

A Description of Teribe Phonology

by

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Abstract: This is a theory-neutral description of the phonology of Teribe, a Chibchan language spoken in northwest Panama. As of 1998 Teribe had almost completed the process of moving from a tonal to a stress system language, so that vestiges of tone occur in certain areas of the phonology to disrupt the stress system. Teribe contains a prelabialized retroflexed lateral flap phoneme which is quite rare, if not unknown, among the other languages of the world. Nasality is also quite interesting, as it remains after the deletion of a nasal segmental phoneme in verb morphology, attaching itself to whatever segment comes to fill the vacant slot.

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1 Introduction¹

1.1 Background

Teribe is a member of the Chibchan family, a group of Central American languages which extends from Honduras on the northernmost end to Colombia in the south. Geographically, Teribe finds itself in the center of this group, being spoken by approximately 3,000 people² in and around the Teribe and Changuinola river valleys in northwest Panama, near the Costa Rican border. It belongs to the Talamancan branch of the Chibchan family which it shares with Bribri and Cabecar, languages which are spoken in the Talamanca valley across the border in Costa Rica. Bribri and Cabecar, however, are much more closely related to each other than they are to Teribe (cf. Constenla 1981:337). The language known as *Térraba* or *Brorán* in Costa Rica is an almost-extinct dialect of Teribe with five elderly living speakers as of 1991 (Grimes 1996:60). According to Teribes who have conversed with these *Térraba* speakers, the two dialects are easily mutually intelligible. The *Térraba* speakers live in and around the town of *Térraba*, Puntarenas, Costa Rica. They are descendents of a group who were moved from Teribe in 1695 and which currently numbers about 400. However, Spanish is now their mother tongue.

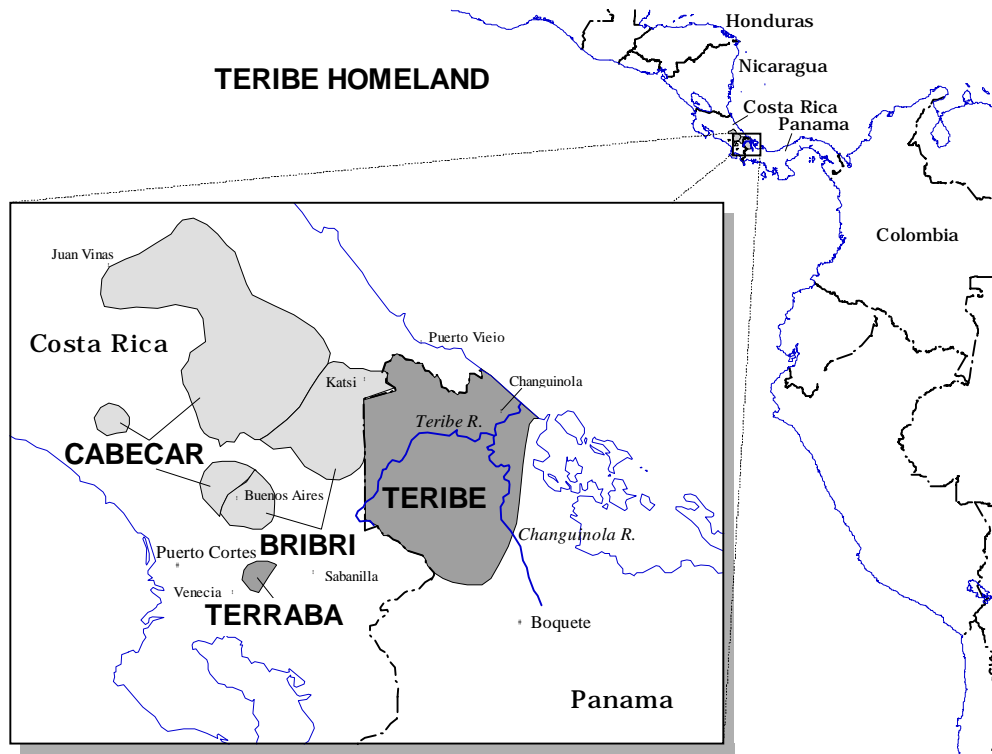
The consensus among Teribe speakers is that the name “Teribe” originated when the Spanish explorers came up what is now known as the Teribe River and asked what this place was. The Teribes answered, *tjer di*, which means, ‘river of the Grandmother’. (The Grandmother was the protective spirit who controlled that area and to whom the Teribes went for help and healing.) The Spaniards corrupted that into Teribe and the name stuck (to the river and the people).³ The Teribes refer to themselves and their language as *Naso* which has come to mean ‘Indian, native’ but which probably derives from the two words *na* ‘here’ and *so, sogo* ‘owner’ to mean ‘the owners of this place’.⁴

¹I am grateful for the comments and suggestions of Paul Thomas and Mike Cahill on earlier drafts of this paper, and owe a special debt of gratitude to my wife, Beth, who contributed many insights, and without whose support this work would not have been possible.

²Their own estimation as of 1998, which is perhaps a bit high. In the early part of the 20th century their numbers were as low as 500, climbing to around 1,000 by 1972 (Grimes 1992). But as late as 1964 (Reverte 1967:2) they were still considered to be on the way to extinction. That is no longer the case.

³There is a minority opinion that the name Teribe derives from the two words *tjer bi* which means ‘hillside of the Grandmother’. This has the advantage of being closer to the final output of Teribe but the objection to this is that it would be a strange thing to say. The Grandmother was thought to control the entire Teribe area, not just one hillside. Nor would this be the way to refer to her seat of power, which is on top of a mountain far up toward the continental divide, farther than the Spanish ever penetrated.

⁴The Teribes use the same construction when referring to those who dwell in a certain village. For example, someone from the village of *Dluy* can be called *dluysso*. The Bribri refer to themselves in a similar way, calling themselves *alárikta wak* which means ‘owners of the place where the children’s river flows’ (Wilson 1972:1). I will continue to use the name Teribe throughout this paper, since it carries no negative connotations, it gives continuity with the rest of the literature and it is the name used by the Teribes for themselves when they are speaking to outsiders (in Spanish). I have the impression that the Teribes would not be completely comfortable with outsiders using *Naso*, since that is an “insider” name. It seems that every Teribe has an official, formal name which is given to outsiders and also an informal name by which they are known in the group. I believe they use Teribe and *Naso* in the same way.



Published information on the Teribe language is scarce. The only works that I am aware of are contained in the *Lenguas de Panamá* series published by the Instituto Lingüístico de Verano and the Instituto Nacional de Cultura in Panama City between 1974 and 1980.⁵ In contrast, much has been published on the dialect of Térraba (resulting in many more published works than there are speakers!), usually with the author assuming that his or her statements also apply to Teribe. The cause of this somewhat backward state of affairs is the political border between the two dialects. The University of Costa Rica has been much more involved in linguistics than the University of Panama, so that the languages of Costa Rica have been studied much more than the languages of Panama. Also, Térraba has long been easily accessible by road, while the Teribe area is still quite isolated.⁶

In another sense this is not backward, since Térraba is almost extinct and the time available to study it is running out, while Teribe is currently living and in continuous use. That is not to say that Teribe is not endangered; language use has begun a steady decline since Spanish-language schools were introduced in the early 1970s. But the Teribes are aware of the problem and do not want to see their language go the way of Térraba. It remains to be seen what they will do about it.

⁵Lincom has recently announced the publication of a book on the grammar of Teribe by J. D. Quesada, but I have not had a chance to examine it.

⁶In fact, when Manuel Alba wrote his book on the indigenous languages of Panama in 1950, he did not include Teribe. Either he was unaware of them, or was unable to reach them.

My intention in this paper is to describe Teribe phonology in a theory—neutral way. I want to present the data in as much detail as possible but also make it accessible to whoever cares to look at it. My own background is in autosegmental phonology, which I believe offers many valid insights, but I only intend to refer to it in the area of nasalization.

I was exposed to the sounds of Teribe through interaction with many different Teribe speakers, but most notably with the following: Antonio Gamarra during August–November, 1993 and Taciano Vargas during January–April, 1994, both in Panama City. On 12 visits to Siyezhik, Teribe during 1992–1996 Antonio Gamarra and Adolfo Berche were particularly helpful. Then during residence in the village of Dluy,⁷ Teribe during 1996–1997 and April–May, 1998, Tony Vargas and Emilia Gamarra spent hundreds of hours tutoring me in their language. Approximately 7,000 individual utterances were recorded, as well as 67 texts of varying lengths.

1.2 Abbreviations and Symbols

The symbols used for phonetic transcription will be in square brackets [] and are taken from the IPA.⁸ The diacritic [~] above a segment signifies that it is nasalized. The same diacritic between two phonetic transcriptions ([] ~[]) means that they are in free variation. The diacritic [˘] above a vocoid indicates that it is extra-short and the diacritic [ː] after a vowel indicates that it is extra long. A sigma (σ) will be used to stand for a syllable. An apostrophe ['] will stand for word stress, placed just to the left of the stressed syllable. For example, ✓ ' ✗ would signify stress on the last of three syllables. A dot (.) will indicate a syllable break.

For phonemic transcriptions (between slashes / /) I will use characters based on the phonemic orthography⁹ proposed by Heinze (1979) along with the Panamanian *Instituto Nacional de Cultura*, with IPA characters used occasionally when needed for clarity.

Table one, which follows, contains the abbreviations used as grammatical tags in the interlinear glossing of Teribe sentences. Table two contains the characters used in phonemic transcription and their IPA equivalents whose relationship may not be obvious. The other phonemic characters are very similar to their IPA counterparts.

⁷I am grateful to the people of Dluy for their hospitality, especially to Valentín Santana, the king, Catalino Victoriano, the village leader and Aguirre Vargas for donating the land on which we built our house.

⁸The segment symbolized by the IPA character [o] is actually a little lower than the /o/ of Spanish or English, somewhere between [o] and [ɔ], but for convenience I will use [o] to represent this sound.

⁹The orthography is phonemic except that it underspecifies between [n] and [ɲ], representing them both as /n/, because of a lack of consensus on the appropriate symbolism for [ɲ]. In this paper I will represent [ɲ] with the digraph /ng/. I also differ from the proposed orthography in representing the segment [ʒ] as /zh/ rather than /ll/. This makes the symbolism for the fricative segments consistent, as the segment [ʃ] is represented by /sh/ and the segment [ç] by /ch/. To these I propose the addition of a phonemic segment [z], to be represented as /dh/ (see section 6.2).

Abbreviations	
1s	First person singular
2s	Second person singular
1p	First person plural
2p	Second person plural
3	Third person
indef	Indefinite person
pl	Plural
poss	Possessive
inc	Inclusive
exc	Exclusive
Cmpl	Completive
Imv	Imperative
perm	Permanently
stand	Standing
Dem	Demonstrative
Q	Question marker
Stat	Stative marker
Subj	Subject marker
Neg	Negative
(n.)	Noun
(v.)	Verb
Pro	Pronoun

Table 1: Abbreviations

Phonemic	IPA
j	h or: h ^h (aspiration)
ng	ŋ
ñ	ɲ
wl	ʷl
ch	ç
dh	ʒ
sh	ʃ
zh	ʒ
ë	ɪ
ö	ʊ
ä	ɒ
ã	õ

Table 2: Phonemic Characters with IPA equivalents

2 Charts of Phonemes

The phoneme inventory of Teribe contains 25 consonants and 14 vowels, 8 oral and 6 nasal.¹⁰

2.1 Teribe Consonant Phonemes

	Bilab.	Dental	Alveo.	Alveopal.	Velar	Glottal	
vl.	p		t		k		stop
vl.	p ^h		t ^h		k ^h		aspirated stop
vd.	b		d		g		stop
vl.				ç			grooved affricate
vd.				ʒ			grooved affricate
vl.			s	ʃ			grooved fricative
vd.			z	ʒ			grooved fricative
vd.	m		n	ɲ	ŋ		nasal
vd.			r				flap
vd.			ɻ				retroflexed lateral flap
vd.			^w ɻ				pre-labialized ret. lat. flap
vl.						h	approximant
vd.	w				y		approximant

Table 3: Teribe consonant phonemes

2.2 Teribe Vowel Phonemes

	Front		Central		Back	
	Unround	Round	Unround	Round	Unround	Round
high close	i					u
nasal	ĩ					ũ
high open	ɪ					ʊ
mid open	ɛ					o
nasal	ẽ					õ
low open	a					ɒ
nasal	ã					õ

Table 4: Teribe vowel phonemes

¹⁰It is also possible to conceive of the phoneme inventory as consisting of 24 consonants, 8 oral vowels and a suprasegmental phoneme of nasalization which combines with 6 of the vowels and the glide /y/ (to produce /ñ/). See sections 6.6, 6.8 and 8.5.

3 Tone vs. Stress

3.1 Minimal Pairs

The ancestor of Teribe, Proto-Chibchan, was a tonal language (see Constenla:171 ff.). Most of the Chibchan languages have not retained this original phonemic tonality, but Bribri and Cabecar have. As the other member of the Talamancan branch, one would expect that Teribe would have a tonal system as well, and there are some very intriguing evidences of it. Enough, in fact, to lead Heinze (1980) to analyze Teribe as tonal, with two tonemes, high [´] and low [˘].¹¹ However, the tonal system has faded away and been replaced for the most part with a system of contrastive stress, so that a strictly tonal analysis of Teribe is no longer useful. Having said that, one must also recognize that a stress system does not entirely explain the data, as the vestiges of the tonal system still assert themselves now and then. For example, in the domain of color terms, tone contrasts between high and low remain:

[´] = high tone, [˘] = low tone, [ˉ] = mid tone, [˝] = extra low tone, [ˆ] = extra high tone.

(1) High and low tone contrasts

[díŋdíŋ]	‘blue’
[dìŋdìŋ]	‘light blue’
[p ^h lúb.lún]	‘white’
[p ^h lùb.lùn]	‘off-white’
[sré:zrén]	‘red’
[srè:zrèn]	‘light red’
[k ^h ísóŋ]	‘green’
[k ^h isòŋ]	‘light green’

This contrast between high and low tone carries over to a few adjectives with reduplicated syllables as well:

(2) [ˆlíˆlíè]	‘dirty’
[ˆlíˆlíè]	‘somewhat dirty’
[drípdríè]	‘clean’
[drìpdríè]	‘somewhat clean’

However, the tone difference in these color and adjective pairs does not produce semantically unrelated terms. Low tone seems to carry the meaning of “somewhat” or “not

¹¹Both Constenla (1981) and Lininger (1978) analyze Térraba as having contrastive stress rather than tone, as do Koontz and Anderson (1974) for Teribe.

quite.” Therefore, they would provide only weak evidence for a tonal system and seem to be better conceived as evidence of contrastive stress. There are very few other minimal pairs in the language that contrast only by tone. I have found only three:¹²

(3) Minimal tone pairs:

[k ^h égé]	‘mother’s brother’
[k ^h égè]	‘father-in-law’
[kùktú]	‘heel’
[kúktù]	‘torcasa (a type of dove)’
[t ^h ók ^ˀ]	‘have, exist’
[t ^h òk ^ˀ]	‘with’

The following pair is a set of compound words which both contain the suffix [-^wlo] ‘for the purpose of’. They have the same shape only by the accident of verb morphology, as the first is the nominalized form of [ʔyɪ] ‘eat, drink’ and the second is the noun [ʔyok] ‘fire’. The difference in pitch pattern is probably due to a leftover underlying tone difference between the two root words (see section 3.2).

- (4) [ʔyók^w.lò] /iyokwlo/ ‘plate (for eating)’
[ʔyòk^w.ló] /iyokwlo/ ‘matches (for fire)’

As an illustration of the process of tone system loss, I submit the following pair, given me by an older Teribe:

- (5) [ˀ.lú] /lũ/ ‘chácara (a kind of basket)’
[ˀ.lũ] /lũ/ ‘steal’

Younger Teribes, however, said that the proper pronunciation is:

- (6) [h.lũ] /hlũ/ ‘chácara (a kind of basket)’
[ˀ.lũ]~[.lũ] /lũ/ ‘steal’

They made no distinction in pitch between the two. For them, the difference is that one has an /h/ and the other one does not. In this way tone contrasts have been lost, so that there are very few contrasts of meaning due to tone remaining in the language.

¹²Koontz and Anderson (1974:53) report /kyóng^wò/ ‘flea’ and /kyòng^wó/ ‘matapalo (a type of bird)’ for Teribe, and Constenla (1981:123) reports /k^hórkuò/ ‘fruit’ and /k^hòrkuó/ ‘cattle tick’ for Térraba.

3.2 Monosyllabic Nouns

Another area where underlying tone becomes evident is with monosyllabic nouns. In isolation they have no noticeable pitch, and in frames there is no contrast with each other, as would be expected in a stress system:

- (7) [húliá ʔè bòr dōr] /Julia e bor dor/ ‘Julia is my sister’
Julia Pro my sister-of-male
[kárlos ʔè bòr wā] /Karlos e bor wa/ ‘Carlos is my child’
Carlos Pro my child
[húliá ʔè bòr .lɪŋ] /Julia e bor ling/ ‘Julia is my younger sister’
Julia Pro my younger-same-sex-sibling
[tómás ʔè bòr tʰɪr] /Tomas e bor tjër/ ‘Tomás is my grandchild’
Tomás Pro my grandchild

But there is at least one exception:

- (8) [tómás ʔè bòr ʃíí] /tomás e bor shiy/ ‘Tomás is my older brother’
Tomás Pro my older-brother-of male

The word [ʃíí] /shiy/ ‘a man’s older brother’ always carries a high tone and throws off the normal intonation of whatever sentence it is in. Other monosyllabic nouns do not do this, but their underlying tone can sometimes be brought out by attaching an enclitic to them. The enclitics /-wa/ ‘diminutive’ and /-pga/ ‘plural (human)’ do not carry any stress and do not affect the normal stress pattern of the noun they attach to. Thus we would expect a monosyllabic noun with an enclitic attached to be stressed on the noun and unstressed on the enclitic, which is what usually happens:

- (9) [ˈsbiwa] /sbiwa/ ‘small pot’
[ˈwawa] /wawa/ ‘small child’
[ˈʃtopwa] /shtopwa/ ‘small nephew/niece’
[ˈwapǒga] /wapga/ ‘children’
[ˈʃtopga] /shtopga/ ‘nephews/nieces’

But some monosyllabic nouns with enclitic have the opposite stress pattern:

- (10) [ʔuˈwa] /uwa/ ‘small house’
[biŋˈwa] /bingwa/ ‘small plantain’
[wipˈga] /wipga/ ‘older sisters’
[nopǒˈga] /nopga/ ‘people’

This is caused by the old tonal system intruding on the new stress system. In the old system, the enclitic took the opposite tone of the stem it is attached to. If the noun has an

inherently high tone, then the first (expected) pattern results. But if it has an inherently low tone, then the enclitic takes a high tone and the second (exceptional) pattern results. Constenla (1981:173) found that Tèrraba words that fit in this second category corresponded to Bribri words with a low or falling tone and words that fit in the first category corresponded to Bribri words with a high or rising tone. There are not as many examples of the second pattern as there are of the first in Teribe, probably because as the underlying tones are fading from memory, the nouns are gradually being shifted into the first category.

