

# Apinayé Phonemic Statement

Preliminary Version

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## 1. Introduction

The Apinayé tribe is a member of the Jê family. It is located in the northern tip of the state of Goiás. There are approximately two hundred living members of the tribe. Data used in this phonemic statement were gathered during tribal visits from 1959-1961. The main informants used were two young women around 20 years of age. They both speak Portuguese, and their degree of bilingualism is approximately 60 per cent.

## 2. Chart of Phones Consonants

p  
p<sup>ə</sup>  
b

t  
t<sup>ə</sup>  
d

tš  
tš<sup>ə</sup>  
ɽ  
dž  
ɖ

k  
k<sup>ə</sup>  
g

w  
w̃  
w̄  
v  
ṽ  
u

ɥ <sup>ə</sup>	ɥ̃ <sup>ə</sup>
ĩ	ĩ̃
ĩ̄	ĩ̄̃
!̄	!̄̃
!̄	!̄̃
ĩ̄	ĩ̄̃
l̄	l̄̃

ž  
ž̃  
y  
ỹ

ʔ  
ʔ<sup>ə</sup>

m  
m<sup>ə</sup>  
mb  
mb<sup>ə</sup>  
bm

n  
nd  
nd<sup>ə</sup>  
dn

ñ  
ñdž  
ñdž<sup>ə</sup>  
ɖñ

ŋ  
ŋ<sup>ə</sup>  
ŋg  
ŋg<sup>ə</sup>

## Chart of Phones (cont.)

### Vowels

i		ĩ	u
ĩ		ĩ̃	ũ
e		ë	o
			õ ~ õ̃
ɛ		ë̃	o
ẽ		ë̃̃	
	a		
	ã		

### Other Data:

Stress  
Syllable break  
Length

## 3. Interpretation

### 3.1. Segments which may be either consonant or vowel

3.1.1.  $y$  and  $w$  may be either consonant or vowel. In this language we have interpreted both as consonants because:

3.1.1.1. They are phonetically non-syllabic as other things that are non-syllabic.

3.1.1.2. Non-syllabic  $y$  is interpreted as a sub-member of /z/, occurring unstressed medially and finally, and stressed following ñ.

[ 'ᵈgoyᵇ ] "pan"      [ aya 'kᵉvaᵇ ] "your mouth"      [ 'pe · ñ 'ya ] "this ball"

3.1.1.3. Non-syllabic  $w$  is interpreted as a submember of /v/, occurring in cluster with tš and k and occurring syllable final preceding other consonants.

[ 'mbuw 'tᵉkᵉ ] "wild turkey"      [ a 'tᵉᵉwaᵇ ] "your tooth"      [ õñ 'kᵉwᵉ ] "house"

3.1.1.4. There is nothing in the non-suspect syllable pattern to prevent this interpretation.

### 3.2. Segments which may be either units or sequences

3.2.1. tš is a single unit because it has a distribution that parallels the distribution of /t/ and /k/ in that like them it occurs in cluster with /v/.



### 3.2.5.2.3. We have decided to interpret it as a new syllable pattern.

This choice was made over calling it a suprasegmental feature in terms of which will be prettier in the complete analysis of the phonological features on a higher level.

[ 'tɛpɛ ]	"fish"	[ tɛɛ 'pidʒi ]	"just fish"
[ tɛɛ ]	"leg"	[ 'tɛ 'pidʒi ]	"just leg"
[ paɹi ]	"foot"	[ 'paa 'řadʒi ]	"big foot"
[ paA ]	"arm"	[ 'pa 'řadʒi ]	"big arm"

### 3.2.6. Glottal stop

Glottal stop is a unit interpreted as a consonant because it has a distribution similar to that of other consonants in that it occurs medially between vowels and preceding consonants.

[ nã ʔiĩndžu bu'mbu ] "he saw her nose"      [ nã ʔkra mbëĚ ] "he carried his child"

3.2.7. Final consonants alternate between voiced and voiceless allophones. All utterance final consonants have release, although [p], [m], [t], [n], and [ŋ] fluctuate as to release or non-release. Release for voiced allophones is voiced.

[ 'tebɛ ] "fish"      [ 'peñi ] "ball"      [ 'kayɪ ] "rabbit"

Release for voiceless allophones is voiceless.

[ 'tɛpɛ ] "fish"      [ 'paɹi ] "foot"

The quality of release is the same as the vowel preceding the final consonant except under the following conditions:

3.2.7.1. All /tš/ and /ñ/ finals release into a high front vowel.

[ 'mbɛdʒi ] "good"      [ 'mbotšɪ ] "cow"      [ 'peñi ] "ball"

3.2.7.2. All with /a/ preceding the final consonant release into a high vowel quality back rounded, if the final consonant is [w], otherwise a high front quality.

