Sɛlɛɛ Phonology

A Short Sketch

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1. INTRODUCTION

1.1 The language and people

The Sɛlɛɛ language is spoken by the Santrokofi people, who call themselves Balɛɛ. About 10,000[1] Balɛɛ people live in the Volta Region of Ghana in the Santrokofi traditional area, in three towns called Benua, Bume and Gbodome. All three towns lie within 5-7 miles north of Hohoe on the main road to Jasikan. The largest of the three towns is Benua. There are also a number of Balɛɛ people living in Accra, the capital of Ghana.

The boundaries of the Santrokofi traditional area are mountain ridges to the east and west and the river Dayi to the south. There is no discernible topographical boundary to the north. Between the mountain ridges the land is flat with a network of streams and marshy areas (many of which only flow / are marshy during the wet seasons) making it ideal for growing rice. The natural vegetation is tropical rainforest.

The main occupation in the Santrokofi traditional area is subsistence farming (the occupation of perhaps 60% of the population). Historically the Balɛɛ were iron workers, but the importing of cheaper tools meant that this was no longer viable. Crops grown include their staples of rice, maize, cassava and 'cocoyam', and a variety of fruits and vegetables. Some people, perhaps 33% of them, are also skilled workers such as carpenters and electricians, and professional workers such as teachers. A small percent are also traders (7%).[2] Those with other professions also farm to provide food and supplement their income. Today many young people are leaving the area in search of work.

The Balɛɛ people claim to be the smallest tribe with a paramountcy in Ghana. Within each town the compounds are grouped together according to clan. Each clan has a chief who deals with problems and disputes within the clan. Each town has a chief, but presiding over the whole Santrokofi community is the paramount chief.

There are no major dialect differences in Sɛlɛɛ. However Sɛlɛɛ spoken in Gbodome does have a tendency to prefer [l] word initially instead of [d] for the phoneme /l/, but there is some free variation in all three towns.

The major second language of the area is Ewe, a regional trade language, spoken to some extent by about 75% of the population.[3] Within the Santrokofi community, Ewe is mainly used for church, school, trading and health purposes. There is also some knowledge of Akan (Asante Twi), especially amongst the elders of the community.

Borrowed or adopted words from Ewe and Twi are reasonably common in spoken Sɛlɛɛ, and have caused the introduction of the phonemes /v/, /dʒ/, /g/, /gb/, and /h/, which only occur in words borrowed from these languages.

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[1] Based on the last ethnic census of 1960 with a conservative growth rate of 2.6%. Andrew Ring, 1995. *Reviewing the Central Volta Region: Avetime, Santrokofi, Bowiri.* Ghana Institute of Linguistics, Literacy and Bible Translation.

[2] Andrew Ring, 1994. *Reviewing the Central Volta Region: Avatime, Santrokofi and Bowiri.* Ghana Institute of Linguistics, Literacy and Bible Translation.

[3] M. E. Kropp Dakubu [ed.], 1988. *The Languages of Ghana.* Kegan Paul International for International African Institute.

1.2 Language classification

Sɛlɛɛ belongs to the Kwa subgroup of the Niger-Congo subfamily and specifically to the Potou-Tano division.[4] Sɛlɛɛ is closely related to Lelemi, Siwu and Sekpele.

1.3 Previous studies

Previous studies of the language include Funke 1909, Heine 1968, Ford 1973,[5] and Allen 1974. Christine Anne Allen, 1974, has written an unpublished thesis entitled 'Studies in the phonology of Sɛlɛ - the language of Santrokofi.'[6] Allen's thesis gives a general description of the language, however her work only came to light after this present work had been started. It is the author's intention, therefore, to finish this present work but it would be inappropriate to do so without referring to Allen's work throughout.

1.4 Scope and purposes of the present work

This description is based on a period of field work lasting 21 months from October 1996 until July 1998. The research was carried out by Sharon Harflett and Peter Tate of the Summer Institute of Linguistics (SIL), working with the Ghana Institute of Linguistics, Literacy and Bible Translation (GILLBT), affiliated with the University of Ghana, Legon. Research was conducted in all three villages, though the majority of data came from Santrokofi Benua.

The conclusions put forward in this paper are preliminary suggestions based on our observations and data collected to date. More research is needed in the following areas (at least): distribution of glottal stop; vowel sequences; phonological processes and tone.

1.5 Acknowledgments

We would like to thank Mr Tom Schwarz of SIL and GILLBT for initial training in linguistics and Dr Rod Casali of SIL and GILLBT for his expert guidance and for the provision of a partial document template which formed the basis of the present work.

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[4] John M. Stewart, 1989, Kwa, in John T. Bendor-Samuel [ed.], *The Niger-Congo Languages*. Lanham, MD: University Press of America, pp. 214-245.

[5] NB The author has been unable to find and consult the latter references to date.

[6] Christine Allen (1974), *Studies in the phonology of Sele - The language of Santrokofi*. Department of Linguistics, University of Ghana, Legon.

2. PHONEMES

2.1 Consonant phonemes

Sɛlɛɛ has a total of thirteen consonant phonemes in native words at five main places of articulation: labial, alveolar, (alveo)palatal, velar, and labiovelar. Common loan-words add six additional phonemes, including the glottal fricative /h/. These consonant phonemes are displayed in Table (1). Evidence of contrast among these consonant phonemes is shown below with the consonant statements. Further examples are illustrated in Appendix A: Evidence of contrast between consonant phonemes, pp. 33-36. The phonemes restricted to loan-words have been placed in brackets in the table and are not included in the contrast charts.

Table (1) Consonant phonemes

	labial	alveolar	(alveo) palatal	velar	labio-velar	glottal
vl. plosive	p	t	tʃ	k	kp	ʔ
vd. plosive	b		(dʒ)	(g)	(gb)	
vl. fricative	f	s				(h)
vd. fricative	(v)					
nasal	m	n				
lateral		l				
flap		(ɾ)				
glides			j	w		

A significant characteristic of this inventory is the presence of the voiced plosive /b/ especially as all other voiced counterparts are absent.[7] This appears to be an unusual feature specific to Sɛlɛɛ as other related languages, such as Siwu[8] and Sɛkpɛlɛ,[9] do have voiced counterparts.

[7] The voiced alveolar plosive [d] is also present as an allophone of /l/ in Sɛlɛɛ. Allen, 1974, pp. 6, presents the reverse in her analysis; she has the phoneme /d/ with [l] as the allophone. For further discussion refer to section 2.1.4: Lateral. Allen's inventory also differs from the above with the inclusion of alveo-velar nasal [n] and velar nasal [ŋw]. For futher discussion see section 2.1.3: Nasal Consonants.

[8] Kropp Dakubu, 1988, pp.127.

[9] Peter Ladefoged (1968). *A Phonetic Study of West African Languages*. Cambridge University Press, pp. 55.

2.1.1 Plosives

The plosives **p, b, t, tʃ, k and kp** are basically labial, alveolar, alveo-palatal, velar and labio-velar.

The plosives are illustrated in two positions of a word by the following examples:

	Word-initial		Word-medial, syllable initial	
p	pɛ̄	*'to beat'*	lɛ̄pāntā	*'lake'*
b	bɛ̄	*'to split'*	lɛ̀bàmbā	*'other'*
t	tɛ̄	*'to put'*	fɛ̀lɛ̀lɛ̀tɛ̄	*'to fly'*
tʃ	tʃɛ̀	*'to go'*	ātʃɛ̄tʃɛ̄lɛ̄	*'tortoise'*
k	kɛ̀	*'to change direction'*	sɛ̀kɛ̄tɛ̀	*'to open'*
kp	kpɛ̄lɛ̀	*'big'*	sɛ̀kpɛ̄	*'works'*

2.1.2 Fricatives

The fricatives **f** and **s** are basically labial and alveolar. They are illustrated below in two positions of a word:

	Word-initial		Word-medial, syllable initial	
f	fɛ̀	*'to blow'*	kɔ̀fá	*'colour'*
s	sɛ̄	*'to fry'*	kɔ́sá	*'yesterday'*

2.1.3 Nasal Consonants

The nasals **m** and **n** contrast at labial and alveolar points of articulation in word-initial and word-medial, syllable-initial position. For example:

	Word-initial				Word-medial, syllable initial	
m	mì	*'I'*	mā	*'to laugh'*	kàpāmì	*'knife'*
n	nī	*'it'*	nànfī	*'to pull'*	kāmànī	*'fish - specific'*

Nasal consonants are homorganic with an immediately following consonant as illustrated below. Further examples can be found in Appendix B: Nasal Assimilation, pp. 37.