4 Stress Statement

4.1 Sentence level

4.1.1 Declarative Sentences

Teribe has two declarative sentence patterns: SOV and OVS, as well as an equative pattern of SO with no explicit verb. For the SOV pattern the verb is unmarked for person and number and thus appears more basic than OVS. The normal pitch melody for these declarative sentence types is starting either low or mid, rising in the middle and falling to low at the end. Stress is realized primarily by a higher pitch and secondarily by an increase in volume. In this section I will mark sentence-level stress (pitch) by using the tone markings from the previous section and word-level stress by the stress marker [']. Throughout the rest of the paper the stress marker will indicate a word-level stress, primarily realized as higher pitch.

(11) SOV:

[t^hà bòr 'dátá 'k^hm̄t̄] /tja bor data kjèmt̄/ 'I will help my father.'

1s 1sPoss father help

[k^hò 'kí s^wí 'sùnò] /kjok̄ swl̄ s̄no/ 'Grandfather brought the spear.'

grandfather spear bring.Cmpl

[t^hā tō ḡn̄ǎ 'mó 'sōyn̄èk̄] /tja to ḡnmo soynek/ 'I'm going to sell oranges.'

1s go orange sell

(12) OVS:

[p^hā 'ʃpóyá bōp̄ 'dátàr̄è] /pja shpoya bop datare/ 'Your father is going to hit you.'

2s hit.3 2sPoss father.Subj

[ʔ̄ē 'krōrōr 'púglòròy] /e krōror pōgloroy/ 'I found it in the jungle.'

Pro find.Cmpl.1s jungle.inside

[t^hā 'ʃāyā 'ʃít̄r̄è] /tja shaya shèt̄ere/ 'The dog is going to catch me.'

1s catch.3 dog.Subj

(13) SO:

[kwē bōr 'dátà] /kwe bor data/ 'He is my father.'

Dem 1sPoss father

[t^hā bōy 'zímè] /tja boy zhème/ 'I have no wife.'

1s wife Neg

[ʔē'ní 'h.lôê] /eni jlœ/ 'That's true.'

thus true.stative

This normal intonation pattern is modified when the underlying tone of certain words becomes manifested, such as [ʃii] /shiy/ 'older brother' (high tone), [biŋ] /bing/ 'plantain' (low tone), [k^ho'kɪ] /kjokë/ 'grandfather' (low-high tone sequence). Note the following differences:

(14) Tone Contrast

[kwè bōr 'dātà] /kwe bor data/ 'He is my father.'

Dem 1sPoss father

[kwè bōr wā] /kwe bor wa/ 'He is my child.'¹³

Dem 1sPoss child

[kwè bōr ʃí'í] /kwe bor shiy/ 'He is my older brother.'

Dem 1sPoss older-brother-of-male

[k^hò'kí s^w.lí 'sùnò] /kjokë swlë söno/ 'Grandfather brought the spear.'

grandfather spear bring.Cmpl

[k^hò'kí biŋ 'sùnò] /kjokë biŋ söno/ 'Grandfather brought the plantain.'

grandfather plantain bring.Cmpl

[t^hà bōr 'dátá 'k^hímî] /tja bor data kjëmtë/ 'I will help my father.'

1s 1sPoss father help

[t^hà bōr k^hò'kí 'k^hímî] /tja bor kjokë kjëmtë/ 'I will help my grandfather.'

1s 1sPoss grandfather help

I expect the number of these words which change the normal intonation pattern to become fewer over time as the underlying tones are gradually forgotten.

4.1.2 Interrogative Sentences

The normal stress pattern for both yes-no and informational interrogative sentences is to start mid or low and end high. To form a yes-no question the question marker /-de/ or /-re/ is attached to the last word of the sentence. It always carries high intonation, which it usually imparts to the entire word.

¹³This sentence breaks the normal pattern by not falling at the end. It started low then ended mid. If the final word had had two syllables, it would normally have dropped again, but since it had only one syllable it had to stay at mid because there can be only one pitch level per syllable.

(15) Yes-No questions:

[ˈnāsō ˈkúgópɔ́dɛ́] /naso kugopde/ ‘Do you understand Naso?’
naso hear.2s.Q

[kwē bōp̄ ˈdátárɛ́] /kwe bop datare/ ‘Is that your father?’
Dem 2sPoss father.Q

[p^hà ˈmèkì ˈt^hókǎdɛ́] /pja mekë tjokde/ ‘Is your mother living?’
2s mother exist.Q

The informational question is formed by using a question word in the place where the information requested would fit if the sentence were declarative. Sometimes this is at the end of the sentence, but often it is not. The question word receives whatever intonation is appropriate for the part of the sentence it occupies. It does not have a set intonation; rather the intonational pattern is a sentence-level phenomenon. In the following examples, the question word is underlined.

(16) Informational questions:

[bōp̄ ʔú hōŋ k^hōˈnɛ́] /bop u hong kjone/ ‘Where is your house?’
2sPoss house be-perm where

[z̄ɪ ˈwóyɔ́dɪp̄] /zhë woydëp/ ‘What do you want?’
what want.2s

[ʃi ˈpārki z̄ɪˈgó] /shi parkë zhëgo/ ‘What are we going to work with?’
1pInc work what.with

[p^hā ʃāŋ z̄ɪ] /pja shang zhë/ ‘What are you doing?’
2s be-stand what

4.2 Word-level Stress

4.2.1 Nouns

Two-syllable nouns with final stress are common:

(17) [doˈmɛɾ] /domer/ ‘man’

[gɪnǎˈmo] /gënmo/ ‘orange’

[.lanˈma] /lanma/ ‘husband’

Two-syllable nouns with penultimate stress are also common:

(18) [ˈmɛkɪ] /mekë/ ‘mother’

[ˈk^hɛbiŋ] /kjebing/ ‘banana’

[ˈk^hamo] /kjam/ ‘mouth’

Three-syllable nouns are relatively uncommon. In present data, stress on a three-syllable noun can be either penultimate or antepenultimate:

- (19) [kwo¹zirwa] /kwozirwa/ ‘child’
[k^hi¹bokwo] /kjibokwo/ ‘book’
[¹kupkeʃko] /kupkeshko/ ‘yesterday’
[¹ʃmĩỹãkwo] /shmiñakwo/ ‘banano primitivo (a type of banana)’

When enclitics are added as nominal modifiers, they do not affect the original stress pattern of the noun:

- (20) [do¹m̄erwa] /domerwa/ ‘small man’
[¹mekɪwa] /mek̄ewa/ ‘small mother’
[k^hi¹bokwowa] /kjibokwowa/ ‘small book’
[¹ʃmĩỹãkwowa] /shmiñakwowa/ ‘small banano primitivo (type of banana)’

4.2.2 Verbs

Stress is not predictable for verbs. In their simplest, unaffixed forms, verbs that have not been formed by compounding are of either one or two syllables. Two-syllable verbs with final stress are common:

- (21) [ʷlor¹kɪ] /wlork̄e/ ‘hunt’
[^ʷlõ¹ʃit^ʷ] /lõshit/ ‘smell’
[^ʷʔu¹ʃik^ʷ]~[^ʷʔu¹nik^ʷ] /uñik/ ‘visit’

Verbs with penultimate stress are also common:

- (22) [¹parkɪ] /park̄e/ ‘work’
[¹soyne^ʷk^ʷ] /soyne^ʷk/ ‘sell’
[¹ʔopin] /opin/ ‘learn’

Just as with nouns, adding syllables to the original stem does not affect the original stress placement, with one exception. The second person plural marker [-¹mi] carries its own stress and when added to the verb stem, the word stress shifts from its original location on the stem to the second person plural marker itself:

- (23) [ˈparkɪpˀ] /parkëp/ ‘you (sing.) work’
 [parkɪˈmi] /parkëmi/ ‘you (pl.) work’
 [ˈparkɪrwa] /parkërwa/ ‘we (excl.) work’
 [ˀlorˈkɪpˀ] /wlorkëp/ ‘you (sing.) hunt’
 [ˀlorˈkɪmi] /wlorkëmi/ ‘you (pl.) hunt’
 [ˀlorˈkɪrwa] /wlorkërwa/ ‘we (excl.) hunt’

The stress on monosyllabic verbs is always on the verb stem, except when inflected with the second person plural marker [-ˈmi], as noted above:

- (24) [ʃakˀ] /shak/ ‘grab’
 [ʃapˀ] /shap/ ‘you (sing.) grab’
 [ʃaˈmi] /shami/ ‘you (pl.) grab’
 [ʃarwa] /sharwa/ ‘we (excl.) grab’
 [zi] /zë/ ‘cut’
 [zɪpˀ] /zëp/ ‘you (sing.) cut’
 [zɪˈmi] /zëmi/ ‘you (pl.) cut’
 [ˈzɪrwa] /zërwa/ ‘we (excl.) cut’

4.2.3 Examples of word-level stress patterns

Final Stress:

ˈ [lanˈma] /lanma/ ‘husband’

Penultimate Stress:

ˈ [ˈsrɔrbo] /srɔrbo/ ‘cane’

ˈ [kʰiˈbɔkwo] /kjibokwo/ ‘book’

Antepenultimate Stress:

ˈ [ˈʃmiỹākwo] /shmiñakwo/ ‘banano primitivo (type of banana)’

5 Syllable Patterns

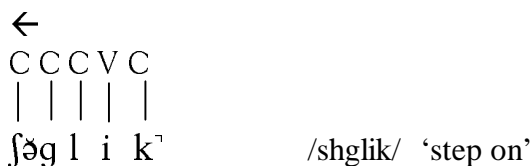
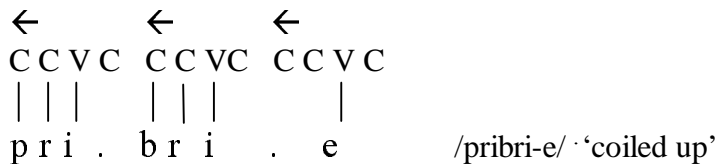
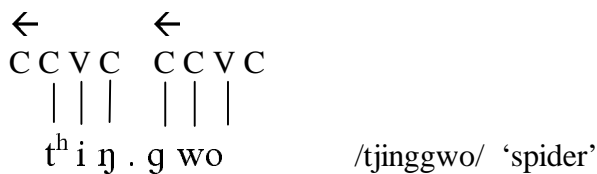
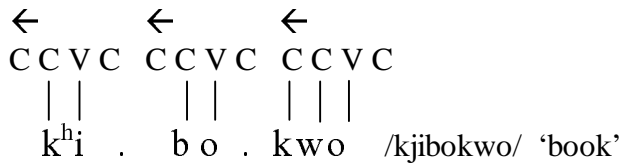
The maximal syllable found in Teribe consists of an onset of three consonants, a nucleus of one vowel and a coda of one consonant, which we can abbreviate as CCCVC. An example of this would be the word [ʃǝglikˀ] /shglik/ ‘step on’ (the short, transitional vocoid [ǝ] is not phonemic—see section 8.2 for a discussion). This motivated Heinze (1980) to posit CCCVC as the syllable template of Teribe. It is rare, however, for a syllable to have this many initial consonants (I have only 6 examples) and in present data the first consonant in the cluster is always a voiceless sibilant (s or ʃ). Further evidence against this being the syllable template is the fact that the maximal word-medial consonant cluster is CCC. If the syllable template of Teribe were CCCVC, then it would be reasonable to expect to find a word-medial consonant cluster of CCCC (representing the concatenation of a CVC

syllable with a maximal CCCVC syllable), but in present data there are none. Therefore an analysis of the Teribe syllable template as CCVC with extraprosodical licensing of an initial sibilant at the beginning of a word makes more sense (cf. Ito 1986). It is quite common for sibilants to be extraprosodically licensed in language since they also stand outside of the normal syllable structure by breaking the sonority curve.

Even less plausible than the CCCVC template is the CCCCVC syllable structure found in Térraba by Lininger (1978:28). Lininger's example of a CCCCVC word in Térraba is /ʃkwre/, 'conejo colorado' (her spelling and definition). The Teribe equivalent would be: [ʃk^w.lɪ] /shkwle/ 'ñeque (a large rodent)'. This word has the initial sibilant which stands outside of the syllable template and also labialization within the consonant cluster which was incorrectly identified as the independent consonant /w/. Heinze correctly identified the labialization, but connected it to the /k/ rather than to the following /l/ (/r/ in Lininger), as will be argued for in this analysis (see sections 6.5 and 7.2.4). Thus analyzed, there is no reason to posit a syllable template larger than CCVC for Térraba or Teribe. Teribe does not allow more than one vowel per syllable (see section 6.3 for a discussion of the glides /y/ and /w/).

5.1 Syllable Mapping

Syllables are divided by mapping the syllable template (CCVC) right-to-left over the word, beginning with the vowels. Lines cannot cross. Unattached C-slots are then deleted.



This simple syllable mapping correctly divides most words, but there are some which need to divide between a cluster of two word-medial consonants (CVC.CV(C)). For this to happen, syllable-internal cooccurrence restrictions come into play. Put simply, syllable breaks occur between segments which cannot legally cooccur in a syllable-internal CC cluster (see 5.2.2, following). For example, /r/ and /ŋ/ cannot be the first consonants in a CC cluster, so the syllable must break between them and the next consonant:

- (25) [pɒŋ.ˈʃo] /pänsho/ ‘cloud’
- [ˈwɪŋ.ya] /wënya/ ‘kidney’
- [ˈʔar.ga] /arga/ ‘almond tree’
- [ˈsir.kekˀ] /sirkek/ ‘sit’

5.2 Syllable Types

5.2.1 Examples

V	[ʔu] /u/ ‘house’
CV	[k ^h o] /kjo/ ‘name’
VC	[ʔɪpˀ] /ëp/ ‘corn’
CVC	[zoŋ] /zong/ ‘beard’
CCV	[p ^h .lu] /pju/ ‘good’
CCVC	[s.lar] /slar/ ‘cry’
CCCV	[ʃk ^w .li] /shkwle/ ‘ñeque (a large rodent)’
CCCVC	[ʃəŋ.liˀ] /shglik/ ‘step on’

5.2.2 Phonemes found filling CV positions in the Syllable Types

(?)V

|
/i,ë,e,a,u,ö,o,ä,ĩ,ẽ,ã,ũ, / (all but /ö,ẽ,õ,ã/)

(This syllable type is not nearly as common as CV.)

CV

| |
| /i,ë,e,a,u,ö,o,ä,ĩ,ẽ,ã,ũ,õ/ (all)

/p,t,k,p^h,t^h,k^h,b,d,g,m,n,ñ,ç,s,z,sh,zh,h,l,^wl,r,w,y/ (all but /ŋ,dh/, the former being found only syllable-final and the latter due to its extreme rarity.)

(?)VC

| |

| /p,k,m,n,ŋ,s,r,y/ (all but /t,p^h,t^h,k^h,b,d,g,ñ,ch,dh,z,sh,zh, ^wl,l,h,w/)

/i,ë,e,a,u,ö,o,ä,ĩ,ũ,õ,/ (all but /e,ã,ẽ,ã/)

(This syllable type is not nearly as common as CVC.)

CVC

| | |

| | /p,t,k,m,n,ñ,ŋ,s,sh,r,y,w/ (all but /p^h,t^h,k^h,b,d,g,ch,dh,z,sh,zh, ^wl,l,h/)

| /i,ë,e,a,u,ö,o,ä,ĩ,ẽ,ã,ũ,õ/ (all)

/p,t,k,p^h,t^h,k^h,b,d,g,m,n,ñ,ch,dh,s,z,sh,zh,h,l, ^wl,r,w,y/ (all but /ŋ/)

CCV(C)

| | | |

| | | /p,t,k,m,n,ñ,ŋ,s,r,y,w/ (all but /p^h,t^h,k^h,b,d,g,ch,dh,z,sh,zh, ^wl,l,h/)

| | /i,ë,e,a,u,ö,o,ä,ĩ,ẽ,ã,ũ,õ/ (all)

| /p,t,k,b,d,g,m,n,l, ^wl,r,w,y/ (all but /p^h,t^h,k^h,ñ,ŋ,ch,dh,s,z,sh,zh,h,/)

/p,t,k,p^h,t^h,k^h,d,g,m,s,sh,z,sh,h/ (all but /b,ch,dh,n,ñ,ŋ,r,l, ^wl,w,y/)

The allowable syllable-internal clusters found are:

/pk/,/pl/,/pr/,/tl/,/t^wl/,/tw/,/ty/,/kl/,/k^wl/,/kr/,/kw/,/ky/,/p^hl/,/t^hl/,/k^hl/,/dl/,/d^wl/,/dr/,/gw/,/my/,
/st/,/sk/,/sb/,/sm/,/sl/,/s^wl/,/sr/,/sht/,/shk/,/shm/,/shl/,/shr/,/shw/,/zg/,/zl/,/zr/,/zw/,/zhw/,/hl/,
/hn/.

With the extraprosodical sibilant:

CC CV (C)¹⁴

| | | | |

| | | | /k,r/

| | | /i,ë,ẽ/

| | /l, ^wl,w/

| /k,g/

/s,sh/

To summarize the above, all vowels can be expected to fill the syllable nucleus spot. The aspirated stops are found only word-initial and, if in a CC cluster, can be followed only by /l/. All consonants except /ŋ/ can begin a syllable. The consonant /ŋ/ is always syllable-final. Aspirated stops, voiced stops, affricates, laterals, voiced fricatives and /h/ cannot close a syllable. This means that stops and fricatives are devoiced syllable-final and the only voiced segments allowed in that position are nasals, glides and /r/.

¹⁴The only words found in this category to date are: [skwẽ] /skwẽ/ ‘crazy’, [ʃkwĩ] /shkwẽ/ ‘wash’, [ʃk^w.lɪ] /shkwĩ/ ‘ñeque (a small rodent)’, [ʃəglik] /shglik/ ‘step on’, [ʃkwirbo] /shkwirbo/ ‘a type of tree’, [ʃgwɔŋ] /shgwɔŋ/ ‘exposed roots of a tree’.

6 Interpretation of Ambiguous Items

6.1 Glottal Stop

In Teribe, the occurrence of glottal stop is almost entirely predictable. It occurs before a word-initial vowel:

- (26) [ʔɔ] /ä/ ‘devil’
[ʔu] /u/ ‘house’
[ʔɪŋ] /ëng/ ‘yes’
[ʔoba] /oba/ ‘someone’
[ʔɛʃko] /eshko/ ‘there’
[ʔãpʔ] /ãp/ ‘molar’

But there is a small group of words that have lengthened initial vowels and no initial glottal stop (see section 6.7):

- (27) [i:r] /iir/ ‘be angry’
[u:ʃi] /uushi/ ‘child-stealing spirit’
[u:r] /öör/ ‘arrive somewhere and leave again’
[ʰo:ka] /ooka/ ‘serpent-spirit’
[ɔ:] /ää/ ‘chicha (a drink)’
[ɔ:r] /äär/ ‘arrive’
[ʰɔ:lu] /äälu/ ‘headless spirit’¹⁵

The contrast can be seen in the minimal pair:

- (28) [ʔɔ] /ä/ ‘devil’
[ɔ:] /ää/ ‘chicha (a drink)’

We don’t need a glottal stop phoneme to distinguish these two words because of the vowel length.¹⁶ As confirmation, native speakers seem to be unaware of the glottal stop and prefer to mark vowel length as the distinguishing feature.