[ 'paɹi ] "foot"      [ a'mbagi ] "his ear"  
[ 'kayɪ ] "rabbit"      [ kuʔ'pawu ] "to drop"

3.2.7.3. A [w] preceded by a back rounded vowel releases into a back low unrounded quality.

[ 'k<sup>ə</sup>ruwĚ ] "arrow"

3.2.7.4. A [y] preceded by a front unrounded vowel releases into a back low unrounded quality.

[ʔa'pey̥] "hunt for it"      [a'kiy̥] "to call"

All other consonants in all other environments release into the same quality as that of the preceding vowel.

['mbobɔ] "yam"      [ka'tutɔ] "shoulder"  
 ['kogo] "wind"      ['k<sup>ə</sup>ritɔ] "bug"

### 3.2.8. Vowel unvoicing

All vowels may unvoice utterance final, but nasalized vowels unvoice less frequently than do unnasalized vowels.

['pu'ti] ~ ['pu'ti̥] "fly"      [ko] ~ [ko̥] "stick"  
 [pĩ] ~ [pĩ̥] "wood"      [pi'tšo] ~ [pi'tšo̥] "banana"

## 4. Contrastive chart of the phonemes

### Consonants

Primary Closure		labial	alveolar	palatal	velar
	Continuants		v	r	z
	Stops	Oral	p	t	č
		Nasal	m	n	ñ
Tertiary Closure					ʔ

### Vowels

		front	central	back	
				unrounded	rounded
Oral	high	i		ĩ	u
	mid	e		ë	o
	low	ɛ		ẽ	ɔ
			a		
Nasal	high	ĩ		ĩ̃	ũ
	low	ẽ		ẽ̃	õ
			ã		

4.1. In addition to the preceding phonemes there is a co-existing sub-system containing four different phonemes used only in special types of speech.

4.1.1. /h/ Voiceless glottal fricative. Occurs only in songs and in a hesitation form of speech.

[h̥'ɪ] "song chant" [ 'ʒ̥ɛd' lɛ h̥ h̥ n̥ ] "(name) uh, uh, and..."

4.1.2. /s/ Voiceless fronted alveo-palatal grooved fricative. Occurs only in names and borrowed words, and may replace /ñ/ and /tš/ in children's speech.

['ʒ̥ɪtɪ] girl's name [pi'ʒ̥ɛn'lɛ] "cat"  
[iʒ'pɑ] "my arm" ~ [iʧ'pɑ]

4.1.3. /f/ Voiceless labio-dental fricative. Occurs only in borrowed words.

[fin̥ʔti] "pin"

4.1.4. /t̺/ Voiceless alveolar click with ingressive mouth air. Occurs only in men's speech.

[t̺] "expression of regret"

5. Evidence for separation of suspect pairs. See following charts.

CHART I.a

Labial Consonants	p	p <sup>a</sup>	b
Utterance initial	'p <u>o</u> "stick" pi't <u>šo</u> "banana"		
Stressed preceding nasalized vowel	'pī "stick" a'pē "smell it"		
Stressed preceding unnasalized vowel	a'p <u>i</u> "climb" ka'p <u>o</u> "outside"		
Unstressed medial between vowels			nā ba ʔa'p <u>řo</u> "I bought it"
In cluster with [ž], [v], [ř]		ʔa'p <sup>a</sup> <u>ž</u> e "long" 'p <sup>a</sup> <u>ř</u> o "wrap"	
Second in consonant cluster			
Preceding voiced consonant across syllable juncture			'mbob'ža "that yam"
Utterance final	't <u>e</u> pɛ 'fish' 'mbop <u>o</u> 'yam'		't <u>e</u> bɛ 'fish' 'mbob <u>o</u> 'yam'

CHART I.a (Cont.)

Labial Consonants	m	m <sup>ə</sup>	mb	mb
Utterance initial	'mī "alligator" 'mā "no"	'm <sup>ə</sup> ñõ "submerge"	'mbaA "liver" 'mbiï "male"	'mb <sup>ə</sup> žen "husband"
Stressed preceding nasalized vowel	'mõ "to go" a'mẽ "throw it"			
Stressed preceding unnasalized vowel			'mbɔɔ "deer" mbɛɛ "or"	
Unstressed medial between vowels	amũ'tʃu "to hide" amĩ'ti "to dream"			
In cluster with [ž], [v], [ř]		'm <sup>ə</sup> ñõ "submerge"		'mb <sup>ə</sup> řɔɔ "cinder"
Second in consonant cluster				
Preceding voiced consonant across syllable juncture	'pẽm'ladži "big father"			
Utterance final	'pẽm "father" 'tẽm ~ 'tẽbm "raw"			

