

**The phonetics of tone in Saramaccan**

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## 0 Introduction

This paper presents the results of a preliminary investigation of the phonetics of tone in Saramaccan, an Atlantic creole spoken in Surinam. Saramaccan has traditionally been described as exhibiting a lexical contrast between high tones and low tones, as well as allowing tone bearing units (TBU's) to be lexically unspecified for tone, but surfacing with either high or low tone, depending on the phonological environment where they appear (Voorhoeve 1961, Rountree 1972).

The tone system of Saramaccan is particularly well developed for a creole—this fact alone makes an examination of the phonetics of the language's tones of potential value. In addition, there are two other interesting aspects of Saramaccan tonology. The first is that, as reported extensively in Good (2004), a range of phonological evidence indicates that the Saramaccan lexicon exhibits a prosodic split wherein most words are marked for lexically-contrastive pitch accent but an important minority of words are marked for true tone—no other language has been explicitly reported as showing such a split.<sup>2</sup> The second area of interest is a process of high-tone plateauing found in phonological phrases in the language which has been the topic of both descriptive and theoretical studies (Voorhoeve 1961, Rountree 1972, Devonish 1989: 48–55, Ham 1999, and Good 2003).

Until now no instrumental phonetic data has been available for Saramaccan tone. While the data to be discussed here falls short of a complete survey, it is hoped that it will be of value both to the study of Saramaccan specifically and to comparative studies of the prosodic systems of Atlantic creoles (and other contact languages) more generally.

The structure of this paper is as follows: Section 1 summarizes some basic descriptive features of tone in Saramaccan. Section 2 briefly examines some of the evidence for a pitch accent/tone split in the Saramaccan lexicon. Section 3 presents the results of a phonetic study of the pitch of words uttered in isolation, and section 4 presents some of the results of an examination of pitch in phrases. Finally, section 5 offers a brief conclusion.

## 1 The three-way tonal lexical contrast in Saramaccan

There is a three-way lexical contrast in Saramaccan among tone bearing units (TBU's) marked for high tone, low tone, and those which are unspecified for tone. By default, TBU's unspecified for tone surface as low, but, in certain well-defined phonosyntactic environments, they surface as high.

The primary evidence for a three-way contrast, as opposed to a two-way contrast, comes from data involving a process of high-tone plateauing which only affects TBU's unspecified for tone. Relevant examples are given in (1).<sup>3</sup>

- (1) a. *taánga* → *tàánga* 'strong'  
b. *dí taánga wómi* → *dí tàánga wómi*  
the strong man  
“the strong man”

In (1a), the word *taánga* ‘strong’ is seen in its citation form outside of a phrase. As indicated in the example, the form of the word in this context is *tàángà*, where the two TBU’s lexically unspecified for tone surface with low tones. In (1b), the word *taánga* appears in a noun phrase, and it surfaces with a final high tone as *tàángá*. The appearance of this high tone follows a general rule that unspecified tones are realized as high tones within a phonological phrase when flanked by high tones. Thus, this yields a type of tonal plateauing, creating one flat series of high tones within phonological phrases where otherwise there might have been a contour. The particular phonological phrase involved in the plateauing seen in (1b) is one formed by a noun and the word preceding it in the noun phrase.<sup>4</sup> For detailed discussion on the syntactic environments constituting phonological phrases in Saramaccan, see Good (2004: 598–607).

Since, in a word like *taánga*, the surface tones on the first and last TBU are predictable based on their phonosyntactic environment, they are most straightforwardly analyzed as being unspecified for tone. A word like *taánga*, then, can be usefully contrasted with a word like *káimà* ‘alligator’. The citation form of this word also contains some high tones and low tones. However, unlike *taánga*, the low tones in *káimà* never appear as high. The examples in (2) show how *káimà* contrasts with the word *wómi* ‘man’, whose final TBU (like that of *taánga*) is lexically unspecified for tone.

- (2) a. *Dí káimà kulé àlá.* → *Dí káimà kùlé àlá.*  
the alligator run there  
“The alligator runs there.” (Rountree 1972: 316)
- b. *Dí wómi kulé àlá.* → *Dí wómí kùlé àlá.*  
the man run there  
“The man runs there.”

The last word of a subject noun phrase forms a phonological phrase with a following verb. Thus, the unspecified final TBU of *wómi* and the unspecified initial TBU of *kulé* ‘run’ both surface with high tones, as a result of plateauing, in (2b). However, in the same basic environment, the final two TBU’s of *káimà* surface as low reflecting the fact that they are lexically specified for their low tones and, therefore, are never affected by plateauing. In addition, the final low-tone TBU’s of *káimà* block the possibility that high-tone plateauing could affect the word *kulé*. Thus, unlike in the sentence in (2b), in (2a), *kulé* surfaces with an initial low-tone TBU.

In the next section, the distribution of different tone patterns in Saramaccan words will be discussed, with a focus on evidence that the language’s lexicon is “split” into an accentual part and a tonal part.

## 2 The “split” lexicon of Saramaccan

### 2.1 Commonly attested tonal patterns

In this section, I will discuss some of the evidence for a lexical split in Saramaccan between a class of words marked for accent and a class marked for tone. Aspects of the analysis I will provide are anticipated by Devonish (1989: 48–55) and Devonish (2002: 120–134), in particular the idea that the majority of words in Saramaccan are marked for pitch accent. While he does not specifically interpret the Saramaccan lexicon as being “split”, Devonish’s analyses and the one given here are largely compatible.<sup>5</sup>

The first step in recognizing the split in the Saramaccan lexicon lies in the observation that, while there is fairly good evidence for an underlying distinction between three types of TBU's in Saramaccan—high tone, low tone, and unspecified for tone—the observable contour patterns on words containing TBU's unspecified for tone are quite limited. All the common patterns are exemplified in table 1.<sup>6</sup>

Table 1: *Common isolation patterns of words with unspecified TBU's*

WORD	TONES	GLOSS
<i>foló</i>	∅H	'flower'
<i>náki</i>	H∅	'hit'
<i>sikífi</i>	∅H∅	'write'
<i>məkisá</i>	∅∅H	'screen, sift'
<i>hákísi</i>	HH∅	'ask'
<i>afokáti</i>	∅∅H∅	'lawyer'
<i>minísíti</i>	∅HH∅	'minister'
<i>alukutú</i>	∅∅∅H	'soursop (fruit)'

Words containing TBU's unspecified for tone comprise the majority of the Saramaccan lexicon (Rountree (1972: 316)). Accurate figures are not available, but probably around ninety percent of monomorphemic words of this type.