However, there is another small set of words which have a glottal stop word-initially before the glides [y] and [w], resulting in a stronger release of the consonant (glide):

¹⁵These are the only long-vowel words collected to date.

¹⁶The length might be a compensation for the lack of glottal stop, or there might be some constraint on the language so that the onset must always be filled, but I will not attempt to theorize at this point.

- (29) [ʔwɪ] /uwë/ ‘eat’
[ʔyɪ] /iyë/ ‘drink’
[ʔyok] /iyok/ ‘fire’
[ʔyeber] /iyeber/ ‘transform, become’
[ʔyoror] /iyoror/ ‘I put’¹⁷

In very slow, emphasized speech (i.e., demonstrating the sound to an outsider) a homorganic vocoid is inserted between the glottal and the glide:

- (30) [ʔuʷwɪ] /uwë/ ‘eat’
[ʔiʷyɪ] /iyë/ ‘drink’
[ʔiʷyok] /iyok/ ‘fire’

There are minimal pairs with some of these words that don’t have the glottal:

- (31) [wɪ] /wë/ ‘bathe’ vs. [ʔwɪ] /uwë/ ‘eat’
[yoror] /yoror/ ‘I hit’ vs. [ʔyoror] /iyoror/ ‘I put’

This would seem to indicate that the glottal stop is indeed a phoneme, or that there are additional, pre-glottalized glide phonemes in the language. But I think that a more likely explanation of what is happening is that these words were at some time in the past vowel-initial as they are in very slow, emphasized speech, but because the vowel was homorganic with the glide (/i/ with /y/ and /u/ with /w/) and unstressed, it was assimilated into the glide, so that what we have left is the initial glottal and very little, if any, of the vowel. Native speaker reaction seems to be more positive to representing these words with an initial vowel, eg. /uwë/ than with some other mark, such as an apostrophe, eg. /ʷwë/, but more testing needs to be done in this area.

There are words in Teribe with an initial vowel followed by a glide, so not all have lost that first syllable:

- (32) [ʔowa] /owa/ ‘bad’
[ʔiʷwɪ] /iwë/ ‘sew, weave, build’
[ʔɔya] /äya/ ‘wild thing’
[ʔayəŋ] /ayang/ ‘flying spirit’
[ʔiye] /ëye/ ‘almost’
[ʔiĩã] /īya/ ‘of whom?’

However, these initial vowel-glide words that have survived assimilation all receive word stress on the first syllable, except for the word [ʔiʷwɪ] /iwë/ ‘sew, weave, build’. This

¹⁷These words, and their derivatives, are the only words of this class encountered so far.

word is apparently saved by the difference in articulation of the vowel and the glide, and perhaps by the fact that there is already a verb [ʔwɪ] /uwë/ ‘eat’.

While it is common for the glottal stop before vowels to be omitted in the flow of normal or fast speech, the glottal stop preceding glides is never omitted. This could be that, as the last vestige of the underlying first vowel, it must be retained to maintain the meaning of the word, while glottal stops before initial vowels are predictable and therefore their meaning load is redundant with the vowel itself, making them expendable. For example, in fast speech the glottal stop before the glide /w/ in the word [ʔwɪ] /uwë/ ‘eat’ is retained even though other glottal stops around it are not:¹⁸

Fast Speech	Careful Speech	Phonemic	Translation
[ʔjaya ʔwe ʔlega]	[ʔjaya ʔwe ʔlega]	/shaya uwe lega/ grab.3 eat.3 say.3.Cnj	‘He said he would grab it and eat it...’
[kliʔgara ʔwega ɒ]	[klikʔ ʔara ʔwega ʔɒ]	/klik ara uwega ä/ hot very eat.3.Cnj not-possible	‘It was too hot; he couldn’t eat it.’
[baŋ ʔara]	[baŋ ʔara]	/bang ara/ hurt very	‘It hurts a lot.’

Table 5: Glottal stop

One place where a glottal stop is never permitted to precede the vowel is before the stative suffix /-e/. When this stative marker is added to a vowel-final word, the transition always occurs without a glottal stop:

- (33) [ʔiʔyadoe] /iñado-e/ ‘always’
 [s^w.lo ʔarae] /swlo ara-e/ ‘He’s very sick.’
 [ʔli^w.lie] /wliwli-e/ ‘dirty’
 [p^h.lue] /pjlue-e/ ‘good’
 [soʔyee] /soye-e/ ‘beginning’

There is a small class of vowel-initial words, all beginning with /i/, which are undergoing a process of loss of the initial vowel along with its glottal stop. Word stress is always on the second syllable. Since these words do not contain a glide, the vowel cannot assimilate and the glottal is deleted along with the vowel:

¹⁸In this type of verb, the third person marker is a lowering of the vowel from [ɪ] to [e].

<u>Older Teribes say:</u>	<u>But most younger Teribes say:</u>
[ʔi'bi] /ibi/ 'witch-doctor'	[bi] /bi/ 'witch-doctor'
[ʔi'bi] /ibë/ 'crab'	[bi] /bë/ 'crab'
[ʔi'ga] /iga/ 'skunk'	[ga] /ga/ 'skunk'
[ʔi'no] /ino/ 'people'	[no] /no/ 'people'
[ʔi'mo] /imo/ 'jealous'	[mo] /mo/ 'jealous' ¹⁹

Table 6: Initial vowel loss

Because of its predictability, it is my conclusion that glottal stop is not a phoneme of Teribe. It may be that an “emphasized glide” phoneme is being created in words such as [ʔwi] /uwë/ ‘eat’ and [ʔyi] /iyë/ ‘drink’, because they do appear to be considered one-syllable words, but I am reluctant to give them phonemic status as yet. The number of words of this type encountered so far is very small, so for now I will treat them as being underlyingly two-syllable words with a homorganic vowel and glide.²⁰

6.2 The Affricates [tʃ] and [dʒ]

I have analyzed the affricate sequences [tʃ] and [dʒ] as the single phonemic segments [ç] and [ʒ], represented as /ch/ and /dh/, respectively. These affricates are relatively rare,²¹ but it does seem that they are phonemic because of the severe cooccurrence restrictions on their component segments. The segment [ʃ] never occurs as the second consonant in a syllable-internal CC cluster except following [t], just as [ʒ] never occurs as the second consonant in a syllable-internal CC cluster except following [d]. In fact, of the class of Teribe fricatives [s,z,ʃ,ʒ,h], only [ʃ] and [ʒ] can occur second in a syllable-internal CC cluster, and then only after [t] and [d], respectively. In all other cases, the fricative is the first consonant in the syllable-internal CC cluster.²² Further evidence comes from native speaker behavior. When writing words with a [tʃ] sequence, native speakers do not use the separate segments /t/ and /sh/, but rather borrow the digraph for the affricate /ch/ from Spanish. In this way they indicate that they think of it as one sound, not two. Spanish does not have the affricate sound [ʒ] so there is no symbol to

¹⁹These are all of the words of this class collected to date.

²⁰Glottal stop has been found to be nonphonemic in Térraba and Cabecar, as well. Heinze (1980:8) posited it as a phoneme of Teribe (although Koontz and Anderson (1974) had not) either because she did not recognize the vowel length of words like [ɔ:] /ää/ ‘chicha (a drink)’ or simply because she chose to mark the glottal stop rather than the vowel length. Wilson (1972) and Constenla (1981) posit glottal stop as a phoneme of Bribri, but Schlabach (1974:360) does not. He explains that it has a very limited distribution (only following an accented syllable pre-pause) and is more likely a manifestation of a higher-level phoneme of glottalization.

²¹I have only eight words with /ç/ and only the two given as examples for /ʒ/.

²²[t] and [s] do occur in conjunction in a CC cluster word-internally, but only in onomatopoeic words, e.g. [pwats] /pwats/ ‘the sound of something breaking’, or across syllable boundaries, e.g. [kyot'so] /kyotso/ ‘throat’.

borrow for that, and I have not witnessed a Teribe speaker writing a word with the [ʧ] sound, but it is highly unlikely that they would think of [tʃ] as one sound and [dʒ] as two. Therefore, analyzing [tʃ] and [dʒ] as the single phonemic segments [ç] /ch/ and [ʒ] /dh/ seems the better analysis.²³ For example:

- (34) [ˈçirawa] /chirawa/ ‘small’
[ˈkuçɪ] /köchi/ ‘pig’
[ˈʔoçan] /ochang/ ‘candle’
[ˈzanswa] /dhanswa/ ‘june bug’
[ʒet̚ ʒet̚] /dhet dhet/ ‘shiny, bright’

6.3 The Glides [y] and [w]

I have interpreted the high vowel glides around the syllable nuclei as the consonants /y/ and /w/, rather than as the vowels /i/ and /u/. I refer here to Teribe syllable structure, which otherwise allows only one vowel per syllable. If we were to interpret these segments as vowels, we would be breaking the syllable structure or adding syllables where they do not exist. In Teribe there are no unambiguous examples of a (C)V syllable being followed by a V(C) syllable, thus allowing two vowels to come together.²⁴ Yet words such as the following are common:

- (35) [ˈiyo] /yo/ ‘earthquake’
[ˈiːaːga] /yayga/ ‘white-face monkey’
[ˈuŋ] /wong/ ‘iguana’
[ˈaːli] /walë/ ‘woman’

If we were to interpret these initial glides as vowels, we would have many V.V(C) words (e.g. /iyo/ ‘earthquake’, /uŋ/ ‘iguana’), but the only vowels allowed in these initial syllables would be /i/ and /u/ and, unlike all other nonlengthened vowels, they would not have a preceding glottal stop. To avoid such an unnatural state of affairs, these glides must be interpreted as consonants.

Lininger (1978), following Bourland’s analysis of Cabecar (1975), analyzes these high vowel glides as VV syllables in Térraba. However, she also posits phonemic /y/ and /w/, and has no unambiguous examples of a VV sequence (one that does not involve /i/ or /u/),

²³Cabecar and Bribri have both of these segments. Lininger (1978) recognizes /ch/ for Térraba, but Constenla (1981) does not. Koontz and Anderson (1974) did not recognize either affricate segment, nor did Heinze (1980), but in later literacy material, produced by Schatz (néé Koontz), /ch/ is listed in the Teribe alphabet.

²⁴With the sole exception of the addition of the stative marker [-e] /-e/ to a vowel-final word, e.g. [tʰa ˈtoe] /tja to-e/ ‘I’m going’. Native speakers did not like the conjunction of vowels when writing words such as “toe” and felt much more comfortable with a hyphen between them: “to-e”.

6.4 The Phonemes /d/ and /r/

There is some evidence for the overlapping of the phonemes /d/ and /r/. As mentioned in the previous section, both the interrogative affix and the subject marker affix have forms which begin with /d/ following consonants and /r/ following vowels. This might lead one to think that the two forms of each are the same morpheme with two surface forms due to phonetic environment. An interesting word which points in the same direction is [ˈdyoryo] /dyoryo/ ‘soft’. In Teribe, many color terms and other adjectives consist of two syllables, the second a reduplication of the first:

- (38) [ˈpʰ.lub.lun] /pjluplun/ ‘white’
[ˈsɾɛzɾɛn] /sresren/ ‘red’
[ˈlʷ.liˈlɪ] /wliwli/ ‘dirty’
[ˈdɛŋdɛŋ] /dengdeng/ ‘thin’
[ˈpɾibri] /pɾipri/ ‘coiled up’
[ˈpʰ.lib.li] /pjlipli/ ‘sweet’

We can see that if the reduplicated syllable contains an initial voiceless stop or sibilant, it becomes voiced due to its new environment of coming after a vowel, as well as preceding a voiced segment. This voicing is a general phonological rule of Teribe (see section 8.1). It looks like the reduplicated syllable of [ˈdyoryo] /dyoryo/ ‘soft’ is also obeying a phonological rule which stipulates that /d/ follows consonants and /r/ follows vowels. In the language as a whole, however, this complementary distribution does not hold, as we get both /d/ and /r/ following consonants and vowels:

- (39) [ʃrunto] /shrunto/ ‘early morning’
[ʃɛdun] /shdun/ ‘punish’
[ʃorɪ] /shorɛ/ ‘sweat (n.)’
[ˈkworbodo] /kworbodo/ ‘thigh’

These phonemes also are found beginning words:

- (40) [ˈroʃko] /roshko/ ‘inside’
[ˈdorko] /dorko/ ‘under’
[rikʰ] /rik/ ‘tie up’
[dikʰ] /dik/ ‘like, similar’

There is evidence of other complimentary distribution between /r/ and /d/, but it is the same as the complementary distribution between the sets of flaps (only next to the vowel) and voiced stops (never syllable final) as a whole. While the evidence for phonemic overlap is intriguing, the rule involved is found to be unproductive in the language as a

whole, and so I will treat the morphemes and reduplicated syllables with /r/ and /d/ variants as manifestations of the two different phonemes.

The word [ʼçirawa] /chirawa/ ‘small’ illustrates the interrelatedness and also the phonemic difference of the alveolar flaps and the voiced alveolar stop /d/:

- (41) [ʼçirawa] /chirawa/ ‘small’
[ʼçilawa] /chilawa/ ‘small (pl.)’
[ʼçidawa] /chidawa/ ‘small child’

6.5 The Sequences [kw] and [gw]

Koontz and Anderson (1974) as well as Heinze (1980) analyzed the sequence [kw] as in [kwrʼsi] /kwəsi/ ‘rat’ and the sequence [gw] as in [ɣurʼɣwo] /görgwo/ ‘bat’ as labialized stops, that is, as the single phonemic segments /k^w/ and /g^w/, respectively. The sequence [gw] is relatively uncommon, and in present data it is restricted to beginning the final syllable of a word, as in [ʼkɔgwa] /kɔgwa/ ‘father’s brother’. But the sequence [kw] is quite common, beginning syllables both word-initially and word-internally, eg. [ʼkwɛgwo] /kwɛgwo/ ‘tortoise’; [ʼsakwo] /sakwo/ ‘finger’. Neither the [kw] nor the [gw] sequence occurs syllable-final, as would be expected of a stop-glide sequence, since glides are restricted to occurring next to the vowel nucleus in Teribe (see 7.2.5). The sequence [kw] does occur more often than the sequence of [w] following any of the other stops, but [w] is certainly not restricted to following [k] or [g] or any other segment.

According to Levinsohn (1975:6) all of the Chibchan languages in Panama (Guaymí, Bokotá, and Teribe), have the labialized segments /k^w/ and /g^w/ . However, he was relying on the analysis of Koontz and Anderson (1974) for Teribe,²⁵ who appear to have been assuming too much similarity between the Panamanian Chibchan languages. The other Chibchan languages in Panama are of the Guaymí branch and do not have the independent segment /w/, whereas Teribe does. In this way it fits in quite nicely with the other members of the Talamancan branch, Bribri and Cabecar, which also have the independent segment /w/ but not /k^w/ or /g^w/.²⁶ In other words, in the Guaymí branch [w] occurs only in conjunction with /k/ or /g/, but in the Talamancan branch [w] occurs with a wide range of other segments, as well as alone. For example, in Teribe we find:

²⁵He credits them as his source for the Teribe data on the unnumbered page 3 of the preface for the volume.

²⁶Constenla is consistent in his refusal to admit /y/ and /w/ to the phoneme inventory of any Chibchan language, even though for Cabecar he says, “/i/ and /u/ have asyllabic manifestations when occurring toneless in contact with other vowels” (1984:104) and for Bribri, “Tonally neutral /u/ and /i/ present semivocalic manifestations before vowels” (1984:115). Wilson (1972), Schlabach (1974) and Lininger (1977) do recognize phonemic /y/ and /w/ in the Talamancan branch, as do Koontz and Anderson (1974) and Heinze (1980).

- (42) [wɛn] /wɛn/ ‘be born, appear’
 [waˈlɪ] /walë/ ‘woman, wife’
 [twe] /twe/ ‘come’
 [dwaˈyo] /dwayo/ ‘from’
 [ˈʒwirwa] /zhwirwa/ ‘a type of insect’
 [ˈtawa] /tawa/ ‘we (excl.)’
 [koˈwo] /kowo/ ‘tooth’
 etc.

Neither does syllable structure provide us with evidence for labialized stop phonemes in Teribe.²⁷ The word [ʃk^w.lɪ] /shkwëlë/ ‘ñeque (a large rodent)’ was presented by Heinze (1980:3) as proving the existence of /k^w/ in this way. She reasoned correctly that the [w] must be labialization rather than a full phoneme, otherwise four initial consonants would be presented, thus breaking the maximal syllable in Teribe of (C)CCVC (see section 5). This would also violate the restriction that glide phonemes occur only next to syllable nuclei. However, apparently due to influence from the Guaymí branch, she attached the labialization to the /k/. In actuality the labialization belongs to the /l/, not the /k/, as was also explained in section 5. This previously unrecognized pre-labialized lateral segment /^wl/ is abundant throughout the language, often following /k/ as in [ʃk^w.lɪ] /shkwëlë/ ‘ñeque (a large rodent)’. It also occurs word-initially, e.g. [ˈ^w.lo] /wlo/ ‘wasp’, as well as following segments other than /k/, e.g. [t^w.lëkˀ] /twlëk/ ‘buy’, [s^w.lo] /swlo/ ‘sick’. This incorrect attachment of the labialization to the preceding rather than the following segment contributed to the motivation for positing /k^w/ and, for the sake of symmetry, /g^w/ in Teribe.²⁸ Since, then, there is no solid evidence for the

²⁷It might be thought that some motivation for a /k^w/ phoneme could be inferred from the word [ˈkwoʃkwɪ] /kwoshkwë/ ‘wash’. If divided by the syllable mapping template as in section 5.1, the word would divide as /kwosh.kwë/ and give us no problem. It appears, however, that native speakers prefer to divide the syllables thus: /kwo.shkwë/. This leaves too many consonants beginning the second syllable, unless the sequence /kw/ is considered one phoneme. However, this is a compound word, consisting of the shape marker /kwo/ added to the word /shkwë/, which means ‘wash’ all by itself. According to the rules of extraprosodicity, the sibilant is allowed to begin a CCC cluster only word-initially. Thus it appears that morpheme boundaries have priority over the syllable template when dividing compound words and that the extraprosodical sibilant is allowed to remain with its original morpheme. A word with the same internal consonant cluster is [ˈmiʃkwo] /mëshkwo/ ‘cat’. In this case the word is not a compound and it is divided according to the syllable template: /mësh.kwo/. As evidence for this I refer to the common “pet” name for a cat which is /mëshi/, indicating that the /sh/ ends the first syllable since it isn’t deleted with the second. In neither case is a /k^w/ phoneme necessary.

²⁸It has been pointed out to me by Andrew Keener (personal communication) that some of the older Teribes pronounce certain words with more consonants in an internal cluster than do younger Teribes, indicating that in the past Teribe may have had a larger syllable template or that there may have been a labialized stop phoneme. They say, for example, [ˈk^hiŋʒgwɛkˀ] /kjingzhgwɛk/ ‘make level’ rather than the standard [ˈk^hiŋʒwɛkˀ] /kjingzhwɛk/ and [ˈk.lopsgwɪ] /klopsgwë/ ‘change (v.)’ instead of [ˈk.losgwɪ] /klogswë/ or [ˈk.loswɪ] /kloswë/ as pronounced by middle-aged and younger Teribes.

existence of /k^w/ and /g^w/ in Teribe or any of the other Talamancan languages, it is simpler and therefore better to exclude them from the phonology.

