

Processing Luumbu consonantal phonological processes

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Résumé

Cette étude le système consonantique de langue luumbu (B44) parlée en République du Congo. Elle analyse les différents changements phonologiques auxquels les consonnes sont confrontées. En se basant sur la phonologie générative, il résulte de cette étude que le luumbu atteste vingt une (21) consonnes contre dix (10) voyelles. Par ailleurs, les consonnes du luumbu peuvent être modifiées dans des environnements spécifiques pour des raisons phonologiques. A ce titre, quatre procédés phonologiques liés à l'assimilation conditionnent ces modifications notamment la palatalisation, la nasalisation, l'assimilation post nasale et l'assimilation liée aux lieux et manières d'articulation.

Mots clés : luumbu, phonologie, procédés phonologiques, assimilation, système consonantique

Abstract

This paper addresses the consonantal system of Luumbu (B44) language variety spoken in the Republic of Congo. It analyses the different phonological changes which can affect Luumbu consonants. Based on generative phonology, Luumbu attests twenty-one consonants and ten vowels. Moreover, Luumbu consonants can be modified at different distributions thanks to phonological reasons. Actually, four assimilation processes can account for Luumbu consonant change notably palatalization, nasalization, post-nasal assimilation and homorganic nasal assimilation.

Keywords: Luumbu, phonology, phonological processes, assimilation, consonantal system

Introduction

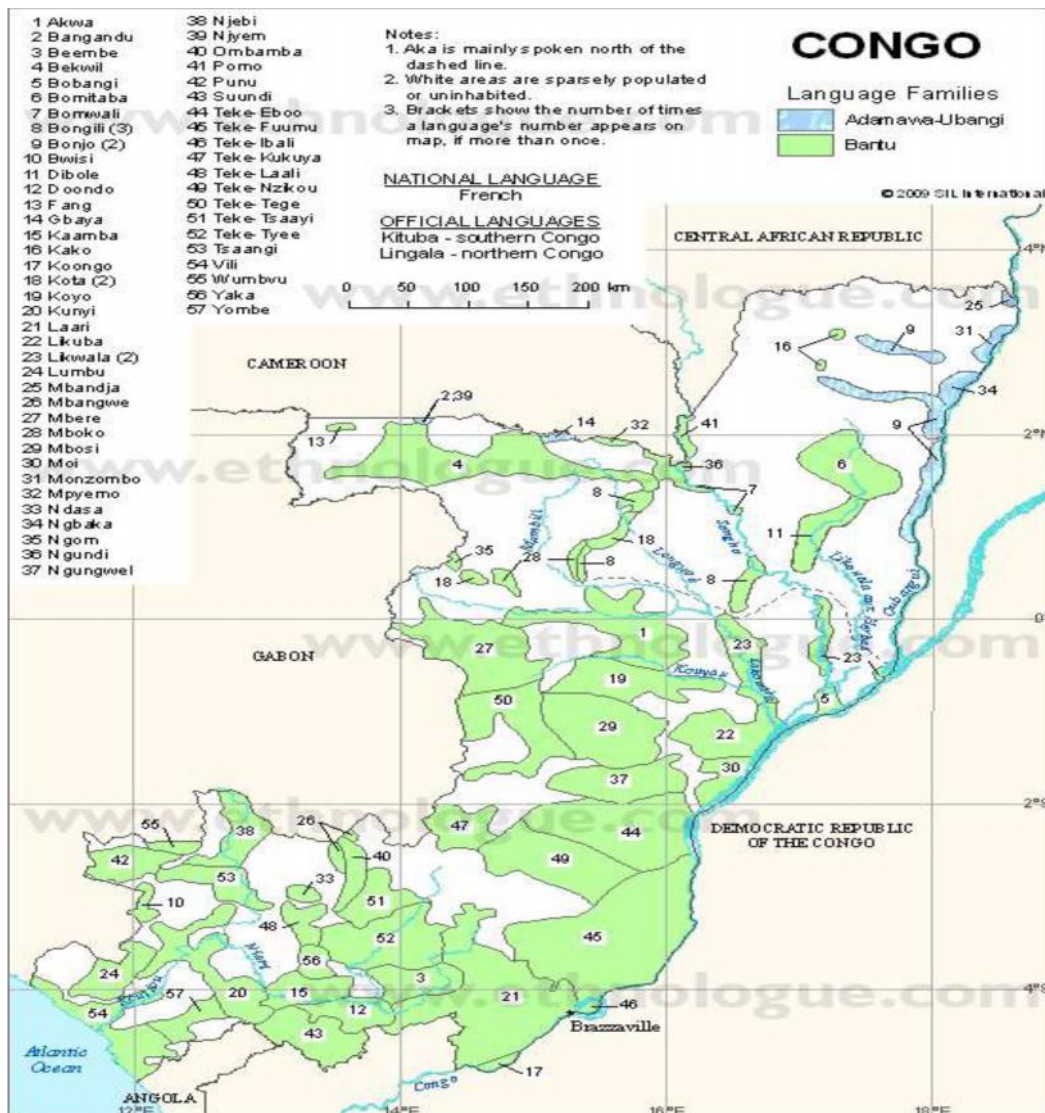
The main aim of this work is to scrutinize the phonological processes attested in Luumbu language. Luumbu language has benefited from some linguists attention (Guthrie 1967-71, Jacquot 1971, Pierre, V.C, Klouvi M. 2009, Maganga-Maganga 2009, Gamille 2013, Mfouhou 2021). As a matter of fact, we restrict our analysis on phonological processes implying the consonant system. Put otherwise, we want to point out the different changes which could affect the consonant of Luumbu language. In this perspective, this research work raises the following question: (i) What characterises Luumbu consonant system? (ii) What are the different phonological processes which can account for Luumbu consonantal system? Prior to the analysis of the phonological processes, a brief account of Luumbu linguistic features and geographical location will be provided. So, section one provides Luumbu linguistic background, whilst section two concerns phonological processes.

