The speech sounds, syllable structure and tone system of a less-studied West African language, Lɛtɛ

Research Article

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Abstract
The paper describes the speech sounds, syllable structure and tone system of a less-studied, West African language, Lɛtɛ. Lɛtɛ is a South-Guan language of Ghana, West Africa, and genetically affiliated to the Niger-Congo family of languages. Eberhard, Simons and Fennig (2019) sub-classifies Guan (Niger-Congo, Kwa) into two language clusters: North Guan and South Guan, to which Lɛtɛ belongs. Lɛtɛ has a symmetrical set of nine vowels, 4 front vowels produced with an advanced tongue root position and four back vowels produced with a retracted tongue root position. The ninth vowel is a low central vowel, /ə /, which is produced with an advanced tongue root position, but unpaired. Its vowel and consonant systems are akin to those of related African languages. The study was purely field-based. Data were collected through elicitation from language speakers who resided in the speech community. Speech sounds and tone patterns were audio recorded and later transcribed and analysed. Tongue root vowel harmony controls vowel distribution to a large measure. A single syllable may be constituted by a vowel, a consonant followed by a vowel (CV), or a nasal consonant. The lexical tone helps to distinguish meaning, whereas the grammatical tone functions to mark tense and aspectual distinctions. It was observed that in many respects, aspects of Lɛtɛ phonology described are akin to other Kwa languages in the Niger-Congo family.

Keywords: consonants, Lɛtɛ, phonology, syllable, tone, vowels

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Public Interest Statement

Tongue root vowel harmony has a huge influence on vowel dispersion. A vowel, a consonant followed by a vowel (CV), or a nasal consonant can make up a single syllable. The lexical tone aids in the differentiation of meaning, whereas the grammatical tone marks tense and aspectual distinctions. For public interest and purposes of research it can be concluded that, in many respects, aspects of Lɛtɛ phonology described are akin to other Kwa languages in the Niger-Congo family.

1. **Introduction: Sociolinguistic and ethnolinguistic notes on Lɛtɛ**

Lɛtɛ is a South Guan language belonging to the Kwa family of languages. The language, Lɛtɛ, is synonymous to the name of the town where the language is spoken. However, in the literature and among non-speakers, both the language and the town are known as Larteh. *Gua* is given as an alternative name for Lɛtɛ (Eberhard, Simons, Fennig, 2019), but from the interviews held with speakers, *Gua* is one of the South Guan languages, and not a variant name of Lɛtɛ. Lɛtɛ, Akuapem Twi and English are the three languages spoken at Larteh where they co-exist in a somewhat triglossic[1] relationship. Lɛtɛ is the first language whereas Akuapem Twi, an indigenous lingua franca, is mostly used in public gatherings and spoken by most Lɛtɛ speakers. English, the third language, is an introduced world language which is spoken by those who have received formal education (Johnson, 1975). Larteh is located in the south-eastern part of Ghana (Fig. 1). It is somewhat isolated on a range of hills which cross Akuapem from south-east to the north-west. The Mamfe-Akropong road is at its northern border, and the Shai Hills in the south. At its eastern and western borders are the towns of Abonse and Apirede; and the Apopoano Hill near Dodowa respectively. The closest neighbors are Mamfe and Akropong where Akuapem Twi is spoken, and Dodowa and Ayikuma in the south where Dangbe[2] is spoken. Larteh is neighbor to language communities like the Akuapem Twi and Dangbe. Her closest Guan community is Abiriw, about 10 kilometers away, where Kyerepɔn is spoken. Interactions among these language groups are through inter-marriages, celebrations of traditional festivals, trade, and education. Consequently, on a typical market day in Larteh, the multilingual skills of the traders within Leteh and those from neighboring towns are utilized. The Population and Housing Census of Ghana (2010) put the population of Larteh at 10, 175. This may not represent the exact number of speakers because of the presence of immigrants in the town. Yet another difficulty in arriving at a specific number stems from the fact that there are many Leteh speakers who reside outside Larteh.

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[1] Trigglossia is a type of language situation where there is division of communicative functions among three languages. One of the languages is indigenous to the speech community, whereas the other two are an indigenous lingua franca and a world language.

[2] Dangbe is a Kwa language of the Niger-Congo group of languages. It is spoken in South-east Ghana.
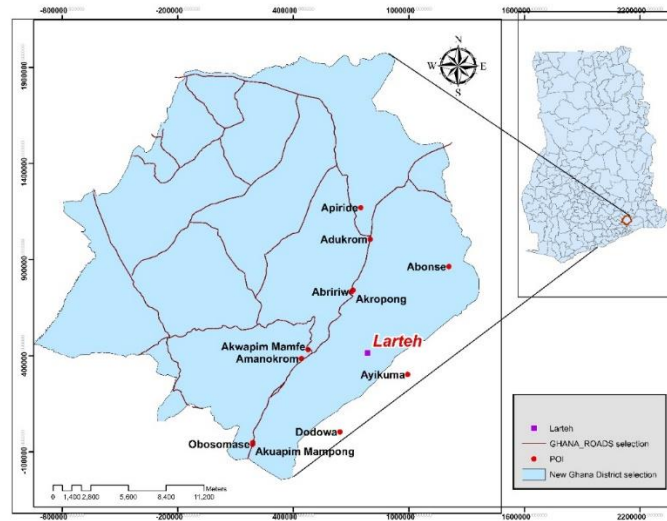
Figure 1 The location of Larteh and surrounding towns
Source: Remote Sensing and GIS Laboratory, University of Ghana