CHART	I.a: (Cont.) Labial Consonants	I.b: Alveolar Consonants
	In this column are included all the allophones of /v/. For the distribution of the different allophones, see CHART IV.	In this column are included all the allophones of /r/. For the distribution of the different allophones, see CHART V.
	v	r
Utterance initial	'va "tooth" vε 'vε "butterfly"	' <sup>a</sup> řɔpɔ "dog" ' <sup>a</sup> ňōňō type of nut
Stressed preceding nasalized vowel	ōň 'k <sup>a</sup> wĩ "house" k <sup>a</sup> věňĩ "don't want"	' <sup>a</sup> ňōňō type of nut
Stressed preceding unnasalized vowel	ku 'vĩ "fire" 'va "tooth"	' <sup>a</sup> řɔpɔ "dog"
Unstressed medial between vowels	nā vε'vε 'pĩ "he took the butterfly"	o řε 'l̥εkε "ripe fruit"
In cluster with [ž], [v], [ř]		
Second in consonant cluster	a 'tšwaA "your tooth" 't <sup>a</sup> vēm "fat" 'nd <sup>a</sup> věn "snail"	'křaA ~ 'kľaA "child" 'ton'ladžĩ "big armadillo"
Preceding voiced consonant across syllable juncture	'k <sup>a</sup> řuw'řadžĩ "big arrow"	pał'mũyĩ "that foot" ňōł'vēřě "to the nut" puł'vēřě "to the field" tĩł'mbεdžĩ "alive good"
Utterance final	'ndivĩ "new" 'k <sup>a</sup> řuwě "arrow"	'pěřě ~ 'pěřě "canoe" 'pařĩ ~ 'paľĩ "foot" 'tĩňĩ ~ 'tĩľĩ ~ 'tĩļĩ "alive"

**CHART I.b (cont.)**

Alveolar Consonants	t	t <sup>ə</sup>	d
Utterance initial	'tɛpɛ "fish" 'tikĩ "dirty"		
Stressed preceding nasalized vowel	'tõ "brother" tiñĩ "alive"		
Stressed preceding unnasalized vowel	'tiĩ "die" 'teɛ "flea"		
Unstressed medial between vowels			koda ɔ'mbuU "he will see it"
In cluster with [ž], [v], [ř]		't <sup>ə</sup> vëm "fat"	
Second in consonant cluster			
Preceding voiced consonant across syllable juncture			žed'ladžĩ "big potato" <sup>ə</sup> řad'veřě "to the can"
Utterance final	'pätĚ "canoe" 'k <sup>ə</sup> řitI "bug"		'pädĚ "canoe" 'k <sup>ə</sup> řidi "bug"

**CHART I.b: (cont.)**

Alveolar Consonants	<b>n</b>	<b>nd</b>	<b>nd<sup>ə</sup></b>
Utterance initial	'nẽ̃ "mother" 'nẽ̃ "and" 'nõ "lie down"	'ndẽ̃Ď "no" 'ndaA "rain" 'ndiI "female"	'nd <sup>ə</sup> vëp "snail"
Stressed preceding nasalized vowel	'nõ "lie down" 'nẽ̃ "mother"		
Stressed preceding unnasalized vowel		'ndaA "rain" 'ndɔɔ "eye"	
Unstressed medial between vowels			
In cluster with [ž], [v], [ř]			'nd <sup>ə</sup> vëp "snail"
Second in consonant cluster			
Preceding voiced consonant across syllable juncture	kõn 'ž <u>a</u> A "that armadillo"		
Utterance final	ton <u>o</u> ~ tod <u>no</u> "armadillo"		

**CHART I.c**

Alveopalatal Consonants	tš	tš <sup>ə</sup>	dž
Utterance initial	'tšɔ'rɛɛ "fox"		
Stressed preceding nasalized vowel	aʔ'tšĩ "sneeze" 'tšũ'rɛɛ "name" 'mboɬ'tũmũ "old cow"		
Stressed preceding unnasalized vowel	a'tšeɛ "your cloth" ka'tšoɔ "tear"		
Unstressed medial between vowels			idžɛ'peñi "my work" adžu'kɛtšɪ "your spin"
In cluster with [ž], [v], [ř]		a'tš <sup>ə</sup> vaA "your tooth"	
Second in consonant cluster			
Preceding voiced consonant across syllable juncture			'mbod'vɛřɛ "to the cow"
Utterance final	'mboɬšɪ "cow" 'tɔtšɪ "sister"		'mbodžɪ "cow" 'tɔdžɪ "sister"

CHART I.c (cont.)

Alveopalatal Consonants	ñ	ñdž	ñdž <sup>ə</sup>
Utterance initial	'ñĕm "move"	'ñdžep <sup>ə</sup> "bat" 'ñdžīĪ "wasp"	
Stressed preceding nasalized vowel	a'ñām "your chin" 'ñūm subject changer		
Stressed preceding unnasalized vowel		'ñdžebe "bat" 'ñdžāA "bite"	
Unstressed medial between vowels	iñī'ndεĒ "my cheek" año'kaA "your back"		
In cluster with [ž], [v], [ř]			u'ñdž <sup>ə</sup> wēĚ "to aim"
Second in consonant cluster			
Preceding voiced consonant across syllable juncture	'peñ'veřĕ "to the ball" 'mbεñ'žāA "this honey"		
Utterance final	'peñī "ball" <sup>ə</sup> řoñī ~ <sup>ə</sup> řođñī "nut"		