6.6 The Alveopalatal Nasal /ñ/ (/ɲ/)

It is possible that this segment is not a phoneme. It is quite rare and could be just the conjunction of the two phonemes /n/ and /y/. The phoneme /y/ occurs freely in conjunction with other consonants, including nasals:

- (43) [k^hyoŋ] /kɲyong/ ‘canoe’
[s^hyōʃtɪ] /syōshtë/ ‘pray’
[sabyɪ] /sabyë/ ‘trip, stumble’
[mya] /mya/ ‘three’
[wɪŋya] /wëngya/ ‘kidney’

If /ñ/ is a phoneme, compared to the other nasals ([n], [m] and [ɲ]) it only occurs five to ten percent as often and, unlike the other nasals, it never occurs in a CC cluster, so syllable structure gives us no help in determining if it is one sound or two:²⁹

- (44) [ɲotso] /ñotso/ ‘better, well’
[piɲako] /piñako/ ‘cilantro’
[ʃuɲo] /shuño/ ‘rain’

Because of these restrictions and in the interest of simplicity, then, it might seem best to assume that /ñ/ is not a phoneme. However, native speakers much prefer the use of /ñ/ over /ny/. They even use /ñ/ to represent what sounds like a nasal /y/, or perhaps a /y/ next to a nasal vowel:

- (45) [ʔu^hỹɪk^ɪ]~[ʔu^hɲik^ɪ] /uñik/ ‘visit’
[^hỹō]~[ɲo] /ño/ ‘(a) lie’
[^hmĩỹākwo] /shmiñakwo/ ‘banano primitivo (a type of banana)’

In fact, one Teribe speaker without any formal education or any training in Teribe orthography consistently spelled the Spanish word “muy” as “mun” (using a computer keyboard on which it is not apparent how to use the tilde).

In verb morphology the final consonant of the “base” form is deleted before the various verb endings are added (cf. sections 8.4.2 and 8.5.3). But if this final consonant is a nasal, the nasality is left behind and attaches to the first consonant of the verb ending. For

²⁹I have only 11 examples of /ñ/ at hand which have not been formed by verb morphology. The variant pronunciation of [ɲo] /ño/ ‘(a) lie,’ as [^hỹo] is, I believe, a lack of closure of the /ñ/ resulting in a breathy onset; it is not a true CC cluster of /h/ and /ñ/.

example, the “base” form of the verb meaning “sharpen” is [hun] /jön/. The second person singular ending is [-pʰ] /-p/. With the nasality combining with the bilabial point of articulation, ‘you (sing.) sharpen’ is realized as [hum] /höm/. The first person plural inclusive ending is [-y] /-y/. So “we (incl.) sharpen” is [hũỹ]. Heinze (1980:9) chose to represent this as /jõñ/, claiming that what we have phonemically is an /ñ/ which does not have full closure. This would be the natural outcome of the nasality combining with an alveopalatal point of articulation. This is also consistent with the words listed above in which the /ñ/ does not always close.

It would certainly be simpler and more elegant to posit the existence of the phoneme /ñ/ for all of the above cases than adding a nasalized glide segment [ỹ] for words where the /ñ/ doesn’t close or for the outcome of verb morphology. It also is advantageous sociolinguistically to recognize /ñ/ as a phoneme, since it is well known from Spanish. The other Chibchan languages in Panama (Levinsohn 1975) recognize /ñ/ as a phoneme but they do not have /y/, ruling out the sequence /ny/ as an option for them, but Wilson (1972) recognizes both /ñ/ and /y/ in Bribri.³⁰ Constenla (1981) does not recognize /ñ/ for Bribri or Cabecar, but he does for Térraba, as does Lininger (1978). Teribe has affricates and fricatives at the alveopalatal point of articulation so it seems natural to have a nasal there as well. It is my conclusion that /ñ/ is a phoneme of Teribe and one which does not always have full closure.

6.7 Long Vowels

There is a small group of words in Teribe with long vowels which could be interpreted as a sequence of two identical vowels or as one lengthened vowel. However, as already mentioned (in sections 5 and 6.1), VV sequences are not a characteristic of Teribe. It would seem best, then, to interpret these few words as exhibiting lengthened vowels, rather than as two identical vowels in a row. Further evidence that they are single, unusual vowels rather than a sequence of two normal vowels is that there is no preceding glottal stop before them, as mentioned in section 6.1. I will repeat the list here:

- (46) [i:r] /iir/ ‘be angry’
[u:ʰʃi] /uushi/ ‘child-stealing spirit’
[u:r] /öör/ ‘arrive somewhere and leave again’
[ʰo:ka] /ooka/ ‘serpent-spirit’
[ɔ:] /ää/ ‘chicha (a drink)’
[ɔ:r] /äär/ ‘arrive’
[ʰb:lu] /ääl/ ‘headless spirit’

³⁰Schlabach (1974), however, maintains that there are no nasal consonant phonemes in Bribri. [m], [n], [ñ] and [ɲ] are allophones of /b/, /d/, /j/ and /k/, respectively, due to the environment of a nasal vowel or, in the case of /k/, the presence of a following /b/, /d/ or /j/. Constenla’s (1981) analysis is similar for both Bribri and Cabecar.

Although these are all phonemically single vowels, we represent them as double vowels in the orthography. This is more convenient than marking them in some other way, and native speaker reaction has been quite positive, although they reject VV representations involving the only other VV sequence in the language: a vowel-final word plus the stative marker /-e/. For example, instead of writing /pjlue/ ‘good’, they prefer to represent the syllables as separate thus: /pjlue/ ‘good’ (see footnote 24).

It could be argued that these are long allophones of normal vowels which appear word-initially in the environment of the absence of a glottal stop, but this seems unlikely since glottal stop is not phonemic. Besides that, one would be left to explain why the glottal stop was missing in these few words (see footnote 16). Because only seven words have been found (so far) which exhibit these vowels, I tend to think that they are remnants of phonemes which are no longer productive parts of the language. Three of the seven are proper names of spirits passed down from generation to generation, which would resist change even though the rest of the language was changing. They perhaps provided the core of this group of hold-outs, around which the others have been slowly chipped away. For example, the word [i:r] /iir/ ‘be angry’ appears to be currently in the process of change. When a second syllable is added it is almost always pronounced beginning with a glide: [ʔyirke ʔara] /yirke ara/ ‘he is very angry.’

6.8 The Nasal Segments [ĩ] (/ë/) and [ũ] (/ö/)

Teribe has eight oral vowels and six nasal vowels which are the nasal counterparts of six of the oral vowels. That leaves two oral vowels, /ë/ and /ö/, with no corresponding nasal vowel. Koontz and Anderson (1974) and Heinze (1980) posited a full set of nasal vowels (eight) to correspond with the oral vowels both for the sake of symmetry and because nasal manifestations of the two vowels in question do occur. However, they only occur in derived forms of verbs. Specifically, these vowels become nasalized when verbs containing them which end in /n/ have the /n/ removed in order to attach the imperative endings. The nasalization of the /n/ then becomes attached to the vowel.³¹ For example:

- (47) [sm] /sën/ ‘to give food’ plus /-s/ becomes [sĩs] /sëš/ ‘you (sing.) give food!’
 [hun] /hön/ ‘to sharpen’ plus /-s/ becomes [hũs] /jöss/ ‘you (sing.) sharpen!’
 [kun] /kön/ ‘to cut down’ plus /-s/ becomes [kũs] /köš/ ‘you (sing.) cut (it) down!’

Bribri, Cabecar and Térraba have very similar vowel systems to Teribe, with distinctions of high, mid, low, front, and back. Like Teribe, they have a close/open (tense/lax) distinction only in the high vowels, yielding phonemic contrasts between [i] and [ɪ], [u] and [ʊ]. Also like Teribe, all of the oral vowels have nasal counterparts except the high open vowels, [ɪ] and [ʊ]. Constenla (1981:104,116) observed this phenomenon in Bribri and Cabecar and explained that “the contrast tense/lax is neutralized in the presence of

³¹For a more in-depth look at this process, see sections 8.5.3 and 8.5.4.

nasalization”.³² Teribe operates in the same way, with the high vowels being close enough that there are not both high tense and high lax nasal phonemes.

The vowels in these verbs also sound quite nasal when they precede the glide /y/ which is attached as a verb ending for the first person plural inclusive and third person forms. Nevertheless, the nasalization in this case is attached to the consonant /y/, not the vowel, (even though it spreads quite freely) and is not marked on the vowel:³³

- (48) [sĩỹ] /sẽñ/ ‘we (incl.) give (food)’
[sĩỹã] /sẽña/ ‘3pers. give (food)’
[hũỹ] /höñ/ ‘we (incl.) sharpen’
[hũỹã] /höña/ ‘3pers. sharpen’
[kũỹ] /köñ/ ‘we (incl.) cut (it) down’
[kũỹã] /köña/ ‘3pers. cut (it) down’

Because these nasal manifestations of the vowels /ë/ and /ö/ occur only in derived forms and are not there underlyingly, that is, in any form contained in the lexicon, I prefer to not give them phonemic status.

³²He did not apply the same explanation to Tórraba because of a neutralization of nasal contrasts found following voiced stops (only oral vowels follow) and nasal consonants (only nasal vowels follow), such that nasalization did not need to be marked in those environments (1981:126). Teribe does not have those neutralizations, and nasalization must be marked, e.g. [dǎgɪ] /dgë/ ‘plant’ vs. [dǎ^lgũʃo] /dgũsho/ ‘brains’, [nek^l] /nek/ ‘toast’ vs. [nǎk^l] /něk/ ‘put away, bury’.

³³For a more in-depth look at this process, see sections 8.5.3 and 8.5.4. For a discussion of /ñ/, see section 6.6.

7 Description of Phonemes

7.1 Charts of the Phones

7.1.1 Contoids

	Bilab.	Dental	Alveo.	Alveopal.	Velar	Glottal	
vl.	p		t		k	ʔ	stop
vl.	p ^h		t ^h		k ^h		aspirated stop
vl.	p ^ʼ		t ^ʼ		k ^ʼ		unreleased stop
vd.	b		d	g			stop
vl.					ç		grooved affricate
vd.					ʒ		grooved affricate
vl.					h		fricative
vd.	β				ɣ		fricative
vl.			s	ʃ			grooved fricative
vd.			z	ʒ			grooved fricative
vd.			l				lateral
vd.	m		n	ɲ			nasal
vd.			r				flap
vd.			ɻ				retroflexed lateral flap
vd.			^w ɻ				prelabialized retroflexed lat. flap
vd.			r				trill
vd.	w		y				approximant
vd.	ɰ		ỹ				nasal approximant

Table 7: Contoids

7.1.2 Vocoids

	Front		Central		Back	
	Unround	Round	Unround	Round	Unround	Round
high close	i	i:			u	u:
nasal	ĩ					ũ
high open	ɪ					
U U:						
nasal	ĩ					ũ
mid close	e				o	o:
nasal	ẽ					õ
mid open	ɛ		ə	ə̃		
nasal	ẽ					
low close						
nasal						
low open	a				ɒ	ɒ:
nasal	ã					õ

Table 8: Vocoids

7.2 Distribution of Allophones

(For phonemic contrasts see section 7.3.)

7.2.1 Stops

/p/

Allophones: [p],[p̚],[b]. The allophone [p̚] (unreleased) occurs word-final before a pause and is most noticeable when [p̚] closes a stressed syllable:

- (49) [bop̚] /bop/ ‘your (sing.)’
[ʃtop̚] /shtop/ ‘niece, nephew’
[mar^wlɪp̚] /marwlöp/ ‘hummingbird’

The allophone [b] occurs intervocally or between a vowel and a voiced consonant in fast speech:

- (50) [wlep̚] /wlep/ ‘tame, calm’ plus the [-e] /-e/ ‘stative’ marker becomes:
[wle:bɛ] /wlep-e/ ‘is tame, calm’
[kwɛ] /kwe/ ‘that’ plus /-pga/ ‘plural (human)’ becomes:
[kwɛböga] /kwepga/ ‘they, them’

The allophone [p] occurs everywhere else:

- (51) [pɪ] /pë/ ‘sleep’
[wop¹kum] /wopkum/ ‘what measure?’
[ʃpök̚] /shpok/ ‘hit’

/t/

Allophones: [t],[t̚],[d]. The allophone [t̚] occurs word-final before a pause and is most noticeable when [t̚] closes a stressed syllable:

- (52) [wɪt̚] /wët/ ‘smooth’
[pe¹sit̚] /pesit/ ‘later’
[.lōʃit̚] /lōshit/ ‘smell (v.)’

The allophone [d] can occur intervocally in certain words:

- (53) [pit̚] /pit/ ‘finish off’ plus the [-e] /-e/ ‘stative’ marker becomes:
[pide] /pit-e/ ‘is finished, gone’
[drete] /drete/ ‘does not exist’ has an alternate pronunciation:

[dre'deŋ] /drete/ 'does not exist'

The allophone [t] occurs everywhere else:

(54) [tokʰ] /tok/ 'flee'

[tlapöga] /tlapga/ 'Mr., Mrs., ancestor'

[ʃtɛn] /shten/ 'cough, choke'

[ʔo'to] /oto/ 'what's wrong?'

/k/

Allophones: [k], [kʰ], [ŋ], [g]. The allophone [kʰ] occurs word-final before a pause and is most noticeable when [kʰ] closes a stressed syllable:

(55) [mokʰ] /mok/ 'moon'

[ʒwɛkʰ] /llwek/ 'fix, straighten'

[ʔu'ỹikʰ]~[ʔu'nikʰ] /uñik/ 'visit'

The allophone [ŋ] may occur following a nasal vowel before a pause and is due to the nasalization of the vowel and the unreleasedness of the stop:

(56) [iŋ]~[ikʰ] /ik/ 'see'

The allophone [g] can occur in fast speech intervocalically or between a vowel and a voiced consonant:

(57) [l'kəgzon 'stige] /käkzong stëke/ 'thin, fine hair'

head.hair thin.Stat

[kʰi'bokwo gwa'ra] /kjibokwo kwara/ 'one book'

book one

[ʃri e hiɡ luŋ] /shri e hëk löng/ 'the wild pigs are walking'

wild-pig Dem walk be-pl

The allophone [k] occurs everywhere else:³⁴

(58) [l'kurku] /körkö/ 'hen'

[l'mi{kwo] /mëshkwo/ 'cat'

[l'ʔuŋkoŋ] /önkong/ 'all'

³⁴Bourland (1975) and Lininger (1978:8) report that the voiceless stop /k/ is actually lengthened pre-pause for Cabecar, Bribri, and Térraba. Lininger adds that this is also true of /p/ in Térraba. They make no mention whether these stops are released or unreleased in that environment. However, Constenla finds no evidence for stop-lengthening in any of those languages.

/pj/

This phoneme has only one phonetic shape, [p^h], and occurs only word-initially:

- (59) [p^ha] /pja/ ‘you (sing.)’
- [^lp^heyöga] /pjejga/ ‘people, family’
- [p^hlu] /pjlu/ ‘heart, king, good’

/tj/

This phoneme has only one phonetic shape, [t^h], and occurs only word-initially:

- (60) [t^ha] /tja/ ‘I, me’
- [t^huŋ] /tjöng/ ‘full’
- [t^hyoŋ] /tjyong/ ‘boat’
- [t^hɪɪ] /tjëtë/ ‘grandmother’

/kj/

This phoneme has only one phonetic shape, [k^h], and occurs only word-initially:

- (61) [k^hor] /kjoɾ/ ‘tree’
- [^lk^hɪmtɪ] /kjëmtë/ ‘help’
- [k^hʂlak^ɿ] /kjlak/ ‘toad’³⁵

/b/

Allophones: [b], [β]. The allophone [β] tends to occur in fast speech intervocalically or between /y/ and a vowel (/wb/ and /bw/ never occur):

- (62) [ʃagoβa luŋ]~[ʃakoba luŋ] /shakoba löng/ ‘they’re catching it’
- [ʔõỹβiŋ]~[ʔõỹbiŋ] /äybing/ ‘a type of plantain’
- [troβyoŋ]~[trobyoŋ] /trobyong/ ‘flying ant that bites’

The allophone [b] occurs otherwise:

³⁵It is interesting to note that Bribri has phonemically aspirated stops, but they are pre-aspirated, rather than “post-aspirated” as in Teribe (Schlabach 1974:357). Lininger (1978) makes no mention of aspirated stops in Térraba, but Constenla (1981:118) recognizes /t^h/ and /k^h/. It appears that the Teribe phoneme /p^h/ has become the bilabial fricative /β/ in Térraba. For example, the Teribe words: /p^ha/ ‘you (sing.)’, /p^hlara/ ‘one’, /p^hluŋ/ ‘ashes’, /parkɪ/ ‘work’, /pɪ/ ‘sleep’, are respectively in Térraba: /βa/ ‘thou’, /βlara/ ‘one’, /βluŋ/ ‘ashes’, /parkɪ/ ‘work’, /pɪ/ ‘sleep’. (Térraba examples are from Constenla (1981)). Cabecar appears to have no phonemic contrast of aspiration.

- (63) [boy] /boy/ 'wife'
[ˈñabgwɪ] /ñabgwë/ 'trick'
[brikˀ] /brik/ 'leave'
[dʰəˈboŋ] /dbong/ 'tiger'
[kʰiˈbokwo] /kjibokwo/ 'book'

/d/

This phoneme has only one phonetic shape, [d]. It can occur as the first or second consonant in a syllable, but can never close a syllable. Examples:

- (64) [di] /di/ 'water'
[druŋ] /dröng/ 'machete'
[zədam] /sdam/ 'plains'
[dəba] /dba/ 'day'
[kʰoneˈdey] /kjonedey/ 'which ones?'