Research Objectives

This paper seeks to do the following:

- Describe the vowel and consonant systems of Lɛtɛ
- Describe the syllable structure of Lɛtɛ
- Describe the tone system of Lɛtɛ

2. Methodology

Chomsky (1965) distinguishes between competence and performance with regard to language. He refers to competence as the speaker or hearer's knowledge of rules of their language which enables them to produce grammatically accepted sentences in the language. Performance on the other hand is the actual use of language in concrete situation; the language as it is produced and used by speakers. In collecting the data, a performance-based approach was used. The approach recognises a language as that which the members of the community speak with one another, while appreciating some amount of variation which could be idiosyncratic or physiological. Three principal speakers of the language[3] were engaged in elicitation sessions within August 1999-July 2008. Apart from the 3 main informants, other speakers were also consulted for confirmation of pronunciation. For the earlier stages of data collection, a notebook was used. The Ibadan Wordlist of 400 Basic items and Summer Institute of Linguistics (SIL) Comparative African Wordlist, 2006 of 1700 words were translated into Lɛtɛ with help from informants. As Lɛtɛ variants of the words were produced, audio recording was done with an edirol R-09HR audio recorder. The data were subsequently transcribed phonetically with help from the informants. With regard to the analyses of tone patterns and pitch traces of utterances, we employed PRAAT. Back-ups were created and subsequent archiving of sound files[4]was done. While transcribing the data, the syllable structure of words was noted.

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[4] Sound files have been archived at the Kwabena Nketia Archives, University of Ghana. They may be accessed at: http://ugspace.ug.edu.gh/handle/123456789/36192 [2021-04-13]

3. Lɛtɛ sounds systems
3.1 An inventory of Lɛtɛ consonant sounds and their phonetic labels
Table 1 Lɛtɛ consonant phonemes chart

Place of articulation → Manner of articulation ↓	Bilabial	Labio-dental	Alveolar	Pre-palatal	Velar	Labial-Velar	Glottal
Plosive	p		t		k	kp	
	b		d			gb	
Affricate			ts	ky [tɕ]			
				gy [dʑ]			
Nasal	m		n	ny [ɲ]			
Lateral			l				
Trill			r				
Fricative		f	s	hy[ɕ]			h
Approximant/Glide	w			y [j]			

Table 1 depicts the inventory of Lɛtɛ consonant sounds in both orthographic and phonetic representation. For most of the consonants, the orthographic symbol and the phonetic symbol do not differ; in instances where the orthographic symbol differs from the phonetic representation, the latter has been put into square brackets. Lɛtɛ has 21 consonant sounds with seven contrasting places of articulation. In table 1, each consonant sound is assigned a two-term label based on the place of articulation and the manner of articulation. In Lɛtɛ, it is mostly plosives and affricates which have voiced and voiceless counterparts. All fricatives are voiceless. However, nasals, the lateral, the trill and the approximants are all voiced. For every pair of consonant sounds in example (1), the voiceless sounds are written before the voiced sounds.

1. Phonetic description Lɛtɛ consonant phonemes

bilabial plosives	/p, b/
Alveolar plosives	/t, d/
Velar plosive	/k/
labial-velar plosives	/kp, gb/
Alveolar affricate	/ts/
Pre- palatal affricate	/ky, gy/
bilabial nasal	/m/
alveolar nasal	/n/
pre-palatal nasal	/ny/
alveolar lateral	/l/
alveolar trill	/r/
labio-dental fricative	/f/
alveolar fricative	/s/
pre-palatal fricative	/hy/
glottal fricative	/h/
bilabial approximant	/w/
pre-palatal approximant	/y/

2.2 Minimal pairs.

 Minimal pairs are used to distinguish Lɛtɛ consonant phonemes. We begin with bilabial sounds: /p, b, m, w/.

(2) /p/   *ɔ̀pɛ́*   'harmattan'   /kp/   *ɔ̀kpɛ́*   'road'
   /b/   *bùǹkyí* 'return'   /f/   *fùǹkyí*   'open'
   /m/   *mìá*   'squeeze'   /b/   *bìá*   'break'
   /w/   *wùrí*   'steal'   /f/   *fùrí*   'collect'

The phoneme /f/ is the only labio-dental sound in Lɛtɛ; it has no voiced counterpart. It contrasts with /m/ and /p/ as follows:

(3)   *f í*   'lose'   *mí*   '1SG EMPH'
        ə'fí   'year'   *ə'pí*   'heart'

Alveolar sounds in Lɛtɛ are /t, d, ts, l, n, r, s/. Their phonemic status is demonstrated in the following minimal pairs in (4).