**CHART I.c: (cont.)**

Alveopalatal Consonants	z	y
Utterance initial	'ž̥t̥Ě "potato"	
Stressed preceding nasalized vowel	avž̥ã 'ŋgřo "dust"	
Stressed preceding unnasalized vowel	'ž̥t̥Ě "potato"	
Unstressed medial between vowels		aya 'k <sup>ə</sup> vaA "your mouth" iya 'mbakĭ "my ear"
In cluster with [ž̥], [v], [ř]		
Second in consonant cluster	'mb <sup>ə</sup> žen "husband" ʔa 'p <sup>ə</sup> ž̥eĚ "long"	
Preceding voiced consonant across syllable juncture		'ŋgoy 'vėř̥e "to the pan" 'kay 'ž̥aA "this rabbit"
Utterance final		'ñi v̥ẽ "opossum" 'ŋgoyi "pan"

CHART I.d

Velar Consonants	k	k <sup>ə</sup>	g	ʔ
Utterance initial	ka 'tš <u>o</u> "to tear" 'k <u>ě</u> "skin"			
Stressed preceding nasalized vowel	'k <u>i</u> "hair" 'k <u>ō</u> k <u>ō</u> "lizard"			'ʔi "ouch"
Stressed preceding unnasalized vowel	'k <u>o</u> "stick" 'k <u>ě</u> "skin"			'ʔi "bone"
Unstressed medial between vowels			nā ga ʔa 'p <u>ř</u> <u>o</u> "you bought it"	nā ʔap <u>ř</u> <u>o</u> "he bought it"
In cluster with [ž], [v], [ř]		k <sup>ə</sup> ž <u>e</u> "side" ʔa 'k <sup>ə</sup> v <u>a</u> "his mouth" 'k <sup>ə</sup> ř <u>a</u> "child"		
Second in consonant cluster				
Preceding voiced consonant across syllable juncture			'k <u>o</u> g 'v <u>ě</u> "to the lizard"	māʔ 'v <u>ě</u> 't <u>ě</u> "he went there"
Utterance final	'k <u>o</u> k <u>o</u> "wind" 'tš <u>a</u> k <u>i</u> "sack"		'k <u>o</u> g <u>o</u> "wind" 'tš <u>a</u> g <u>i</u> "sack"	

**CHART I.d (cont.)**

Velar Consonants	ŋ	ŋ <sup>a</sup>	ŋg	ŋg <sup>a</sup>
Utterance initial			ŋg <sup>o</sup> "water" ŋg <sup>ɛ̃</sup> "name"	
Stressed preceding nasalized vowel	ka 'ŋ <sup>ɛ̃</sup> "snake" ku 'ŋ <sup>o</sup> "to give"			
Stressed preceding unnasalized vowel			'ŋg <sup>o</sup> "water" 'ŋgitš <sup>ɪ</sup> "sharp"	
Unstressed medial between vowels			o ŋguʔ 'křatš <sup>ɪ</sup> "his gourd"	
In cluster with [ž], [v], [ř]		'ŋ <sup>a</sup> ņ <sup>o</sup> "toucan"		a 'ŋg <sup>a</sup> že <sup>ɛ</sup> "keep it"
Second in consonant cluster				
Preceding voiced consonant across syllable juncture				
Utterance final				

CHART II

	Alveolar		Alveo-palatal		Velar	
	t	t <sup>ə</sup>	tš	tš <sup>ə</sup>	k	k <sup>ə</sup>
Utterance initial	'teE "flea"		'tšeE "oh"		'këĚ "skin"	
Stressed preceding nasalized vowel	'tō "brother"  'tĕ "to go"		'tšŭ'rɛĚ "moon" aʔ'tšĭ "to sneeze"		'kĭ "hair"  'kōgō "lizard"	
Stressed preceding unnasalized vowel	a'tɛĚ "your leg"  a'taA "that"		a'tšeE "your cloth"  tšaA "stand up"		a'kaA "roast it"	
Unstressed medial between vowels						
In cluster with [ž], [v], [ř]		t <sup>ə</sup> vēm "fat"		tš <sup>ə</sup> vĕĚ "farinha"		'k <sup>ə</sup> vĕĚ "bit"
Second in consonant cluster						
Preceding voiced cons. across syllable juncture	žĕd'ladži "big potato"			'mbođ'ladži "big cow"		'kōg'řadži "big wind"
Utterance final	'potō "open"		'mbošĭ "cow"		'pokō "burn"	

CHART III

Nasals, Bilabial	m	m <sup>ə</sup>	mb	mb <sup>ə</sup>
Utterance initial	'mã "no"		'mbaA "liver"	
Stressed preceding nasalized vowel	'mã "no"			
Stressed preceding unnasalized vowel			'mbaA "liver"	
Unstressed medial between vowels	amũ 'tš <u>u</u> "to hide"			
In cluster with [ž], [v], [ř]		'm <sup>ə</sup> ňõ "submerge"		'mb <sup>ə</sup> žen "husband"
Second in consonant cluster				
Preceding voiced consonant across syllable juncture	'pẽm'řad <u>ž</u> i "big father" 'tɔm'řad <u>ž</u> i "big freckle"			
Utterance final	pẽm "father" tɔm ~ tɔ <u>m</u> "freckle"			

CHART III (Cont.)