One of the most noteworthy restrictions on words with TBU's unspecified for tone, which comes out clearly in table 1, is that none of the common types contain low tones.<sup>7</sup> Another restriction is that most words of this type only surface with one high-tone TBU in their citation form. As can be seen in the table, in some cases, these words do have multiple high-tone TBU's, but, when this is the case, the high-tone TBU's must be adjacent and are always the antepenultimate and penultimate TBU's of the word. As discussed in detail in Good (2004), the distribution of high tones in these words has the characteristics of a pitch accent system instead of a true tone system.<sup>8</sup> By *pitch accent*, I mean a type of lexical marking wherein one position in a word is specified for abstract phonological prominence and the primary phonetic realization of prominence is via a consistent tonal pattern—in Saramaccan, this tone pattern would be a simple high tone. Pitch-accent systems can, on the one hand, be opposed to stress-accent systems, like that of English, where the primary realization of prominence is through non-pitch cues like the amplitude, duration, and vowel quality of a particular syllable.<sup>9</sup> And, they can, on the other hand, be opposed to tone systems where pitch is assigned to words lexically and is not a reflex of phonological prominence at all.

To understand how a pitch accent analysis of words with TBU's unspecified for tone would work, it is first useful to group the major tone patterns seen in table 1 with respect to CV structures, which is done in (3).

- (3) **2-σ words:** CVCV            CVCV̂  
**3-σ words:** CVCVCV    CVCVCV̂    CVCVCV̂C  
**4-σ words:** CVCVCVCV   CVCVCVCV̂   CVCVCVCV̂C

In (4) the words from table 1 exemplifying the patterns in (3) are given.

- (4) **2-σ words:** *náki*    *foló*  
**3-σ words:** *hákísi*    *sikífi*    *məkisá*  
**4-σ words:** *minísíti*    *afokáti*    *alukutú*

The restricted possibilities for the tonal patterns in words containing TBU's unspecified for tone allows for a "one-mark-per-word" analysis wherein the specification of one TBU in a word for prominence allows us to predict where the high tone or high tones will appear. The location of the necessary prominence "mark", with respect to the CV schematization seen in (3), is given in (5) where an asterisk above a vowel indicates abstract phonological prominence.

- (5) **2- $\sigma$  words:** CVCV\*                  CVCV\*
- 3- $\sigma$  words:** CVCVCV\*                  CVCVCV\*                  CVCVCV\*
- 4- $\sigma$  words:** CVCVCVCV\*                  CVCVCVCV\*                  CVCVCVCV\*

The high-tone pattern on words with TBU's unspecified for tone is completely predictable from the position of the abstract prominence marks given in the schematized word structures in (5). In some cases, the relationship between prominence and high tone marking is trivial—a vowel marked for prominence simply surfaces with a high tone. However, the relationship is not always so simple—in words with a prominence mark in antepenultimate position a high tone is realized on both the antepenultimate and penultimate TBU. If there were a class of words showing contours like  $(\emptyset)H\emptyset\emptyset$  in Saramaccan, the analysis of words with  $(\emptyset)HH\emptyset$  as showing the reflex of antepenultimate prominence would be problematic. However, a conspicuous lack of  $(\emptyset)H\emptyset\emptyset$  contours in the language makes such an analysis straightforward.

The fact that the position of the high tone or high tones in words containing TBU's unspecified for tone can be predicted on the basis of one abstract lexical "mark" means that they belong to a system which marks syntagmatic contrast—that is the locus of the contrast is the relationship different positions within the word have with respect to each other. As discussed by Hyman (1978: 7), this is a central characteristic of an accent system.

If the Saramaccan lexicon consisted only of words of the type just discussed, the language could be described simply as a pitch accent language. However, not all words belong to one of the types exemplified in table 1. In (2a), for example, we saw the word *káimà* 'alligator', which is fully marked for tone. Furthermore, there are cases in Saramaccan where one clearly finds pitch being used to mark paradigmatic contrast—that is, two words lexically contrast solely on the basis of the pitch used to mark one of the TBU's in each word. Hyman (1978: 7) gives the use of pitch to mark such contrast as a central characteristic of a tone system. One example of a pitch-based paradigmatic contrast in Saramaccan can be found in the minimal pair *fà* 'fun' and *fá* 'manner', two words which differ phonologically only in the pitch assigned to their one TBU.

However, the clearest case of tone being used to mark paradigmatic contrast comes from the opposition between "non-emphatic" and "emphatic" pronominal forms in the language.<sup>10</sup> These are given in table 2, as reported in Voorhoeve (1961: 161).<sup>11</sup>

Table 2: *Emphatic and non-emphatic pronouns in Saramaccan*

PER	NON-EMPHATIC		EMPHATIC	
	SG	PL	SG	PL
1st	<i>mì</i>	<i>ù</i>	<i>mí</i>	<i>ú</i>
2nd	<i>ì</i>	<i>ùn</i>	<i>í</i>	<i>ún</i>
3rd	<i>à</i>	<i>dè</i>	<i>hén</i>	<i>dé</i>

As can be seen in table 2, for five of the six pronominal forms, the only way the emphatic form is distinguished from the non-emphatic form is via a change in tonal marking.

