

A cross dialectal variation between Likwála and Likuba

**Embanga Aborobongui Georges Martial, Orchider Chéril Oba,
Yvon-Pierre Ndongo Ibara**
Université Marien Ngouabi

Abstract

This study scrutinises whether Likwála C26 and Likuba C27 are two dialects or independent languages within the Group C20 with a particular regard to the phonemic analysis. It results from the comparative phonematic analysis that, in spite of some full sound pairs of words, consonantal and vocalic distribution, as well as allophonic variation of some segments in intervocalic position, the degree of opacity between the two languages is more than the degree of stability in terms of intercomprehension. So, it comes out that Likwála (C26) and Likuba (C27) are not two dialects of either of the two language, but rather two different languages within the group C20.

Keywords: Likwálà, Likùbà, dialectal variation, phonematic

Resumé

Cette étude examine si Likwála C26 et Likuba C27 sont deux dialectes ou deux langues indépendantes au sein du groupe C20, avec une attention particulière sur la phonématique. Il résulte de cette analyse que, en dehors de quelques paires sonores complètes des mots, de la distribution consonantique et vocalique, ainsi que de la variation allophonique de quelques segments en position intervocalique, l'écart d'intercompréhension est important. Par conséquent, le Likwála (C26) et Likuba (C27) ne sont pas deux dialectes d'une même langue mais deux langues différentes du groupe C20.

Mots-clés: Likwála, Likuba, variation dialectale, phonématique

Introduction

This work compares Likwála and Likuba, two languages of Group C20 classified as C26 and C27 respectively (Guthrie, 1971) with a particular reference to the phonemic aspects. The aim is to scrutinise whether they are two different languages or two dialects of one language. As such, it falls within the domain of dialectology. As a matter of fact, Chambers and Petter's (2004) states that language varieties may differ in terms of phoneme inventory, phoneme distribution, and phoneme incidence without affecting intercommunication. Through this study, we want to point out which full similarity and partial similarity that include one sound difference, two sound differences, and three sound differences as well as total differences between the two languages under scrutiny. Therefore, the work put up research questions below:

1. Are Likuba and Likwála different languages or dialects of either of the two within C20 group?
2. How are phonemes distributed in Likuba and Likwála?
3. How similar and dissimilar are Likuba and Likwála in terms of segments?

Languages are genetically related if they are descended from the same ancestor language. As such, the synchronic comparison can help answer diachronic questions about language

development and classification. Thus, Likuba and Likwála due to their geographical setting people wonder whether they are two languages or two dialects of one of the two languages. Then, our task consists in pointing out the connection that exists between the two languages under scrutiny distinguishing the degree of opacity and stability between the segment which is being assimilated – the assimilee, the segment which assimilates another segment – the assimilator, and the segment resulting from the assimilation –the assimilant cross linguistically.

4. Comparative phonematic study between Likuba and Likwála

This section aims at providing comparative phonematic analysis between Likuba and Likwála to point out similarities and dissimilarities. Prior to presenting sounds system charts of each of the two dialects under scrutiny.

4.1. Likuba phonemes

The aim of this subsection is to present Likuba consonants and vowels as well as their distinctive features.

4.1.1. Likuba consonants chart.

Adoua (1981), Ndinga Oba(2003), Oba(2019), have dealt with the sound patterns of Likuba each of them points out consonants system chart of this dialect regarding his research limit based on the related corpus. Therefore, for the sake of the present study we consider Oba (2019) below illustrate:

(1)

	labial	Labio dental	alveolar	Alveo -palatal	palatal	velar	Labio velar
Stop	p b		t d	ts dz		k	
Fricatives		f	s		j		w
Lateral			l				
Pre- nasal	mb		nd	Ndz		ng	
Nasal	m		n		ɲ	ŋ	

4.1.2 Likwála vowel system

The following vowels chart is extracted from Ndongo Ibara(2000); we consider it in comparison with our finding after undertaking on vocalic system of Likuba.

	unrounded/front	Central	back/rounded
close	i		u
half close	e		o
half open	ɛ		ɔ
open		a	

(Oba: 2019)

4.2. Likwála consonants

This section purports at providing Likwála consonants and vocalic sounds together with their distinctive features.

4.2.1. Likwála consonants chart

Likwála dialect has already been documented in some research work, notably Louango(1989), Ndinga Oba(2003), Oba(2019). However, their conclusions distinguish each other in term of consonants number. Thus, the chart below is extracted from Oba (2019: 57) so that we consider this one as more detailed than others.