Nasals, Alveolar	n	nd	nd <sup>ə</sup>
Utterance initial	'nẽ "mother"	'ndaA "rain"	
Stressed preceding nasalized vowel	'nõ "lie down"		
Stressed preceding unnasalized vowel		'ndaɔ "eye"	
Unstressed medial between vowels			
In cluster with [ž], [v], [ř]			ʔi'nd <sup>ə</sup> wedži "wrist"
Second in consonant cluster			
Preceding voiced consonant across syllable juncture	'kõn'ladži "big lizard" ton'ladži "big armadillo"		
Utterance final	'kõnõ "knee" 'ton ~ todn "armadillo"		

CHART III (Cont.)

Nasals, Alveo-palatal	ñ	ñdž	ñdž <sup>ə</sup>
Utterance initial	'ñẽm "move"	'ñdžoň'di "vulture"	
Stressed preceding nasalized vowel	'ñãm "chin"		
Stressed preceding unnasalized vowel		'ñdžepE "bat"	
Unstressed medial between vowels	aňi? 'křaA "your hand"		
In cluster with [ž], [v], [ř]			u 'ñdž <sup>ə</sup> wè "to aim"
Second in consonant cluster			
Preceding voiced consonant across syllable juncture	peň 'ladž <i>̣</i> i "big ball"		
Utterance final	'peňi ~ 'ped <i>̣</i> ňi "ball"		

CHART III (Cont.)

Nasals, Velar	ŋ	ŋ <sup>ə</sup>	ŋg	ŋg <sup>ə</sup>
Utterance initial			'ŋg <sub>o</sub> "water"	
Stressed preceding nasalized vowel	'ŋõ "give"			
Stressed preceding unnasalized vowel			'ŋg <sub>i</sub> v <sub>i</sub> "mud"	
Unstressed medial between vowels	aŋã 'k <sup>ə</sup> vã "your mouth"			
In cluster with [ž], [v], [ř]		'ŋ <sup>ə</sup> ñõ "toucan"		a 'ŋg <sup>ə</sup> že "guard it"
Second in consonant cluster				
Preceding voiced consonant across syllable juncture				
Utterance final				

**CHART IV**

Allophones of /v/	w	w̥	ṽ
Syllable final followed by Consonant and/or preceded by [u], and utterance final preceded by [a]	'mbuw'tɛ̃k̃ɛ̃ "wild turkey" kuʔ'pawu "drop"		
Second in cluster with palatal consonants		a'tš <sup>ə</sup> waA "your tooth"	
In cluster with [k] preceded by rounded vowel and followed by nasalized vowel.			õŋ'k <sup>ə</sup> ṽĩ "house"

**CHART IV (Cont.)**

Allophones of /v/	u	ũ	v
Syllable initial preceded by [u]	ku'vĩ "fire"		
In cluster with [k] preceding nasalized vowel		kũẽ'ŋĩ "don't want"	
Elsewhere			'vaA "tooth" aya'k <sup>ə</sup> vaA "your mouth" 'ndivĩ "new" 'k <sup>ə</sup> vřëtĕ "beak"

**CHART V**

Allophones of /r/	əř	əň	ř	ĩ
Initial	əřcpɔ "dog"	'əňõňõ type of nut		
Preceding [v], [ž], [ʔ]			'puř'vėřě "to the field" 'pař'ẓ̌a "this foot" 'puřʔapetṣ̌ɪ "finished field"	'əňõĩ'vėřě "for nuts"

CHART V (cont.)	ɫ	ĩ	l	ĩ
Preceding stop & nasal consonants	'puɫ'pidẓ̌i "just a field" 'puɫ'mbetṣ̌ɪ "good field"	'tĩĩ'pidẓ̌i "just alive"		
Following [d], [n], [ḍ], [ñ]			'ton'ladẓ̌i "big armadillo" mbod'ladẓ̌i "big cow" 'peñ'ladẓ̌i "big ball"	'əřad'ĩũñĩ "dirty can"

CHART V (cont.)	ṛ̌	ṇ̌	ĩ	ĩ
Final	'paṛ̌ɪ "foot"	'tĩṇ̌ĩ "alive"	'paĩɪ "foot"	'tĩĩĩ "alive"
Elsewhere				

CHART V (cont.)	ĩ	ĩ	ṛ̌	ṇ̌
Final	'paĩɪ "foot"	'tĩĩĩ "alive"	'paṛ̌ɪ "foot"	'tĩṇ̌ĩ "alive"
Elsewhere	ʔi'leṇ̃ĩ "clean" 'kľaA "child" ʔa'ľaA "wing"	ňã'ľĩ "where" 'kľě "head" ʔa'ľĩ "jump"	ʔi'řeṇ̃ĩ "clean" 'kṛ̌aA "child" ʔa'ṛ̌aA "wing"	ňã'ṇ̌ĩ "where" 'kṇ̌ě "head" ʔa'ṇ̌ĩ "jump"

