TAL2018, Sixth International Symposium on Tonal Aspects of Languages
18-20 June 2018, Berlin, Germany

Depressor consonants and the tones of Tɔŋúgbé

Promise Dodzi Kpoglu[1,2], *Cédric Patin*[1]

[1]STL (CNRS UMR 8163 & Université de Lille), France
[2]LUCL – Universiteit Leiden, Netherlands
promise-dodzi.kpoglu@etu.univ-lille3.fr, cedric.patin@univ-lille3.fr

Abstract

This paper is a first introduction to the tone system of Tɔŋúgbé, a dialect of Ewe. Depressor consonants are known to play an important role in the tonal realizations of Ewe; our main goal is to determine if it is also the case in Tɔŋúgbé. The first part of the paper is a brief survey of the tone system of Ewe, examining the role depressor consonants play there within. A brief presentation of the tone system of verbs in Tɔŋúgbé follows, indicating that voiced obstruents can operate as depressors in the dialect. Then, a detailed description of the surface tones of root nouns is provided, with an emphasis on their acoustic correlates. In comparison to other Ewe dialects, Tɔŋúgbé adds a superhigh tone, and a contrast in duration between mid-toned and low-toned nouns. Most importantly, it is shown that depressor consonants seem not to have significant effects on the tones of root nouns in Tɔŋúgbé. In its final part, the paper discusses the possible implications of this latter observation on the differences between the tone system of Tɔŋúgbé and those of other Ewe dialects, Aŋlɔgbe and Eʋedomegbe.

Index Terms: Ewe, Tone, Tɔŋúgbé, depressor consonants.

1. Introduction

This paper is a first introduction to the tone system of Tɔŋúgbé, a dialect of Ewe spoken in southeastern Ghana. The dialect itself is subdivided in various local varieties, such as Agavégbé, Mafigbé or Me*f*égbé. The variant that is the subject of the current study refers to the varieties that are spoken on the Western side of the Volta River, in Me*f*é, Battor Aveyíme, Devĭme and Dovĕ. Although Tɔŋúgbé displays some peculiarities (mostly phonetic), the properties of the dialect have been claimed in the literature to be similar in nature to those of the other coastal dialects (i.e. Aŋlɔgbe) ([1], [2]).

This paper has three main objectives. The first one is to offer a first insight into the tone system of Tɔŋúgbé, which to our knowledge has never been described before. The second objective is to investigate the role of depressor consonants in the tone system of this dialect, and in Ewe in general.

Depressor consonants are segments that have a lowering effect on a following tone, such as downstepping or deleting its high tone, or preventing it from being the target of a high tone shift or a high tone spread. Depressor consonants are common in various areas and/or language families (e.g. Southern Bantu, Wu dialects of Chinese, etc. – see a.o. [3], [4]), one of them being the Gbe family that includes Tɔŋúgbé (see [5], [6] on Ewé, [7] on Wemɛgbe).

The paper is based on recordings of one of the authors, a male native speaker of Tɔŋúgbé (28 years old), which were carried out over a period of three months. The recordings were submitted for evaluation to two other speakers of Tɔŋúgbé.

Section 2 is a short presentation of the tone system of Ewe, focusing on the role of depressor consonants. Section 3 briefly discusses tones as they emerge in the verbs of Tɔŋúgbé and the role that depressor consonants play in their realizations. The surface tones of Tɔŋúgbé root nouns are presented in detail in Section 4, showing their relative immunity to depressor consonant effects. Finally, a brief discussion follows in Section 5.