(4)   /t/   *tè*   'in'   /n/   *nè*   'today'
       /d/   *dɔ̀kyí*   'overturn'   /s/   *sɔ̀kyí*   'search'
       /ts/   *tsá*   'room'   /s/   *sá*   'three'
        /l/   *ólû*   'medicine'   /d/   *ódû*   'tail'
       /n/   *nù*   'drink'   /s/   *sù*   'send'
       /r/   *tìrí*   'call'   /n/   *tìní*   'overrun'
        /s/   *sá*   'three'   /ts/   *tsá*   'room'

 Pre-palatal sounds in Lɛtɛ are /ky, gy, ny, hy, y/ as illustrated in (5).

(5)   *kyì*   'hate'   *gyì*   'eat'
       gyì   'eat'   *yì*   'say'
       hyɛ̀   'coerce'   *hɛ̀*   'deceive'
       yìrí   'stand'   *kìrí*   'catch'
       kyɛ̀   'change'   *kɛ̀*   'teach/show'
       nyɛ̀   'receive'   *nɛ̀*   'give'

        There is one velar stop in Lɛtɛ, /k/, produced when the back of the tongue is brought against the velum. /k/ contrasts with /kp, ky/ as illustrated in (6).

(6)   *ɔ̀kɛ́*   'tomorrow'   *ɔ̀kpɛ́* 'road'
        kà   'listen'   *kyà*   'to dance'

        The labial-velar sound /kp/ is produced when the back of the tongue is raised towards the velum whilst the lips are in contact. Data for the study reveal that /gb/ has limited distribution and

rarely contrasts with any sound. It occurs in what is believed to be an Ewe[5] loan word, *ə̀gbèlì* 'cassava'. It also occurs in *dwògbùnì,* a Lɛtɛ lexeme for 'vulture'. /kp/ contrasts with /k, p/ as shown in (7).

(7)   *ɔ̀kpɛ́*   'road'   *ɔ̀pɛ́*   'harmattan'
        kpɛ̀   'remove'   *kɛ̀*   'show/teach'

The glottal fricative /h/ is produced in the glottis. During its articulation, the tongue assumes the position for the following vowel. For example, during the articulation of /h/ in *hù* 'see' the back part of the tongue is raised. It contrasts with /f/ and /s/ as in (8).

(8)   *hì*   ' wear cloth'   *fì*   'drink soup'
        hũ̀   'see'   *sũ̀*   'send'

2.3   Allophonic variation

Some Lɛtɛ consonant phonemes have variants depending on the type of vowel and consonant sounds in their environments. The following are allophones of consonant phonemes in Lɛtɛ (9).

Plosives

(9).   /b/   voiced bilabial
        [bᶣ]   palatalized before */ɛ/* as in *bìɛ̀* [bᶣɛ̀] 'bathe'
        [b]   elsewhere
        /k/   voiceless velar
        [kʷ]   labialized before */e/* as in *kúé [kʷé]* 'debt'
        [k]   elsewhere

Nasals

(10).   /m/   voiced bilabial
[ɱ]   labiodental before /f/ as in *m̀fírà* [ɱfírà]
        [m]   elsewhere
        /n/   voiced alveolar
        [ŋ]   velar before velar consonants as in *ǹkìrɛ́* [ŋ̀kìrɛ́] 'blood'
[ɱ]   labiodental before /f/ as in *ǹfá* [ɱ fá] 'guinea worm'
[n]   elsewhere

Fricatives

(11).   /s/   voiceless alveolar
        [sʸ]   palatalized before */a/* as in *ósíà [ósʸà]* 'in-law'.

        [s]   elsewhere
        /h/   voiceless glottal

[hʷ]   labialized before /e/ as in *húè* [hʷe] 'Saturday'

[h]   elsewhere

Affricates

(12).   /tɕ/   voiceless pre-palatal

[tɕ ʷ]   labialized before /o, ɔ, u, ʋ / as in *twù* [/tɕ ʷù] 'take'

[tɕ]   elsewhere

/dʒ/   voiced pre-palatal

[gʷ]   labialized before /a/ and back vowels as in *gúáw* [gʷáw] 'lash'

[dʒ]   elsewhere

2.4 Phonotactics of consonant sounds

The distribution of Lɛtɛ consonant sounds within words and the syllable is displayed in Table 2.