CHART VI Vowels.

	i	ĩ	e	ɛ	ẽ	a
Initial	iʔ'paA "his arm" iʔ'tɛɛ "my leg" i'ñām "my chin"	ĩʔ'kʰaA "his hand" ĩ "flesh"	e'tiI "spider"			aʔ'kʰɛ "hole" a'tʃeE "your cloth" aya'kɛtʃI "you spin"
Medial	pi'tʃoO "banana" 'kiyɛ "oven" 'kʰritI "bug"	pĩ'ɲgetE "old man" ka'ñin "secretion" 'pʰĩĩ fruit	žen "loot" ñdžebe "bat" 'kʰɛn "pimple"	'mbɛdʒi "good" 'tebe "fish" 'vetɛ "lizard"	'kɛn "bead" 'ka'tɛ'ɾɛ "squash" 'pʰɛp "bud"	ka'paA "remove" ʔa'tuyi "dull" kʰaki "shot"
Final	a'piI ascend" 'ndiI "woman" 'pʰiI "frog"	a'pĩ "kill" 'mĩ "alligator" 'pʰĩ "small"	a'peE "work" 'mbeE "or" kʰzeE "side"	a'pɛɛ "lick" ka'ndɛɛ "medicate" 'pʰɛɛ "dress"	a'pẽ "show" a'mẽ "throw" 'kʰẽ "bird"	a'paA "your arm" mbaA "liver" kʰaA "child"

CHART VI (cont.)

	ã	ĩ	ĩ	ë	ẽ	ẽ
Initial	ãm "her chin"		ĩ "hoof"	ë "yes"	ẽkẽ "bird"	'ẽm 'to cook'
Medial	'ñām "chin"	pi'tĩ "heavy" 'ndivi "new" ku'kʰiti "animal"	ñĩĩ "sat"	tʰvɛm "fat" 'mbɛɾɛ "cry" 'kʰvɛɾɛ "manioc"	'kɛtʃI "iron" 'ka'mbɛt "night" 'kʰɛm'ñdʒwɛ "friend"	'tʃẽm "to cook" ɾɛɾɛ'ti a bird

CHART VI (cont.)

	ã	ĩ	ĩ̃	ë	ë̃	ë̃̃
Final	'mã "no"	a'pĩĩ "take it" ñdžĩ "bee" 'p <sup>ə</sup> řĩ "road"	ñĩ̃ "sit"	a'mbé "carry it" k <sup>ə</sup> vë "bit" 'p <sup>ə</sup> řë "feather"	'kë "skin" ndë "no" p <sup>ə</sup> řë̃ "cinder"	a'pë̃̃ "smell it" pi'në̃ "reach" 'k <sup>ə</sup> řë̃̃ "head"

CHART VI (cont.)

	u	ũ	o	õ	õ
Initial	u?'p <sup>ə</sup> žeE "to hang" u'këts̩I 'spin' 'uřu 'pus' uya'p <sup>ə</sup> řořo 'purchase'	'ũm "dirty"	'o 'fruit' 'om 'starch'	õm'ndot̩O 'navel' õ?'t̩O "tongue" õ'k <sup>ə</sup> řeE "throat"	õm'nduyi "bad" o?'toO "much"
Medial	ka'tutU "shoulder" 'mbutU "back" pu'ts̩uU "hide" 'puřu "field"	' <sup>ə</sup> řũm "from" 'kũmũ "smoke" 'mřũmũ "ant"	'tono "armadillo" 'mbopO "yam" 'ɲgřodo "bug"	'tõt̩s̩I "sister" 'kõnõ "knee" i'mõkõ "crown of head"	ka'tõřo "born" ku'ndõm "thigh bone" 'ɲgõř'këE "comb"

CHART VI (cont.)

	u	ũ	o	õ	ɔ
Final	a'pu̯ "perhaps" pu'tʃu̯ "hide" ɔm'ndu̯ "bad"		?a'ko̯ "blow it" pi'tʃo̯ "banana" 'ŋgo̯ "water" ka'mb <sup>ə</sup> řo̯ "blood" k <sup>ə</sup> řo̯ "rat"	ka'põ "sweep" m <sup>ə</sup> řõ "submerge" 'p <sup>ə</sup> řõ "husband"	'tɔ̯ "fly" 'mbɔ̯ "deer" 'k <sup>ə</sup> řɔ̯ "rotten" 'mb <sup>ə</sup> řɔ̯ "ashes"

## 6. Formational statement of the phonemes

### 6.1. Consonants

#### 6.1.1. Stops

6.1.1.1. Every voiceless stop phoneme has a voiced allophone which occurs:

6.1.1.1.1. In unstressed syllables other than utterance initial

[nã ba ga'põ] "I swept"

6.1.1.1.2. Syllable final before a vowel or voiced consonant

['tɛb'radʒi] "big fish"