(3)

	labial	alveolar	alveo-palatal	palatal	velar	Labio velar	Glottal
Stop	p b	t d	ts dz		k		
Continuant		s		j		w	h
Lateral		l					
Pre-nasal	mb	nd	ndz		ng		
Nasal	m	n		ɲ	ŋ		

(Oba, 2019: 57)

4.2.2. Likwála vowel chart

In accord with authors above mentioned who undertook on Likwála sound patterns; it comes out that the dialect attests seven (07) vocalic sounds that Oba(2019) represents as follow:

(4)

	unrounded/front	central	back/rounded
Close	ɪ		u
Half close	E		o
Half open	ɛ		ɔ
Open		a	

(Oba, 2019: 59)

Actually, as above mentioned the comparison focuses on phonemic analysis. Firstly, we deal with consonants analysis to point out the manner of articulation set cross the two languages under scrutiny. Secondly, we provide vocalic process analysis in terms of vowel combination compatibility and incompatibility.

5. Consonant sound comparison between Likuba and Likwála

In this section, the comparison focuses on consonants variation from Proto-Bantu (PB) cross Likuba and Likwála so as to point out similar and dissimilar point. As regards similar point, prior to mentioning that allophonic variation will be taken into account in order to provide phonological rules. It will be noticed that one sound can have more than one realisation attested in one of the two languages under comparison due to the environmental constraints, while in other it is not attested.

As for dissimilar point, we compare pair of words in terms of one sound difference; two sounds difference; three sounds difference; and full differences.

5.1. Similarities between Likuba and Likwála

This part is concerned with selecting some Likuba and Likwála full segment similarities in comparison with the PB, by pointing out sounds that are allophones regarding environmental constraints. Among the main sounds that change according to the environmental constraints, we are: /Nt, g, k, t, b/

(5). The historical change of the PB /Nt, g, k/ in Likuba and Likwála				
	PB	Likuba	Likwála	Meaning
a.	*-Ntu	mo-to	mo-to	"person"
b.	*-Guba	mo-kuba	mo-kuba	"smith"
c.	*-Boko	lo-bɔɔɔ	lo-bɔɔɔ	"arm"

It results from (5a) that the PB prenasalised consonant /Nt/ lost its nasality feature and is realised as [t] in both languages. This loss is not phonologically conditioned. Nevertheless, the PB voiced velar /g/ and the velar /k/ are respectively realised [ɣ] and [ɰ] in an intervocalic position. These allophonic variations can be interpreted according to the following rules:

(6). The PB /g, k/ variations in Likuba and Likwála					
a.	/g/	→	[ɣ]	/	v – v
b.	/k/	→	[ɰ]	/	v – v

The first rule shows that [+voiced] velar becomes [-voiced] when it appears between two vowels. This devoicing rule is quite surprising as a voiced consonant is devoiced in the environment of two voiced vowels. This is a case of dissimilation by loss of the feature [+voice]. The second rule is a case of weakness of the velar by the loss of place of articulation.

Other changes are observed with /t/ and /k/ which are respectively as [r/ɾ ?] and [ɰ] between vowels. (7) below illustrates these changes.

(7). Allophonic variations of /t/ and /k/ between vowels.

Phonological rules for these changes can be formulated as followed: Realisations of /t/ and /k/ in Likuba and Likwála in intervocalic

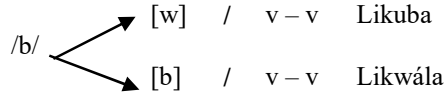
(8)					
a.	/t/	↗	[r]	/	v – v
		↘	[t]	/	Elsewhere
b.	/k/	↗	[ɰ]	/	v – v
		↘	[k]	/	elsewhere

It is worth pointing out that allophonic variations occur only in intervocalic position. Furthermore, in Likuba, the PB /b/ is realised [w] in intervocalic as illustrated in (9) below which show the difference between Likuba and Likwála.

(9). Allophonic variation of /b/ in Likuba					
	PB ?		Likuba	Likwála	meaning
	/*-jīb-/	→	[mo-jíwi]	[mo-jíbi] ?	"thieth"
	/*-lob-/	→	[o-lowá]	[o-loba] ?	"say"
	/*-jéb-/	→	[o-jéwa]	[o-jéba] ?	"know"
	/*-kùbà/ ?	→	[mo-kùwa]	[mo-kùba] ?	"smith"

It results from (9) that, between vowels, /b/ is realised [w] in Likuba, while it remains [b] in Likwála. This difference cross Likuba and Likwála can be formulated through the following rules:

(10). Realisation of /b/ in intervocalic



This realisation of the PB /b/ by [w] in Likuba in intervocalic position is a language specificity (parametric). The following section focuses on dissimilarities in the two languages under comparison.

5.2. Dissimilarities between Likuba and Likwála

This section aims at pointing out consonant differences in pairs between Likuba and Likwála in terms of one sound difference, two sounds difference, three sounds difference and total difference.