I- Luumbu linguistic background

1.1 Linguistic classification

Luumbu is classified by Guthrie (1967-71) as B44. It belongs to the Bantu languages family headed by Esira group which according to Malcolm Guthrie's classification (1971), forms the B40 cluster. In his inventory and classification of Congolese languages, André Jacquot (1971) classifies within the Esira cluster three dialects including: Ipuu (B41), Iluumbu (B44) and Ibwise (B45), all of which communicate with one another with little effort.

Map 1: Linguistic map of Congo showing the area (encircled) where the Esira cluster is to be found: numbers. 42, 24 and 10 (Lewis 2009)



1.2 Geographical location

This section is concerned with specifying where Luumbu people are located. Actually, Luumbu is spoken both in Gabon and in Congo-Brazzaville. In Congo-Brazzaville, the Baluumbu are for the most part present in the department of Niari, precisely in the district of Banda located about 150 km from Dolisie, capital of this region, in the southwest of Congo-Brazzaville. Banda borders with the neighboring country Gabon through the locality of Moulengui-Binza (Nyanga province). Within the county, the district of Banda is bordered by the region of Kwilou and the districts of Kibangou and Nyanga. The map in Fig 1 below shows the areas where Luumbu is spoken (i.e., Banda)

Map 1: Political map of Congo, showing the area (encircled) where Luumbu is spoken.



Source: www.mapsoftheworld.com

The district of Banda is populated for the most part by the Luumbu ethnic group whose linguistic and cultural characteristics are similar to the Punu and Bwisi. It (the district) is made up of two axes having for starting point the National Rout 3 (RN3) which extends to the border with Gabon. The main villages in this district include:

- Kayes-Banda Axis: Ngoudou, Nguetsi, Makaye Ma Taty, Bahama, Ngouanga, Nioumvou, Poubou, Tandou-Petso, Banda-Center, Dilalou, Ngangou, Loubamba, Ngondzo and Kaye Ibinda;
- Pont du Niari-Banda axis: Mouhatsou, Vounda, Tsembo, Mamba Na Yilou, Bivela, Koto-Vindou, Kola, PMD, Ndilou Mamba, Mbi-Tsialoulou, Loufouma, Mbota, Mouba and Mbiribi.