/g/

Allophones: [g], [ɣ]. The allophone [ɣ] tends to occur in fast speech before a vowel or [w] (/gy/ never occurs):

- (65) [ɣurˀɣwo] /görgwo/ 'bat'
[ˈkweɣwo] /kwegwo/ 'tortoise'

The allophone [g] occurs otherwise:

- (66) [ga] /ga/ 'skunk'
[ñaˈglo] /ñaglo/ 'picture'
[kwomˀgwo] /kwomgwo/ 'ear'
[zəˈgõgwo] /zgãgwo/ 'leaf-cutter ant'

7.2.2 Fricatives and Affricates

/ch/

This phoneme is the affricate [ç]. It has only one phonetic shape and occurs syllable-initial, never in a CC cluster:

- (67) [ˈçige] /chige/ 'oldest brother'
[ˈʔiçɪ] /ichë/ 'send'

/dh/

This phoneme is the voiced affricate [ʒ]. It has only one phonetic shape and occurs syllable-initial, never in a CC cluster:

- (68) ['zanswa] /dhanswa/ 'june bug'
- [ʒet̚ ʒet̚] /dhet dhet/ 'shiny, bright'

/sh/

This phoneme is the alveopalatal fricative [ʃ]. It has only one phonetic shape. It almost always occurs before the vowel (in the syllable onset)³⁶ and when in a CC cluster, it is always first:

- (69) ['ʃɪɾɪ] /shëtë/ 'dog'
- [ʃwoŋ] /shwong/ 'cloth, clothes'
- [ʃkwɪ] /shkwë/ 'wash'
- [ʰlõʃit̚] /lõshit/ 'smell'
- [ʃỹõʃɪɾɪ] /syõshtë/ 'pray'
- [ʰmɪʃkwɔ] /mëshkwo/ 'cat'
- [ʰkwɔʃkwɪ] /kwoshkwë/ 'wash'

/zh/

This phoneme is the voiced alveopalatal fricative [ʒ]. It has only one phonetic shape. It only occurs syllable-initial and if in a CC cluster, it is always first:

- (70) [ʒɪ] /zhë/ 'what?'
- [ʒwaŋ] /zhwang/ 'disassemble'
- [ʒə'griglo] /zhgriglo/ 'side of body'
- [ʰduʒɪŋ] /dözhing/ 'vine'
- [ʔopə'ʒwɛk̚] /opzhwek/ 'stretch'

/j/

This phoneme has only one phonetic shape, [h]. It only occurs syllable-initial and if in a CC cluster, it is always first:

³⁶The only examples I have of /sh/ occurring syllable-final are the word [ʰmɪʃkwɔ] /mëshkwo/ 'cat' (see footnote 27) and the onomatopoeic word [ɾɪʃ] as in [ɾɪʃ ɾɪʃ ɾɪʃ...] /rish rish rish.../ 'the sound of a tiger running' or [hɛk̚ ɾɪʃ] /hek̚ rish/ 'he/she/it fell over'.

- (71) [hɛkʰ] /jek/ 'go'
[hɔn] /jön/ 'sharpen'
[hlõ] /jlõ/ 'true'
[ʰhɛzron] /jnezron/ 'restful'
[boŋʰhã] /bongjä/ 'tomorrow'

7.2.3 Nasals

/m/

This phoneme has only one phonetic shape, [m]:

- (72) [mokʰ] /mok/ 'moon'
[mya] /mya/ 'three'
[mlũ mlũ] /mlũ mlũ/ 'palanquilla (a type of plant)'
[ʒɪm] /zhëm/ 'not'
[do'mɛɾ] /domer/ 'man'
[kʰɪmtɪ] /kjëmtë/ 'help'
[kwom'gwo] /kwomgwo/ 'ear'

/n/

This phoneme has only one phonetic shape, [n]:

- (73) [na] /na/ 'here'
[ʰhɛzron] /jnezron/ 'restful'
[gmǎ'mo] /gënmo/ 'orange'
[yon] /yon/ 'good'
[ʰʃunsli] /shunsli/ 'name of a spirit'

/ɲ/

Allophones: [ɲ], [ỹ]. The allophone [ỹ] occurs intervocally and word-final due to verb morphology, in which case the segment is not given full closure:

- (74) [hũỹ] /höñ/ 'we (incl.) sharpen'
[hũỹã] /höña/ '(3pers.) sharpen'
[sãỹ] /sañ/ 'we (incl.) return'
[sãỹã] /saña/ '(3pers.) return'

The allophone [ỹ] occurs in more or less free variation with [ɲ] in certain other words:

- (75) [ʔu'ʝikʰ]~[ʔu'ɲikʰ] /uñik/ 'visit'
[hʝo]~[ɲo] /ño/ '(a) lie'
[ʃmĩyãkwo] /shmiñakwo/ 'banano primitivo (a type of banana)'

The allophone [ɲ] occurs elsewhere:

- (76) [ʎnotso] /ñotso/ 'better, well'
[pi'ɲako] /piñako/ 'cilantro'
[ɲa'glo] /ñaglo/ 'picture'
[ɲabgwɪ] /ñabgwë/ 'trick (v.)'

/ng/

This phoneme has only one phonetic shape, [ŋ]. It only occurs syllable-final:

- (77) [ʔɪŋ] /ëng/ 'yes'
[dʊʒɪŋ] /dözhing/ 'vine'
[sɔŋbo] /songbo/ 'almost ready'
[wɪŋgla] /wlinggla/ 'male'

7.2.4 Laterals, Flaps and Trills

/l/

Allophones: [l], [ɭ]. This phoneme occurs only syllable-initially and only next to the vowel. The allophone [l] is a plain alveolar lateral, not a flap, very similar to the /l/ of Spanish or English. It occurs intervocally:

- (78) [dǎba'la] /dbala/ 'stars'
[pʰo'la] /pjola/ 'far'

The retroflexed alveolar flap allophone [ɭ], produced by curling the tongue back, then flapping it forward against the alveolar ridge, occurs elsewhere:

- (79) [dli] /dli/ 'food'
[kɭikʰ] /kɭik/ 'hot'
[tɭlapõga] /tɭlapga/ 'Mr., Mrs., ancestor'
[sɭar] /sɭar/ 'cry'

When word-initial and not in a CC cluster, the /l/ is often prevocalized. If the nucleus of the syllable contains an oral vowel, the prevocalization takes the form of a short, mid central vocoid [ə̃]. If the nucleus of the syllable contains a nasal vowel, the prevocalization takes the form of a short, alveolar nasal sound [ʎ]:

- (80) [ə̃.lu]~[lu] /lu/ ‘year’
- [ə̃.lan]~[lan] /lan/ ‘talk’
- [ʎ.lãr] /lãr/ ‘crawl’
- [ʎ.lõ] /lõ/ ‘vulture’

/wɫ/

This phoneme, a prelabialized retroflexed lateral flap, has only one phonetic shape, [ʷɫ]. It is the same as the flapped /l/ above, but with prelabialization. It only occurs syllable-initially and only next to the vowel:

- (81) [ʷ.linəmo] /wlinmo/ ‘sloth (the animal)’
- [dʷ.lo] /dwlo/ ‘medicine’
- [kʷ.lɪ] /shkwɫë/ ‘ñeque (a large rodent)’
- [marʷ.lɪpʷ] /marwɫëp/ ‘hummingbird’
- [dʷ.lɪrʷ.lɪnʒikʷ] /dwɫërwɫënzɫik/ ‘name of a certain stream’

This segment was overlooked in previous analyses of Teribe, perhaps because it is unknown in the other languages of the Chibchan family. In fact, it is such a rare item that UPSID³⁷ does not have a single example of it, nor is it listed in Ladefoged (1996). Evidence that it is a single phoneme, rather than the conjunction of the two phonemes /w/ and /l/, is that this labialization behaves very differently than /w/. The phoneme /w/ never occurs in a CC cluster except next to the vowel. This labialization, however, occurs between consonants as well as word-initially followed by a consonant, which is always /l/. Evidence that this labialization is not vocalic comes from the word [sʷ.lo] /swlo/ ‘sick (person)’. Teribe has a plural marker for human nouns that changes shape depending on whether the noun has one or more syllables. For monosyllabic human nouns it is /-pga/, and for polysyllabic human nouns it is /-ga/. If the labialization were vocalic and thus syllabic, we would get */suloga/. Instead, the plural of /swlo/ is [ʷ.sʷ.lɔpɔga] /swlopga/ ‘sick ones’, taking the plural ending for monosyllabic human nouns.³⁸

Recognition of this phoneme clears up a problem in the analyses of Koontz and Anderson (1974:55) and Heinze (1980:5). They state that the first consonant of the maximal CCCV(C) syllable of Teribe can be an alveolar stop or a sibilant. By including the alveolar stops they made an unnatural set of consonants for this position, but they had to account

³⁷UPSID stands for the UCLA Phonological Segment Inventory Database (a survey of 317 languages worldwide) found in Maddieson (1985).

³⁸See section 8.2 for more examples of the plural suffix and an explanation of the transitional vocoid.

for words such as [d^w.lo] /dwlo/ ‘medicine’ and [t^w.lõ] /twlõ/ ‘value’, which they considered to have three initial consonants. We now see that the [w] is labialization, part of the same /w/ phoneme which caused problems with their analysis of true CCCV(C) words (see sections 5 and 6.5) and that the above words are actually CCV(C). The prelabialized retroflexed lateral flap is abundant throughout the language of Teribe. For more examples, see section 7.3.4.

/r/

Allophones: [r], [r̄]. These two allophones (a flap and a trill) appear to occur in free variation, depending on the mood and style of the individual speaker. They can occur syllable-initial or final, but only next to the vowel:

- (82) [ˈrokɪ]~[ˈrokɪ̄] /rokë/ ‘call’
[bor]~[bor̄] /bor/ ‘our (excl.)’
[ˈw.lorˈkɪ]~ [ˈw.lorˈkɪ̄] /wlorkë/ ‘hunt’

It could be that the trill [r̄] is creeping into Teribe due to influence from Spanish. However, when in a syllable-internal CC cluster, only the flap occurs:

- (83) [krik̄] /krik/ ‘thunder’
[zrok̄] /zrök/ ‘kill’
[druŋ] /dröng/ ‘machete’

7.2.5 Approximants

/y/

Allophones: [y], [ỹ]. The allophone [ỹ] occurs when preceded or followed by a nasal vowel and is due to the nasality spreading to the glide:

- (84) [ˈʔõỹβiŋ] /ãybing/ ‘a type of plantain’
[ˈsỹõʃtɪ] /syõshtë/ ‘pray’

The allophone [y] occurs next to oral vowels:

- (85) [yon] /yon/ ‘well, good’
[kyuŋ] /kyung/ ‘rope’
[ˈwɪŋya] /wëngya/ ‘kidney’
[roy] /roy/ ‘inside’
[p^heyõga] /pjeyga/ ‘people’

/w/

Allophones: [w], [w̃]. The allophone [w̃] occurs when preceded or followed by a nasal vowel and is due to the nasality spreading to the glide:

- (86) [skw̃ē] /skwē/ ‘crazy’
[¹m̃ēw̃ã] /m̃ēwa/ ‘mother’s sister’

The allophone [w] occurs next to oral vowels:

- (87) [wa¹ɫɪ] /walɛ̃/ ‘woman’
[¹kwɪskwɪŋ] /kwɛskwɪŋ/ ‘mosquito’
[¹kaw] /shkaw/ ‘nine’³⁹

7.2.6 Vowels

/i/

Allophones: [i], [ɪ]. The phoneme [i] is lax to [ɪ] when preceding a labial consonant (except for the glide /w/) which has been attached due to morphology (see section 8.13.2):

- (88) [di] /di/ ‘water, river’ becomes [¹dɪpɪ] /dɪpɛ̃/ ‘cross the river’
[sɪŋ] /sing/ ‘a woman’s brother’ becomes [¹sɪmɠa] /sɪmɠa/ ‘a woman’s brothers’
[ɫɪk^ɾ] /lik/ ‘cook’ becomes [ɫɪ¹ba] /liba/ as in:
[dli ɫɪ¹ba ɫɔŋ] /dli liba lɔŋ/ ‘People are cooking food.’
 food cook.indef be-pl

This laxing is especially noticeable in verbs, as the second person endings are /-p/ (sing.) and /-mi/ (pl.):

³⁹There appears to be no word-initial /w/ in Tèrraba (Lininger 1978, Constenla 1981). Following silence or a vowel, the /w/ has an /h/ preceding (Constenla’s phonemic spelling and definition): /huoy/ ‘iguana’ Teribe: [woŋ] /wong/ ‘iguana’. Or a /g/ preceding (Lininger’s phonemic spellings and definitions): /gwaré/ ‘wife’, /gwóide/ ‘think’, /gwe/ ‘bathe’. Teribe: [wa¹ɫɪ] /walɛ̃/ ‘woman’, [¹woydɪ] /woydɛ̃/ ‘think (brood)’, [wɪ] /wɛ̃/ ‘bathe’. Arroyo (1972:113) makes the same observation and uses the /gw/ phonemic spelling. According to Lininger this phenomenon even extends to what in Teribe begins with the pre-labialized lateral flap [^wɫ]: [^wɫɔɾ¹kɪ] /wlɔrkɛ̃/ ‘hunt’, [^wɫɪ^wɫɪ] /wliwli/ ‘dirty’. Tèrraba: /gwrórke/ ‘hunt’, /gwrígrí/ ‘dirty’. This does not mean that Tèrraba has a labialized velar segment /gw/, but only a word- (or syllable-) initial allophone of /w/.

	Number & person markers	'cook'	'corner'
		[ɽikʰ] /lik/	[kor'kir] /korkir/
1sing.	[-r]	[ɽir] /lir/	[kor'kir] /korkir/
1pl.incl.	[-y]	[ɽiy] /liy/	[kor'kiy] /korkiy/
1pl.excl.	[-rwa]	[ʰlirwa] /lirwa/	[kor'kirwa] /korkirwa/
2sing.	[-p]	[ɽipʰ] /lip/	[kor'kip] /korkip/
2pl.	[-'mi]	[ɽi'mi] /limi/	[korki'mi] /korkimi/
3	[-ya]	[ɽliya] /liya/	[kor'kiya] /korkiya/

Table 9: Verb forms with /i/ laxing

The allophone /i/ occurs elsewhere, including preceding labial consonants which are present underlyingly:

- (89) [ɽli] /dli/ 'food'
 [ʔikʰ] /ik/ 'yuka'
 [ʃin] /shin/ 'basket'
 [pri'bri] /pribri/ 'all around'
 [kʰi'bokwo] /kjibokwo/ 'book, paper'

/ĩ/

This phoneme has only one phonetic shape. It occurs as the nucleus of a syllable:

- (90) [ʔikʰ] /ik/ 'see'
 [sĩ] /sĩ/ 'black'
 [ʒwĩkʰ] /zhwĩk/ 'crooked'

/ë/

This phoneme has only one phonetic shape: [ɪ]. It occurs as the nucleus of a syllable:

- (91) [ʔipʰ] /ëp/ 'corn'
 [ʒi] /zhë/ 'what?'
 [kʰimti] /kjëmtë/ 'help'

/e/

Allophones: [e], [ẽ], [ɛ]. The allophone [e] occurs as the nucleus of a syllable when followed by a glide (/y/ or /w/) or when preceded by a vowel or a glide and it is the last segment in the word. These environments lend tenseness to the underlying /e/ phoneme,

which is lax ([ɛ]). The most usual occurrence of this tense allophone [e] is as the stative marker /-e/ attached to a vowel-final word. This is the only context in which Teribe permits a VV sequence. The stative marker attaches to the end of words, causing them to modify the subject:

- (92) [buk^ɾ 'pre] /bö^k pë-e/ 'he/she is asleep'
[buk^ɾ p^ho'lae] /bö^k pjola-e/ 'it is far'
[dli 'wako p^h.lue] /dli wako pjlu-e/ 'the food tastes good'

The allophone [e] in the environment of a semi-vowel:

- (93) [p^heyöga] /pje^yga/ 'people, family'
[ʃarye] /sharye/ 'make, do'
[twe] /twe/ 'come'
[dew] /dew/ 'down below'

The allophone [ẽ] occurs when the stative marker /-e/ is attached to a word ending in a nasal vowel, thus receiving nasality by spreading:

- (94) [h.lõẽ] /jlõ-e/ 'true'

The allophone [ɛ] occurs elsewhere:

- (95) [ʔeri] /eri/ 'today'
[tek^ɾ] /tek/ 'come'
[sirkek^ɾ] /sirkek/ 'sit'
[k^hεge] /kjé^ge/ 'father-in-law'
[t^ha 'yonε] /tja yon-e/ 'I am fine'

/ẽ/

Allophones: [ẽ], [ẽ̃]. The allophone [ẽ̃] occurs when adjacent to a semi-vowel, which adds tenseness to the underlying phoneme /ẽ/ [ẽ̃]:

- (96) [mẽwã] /mẽwa/ 'maternal aunt'
[skwẽ̃] /skwẽ̃/ 'crazy'

The allophone [ẽ̃] occurs elsewhere:

- (97) [tʷlɛkʰ] /twlɛk/ 'buy'
[t.lɛ] /tlɛ/ 'speak'
[ʷlɛkʰ] /wlɛk/ 'look for'

/a/

Allophones: [a], [ə]. The allophone [ə] occurs occasionally as the nucleus in an unstressed syllable in free variation with [a]:

- (98) [dǎ'borbə]-[dǎ'borba] /dborba/ 'avocado'
[ʔayəŋ]-[ʔayaŋ] /ayang/ 'monkey-spirit'

The allophone [a] occurs as the nucleus of a syllable elsewhere:

- (99) [ʔara] /ara/ 'much'
[ʔata] /ata/ 'father'
[tʰan] /tjan/ 'already'

/ã/

This phoneme has only one phonetic shape, [ã]. It occurs as the nucleus of a syllable:

- (100) [ʔãska] /ãska/ 'in place of'
[ʰlãr] /lãr/ 'crawl'
[pʰãỹ] /pjãỹ/ 'you (pl.)'

/u/

This phoneme has only one phonetic shape, [u]. It occurs as the nucleus of a syllable:

- (101) [ʔu] /u/ 'house'
[pʰlu] /pjl̥u/ 'good'
[dluŋ] /dluŋ/ 'sea, salt'

/ũ/

This phoneme has only one phonetic shape, [ũ]. It occurs as the nucleus of a syllable:

- (102) [hũ] /jũ/ 'this'
[ʔũta] /ũta/ 'sore (n.)'
[dǎ'gũʃo] /dgũsho/ 'brains'

/ö/

This phoneme has only one phonetic shape, [ʊ]. It occurs as the nucleus of a syllable:

- (103) [ʔuŋ] /öng/ ‘domesticated animal’
[kwu^hbʊ] /kwöbö/ ‘some’
[zruk^ʔ] /zrök/ ‘kill’

/o/

This phoneme has only one phonetic shape, [o]. It occurs as the nucleus of a syllable:

- (104) [ʔorkwo] /orkwo/ ‘hand’
[mok^ʔ] /mok/ ‘moon’
[to] /to/ ‘go’

/õ/

This phoneme has only one phonetic shape, [õ]. It occurs as the nucleus of a syllable:

- (105) [ʔsỹõʃti] /syõshtë/ ‘pray’
[hlõê] /hlõ-e/ ‘true’
[ʔlõʃit] /lõshit/ ‘smell’
[ʃõwĩlõre] /showilõre/ ‘yellow’
[t^wlõ] /twlõ/ ‘worth’

/ä/

This phoneme has only one phonetic shape, [ɒ]. It occurs as the nucleus of a syllable:

- (106) [ʔɒ] /ä/ ‘devil’
[k^hɒ] /kjä/ ‘cocoa’
[ʔɒya] /äya/ ‘wild thing’
[bɒmgo] /bämgo/ ‘first’

/ã/

This phoneme has only one phonetic shape, [ã]. It occurs as the nucleus of a syllable:

- (107) [ʔõyβiŋ] /ãybing/ ‘a type of plantain’
[ʔlã] /lã/ ‘vulture’
[zã^hgõgwo] /zgãgwo/ ‘leaf-cutter ant’

7.3 Phonemic Contrasts

7.3.1 Stops

/p/, /p^h/

The phonemes /p/ and /p^h/ contrast word-initially:

- (108) [p^hɪ] /pjë/ ‘burn (v.)’
[pɪ] /pë/ ‘sleep (v.)’