In addition to showing such paradigmatic contrasts, words fully marked for tone further differ from words containing TBU's unspecified for tone insofar as they exhibit a wide range of possible tone patterns, including patterns consisting of multiple high-tone TBU's, multiple low-tone TBU's, and patterns where both high-tone and low-tone TBU's are found within a single word. Examples are given in table 3.

Table 3: *Tone patterns for words fully specified for tone*

	WORD	TONES	GLOSS
High tones only	<i>hén</i>	H	'he'
	<i>sósó</i>	HH	'only'
	<i>búúú</i>	HHH	'ideophone for covering'
Low tones only	<i>bà</i>	L	'carry (mass noun)'
	<i>bàsò</i>	LL	'loosen'
	<i>lègèdè</i>	LLL	'lie'
High and low tones	<i>àkí</i>	LH	'here'
	<i>káimà</i>	HLL	'alligator'
	<i>tótómbòtí</i>	HHLH	'woodpecker'
	<i>séségùùsé</i>	HLLH	'kind of fish'

There is good evidence, then, that while most words in Saramaccan may be part of a pitch accent system, there is a separate class of words which appear to be part of a true tone system, showing both paradigmatic pitch contrasts and a wide range of tonal contours. In the next section, I will briefly comment on the likely historical origins of this split in the Saramaccan lexicon.

## 2.2 *On the origins of the split*

The most likely account of the origins of the split lexicon in Saramaccan is that the language exhibits a logically possible (but otherwise unattested) contact phenomenon between European accent languages and African tonal languages. Rather than "levelling" its lexicon towards an African type or a European type, Saramaccan appears to have maintained two parallel prosodic systems, one, roughly speaking, with "European" characteristics and another with "African" characteristics.<sup>12</sup>

Some evidence for this historical scenario comes from the fact that, as pointed out by Ham (1999: 55), in transferred words of European origin, the high-tone TBU in Saramaccan tends to correspond to the nucleus of the stressed syllable in the relevant European language. Additionally, in words with two adjacent high-tone TBU's across two syllables, the general pattern is that the initial TBU corresponds to a TBU in the stressed syllable of the source language and the second high-tone TBU is a historically epenthetic vowel. Relevant examples are given in table 4.

There are exceptions to these generalizations. For example, following the pattern exemplified in table 4, the word *àkí* 'here', from Portuguese *aqui*, would be expected to have been transferred into Saramaccan as *akí* with its first TBU unspecified for tone. However, the word *àkí* is instead fully marked for tone. Nevertheless, the fact that there is a strong correlation between accent in European languages and pitch-accent in Saramaccan strongly indicates that accent entered the language via transfer from European languages.

Though the case is more tenuous because of the lack of sufficient data, there is some indication

Table 4: *Some Saramaccan words of European origin*

SARAMACCAN	GLOSS	ORIGIN	
<i>náki</i>	‘hit’	< English	<i>knock</i>
<i>kulé</i>	‘run’	< Portuguese	<i>correr</i>
<i>sitónu</i>	‘stone’	< English	<i>stone</i>
<i>síkísi</i>	‘six’	< English	<i>six</i>
<i>wólúku</i>	‘cloud’	< Dutch	<i>wolk</i>
<i>minsíti</i>	‘minister’	< Dutch	<i>minister</i>
<i>amækán</i>	‘American’	< Dutch	<i>Amerikaan</i>

that words fully marked for tone tend to be of African origin, giving us evidence that the existence of the tonal part of the Saramaccan lexicon has its roots in transfer of African prosodic systems. Daeleman (1972: 2), for example, notes a correlation between words fully marked for low tone in Saramaccan with comparable words in Kongo. Examples, taken from Daeleman (1972), are given in table 5.

Table 5: *Some Saramaccan words of Kongo origin*

SARAMACCAN	GLOSS	ORIGIN	
<i>püküsü</i>	‘bat’	< Kongo	<i>lu-mpukusu</i>
<i>bàndjà</i>	‘side’	< Kongo	<i>mbaansya</i>
<i>mbàlù</i>	‘(wood) chips’	< Kongo	<i>mbalu</i>
<i>màtùtù</i>	‘small rat’	< Kongo	<i>ma-tutu (pl.)</i>

As Daeleman (1972: 5) points out, there is not always complete correspondence between Kongo tones and Saramaccan tones. So, the story is more complicated than simply stating that tonal words in Saramaccan have their tones as a result of direct transfer from an African language. Nevertheless, the data in tables 4 and 5 gives us initial evidence, at least, that the split between tonal and accentual words in the Saramaccan lexicon is, broadly speaking, the result of transfer of both African tonal systems and European accentual systems into the language without any levelling of the prosodic structure of words in favor of one system over the other.

### 3 A preliminary phonetic examination of the split lexicon

#### 3.1 Theoretical background

Given the apparent split *phonology* of the Saramaccan lexicon, an important question is whether or not this split has any detectable phonetic reflex. This issue is of more than purely descriptive interest given the assumptions of works like Ladd (1996) (and related references cited therein) which assume that, except for the level of constituency where it is assigned, there is no fundamental phonological difference between lexically-assigned pitch (i.e. tones) and pitch assigned as a result of pitch-accent or intonation.

Under such a view, both tonal languages and intonational languages are understood to be making use of “tones” in the assignment of pitch contours. In a tone language tones are assigned to particular positions in words within the lexicon, while in an intonational language tones are assigned

to larger constituents, like sentences. In a pitch accent language, tones are realized in particular positions in a word, like in a tone language. However, tone itself is not assigned lexically—only prominence is lexical, with tone assignment being a predictable reflex of prominence.