2. The tone system of Ewe

Every syllable in Ewe bears a tone, i.e. the tone bearing unit (TBU) is the syllable. There are two underlying tones: the *high* toneme and the *non-high* toneme [5]. In root nouns, the *high* toneme can occur as a high tone or a mid tone (in Aŋlɔgbe, but as a mid-rising tone in Eʋedomegbe) depending on the onset of the syllable (1). When the onset is a voiceless obstruent or a sonorant, the *high* toneme emerges as a high tone. However, when the onset is a voiced obstruent, the tone is a mid or a rising tone [8]. (N.B. the extra-short vowel in the beginning of nouns is described in Section 4.1)

Verbs		*Nouns*		(1)
tá	‘draw’	ᵃtá	‘thigh’	
kpɔ́	‘meet’	ᵃkpɔ́	‘stone’	
yá	‘unwholesome’	ᵃyá	‘air’	
má	‘share’	ᵃmá	‘cassava dough’	
gbɔ́	‘refuse’	ᵃgbə/ᵃgbə̌	‘grass’	
zá	‘use’	ᵃza/ᵃzə̌	‘feast’	

The *non-high* toneme, in root nouns, occurs as a low tone when the onset of the noun is a voiced obstruent, and as a mid when the onset of the noun is a voiceless obstruent or a sonorant (2).

				(2)
ᵃdzɔ̀	‘salt’	ᵃtə	‘yam’	
ᵃdà	‘snake’	ᵃnyi	‘cow’	
ᵃtsi	‘water’	ᵃmə	‘person’	

In verbs, the *high* toneme surfaces as a high tone. The *non-high* toneme on the other hand occurs as either a low tone, when the word that follows the verb begins with an obstruent (3a-b), or a mid tone, when the following word begins with a sonorant (3c) [9:141]. (N.B. abbreviations are listed in Section 7)

10.21437/TAL.2018-45

a.	wó	wù	dzàtá	lá	(3)
	PRO.3.PL	*kill*.PST	*lion*	DEF	
	'They killed the lion.'				
b.	wó	wù	sɔ́	lá	
	PRO.3.PL	*kill*.PST	*horse*	DEF	
	'They killed the horse.'				
c.	wó	wu	nyi	lá	
	PRO.3.PL	*kill*.PST	*cow*	DEF	
	'They killed the cow.'				

3. Tone on Tɔŋúgbé verbs

Verbs in Tɔŋúgbé have a CV shape. They can be either high or low. The high tone emerges as level in the upper register, while the low tone surfaces as falling in the lower register (see Figure 1 below). Low-toned vowels often, are slightly longer than their high-toned counterparts, and are produced with a slightly breathy voice.

a.	/bú/	[bú]	'lose'	~ (4)
	/bù/	[ˈbû̯ˑ]	'respect'	
b.	/fɔ́/	[fɔ́]	'divide'	~
	/fɔ̀/	[ˈfû̯ˑ]	'to get into debt'	
c.	/kó/	[kó]	'to disembowel'	~
	/kò/	[ˈkû̯ˑ]	'to laugh at'	
d.	/tɔ́/	[tɔ́]	'to press'	~
	/tɔ̀/	[ˈtû̯ˑ]	'to try'	
e.	/dɔ́/	[dɔ́]	'to load'	~
	/dɔ̀/	[ˈdû̯ˑ]	'to climb'	

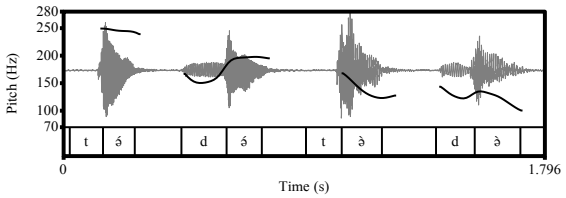

Figure 1: *Signal and F0 curves of the verbs in (4d-e) as produced by a male speaker.*

As illustrated in Figure 1, some of the obstruents display a depressor effect such that the tones of the vowels that follow a voiced obstruent are realized at a significantly lower level than those of vowels that follow a voiceless one. The high tone of *dɔ́* 'to load' is 50hz lower than the high tone of *tɔ́* 'to press', for instance. In Tɔŋúgbé, the depressor effect mostly applies to coronals.