The villages mentioned have a roughly linear structure and differ from each other according to their internal structures and divisions. The Poubou-Loubetsi-Dilalou-Ngangou conurbation constitutes the most important linear grouping, which includes the administrative district where I have stayed and collected our data.

1.2 Luumbu phonemic system

In this section, I proceed to the identification of distinctive units. To quote Yule (1985:45): ‘An essential property of a phoneme is that it functions contrastively’. Accordingly, the phonemes of Luumbu are presented here in distinctive oppositions in order to bring out their particularity. The importance is given to minimal pairs in identical context in stems. We have used phonetic symbols proposed by the International Phonetic Alphabet for the transcription of linguistic occurrences.

All things considered, Luumbu has 21 consonants that spread across six places of articulation and seven manners of articulation. A phonemic chart of Luumbu consonants is presented in Table 2 below:

Table 1: Chart of Luumbu Consonants

Consonants	Bilabial		Labio Dental		Alveolar		Post Alveolar		Palatal		Velar	
<i>Voice</i>	-	+	-	+	-	+	-	+	-	+	-	+
Plosive	p	b			t	d					k	
Fricative			f	v	s							ɣ
Affricative							ts					
Nasal		m				n				ɲ		
Pre-nasal		mb				nd	ns					ŋg
Lateral Approximant						l						
Approximant		w					r			j		

Gamille asserts that Lumbu attests 10 vowels as illustrated below:

Table 2: Chart of Luumbu Vowels

Ordre Series	High		Mid		Low	
	Short	Long	Short	Long	Short	Long
Front	i	i:	ɛ	ɛ:		
Central					a	a:
Back	u	u:	ɔ	ɔ:		

(Léa Ghislaine Gamille : 2013: 51)

The next section is devoted to the analysis of the different phonological processes conerneing Luumbu consonants.

II- Phonological Processes

In this section, we discuss the phonological processes prevalent in Luumbu consonants. We focus on the processes occurring across the noun class system, stems and in verbal constructions.

2.1 Homorganic nasal assimilation

This section deals with the common process in most Bantu languages known as homorganic nasal assimilation. In fact, in a nasal+ consonant sequence, the nasal copies the place of articulation features of the following consonant. The nasal is therefore argued to be abstract with no place of articulation value associated to it until it combines with the following consonant. For the purposes of our discussion in this piece of research work, we have adopted this position on the grounds that /N/ is the most natural nasal consonant (Hyman, 1975).

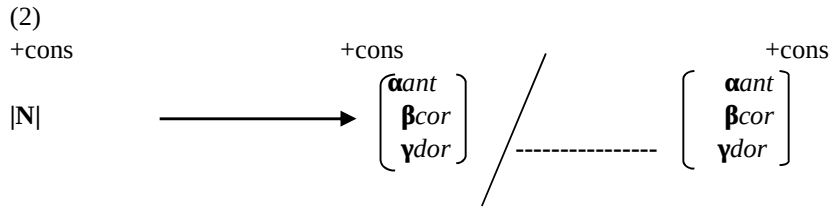
Consider:

(1)

/N-patula/	→	[mpátula]	‘extract me’
/N-beeya/	→	[mbé:ya]	‘bring me’
/N-wamusi/	→	[mwá:músi]	‘help me’
/N-kotisa/	→	[ŋkótísa]	‘let me enter’
/N-ɣaka/	→	[ŋgáka]	‘bite me’
/N-futa/	→	[mfúta]	‘pay me’
/N-tsibula/	→	[nsíbúla]	‘open me (the door)’

In Luumbu, the 1st person singular (object) is marked [N] in the prefix subject position of a finite verb (see the section on key linguistic features). When the prefix [N] precedes a verb root beginning with a consonant; it assimilates to the point of articulation of the following obstruent as in (1) above. Put otherwise, the data in (1)

shows that in all the instances, the alveolar nasal consonant adjusts to the point of articulation of the following obstruent, hence homorganicity. The rule that governs this change takes the following form:



The rule (2) underlies the process of homorganic nasal assimilation and stipulates that the alveolar nasal consonant agrees with the following obstruent for the features [ANTERIOR, CORONAL, and DORSAL].