Saramaccan is, at present, the only language explicitly analyzed as having a split tonal/accental phonology along the lines described here. It, therefore, serves as an interesting test case for claims like those found in Ladd (1996). If those claims are correct, lexically-specified high tones should be indistinguishable, in terms of  $F_0$  targets, from high tones realized as the result of pitch accent, and lexically-specified low tones should be similarly indistinguishable from “default” low tones (that is, the low tones appearing on TBU’s unspecified for tone when they have not undergone high-tone plateauing of the sort discussed in section 1).

### 3.2 Data collection

To determine the overall phonetic properties of Saramaccan tone, with a focus on possible differences between tones assigned lexically versus those assigned accentually, a number of words were each elicited twice in isolation from a male native speaker of Saramaccan. These words were chosen so as to exemplify the various tonal combinations found in Saramaccan as first classified by Rountree (1972: 314–18).

The recordings of these words were analyzed in Praat and measurements of  $F_0$  were made for each TBU—except for ideophones where a string of adjacent identical vowels was treated as one TBU.<sup>13</sup> Ideophones are a special lexical class of words in Saramaccan used for emphasis and not typically integrated into the syntax of sentences but, instead, used exclamatively. They differ phonologically from other words in Saramaccan in that they generally must be specified as having all high-tone TBU’s or low-tone TBU’s (in addition to having other, specific phonological characteristics like a strong tendency towards total vowel harmony).

The words in table 6 were the words used in this study analyzed as being part of the tonal part of the Saramaccan lexicon, and the words in table 7 were the words used in this study analyzed as being part of the pitch-accent part of the Saramaccan lexicon.

Table 6: *Words fully marked for tone elicited for this study*

tone type	word	gloss
High	<i>búúú</i>	‘ideophone for covering’
	<i>hén</i>	‘he.EMPH’
	<i>fáán</i>	‘ideophone for white’
	<i>kúlúlúú</i>	‘ideophone for straight’
Low	<i>bà</i>	‘carry (liquid)’
	<i>bè</i>	‘red’
	<i>bðsð</i>	‘loose’
	<i>lègèdè</i>	‘lie’
	<i>kùnàkùnà</i>	‘old, worn out’
	<i>pètèpètè</i>	‘ideophone for salve-like’
Mixed	<i>àkí</i>	‘here’
	<i>kâimà</i>	‘alligator’
	<i>séségùùsé</i>	‘type of fish’
	<i>tótómbòtí</i>	‘woodpecker’

Table 7: *Pitch-accent words elicited for this study*

WORD	GLOSS
<i>amɛkán</i>	‘American’
<i>éi</i>	‘if’
<i>foló</i>	‘flower’
<i>folósi</i>	‘crowd’
<i>maaní</i>	‘screen, sift’
<i>náki</i>	‘hit’
<i>ingítsi</i>	‘English’
<i>sóso</i>	‘only’
<i>sukuáti</i>	‘chocolate drink’
<i>taánga</i>	‘strong’

Table 8: *Pitch figures for different phonological sources of tone in Saramaccan*

	MEAN F <sub>0</sub>	ST.DEV.	RANGE	NO.
High-tone ideophones	162	3.8	11	10
Lexical high tones	131	7.3	24	18
Accent high tones	127	5.1	18	24
Low-tone ideophones	107	3.8	12	8
Lexical low tones	104	4.9	18	34
Low-tone defaults	106	7.0	35	36

The pitch measurement for each TBU was measured at the highest F<sub>0</sub> value for surfacing high-tone TBU’s and the lowest F<sub>0</sub> value for surfacing low-tone TBU’s. (This method of measurement is consistent with Ladd (1996) and was explicitly adopted by Liberman et al. (1993).) Table 8 summarizes the results of this data collection. The mean F<sub>0</sub> is given for three different classes of high tones and three different classes of low tones. For high tones these classes were: high tones in ideophones, lexically-specified high tones, and pitch-accent high tones. For low tones, these classes were: low tones in ideophones, lexically-specified low tones, and default low tones.<sup>14</sup> In addition to giving the mean F<sub>0</sub> value (in Hertz) for each type of TBU, the table also gives the standard deviation and range of F<sub>0</sub> as well as the number of TBU’s of each type measured in the study.

An informal examination of the table reveals first and foremost that the high tones in ideophones were realized with much higher pitch than the other types of high tones, which had relatively similar pitch values to each other. In addition, all three types of low tones had roughly similar pitch values.

Not surprisingly given the very high pitch range of the high-tone ideophones, the differences among the three types of high tones were found to be highly statistically significant (a one way ANOVA test over the three types of high tones gave a p-value of effectively zero).<sup>15</sup> Lexically-specified high tones, however, were not found to be significantly different from high tones resulting from pitch accent (two-tailed t-test, p-value 0.068).<sup>16</sup> Finally, the three types of low tones were also not found to be significantly different from each other (one way ANOVA, p-value 0.35).

Both informally and statistically, then, these measurements indicate several things. First, the high tones in ideophones are clearly different from other high tones—in fact, the data points to an analysis where ideophones should be considered to be marked with something like a “super-high” tone. These measurements also indicate that, from a phonetic standpoint, the F<sub>0</sub> maxima of lexical high tones and pitch accent high tones are the same, consistent with Ladd’s (1996) hypotheses

about the relationship between lexical tones and other types of tone. In addition, they indicate that lexical low tones and default low tones have the same  $F_0$  minima, also consistent with Ladd's (1996) hypotheses. Finally, unlike high-tone ideophones, low-tone ideophones appear to make use of the same  $F_0$  target as other low tones.

The results seen here, then, favor the basic hypotheses espoused by Ladd (1996). Despite their different phonological sources, the  $F_0$  maxima and minima of high tones and low tones respectively in words marked for pitch accent, as opposed to tone, appear to be the same. Ideophones complicate the picture somewhat. In the case of high-tone ideophones, the results suggest a third phonological tone in Saramaccan—the super-high tone. This fact is not particularly striking since, as mentioned above, ideophones differ phonologically in a range of ways from non-ideophones in the language. In the case of low-tone ideophones, there is no such complication—they appear to have the same  $F_0$  target as the two other types of low tones.