4. Tone on Tɔŋúgbé nouns

4.1. Noun forms

Nouns in Tɔŋúgbé can be divided into two types: root nouns and derived nouns. Roots nouns generally have a VCV shape, the initial vowel being extra short (5). These later vowels viz. *–a* and *–ɔ*, referred to in Ewe linguistics as 'noun prefixes' [9], generally have an underlying non-high toneme in Tɔŋúgbé, as well as in other Ewe dialects.

ᵃsī	ᵊtá	ᵃmə	(5)
'hand'	'head'	'human'	

Derived nouns are nouns that are formed from reduplication (*sú* 'think' ⟶ *sù-sŭ* 'brain'), compounding with (*ɖù* 'eat' + *nū* 'thing' ⟶ *nu-ɖú* 'food' 'to eat') or without (*ɔ̀gbɔ-kpɔ́* 'goat pen (*goat-wall*)') permutation, or affixation (*dɔ̀-nɔ̀* 'a patient (*sickness*-POSS)').

4.2. Level tones

This section presents the tones as they emerge in root nouns. It will be shown that depressor consonants do not display the same influence on the pitch level of root noun tones as they do on the tones of verbs.

4.2.1. General

There are four level tones in root nouns of Tɔŋúgbé. In addition to the three surface tones identified for Ewe, Tɔŋúgbé adds to the list a fourth level tone. We mark this fourth level tone as [ˊˊ] and label it as 'superhigh' because it emerges in the upper register, with a pitch level that is higher than high tones (see Section 4.2.2 below); it is illustrated in (6a). Minimal pairs illustrating the three other tones are provided in (6b-d), and the four surface tones are illustrated by Figure 2.

a.	ᵃtɔ̋	[ᵃtɔ̋]	'fruit' (sp.)	(6)
b.	ᵃtó	[ᵃtó]	'mortar'	
c.	ᵃtō	[ᵃtōˑ]	'ear'	
d.	ᵃtò	[ᵃtù̯]	'buffalo'	

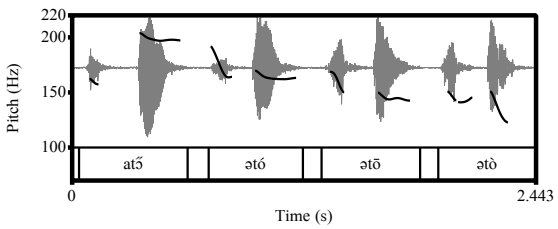

Figure 2: *Signal and F0 curves of (6).*

4.2.2. Superhigh and high nouns

Only few words surface with a superhigh tone. Most of them were borrowed from Akan, and are traditional day names (7a). The two other lexemes belonging to this category are a fruit that is not grown in the area where Tɔŋúgbé is spoken (6a), and the word for 'six' (7b).

a.	ᵃkű	'Aku'	(7)
	ᵃmű	'Ami'	
b.	ᵃdɔ̋	'six'	

No minimal pair distinguishing a word with a superhigh tone from a word with a high tone has been identified, raising doubts on the phonemic nature of the superhigh. However, it is worth noting that i. superhigh tones emerge in other parts of the lexicon, and ii. superhigh and high tones do not display the same behavior in tone contact situations. Compare the data in (8):

a.	alɛ̋	+	ᵃtɔ̃	⟶	alɛ̋ tɔ̃	(8)
	such		*fruit*		'such a fuit sp.'	
b.	alɛ̋	+	ᵃtó	⟶	alɛ̋ tó	
	such		*mortar*		'such a mortar'	
c.	alɛ̋	+	ᵃʤó	⟶	alɛ̋ ʤɔ̃	
	such		*Adjo*		'such an Adjo'	

While the noun 'Adjo' surfaces as high in isolation, it emerges as a superhigh after a superhigh, contrary to the word for 'mortar', which is high both in isolation and after a superhigh (see Figure 3 for an illustration). This indicates that the former is superhigh at the underlying level, while the later is phonemically high. Two other names exhibit the same behavior as 'Adjo' (e.g. awó); no shared property distinguishes them from the words that surface with a superhigh in isolation. Note that this does mean that the voiced obstruents consistently reduce the pitch level of the superhigh, since the pitch level of ᵃdɑ̃́ 'six' (7b) is equivalent to ᵃtɔ̃́ 'fruit' (8a, Figure 3) in isolation (roughly 200Hz).