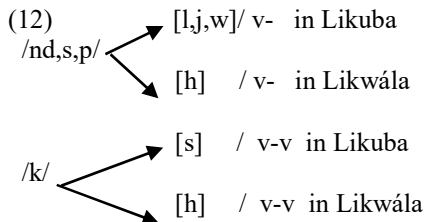
5.2.1. One different sound words between Likuba and Likwála

Likuba and Likwála do not only share full sound words; they also have words that present one consonant difference. To point out the difference, let consider data exemplified below:

(11). One different sound between Likwála and Likuba referring to PB

PB	Likùbà	Likwála	Meaning
*-ndongud	/mo-lakisi/	/mo-hakisi/	"the guide"
*-sucol	/o-jéke/	/o-héke/	"wash"
*-puto	/o-wúra/	/o-húra/	"payment"
*-búk	/o-bosa/	/o-boha/	"break"
*-	/ó-ngáa/	/ó-ha/	"here"

It results from (11) that the Proto-Bantu initial and final phonemes /nd, s, p, k / in **bold** do not have the same realisation in Likuba and Likwála. They vary by [l, j, w, s, ng, ɣ] in Likuba, whereas in Likwála these alternations are only realised by a glottal fricative [h]. As one can remark in (5a and 5b) there are opacities in pairs from PB cross Likuba and Likwála. As a matter of fact, these different realisations from PB cross Likuba and Likwála regard the environmental context. The realisation of the PB sounds in Likwála and Likuba can provide the following phonological rule:



As a matter of fact, all variations at this level concern the alternation of the PB /nd, s, p, k / to other manners of articulation in Likùbà and Likwála regarding the environmental constraint.

Furthermore, the Likwála /h/ is also realised [g] in both initial and intervocalic position as we can see below:

(13). Realisation of /h/ in Likwála				
a)	*-Gad-	/-hém-b-a/	[-gém-ba]	Man
b)	*-Dzeb-	/-hé-ba/	[-géb-a]	Know
c)	*-Nyung-	/o-tìhìn-à/	[o-tìgìn-à]	Movement

From (13), it is observed that the PB /g, dz, ng/ are realised as a fricative /h/ in Likwála and the last can also be realized as a velar stop /g/ in both initial and intervocalic position. Hence, the following phonological rule is provided:

(14). Realisation of the PB /g,dz, ng/ in initial and intervocalic in Likwála					
/g, dz, ng/	{	[h] → [g]	/	v _ v	Likwála
		[h] → [g]	/	_ v	Likwála
		[g, dz, ng]	/	elsewhere	Likwála

In (15), we are going to compare the variation of the Likùbà fricative /f/ in Likwála in both initial and mid position referring from PB.

(15) Realisation of Likùbà /f/ cross Likuba and Likwála				
	PB	Likùbà	Likwála	meaning
a)	*-Pl-e	kafé	kapé	Coffee
b)	*-Yung-u	fulélé	pulélé	flower

It results from (15) that the PB /pl and y/ are not the same realisation cross Likuba and Likwála. In Likuba, they are realised as a voiceless fricative /f/, whereas they are voiceless stop [p] in Likwála. Such phonological variation cross linguistically may be historical, whence the manner of articulation sets the realisation from /pl, y/ to [f] and [p]. Furthermore, the alternation is attested in intervocalic; but in initial when the following vowel is /u/. The phonological rule can be put up as follows:

(16). Realisation of the PB /pl, y/ Likuba and Likwála				
/pl,y/	{	[f]	/	v _ y/-v
		[p]	/	v-v/ _ y

Besides, one sound difference between Likùbà and Likwála can also occur in terms of consonant deletion. The case of the Likwála /p/, /b/, and /l/ that can be deleted in intervocalic position as below illustrated:

(17) Deletion case				
	PB	Likwála	Likùbà	Meaning
a)	*-Gubu	ngubú	nguú	Hippopotamus
b)	*-Gedé	ngelé	ngéé	downriver
c)	*-Sobo	mɔtsɔpɔ	mɔtsɔɔ	Intestines
d)	*-Púdu	pulú	Puú	Foam

It appears from (17a, 17c) that the PB velar stop /g/ is prenasalised in the two dialects at initial position. Although, in mid position the Proto-Bantu /b/ has the same realisation in the first dialect between close sounds /u-u/, but it varies by [p] when occurring between vowels; while in the second dialect it is deleted. From (17b, 17d) we observe that the PB alveolar /d/ is realised as a lateral [l] in the mid position in the first dialect; whereas they are deleted in the second dialect by combining two vowels from two different syllables that become long vowels. Nevertheless, vowels length in Likuba are not phonological. It derives from the loss of the intervocalic consonant. Furthermore, the change of /d, b/ to [l, p] is not due to the nature of the environmental vowels, but to its environment of occurrence. This is a process of dissimilation as argued previously. The following phonological rule can make it clearer.