Table 2   Distribution of consonant sounds

Consonant Sound	Word-initial/ syllable-initial		Word-medial/ syllable-initial		Word-final/ syllable-final	
p	*péɛ́*	'all'	*ɔ`pɛ́*	'harmattan'		
b	*bábí*	'finger'	*bóbù*	'bone'		
t	*tégyí*	'food'	*àkìtìbí*	'small'		
d	*dú*	'Monday'	*àdìbáàkɛ̀*	'dawn'		
k	*kùbí*	'cut'	*ɔ́kɔ́*	'hunger'		
ts	*tsá*	'room'	*ɔ`tsí*	'woman'		
ky	*kyà*	'dance'	*bùǹkyí*	'return'		
gy	*gyàmɛ́*	'younger sibling'	*ìgyésù*	'smoke'		
kp	*kpɛ́*	'Wednesday'	*m`kpɛ̃́*	'life'		
f	*fɔ́kʋ́*	'somewhere'	*m`fúé*	'oil'		
s	*sɔ`*	'take/buy'	*ɔ`sɔ`kʋ́*	'somebody'		
hy	*hyìrí*	'play'	*òhyìráw*	'lazy person'		
h	*hírí*	'shame'	*nə`húní*	'knee'		
l	*lìlí*	'repair'	*bìèlé*	'break'		
r			*kìrí*	'catch'		
m	*mínɛ́*	'hair'	*gyàmɛ́*	'younger sibling'	*ə`fúrúm*	'donkey'
n	*nú*	'flesh'	*mínɛ́*	'hair'	*ɔ`mán*	'country'
ny	*nyèntɛ́*	'spoil'	*ényɛ́*	'night'		
w	*wʋ̀rɛ́*	'wear dress'	*èwé*	'cold'	*kúw*	'group'
y	*yéŋkɛ̂*	'Sunday'	*òyì*	'tree'		

From the distribution Table (2), the following conclusions may be drawn about Lɛtɛ consonant sounds' distribution:

(i)   With the exception of /r/ which occurs only in intervocalic position, any consonant sound may occur in word-initial/syllable initial position.

(ii)   Consonant sounds that may occur in word-final/syllable-final position are /m, n, w/. However, available data indicate that /m, n, w/ occur in word final position only in loan words from Akuapem Twi (Kwa, Ghana) (Dolphyne, 2006: 47).

(iii)   /gy/ and /g/ are in complementary distribution. /gy/ occurs only before front vowels whereas /g/ occurs before back vowels.

(iv)   The velar nasal [ŋ] is a variant of /n/. The former is found before velar stops and word/syllable-finally. The latter occurs elsewhere.

(v)   Phonotactics of Lɛtɛ does not allow consonant clusters.

3. Lɛtɛ vowel sounds

3.1 Oral vowel inventory

Lɛtɛ has a symmetric set of nine vowels: four front vowels, paralleled by four back vowels and a low central vowel which is unpaired. In figure (2), the vowel phonemes are put on a chart which illustrates the approximate tongue positions for the production of Lɛtɛ vowel sounds.

FRONT	CENTRAL	BACK	
i		u	CLOSE (high)
ɪ		ʊ	
e		o	HALF-CLOSE
ɛ		ɔ	HALF-OPEN
	[ə]		
	a		OPEN (low)

Figure 2 Oral vowel chart

The oral vowels may be grouped into two depending on the position of the tongue root during their production. With regard to the tongue root position, a vowel may have an advanced tongue root [+ATR] feature or an unadvanced/retracted tongue root specification [-ATR]. (Tongue root harmony is discussed in more detail in section 3. 4). Vowels produced with advanced tongue root are: /i, e, o, u/ whereas vowels produced with retracted tongue root are: / i, ɛ, ɔ, u, a/. The vowels may be described using a four-term phonetic label:

[+/-ATR vowels]

(13)

i - front, close, oral, advanced

ɩ - front, close, oral, unadvanced

e - front, half-close, oral, advanced

ɛ - front, half-open, oral, unadvanced

a- central, open, oral, unadvanced

o - back, half-close, oral, advanced

ɔ - back, half- open, oral, unadvanced

 u - back, close, oral, advanced

 ʊ- back, close, oral, unadvanced

The oral vowels contrast as the following minimal pairs show in (14).

(14)	*sù*	'send'	*sʊ́*	'Tuesday'
	lò	'be sick'	*lɔ̀*	'weave'
	sì	'leave'	*sí*	'sand'
	fè	'sell'	*fɪ̂*	'lose'
	mɔ̀	'kill'	*mɛ̀*	'swallow'
	dè	'be able'	*dì*	'sleep'
	yʊ́	'skin'	*yó*	'go'
	bɛ̀	'come'	*bà*	'sew'
	kù	'fight'	*kà*	'listen'

3.2 Lɛtɛ nasal vowels

Besides oral vowels, seven nasal vowels are noted in Lɛtɛ. Nasal vowels in Lɛtɛ are independently nasalized after non-nasal consonants (15). The front and back half-close vowels /e, o/ do not have nasal counterparts. Nasal vowels may be produced with either advanced or unadvanced tongue root; nasality is therefore an added feature. The phonemic status of nasal vowels is further illustrated in (16).

(15)

[ĩ]	*ébĩɛ̃*	'louse'
[ɛ̃]	*sìsɛ̃*	'people'
[ũ]	*òdũ*	'tail'
[ʊ̃]	*ɔ̀dʊ̃̀*	'machine/car'
[ɔ̃]	*tɔ̃*	'feather'
[ã]	*sã*	'three'
[ɪ̃]	*másɪ̃*	'laughter'

Examples in (15) further indicate that the distribution of nasal vowels also conform to the tongue root harmony principles. The data point out that in Lɛtɛ, vowel nasality is phonemic. What this means is that nasality brings about a difference in meaning between some pairs of words that are otherwise identical in terms of segments (16). For example, words in (16a) are the same as in

(16b) in terms of consonant and vowel composition as well as tonal pattern. However, nasality in (16b) brings about meaning differences.