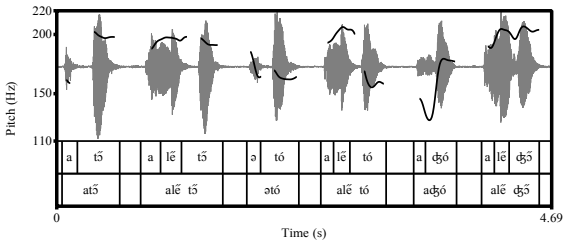

Figure 3: *Signal and F0 curves of (8).*

It is well known that a superhigh tone has been identified in the Aŋlɔ dialect of Ewe ([10], [11]), while it lacks any lexical status. The 'superhigh' tone that we identify in Tɔŋúgbé is not in any way to be equated to the superhigh of Aŋlɔ, which has a higher pitch level as compared to the Tɔŋúgbé 'superhigh'. Instead,it is equivalent to the high of isolated root nouns in Aŋlɔgbe.

All the nouns that are underlyingly high (i.e. which surface as a high after a superhigh) also surface as high in isolation. They all include voiceless obstruents (9a) or sonorants (9b). We identified roughly fifteen nouns belonging to this category in our corpus.

a.	ᵃk͡pá	'tilapia'	ᵃʧɛ́	'twin'	(9)
	ᵃɸó	'millet'	ᵃsɔ́	'dear'	
b.	ᵃlɛ́	'miracle fruit'	ayé	'spider'	
	ᵃnú	'mouth'	əyá	'air'	

4.2.3. Mid and low nouns

Nouns that surface with a low or a mid tone (10) largely outnumber those of the superhigh and high categories.

a.	ᵃsī	'hand'	ᵊfiā	'crowd'	(10)
	ᵊfū	'pregnancy'			
b.	ᵃsì	'market'	ᵊfià	'pig'	
	ᵊfù	'suffering'			

As illustrated in (6), (11) and figure 2 and 4, mid and low tones differ in the shape of their pitch tract rather than on their height: a mid tone usually has a level realization, while the F_0 of a low tone is falling. In addition, mid tones are longer, and the voice quality of low-toned nouns is breathy. Note however that we observed a tendency towards the reduction of differences in pitch realization and voice quality, e.g. mid-toned words can be realized with a slightly falling F0, especially after a voiced fricative (duration thus becomes the main acoustic correlate of the mid tone).

Crucially, both categories can associate with either a voiced or a voiceless obstruent without any perceptible difference. See Figure 4, contrasting (6c-d) – involving a voiceless obstruent – with (11) – involving a voiced obstruent.

a.	ᵊdō	[ᵊdō˙]	'twin boy'	(11)
b.	ᵊdò	[ᵊdò̤]	'hole'	

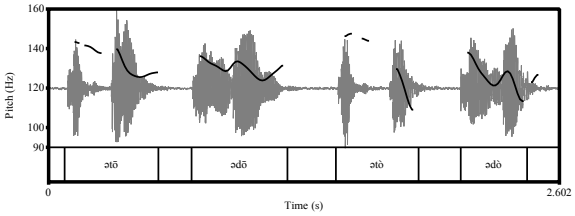

Figure 4: *Signal and F0 curves of (11).*

4.3. Contour tones

We identified only one (true) falling tone in our corpus (12a). Nouns that exhibit a rising tone are however frequent (12b). The height of the rising tone depends on the nature of the consonant: it is lowered after a voiced obstruent or a sonorant (see Figure 5).