6.1.1.1.3. Utterance final alternation with voiceless CV and voiced CV. (Voiceless stop with voiceless release and voiced stop with voiced release whose quality can be predicted in terms of the preceding vowel)

['tɛbɛ] ~ ['tɛpɛ] "fish"

6.1.1.2. Stops occur with open transition when initial in cluster with /v/, /r/, and /z/.

['k<sup>ə</sup>raA] "child" [a'tʃ<sup>ə</sup>vaA] "your tooth" [ʔa'p<sup>ə</sup>žɛE] "long"

**N.B.** When [nã 'ba] occurs final and carries the final punch of the pause group, it still has [b] even though it appears to carry heavy stress. It is important to note that conditioning is by stress on the foot level only and is not affected by over-riding stress phenomena of the pause group or intonation group features.

['pɛ̃t̃'tiʔ'k<sup>ə</sup>ra nã'ga] "you are pɛ̃t̃ti's child"

**N.B.B.** In addition, /t/ and /tš/, but not /p/ and /k/, are voiced even though stressed when they occur within a rhythm group contiguous to voiced consonants and/or long vowels.

[ajëm' dëřë] "you catch it" ['kay'diI] "rabbit" [ka'tu·'diI] "shoulder"

For further information on this, see "Apinayé Hyperphonemic Structure".

### 6.1.1.3. Formational statement of stops

/p/ [p] Voiceless bilabial stop

N.B. When there is a C?C cluster combination of CCC, the phonetic detail has not been completely worked out, but the informant has a choice of ways of actualizing the cluster, and these include:

- (1) pʔ<sup>h</sup>k
- (2) pg<sup>f</sup>
- (3) pk<sup>f</sup>

/t/ [t] Voiceless alveolar stop

/c/ [t̚] Voiceless alveo-palatal stop characterized by high front on-glide following vowels. Only occurs preceding other stops.

[d̚] Voiced alveo-palatal stop characterized by high front on-glide following vowels. Only occurs preceding [l] and [v].

[tš] Voiceless alveo-palatal grooved affricate characterized by high front on-glide following vowels. Occurs elsewhere.

/k/ [k] Voiceless velar stop

/ʔ/ [ʔ] Voiceless glottal stop

### 6.1.2. Continuants

6.1.2.1. All continuants have nasalized allophones which occur contiguous to nasalized vowels.

[õñ' k<sup>ə</sup>ĩ̃] "house"

### 6.1.2.2. Formational statement of continuants

- /v/
- [w] Voiced rounded bilabial frictionless continuant, occurring syllable final followed by another consonant and/or preceded by [u], and utterance final preceded by [a].
  - [w̥] Voiceless rounded continuant with friction, varying from bilabial to labio-dental in position. Occurs second in cluster with palatal consonants.
  - [ʋ] Voiced rounded labio-dental continuant with friction. Occurs syllable initial preceded by [u]
  - [v] Voiced unrounded labio-dental fricative with tooth position on lip varying. Occurs elsewhere.

/r/ has lateral and non-lateral allophones. See CHART V.

1. The lateral allophones occur contiguous to consonants and in alternation with non-lateral allophones in certain environments.
  - a. There are flap and non-flap laterals.
    1. Flap allophones occur before [v], [ʒ̥], and [ʔ], and in alternation with [r̥] between vowels when preceded or followed by a high front vowel, in CC cluster, and utterance final; and in alternation with non-flap allophones utterance final.
    2. Non-flap allophones occur before stop and nasal consonants, following alveo and alveo-palatal stops and nasals, and in alternation with flap allophones utterance final.
  - b. There are retroflexed and non-retroflexed laterals.
    1. Retroflexed allophones occur before:
      - a) [v], [ʒ̥], & [ʔ] (flap allophones)
      - b) stops and nasals (non-flap allophones)
    2. Non-retroflexed allophones occur elsewhere.
2. The non-lateral allophones occur elsewhere.

[<sup>ə</sup>r̥] Voiced retroflexed alveolar flap, with pre-voicing. Occurs only initial.

- /z/
- [y] Voiced alveo-palatal frictionless continuant, occurring unstressed utterance medial, between vowels and preceding other consonants, and stressed following [ɲ]
  - [ʒ̥] Voiced fronted alveo-palatal grooved fricative, occurring elsewhere.
- N.B. The older generation tends to freely fluctuate [y] and [ʒ̥] throughout wherever [ʒ̥] occurs, but the younger generation tends to use only [ʒ̥] stressed.

### 6.1.3. Nasals.

Every nasal has allophones consisting of:

6.1.3.1. Nasal + voiced stop at same point of articulation which occurs preceding unnasalized vowels.

[nda̯] "rain"

[mbi̯] "male"

6.1.3.2. Nasal + voiced stop with open transition, at the same point of articulation, occurring in cluster preceding [v], [ř] & [ž] followed by unnasalized vowels.

[mb<sup>o</sup>ž<sup>o</sup>en] "husband"

6.1.3.3. Voiced stop + nasal at the same point of articulation, occurring syllable final following unnasalized vowels, only in alternation with the nasal.