1)	[m̩bā]	/mbā/	'salt'
	[m̩fɛ̄]	/mfɛ̄/	'axes'
	[n̩lɛ̄]	/nlɛ̄/	'nations'
	[ŋ̩kɔ̀mbɔ̄]	/nkɔ̀mbɔ̄/	'conversations'
	[ŋ̩m̩kpá]	/nkpá/	'life'
	[ŋ̩wāàkɔ̀][10]	/nwāàkɔ̀/	'snake'[11]
	[ɲ̩jɔ̄]	/njɔ̄/	'louse'[12]
	[ɲ̩tʃé]	/ntʃé/	'hawks'

2.1.4 Lateral

The lateral phoneme /l/ has three allophones: [d], [l] and [ɾ] (even though /ɾ/ as a separate phoneme also occurs in loan-words). The distribution of these phones is essentially as shown below:

/l/ is [d] before high vowels (optional)

/l/ is [ɾ] intervocalically (optional)

/l/ is [ɾ] following a consonant (upon elision of a vowel)

/l/ is [l] otherwise

The allophone [l] does occur before all of the vowels, for example:

2)	[fɛ́sɛ̄lī]	'window'
	[lɛ̄]	'to eat'
	[bɛ̄lɛ̄fɛ̄]	'to be wide'
	[lāfé]	'to thank'
	[lɛ̄bùlùbɛ̄]	'pineapple'
	[kālò]	'lower'
	[tʃɔ̄lɔ̄]	'to be smooth'

The allophone [d] is an optional realisation of the phoneme /l/ before high vowels (namely [i] and [u]). For example:

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[10] Long vowels have been transcribed as double vowels.

[11] Initially we had analysed [ŋw] as labialised nasal velar [ŋ^{w}]. If this was so then one possible analysis is that [ŋ^{w}] is an allophone of /w/, occuring before nasal vowels, as happens in many other Kwa languages (Bendor-Samuel, 1989, pp. 239-240). However, this analysis cannot stand with Sɛlɛɛ as [ŋw] occurs before vowels which are not nasalised and in word positions where nasal vowels do not occur (see section 2.2.2: Nasal vowels). The simplest analysis is that of nw sequence.

[12] Allen does include [ŋ^{w}] and [ɲ] as phonemes in her inventory, however she does not present any data to illustrate that they are phonemes rather than sequences.

3)	[dībúlāá]	'onion'	[lībúlāá]
	[dítúbákání]	'hail'	[lítúbákání]
	[dītùntǔ]	'fog/mist/cloud'	[lītùntǔ]

4)	[dī]	'quiet'
	[dùfù]	'poke'
	[dìdùbà]	'pawpaw'
	[būdì]	'cut'
	[kùdū]	'dust (noun)'

There are a few words of interest where [d] or [l] would be expected but has not been heard. In these instances we are not sure of [d] and /l/ optionality:

5)	[lɛ̄kɔ̀dúbí]	'one finger of banana'
	[lēkùlùmàntà]	'millipede'
	[lɛ̄bùlùbɛ̄]	'pineapple'
	[bɛ̄sìbījɛ̀lì]	'plate'
	[fɛ́sɛ̄lī]	'window'
	[kūwɔ̄lì]	'paste'

The phoneme /l/ is optionally and commonly realised as [ɾ] intervocalically. For example:

6)	[fɛ́sɛ̄lī]	'window'	[fɛ́sɛ̄ɾī]
	[kékéléké]	'very'	[kékeɾéké]
	[lɛ̄tɛ́lɛ̄bí]	'shell'	[lɛ̄tɛɾɛ̄bí]
	[ɔ̀sɔ̀lɔ̀]	'lover'	[ɔ̀sɔ̀ɾɔ̀]
	[ɔ̄pálálā]	'thunder'	[ɔ̄paɾaɾā]

It is common for vowel deletion to occur in the environment of plosive Consonant Vowel [l], though this is not 100% predictable. Deletion only occurs when both vowels are the same. For example:

<u>without deletion:</u>		<u>with deletion:</u>
[kékéléké]	'very'	[kékléké]

Once vowel deletion occurs there is a preference for [l] to go to [ɾ] though there is one example where either [l] or [ɾ] can occur:

7)	[kékéléke]	'very'	[kékɾéke]	[kékléke]
	[ɔ̄pálálā]	'thunder'	[ɔ̄pɾáɾā]	
	[àtɛ̄lɛ̄]	'spoon'	[àtɾɛ̄]	

However, you do not get Consonant [d] Vowel [+high] as this would violate the tendency for syllables to have increasing sonority.

When [ɾ] occurs in loanwords it does not necessarily alternate with [l]. We are yet to find examples of loan words with [ɾ] word initially.

We have presented the phoneme as /l/ since [l] occurs in the greatest number of environments and this allows the most straightforward account of the relationships between lateral, flap, and plosive variants. Allen (1974)[13] proposed the phoneme /d/ for this language, but her data did not include the flap allophone.

2.1.5 Glides

The glides **j** and **w** are alveo-palatal and velar. When [j] and [w] follow high vowel [i] or [u], they are not as strongly articulated.[14] They are illustrated below in two positions of a word by the following examples:

	Word-initial		**Word-medial, syllable initial**	
j	jɛ̀	*'to stand'*	àjō	*'we'*
w	wɛ̀	*'to find'*	āwò	*'houses'*

2.1.6 Glottal Stop

Many words (all vowel-final) end in glottal stop when they occur before pause. This can vary from speaker to speaker. From the data in our corpus, we have been unable to fully account for the distribution of glottal stop. Further research is needed to determine its role in the language and the generalisation that accounts for its presence or absence.

2.2 Vowel phonemes

2.2.1 Oral vowels

Sɛlɛɛ has seven phonemic oral vowels, shown in Table (2):

Table (2) Vowel phonemes[15]

[13] Allen, 1974, pp. 64-65.

[14] Initially we were not sure whether to analyse sequences with C highV G mid/lowV as being CV CV or CV V. We conducted a test with our language helper where he was asked to reverse the syllable order. When he did this the glide could be clearly heard.

[15] Allen, 1974, pp. 7, has the same inventory.

	front	central	back
high, advanced	i		u
mid, advanced	e		o
mid, retracted	ɛ		ɔ
low, retracted		a	

The reason for advanced ([+ATR]) and retracted ([-ATR]) analysis is demonstrated below in section 2.3: Vowel Harmony.

Evidence of contrast among these are shown below in two word positions. Further examples are illustrated in Appendix C: Evidence of contrast between oral vowel phonemes, pp. 38-39.

	Word-medial, *tV*		**Word-final, *tV***	
i	tīkā	*'to place'*	ànāàtì	*'cooked rice*
e	tēkētē	*'to learn'*	tè	*'to rest'*
ɛ	lɛ̄tɛ́lɛ́bí	*'shell'*	tɛ̄	*'to put'*
a	tākā	*'to stand'*	tà	*'to give'*
u	túkā	*'to carry'*	ntū	*'water'*
o	ntòkòtā	*'sandal'*	tò	*'elephant'*
ɔ	tɔ̀kɔ̄	*'to tell'*	ɔ̀tɔ́	*'fire'*

The relative frequencies of the different Sɛlɛɛ vowels (ignoring length differences - see section 2.2.3: Long Vowels) in a lexical corpus of about 1,000 entries were found to be as follows: /a/ 37%[16], /ɛ/ 13%, /ɔ/ 13%, /e/ 11%, /i/ 10%, /o/, 9%, and /u/ 7%.

The advanced vowels in Sɛlɛɛ exhibit some allophonic variation in their phonetic realisation. The front advanced vowels /i/ and /e/ are sometimes slightly centralised, and pronounced more like [ɪ] when they occur between consonants. Similarly the back advanced vowels /u/ and /o/ are optionally pronounced [ʊ] in the same environment.

The same allophonic variation can also occur when the vowel follows a nasal consonant. For example:

8) [òηw$\bar{\bar{\imath}}$n$\bar{\bar{\imath}}$] 'hair (singular)'
[sènṵ̄] 'songs'

All oral vowels exhibit some allophonic variation in their phonetic realisation when they are adjacent to a nasal element. For example:

[16] N.B. The vowel /a/ occurs in a majority of noun class prefixes and these were included in the percentage calculations. Verb inflection has not been included.

9) [mā̄] 'to laugh'
[nǐnū̄] 'eye'
[nē̄] 'this'
[kónō̄] 'to carry'
[ɲ̣jɛ̄] 'there'
[ŋ̣wɔ̄] 'him'

There are two reasons for considering them as allophones rather than nasal vowels:

1. The degree of nasality is less
2. Nasal vowels only follow obstruents

2.2.2 Nasal vowels

Two vowels, /i/ and /u/, have phonemic nasal counterparts which follow obstruents.[17] These are exemplified in Table (3):

Table (3) Evidence of contrast between nasal vowel phonemes:

/ĩ/		/i/	
[fī̄]	'blow'	[sīfī]	'leave'
[kòtì̄]	'thigh'	[òtī]	'person'
[sɛ̄tʃósī̄]	'sleep' - noun	[lɛ̀fɔ̄sì]	'ten'
[mīnīkǐ]	'turn'	[dīkì]	'take'
[kàpī̄]	'gut'	[òpī]	'thickness'
/ũ/		/u/	
[fū̄]	'get'	[fùfū]	'swell'
[kàtù̄]	'forehead'	[kātù]	'tap' noun
[sùnsù̄]	'sell'	[ókūsù]	'beard'
[kùkū̄]	'book'	[kākú]	'funeral'

Nasal vowels usually occur word-finally, however there are two lexical items where this is not the case:[18]

10) [fī̄jɛ̄] 'to be sick'
[fī̄jɛ̀̄] 'to burn'

There are two alternative explanations for this:

1. Contrastive nasalisation need not be word final and is spreading forwards through the vocalic elements to include the final vowel.
2. Contrastive nasalisation is still only word final and it is spreading backwards through the vocalic elements to include the first vowel.