(18) Realisation of PB /g,b,d/ cross Likùbà and Likwálà

Likuba

/b/ → [p] / v – v
 /d/ → [l] / v – v
 → [ø] / v – v
 /g/ ↘ [g] / elsewhere

Likwala

/b/ → [l] / v – v
 /d/ → [p] / v – v

In (18), we point out that labia-velar /w/ and fricative /s/ can occur in mid position in Likùbà whereas they are deleted in Likwálà as exemplified below:

(18) Realisation of /w/ and /s/ in Likùbà and Likwálà				
	PB	Likùbà	Likwálà	Meaning
a)	*-Duk	o-lùwà	o-lùà	Vomit
b)	*-Buk	o-bòsà	o-bòà	Break

As we can notice from (18), the phoneme /k/ from PB has two realisations in Likùbà namely /w/ and /s/ regarding the environmental constraints. However, it is deleted in intervocalic position in Likwálà and gives rise to phonetic realisations of the diphthongs /ua/ and /oa/; while in Likùbà they are not realized as diphthongs, but belonging to two different syllables as below illustrated.

(19) Realisation of PB /k/ in Likùbà and Likwálà				
/k/ →	[Ø]	/	v – v	Likwálà
	[w, s]	/	v – v	Likùbà

The upcoming subsection presents pairs of words which have two different sounds.

5.2.2. Two different sound words between Likùbà and Likwálà

This subsection deals with pair of words that distinguish by two sounds between the two languages under comparison. To this effect, we focus on the way the manner of articulation sets sounds realisation from Proto-Bantu cross Likùbà and Likwálà to point out the way sounds change regarding the environmental context.

(20). Consonants alternation between Likùbà and Likwálà				
	PB	Likùbà	Likwálà	Meaning
a)	*-tsembo	esésékù	elélékù	hiccough
b)	*-jok	o-jókà	o-wóhà	Hear
c)	*-tolo	tólò	ndóndó	Chest

(20a) shows that the PB /ts/ is realised as alveolar fricative /s/ in Likùbà and as a lateral sound /l/ in Likwálà in intervocalic position of the second and third syllable of the four syllable word. In (20b), it appears that the Proto-Bantu /j and k/ have the same realisation in Likùbà; whereas are differently realised in Likwálà notably by [w and h]. In the same fashion, the PB /t and l/ keep the same realisation in Likùbà; while realised as prenasalised [nd] in initial as well as in intervocalic position in Likwálà. These phoneme variations are due to the manner of articulation set cross linguistically as exemplified in the following phonological rule:

(21). Realisation of PB // of Likùbà in Likwálà				
/ts/ →	[s]	/	v-v	Likùbà
	[l]	/	v-v	Likwálà
/y,k,t,l/ →	[y,k,t,l]		-v, v-v	Likùbà
	[w,h,nd,nd]		-v, v-v	Likwálà

As one can remark, consonant variation into two different sounds word is due to the environmental constraint, as well as the manner of articulation set cross linguistically.

5.2.3 Three different sound words between Likùbà and Likwálà

This part concerns at putting in parallel some word that distinguish by three sounds between Likùbà and Likwálà. It is worth stating that differences at that level depend on consonant distribution constraints in polysyllabic words regarding the terminology of the language as exemplified below:

(22) Constraints related to consonant compatibility				
	PB	Likùbà	Likwálà	meaning
a)	*-Koko	lòkòyó	mòngòhó	Sugar cane
b)	*-Nanud	o-wólísà	o-hótínà	Stretch
c)	*-Soko	lìtáká	Lìléké	buttock

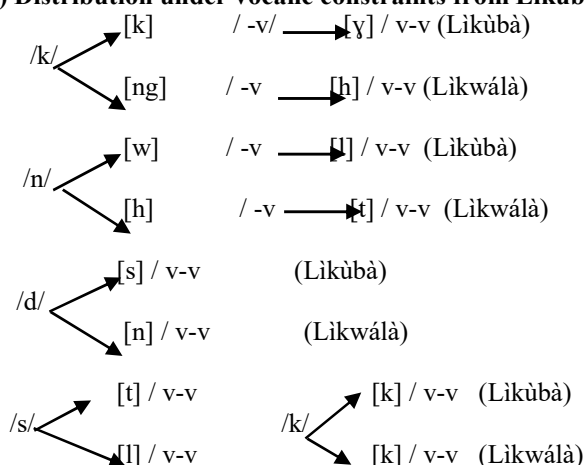
From the above illustration, the comparison refers to consonant distribution under vocalic constraint in more than two syllable words. The PB voiceless velar /k/ has not the same realisation in both Likùbà and Likwálà. Indeed, the first dialect from (22a) keeps the PB phoneme [k] in initial position, and realised as a voice fricative velar [ɣ] between vowels;

albeit in the second dialect /k/ is realised as a prenasalised voice velar [ŋg] in initial position, and as a voiceless fricative glottal [h] in intervocalic position.

Since, consonant alternations between the two languages under scrutiny are observed in presence of mid back vowel /o/; therefore, we can say that consonant distributions between the two dialects are selected under vocalic sound influence which allows the manner of articulation to set the realisation of segments cross linguistically.