/t/, /t^h/

The phonemes /t/ and /t^h/ contrast word-initially:

- (109) [tok^ɿ] /tok/ ‘flee’
[t^hok^ɿ] /tjok/ ‘exist, be’
[tɪɾ] /tër/ ‘I write’
[t^hɪɾ] /tjër/ ‘grandchild’
[tuɾ] /tur/ ‘come out’
[t^huɾ] /tjur/ ‘play’

/k/, /k^h/

The phonemes /k/ and /k^h/ contrast word-initially:

- (110) [kǎ.lak^ɿ] /klak/ ‘Martín Peña bird’
[k^hǎ.lak^ɿ] /kjlak/ ‘toad’
[kim] /këm/ ‘over there’
[k^hɪmtɪ] /kjëmtë/ ‘help’

/p/, /t/, /k/

The phonemes /p/, /t/ and /k/ contrast with each other word-initially:

- (111) [pɪ] /pë/ ‘sleep’
[tɪ] /të/ ‘write’
[kim] /këm/ ‘over there’

The phonemes /p/, /t/ and /k/ contrast word-medially:

- (112) [ʔopiŋ] /oping/ ‘learn, study’
[ʔoto] /oto/ ‘what’s wrong?’
[ʔokɪ] /rokë/ ‘call’

The phonemes /p/, /t/ and /k/ also contrast word-finally:

- (113) [lɪp˦] /lip/ ‘you (sg.) cook’
[pɛ˦sɪt˦] /pesit/ ‘later’
[bɪk˦] /brik/ ‘leave’

/b/, /d/, /g/

The phonemes /b/, /d/ and /g/ contrast with each other word-initially:

- (114) [˦bɪmkwo] /bɛmkwo/ ‘front keel of a canoe’
[˦dɪŋdɪŋ] /dɛngdɛng/ ‘blue’
[gɪnǎ˦mo] /gɛnmo/ ‘orange (n.)’

and word-medially:

- (115) [˦ʔyeber] /iyeber/ ‘transform, become’
[kone˦dey] /konedey/ ‘which?’
[k˦hɛgɛ] /kjege/ ‘father-in-law’

Voiced stops do not occur word-finally. These phonemes contrast with their voiceless counterparts word-initially:

- (116) [bɪ] /bɛ/ ‘dance’
[pɪ] /pɛ/ ‘sleep’
[t˦w.lõ] /twlõ/ ‘value’
[d˦w.lõ] /dwlõ/ ‘medicine’
[k˦hɪnǎmo] /kjɛnmo/ ‘than’
[gɪnǎ˦mo] /gɛnmo/ ‘orange (n.)’

And word-medially:

- (117) [˦ʔopiŋ] /oping/ ‘learn’
[˦ʔobi] /obi/ ‘other’
[˦ʔoto] /oto/ ‘what’s wrong?’
[k˦worbodo] /kworbodo/ ‘thigh’
[˦wako] /wako/ ‘taste’
[plɑ˦rago] /plarago/ ‘once’

7.3.2 Fricatives

/s/,/z/,/h/

The phonemes /s/,/z/,/h/ contrast with each other word-initially:

- (118) [soŋ] /song/ ‘poor’
[zoŋ] /zong/ ‘beard’
[hoŋ] /jong/ ‘be (permanently)’

The phonemes /s/,/z/,/h/ also contrast with each other word-medially:

- (119) [ʔu¹ʃkoso] /ushkoso/ ‘domesticated’
[¹ʔyozoŋ] /iyozong/ ‘eat!’
[¹wohoŋ] /wojong/ ‘turn face-down’

The phoneme /h/ does not occur word-finally, nor do the voiced fricatives /z/, /zh/ and /dh/, since stops and fricatives are devoiced when syllable-final (see sections 5.2.2 and 8.11). The voiceless affricate /ch/ does not occur word-finally and in present data /sh/ only occurs in that position in the onomatopoeic word [riʃ] /rish/ (see footnote 36). The phoneme /s/ occurs word-finally, but only in second person singular imperative verb forms:⁴⁰

- (120) [twos] /twos/ ‘give!’
[hũs] /hõs/ ‘sharpen!’
[¹ʔoptus] /optös/ ‘jump!’

/sh, /zh/

The phonemes /sh/ and /zh/ contrast with each other word-initially:

- (121) [ʃik¹] /shik/ ‘take out’
[ʒik¹] /zhik/ ‘fork, branch’
[ʃaŋ] /shang/ ‘be-standing’
[ʒaŋ] /zhang/ ‘excrement’

The phonemes /sh/ and /zh/ also contrast with each other word-medially:

- (122) [¹ʃuskroʃo] /shuskrosho/ ‘spaghetti’
[kwono¹ʒoŋ] /kwonozhong/ ‘where?’

⁴⁰The /s/ of the imperative verb ending is probably a devoiced /z/ underlyingly. See section 8.11.

The phonemes /sh/ and /zh/ also contrast with their alveolar counterparts word-initially:

- (123) [ʃorɪ] /shorë/ ‘sweat’
[sorɪ] /sorë/ ‘how?’
[ʒɪ] /zhë/ ‘what?’
[zɪ] /zë/ ‘cut (v.)’

The phonemes /sh/ and /zh/ also contrast with their alveolar counterparts word-medially:

- (124) [laʃo] /lasho/ ‘sand’
[naso] /naso/ ‘Indian’
[kwonoʒoŋ] /kwonozhong/ ‘where?’
[kõhõzõn] /kõjozon/ ‘get up!’

/ch/, /dh/

As mentioned in section 7.2.2 the affricate phonemes /ch/ and /dh/ are fairly rare items, so in present data they only contrast word-initially in somewhat analogous environments:

- (125) [ʔçige] /chige/ ‘oldest brother’
[ʔɛtʰ ʔɛtʰ] /dhet dhet/ ‘shiny, bright’

They also contrast with their non-affricate counterparts:

- (126) [ʔçida] /chida/ ‘small’
[ʃira] /shira/ ‘took out’
[u:ʃi] /uushi/ ‘child stealing spirit’
[ʔiçɪ] /ichë/ ‘send’
[ʔzanswa] /dhanswa/ ‘june bug’
[ʒaŋ] /zhang/ ‘excrement’

7.3.3 Nasals

/m/, /n/, /ñ/, /ŋ/

The phonemes /m/, /n/ and /ñ/ all contrast with each other word-initially:

- (127) [ma] /ma/ ‘boca chica (a kind of fish)’
[na] /na/ ‘here’
[ña] /ña/ ‘ink’

The phoneme /ŋ/ does not occur syllable-initially. The phonemes /m/, /n/ and /ŋ/ contrast word-medially:

- (128) [do'mɛr] /domeɾ/ 'man'
[kʰo'nɛ] /kjone/ 'where?'
[soŋe] /song-e/ 'poor'

They also contrast with /ñ/ word-medially but less satisfactorily due to the low occurrence of /ñ/:

- (129) [ʔɛ'ni] /eni/ 'thus, so'
[ʒədu'mi] /shdumi/ 'you (pl.) punish'
[ʔu'ỹikʰ]~[u'jikʰ] /uñik/ 'visit'

The phonemes /n/ and /ŋ/ contrast with each other:

- (130) [yon] /yon/ 'good'
[yoŋ] /yong/ 'floor'
[klun] /klun/ 'yell (v.)'
[klunŋ] /klung/ 'dirt'

The phonemes /n/ and /ŋ/ also contrast with /m/ and /ñ/:

- (131) [zədəm] /sdam/ 'plains'
[tan] /tan/ 'already, yet'
[saỹ] /sañ/ 'we (incl.) return'
[baŋ] /bang/ 'hurts'

The phonemes /m/, /n/ and /ŋ/ also contrast with their voiced stop counterparts:

- (132) [ma] /ma/ 'boca chica (a kind of fish)'
[ba] /ba/ 'him, her'
[no] /no/ 'people'
[do] /do/ 'classifier for two roundish, longish things'
[lɔŋe] /löng-e/ 'be-pl.'
[suge] /sök-e/ 'be-sitting'

7.3.4 Flaps

/l/, /wl/, /r/

These three phonemes contrast word-initially:

- (133) [rikʷ] /rik/ ‘tie up’
[ǎlikʷ]~[likʷ] /lik/ ‘cook’
[ʷliʷli] /wliwli/ ‘dirty’

They contrast in syllable-initial clusters:

- (134) [krikʷ] /krik/ ‘thunder’
[klikʷ] /klik/ ‘hot’
[dlo] /dlo/ ‘sun’
[dʷlo] /dwlo/ ‘medicine’

They also contrast word-medially:

- (135) [kla¹ra] /klara/ ‘one’
[dǎba¹la] /dbala/ ‘stars’
[yir¹waʷlo] /yirwawlo/ ‘for us to drink’
drink.1plexc.for

But only /r/ occurs syllable-final:

- (136) [slar] /slar/ ‘cry’
[¹ʔarga] /arga/ ‘almond tree’

The phoneme /r/ also contrasts with its voiced stop counterpart /d/:

- (137) [dikʷ] /dik/ ‘like, similar’
[rikʷ] /rik/ ‘tie up’
[¹dorko] /dorko/ ‘under’
[roy] /roy/ ‘inside’
[¹kworbodo] /kworbodo/ ‘thigh’
[so¹roŋ] /sorong/ ‘tapir footprint’
[ʃǎdun] /shdun/ ‘punish’
[¹ʃrunto] /shrunto/ ‘early morning’

Since /l/ and /r/ are both voiced alveolar flaps, they can sound very similar and be difficult for a nonnative speaker to distinguish. Ladefoged (1996:243) describes the lateral flap as belonging to both the group of laterals and the group of rhotics (r-sounds), making a sound “auditorily reminiscent of both *r* and *l*.” Because of this, there has been some confusion in the representation of many words containing /l/ and /r/ in the Talamancan languages, usually resulting in the /l/ being mistaken for /r/. The /r/ is not retroflexed and

the release is, of course, apical rather than lateral. Another helpful clue for Teribe is that when /l/ is word-initial it tends to be prevocalized, whereas /r/ does not:

- (138) [res] /rez/ 'rice'
[ǎ.ɛ]~[ɬ.ɛ] /le/ 'say'

But this prevocalization is distinct from prelabialization:

- (139) [ǎ.lokʰ] /lok/ 'be (pl.)'
[ʷ.lo] /wlo/ 'wasp'
[ʰ.l̃ɑr] /l̃ɑr/ 'crawl'
[ʷ.lɑr] /wlar/ 'sit'

7.3.5 Approximants

/y/, /w/

These phonemes contrast with each other word-initially:

- (140) [yoŋ] /yong/ 'floor'
[woŋ] /wong/ 'iguana'

They also contrast with /h/ and nothing (glottal stop):

- (141) [yoŋ] /yong/ 'floor'
[woŋ] /wong/ 'iguana'
[hoŋ] /jong/ 'be-permanently'
[ʔoŋ] /ong/ 'rotten'

The phonemes /y/ and /w/ also contrast with the voiced labial phonemes:

- (142) [yoŋ] /yong/ 'floor'
[woŋ] /wong/ 'iguana'
[boŋ] /bong/ 'tomorrow'
[mɔkʰ] /mok/ 'moon'

The phonemes /y/ and /w/ contrast word-medially:

- (143) [koʷo] /kowo/ 'tooth'
[ʰkoyo] /koyo/ 'like'

They also contrast word-finally:

- (144) [ʃay] /shay/ 'we (incl.) grab'
[ʃkaw] /shkaw/ 'nine'

7.3.6 Vowels

7.3.6.1 Oral Vowels

/i/, /ë/

These phonemes contrast with each other:

- (145) [ʃri] /shri/ 'wild pig'
[ʃrɪ] /shrë/ 'rain'
[wi] /wi/ 'a woman's older sister'
[wɪ] /wë/ 'bathe'

/e/, /a/

These phonemes contrast with each other:

- (146) [we] /we/ '3 pers. bathe'
[wa] /wa/ 'child'
[p^hɛ] /pje/ '3 pers. burn'
[p^ha] /pja/ 'you (sing.)'

The phoneme /e/ also contrasts with the phoneme /ë/:

- (147) [p^hɛ] /pje/ '3 pers. burn'
[p^hɪ] /pjë/ 'burn'

/u/, /ö/

These phonemes contrast with each other:

- (148) [lu] /lu/ 'year'
[lʊ] /lö/ 'acla palm'
[suk^ʔ] /suk/ 'burn, bake'
[suk^ʔ] /sök/ 'be-sitting'

/o/, /ä/

These phonemes contrast with each other:

- (149) [ʃto] /shto/ 'place'
[ʃtɔ] /shtä/ 'worm'
[dɔr] /dor/ 'a man's younger sister'
[dɔr] /där/ 'let go'

The phoneme /o/ also contrasts with the phoneme /ö/:

- (150) [ʃto] /shto/ 'place'
[ʃtʊ] /shtö/ 'wild pig'
[so] /so/ 'tapir'
[sʊ] /sö/ 'fishing hook'

The phoneme /ä/ also contrasts with the phoneme /a/:

- (151) [ʃtɔ] /shtä/ 'worm'
[ʃta] /shta/ 'beans'
[nɔ] /nä/ 'breast'
[na] /na/ 'here'

7.3.6.2 Nasal Vowels

Teribe has six nasal vowels which correspond with six of the eight oral vowels. The vowels which do not have corresponding nasals are the high open vowels /*ɛ̃*/ [ɪ] and /*ö̃*/ [ʊ]. The nasal vowels are less frequent than the oral vowels.

/i/, /ĩ/

These phonemes contrast with each other:

- (152) [ʔik^ɪ] /ik/ 'yuka'
[ʔik^ĩ] /ik/ 'see'
[si] /si/ 'anus'
[sĩ] /sĩ/ 'black'

/e/, /ẽ/

These phonemes contrast with each other:

- (153) [nɛkʰ] /nek/ 'toast'
[nɛ̃kʰ] /nɛ̃k/ 'put away, bury'
[ʒɬɛ] /le/ '(3pers.) say'
[tɬɛ̃] /tɬɛ̃/ '(3pers.) speak'

/a/, /ã/

These phonemes contrast with each other:

- (154) [mya] /mya/ 'three'
[mỹã] /mỹã/ 'golofa (an animal)'
[ʃar] /shar/ 'I grab'
[ʃãr] /shãr/ 'soft'

/u/, /ũ/

These phonemes contrast with each other:

- (155) [lu] /lu/ 'year'
[ˠlũ] /lũ/ 'steal'
[ʔuʰʃko] /ushko/ 'at home'
[hũʰʃko] /jũshko/ 'at this place'
[ʔu] /u/ 'house'
[ʰũta] /ũta/ 'sore (n.)'

/o/, /õ/

These phonemes contrast with each other:

- (156) [dʷlo] /dwlo/ 'medicine'
[tʷlõ] /twlõ/ 'value'
[ʷlo] /wlo/ 'wasp'
[hlõ] /jlõ/ 'true'

/ɒ/, /õ/

These phonemes contrast with each other:

- (157) [lɒ] /lä/ 'jaw'
[ˠlõ] /lã/ 'vulture'
[tɒ] /tä/ 'a cold'
[tõ] /tã/ 'the soft spot on an infant's head'

8 Phonological Rules

8.1 Consonant Voicing

8.1.1 Stop Voicing

A /p/ or /k/ preceded by a voiced segment and followed immediately by a voiced segment which is not homorganic⁴¹ has a strong tendency to become voiced, especially in fast speech:

- (158) [tɛkʷ] /tek/ 'come' plus [luŋ] /lung/ 'they (are)' becomes [tɛg luŋ] /tek lung/ 'they are coming'
[kʰokʷ] /kjok/ 'head' plus [zoŋ] /zong/ 'hair' becomes [kʰogəzoŋ] /kjokzong/ '(head) hair'
[kwe] /kwe/ 'that one' plus /-pga/ 'pl. (human)' becomes [kwɛbǒ'ga] /kwɛpga/ 'they'⁴²

8.1.2 Sibilant Voicing

An /s/ or /sh/ preceding a voiced stop becomes voiced, especially in fast speech:

- (159) [ʃədun]~[ʒədun] /shdun/ 'punish'
[səbi]~[zəbi] /sbi/ 'cooking pot'
[sə'gara]~[zə'gara] /sgara/ 'became accustomed'
[zə'dam] /sdam/ 'plains'

But the sibilant does not become voiced preceding any other segment:

- (160) [ʃku] /shkǒ/ 'needle'
[ʃtɛn] /shten/ 'cough'
[ʃpo] /shpo/ 'bitter'
[stikʷ] /stëk/ 'thin, fine'
[smokʷ] /smok/ 'glue (v.)'
[ʃri] /shri/ 'wild pig'
[sə.lar]~[s.lar] /slar/ 'cry'
[ʃwoŋ] /shwong/ 'clothes'

⁴¹The stipulation that the following voiced segment not be homorganic is needed to allow velar deletion (rule 8.6) which resists voicing.

⁴²For an exposition of the transitional vocoid ([ə], [ǒ]), see section 8.2. It is not the transitional vocoid which produces voicing in the preceding stop, but the following voiced segment.

8.2 Vocoid Epenthesis

Teribe has “open transitions”,⁴³ such that when two consonants come together there is a strong tendency to insert a short mid central vocoid [ə] between them, thus creating an additional etic syllable where there is none emically. There is never more than one open transition in a cluster, that is, where three consonants come together the transitional vocoid will be inserted (if at all) between only the first two:

- (161) [ʃəglikʰ] /shglik/ ‘step on’
[ʰopəʒwekʰ] /opzhwek/ ‘stretch out’

Whether or not the transitional vocoid is inserted depends on three factors: the sonority of the consonants involved, whether or not there is a vowel preceding the cluster, and their point of articulation. For example, the transition is always inserted between two syllable-initial stops:

- (162) [pəkɪŋ] /pkəng/ ‘four’
[dəgɪr] /dgur/ ‘snake’
[dəba] /dba/ ‘day’

Stops are low on the sonority curve and without the transition the first one would not be well articulated since there is no vowel preceding. But a stop cluster word-medially does not get the transition, presumably because of the preceding vowel, or perhaps due to a syllable break:

- (163) [kʰupkɛʃko] /kjupkeshko/ ‘yesterday’
[dupkwo] /dupkwo/ ‘armadillo’
[ɲabgwɪ] /ɲabgwë/ ‘trick (v.)’
[ʃtopga]~[ʃtobga] /shtopga/ ‘nieces, nephews’

The exception to this, for which I have no explanation, is when the second consonant is the voiced alveolar stop /d/:

⁴³Lininger (1977, 1978) often (but not always) wrote what would be open transitions in Teribe as full vowels in her analysis of Térraba: /doborba/ ‘avocado’, /dabar/ ‘day’. Teribe: [də^lborbə]~[də^lborba] /dborba/ ‘avocado’, [dəba] /dba/ ‘day’. The tendency toward separating consonants does seem to be even stronger in Térraba than in Teribe, as she sometimes writes /kwará/ ‘one’ as /kawará/ ‘one’, thus separating consonants (a stop and a glide) that Teribe would never separate: [kwa^lra] /kwara/ ‘one’. Constenla (1981:121) does the same, representing the Térraba word for “tiger” as /dobóŋ/ whereas in Teribe it is [də^lbɔŋ] /dbong/ ‘tiger’.