[17] Allen, 1974, pp. 66-69 presents the same analysis concerning nasal vowels. She also states that nasal vowels only occur in syllable-final position (with the exception of two examples (see below), the same has been observed in our data), or as syllable nasal prefixes (see Section 3.1.1: V Syllables).

[18] The one exception to this is [ɛ̃ː], the Sɛlɛɛ word / ideophone for 'yes' / agreement.

However, this does not account for the fact that the final vowel is realised as /ɛ̃/ and it does not follow an obstruent. One possibility is that front advanced nasal vowel /ĩ/ can follow a glide, but when it does so it exhibits some allophonic variation in it's phonetic realisation, is lowered, and pronounced as /ɛ̃/.

2.2.3 Long vowels

Vowel length[19] is contrastive in Sɛlɛɛ. In our data all the vowels except /u/, /ĩ/ and /ũ/ have phonemically long vowel counterparts, some in identical environments, as illustrated below.[20] Further examples of contrast between long and short vowels are shown in Appendix D: Evidence of contrast between long and short vowels, pp. 40.

Long word-final vowels are often shortened in fast speech.

11)	/i/	[tʃì]	'to go round'
	/ii/	[tʃīīfī]	'fish - specific'
	/e/	[sē]	'to set'
	/ee/	[kàwēsēē]	'stick'
	/ɛ/	[sɛ̄sá]	'towels'
	/ɛɛ/	[sɛ̄ɛ̄sa]	'to greet'
	/o/	[lō]	'to kill'
	/oo/	[lōō]	'to finish'
	/ɔ/	[tɔ̄]	'to worship the devil'
	/ɔɔ/	[tɔ̀ɔ̀]	'to herd/drive'
	/a/	[kākó]	'river fish'
	/aa/	[kāākō]	'to be near'

[19] When looking at vowel length, we selected those examples which had level pitch on the long vowel. Length has been transcribed as VV throughout this paper.

[20] Allen, 1974, pp. 93, has also found vowel length to be contrastive in Selee. She presents evidence of contrast between /u/ and /uu/, and nasal vowels. pp. 209-211.

2.3 Vowel Harmony

As noted, Sɛlɛɛ has a seven vowel system and full cross-height vowel harmony is not found. However there is restricted harmony in Sɛlɛɛ.[21] The vowels of roots and prefixes can be divided into two harmonising sets:

Set 1	i		u
	ɛ		ɔ
		a	
Set 2	i		u
	e		o
		a	

This has also been observed in other Ghanaian languages including Siwu, a related language to Sɛlɛɛ.[22]

When more than one vowel occurs root internally and both are mid then they will either be advanced ([+ATR]) or retracted ([-ATR]). High vowels [i] & [u] and low vowel [a] freely occur with either [±ATR].

Prefix harmony appears to be root controlled as in many other Ghanaian languages.[23] Therefore, mid vowels will agree in harmony with the first vowel of the root where high vowels [i] and [u] are [+ATR] and low vowel [a] is [-ATR].

When the prefix vowel is [a] it freely occurs with either [±ATR] first vowels in the root. For example:

	Set 1		**Set 2**	
1st person plural-perfective-	/bu-tɔɔ-ma/	'we have laughed'	/bu-too-bu/	'we have thought'
2nd person plural-perfective-	/bi-tɔɔ-lɔɔfɔ/	'you have sharpened'	/bi-too-loo/	'you have finished'
1st person single, recent past-	/lɛ-tʃa/	'I cut'	/le-sifi/	'I left'
	/lɛ-sɛ/	'I fried'	/le-se/	'I set'
1st person single, present	/kɔ-lɛ/	'I am calling'	/ko-le/	'I am eating'
	/kɔ-bɔmbɔ/	'I am loving'	/ko-bonsa]	'I am bending
Nouns	/lɛ-kɔni/	'ring'	/ɛ-bo/	'bottle'
Noun class marker-	/a-kɔni/	'rings'	/a-ɓ/	'bottles'
	/ɔ-kpɛ/	'work'	/o-kum/	'gun'
	/sɛ-kpɛ/	'works'	/si-kum/	'guns'

[21] Allen, 1974, pp. 86-92 presents the same analysis.

[22] Kropp Dakubu, 1988, pp. 131-132.

[23] Rod Casali, 1998. *Vowel Systems in Ghana: Aspects of their distribution and phonological behavior.* Ghana Institute of Linguistics, Literacy and Bible Translation

There are a few instances where the rules of vowel harmony are infringed:

- Low vowel [a] is 'opaque'; it blocks agreement between harmonising prefixes and roots. For example:

  12) [ɔ̄-sāŋkō] 'single-woman'

- Vowel harmony does not apply to compound words, which may combine vowels from opposite sets. For example:

  13) [kɔ̀-lɛ̀-tānɛ̄ɛ̀] 'singular-eat-hand' 'right hand'
  [sɛ̀-tɔ̄-lēbō] 'plural-fire-bottle' 'light bulbs'

- Vowels from both sets can occur in the same word when the initial vowel of the root is high [+ATR]. The prefix vowel will also be [+ATR] however, the following vowels of the root may well be [-ATR]. For example:

  14) [ō-sūwɔ̄tɔ̀] 'single-man' 'man'
  [kō-fǐjɛ̌] 'I-sick' 'I am sick'
  [ēē-mùwɔ̀] 'he-fat' 'he is fat'

- The addition of Suffixes. The suffix [le] to a verb root to derive an adjectivc does not interact with vowel harmony. For example:

  15) [lɛ̄-bɛ̄lɛ̄fɛ̄-lē] 'it-wide-adjectiviser' 'it is wide'
  [à-fɔ́-lé] 'they-new-adjectiviser' 'they are new'

Further research may be needed to establish whether [le] is indeed a derivational suffix. Alternatively it could be either a bound word clitic. If so this could explain why vowel harmony does not comply here.

3. PHONOTACTICS

3.1 Syllable Structure

In addition to the unmarked syllable type CV, Sɛlɛɛ has the following, more marked, types of syllables: V, CVV, CVC and CCV.[24] Examples are shown below:

V (vocoid)		V (nasal)	
/ānù/	'face'	/mbā/	'salt'
/ākpā/	'bridge'	/mmà/	'backs'
/ōsí/	'yam'	/nfɛ̄/	'axes'
/ōdù/	'root'	/nlē/	'nations'
/òfā/	'grass'	/ntʃé/	'hawks'
/òtó/	'fire'	/nnjā/	'mouths'

CVV	
/kɔ̀sàānwù/	'snake'
/kàwēsēē/	'stick'
/tɛ̀ɛ̄mì/	'forefather'
/fàā/	'to shout'
/bùūsà/	'to be wet'
/lɔ̀ɔfɔ̀/	'to sharpen'

CVC (nasal)		CVC (glottal stop) (See Section 2.1.6)	
/òbòmbō/	'corner'	[njō?]	'louse'
/bìm-pɛ/	'you-beat'	[pē?]	'to beat'
/bàn-fɛ̄/	'they-blow'	[nú?]	'to bite'
/bōnsā/	'to bend'	[lò?]	'to kill'
/kàntō/	'rain'	[jū?]	'to throw'
/pònkó/	'horse'	[sā?]	'to sing'

3.1.1 V syllables (oral and nasal)

V syllables only occur in word-initial position.

High vowels never occur as V syllables.

The use of front vowels as V syllables is very marginal, there being only three lexical items in a database of about 10000 words.

V syllables occur as noun class markers, verb markers and in some pronouns.

[24] Allen, 1974, does not deal with syllable and word structure in her thesis.

3.1.2 CVV syllables

CVV syllables can occur in word-initial, medial and final position.

3.1.3 CVC syllables

Although all consonants can occur as syllable onsets, only nasal consonants and glottal stops may occur in coda position. CVN syllables never occur word finally. One possible analysis is that since we have a CVN pattern which is not found word-finally phonetically whereas nasalised vowels are found there exclusively, then the analysis of CnasV as CVN is possible. However, this analysis does not explain why only high vowels can be nasalised in this position, whereas in CVN syllables the vowel quality is not similarly constrained.

There is no evidence of contrast between CVC with a glottal stop and CV. The use of the glottal stop seems to be in free variation. This would mean that there is no univalent CVC pattern, only CVN.