## 4 The phonetics of high-tone plateauing

### 4.1 Introduction

As discussed above in section 1, one of the areas of Saramaccan tonology which has been of interest to previous researchers is a process of tonal plateauing wherein TBU's unspecified for tone are realized with high tones, instead of default low tones, when flanked by high tones within a phonological phrase. Rountree (1972) and Good (2004) offer fairly detailed discussion of where high-tone plateauing occurs. Here, I will present limited data on the phonetics of two environments where plateauing is found: between a noun and a preceding adjective and between a subject and a following verb. The data will be in the form of pitch traces of particular phrases. These will primarily be examined to determine whether or not they are consistent with the reported descriptions, but, where relevant, other points of potential interest will be discussed.

### 4.2 Plateauing between a noun and preceding adjective

As seen above in (1), an adjective and following noun form a high-tone plateauing environment. The examples in (1) are repeated below in (6).

- (6) a. *taánga* → *tàángà* 'strong'  
 b. *dí taánga wómi* → *dí tàángá wómi*  
     the strong man  
     “the strong man”

In (6a) the citation form for *taánga* 'strong' is given where default low tones appear on its first and last TBU's. In (6b) the final TBU of *taánga* is realized with a high tone since it is flanked by two high tones and is part of a phonological phrase consisting of a noun and a preceding adjective. Pitch traces for (6a) and (6b) are given in figures 1 and 2 respectively.

The pitch traces in figure 1 and figure 2 are both consistent with the reported descriptions. In figure 1, the contour starts relatively low, reaches a maximum over the second TBU of *taánga*, and then falls over the last TBU, as expected given the transcription. In figure 2, the sequence *tàángá wómi* roughly matches the pattern indicated in the transcription. Of particular interest is the lack of

Figure 1: *Pitch trace and segmentation of tàángà ‘strong’*

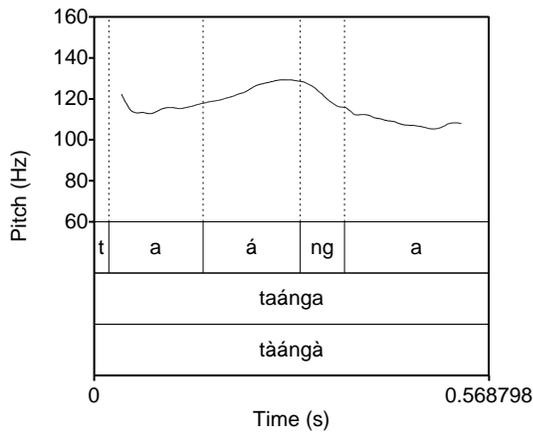
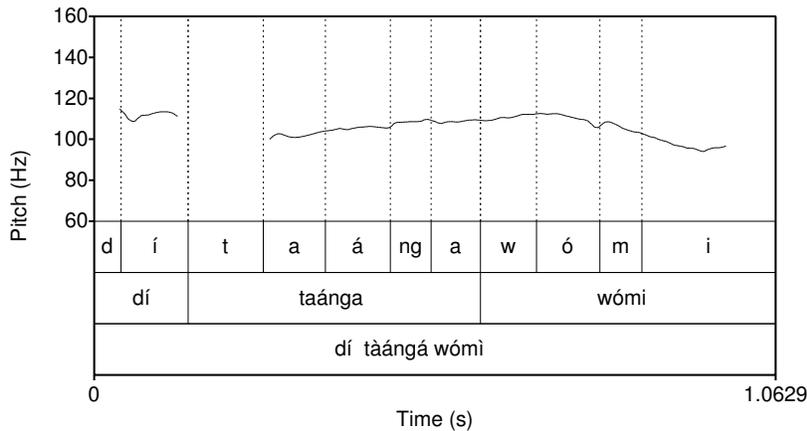


Figure 2: *Pitch trace and segmentation of dí tàángá wómi ‘the strong man’*



any drop over the last TBU of *taánga*—this is the TBU described as being realized as high as the result of plateauing.

A noteworthy property of the pitch trace in figure 2, however, is that it is not completely level between the second TBU of *taánga* and the first TBU of *wómi* ‘man’. Rather, the pitch gradually moves upward, reaching its highest point above the first TBU of *wómi*. This gradual movement, in fact, calls into question the accuracy of the transcription *dí tàángá wómi* given how slight the pitch difference is between the first TBU of *taánga* and the two subsequent TBU’s. Transcribing adjective-noun combinations as exhibiting plateauing is not new to this work, but, in fact, has precedents in Voorhoeve (1961: 159) and Rountree (1972: 321).

This discrepancy between the pitch trace and these transcriptions is suggestive of a system wherein, within the phonological phrase *taángá wómi*, a second phenomenon, in addition to plateauing, can be observed—specifically, the head noun of the phrase may be receiving primary accent while the adjective has secondary accent. The phonetic reflex of this primary accent would be the higher pitch over *wómi* as compared to *taánga* as well as the relative lack of differentiation between the pitch levels of the first TBU of *taánga* and the two subsequent TBU’s.