(16)   a.   b.
    kɛ̀   'show/teach'   *kɛ̃*   'pay'
    fɔ`   'wash'   *fɔ̃*   'first/before'
    ká   'then'   *kã*   'it's lying…'
    dù   'sow'   *dũ*   'bite'

3.3 Lɛtɛ vowel distribution

The position of vowels in word initial, medial and final positions is illustrated (Table 3). Some generalizations are made afterwards.

Table 3   Vowel distribution in words

Vowel	Word-Initial		Word-medial		Word-final	
i	*ìfú*	'fear'	*ògyíwù*	'glutton'	*òkìrénì*	'fowl'
ĩ			*èbĩ̀ɛ̀*	'louse'	*ə`hĩ*	'insult'
ɪ	*í`ní*	'yesterday'	*bìtí*	'take'	*kìrí*	'catch'
ɪ̃			*fĩɔ́*	'dissolve'	*másí*	'laughter'
e	*ésé*	'case'	*fébì*	'thread'	*òsèn`té*	'goat'
ɛ	*ɛ̀wʊ́*	'honey'	*kyélì*	'tear'	*kìté*	'hold'
ɛ̃			*ɛ̃wɛ̃̀ɛ̃bì*	'stars'	*sìsɛ̃*	'people'
u			*fùn`kyí*	'open'	*Dú*	'Monday'
ũ					*òdũ*	'tail'
ʊ			*bʊ́nɔ`*	'egg'	*kʊ̀tʊ́*	'hat'
ʊ̃					*ɔ̀dʊ̃*	'vehicle'
ə	*ə`síbìté*	'face'	*ə`bə`kú*	'elbow'		
a	*àhʊ́nʊ́*	'nose'	*àtàlí*	'clothing'	*bá*	'arm'
ã			*dãĩ•*	'turn'	*sã*	'three'
o	*òyúwù*	'thief'	*bóbù*	'bone'	*ìdwó*	'yam'
ɔ	*ɔ̀sɔ̀kʊ́*	'somebody'	*bɔ̀té*	'fold'	*bʊ́n ɔ`*	'egg'
ɔ̃			*tsɔ̃bì*	'grass'	*tɔ̃*	'feather'

The following generalizations on Lɛtɛ vowel distribution can be made from Table 3:

(i)   all oral vowels may occur in word initial position with the exception of /u, ʊ /.
(ii)   all oral vowels may occur in word medial position.
(iii)   all oral vowels may occur in word final position except /ə/.
(iv)   nasal vowels do not occur in word initial position.
(v)   all nasal vowels may occur in word final position.
(vi)   in word medial position, all nasal vowels may occur except /ũ, ʊ̃ /.

3.4 Tongue root vowel harmony

As already mentioned, Lɛtɛ vowels are either produced with advanced tongue root position [+ATR] or a retracted tongue root posture [-ATR]. During the production of [+ATR] vowels, the root of the tongue is pushed forward, and this enlarges the space in the pharynx. The [-ATR] vowels on the other hand are articulated with the root of the tongue pushed back or retracted; this leads to the narrowing of the space in the pharynx during the articulation of these vowels. Our data display tongue root harmony to a large extent. What this means is that for every Lɛtɛ word of two or more syllables, vowels that appear must either come from set A or set B (17). The oral vowels may therefore be classified into two groups based on tongue root position. Lɛtɛ has four dominant set A vowel phonemes /i, u, e, o/ and five set B phonemes /ɪ, ʊ, ɛ, ɔ, a / (17). The low vowel /a/ is opaque; it occurs freely with advanced vowels in roots, where it becomes [ə] before an advanced vowel in the following syllable as in a*sibi* [əsibi] 'eye' (18) but maintains its basic phonetic value when it occurs in root-final position after advanced vowels as in [*osia*] 'in-law' (19). In an environment of unadvanced vowels too, the low vowel /ə/ maintains its basic phonetic value /a/. It has been noted that the vowel [ə] occurs in Lɛtɛ as a result of Vowel Harmony; it may therefore be regarded as an allophone of /a/.

(17)   **SET A**   **SET B**
          [+ATR]   [- ATR]
          i   u   ɪ,   ʊ
          e   o   ɛ   ɔ

                                            a

As already noted, vowels in a Lɛtɛ word of two or more syllables share the tongue root feature, [+/-ATR] (18). Available data however indicate that in exceptional cases, vowels from set A and set B may co-occur in a word of two or more syllables, and it has been observed that in such instances, advanced vowels usually precede unadvanced vowels as illustrated in (19).