3.2 Word Structure

3.2.1 Verb structure

Verb roots in Sɛlɛɛ contain up to five syllables, although roots of three syllables and more are rare (11% and 3%). Those of four and five syllables usually contain repeated morphemes. For example:

16) /tʃōlōtʃōlō/ 'to be smooth'
/mùnùmùnú/ 'to be round'
/kùsèkùsèsā/ 'to bless'

Monosyllablic verb roots are CV and CVV in shape. For example:

17) /fè/ **CV** 'to go'
/tʃì/ **CV** 'to turn'
/làā/ **CVV** 'to vomit'

Disyllabic verb roots are usually CVCV though there are examples of CVNCV, CVVCV, CVVCVV and CVCVV. For example:

18) /dùfù/ **CV CV** 'to poke'
/bōnsā/ **CVN CV** 'to bend'
/wōòfò/ **CVV CV** 'to be cool'
/wòlāà/ **CV CVV** 'to search'
/njōōnìì/ **CVV CVV** 'to be dull'

Trisyllabic verb roots are usually CVCVCV though there are a few of examples of CVNCVCV and CVCVNCV (9.5%). For example:

19) /pùkūtù/ **CV CV CV** 'to be dirty'
/tʃōntʃòlò/ **CVN CV CV** 'to be long'
/lākánkò/ **CV CVN CV** 'to stay busy'

Verb prefixes contain a maximum of two syllables. Prefixes include markers for person, number, tense and aspect. For example:

Position Class Table:

-2 Person and number		-1 Tense / Aspect		0 Root
a-	'3rd person, sg'	a-	'distant past'	
ba-	'3rd person, pl'	ba-	'future'	
bi-	'2nd person, pl'	ɛ- e-	'recent past'	
bu-	'1st person, pl'	ɔ- o-	'continuous aspect'	
fa-	'2nd person, sg'	tɔɔ-	'perfective aspect'	

24)	/ɔ̄-sānkō-bí/	**V CVN CV CV**	'sg-woman-small'	*'girl'*
	/kà-kpànà-wēsēē/	**CV CV CV CV CVV**	'sg-write-stick'	*'pencil'*
	/sē-kélé-kátáá-kɔ́/	**CV CV CV CV CVV CV**	'pl-river-start-place'	*'springs'*

3.3 Segment co-occurrence restrictions

3.3.1 CCV Sequences

See section 2.1.4: Lateral.

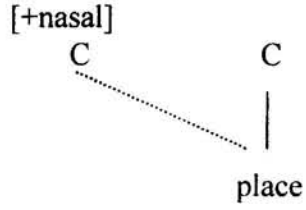
3.3.2 Vowel Harmony

As stated in section 2.2.4, Sɛlɛɛ does have a restricted form of vowel harmony where the vowels of roots and prefixes can be divided into two harmonising sets.

4. PHONOLOGICAL PROCESSES (MORPHOPHONEMICS)

4.1 Processes affecting consonants

4.1.1 Homorganic Nasal Assimilation rule



4.1.2 Assimilation

Assimilation can optionally occur between 1st, 2nd and 3rd plural verb markers /bu/, /bi/ and /ba/ when used with the habitual aspect marker N (see also paradigm tables in section 4.2.1: Vowel Deletion). For example :

	/b/	/m/		
25)	/bù-m-pɛ̄/	/mù-m-pɛ̄/	'1PL-habitual-beat'	*'we beat'*
	/bì-m-pɛ̄/	/mì-m-pɛ̄/	'2PL-habitual-beat'	*'you beat'*
	/bà-m-pɛ /	/mà-m-pɛ̄/	'3PL-habitual-beat'	*'they beat'*
	/bù-n-fɛ̄/	/mù-n-fɛ̄/	'1PL-habitual-blow'	*'we blow'*
	/bì-n-fɛ̄/	/mì-n-fɛ̄/	'2PL-habitual-blow'	*'you blow'*
	/bà-n-fɛ̄/	/mà-n-fɛ̄/	'3PL-habitual-blow'	*'they blow'*

4.1.3 Nasal Deletion

There are some instances of nasal deletion in some verb phrases where the nasal is deleted from the first person and third person singular direct object pronoun. The deletion is optional. We have not heard deletion occurring with the third person plural direct object pronoun as would be expected. For example:

26)	/ā-ā-pɛ̄ mì /	'3SG-past-beat 1SG.DO'	'he beated me'
	/ā-ā-pɛ̄-ì /	'3SG-past-beat 1SG.DO	'he beated me'
	/ā-ā-pɛ̄ fɔ̀/	'3SG-past-beat 2SG.DO	'he beated you'
	/ā-ā-pɛ̄ nwɔ̀/	'3SG-past-beat 3SG.DO	'he beated her'
	/ā-ā-pɛ̄-ɔ̀/	'3SG-past-beat 3SG.DO	'he beated her'
	/ā-ā-pɛ̄ wò/	'3SG-past-beat 1PL.DO	'he beated us'
	/ā-ā-pɛ̄ jè/	'3SG-past-beat 2PL.DO	'he beated you'
	/ā-ā-pɛ̄ mà/	'3SG-past-beat 3PL.DO	'he beated them'

4.2 Processes affecting vowels

4.2.1 Vowel Assimilation

Vowel assimilation can occur within verb phrases which involve goal argument verb roots and indirect object pronouns for first and third person singular. It has not been observed to happen with the other pronouns. For example:

27)	/à-à-tɛ̄-ɛ̀ sìsī/	'3SG-past-give-1SG.IO yam'	*'he gave me yam'*
	/à-à-tā fɔ̀ sìsī/	'3SG-past-give 2SG.IO yam'	*'he gave you yam'*
	/à-à-tɔ̄-ɔ̀ sìsī/	'3SG-past-give-3SG.IO yam'	*'he gave him yam'*
	/à-à-tā wò sìsī/	'3SG-past-give 1PL.IO yam'	*'he gave us yam'*
	/à-à-tā jè sìsī/	'3SG-past-give 2PL.IO yam'	*'he gave you yam'*
	/à-à-tā mà sìsī/	'3SG-past-give 3PL.IO yam'	*'he gave them yam'*

28)	/ɔ̀-ɔ̀-wàkɛ̄-ɛ̄ sìsī/	'3SG-CON-bring-1SG.IO yam'	*'he brings me yam'*
	/ɔ̀-ɔ̀-wàkɔ̄ fɔ̄ sìsī/	'3SG-CON-bring 2SG.IO yam'	*'he brings you yam'*
	/ɔ̀-ɔ̀-wàkɔ̄-ɔ̄ sìsī/	'3SG-CON-bring-3SG.IO yam'	*'he brings him yam'*
	/ɔ̀-ɔ̀-wàkɔ̄ wɔ̄ sìsī/	'3SG-CON-bring 1PL.IO yam'	*'he brings us yam'*
	/ɔ̀-ɔ̀-wàkɔ̄ jɛ̄ sìsī/	'3SG-CON-bring 2PL.IO yam'	*'he brings you yam'*
	/ɔ̀-ɔ̀-wàkɔ̄ mā sìsī/	'3SG-CON-bring 3PL.IO yam'	*'he brings them yam'*

This only appears to happen when the object pronoun is indirect. In these instances the final vowel of the verb root assimilates to the vowel of 1st person and 3rd person indirect object pronoun. The vowel must also agree in ATR:

{à-à-tā E}	⟶	{à-à-tE-E}	⟶	/à-à-tɛ̄-ɛ̀/ *'he gave me...'*
{ɔ̀-ɔ̀-wàkɔ̄ E}	⟶	{ɔ̀-ɔ̀-wàkE-E}	⟶	/ɔ̀-ɔ̀-wàkɛ̄-ɛ̄/ *'he brought me...'*
{à-à-tā O}	⟶	{à-à-tO-O}	⟶	/à-à-tɔ̄-ɔ̀/ *'he gave him...'*
{ɔ̀-ɔ̀-wàkɔ̄ O}	⟶	{ɔ̀-ɔ̀-wàkO-O}	⟶	/ɔ̀-ɔ̀-wàkɔ̄-ɔ̄/ *'he brought him...'*

Assimilation also occurs with verb prefixes. When low vowel /a/ occurs in the person/number marker it will assimilate to the following mid vowel of the tense marker (see position class chart, section 3.2.1 and paradigm charts below). The vowel must also agree in ATR with that of the tense marker, which in turn is determined by the verb root (see section 2.3: Vowel Harmony):

{fā-E-fɛ̀}	⟶	{fE-E-fɛ̀}	⟶	/fɛ̄-ɛ̄-fɛ̀/ *'you blew'*
{fā-E-lòò}	⟶	{fE-E-lòò}	⟶	/fɛ̄-ɛ̄-lòò/ *'you finished'*
{ā-O-fɛ̀}	⟶	{O-O-fɛ̀}	⟶	/ɔ̄-ɔ̀-fɛ̀/ *'he is blowing'*
{à-O-njì}	⟶	{O-O-ɲjì}	⟶	/ɔ̀-ɔ̄-njì/ *'she is drinking'*

Paradigm Table for the verb *fɛ* 'to blow' *ɔtɔ* the fire:

	Distant Past	Recent Past	Continuous	Future	Habitual
1SG	là-fɛ̄ ɔ̀tɔ́	lɛ̄-fɛ̀ ɔ̀tɔ́	kɔ̄-fɛ̀ ɔ̀tɔ́	mā-fɛ̄ ɔ̀tɔ́	n-fɛ̄ ɔ̀tɔ́
2SG	fà-à-fɛ̄ ɔ̀tɔ́	fɛ̄-ɛ̄-fɛ̀ ɔ̀tɔ́	fɔ̄-ɔ̀-fɛ̀ ɔ̀tɔ́	fà-bā-fɛ̄ ɔ̀tɔ́	fà-n-fɛ̄ ɔ̀tɔ́
3SG	à-à-fɛ̄ ɔ̀tɔ́	ɛ̄-ɛ̄-fɛ̀ ɔ̀tɔ́	ɔ̄-ɔ̀-fɛ̀ ɔ̀tɔ́	à-bā-fɛ̄ ɔ̀tɔ́	à-n-fɛ̄ ɔ̀tɔ́
1PL	bù-à-fɛ̄ ɔ̀tɔ́		bū-ɔ̀-fɛ̀ ɔ̀tɔ́	bù-bā-fɛ̄ ɔ̀tɔ́	bù-n-fɛ̄ ɔ̀tɔ́ mù-n-fɛ̄ ɔ̀tɔ́
2PL	bì-à-fɛ̄ ɔ̀tɔ́	bì-ɛ̄-fɛ̀ ɔ̀tɔ́	bī-ɔ̀-fɛ̀ ɔ̀tɔ́	bì-bā-fɛ̄ ɔ̀tɔ́	bì-n-fɛ̄ ɔ̀tɔ́ mì-n-fɛ̄ ɔ̀tɔ́
3PL	bà-à-fɛ̄ ɔ̀tɔ́	bɛ̀-ɛ̄-fɛ̀ ɔ̀tɔ́	bɔ̄-ɔ̀-fɛ̀ ɔ̀tɔ́	bà-bā-fɛ̄ ɔ̀tɔ́	bà-n-fɛ̄ ɔ̀tɔ́ mà-n-fɛ̄ɔ̀tɔ́

Paradigm table for the verb *loo* 'to finish'

	Distant Past	Recent Past	Continuous	Future	Habitual
1SG	lā-lòò	lē-lòò	kō-lòò	mā-lòò	n-lòò
2SG	fā-ā-lòò	fē-ē-lòò	fō-ō-lòò	fā-bā-lòò	fā-n-lòò
3SG	ā-ā-lòò	ē-ē-lòò	ō-ō-lòò	ā-bā-lòò	ā-n-lòò
1PL	bù-ā-lòò		bū-ō-lòò	bū-bā-lòò	bū-n-lòò mū-n-lòò
2PL	bī-ā-lòò	bī-ē-lòò	bī-ō-lòò	bī-bā-lòò	bī-n-lòò mī-n-lòò
3PL	bà-ā-lòò		bō-ō-lòò	bā-bā-lòò	bā-n-lòò mā-n-lòò

Finally, vowel assimilatin occurs in prepositional phrases between the prepositon 'le', meaning *'on'* and the following noun, where the noun is vowel initial. For example:

Underlying form:

29) m-pāmí n-tīkà lē ò-púnú
NC3.pl-knife 3PK.PRS-place Prep NC4.sg-table
'the knives are on the table'

Surface form:

30) m-pāmí n-tīkà lō ò-púnú
NC3.pl-knife 3PK.PRS-place Prep NC4.sg-table
'the knives are on the table'

Ubderlying form:

31) jɔ̀ mbā fà-tìkà lē àkpà
IMP.take NM.salt 2SG-place Prep NM.shelf
'take the salt and put it on the shelf'

Surface form:

32) jɔ̀ mbā fà-tìkà lā àkpà
IMP.take NM.salt 2SG-place Prep NM.shelf
'take the salt and put it on the shelf'

5. TONE

5.1 Pitch

Sɛlɛɛ is a pitch language and has three lexically significant pitches.[25] [26] Level tones are predominant though rising and falling tones do occur. Downstep and downdrift have not been observed.

Pitch	Diacritic
High	´
Mid	¯
Low	`

5.2 Intonation

Grammatically the overall intonation of a clause is raised when a [+WH] question is asked. The overall tonal pattern is maintained and is the same as that of the declarative clause. For example:

33) kōdú lé-lē? ɛ̄ɛ̄, kòdū lē-lè.
Banana 3PK.rp-good? Yes, banana 3PK.rp-good.
'Was the banana good? Yes, the banana was good.'

34) kūnūá fá-sī? ɛ̄ɛ̄, kùnùā n-sì.
Benua 2SG-sit? Yes, Benua 1SG-sit.
'Do you come from Benua? Yes, I come Benua.

It could be said that Sɛlɛɛ has a fourth, extra high, grammatical pitch.

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[25] As does Siwu, a related language. Krop-Dakubu, 1988, pp. 129.

[26] Allen, 1974, pp. 111, proposes four pitches in her analysis, however four tones have not been observed to occur within the same utterance. The main focus of her thesis is on tone, pp. 111-179.

6. WORD LIST

Swadesh 200 Word List for Sɛlɛɛ					
#	English	Phonetic[27]	Phonemic[28]	Plural (where relevant)	
1	I	āmì?	āmì		
2	you (singular)	āfò?	āfò		
3	we	āwò?	āwò		
4	this	n̪nē?	nnē		
5	that	ɲ̪jā?	njā		
6	who	ōwé?	ōwé	bāwé?	bāwé
7	what	ōbé?	ōbé		
8	not	nāà?	nāà		
9	all	àmūŋwù	àmūnwù		
10	many	k͡pínwū?	kpínwū		
11	one	nìŋwīì	nìnwīì		
12	two	àŋjō?	ànjō		
13	big	k͡pēlè?	kpēlè		
14	long	t͡ʃōŋt͡ʃōɾò?	tʃōntʃōlò		
15	small	bībī?	bībī		
16	woman	òsāŋkō?	òsānkō	bàsāŋkō?	bàsānkō
17	man	òsùwōtò?	òsuẁōtò	bàsuẁōtò?	bàsuẁōtɔ
18	person	òtīì?	òtīì	bàtīì?	bàtīì
19	fish	kàk͡pàkū?	kàkpàkū	kòk͡pàkū?	kòkpàkū
20	bird	kànsíjɛ́?	kànsɪ́jɛ́	bākànsíjɛ́?	bākànsíjɛ́
21	dog	wēwēē?	wēwēē	bàwēwēē?	bàwēē
22	louse	ɲ̪jō?	njō	bàŋjō?	bànjō
23	tree	kòwōsò?	kòwōsò	àwōsò?	àwōsò
24	seed	lèbī?	lèbī	àbī?	àbī
25	leaf	lɛ̀fātà?	lɛ̀fātà	àfātà?	àfātà

[27] These forms are as they occur in pre-pausal position. For many of these words this is an unnatural situation. Most of these words would probably never occur with glottal stop in normal utterances because they do not occur prepausally in natural speech.

[28] These transcriptions assume that glottal stop is not a phoneme.

26	root	ōdù?	ōlù	sīdù?	sīlù
27	bark (of tree)	kōpóō?	kōpóo	sēpóō?/āpóō?	sēpóō/āpóō
28	skin	kùkū̃?	kùkū̃	àkū̃?	àkū̃
29	flesh (meat)	sīnà?	sīnà	-----	-----
30	blood	n̩tò?	ntò	-----	-----
31	bone	dìkūfì?	lìkūfì	àkūfì?	àkūfì
32	oil/grease	nɔ̄jī?	nɔ̄jī	-----	-----
33	egg (lit. Chicken stone)	kɔ̄kɔ̄? dīfūwɔ̄?	kɔ̄kɔ̄ līfūwɔ̄	kɔ̄kɔ̄? āfūwɔ?	kɔ̄kɔ̄? āfūwɔ̄
34	horn	lɛ̄t͡ʃà?	lɛ̄t͡ʃà	āt͡ʃà?	āt͡ʃà
35	tail	ɔ̀kā?	ɔ̀kā	sɛ̀kā?	sɛ̀kā
36	feather	ɔ̀lɔ̀ŋkɔ̄ɔ̀	ɔ̀lɔ̀nkɔ̄ɔ̀	sɛ̀lɔ̀ŋkɔ̄ɔ̀	sɛ̀lɔ̀nkɔ̄ɔ̀
37	hair	ɔ̀ŋwīnì?	ɔ̀nwīnì	sìŋwīnì?	sìnwīnì
38	head	dīsì?	līsì	āsì?	āsì
39	ear	kɔ̀tɔ̀kɔ̄?	kɔ̀tɔ̀kɔ̄	àtɔ̀kɔ̄?	àtɔ̀kɔ̄
40	eye	nīnù?	nīnù	ānù?	ānù
41	nose	ɔ̀ŋwū?	ɔ̀nwū	sìŋwū?	sìnwū
42	mouth	kàɲjā?	kànja	n̩ɲjā?	nnja
43	tooth	lɛ̄ɲjɛ̀ɛ̄?	lɛ̄njɛ̀ɛ̄	āɲjɛ̀ɛ̄?	ānjɛ̀ɛ̄
44	tongue	ɔ̀k͡pālàlòmìī?	ɔ̀kpālàlòmìī	sɛ̀k͡pālàlòmìī?	sɛ̀kpālàlòmìī
45	claw (nail)	ɔ̀nɛ̄ɛ̄fɔ̄ɔ̀	ɔ̀nɛ̄ɛ̄fɔ̄ɔ̀	sɛ̀nɛ̄ɛ̄fɔ̄ɔ̀	sɛ̀nɛ̄ɛ̄fɔ̄ɔ̀
46	foot	kɔ̄k͡pà	kɔ̄kpà	ŋ̍mk͡pà	nkpà
47	knee	dìkūñt͡ʃì?	lìkūñtʃì	àkūñt͡ʃì?	àkūñtʃì
48	hand	kɔ̄nɛ̄ɛ̀?	kɔ̄nɛ̄ɛ̀	n̩nɛ̄ɛ̀?	nnɛ̄ɛ̀
49	belly	kàfūtù?	kàfūtù	ŋ̍fūtù?	nfūtù
50	neck	sìmū?	sìmū	sìmū?	sìmū
51	breast	lɛ̀ɲjɛ̀ɛ̄?	lɛ̀njɛ̀ɛ̄	àɲjɛ̀ɛ̄?	ànjɛ̀ɛ̄
52	heart	ɔ̀tǔ?	ɔ̀tǔ	sìtǔ?	sìtǔ
53	liver	lɛ̄kɔ̀ɔ̀	lɛ̄kɔ̀ɔ̀	ākɔ̀ɔ̀	ākɔ̀ɔ̀
54	drink	n̩jī?	ɲjī		
55	eat	lē?	lē		
56	bite	nú?	nú		
57	see	n̩jú?	njú		
58	hear	nù?	nù		