Furthermore, in (22b, 22c) we notice an opacity at level of the PB roots cross Likùbà and Likwálà. Unless, the variation of the Likùbà labio-velar /w/ by a fricative glottal [h] in Likwálà in initial position is observed in front of /o/. The change of the Likùbà phoneme /l/ by the Likwálà sound [t] is observed in intervocalic position, as well as the realisation of the phoneme /s/ by [n] cross the two languages. We can provide the following phonological rules that attest the manner of articulation set cross linguistically.

(23) Distribution under vocalic constraints from Likùbà to Likwálà



As we can notice from the above phonological rules, three syllable words in Likùbà attest consonant combination of the type initial lateral /l/, followed by stop velar /k/ in intervocalic, and ended with fricative velar /ɣ/ in intervocalic; while such combination is not attested in Likwálà. However, Likwálà allows consonant harmony of initial nasal /m/, velar prenasalised /ŋg/ in intervocalic and fricative glottal /h/ in intervocalic, what is not possible in Likùbà.

The following subsection deals with full differences in the two languages under comparison.

5.2.4. Full different sound words between Likùbà and Likwálà

In this part we are concerned with providing Likùbà and Likwálà pairs of words that phonemes are totally distinct. As a matter of fact, this case is more morphological than phonological as represented in (20) below:

(24) Phoneme difference between Likùbà and Likwálà				
	PB	Likùbà	Likwálà	Meaning
a)	*-Cecu	tsòkà	ekókòró	(be) old
b)	*-Kad	mambí	hɔɔ	problem
c)	*-Nyo	yaú	nɔɔ	You
d)	*-Bemb	o-nyànyà	o-meme	carry
e)	*-Bende	mòbùkà	esómbà	Rat

From (24), we observe distant differences in pairs from PB cross Likùbà and Likwálà. In fact, such case also helps pointing out whether the two languages under scrutiny are linguistically endogenous or exogenous basing on morphophonemic aspect.

Consonantal variation Analysis between Likùbà and Likwálà have helped identifying similarities and dissimilarities in pairs. As regards similarities we have provided some phonological rules on possible allophonic variation inside each language under comparison. While, in term of dissimilarities we have selected pairs which distinguish by one sound, two sounds, three sounds and full sounds difference. The next section deals with vocalic processes cross Likùbà and Likwálà.

6. Vocalic processes in Likùbà and Likwálà

The purpose of this section is to provide vocalic variation between Likùbà and Likwálà. To this effect, we focus on both vocalic alternation under nasal and prenasalised consonant constraints; and vocalic combination compatibilities and incompatibilities in Likùbà and Likwálà.

6.1. Final vowel alternation under nasal consonant constraints

In this part we present the permissible final vowels allowed in Likùbà and in Likwálà under nasal and/or prenasalised consonants constraint. Prior to mentioning that, such constraints do not include vocalic compatibilities and incompatibilities in the two languages under scrutiny as represented in charts (). However, they are taken into account under vocalic manner of articulation set across linguistically according to the environmental context.

27.Final vowel alternation between Likùbà and Likwálà				
	PB	Likùbà	Likwálà	Meaning
a)	-*peep	Lowómì	Lowómà	Breathing
	-*jino	Línù	Línà	Tooth
b)	-*jimba	Tsímíbí	Tsímíbà	Antbear
	-*cundue	Tsónndzi	Tsónndzo	Leech
	bung	Pambù	Pambò	Eartworm

It results from the above pairs between Likùbà and Likwálà that, Likùbà allows high vowels /i/ and /u/ in final position when preceding phonemes are nasal or prenasalised consonants; while in the same environments the Likùbà high vowels is realised by open low /a/ and half close /o/ in Likwálà. Whence, we welcome the following phonological rules:

28.Vocalic alternation under nasal and prenasalised sounds constraints				
a)	/i,u/ →	[a]	/	n ____ Likwálà
		[i,u]	/	elsewhere Likùbà and Likwálà
b)	/i/ →	[a,o]	/	NC ____ Likwálà
		[i]	/	elsewhere Likùbà and Likwálà
	/u/ →	[o]	/	NC ____ Likwálà
		[u]	/	elsewhere Likùbà and Likwálà

It is worth stipulating that such variation is only attested in presence of high vowels /i,u/. As a matter of fact, realisations of /i/ and /u/ from Likùbà to other areas of articulation in Likwálà refer to the phonology of the language. For phonologically speaking environmental constraints depend on features set within segments.

In () we are going to present the constant case that nasal and prenasalised consonants do not affect final vowels between Likùbà and Likwálà.

29.Constant case between Likùbà and Likwálà				
	PB	Likùbà	Likwálà	Meaning
a)	-*cumbagld	eléme	eléme	Limp
a)	-*jonjo	mɔndzɔ	mɔndzɔ	Elephant's tust
c)	-*bembe	Ebembe	Ebembe	Corpse

It appears from (29) that, if the final sounds are half close, and half open vowels, the preceding nasal and/or prenasalised consonants cannot carry the change between Likùbà and Likwálà. The following subsection presents vocalic harmony in the two languages under comparison.