(18)   [+ATR]   [- ATR]
          / i, u, e, o /   /ɪ, ʊ, ɛ, ɔ, a /

          òlú   'medicine'   fʊ̀tsí   'sweep'

          òkìrénì   'chicken'   sèmí   'spread'
          ə̀síbì   'eye'   àhʊ́nʊ́   'nose'
          sìré   'peel'   sɔ́hwɛ́   'test'
          òbìrèhú   'neighbour'   dàǹkɛ́   'cook'

(19)   òsíà   'parent in-law'
          òbítéẁ   'uncle'
          òfúrɛ́   'farm'
          òkòǹkùrá   'pepper'

It is not clear at this stage what motivates the co-occurrence of advanced and unadvanced vowels in words. Available data show that these words are not loan words; neither do they belong to any special semantic class. It is however noteworthy that usually the retracted vowels [-ATR] that defy the harmony are /a/ and /ɛ/ and these usually occur in the final syllables. It will however be interesting to investigate in future what the motivating factors are.

4.0 Lɛtɛ Syllable structure

Lɛtɛ has open syllables with the minimum number of segments of a syllable being one which may be a vowel or a nasal. In addition, the approximant /w/ or the alveolar trill /r/ may become syllabic, but in rapid speech only. The syllabicity of the approximant /w/ is due to the loss of a following vowel, commonly /u, ʋ /, and the retention of the syllabicity and tone of the elided vowel (20). Clements (2000:140) reports this as a common phenomenon in African languages. Maximally, a syllable of Lɛtɛ has two segments; a vowel and a consonant. As it will be illustrated soon, long and short vowels are not distinguished in Lɛtɛ; syllable weight is therefore not relevant to the phonology of Lɛtɛ. Canonical forms of syllables are presented in (20). In the examples, syllable boundaries are marked with a dot. Syllabic consonants /n, m, w/ are illustrated in (21 & 22).

(20) *ò. ló*   *í. fú'*   *bì .ɛ́*   *f ɔ`. í*   *à.wá. à. bì*
       V.CV   V.CV   CV.V   CV.V   V.CV.V.CV
       'sore'   'wind'   'bathe'   'stop'   'stars'

(21) *ǹ. tsú*   *ḿ . fï. rà*   *sà. ǹ . kyí*   *Bí. rí. ẁ*
       C.CV   C. CV. CV   CV. C. CV   CV. CV. C
       'water'   'salt'   'untie'   'Friday'

(22) *ɔ`. má.  ŋ́*      *ɔ`. k í. rá. má. ŋ́*   *à. fú. rú. ḿ*   *ǹ. kɔ́. ḿ*
       V. CV. C   V. CV. CV.CV. V   V.CV.CV.C   V.CV.C
       'nation'   'dog'   'camel'   'prophecy'

As depicted by (20 & 21), syllable types occurring in Lɛtɛ are V, CV, C. The V-type may occur word–initially or word finally. With the exception of /u, ʋ /, all other vowels may initiate a word as a word–initial syllable. When there is a sequence of two vowels, each of them constitutes the nucleus of a syllable. The C-type (21) could be a nasal in word initial, medial or final position. The C-type could also be the approximant /w/ or the trill /r/; their syllabic status in the few Lɛtɛ words is as a result of the elision of u/ ʋ; i/ ɪ / in word final position or word-medial position during rapid speech (23, 24). It was noted that when a nasal occurs as a final syllable of a word, it was a velar nasal, and that word was usually an Akan loan word (22). With the syllabic consonant /w/, the process starts with the loss of a vowel, commonly /u, ʋ / in word- final during rapid speech; syllabicity is thus shifted to the approximant (23).

(23)   V. CV. CV   →   V. CV. C
        /ò.gyí.wù/   →   [ò.ʤí.ẁ]   'a glutton'

The trill /r/ also becomes syllabic when a high vowel /i, ɪ / of a preceding syllable is elided. The tone of the elided vowel docks on /r/, transferring its syllabicity to it (24).

(24)   V. CV. CV. CV.C   →   V. CrV. CV.C
        /ɔ̀. kɪ́ . rá. má. ŋ́/   →   [ɔ̀. krá. má. ŋ́]   'dog'

4. Lɛtɛ tonology

Lɛtɛ is a register tone language with two level tones, high and low tones, and the syllable functions as the tone-bearing unit. The following monosyllabic words are said with a high tone:

(25).
mɔ́ - 'this'   nyɛ́ - 'go'
nú   - 'flesh/meat'   bá   - 'hand'

The following monosyllabic words are said with a low tone:
(26)
kà - listen   bɛ̀ - come
gyì - eat   yè - say

The low and high tones may contrast as follows:
(27) nù   - drink   nú - meat
     nyɔ̀ - switch on   nyɔ́ - two
     bà   - sew   bá - hand/arms
     mɔ̀   - kill   mɔ́ - this
     sɔ̀   - buy/collect   sɔ́   - earthenware bowl
     kù   - cut   kú - mountain
     nà   - walk   ná - leg/foot
     ǹkìrɛ́ - blood   ńkírɛ̀ - message

High and low tones may combine in words as follows:

	H- H	**L- H**	**H- L**	**L- L**
(28)[6]	hɛ́. !ní	sò.kyí	bó.bù	Lɛ̀tɛ̀
	'scar'	'search for'	'bone'	language/town

A sequence of a high and a low tone on a syllable is perceived as a falling pitch (29a), whereas a low-high sequence on a syllable is perceived as a rising pitch (29b). It has however been observed that the rising pitch is rare in Lɛtɛ discourse.