59	know	tòfò?	tòfò		
60	sleep	t͡ʃòsīì?	t͡ʃòsīì		
61	die	k͡pí?	k͡pí		
62	kill	lò?	lò		
63	swim	fìjā?	fìjā		
64	fly	fɛ̀ɾɛ̀ɾɛ̀tɛ̄?	fɛ̀lɛ̀lɛ̀tɛ̄		
65	walk	t͡ʃɛ̀	t͡ʃɛ̀		
66	come	wà	wà		
67	lie down	tē	tē		
68	sit	sījɛ̀	sījɛ̀		
69	stand	jīlà	jīlà		
70	give	tà	tà		
71	say	búwé	búwé		
72	sun	kúfì	kúfì	áfì	áfì
73	moon	kòwɛ́ntɛ́?	kòwɛ́ntɛ́	àwɛ́ntɛ́?	àwɛ́ntɛ́
74	star	lɛ̀wɛ́ntɛ́ɾɛ́bí?	lɛ̀wɛ́ntɛ́lɛ́bí	àwɛ́ntɛ́ɾɛ́bí?	àwɛ́ntɛ́lɛ́bí
75	water	n̩tù?	ntù	-----	-----
76	rain	kàntō?	kàntō	bākàntō?	bākàntō
77	stone	dìfùwɔ̄?	lìfùwɔ̄	àfùwɔ̄?	àfùwɔ̄
78	sand	ɔ̀tɛ̀nsíjá?	ɔ̀tɛ̀nsíjá	-----	-----
79	earth/soil	kòtɛ̄?	kòtɛ̄	àtɛ̄?	àtɛ̄
80	cloud	dītùntṹ?	lītùntṹ	ātùntṹ?	ātùntṹ
81	smoke	kɔ̄jɔ̀?	kɔ̄jɔ̀	ājɔ̀?	ājɔ̀
82	fire	ɔ̀tɔ́?	ɔ̀tɔ́	sɛ̀tɔ́?	sɛ̀tɔ́
83	ash	n̩tɔ́?	ntɔ́	-----	-----
84	burn	fìjɛ̀?	fìjɛ̀		
85	path	ɔ̀sūkù?	ɔ̀sūkù	sìsūkù?	sìsūkù
86	mountain	kōbɔ̀kɔ̀tɛ̀?	kōbɔ̀kɔ̀tɛ̀	ābɔ̀kɔ̀tɛ̀?	ābɔ̀kɔ̀tɛ̀
87	red	lɛ̀sɛ̀ɛ̄lɛ̀?	lɛ̀sɛ̀ɛ̄lɛ̀		
88	green	lɛ̀kɔ̀ɔ̄lɛ̀?	lɛ̀kɔ̀ɔ̄lɛ̀		
89	yellow	-----	-----		
90	white	dìfùfùtū?	lìfùfùtū		
91	black	lɛ̀wēɛ̀fēɛ̀?	lɛ̀wēɛ̀fēɛ̀		

92	night	kàt͡ʃé?	kàtʃé	n̥t͡ʃé?	ntʃé
93	hot, be	dìfīlālè?	lìfīlālè		
94	cold	lɛ̀ŋjɛ̄nɛ̀nɛ̄ɛ̀?	lɛ̀njɛ̄nɛ̀nɛ̄ɛ̀		
95	full, be	dìjīlè?	lìjīlè		
96	new	lɛ̀fōlè?	lɛ̀fōlè		
97	good, it	dìlé?	lìlé		
98	round	nìmùnùmùnū?	nìmùnùmùnū		
99	dry, be	lèkòsōlè?	lèkòsōlè		
100	name	lèjōòtò?	lèjōòtò	àjōòtò?	àjōòtò
101	you (plural)	ájē	ájē		
102	he/she	ŋ̀wōò	nwōò		
103	they	m̀má?	mmá		
104	how?	lɛ̄	lɛ̄		
105	when?	ɔ̀mɛ̄mbɛ̀?	ɔ̀mɛ̄mbɛ̀		
106	where?	fɛ́?	fɛ́		
107	here	ŋ̀fū̄?	nfū̄		
108	there	ŋ̀fā?	nfā		
109	other	lɛ̄bàmbā?	lɛ̄bàmbā	ābàmbā?	ābàmbā
110	three	àtījɛ̄?	àtījɛ̄		
111	four	ānà?	ānà		
112	five	ànōò	ànōò		
113	few	àsɛ́ɛ́?	àsɛ́ɛ́		
114	sky	kòlō?	kòlō	-----	-----
115	day	dīì?	līì	ājì?	ājì
116	fog	lītùntū̃?	lītùntū̃	ātùntū̃?	ātùntū̃
117	wind	kɔ̀fɛ̀fɔ̄?	kɔ̀fɛ̀fɔ̄	àfɛ̀fɔ̄?	àfɛ̀fɔ̄
118	flow	bìjɛ̄?	bìjɛ̄		
119	sea	lèk͡pò?	lèkpò	-----	-----
120	lake	lītūpàntà	lītūpàntà	ātūpàntà	ātūpàntà
121	to rain (rain, it fall)	kàntò kɔ̄nɔ̀	kàntò kɔ̄nɔ̀		
122	wet, be	bùūsà?	bùūsà		
123	wash	fōtò?	fōtò		
124	snake	kɔ̀sàāŋ̀wù	kɔ̀sàānwù	bàsàāŋ̀wù	bàsàānwù

125	worm	dīkúkùdī?	līkúkùlī	ākúkùdī?	ākúkùlī
126	back	kāmà	kāmà	m̩̄mà	mmà
127	leg	kōk͡pà	kōkpà	ŋ̄͡mk͡pà	nkpà
128	arm	kònɛ̄ɛ̀?	kònɛ̄ɛ	ǹ̩nɛ̄ɛ?	nnɛ̄ɛ
129	wing	kùfūkǔ?	kùfūkǔ	àfūkǔ?	àfūkǔ
130	lip	lèɲjāsíbí?	lènjāsíbí	àɲjāsíbí?	ànjāsíbí
131	fur	òŋwīnì?	ònwīnì	sìŋwīnì?	sìnwīnì
132	navel	lɛ̀kòō?	lɛ̀kòō	àkòō?	àkòō
133	gut	kàpī̄?	kàpī̄	m̩̀pī̄?	mpī̄
134	saliva	sìtā?	sìtā		
135	milk	ǹ̩jɛ̀ɛ̄tù?	njɛ̀ɛ̄tù		
136	fruit	lēwósóbí?	lēwósóbí	āwósóbí?	āwósóbí
137	flower	lētótō?	lētótō	ātótō?	ātótō
138	grass	òfā?	òfā	sɛ̀fā?	sɛ̀fā
139	with	kú?	kú		
140	in	kàmɛ̄?	kàmɛ̄		
141	at	lɛ̄?	lɛ̄		
142	if	ǹ̩sé?	nsé		
143	mother	jàāmì?	jàāmì	bājàlōò?	bājàlōò
144	father	tɛ̀ɛ̄mì?	tɛ̀ɛ̄mì	bātɛ̄lōò?	bātɛ̄lōò
145	husband	òsā?	òsā	bàsā?	bàsā
146	wife	ósōfò?	ósōfò	básōfò?	básōfò
147	salt	m̩̀bā?	mba	-----	-----
148	ice (hail)	lītúbákání	lītúbákání	ātúbákání	ātúbákání
149	snow	-----	-----	-----	-----
150	freeze	nìì?	nìì		
151	child	òbìsō?	òbìsō	bàbìsō?	bàbìsō
152	dark, be	wōfò?	wōfò		
153	cut	búdī?	búlī		
154	wide	bɛ̄lɛ̄fɛ̄?	bɛ̄lɛ̄fɛ̄		
155	narrow	máámá	máámá		
156	far, be	t͡ʃó?	tʃó		
157	near	kààkō?/tɛ̀ɛ̀tɛ̄?	kààkō/tɛ̀ɛ̀tɛ̄		