a.	ᵃklɔ̃	'light soup'		(12)
b.	ᵃtŏ	'mountain'		
	ᵊbŏ	'outer-covering'		

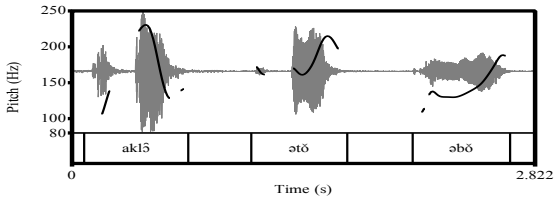

Figure 5: *Signal and F0 curves of (12).*

5. Discussion

Research on the tone system of Tɔŋúgbé is in its infancy, and it is thus difficult, if possible, to evaluate the role depressor consonants played in the development of tones in Tɔŋugbe. However, a comparison of Tɔŋúgbé with other dialects of Ewe may help us to elaborate some hypotheses. This is the purpose of this final section.

Ewe dialects are grouped into two groups: coastal dialects and inland dialects [1]. As for coastal dialects, we will consider Aŋlɔgbe (our data). As for inland dialects, we will consider the Peki/Kpando dialect (a local variation of Eʋedomegbe); data are extracted from [8] and [9].

Tones of verbs in Tɔŋúgbé, at least when produced in isolation, do not demonstrate variability in relation to tones of verbs in the other dialects. We will thus focus on root nouns.

The tones of the root nouns of Tɔŋúgbé correlate differently to the tones of Aŋlɔgbe. Root nouns with high tones in Tɔŋúgbé also are realized with a high in Aŋlɔgbe (13).

	Tɔŋúgbé	*Aŋlɔgbe*	(13)
'head'	ᵃtá	tá	
'air'	ᵃyá	yá	

Nouns that have a low tone in Tɔŋúgbé correlate to two different categories in Aŋlɔgbe: mid tones, when the root involves a voiceless obstruent or a sonorant (14a), and low tones, when the consonant is a voiced obstruent (14b).

		Tɔŋúgbé	*Aŋlɔgbe*	(14)
a.	'yam'	ᵃtè	te	
	'taboo'	ᵃkɔ̀	kɔ	
	'water'	ᵃʧì	tsi	
b.	'two'	ᵈvè	evè	
	'beared'	ᵈgè	gè	

Nouns that are realized with a mid in Tɔŋúgbé also correlate to two tones in Aŋlɔgbé: the high tone when the onset is a voiceless obstruent or a sonorant (15a), and the mid when the onset is a voiceless obstruent (15b).

		Tɔŋúgbé	*Aŋlɔgbe*	(15)
a.	'thanks'	ᵃk͡pə̄	ᵃk͡pɔ́	
	'house'	ᵃfə̄	ᵃfɔ́	
	'bee'	ᵃnyī	ᵃnyí	
	'flatulence'	ᵃŋ̄ɔ	ᵃŋɔ́	
b.	'work'	ᵈdɔ̄	dɔ	
	'scrotum'	ᵈvō	vo	
	'child'	ᵈvī	vi	
	'bowl'	ᵃg͡bā	ᵃg͡ba	

Finally, root nouns with a rising tone in Tɔŋúgbé correlate to nouns with high tones in Aŋlɔgbé (16).

	Tɔŋúgbé	*Aŋlɔgbe*	(16)
'cough'	ᵃk͡pə̌	k͡pɔ́	
'mountain'	ᵃtŏ	tó	
'faeces'	ᵈmĭ	mí	
'cutlass'	ᵃyĭ	ᵃyí	

Table 1 is a summary of the correspondences.