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[6] ! downstepped high tone

(29)
a. *bám̀bà* 'arm'   *yỏ̀* 'yes'   *óyî̀* 'tree'
b. *ḧ̀m̋* 'okay'

5.1 Non-automatic downstep in Lɛtɛ

When there is a sequence of two high tones occurring on two adjacent syllables, the second high tone is perceived at a slightly lower pitch than that of the first high tone (Figure 3). The second high tone is said to be downstepped (30).
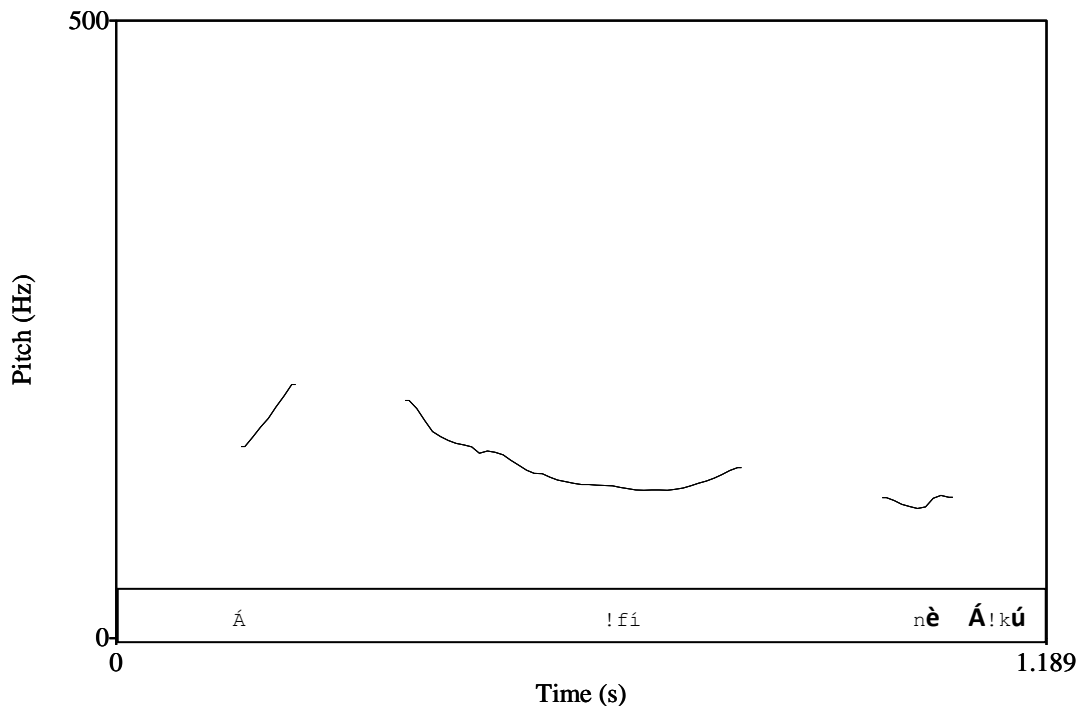

Figure 3 A pitch trace of non-automatic downstep

(30)   *Á!fí nè Á!kú.*

        'Afi and Aku'.

4.2 Automatic downstep in Lɛtɛ

This is caused by a cumulative effect of a local interaction between low and high tones. This results in a gradual lowering of pitch over a sentence or some unit; consequently, successive high tones are progressively lowered, often to a level phonetically below that of low tones earlier in the unit. In the following utterance (31), there is a successive H-L-H-L sequence (Figure 4). Figure 4 illustrates automatic downstep in the sentence (31):