158	thick	òpī?	òpī		
159	thin	wókólóó	wókólóó		
160	short	kúŋkú?	kúnkú		
161	heavy	ònòtō?	ònòtō		
162	dull	ɲ̣jōōníī	njōōníī		
163	sharp, be	kòbē?	kòbē		
164	dirty, be	k͡pōnòfò?	kpōnòfò		
165	bad	làlāà?	làlāà		
166	rotten	bùū?	bùū		
167	smooth, be	t͡ʃōlōt͡ʃōlō?	t͡ʃōlōt͡ʃōlō		
168	straight	wōlōlō?/tīnīnīī?	wōlōlō/tīnīnīī		
169	correct/true	ŋ̣wáā	nwáā		
170	left	kòmɛ̀ntū?	kòmɛ̀ntū		
171	right	kōlétánɛ́ɛ̄?	kōlétánɛ́ɛ̄		
172	old (it is)	lèkòfōlè?	lèkòfōlè		
173	rub[29]	lōòfò?	lōòfò		
174	pull	nāŋfī?	nānfī		
175	push	tùkūsá?	tùkūsá		
176	throw	jū?	jū		
177	hit/beat	pɛ̄?	pɛ̄		
178	split	bɛ̄?	bɛ̄		
179	poke/pierce (hole)	dùfù?/tòfō?	lùfù/tòfō		
180	dig	kùtù?	kùtù		
181	tie	nìì	nìì		
182	sew	kàā	kàā		
183	fall	nōò	nōò		
184	swell	fūfú?	fūfú		
185	think	bú?	bú		
186	sing	sā?	sā		
187	smell[30] (put nose)	t͡ʃōō? òŋwú?	t͡ʃōō òŋwú		

[29] lōòfò? - to rub as in rubbing a crayon on paper

[30] t͡ʃōō? òŋwú?- 'put nose' (against an object to smell it)

188	vomit	làā?	làā		
189	suck	fījònì?	fījònì		
190	blow	fɛ̄?	fɛ̄		
191	fear	jɛ̀kɛ̀?	jɛ̀kɛ̀		
192	squeeze	mìnā?	mìnā		
193	hold	kèlē?/mūfū́?	kèlē/mūfū́		
194	down	kālà	kālà		
195	up	kàtòō?	kàtòō		
196	ripe, be[31]	sɛ̀ɛ̄? / bé?	sɛ̀ɛ̄ / bé		
197	dust	kùdū?	kùlū	-----	-----
198	alive, be	ŋ͡mk͡pā?	nkpā		
199	rope	ókū̄?	ókū̄	síkū̄?	síkū̄
200	year	lɛ̀lɛ̄ɛ̀	lɛ̀lɛ̄ɛ̀	àlɛ̄ɛ̀	àlɛ̄ɛ̀

7. ABBREVIATIONS

1PL first person plural
1SG first person singular
2PL second person plural
2SG second person singular
3PK third person known
3PL third person plural
3SG third person singular

ATR advanced tongue root

CON continuous aspect

GILLBT Ghana Institute of Linguistics, Literacy and Bible Translation.

IMP imperative
IO indirect object

NC noun class

[31] sɛ̀ɛ̄? - literally 'red'; bé? - literally 'ready to pick'

NM	mass noun
pl	plural
Prep	preposition
PRS	present
rp	recent past
sg	singular
SIL	Summer Institute of Linguistics

Appendices

Appendix A

Evidence of contrast between consonant phonemes:

		/p/		/b/		/f/	
word-initial:		[pī]	'thick'	[bìjɛ̄]	'to flow'	[fīnfì]	'ant'
				[bē]	'to grow'	[fè]	'to go'
		[pɛ̄]	'to beat'	[bɛ̄]	'to split'	[fɛ̄]	'to blow'
		[pùkūtù]	'to be dirty'	[būdì]	'to cut'	[fùfū]	'to swell'
				[bōnsā]	'to bend'	[fōtō]	'to wash'
		[pòŋkó]	'horse'	[bɔ̀]	'to like'	[fɔ̄]	'to be new'
				[bāsāntòwìsá]	'ginger - root'	[fà]	'to lay'
word-medial, syllable initial:	*Ci*	[kònɛ̄ɛ̄pī]	'upper arm'	[lèŋjāsíbí]	'lip'	[sīfī]	'to leave'
	Cu	[òpū]	'white'	[dībúlà]	'cloth'	[dùfù]	'to poke'
	ɛCa	[lɛ̄pāntā]	'lake'	[lɛ̀bàmbā]	'other'	[sɛ́fā]	'thanks'
	ɔCa	[kɔ̀pā]	'cutlass'	[ɔ̀bàlá]	'palm tree'	[kɔ̀fá]	'colour'
	Co	[āpòtɾò]	'frogs'	[àbó]	'bottles'	[tòfò]	'to know'

		/t/		/l/		/s/		/tʃ/	
word-initial:		[tìkītì]	'to open'			[sí]	'to stay'	[tʃì]	'to turn'
		[tè]	'to rest'	[lē]	'to eat'	[sè]	'to put'	[tʃē]	'to come from'
		[tɛ̄]	'to put'	[lɛ̄]	'to call'	[sɛ̄]	'to fry'	[tʃè]	'to go'
		[tū]	'to taste'			[sùnsǔ]	'to clean'		
		[tō]	'elephant'	[lò]	'to kill'	[sōō]	'to drop'	[tʃó]	'to be far'
		[tɔ̄]	'to worship'	[lɔ̀ɔ́fɔ̀]	'to sharpen'	[sɔ̀sɔ̀kɔ̄]	'to urinate'	[tʃɔ̀ɔ̄]	'to smell'
		[tà]	'to give'	[lāfé]	'thank'	[sà]	'to sing'	[tʃà]	'to cut'
word-medial, syllable initial:	*Ci*	[pùkìtìsā]	'to move'	[fésēlī]	'window'	[dīsì]	'head'	[kàtʃìtʃè]	'basket'
	Cu	[kútū]	'soup'	[lēkùlùmàntà]	'millipede'	[ókūsù]	'beard'		
	ɛCɛ	[fɛ̀rɛ̀rɛ̀tɛ̄]	'to fly'	[bɛ̄lɛ̄fɛ̄]	'to be wide'	[fésɛ̄rī]	'window'	[ātʃɛ̄tʃɛ̄lɛ̄]	'tortoise'
	ɔCɔ	[kɔ̄tɔ̄ɔ̀fɔ̀]	'evening'	[tʃɔ̄lɔ̄]	'to be smooth'	[sɔ̀sɔ̀kɔ̄]	'to urinate'	[kɔ̀tʃɔ̀]	'game'
	Co	[kátóó]	'up'	[kālò]	'lower'	[fōsō]	'sheep'	[bɛ̀lɛ̀tʃō]	'plantain'

		/k/		/kp/	
word-initial:				[kpī]	'to die'
		[kēlè]	'to hold'	[kpèlē]	'to return'
		[kɛ̀]	'to change direction'	[kpɛ̄lɛ̀]	'big'
		[kútū]	'soup'		
		[kòwōsò]	'tree'	[kpōwù]	'to bark'
		[kɔ̀ká]	'hunger'	[kpɔ̀]	'to mix'
		[kàfā]	'home town'	[kpànà]	'to write'
word-medial, syllable initial:	*iCi*	[dīkí]	'to take'	[sìkpīlākpí]	'rag cloths'
	oCo	[kàjòkō]	'entrance'	[ōkpóō]	'town'
	ɛCɛ	[sɛ̀kɛ̄tɛ̀]	'to open'	[sɛ̀kpɛ̄]	'works'
	ɔCɔ	[kɔ́ɔ́kɔ́]	'chicken'	[kpɔ̄kpɔ̀]	'duck'
	aCo	[wàkō]	'to bring'	[ōmákpòlò]	'backbone'

		/j/		/w/	
word-initial:		[jī]	'to be full'	[wìī]	'to throw'
		[jē]	'to forget'	[wēwē]	'dog'
		[jɛ̀]	'to stand'	[wɛ̀]	'to find'
		[jù]	'to throw'	[wūwò]	'to pound'
				[wó]	'us'
		[jɔ̀]	'to take'	[wōfɔ̀]	'to be black'
		[jā]	'to buy'	[wà]	'to cook'
word-medial, syllable initial:		[lèlòfūjī]	'birthday'	[sìwūù]	'thorns'
	Ce	[tíjè]	'goat'	[ōbūwē]	'carpentry nail'
	aCɛ	[kājɛ̄ɛ̀]	'chin'	[àwɛ́ntɛ́]	'moons'
	aCo	[àjō]	'houses'	[āwò]	'we'