6.2. Vocalic harmony in Likùbà and Likwálà

This section purports to provide vocalic combination compatibilities and incompatibilities in Likùbà and in Likwálà. In fact, prior to representing vocalic distribution as assimilation processes, to warning that consonant sounds distinction are not taken into account in pairs of word represented in (26), but rather vocalic sounds only.

30.Vocalic distribution cross Likùbà and Likwálà				
	PB	Likùbà	Likwálà	meaning
a)	-*ndzo	Lórò	Lórò	womb
b)	-*jico	Lísù	Lísù	Eye
c)	-*cudu	wóyà	Wóhà	Hear
d)	-*junglda	méyá	móyá	warm
e)	-*jaka	Mobú	mɔbú	season
f)	-*tumb	o-kàmbà	o-mɛmà	Lead

Vocalic distribution in Likùbà and in Likwálà presents the both similarities and dissimilarities. In (30 a,b, and c), the two languages attest the combination between high vowels (CiCu), back (CoCo), back and low (CoCa). Nevertheless, in (30e and d) vocalic harmony presents parameter. Likwálà attests vocalic harmony between front half open and open low vowels of the type CɛCa; while such combination is incompatible in Likùbà.

7. Comparison under marks calculation scale.

This section aims at calculating percentages of proximity between the two languages under analysis. In fact, as mentioned above, this synchronic study grounds on phonological features. To quote Nermine Naboulsi(2012:11) *The only way you can do that is by finding systematic similarities between these languages in every area (...) similarities in their sounds, and so forth.*

It is emerged from this quotation that, systematic similarities allow pointing out whether languages under scrutiny descend from a single proto-language by comparing lists of cognate terms.

As a matter of fact, dialectological study proposes the both data processing method and non-computational method. For the sake of the present study I am going to use last method put forward by Mous and Breedveld (1986) conceive for African languages, adapted with synchronic studies.

However, such study requires parallel lists of words from languages under comparison. Pairs of words are marked according to their differences. As a rule, the communication takes place between two speakers of different linguistic communities when they are phonetically more similar. Thus, calculation scale varies from zero to four based on similarity and dissimilarity between the two languages under comparison.

The mark 4 is given for full segment similarity

(33). Full segment similarity									
Likùbà	l	ì	ng	é	k	ì	s	ì	ankle
Likwálà	l	ì	ng	é	k	ì	s	ì	ankle

The mark 3 is given when there is one segment change

(34)	Likùbà	o	k	a	mb	ì	l	à	Say
	Likwálà	o	k	a	mb	ì		à	Say

The mark is 2 when there are two segment changes

(35)	Likùbà	e	p	á	p	á	ng	á	sparrowhawk
	Likwálà	e	h	á	ng	á	ng	á	sparrowhawk

The mark 1 is given when there are more than two segment changes

(36)	Likùbà	m	o	t	ó	mb	à	rat
	Likwálà		e	s	ó	mb	à	rat

The mark zero is selected when there are more than three segment changes in the pair

(37)	Likùbà	m	a	t	ó	r	ó	Flute
	Likwálà	m	o	ts	á	ɲ	á	Flute

Further to the presentation of the method, I am going to proceed with average calculations.

7.1. Proximity calculation formulaic

This part concerns with considering the sum of marks from each pair of words in the corpus, represented in the chart below:

(38). Sum of value	
	Likùbàá
Likwálà	2543

Before starting with calculation of percentage of proximity the following elements are required:

1- Inpit(IP)= 1700

- 2- Maximal Mark (MM)= 4
- 3- Maximal Marks Number (MMN)= IP x MM (1700x 4=6800)
- 4- Maximal Percentage (MP)=MMNx100/ MMN (6800 x100/6800=100%)

Thanks to the above formulaic, I am going to calculate the percentage of proximity between Likùbà and Likwàlà. Percentage of proximity (PPR) calculation formulaic looks like the following:

$$PPR = SV \times MP / MMN = 2543 \times 100 / 6800 = 37.39\%$$

$$PPR = 37.39\%.$$

(39).Percentage of proximity	
	Likùbàá
Likwàlà	37.39%

The next calculation formulaic consists to check whether Likùbà and Likwàlà are varieties or two distinct languages in the group C20. To this effect, the calculation is done by adding up percentages got in each comparison. As the present study has only one comparison, the result remains 37.39%. As such the percentage of proximity is as follows:

(40).Percentage of similarity	
	Likùbàá
Likwàlà	37.39%

This study has been concerned with comparative phonematic study. It has dealt with consonant similarities and dissimilarities as well as vocalic processes cross Likùbà and Likwàlà referring to PB. It results from the comparative phonematic analysis that Likùbà and Likwàlà have similar and dissimilar points. As regards similar points, they share some full sounds words; attest realisation of /t/ by [r] and /k/ by [ɣ] in intervocalic. They also share some vocalic harmony in the structure CVCV.