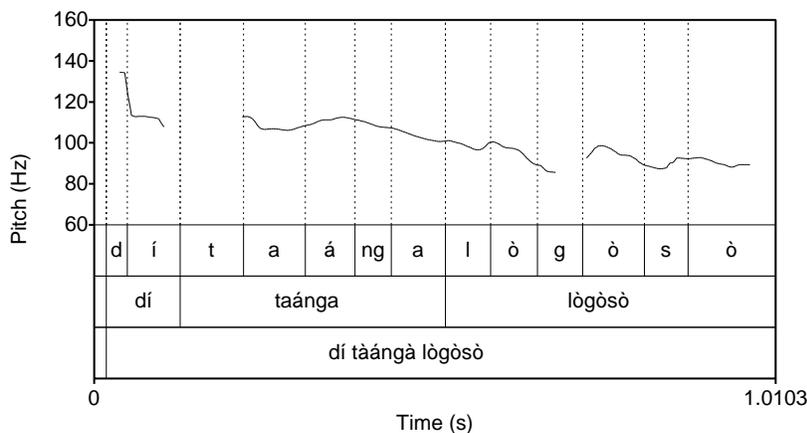
If the two words in the phrase are being marked for different levels of accent, Saramaccan would be showing behavior attested in other languages which mark their words for accent. For example, in English, a stress-accent language, the phrase *white house* receives primary stress on the noun and the adjective is only secondarily stressed, as is clear from the opposition between that phrase and the compound *White House*. Of course, evidence from one pitch trace can only be taken as suggestive of the idea that Saramaccan shows primary and secondary accent phenomena in phrases. Nevertheless, figure 2 indicates that this is an area worthy of further study, especially in light of arguments in Good (2004: 602–7) which suggest, on purely phonological grounds, that the phrasal phonology of Saramaccan more closely resembles that of an accentual language than a tonal one, despite the presence of a class of tonal words in its lexicon. It would seem that phonetic data, in addition to phonological data, could have bearing on this issue.

High-tone plateauing, of the sort seen in (6b), between nouns and adjectives has been reported as being blocked when the head noun begins with a low-tone TBU. An example of such a noun phrase is given in (7). This example is syntactically parallel to (6b). As indicated in the transcription, the last TBU of *taánga* has been observed to surface with a low tone when preceding the noun *lògòsò* ‘turtle’.

- (7) *dí taánga lògòsò* → *dí tàánga lògòsò*  
 the strong turtle  
 “the strong turtle”

The effect indicated by the transcription in (7) can be clearly observed in the pitch trace of the phrase seen in figure 3. In particular, the pitch trace of the word *taánga* takes on a shape which is roughly similar to the shape it has in isolation in figure 1, and it markedly differs from its shape in figure 2.

Figure 3: *Pitch trace and segmentation of dí tàánga lògòsò ‘the strong turtle’*



In this section, we have seen some data on high-tone plateauing between a noun and preceding adjective. The pitch traces verify previous descriptions of the language, and the pitch trace in figure 2 further indicates that a worthwhile future area of research would be an examination of the possibility that Saramaccan uses varying pitch levels to mark words in phrases for primary and secondary accent.

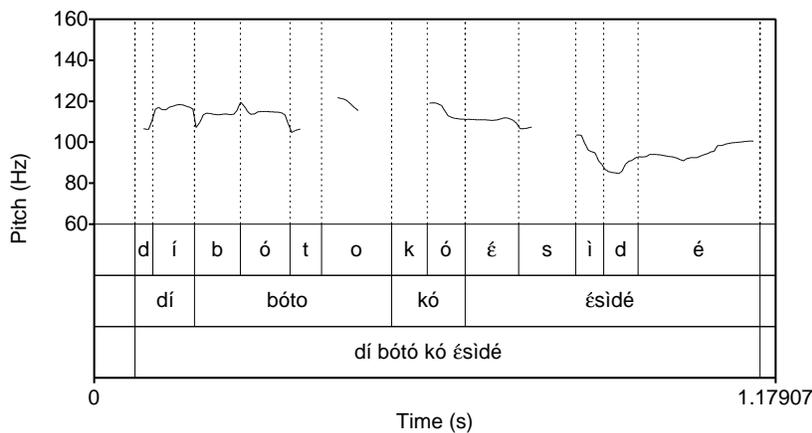
In the next section, I will discuss data regarding high-tone plateauing found between the last word of a subject noun phrase and a following verb.

### 4.3 Plateauing between a subject and predicate

In addition to taking place between a noun and preceding adjective, another environment where plateauing has been reported to occur is between the last word in a subject noun phrase (typically the head noun) and the verb in the following predicate. (Basic Saramaccan word order is SVO.) The sentence in (8) shows this type of plateauing. Its pitch trace is given in figure 4. The second vowel in *bóto* is a TBU reported as being affected by the plateauing, and the pitch trace clearly reflects this.

- (8) *Dí bóto kó ésidè.* → *Dí bó**tó** kó ésidè.*  
 the boat comes yesterday  
 “The boat came yesterday.”

Figure 4: Pitch trace and segmentation of *dí bóto kó ésidè* ‘the boat came yesterday’



The sentence in (9) gives a sentence where high-tone plateauing is blocked by the presence of the low-tone noun in the subject. The pitch trace for this sentence is given in figure 5.<sup>17</sup>

- (9) *Dí lògòsò kulé àlá.* → *Dí lògòsò kùlé àlá.*  
 the turtle run there  
 “The turtle ran there.”

As can be seen, the pitch trace in figure 5 is consistent with the reported descriptions since the first TBU of *kulé* ‘run’, though higher than the last TBU of *lògòsò*, is relatively close to it as well as being markedly lower than the second TBU of the word, indicating plateauing has not taken place.

The pitch trace for the sentence in (10), in principle, should straightforwardly contrast with the pitch trace for the sentence in (9). While the two sentences are not exactly parallel, they are very similar syntactically. Critically, they both contain the same verb *kulé*. Unlike (9), however, the subject of (10) is not a noun phrase headed by a low-tone noun. Rather, it is a high-tone emphatic pronoun *hén*. The pitch trace of (10) is given in figure 6.<sup>18</sup>

- (10) *Dí wómì, hén kulé dé.* → *Dí wómì, hén kùlé dé.*  
 the man he.EMPH run there  
 “The man, he runs there.”

