílílí/	'breeze'	/gìngájá/	'girl'

Contrast on the second syllable:

/wìréngà/	(species of snake)	/pìlègù/	(species of bird)

Contrast on the third syllable:

/hílílí/	'breeze'	/hígúlà/	'gazelle'

6.3 Tone Patterns

All tone patterns are possible with one and two syllable nouns. With three syllable nouns, examples were found for all possible tone patterns except high-low-high.

Monosyllabic nouns:

High	/'bú/	'hunger'
Low	/'bù/	'egg'

Disyllabic nouns:

High-high	/kágá/	'tree'
High-low	/pádà/	(species of tree)

| Low-high | /tàgá/ | 'evening' |
| Low-low | /kàdà/ | 'sun' |

Trisyllabic nouns:

High-high-high	/búrúkú/	'ashes'
High-high-low	/hígúlè/	'gazelle'
High-low-low	/kílìŋbà/	(species of tree)
Low-high-high	/màgúbá/	(species of worm)
Low-high-low	/wìréŋgè/	(species of snake)
Low-low-high	/gbàràgbú/	'small turtle'
Low-low-low	/pìlàgù/	(species of bird)

Most verbs in Bongo have the word shapes VCV or VCVCV in isolation, with the initial V being a central vowel. All four two-syllable patterns are possible. Because many of the three-syllable verbs have not been checked for tone, examples are given for only five of the eight possible tone patterns.

Disyllabic verbs:

High-high	/á'bé/	'to shoot'
High-low	/ɨ'bì/	'to give'
Low-high	/àdá/	'to tie'
Low-low	/àdà/	'to count'

Trisyllabic verbs:

High-high-high	/ánéné/	'to lick'
High-high-low	/ɨtúnyè/	'to smell'
High-low-high	/átùné/	'to kill'
Low-high-high	/àdúgbá/	'to catch'
Low-high-low	/àpɔ'dè/	'to scrape (bark)'

There are fewer examples of the other parts of speech in comparison to nouns and verbs. There do not seem to be any restrictions, however, on what tone patterns different parts of speech can have.

Most adjectives are disyllabic, and all four tone patterns are possible.

High-high	/tó'bó/	'fat'
High-low	/kídì/	'cold'
Low-high	/mɔ̀nɔ́/	'another'

Low-low	/gbɔ̀kɔ̀/	'old'

The following patterns were found on trisyllabic adjectives:

High-high-high	/émémé/	'good'
High-high-low	/títígɔ̀/	'strong'
Low-high-high	/kpìngílí/	'high'

Most prepositions are one or two syllables.

Monosyllabic prepositions:

High	/ná/	'with'
Low	/dɔ̀/	'on'

Disyllabic prepositions:

High-high	/'bɔ́nɔ́/	'in front of'
High-low	/'bótù/	'across'
Low-high	/dì'bá/	'from'
Low-low	/mɔ̀lɔ̀/	'under'

6.4. Intonation

In addition to the tone pattern for each word described in 6.1 to 6.3, certain intonation patterns in Bongo are associated with different grammatical constructions.

Intonation is constrastive in yes-no questions: the only difference between a yes-no question and its positive answer is the intonation. The question has a rising intonation in which the pitch at the end of the question rises above the level of the normal high tone. The answer to a yes-no question has a falling intonation at the end of the utterance. The intonation patterns on the yes-no questions and answers are quite pronounced.

/a na ka lav/	'Is this a shirt?'

/a na ka lav/	'This is a shirt.'

/kínjí ná 'dú bìhì nandanakɔ/	'Is Kinji sleeping now?'

/kínjí ná 'dú bìhì nandanakɔ/	'Kinji is sleeping now.'

All statements have a falling intonation, which is less pronounced than for the answers of yes-no questions.

/má ndé 'be cug/   'I am going to the market.'

There is a rising intonation on all but the final item in a list of items. The final item has a falling intonation.

/má gú méhì, mándá, kínjí/   'I bought meat, groundnuts and fish.'

There is a falling intonation before any nonfinal pause in a statement. This falling intonation is less than at the end of the statement.

/má ka mony kamakádìir,   tó'bó   nerɔma   rɔ/.
'If I eat a lot,   I will become   fat.'

WH-questions have a falling intonation.

/ká bá 'dì/   'What is it like?'

/í dóndí 'bá/   'Where do you live?'

/hé ndé táà/   'When are you (pl.) going?'

With all of the falling intonations, the words keep their respective tones. Over longer utterances, there is a general downdrift throughout the sentence, beginning at the peak syllable. The high and low tones at the end of the utterance are of lower pitch than the respective high and low tones at the beginning of the utterance. In shorter utterances, the falling intonation is only perceptible at the end of the utterance.

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