		/m/		/n/	
word-initial:		[mījē]	'today'	[nìì]	'to tie'
		[méné]	'to be sweet'	[nē]	'this'
		[mɛ̄]	'to swallow'		
		[mùfū̃]	'to hold'	[nū]	'to hear'
				[nɔ̄]	'to fall'
		[mā]	'to laugh'	[nàŋfī̃]	'to pull'
word-medial, syllable initial:	*iCu*	[sìmū]	'neck'	[nīnù]	'eye'
	uCa	[ōkūmá]	'gun'	[mùmūná]	'to smile'
	ɛC	[sɛ́má]	'back'	[ɲjɛ̀nɛ̀nɛ̀]	'to be cool'
	Cɔ	[kàmɔ̀ɔ̄]	'rice'	[kɔ̀nɔ̀nɔ̀]	'to snore'
	aCa	[kāmànī]	'fish-specific'	[kpànà]	'to write'
	aCi	[kàpāmì]	'knife'	[kāmànī]	'fish-specific'

Appendix B

Nasal Assimilation

word-initial, preconsonantal:		word-medial, syllable-final:	
[m̩pájɛ̄]	'prayer'		
[n̩bā]	'salt'	[òbòmbō]	'corner'
[ŋ̩fɛ̄]	'axes'	[fīŋfì]	'ant'
[m̩mà]	'backs'		
[n̩tādúū]	'waists'	[kɔ̀wɛ́ntɛ́]	'moon'
[n̩sìmà]	'napes'	[bōnsā]	'to bend'
[n̩nɛ̄ɛ̀]	'arms'		
[n̩lē]	'nations'		
[ɲ̩tʃɛ́]	'hawks'	[dìkūɲtʃì]	'knee'
[ɲ̩ɲjā]	'mouths'	[wɔ̄ɲjā]	'mosquito'
[ŋ̩kɔ̀mbɔ̄]	'conversations'	[kàŋkàā]	'lemon'
[ŋ͡m̩kpá]	'life'	[wɛ̀ŋ͡m̩kpā]	'alive'
[ŋ̩wāàkɔ̀]	'snake'	[kɔ̀sàāŋwù]	'snake'

Appendix C

Evidence of contrast between oral vowel phonemes:

		/i/		/e/		/ɛ/		/a/	
word-initial:				[èjō]	'rice porridge'	[ɛ̄bɔ̀]	'better'	[áfɔ̄]	'you'
				[èlōmī]	'o' clock'			[ākpā]	'bridge'
								[āmī]	'I'
								[ānù]	'face'
								[ātʃɛ̄tʃɛ̄lɛ̄]	'tortoise'
								[àwū]	'dress'
								[ájē]	'you - plural'
word-medial:	*bV*	[òbìsó]	'child'	[bènè]	'hot'	[bɛ̄lɛ̄fɛ̄]	'to be wide'	[bāsāntòwìsá]	'ginger-root'
	tV	[tīkā]	'to place'	[tēkētē]	'to learn'	[lɛ̄tɛ́ɾɛ́bí]	'shell'		
	fV	[fīlā]	'to be hot'	[fēnsà]	'to borrow'	[fɛ́sɛ̄ɾī]	'window'	[tākā]	'to stand'
	kV	[fōkītī]	'to be empty'	[kēlè]	'to hold'	[lɛ̄kɛ̀lɛ́]	'pepper'	[fātɛ̀]	'herbalist'
	sV	[lɛ̀ŋjāsíbí]	'lip'	[sépōpō]	'flower'	[kāsɛ̀fɛ̀]	'clay bowl'	[kàkú]	'cry'
	mV	[mīnīkǐ]	'to turn'	[méné]	'to be sweet'	[kòmɛ̀ntū]	'left'	[kōlōsānsá]	'rainbow'
	wV	[òŋwīnī]	'hair'	[wēwē]	'dog'	[lɛ̄wɛ́ntɛ́ɾɛ́bí]	'star'	[māsā]	'to close'
								[wàkō]	'to bring'
word-final:	*bV*	[òbī]	'child'	[bē]	'to grow'	[bɛ̄]	'to split'	[m̀bā]	'salt'
	fV	[dìkūfì]	'bone'	[fè]	'to go'	[fɛ̄]	'to blow'	[fà]	'to lay'
	tV	[ànāàtì]	'cooked rice'	[tè]	'to rest'	[tɛ̄]	'to put'	[tà]	'to give'
	sV	[sí]	'to stay'	[sè]	'to set'	[sɛ̄]	'to fry'	[sà]	'to sing'
	kV	[dīkí]	'to take'			[kɛ̄]	'to change direction'	[kà]	'to read'
	mV	[kàpāmí]	'knife'	[lèkpòmē]	'chair'	[mɛ̄]	'to swallow'	[mā]	'to laugh'
	lV	[fɛ́sɛ̄lī]	'window'	[lē]	'to eat'	[lɛ̄]	'to call'	[fīlā]	'to be hot'

		/u/		/o/		/ɔ/	
word-initial:				[òkòsō]	'lean'	[ɔ̄prárā]	'thunder'
				[òlēsē]	'morning'	[ɔ̀sá]	'towel'
				[ònòtō]	'to be heavy'	[ɔ̀tɛ̀nsījā]	'sand'
				[òpū]	'white'	[ɔ̄tʃɛ̀]	'a visit'
				[ōsījè]	'to be strong'		
				[ōtūsù]	'running'		
word-medial:	*bV*	[būdì]	'to cut'	[kōbòkòtè]	'mountain'	[lɛ̄kɔ̀bɔ̀mbɔ̀]	'adam's apple'
	tV	[túkā]	'to carry'	[n̩tòkòtā]	'sandals'	[tɔ̀kɔ̄]	'to tell'
	fV	[fùtùtū]	'to be white'	[fōtō]	'to wash'	[lɛ̀fɔ̄sì]	'ten'
	kV	[lēkùlùmàntà]	'millipede'	[kōló]	'sky'	[kósá]	'yesterday'
	sV	[òsūkù]	'path'	[lēwósóbí]	'fruit'	[ɔ̄sɔ̄fɔ̀]	'wife'
	NV	[āmúsì]	'shoulders'	[ònòtō]	'heavy'	[kɔ̀nɔ̀nɔ̀]	'to snore'
	Vw	[kɔ̀nɛ̄ɛ̄wūsù]	'lower arm'	[kòwōsò]	'tree'	[kɔ̀wéntɛ́]	'moon'
word-final:	*pV*	[òpū]	'white'	[sépōpō]	'flower'	[àpɔ̄]	'many'
	fV	[dùfù]	'to poke'	[tòfō]	'to pierce'	[lɔ̀ɔ̀fɔ̀]	'to sharpen'
	tV	[n̩tū]	'water'	[tò]	'elephant'	[ɔ̀tó]	'fire'
	sV	[ókūsù]	'beard'	[fōsō]	'sheep'	[ɔ̄kɔ̀nsɔ̀]	'throat'
	kV	[àkū]	'rubbish'	[wàkō]	'to bring'	[tʃɔ̀kɔ̀]	'to be lazy'
	NV	[ānù]	'face'	[òlōmō]	'clock'	[nɔ̄]	'to fall'
	lV			[lò]	'to kill'	[tʃɔ̄lɔ̄]	'to be smooth'

Appendix D

Evidence of contrast between long and short vowel phonemes:

/ii/		/i/	
[tʃīīfī̄]	'fish'	[tʃì]	'to go-around'
[mììná]	'squeeze'	[mīnīkí]	'to turn'
[nìì]	'to tie'	[nī]	'it'

/ee/		/e/	
[kàwēsēē]	'stick'	[sē]	'to set'
[tèètē]	'forefather'	[tēkētē]	'to learn'

/ɛɛ/		/ɛ/	
[sɛ̄ɛ̄sā]	'to greet'	[sɛ̄sá]	'towels'
[ɲjɛ̄ɛ̄nɛ̄]	'to pour'	[ɲjɛ̄nɛ̄nɛ̄]	'to be cool'

/oo/		/o/	
[sōō]	'to drop'	[tōsō]	'to run'
[sōōsā]	'to liftdown'	[tòsōsá]	'to drive-away'
[lōō]	'to finish'	[lō]	'to kill'

/ɔɔ/		/ɔ/	
[kpɔ̀ɔ̀kpɔ̀ɔ̀]	'to lather'	[kpɔ̄kpɔ̀]	'duck'
[lɛ̄kɔ̀ɔ̀]	'liver'	[lɛ́kɔ̄]	'curve in road'
[lɔ̄ɔ̄fɔ̄]	'to sharpen'	[ɲ́lɔ̄fɔ̄]	'palm oil'
[tɔ̀ɔ̀]	'to drive/herd'	[tɔ̄]	'to worship'

/aa/		/a/	
[kāākō]	'to be near'	[kākó]	'river fish'
[ānààsī́]	'nine'	[ánā]	'four'

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