Regarding dissimilarities the two languages under scrutiny have phenomena of consonant and vocalic alternations due to the manner of articulation set from one language to another examined in term of one sound difference, two sounds difference and three sounds difference. They also have total different sounds words. Consequently Oba(2019:100) proves that within one thousand and seven hundred's (1700) corpus input (pairs of words between Likùbà and Likwàlà) regarding to their similarity and dissimilarity basing on marks scales are regrouped as exemplified hereafter:

(41)

Full similarity	One different sounds	Two different sounds	Thee different sounds	Full different sounds
345 pairs	183 pairs	182 pairs	269 pairs	721 pairs
Total 1700 pairs				

Such are distribution of data which have allowed calculating percentages of proximity and/or similarity between Likùbà and Likwàlà. In accord with comparative phonematic analysis as well as dialectological analysis under non-computerised method put forward by Mous and Breedveld (1986) for African languages, adapted with synchronic studies; it is come

out that the two languages under scrutiny are not dialects of one of the two languages. From the above chart, they share more dissimilar phonological features than similar. Whence 37.39% as percentage of proximity, this certifies that the intelligibility cross Likùbà and Likwálà is very weak. It appears that during the speech if speakers of one of the two languages use for example 1700 words; the message will not be well caught if there is not a performer. Comparative phonematic analysis and dialectological percentage calculations have helped shedding light on the relationship between Likùbà and Likwálà in the group C20. This has also broken down the uncertainty that people had toward the two languages, wondering whether they were varieties or not.

CONCLUSION

This work has scrutinized the relationship between Likùbà C27 and Likwálà C26 to find out whether they are two different languages or two dialects of either of the two languages in the Group C20. To solve the issue, we have focused on phonemic analysis under a dialectological framework.

After data analysis, it has resulted that the two languages have some common and different features. As far as common features are concerned, the two languages share some full sound words, as well as vocalic harmony in two syllable words of the form CVCV. They also attest some consonant allophonic variations under intervocalic constraints; as mentioned above /t/ can be realised [r] and /k/ by [ɣ].

As regards dissimilarities, the analysis has focused on both partial and full differences. As regards partial difference, it includes one different sound word, two different sounds word, and three different sounds words. It appears from partial difference that the Likwálà glottal fricative /h/ has more realisations in Likùbà. It varies to [ɣ, w, l, s, y, ng] according to the environmental constraints and the manner of articulation set across the two languages.

Regarding total difference, this work selected pairs of words that have more than four different sounds, and which are morphologically dissimilar. From the corpus input it proved that Likùbà and Likwálà have more full different sound words than full similar sound ones.

Furthermore, on the one hand, Likwálà allows /ε--a/ a--ε/ as vocalic harmony, while these are unattested in Likùbà. On the other hand, the combination /o--ɔ/ is attested in Likùbà, whereas this is not possible in Likwálà.

As for proximity percentage calculation, in terms of intercomprehension, it has resulted that Likùbà and Likwálà are not linguistically endogenous, i.e they are not dialects of the same language; for 37.39% is very low to languages to be claimed dialects.

This study allowed the modification of information related to the intelligibility in the group C20 in general and between Likùbà and Likwálà in particular. Central African Atlas (1987:26) may be wrong because they did not provide a comparative analysis under dialectological framework before assuming the full intelligibility between Likùbà and Likwálà.

This work proved that Likùbà and Likwálà are linguistically exogenous; while they are geographically endogenous. As Ndongo-Ibara (2018:14) states *l'intercompréhension a des valeurs endogènes et exogènes au sein d'une langue. Cela se justifie linguistiquement d'une part et géographiquement d'autre part*¹. Another issue raises between unclassified language Bwenyì and a classified one namely Likwálà C26 in the group C20. People wonder if they are two languages or two dialects of the one language. Further to Ndongo-Ibara (2018) aims of reinforcing field works in scrutinising the relationship between languages classified in the

¹ Intercomprehension has endogenous and exogenous values within a language. This can be justified linguistically on the one hand and geographically on the other hand. (my translation)

group C20 whether they deserve to be in the same group or not. This is what we plan to do in a future research work.