Table 1: *Summary of the correspondences. 't' stands for a voiceless obstruent and 'd' for a voiced obstruent (A. is Aŋlɔgbe and T. is Tɔŋúgbé).*

A	*high*				*non-high*	
	H (t_)			M (d_)	M (t_)	L (d_)
T.	H	R	M	M	L	

The same correlations exist between Tɔŋúgbé and Eʋedomegbe except for one instance: when the underlying tone is a high tone and the onset of the noun is a voiced obstruent. In this latter instance, the tone of the noun is a rising tone in Eʋedomegbe.

	Tɔŋúgbe	*Evedomegbe*	(17)
'grass'	ᵈgbē	ᵃgbĕ	
'arm'	ᵃbɔ̄	ᵃbɔ̆	
'dog'	ᵃvū	ᵃvŭ	

On the basis of Table (1), various hypotheses can be made. The low tone of Tɔŋúgbe may for instance result from the fusion of previous M and L tones, or reflect a conservative state. In the latter case, it can be considered that no split, such as the one that characterizes the non-high in the other dialects, would have occurred. This may explain why depressor consonants do not have the same impact on low tones in Tɔŋúgbe as they do in the other dialects.

The mid tone of Tɔŋúgbe can result from the partial fusion of older categories (high and mid), but it is also possible that some of the actual mid tones of Tɔŋúgbe (i.e. those that are preceded by a voiceless obstruent) result from the fission of H. An argument supporting this hypothesis is the distribution of vowels in the two categories: high-toned nouns in Tɔŋúgbe mostly involve [ɛ] or [o], while mid-toned nouns have [e], [ɔ] or high vowels (but both the categories involve [a]). Again, such a process of fission may have blundered the effect of depressors in Tɔŋúgbe. A similar process may be at the basis of the emergence of the rising tones of Tɔŋúgbe.

Further research is required in order to explore these issues.

6. List of abbreviations

DEF = definite, PL = plural, PRO = pronoun, PST = past.

7. References

[1] G. Ansre, "The Ewe language", in *A Handbook of Eweland Volume II: The northern Ewes in Ghana*, Accra, Woeli, pp. 22−47, 2000.

[2] P. Kpodo, "Vowel Height Agreement in Ewe", *Journal of Applied Linguistics and Language Research*, vol. 4.7, pp. 206–216, 2017.

[3] J.-M. Hombert, "Consonant type vowel quality and tone", in V. Fromkin (ed.), *Tone: A Linguistic Survey*, New York, Academic Press, pp. 77–111, 1978.

[4] M. Bradshaw, *A Crosslinguistic Study of Consonant-Tone Interaction*, Ph. D. Dissertation, Ohio State University, 1999.

[5] G. Ansre, *The tonal structure of Ewe*, Masters Thesis, The Kennedy School of Missions of The Hartford Seminary Foundation: Hartford (Connecticut), 1961.

[6] R. Bole-Richard, *Systématique phonologique et grammaticale d'un parler Ewe: le Gen-Mina du Sud-Togo et Sud-Bénin*. Paris: L'Harmattan, 1983.

[7] F. Gbéto, "Esquisse de la tonologie synchronique de wemegbe, dialecte gbe du sud-Benin", *Studies in African Linguistics*, vol. 33, pp. 65–90, 2004.

[8] A.S. Duthie, *Introducing Ewe linguistic patterns: A textbook of phonology, grammar, and semantics*, Accra, Ghana Univ. Press, 1996.

[9] H.F.W. Stahlke, *Topics in Ewe Phonology*, Ph.D. Dissertation, UCLA, 1971.

[10] G.N. Clements, "Four Tones from Three: the Extra-High Tone in Anlo Ewe", in P.F.A. Kotey & H. Der-Houssikian (eds.), *Language and Linguistic Problems in Africa*, Columbia, Hornbeam Press, pp. 168–191, 1977.

[11] G.N. Clements, "Tone and Syntax in Ewe", in D.J. Napoli (ed.), *Elements of Tone, Stress, and Intonation*, Washington D.C., Georgetown University Press, pp. 21–99, 1978.