[tɔbm] ~ [tɔm] "freckle"

6.1.3.4. Nasal with open transition, occurring only in cluster with [ň] followed by nasalized vowel.

[m<sup>o</sup>ň<sup>o</sup>] "submerge"

**N.B.** There is in current usage one word - [pɪ'ndã̯y̯i] "bad" in which the nasalized vowel occurs following the oral allophone of the alveolar nasal. The origin of this word is uncertain, but since it largely overlaps in meaning a clearly native word of normal structure [pu'nduy̯i] "bad", it seems quite possible that it may be a recent borrowing. This could be, therefore, the beginning of the changes which may eventually cause the interpretation of nasals and pre-nasalized stops as separate phonemes.

/m/	[m]	Voiced bilabial nasal
/n/	[n]	Voiced alveolar nasal
/ň/	[ň]	Voiced fronted alveo-palatal nasal, characterized by high front on-glide following vowels
/ŋ/	[ŋ]	Voiced velar nasal

## 6.2. Vowels

/i/	[i]	Voiced high close front unrounded vocoid
/ĩ/	[ĩ]	Voiced high close front unrounded nasalized vocoid
/e/	[e]	Voiced mid close front unrounded vocoid
/ɛ/	[ɛ]	Voiced mid open front unrounded vocoid
/ẽ/	[ẽ]	Voiced mid open front unrounded nasalized vocoid
/a/	[a]	Voiced low open central unrounded vocoid
/ã/	[ã]	Voiced low open central unrounded nasalized vocoid
/i/	[i]	Voiced high close back unrounded vocoid
/ĩ/	[ĩ]	Voiced high close back unrounded nasalized vocoid
/ë/	[ë]	Voiced mid close back unrounded vocoid
/ɛ/	[ɛ]	Voiced mid open back unrounded vocoid
/ẽ/	[ẽ]	Voiced mid open back unrounded nasalized vocoid
/u/	[u]	Voiced high back rounded vocoid
/ũ/	[ũ]	Voiced high back rounded nasalized vocoid
/o/	[o]	Voiced mid close back rounded vocoid
/õ/	[õ] ~ [õ̃]	Voiced mid close back rounded nasalized vocoid, varying occasionally to low close back rounded nasalized vocoid
/ɔ/	[ɔ]	Voiced low close back rounded vocoid

## 6.3. Other

/'/	[ ' ]	Stress
/·/	[ · ]	Vowel length
/syllable break/	(syllable break)	

## 7. Higher Layered Phonological Units

The allophones of the segmental phonemes are in part conditioned by units which are part of the phonemes and will be treated in greater detail on the hyperphonemic layer.

### 7.1. Syllables are emic units

Their contrast in syllable boundary can be demonstrated in identical environment.

[iɰ'par'i]	"bone of my foot"	[iɰ'pa'ri]	"near my arm"
[tɔ·m'pidẓ̌i]	"just a freckle"	[tɔ·'mbɛdẓ̌i]	"good freckle"

## 7.2. There is contrast between stressed syllables and non-stressed syllables.

It should be noted that more than one stressed syllable can occur in a single rhythm group (where rhythm group equates approximately with "word").

['kɔg 'řɛ]	"little wind"	['k <sup>ə</sup> řagri]	"beneath"
[nã mɛ 'm <sup>ə</sup> ňõ]	"they submerged"	[nã 'mã 'mõ]	"he went away"

## 8. Changes from Callow's paper

### 8.1. Additions

#### 8.1.1. Phonemic stress

#### 8.1.2. Phonemic syllable juncture

#### 8.1.3. Nasalized submembers of /v/, /r/, /z/

#### 8.1.4. Submembers of /v/

#### 8.1.5. /ã/

### 8.2. Omissions

8.2.1. Callow's paper page 1, line 5; 2, line 29; 1, line 22. The utterance final [mp], [nt], and [ŋk] is actually a nasal vowel followed by [p], [t], and [k].

[kuʔ'pĩpĩ̃] not [kuʔ'ĩmpĩ̃] "mat"

8.2.2. Page 1, line 5, 18. [ṁb] and [ṁd] same as [mb] and [nd].

8.2.3. Page 2, line 6, 18. [ṁdž] and [ṁg] same as [ndž] and [dg].

8.2.4. Page 5, line 8. [x] same as [g].

8.2.5. Page 5, line 14; page 6, line 12. [ṁ], [ṁ] same as [m] and [n].

8.2.6. Page 6, line 16, 19. [ʒ] same as [ž].

8.2.7. Vowel 1, line 3 [ĩĩ̃] same as [iĩ̃].

### 8.3. Changes

8.3.1. Page 3, line 4. I have assigned the nasalized vowel here to be /õ/ rather than /õ̃/, since I have seldom heard õ fluctuate with õ̃.

8.3.2. Callow differentiated [m] and [mb], [n] and [nd], [ṁ] and [ṁdž], [ṁ] and [ṁg]. We have found them to be mutually exclusive.