REFERENCES

- Abdolazim Hakimi, (2012), Comparative Phonetic Study of Frequently Used Words in Iranian Farsis versus Tajik. *Journal of American Science* 2012, 8 (4):6-16. (ISSN:15-451003). <http://www.americanscience.org>. 2
- Adoua Jean Marie (1981), *Description Phonologique du Likùbà (Langue Bantu du Congo)*, Mémoire, Département Linguistique ; FLSH, UMN ; Brazzaville. 129 pages
- Adrian P. Simpson (2002). *Fundamental problems in comparative phonetics and phonology: does upsid help to solve them?* Institute of Phonetics and Digital Speech Processing, University of Kiel, Germany.
- Ali Israr (2018), *A Comparative Study of Phoneme-and Word-Based Learning of English Words Presented to the Skin*. Haptic Interface Research Lab, Purdue University, West Lafayette, IN 47907, USA. © Springer International Publishing AG, part of Springer Nature 2018.
- Angoujard Jean Pierre (1997), *Théorie de la syllabe ; Rythme et qualité*, Paris : CNRS Editions.
- Anttila Raimo (1972), *An Introduction to Historical and Comparative Linguistics*. University of California. Los Angeles. MACMILLAN Publishing CO., Inc. New York. Collier MACMILLAN Publisher London.
- Atlas Linguistique de l'Afrique Centrale(1987), *Situation linguistique de l'Afrique Centrale inventaire préliminaire le Congo*.(c)ACCT-CERDOTOLA-équipe nationale du Congo.
- Baltanski Elie (1999), *La Phonology Versicale; Nouvelles Directions en Phonology*. Paris: Presses Universitaire France.
- Britain David (2010), *Dialectology*. Department of Language and Linguistics. University of Essex Wivenhoe Park. COLCHESTER Essex Great Britain CO4 3SQ
- Bruce Hayes (1973), *Introductory Phonology*
- Chambers J.K. and Peter Trudgill (2004) *dialectology*. CAMBRIDGE UNIVERSITY PRESS
- Charles F. Meyer (2009), *Introducing English Linguistics*, Cambridge, Cambridge University Press (CVP)
- Cheryl A. Black (1995), *Boundary Tones on Word-Internal Domains in Kénande*. Summer Institute of Linguistics/University of North Dakota
- Clarence Sloat, Sharon Henderson Taylor, James E. Hoard (1978), *Introduction Phonology*. By Prentice-Hall. INC, Englewood Cliffs, N.J 07632. University of Oregon
- Colin J. Even and Ellen M. Kaisse (1995), *Phonology 12 number 1*. Cambridge University Press
- Creanza N. et Al. (2015), *A Comparison of Worldwide Phonemic and Genitic Variation in Human Population*. Department of Biology and Anthropology, Stanford University, Stanford, CA 94305, Proc Natl Acad, SCI SA.
- David Crystal (1991), *A dictionary of Linguistics and Phonetics*, Oxford: OUP
- Demuth, K. 2000. *Bantu noun class systems: Loan word and acquisition evidence of semantic productivity*. In G. Senft(ed.), *Classification Systems*. Cambridge University Pssess. Pp. 270-292.
- Eric Bocavić, Anna Mai, Eric Meinhardt (2018), *The Expressivity of segmental phonology and the definition of weak determinism*. University of California, San Diego.
- Frawley William J. (2003), *International Encyclopedia of LINGUISTICS* Second edition. Volume 3 Mande Languages-Selection. OXFORD University Press 2003.
- Goldsmith, John (1993), *The Last Phonological Rule: "Reflexions on Constraints and Derivations"* University of Chicago

- Grimes Joseph E. (1969), *Phonological Analysis part one*. Summer Institute of Linguistics, Inc. Santa Ana, California; Mexico City
- Howe Darin, Mathiew (1995), *Oowekyala Segmental Phonology*. B.A. (Hons.), University of Ottawa, 1994, M.A. University of Ottawa 1995
- Howe Darin, Mathiew (2003): *Segmental phonology*, University of Calgary
- Hunley K. et Al. (2012), *Rejection of a Serial Founder Effects Model of Genitic and Linguistic Evolution*, Proc. Biol sci.
- Ndinga Oba Antoine (2003), *Les langues Bantu du Congo Brazzaville: Etude Typologique des langues du groupe C20(Mbochi)*. Tom 1 : Introduction, Présentation, Phonology. Paris : L'Harmattan.
- Ndongo Ibara Yvon Pierre (2000), *The Phonology of Tsɔmbitsɔ: embɔsi Dialect*. Mémoire présenté en vue de l'obtention de la Maîtrise ES Lettre; Anglais
- Ndongo Ibara Yvon Pierre (2018) Problématique de la terminologie et de la classification des langues bantoues : cas du koyó et d'embɔsi du groupe C20, *Humanités Gabonaises*, p.7-32.
- Nermine Naboulsi (2012). Comparative Linguistics. Department of Language and Linguistic. University of Essex Wivenhoe Park COLCHESTER. Essex Great Britain. CO4 3SQ.
- Noam Chomsky and Morris Halle (1990), *The Sound Pattern of English*; originally published, New York; Harper and Row, 1968, originally in series. Studies in language. The MIT Press Cambridge, Massachussets, London, England.
- Radoslav Pavlík (2009) Department of English Language and Literature Faculty of Education Comenius University Račianska 59 813 34 Bratislava 1 Slovakia
Radoslav.Pavlik@fedu.uniba.sk
- Ramachandran S. et Al. (2005), *Support for the relationship of genetic and geographic distance in human populations for a serial founder effect originating in Africa*. Proc. Natl. Aca. Sci, U.S.A.
- Trudgill Petter (1999), *Dialect Contact, Dialectology and Sociolinguistics*. Cuadernos de Filologia Inglesa. Vol. 8. pp.1-8