(Rountree 1972: 324)

Figure 5: Pitch trace and segmentation of *dí lógòsò kùlé àlá* ‘the turtle ran there’

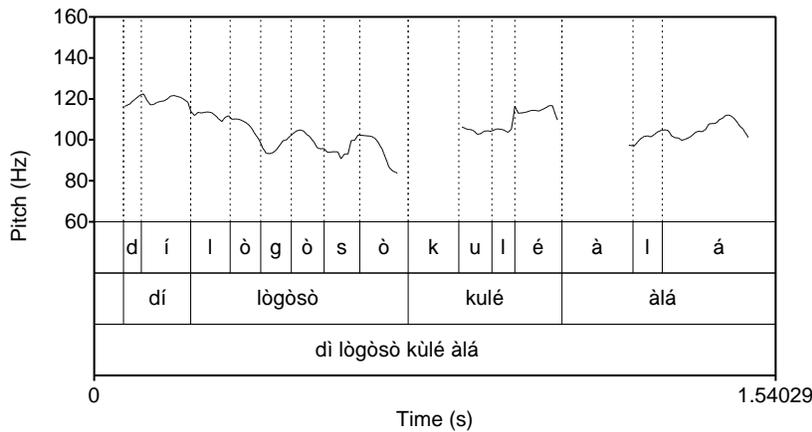
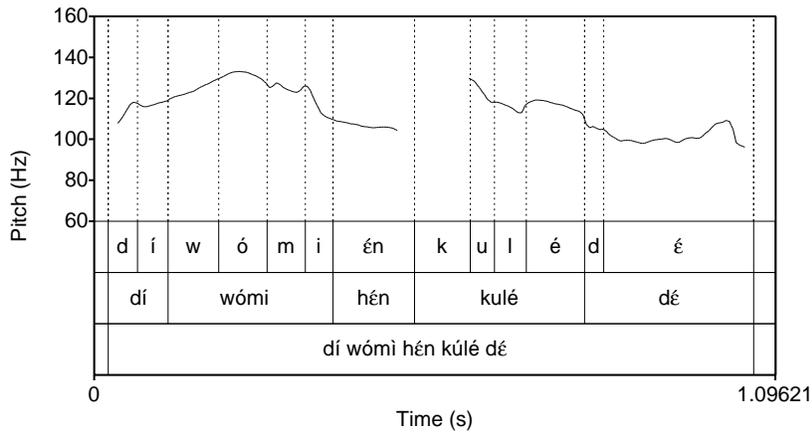


Figure 6: Pitch trace and segmentation of *dí wómì, hén kùlé dè* ‘the man, he runs there’



As can be seen, the first TBU of *kùlé* in figure 6 is clearly higher than it is in figure 5, consistent with the fact that plateauing is reported in sentence (10), but not in sentence (9). The pitch contour starts surprisingly high in the first syllable of *kùlé* in (6), but this might be an effect of the voiceless stop at the beginning of the word—I will come back to this issue briefly in section 5.

There is another, less easily explained, aspect of figure 6, however. The traditional description of the sentence in (10) would suggest that the last TBU of *wómì* would surface as low. However, it is slightly higher (and, in fact, falls into) the transcribed high tone of *hén*. This suggests some complex interaction between the pitch contour assigned to the initial appositive noun phrase and the pitch contour of the whole sentence. While not necessarily contradicting traditional descriptions, the pitch trace in figure 6 indicates that there are unresolved issues in the study of Saramaccan pitch contours at the level of the utterance and that, while phonemicized transcriptions of each TBU as high or low might be appropriate for some levels of description, they are not appropriate for all phenomena.

## 5 Conclusion

This study has been intended only as a preliminary analysis and clearly further investigation is needed in order to solidify the conclusions reached here. Nevertheless, it is possible to make some tentative statements about the phonetics of the Saramaccan tone at this point.

First, an examination of words in isolation indicates that the  $F_0$  targets of tones assigned to words phonologically marked for pitch accent and words phonologically marked for tone are the same. This makes the Saramaccan system consistent with ideas discussed in Ladd (1996) that the difference between tone, pitch accent, and intonation is not whether or not a language uses tone but, rather, at what level of constituency tones are associated with segmental material. This is a relatively striking result given that the hypotheses in Ladd (1996) were not designed with a split system like Saramaccan's in mind, for the simple reason that no other language has been explicitly reported as exhibiting such a split. This preliminary study, therefore, gives a new line of support to Ladd (1996) and related work.

Another result of this study is that it has verified the reported descriptions of tonal plateauing in Saramaccan. While this is not a new result, it lends valuable support to the transcribed tones for Saramaccan insofar as they are consistent with instrumental data. However, as we have seen, the instrumental data indicates that there are aspects of Saramaccan phrasal phonology which need to be further examined, in particular the possibility that particular words in phonological phrases are marked for primary and secondary accent and the way relative pitch levels are assigned to adjacent phonological phrases.

There are various ways in which the data collected for this study could be improved in future work. Perhaps the most important factor not controlled for in the elicited data was the segmental phonology of the words involved. It is well known that nearby consonants can have effects on the  $F_0$  of nearby vowels (see, e.g., Hombert (1978)). To the extent that segmental material was not controlled for, the figures presented in table 8 may have not been the most accurate possible reflection of the real relative  $F_0$  values of the different types of tones. Particular segments might also have affected some aspects of the pitch traces discussed in section 8.<sup>19</sup>

Another area where improved data collection would be useful is that a larger number of phrases needs to be collected and analyzed in order to decrease reliance on impressionistic evaluation of pitch traces, as done here, and to, instead, come to conclusions about the pitch in phrases based on quantitative data.

## Notes

<sup>1</sup>I would like to thank Larry Hyman, John McWhorter, and Irina Galichenko for their extensive contributions to this paper. Thanks are also due to Sharon Inkelas, Ian Maddieson, Marvin Kramer, Catherine Rountree, audience members at the SPCL conference in Atlanta in January 2003, and two anonymous reviewers. Finally, I would like to give special thanks to my principal consultants.