(31)   *Pàpá   Kòfí   bènyɛ́   tɔ̀kú.*
        Mr   Name   FUT-get   something
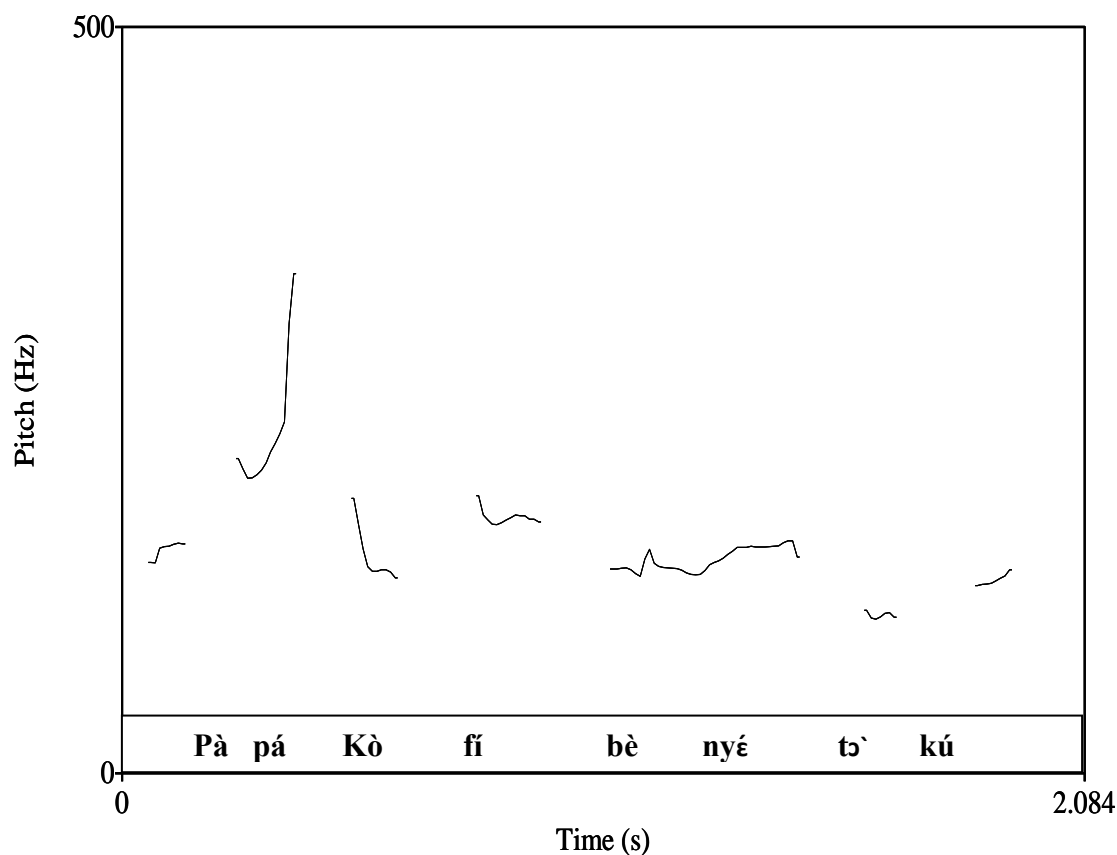   'Mr Kofi will earn something'.

Figure 4   A pitch trace of automatic downstep

6.0 Conclusion

The paper is a compilation of sociolinguistic and phonological notes taken from linguistics field trips within 1999-2001and 2006-2009, for a Master's thesis and a Ph. D thesis respectively. They are sociolinguistic notes; speech sounds, syllable structure and tone, from the speech community, Larteh. Data were elicited from 3 language speakers who resided in the speech community. As already stated in the introductory section, Lɛtɛ is a minority language of Ghana, West Africa which is under-documented. The notes constitute one of the most comprehensive set of notes on the phonology of Lɛtɛ. It is observed that in many respects, aspects of Lɛtɛ phonology described are akin to other Kwa languages in the Niger-Congo family.

Disclaimer Statement

Data in this paper originated from field notes which were taken for a Master's thesis in 1999-2001; and for a Ph. D. thesis from 2006-2009.

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APPENDIX 1
Language identity

Name:	Leteh[7], Larteh
Genetic affiliation:	South Guan; Kwa; Niger-Congo
ISO 693-3 code:	lar
Glottolog code:	lart1238
Number of speakers:	74,000 (Ethnologue)
Location:	Latitude 5.94; Longitude -0.08
Vitality rating:	EGIDS 6a (vigorous) (Eberhard, Simmons & Fennig 2019).
AES status:	not endangered

APPENDIX 2

ETHNOLINGUISTIC PROFILES OF LƐ TƐ CONSULTANTS

(Larteh-Akuapem, Ghana-July 2007)

Name (s) of consultant	Florence Owusu-Bamfo	Akosua Dentaa	L. D. Apraku	Ohene Amoyaw
Ethnic affiliation: clan, lineage	Lɛtɛ: Ahenease, Awurade	Lɛtɛ: Kubease, Akantsane	Lɛtɛ: Kubease, Kyerahantan	Lɛtɛ: Ahenease, Awurade
Sex	Female	Female	Male	Male
Date of birth, place of birth	August 30, 1934; Larteh-Akuapem	July 21, 1936; Larteh-Akuapem	October 30, 1924; Larteh-Akuapem	July 24, 1984; Larteh-Akuapem
Mother tongue	Lɛtɛ	Lɛtɛ	Lɛtɛ	Lɛtɛ
Other languages	Akan, English	Akan	Akan, English	Akan, English
Time spent in language community	60 years	61 years	25	20
Time spent outside of language community	34 years	n/a	25	3
Condition in which language was acquired	Domestic use: home; traditional settings	Domestic use: mother tongue; home; traditional settings	Mother tongue; home; traditional setting	Mother tongue; home
Profession, social position	Pre-school teacher; family head	Farmer; family head	Tertiary school teacher; author of Akan novels; family head	Banker; 1st child of 5 siblings

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[7] The name of the language under study is variously known as Leteh, Larteh, Latɛ. The various names are synonymous to the name of the town where the language is spoken. In this paper, I refer to the language as Leteh, and the town as Larteh.