- (164) [ʰpogǎdoe] /pogdo-e/ ‘almost asleep’
 [ʒɪ ʰlopǎdɛ] /zhě lopde/ ‘what did you say?’
 what say.2s.Q
 [ʰsukǎdɛ] /sökdɛ/ ‘is he there?’
 be-sitting.Q
 [dǎbopǎˈdo] /dbopdo/ ‘shoulder’

The transition is never inserted between a consonant and the consonantal glides [y] and [w]. They are high on the sonority curve and allow full articulation of the preceding consonant as they themselves transition into the vowel:

- (165) [ʰdwayo] /dwayo/ ‘from’
 [kʰyoŋ] /kɲyong/ ‘boat’

For consonants between these two extremes of sonority, whether or not they get the transitional vocoid depends on their particular combination. Sibilants (/s/, /ʃ/, /z/, /ʒ/) followed by a voiced stop in a syllable-internal cluster always have the transition:

- (166) [sǎbi] /sbi/ ‘cooking pot’
 [ʃǎdun]~[ʒǎdun] /shdun/ ‘punish’
 [zǎˈgōgwo] /zgǎgwo/ ‘leaf-cutter ant’
 [ʒǎˈgriglo] /zhgriglo/ ‘side’

But there is no transition across syllable or morpheme boundaries:

- (167) [kɪzˈbaŋ] /kězbang/ ‘big’
 [ʰrezgwo] /rezkwo/ ‘grains of rice’

A sibilant combined with a flap may or may not have the transition:

- (168) [sǎlar]~[s.lar] /slar/ ‘cry’
 [sǎrɛɾ]~[srɛɾ] /srɛɾ/ ‘be damaged’

A sibilant followed by a voiceless stop or a glide never has the transition:

- (169) [ʃpo] /shpo/ 'bitter'
[skoŋ'kwa] /skongkwa/ 'lightning bug'
[stikʰ] /stëk/ 'thin, fine'
[ʃta] /shta/ 'beans'
[ʃwoŋ] /shwong/ 'clothes'
[ʒwoŋ] /zhwong/ 'untie'
[ʰsỹõʃtɪ] /syõshtë/ 'pray'

When a nasal consonant is involved in a cluster there is no transition:

- (170) [skoŋ'kwa] /skongkwa/ 'lightning bug'
[kwaŋ'na] /kwangna/ 'one (flat thing)'
[ʰunko] /jõnko/ 'type of bird'
[boŋ'hã] /bongjä/ 'tomorrow'
[kwom'gwo] /kwomgwo/ 'ear'
[kʰɪmtɪ] /kjëmtë/ 'help'

The exception to this is the sequence /nm/. Some words with this sequence have the transition:

- (171) [gɪnǎ'mo] /gënmö/ 'orange'
[kʰɪnǎmo] /kjënmö/ 'than'
[ʷɪnǎmo] /wlënmö/ 'sloth'

Others words with the sequence /nm/ do not have the transition:

- (172) [ʃɪnmo] /shënmö/ 'dead person'
[ɭan'ma] /lanma/ 'husband'
[kunmã'hã] /kunmahã/ 'day after tomorrow'

The nasal must always be first in the cluster unless there is more than one nasal involved, with the exception of /m/. In the cases where /m/ is the second consonant in the cluster following a nonnasal consonant, there is no transition, even after a sibilant:

- (173) [kur'may] /kurmay/ 'long'
[smokʰ] /smok/ 'glue (v.)'
[ʃmĩỹãkwo] /shmiñakwo/ 'type of banana'

When one of the consonants in the cluster is a flap (/l/, /^wl/ or /r/), there is no transition, unless the first consonant is a sibilant, in which case it may or may not have the transition, as noted above:

- (174) [drek^l.lorba] /dreklorba/ ‘lower leg’
[pri^lˈbri] /pribri/ ‘all around’
[p^h.lu] /pjlu/ ‘good’
[ˈʒaŋkog.lo] /zhangkoglo/ ‘intestines’
[dʒ^lˈborba] /dborba/ ‘avocado’
[sʒ^l.lar]~[s.lar] /slar/ ‘cry’
[sʒ^lrɛr]~[srɛr] /srer/ ‘be damaged’

The prelabialized lateral flap phoneme, when in a consonant cluster, is always prenuclear and the final element of the cluster. It never has the transition before it, due to the vowel-like quality of the prelabialization:

- (175) [d^w.lɪr^w.lɪmʒɪk^ʔ] /dwlɛrwlɛnzɪk/ ‘name of a stream’
[^w.lɛk^lˈzɔŋ] /shwlekzong/ ‘criollo (a type of tree)’
[^w.lɛrk.la] /kwlerkla/ ‘tucan’

If the two consonants in a cluster are both alveolar, then the transition may occur, presumably to give the tongue time to get back for the second articulation, even though it would not normally be there:

- (176) [dli]~[dʒ.li] /dli/ ‘food’
[drɔŋ]~[dʒrɔŋ] /dröng/ ‘machete’
[ˈt.lapöga]~[tʒˈlapöga] /tlapga/ ‘respected person, ancestor’

This last example exhibits two transitional vocoids, the [ə] which we have been discussing as well as the rounded vocoid [ɔ]. The [ə] transition is productive throughout the language, as we have seen, but the distribution of the [ɔ] is severely limited. It only occurs between the two consonants of the plural suffix /-pga/. This suffix is itself severely limited, as it is only used on nouns referring to human beings. Therefore, I believe that this epenthetic [ɔ] is a fossilized form of a transitional vocoid which may have been quite productive in the past, but which is no longer a functioning part of the Teribe phonological system. This word [ˈt.lapöga]~[tʒˈlapöga] /tlapga/ ‘respected person, ancestor’ is itself a fossilized form. It appears to have been originally a pluralized form of the word [t.lapˈla]~[t.labˈla] /tlapla/ ‘old (human)’, but it is now a singular noun, and the /-pga/ at the end is an integral part of the word. To make it plural an additional plural

- (180) [do'mer] /domer/ 'man' becomes [do'merga] /domerga/ 'men'
 [kwo'zir] /kwozir/ 'child' becomes [kwo'zirga] /kwozirga/ 'children'
 [d^w.las] /dwlas/ 'youth' becomes [d^w.laz'ga] /dwlasga/ 'youths'
 ['data] /data/ 'father' becomes ['dataga] /dataga/ 'fathers'
 ['sogo] /sogo/ 'owner' becomes ['sogoga] /sogoga/ 'owners'

This last word has two forms and thus appeared in both lists: [so, 'sogo] /so, sogo/ 'owner'. When the shorter form is used, the plural marker is /-pga/ and it becomes ['sopga]~['sobga] /sopga/ 'owners'. When the longer form is used, it is /-ga/ and becomes ['sogoga] /sogoga/ 'owners'.

To summarize this section on vocoid epenthesis, I present the following table:

Vocoid epenthesis	No vocoid epenthesis	Variable vocoid epenthesis
syllable internal stops:	stops or sibilants across syllables:	a sibilant and a flap:
[pǎkɪŋ] /pkɛŋ/ 'four' ['wapǒga]~['wabǒga] /wapga/ 'children'	['dupkwo] /dupkwo/ 'armadillo' [kɪz'baŋ] /kɛz'baŋ/ 'big'	[sǎlar]~[slar] /slar/ 'cry' [sǎrɛr]~[srɛr] /srer/ 'be damaged'
clusters of a stop and /d/:	clusters involving glides:	the cluster /nm/:
['sukǎdɛ] /sokde/ 'is he there?'	[k ^h yoŋ] /kɟyong/ 'boat'	[^w .lmǎmo] /wlɛnmo/ 'sloth' [ʃmmo] /shɛnmo/ 'dead person'
sibilants followed by a voiced stop:	sibilants followed by a voiceless stop:	clusters of two alveolars:
[sǎbi]~[zǎbi] /sbi/ 'cooking pot'	[ʃta] /shta/ 'beans'	[d.li]~[dǎ.li] /dli/ 'food'
	clusters involving nasals:	
	['hunko] /jɔnko/ 'type of bird'	
	clusters involving flaps:	
	[p ^h .lu] /pɟlu/ 'good'	

Table 10: Summary of vocoid epenthesis

8.3 Nasal Assimilation to a Following Stop (N-S Assimilation)

When a suffix beginning with a stop is added to a noun ending with a nasal consonant, the nasal segment assimilates to the point of articulation of the stop. This happens, for example, when the suffix [-g^w.lo] /-gwlo/ 'for the purpose of' is added to a word ending in a nasal consonant:

- (181) [hun] /jɔn/ 'sharpen' becomes [hunɟ^w.lo] /jɔŋɟwlo/ 'sharpen'
 ['ʔopin] /opin/ 'learn' becomes ['opinɟ^w.lo] /opinɟwlo/ 'for learning'

When the human plural marker /-pɡa/ is added to a consonant-final noun, the /p/ of the suffix deletes, as we saw in section 8.2, data set 179. However, when it is added to a noun ending with a nasal consonant, the nasal assimilates to the point of articulation of the /p/ before the /p/ deletes, turning the /n/ into an /m/:⁴⁷

- (182) [lɪŋ] /lëŋg/ ‘younger same-sex sibling’ plus /-pɡa/ becomes [lɪmɡa] /lëmɡa/ ‘younger same-sex siblings’
 [sɪŋ] /sing/ ‘a woman’s brother’ plus /-pɡa/ becomes [sɪmɡa] /simɡa/ ‘a woman’s brothers’

8.4 Consonant Deletion

8.4.1 In Noun Morphology

Some noun or nominalizing suffixes which begin with two consonants delete the first one, under conditions specific to the respective suffixes (see sections 8.2, 8.3 and 8.6):

- (183) [dɔr] /dor/ ‘a man’s sister’ plus /-pɡa/ ‘plural’ becomes:
 [dɔrga] /dorga/ ‘a man’s sisters’
 [ʃiy] /shiy/ ‘a man’s older brother’ plus /-pɡa/ ‘plural’ becomes:
 [ʃiyɡa] /shiyɡa/ ‘a man’s older brothers’
 [ʔwe] /we/ ‘to eat’ plus /ɡwlo/ ‘for the purpose of’ becomes:
 [ʔwe^w.lo] /uwewlo/ ‘for eating’
 [kwoʃkwɪ] /kwoshkwë/ plus /ɡwlo/ ‘for the purpose of’ becomes:
 [kwoʃkwɪ^w.lo] /kwoshkwëwlo/ ‘for washing’

8.4.2 In Verb Morphology

This rule also applies in verb morphology and will be referred to in section 8.5.2, following. Most Teribe verbs have a “base” form which can be used unaffixed with independent nouns or pronouns in SOV order:

- (184) [tʰa 'kʰɔrkɔ ʃakʰ] /tja kjörkö shak/ ‘I’ll catch the chicken’
 1s chicken grab
 [bor 'mɛkɪ dli .likʰ] /bor mekë dli lik/ ‘my mother cooks the food’
 1sPoss mother food cook

⁴⁷It is unlikely that the /ŋ/ deletes, leaving behind its nasality to attach to the /p/, which is the process involved in verb morphology (see sections 8.5.3 and 8.5.4). These are nouns, not verbs; moreover, nasal assimilation to the following stop is a very common process in language (although not completely productive for Teribe as a whole) so no recourse is needed to a more complex process and, most importantly, the normal process for this suffix is for the /p/ to delete, not the end consonant of the noun.

If this “base” form of the verb ends in a consonant, that consonant is deleted so that the affixes for person and number can then be attached, and the order becomes OVS:

- (185) [kʰurku ʃar] /kjörkö shar/ ‘I’ll catch the chicken’ (shak + -r = shar)
 chicken grab.1s grab 1s grab.1s
 [dli 'liya bor 'mekırı] /dli liya bor mekëre/ ‘my mother cooks the food’ (lik + -ya = liya)
 food cook.3 1sPoss mother.Subj cook 3 cook.3

The rule of consonant deletion in verb morphology differs from that of noun morphology in that in noun morphology it is the first consonant of the noun suffix which deletes, whereas in verb morphology it is the final consonant of the verbal base form which deletes. For more examples of this process, see tables 11, 12, 14, and 16, following.

8.5 Nasalization

8.5.1 Nasal Spreading from a Vowel to Other Vowels and Glides

Nasalization will spread from a nasal vowel in both directions to other vowels or glides until stopped by a stop, a nasal, or a voiceless consonant. Nasalization is usually marked on the vowel of the accented syllable:

- (186) [pʰa 'kʰōhōzōŋ] /pja kjōjozong/ ‘get up!’
 2s arise.2sImv
 [zə'gōgwo] /zgǎgwo/ ‘leaf-cutter ant’
 [ʰũta] /ũta/ ‘sore (n.)’
 [mỹã'wãʃko] /myawãshko/ ‘3 days ago’
 [ʃōwĩ'lōrē] /showilōre/ ‘yellow’
 [də'gũʃo] /dgũsho/ ‘brains’
 [dli tʷ.ʎēnopdĩ] /dli twlēnopdē/ ‘Did you buy food?’
 food buy.Cmpl.2s.Q

By this rule, the nasality of the nasal vowel spreads through a word-initial /l/, nasalizing the prevocalization so that it sounds like an initial /n/. Words with word-initial /l/ followed by an oral vowel have the short oral vocoid:

- (187) [ǎlu]~[lu] /lu/ ‘year’
 [ǎlan]~[lan] /lan/ ‘talk’

Words with a word-initial /l/ followed by a nasal vowel have a nasal prevocalization:

- (188) [ʰl̃ɑr] /l̃ɑr/ ‘crawl’
 [ʰl̃ɔ̃] /l̃ɑ̃/ ‘vulture’
 [ʰl̃ɔ̃ ʔowa] /l̃ɔ̃ owa/ ‘it smells bad’
 smell bad

8.5.2 Nasal V-C Spreading from a Vowel to a Final Consonant in Verb Morphology

In verb morphology the rule of nasal spreading is even stronger. When the final consonant of the “base” form is deleted so that the number and person markers can be added as in rule 8.4.2, the nasality of an exposed nasal vowel spreads to the consonant of an attached verb ending, as long as it is not a stop, a nasal, or a voiceless consonant. These are the same segments which stop nasal spreading in the language as a whole. In the following table, the verb endings attach normally to the paradigmatic verb, “grab”, but the nasality of the nasal vowel of the verb “see” spreads to the /r/ of the verb ending, turning it into a nasal consonant at the same point of articulation (/n/).⁴⁸ The same process affects the /y/, turning it into an /ñ/ (without full closure). Notice that the /p/ and /m/ are unaffected. This is the pattern for all verbs with exposed nasal vowels after deletion of the final consonant.

	Number and person markers	‘grab’ [ʃakʰ] /shak/	‘see’ [ʔikʰ] /ik/
1sing.	[-r]	[ʃar] /shar/	[ʔin] /in/
1pl.incl.	[-y]	[ʃay] /shay/	[ʔiỹ] /iñ/
1pl.excl.	[-rwa]	[ʃarwa] /sharwa/	[ʔinwa] /inwa/
2sing.	[-p]	[ʃap] /shap/	[ʔip] /ip/
2pl.	[-'mi]	[ʃa'mi] /shami/	[ʔi'mi] /imi/
3	[-ya]	[ʃaya] /shaya/	[ʔiỹã] /iña/

Table 11: Verb forms with nasal spreading

8.5.3 Nasality Assimilation from a Deleted Consonant

If the “base” form of the verb ends in a nasal consonant, then that consonant is deleted before attaching the verbal affixes in the same way as are nonnasal consonants. However, the nasality of the nasal consonant is not deleted. Instead, the nasality remains and will attach itself to whatever consonant is added in place of the deleted one, unless the added consonant has no nasal phoneme counterpart (eg. sibilants, see tables 14 and 15). In other words, the nasality left behind attaches to the consonant slot so that whatever is put there

⁴⁸To be more precise and for the sake of consistency with the Nasality Assimilation rule (section 8.5.3), the nasality of the vowel spread to the /r/ would produce a nasal flap [ɾ̃]. This would then be acted on by the Nasal Phoneme Repair rule (section 8.5.4) to produce the phoneme /n/.

becomes the nasal phoneme corresponding to that point of articulation. In order for this to happen, another rule is needed which completes the transformation from a nasalized contoid into a legitimate nasal phoneme of Teribe. This “Nasal Phoneme Repair” rule will be discussed in the next section (8.5.4).

Before we discuss nasal phoneme repair, however, it is important to note that this process of nasality assimilation from a deleted consonant is completely different than the process of nasal spreading from a nasal vowel to a consonant (section 8.5.2). Nasality does not spread from a nasal consonant in Teribe, except for that slight (nonphonemic) nasal effect which it gives to an adjacent oral vowel, and even a nasal vowel does not affect a voiceless stop such as /p/ (note the crucial example of [h_um] in table 12, compared with [ʔip] in table 11). So, in the case of [h_um], it is unintuitive to conceive of the /p/ assimilating the nasality of the final /n/ before the /n/ deletes, since nasal segments never affect stops in Teribe. We saw in the case of /-pɡa/ ‘human plural’ added to a nasal-final noun that the nasal assimilates to the /p/, not the other way around, then the /p/ is deleted (section 8.3). That is a very common process in language and is the one that we expect, thus we might be tempted to appeal to it. However, that process is not an option in this case involving verb morphology, since the pattern is for the final consonant of the base form to delete, not the person and number marker that is being attached. For these reasons, the /n/ must delete in order for the /p/ to be affected with its nasality.

	Incompletive Person markers	‘grab’ [ʃakʔ] /shak/	‘sharpen’ [hun] /jön/
1sing.	[-r]	[ʃar] /shar/	[hun] /jön/
1pl.incl.	[-y]	[ʃay] /shay/	[hoỹ] /jõñ/
1pl.excl.	[-rwa]	[ʃarwa] /sharwa/	[ʰunwa] /jönwa/
2sing.	[-p]	[ʃap] /shap/	[hum] /jöm/
2pl.	[-'mi]	[ʃa'mi] /shami/	[hu'mi] /jömi/
3	[-ya]	[ʃaya] /shaya/	[ʰoỹa] /jõña/

Table 12: Verb forms with nasality assimilation

8.5.4 Nasal Phoneme Repair

This rule takes the output of the previous two rules, Nasal V-C Spreading and Nasality Assimilation from a Deleted Consonant, and does whatever is necessary to make a real phoneme out of it. For example, when nasality spreads to an /r/ or when an /r/ is added to the consonant slot which has nasality attached, this rule turns the consonant from a flap into a sonorant, creating the phoneme /n/. Also, when a /p/ is added to the consonant slot which has nasality attached, this rule adds voicing as well, creating the phoneme /m/. The /y/ added to the nasalized consonant slot needs no repair, as adding nasality alone creates the phoneme /ñ/ (without full closure). The /m/ of the second person plural ending, being

already a nasal, is unaffected. It seems reasonable for a rule to do this, since opening the velum (as is the function of the feature [+nasal]) creates sonorancy, which entails voicing, in Teribe and most other languages.