<sup>2</sup>Two languages are explicitly reported as exhibiting phenomena which bear some similarity to the Saramaccan situation. One of these is Papiamentu, another Atlantic creole, which has been reported to make use of both contrastive pitch accent and stress (Kouwenberg and Murray 1994, Rivera-Castillo 1998, Remijsen 2002: 43, Rivera-Castillo and Pickering 2004). Another language, Ma'ya, of the Austronesian family, has been reported as having both contrastive tone and contrastive stress (Remijsen 2001, Remijsen 2002: 39–68). While neither of these languages show *split* lexicons like Saramaccan, they represent cases where a language makes use of two different prosodic systems to make lexical contrasts. Devonish's (2002) analyses of Guyanese Creole (2002: 82–119) and, perhaps, Krio (2002: 147)

indicate they may exhibit something similar to what will be reported here for Saramaccan. He does not explicitly describe them as having split lexicons, but, clearly, they would be worthwhile to examine in trying to find further examples of this type of phenomenon.

<sup>3</sup>Throughout this paper, the following conventions will be maintained: an acute accent (´) will be used to mark a high tone and a grave (`) will be used to mark low tone. Surface forms will be completely tone marked, reflecting their actual pronunciation. Underlying forms, however, will only show the tone marking which is taken to result from their lexical specification. Orthographic *ng* is a velar nasal and “coda” *n*’s indicate nasalization on the preceding vowel. All uncited data comes from consultant work.

<sup>4</sup>The data in (1b) also shows that an adjective and a preceding article do not form a phonological phrase—hence, the initial TBU of *taánga* surfaces as low in (1b) even though it is flanked by high tones.

<sup>5</sup>I believe some of the differences between the analysis here and that of Devonish (2002: 120–134) lie in the fact that his analysis relied on published sources, where the tones of words are often inconsistently transcribed, while I made use of data from published sources and also had the opportunity to collect data from consultants to verify those sources.

<sup>6</sup>The tonal contours in table 1 are solely meant to serve as a schematic way of representing a particular, attested surface pattern. They are not intended to be interpreted as underlying tonal representations.

<sup>7</sup>I have identified one monomorphemic word containing both a lexical low tone and a TBU unspecified for tone, *anákià* ‘biting ant’ which has the tonal form  $\emptyset$ HLH. Voorhoeve (1961: 154) identifies about ten words (out of a sample of 1500 words) which follow a similar pattern—an initial TBU unspecified for tone with lexical low tone in some other position in the word. All but one of the words he gives begin with *a* like *anákià*, and the one exception to this, *obíògbén* ‘a type of snake’, also begins with a vowel.

<sup>8</sup>Good (2004) contains a number of arguments for the position that words with TBU’s unspecified for tone should be analyzed as being within a pitch accent system wherein other words in Saramaccan are truly tonal. It will not be possible to go through all of those arguments here.

<sup>9</sup>The distinction between these two ideal types of accent systems can sometimes be obscured in stress-accent languages, like English, where the realization of an intonational pitch contour is sensitive to the position of stress-accent in the words comprising an utterance. The difference between a pitch-accent language and a language like English is that, in English, there is not a consistent tonal contour associated with a stressed syllable. Rather this tonal contour can change depending on the nature of the intonational contour associated with the utterance.

<sup>10</sup>The distribution of these two sets of pronouns is complicated and not simply conditioned by the pragmatic parameter of non-emphatic versus emphatic. For example, object pronouns, except for the third plural, are drawn from the “emphatic” paradigm (Voorhoeve 1961: 161).

<sup>11</sup>A possible alternative way of analyzing the “tonal” opposition of the pronominal forms in table 2 would be to say that the non-emphatic pronouns are underlyingly unaccented while the emphatic ones are underlyingly accented. My primary reason for adopting the tonal analysis given here is that, as pointed out by Voorhoeve (1961: 161), both paradigms of pronouns are subject to reductions, indicating that neither is truly stressed and, as discussed in Good (2004: 588–592), there is otherwise a close correlation between a pitch accent high tone and stress, which implies that, if the pronouns of the emphatic paradigm were marked for pitch accent, they should also be stressed and, therefore, not subject to reduction.

<sup>12</sup>As discussed by Bruyn (2002: 165–167), Amerindian elements can also be identified in Surinamese creoles. It is not clear what general principles, if any, govern their prosodic phonology in Saramaccan. For example, the Saramaccan word *amáka* ‘hammock’, identified by Bruyn (2002: 166) as being of Arawakan origin, is apparently marked for pitch accent, while the word *káimà* ‘alligator’, which (controversially) is of Carib origin, according to the Oxford English Dictionary, is apparently marked for true tone.

<sup>13</sup>Praat is a free speech analysis program. Detailed information about it can be found at <http://www.praat.org/>.

<sup>14</sup>At the beginning of the study, ideophones were not intended to be treated as a separate class for pitch measurement. However, a cursory examination of the mean  $F_0$  values for high tones in ideophones made it immediately clear that they strongly diverge from the other high tones, which is why ideophone tones were separated from the other tone types here.

<sup>15</sup>All statistical calculations were done using Microsoft Excel.

<sup>16</sup>This result is much closer to being significant than the differences between low tones, indicating that the  $F_0$  maxima for lexical high tones versus pitch accent high tones should be examined closely in future work.

<sup>17</sup>The final high tones of the sentences in (9) and (10) are affected by an untranscribed process of utterance-final lowering (see Rountree (1972: 309)).

<sup>18</sup>In the particular utterance, examined in figure 6, the speaker used a reduced form of *hén* without the initial *h*, which is why this segment does not appear in the segmental tier of the transcription.

<sup>19</sup>With respect to figure 10, in particular, the surprisingly high  $F_0$  of the first syllable of *kúle* ‘run’ could have been due to the generally observed fact that voiceless stops tend to raise the  $F_0$  of a following vowel (Hombert 1978: 79).

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