Viewing the nasality as on an autosegmental tier attached to the consonant slot in this case of Nasality Assimilation seems the most intuitive solution and most elegantly captures the process whereby a stop (/p/) can become a nasal (/m/) in Teribe:

		Consonant Deletion		Nasality Assimilation		Nasal Phoneme Repair	
[+nas]	[+lab]	[+nas]	[+lab]	[+nas]	[+lab]	[+nas]	[+lab]
		∅		-----		-----	
C	+ C	→ C	C	→ C	→ C	→ C	C
n	p	n	p		ṽ		m

Table 13: Nasality assimilation in verbal affixation

Further evidence for this view comes from the attachment of grooved fricatives to these nasal-final verbs. If the consonant being attached to fill the place of the deleted nasal has no nasal phoneme counterpart (as with /s/ and /z/),⁴⁹ then the repair rule cannot turn it into a phoneme and the nasality cannot attach to that consonant. But something must be done with it and it apparently cannot be deleted. So the repair rule causes the nasality to attach itself to the preceding vowel. Imperative form endings begin with a grooved fricative (sibilant or strident), so they reject the nasality of the deleted nasal consonant, which then attaches to the preceding vowel. Again, an autosegmental view of nasality is most insightful here. If this were a case of assimilation of nasality from one consonant to another, followed by deletion of the original nasal consonant, there would be no effect on the vowel. But if the nasal is on an autosegmental tier, it is free to associate to the slots below, constrained by the phonological rules. The word [hũs] /jõz/ is the crucial example here, as the only nasality involved is that from the deleted consonant and the only vowel is the one preceding the sibilant:

[hũn] /jõn/ ‘sharpen’			
Imperative	No. & person	short form	No. & person full form
2sing.	[-s] /-z/	[hũs] /jõz/	[-zoŋ] /-zong/ [hũzõŋ] /jõzong/
2pl.	[-zĩ] /-zĩ/	[hũzĩ] /jõzĩ/	[-zĩyã] /-zĩya/ [hũzĩyã] /jõzĩya/

Table 14: Imperative forms

⁴⁹Apparently a nasal /r/ is close enough to an /n/ to be repaired, but a nasal /z/ is not. The manner of articulation, flap versus grooved fricative, must make a difference.

		Consonant Deletion		Nasality Assimilation		Nasal Phoneme Repair	
[+nas]	[+stri]	[+nas]	[+stri]	[+nas]	[+stri]	[+nas]	[+stri]
		≠		—			
V C	+ C	→ VC	C	→ V	C	→ V	C
u n	z	u n	z	u	z̃	ũ	z

Table 15: Nasality assimilating to a vowel in the case of [hūs]

8.6 Velar Deletion

When a /k/ is closely followed by a /g/, the /g/ deletes. This happens in fast speech, as when the connective particle /ga/ follows a /k/-final word:

- (189) [ʼīya luk ga] /īya lök ga/ ‘they saw and...’ becomes:
[ʼīya ʼluka] /īya lök ga/ ‘they saw and...’

[wotʼl̄ik ga] /wotl̄ik ga/ ‘he thinks that...’ becomes:
[wotʼl̄ika] /wotl̄ik ga/ ‘he thinks that...’

This also happens in morphology, for example, when the suffix [-g^w.lo] /-gwlo/ ‘for the purpose of’ is added to a word ending in /k/. When added to a word ending in a consonant other than /k/ the /g/ remains:

- (190) [tʰur] /tjör/ ‘play’ becomes [tʰurg^w.lo] /tjörgwlo/ ‘toy’
[hun] /jön/ ‘sharpen’ becomes [hunḡ^w.lo] /jöngwlo/ ‘sharpener’
[ʼ?opin] /opin/ ‘learn’ becomes [ʼ?opiḡ^w.lo] /opingwlo/ ‘for learning’

But when added to a word ending in /k/, the /g/ of the suffix deletes:

- (191) [hikʼ] /jök/ ‘walk, go’ becomes [ʼhik^w.lo] /jökwo/ ‘conveyance’
[ʼ?yokʼ] /iyok/ ‘fire’ becomes [ʼ?yok^w.lo] /iyokwo/ ‘matches’

[kʰiʼbokwo tokʼ] /kjibokwo tok/ ‘to write’ becomes:

book write

[kʰiʼbokwo ʼtok^w.lo] /kjibokwo tokwo/ ‘writing instrument’

book write.for

The first consonant of the [-g^w.lo] /-gwlo/ suffix also deletes when added to a vowel-final word, but this is a morpheme-specific rule, not a productive phonological rule (note that it

is the opposite of what happens with the /-pga/ suffix, which deletes the first consonant when added to a consonant final word):

- (192) [ʔwe] /we/ ‘to eat’ becomes [ʔwe^w.lo] /uwewlo/ ‘for eating’
 [kwoʃkwɪ] /kwoshkwë/ ‘to wash’ becomes [kwoʃkwɪ^w.lo] /kwoshkwëwlo/ ‘for washing’
 [soy^hneya] /soyneya/ ‘sell.3pers.’ becomes [soy^hneya^w.lo] /soyneyawlo/ ‘for sale’

8.7 Vowel Deletion

The verb suffix for the completive aspect is [-ro] /-ro/. This is added to the “base” form after deletion of the final consonant and to this is added the person and number suffixes as described in tables 1 and 2, except that the third person suffix is (for this and all aspects other than incomplete) /-a/ rather than /-ya/. Teribe does not allow VV sequences,⁵⁰ so the first vowel is deleted. Notice also that the marker [-ro] /-ro/ ‘completive aspect’ becomes [-no] /-no/ by two different processes: spreading from the vowel in the verb [ʔik^h] /ik/ ‘see’ as described in section 8.5.2 and assimilation from a deleted nasal consonant in the verb [hun] /jön/ ‘sharpen’ as described in section 8.5.3:

	Completive markers		‘grab’	‘sharpen’	‘see’
	Aspect	person	[ʃak ^h] /shak/	[hun] /jön/	[ʔik ^h] /ik/
1sing.	[-ro]	[-r]	[ʃaror] /sharor/	[honor] /jönor/	[ʔinor] /inor/
1pl.incl.	[-ro]	[-y]	[ʃaroy] /sharoy/	[hunoy] /jönoy/	[ʔinoy] /inoy/
1pl.excl.	[-ro]	[-rwa]	[ʃarorwa] /sharorwa/	[honorwa] /jönorwa/	[ʔinorwa] /inorwa/
2sing.	[-ro]	[-p]	[ʃarop ^h] /sharop/	[hunop ^h] /jönop/	[ʔinop ^h] /inop/
2pl.	[-ro]	[- ^h mi]	[ʃaro ^h mi] /sharomi/	[huno ^h mi] /jönomi/	[ʔino ^h mi] /inomi/
3	[-ro]	[-a]	[ʃara] /shara/	[hona] /jöna/	[ʔina] /ina/

Table 16: Completive verb forms

8.8 Stop Unreleasing

When a voiceless stop occurs pre-pause, it is unreleased:

- (193) [ʒwɛk^h] /zhwek/ ‘fix, straighten’
 [mar^hlip^h] /marwlëp/ ‘hummingbird’
 [pe^hsit^h] /pesit/ ‘later’

⁵⁰With the sole exception of the addition of the stative marker [-e] /-e/ to a vowel-final word as referred to in footnote 23.

8.9 Stop Fricativizing

When a voiced labial or velar stop occurs intervocalically or between a vowel and a glide, it is softened to a fricative in fast speech:

- (194) [ʼʃagoβa luŋ] /shakoba lön/ ‘they’re catching it’
 [ʼʔöyβiŋ] /äybing/ ‘type of plantain’
 [ʼkweywo] /kwegwo/ ‘tortoise’

8.10 Lateral Softening

When a lateral occurs intervocalically, it softens from a flap [ɺ] to a plain lateral [l]:⁵¹

- (195) [däba¹la] /dbala/ ‘stars’
 [p^ho¹la] /pjola/ ‘far’
 [ʼhulu] /jölä/ ‘O.K.’

8.11 Consonant Devoicing

Stops and fricatives are devoiced word-final. Because voiceless stops and fricatives are also voiced according to the rules in section 8.1, it is often difficult to tell if the particular stop or fricative in the environment in question is underlyingly voiced or voiceless. It is usually easier to detect voicing, as in the examples of section 8.1, than devoicing. In careful speech, consonants, which have become voiced due to environment, are often pronounced as voiceless. But because consonant devoicing is a word-final phenomenon, the pauses of careful speech do not help to re-voice them; thus consonants which have been devoiced are never pronounced as voiced. However, because the following words have more than one form, I believe they do show consonant devoicing:

- (196) [kɪz¹baŋ] /këzbang/ ‘big (sing.)’ becomes [kɪs kɪs] /këz këz/ ‘big (pl.)’
 [ʼrezgwo] /rezkwo/ ‘grains of rice’ becomes [ɾɛs] /ɾez/ ‘rice’
 [dli ʼʃizɔŋ] /dli shizong/ ‘take out some food!’ becomes:
 food take-out.2sImv
 [dli ʃis ʼborwakɔŋ] /dli shiz borwakong/ ‘take out some food for us!’
 food take-out.2sImv 1pexc.for

In the example of /këzbang/ I am taking the singular form as more basic (more representative of the underlying form). If the plural form is more basic, then it exhibits

⁵¹The flap [ɺ] occurs elsewhere, therefore these two laterals are in complementary distribution. Because the flap is much more abundant and occurs in a variety of environments, I am assuming that it is the underlying phoneme, requiring only this one rule: [ɺ] → [l] / V_V.

stop voicing as in section 8.1.1. In the example of /rezkwo/, it is the underlyingly voiced sibilant /z/ which allows stop voicing to operate on the /k/ of the suffix [-kwo] /-kwo/ ‘grains of’, turning it into a /g/. With the removal of the suffix [-kwo] /-kwo/ ‘grains of’ the /z/ then devoices to an /s/. It appears that this is indeed a process of devoicing, rather than a process of sibilant voicing wherein an underlying /s/ becomes a /z/ due to the following /g/, because of the pattern of the suffix /-kwo/. It appears to begin with a voiceless stop which becomes voiced between voiced segments (as in 8.1.1), for example, [ʼrezgwo] /rezkwo/ ‘grains of rice’ and [ʼʃtɔgwo] /shtäkwo/ ‘grains of beans’. Following voiceless consonants, the suffix is [-kwo]. For example, adding the suffix [-kwo] /-kwo/ ‘grains of’ to [ʼɪpʷ] /ëp/ ‘corn’ produces [ʼɪpkwo] /ëpkwo/ ‘grains of corn’, and [ʼakʷ] /ak/ ‘rock’ becomes [ʼakwo] /akkwo/ ‘pebbles, gravel’.⁵²

It is likely that the short form of the second person singular imperative also exhibits consonant devoicing. The full form ending is [-zɔŋ] /-zong/ as in the example above: [d.li ʼʃizɔŋ] /dli shizong/ ‘take out some food!’ The short form ending, which can be used when the command does not end the sentence, is [-s] /-z/, as in [d.li ʃis ʼborwakɔŋ] /dli shiz borwakong/ ‘take out some food for us!’ With the [-ɔŋ] of the ending removed, the /z/ ends the word and must devoice to [s]. In contrast, the second person plural imperative ending is [-zĩyã] /-zĩya/, which can be shortened to [-zĩ] /-zĩ/. In this case, the /z/ does not end the word and cannot devoice (see table 14 for a chart of imperative endings).

8.12 Vowel Raising

Before a glide or after a glide or a vowel, the vowel /e/ is raised from the underlying [ɛ] to [e]:

- (197) [ʼp^heyöga] /pjeyga/ ‘people, family’
 [dew] /dew/ ‘down below’
 [ʼʃarye] /sharye/ ‘make, do’
 [twe] /twe/ ‘come’
 [bökʷ ʼpre] /bök pë-e/ ‘he/she is asleep’
 [bökʷ p^hoʼlae] /bök pjola-e/ ‘it is far’
 [d.li ʼwako ʼp^h.lue] /dli wako pjlu-e/ ‘the food tastes good’

⁵²A possible argument against [rɛs] /rez/ ‘rice’ exhibiting consonant devoicing is that the word is most likely borrowed from English or Spanish (most loan words in Teribe are from English), and in neither language would the sibilant be voiced, so there would be no reason for the sibilant to be underlyingly voiced in Teribe. The voicing of the sibilant in [ʼrezgwo] /rezkwo/ ‘grains of rice’ would have to be explained by the environment of a following voiced stop, making the ending /-gwo/, rather than /-kwo/ ‘grains of’. However, one would be left to explain why the initial stop of the suffix is voiced in this case, when in all other cases it is only voiced following a voiced segment.

8.13 Vowel Laxing

8.13.1 Low Vowel Laxing

The low, front vowel /a/ can be laxed to [ə] in unstressed syllables:

- (198) [dǎ'borbə] ~[dǎ'borba] /dborba/ 'avocado'
 ['ʔayəŋ] ~['ʔayaŋ] /ayang/ 'monkey-spirit'

8.13.2 High Vowel Laxing

The high, front vowel /i/ is laxed from [i] to [ɪ] when an ending beginning with a labial consonant (except for the glide /w/) becomes attached after it. This can happen when an ending is added to a noun or in the process of verb morphology:

- (199) The noun [di] /di/ 'water, river' ends with [i], which is laxed in the verb:
 ['dɪpzi] /dɪpzɛ/ 'cross the river'

[.likʰ] /lik/ 'cook' plus the second person singular ending becomes [ɪpʰ] as in:
 [tʰakɔŋ 'sɪŋna ɪpʰ si'ra] /tjakɔŋ səŋna lip sira/ 'Cook me a little meat.'
 1s.for meat cook.2s a-little

[.likʰ] /lik/ 'cook' plus the indefinite person ending becomes [ɪ'ba] /liba/ as in:
 [dli ɪ'ba ɬɔŋ] /dli liba löŋ/ 'People are cooking food.'
 food cook.indef be-pl

[siŋ] /sing/ 'a woman's brother' plus the plural becomes:
 [sɪmga] /simga/ 'a woman's brothers'⁵³

[kor'kir] /korkir/ 'corner, trap (v.)' plus the second person plural ending becomes
 [korkɪ'mi] as in:
 [dǎ'boŋ ʔe korkɪ'midɛ] /dbɔŋ e korkimide/ 'Are you (pl.) going to corner the tiger?'
 tiger Dem corner.2pl.Q

But if the word contains /i/ followed by a labial consonant which is a part of the lexical root of the word, that is, the two phonemes are not joined as the result of any kind of morphology, then the /i/ does not become lax:

⁵³In the case of [sɪmga] /simga/ 'a woman's brothers,' the labial consonant /p/ of the suffix /-pga/ has been deleted, and the /m/ is the assimilated final nasal of the noun stem [siŋ] /sing/ 'a woman's brother' (see sections 8.2 and 8.3). Therefore, this laxing rule must be ordered after the nasal assimilation to a following stop rule (8.3).

- (200) [k^hi'bokwo] /kjibokwo/ 'book'
[pri'brie] /pribri-e/ 'coiled up'

The glide /w/ does not have this laxing effect:

- (201) [di] /di/ 'water, river' plus the diminutive ending becomes [d^hdiwa] /diwa/ 'small river'.
[çiçi] /chichi/ 'small one' plus the diminutive ending becomes [ç^hiçiwa] /chichiwa/ 'very small one'.

9 Derivations

In this section I intend to show the operation of the preceding rules on the underlying Teribe phonemes to produce the observed phonetic output. The numbering of the rules corresponds to the numbering in section 8. Some rule ordering is necessary; both Nasal V-C spreading (5.2) and Nasality Assimilation (5.3) feed the Nasal Phoneme Repair rule (5.4). Rule 3, N-S Assimilation (assimilation of a nasal to a following stop), must occur before that stop is deleted by rule 4, Consonant Deletion, which in turn must occur before rule 5.2 or 5.3. These rules have to do with verb morphology and cannot be activated until the final consonant of the "base" form of the verb has been deleted. High Vowel Laxing (13.2) must occur after N-S Assimilation (3) in the case of [sɪmga] 'brothers'.

I will break the examples into two tables in order to accommodate them to the size of the page.

9.1 Phonemic Rules Summary:

- 1.1 Stop Voicing (/p/ or /k/ between voiced segments becomes voiced in fast speech)
- 1.2 Sibilant Voicing (preceding a voiced stop)
- 2 Vowoid Epenthesis
- 3 N-S Assimilation (nasal consonant assimilating to a following stop)
- 4 Consonant Deletion (in noun and verb morphology)
- 5.1 Nasal Vowel Spreading (from a nasal vowel to other vowels and glides)
- 5.2 Nasal V-C Spreading (from a vowel to a final consonant in verb morphology)
- 5.3 Nasality Assimilation (from a deleted consonant in verb morphology)
- 5.4 Nasal Phoneme Repair
- 6 Velar Deletion (when a /k/ is closely followed by a /g/, the /g/ deletes)
- 7 Vowel Deletion (to avoid VV sequence in verb morphology)
- 8 Stop Unreleasing (a voiceless stop occurring pre-pause is unreleased)
- 9 Stop Fricativizing (of voiced labial or velar stops, intervocalically or between a vowel and a glide, in fast speech)
- 10 Lateral Softening (intervocalically from a flap to a plain lateral)
- 11 Consonant Devoicing (stops and fricatives are devoiced word-final)
- 12 Vowel Raising (/e/ raised from [ɛ] to [e] before a glide or after a glide or a vowel)
- 13.1 Low Vowel Laxing (the low, front vowel /a/ laxing from [a] to [ə])

13.2 High Vowel Laxing (the high, front vowel /i/ laxing from [i] to [ɪ])

9.2 Example Derivations

Underlying form	ʃik -z 'take-out' '2sImv'	sbi 'pot'	ʃowɪ'lōrɛ 'yellow'	ĩk -r 'see' 'I'	siŋ -pga 'brother' 'pl'	hɔn -ro -a 'sharpen' 'compl. 3p.'
stop voic.	ʃigz			ĩgr	'siŋbga	
sib. voic.		zbi				
V epenth.		zəbi				
N-S assim					'simbga	
C deletion	ʃiz			ĩr	'simga	hɔroa
NV spread			ʃōwĩ'lōrē			
nas. V-C spreading				ĩr̃		
nas. assim						hɔr̃oa
N phon. repair				ĩn		hɔnoa
velar del.						
V deletion						'hɔna
St. unrel.						
stop fric.						
lat. soft.			ʃōwĩ'lōrē			
C devoic.	ʃis					
V raising						
LV lax.						
HV lax.					'simga	
Output	ʃis 'take out!'	zəbi 'pot'	ʃōwĩ'lōrē 'yellow'	ĩn 'I see'	'simga 'brothers'	'hɔna '3 person sharpen'

Table 17: Example derivations

Underlying form	pɛ'sit 'later'	'kwɛgwo 'tortoise'	twe 'come'	dba'la 'stars'	lik -p 'cook' '2sing.'	'hɪk -g ^w .lo 'go' 'purpose'	'dborba 'avocado'
stop voic.							
sib. voic.							
V epenth.				dǎba'la			dǎ'borba
N-S assim							
C deletion					.lip		
NV spread							
nas. V-C spreading							
nas. assim							
N phon. repair							
velar del.						'hɪk ^w .lo	
V deletion							
St. unrel.	pɛ'sit'				.lip'		
stop fric.		'kweywo					
lat. soft.				dǎba'la			
C devoic.							
V raising			twe				
LV lax.							dǎ'borbɔ
HV lax.					.lip'		
Output	pɛ'sit' 'later'	'kweywo 'tortoise'	twe 'come'	dǎba'la 'stars'	.lip' 'you cook'	'hɪk ^w .lo 'conveyance'	dǎ'borbɔ 'avocado'

Table 18: More example derivations

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