Although the data we have presented to illustrate homorganic nasal assimilation is drawn from verbs, homorganic nasal assimilation in Luumbu is not restricted to this grammatical category. It also operates in the nouns with prenasalised consonants. Let us look at the data in (3) below:

(3)

/iN-beeli/	→	[imbɛ:li]	‘knife’
/tsi-N-limi/	→	[tsindi:mi]	‘tongues’
/i-Ngoondi/	→	[iŋgɔ:ndi]	‘moon’
/i-Njoya/	→	[iɲɔɣa]	‘snake’

According to this data, [N] has four surface manifestations, namely [m], [n], [ŋ], and [ɲ]. These manifestations precede bilabial, alveolar, velar, and palatal sounds, respectively. In addition, it may be noted that [N] surfaces in four different phonetic forms owing to the operation of homorganic nasal assimilation.

In all the data in (3) the assimilation of [N] to the point of articulation of the following sound results from the early adjustments of the articulators in anticipation of the production of the obstruent. Such adjustments, which have the effect of harmonizing the point of articulation of the nasal consonant and the following obstruent, lead to “articulatory simplification” (Antilla, 1972:74). In other words, the homorganicity of the two segments succeeds in “producing some economy of effort in the utterance” (Abercombie, 1976:136).

2.2. Palatalization

This section focuses on the phonological process known as palatalization. Our analysis mainly draws from illustrations in (4) below:

(a) /-ɣeda/	→	[-ɣeda]	‘to cut’
(b) /-dúmúɣa/	→	[-dúmúɣa]	‘jump’
(c) /-dora/	→	[-dɔra]	‘to dream’
(d) /-défu/	→	[-défu]	‘beard’
(e) /-dílu/	→	[-dʒilu]	‘noze’
(f) /-ngúdi/	→	[-ŋguɖʒi]	‘mother’
(g) /-tsútsu/	→	[-tsútsu]	‘mortar’
(h) /-tsééndi/	→	[-tsé:ndi]	‘thorn’
(i) /-tsaala/	→	[-tsa:la]	‘to sit down’
(j) /-tsiemuɣa/	→	[-tʃémúɣa]	‘to go away’
(k) /-ɣátsi/	→	[-ɣáfʃi]	‘wife’

The examples in (4) are worthy of attention. First, in each case both the alveolar /d/ and the post alveolar /ts/ are followed by different vowels. In fact, in (4a, b, c & d), the alveolar /d/ is underlyingly followed respectively by: /a/, /u/, /o/, and /e/. In all these examples, the alveolar /d/ has not undergone any change in its realisation, i.e., [d]. In (4e & f), the alveolar /d/ is underlyingly followed by: /i/. In these two examples and unlike the examples in (4a, b, c & d), the alveolar /d/ has undergone change in its realisation, i.e., [dʒ] either stem initially (4e) or stem medially (4f).

In (4g, h & i), the post alveolar /ts/ is underlyingly followed respectively by: /u/, /e/, and /a/. The realization of the post alveolar /ts/ to [ts] has not been affected at any time in all these examples.

Finally, in (4j & k), the post alveolar /ʈ/ is underlyingly followed by: /i/. In these two examples and unlike the examples in (4g, h & i), the post alveolar /ʈ/ has undergone change in its realisation and has surfaced as [ɟ] either stem initially (4j) or stem medially (4k).

It results from the examples in (139) that, when either the alveolar /d/ or the post alveolar /ʈ/ is followed by a front and high vowel /i/, there occurs some slight anticipatory fronting of the part of the tongue that makes contact with the roof of the mouth.

The effect of the fronting is that the alveolar or post alveolar consonant is made partly in the palatal region; hence palatalization whereby “non-palatal consonants become palatalized before front vowels especially /i/” (Katamba 2009: 86).

Such a process would be phonetically-motivated since a non-palatal segment would acquire the feature [+ high] from the high front vowel.

The rules that govern these changes take the following form:

(5)

(a) $\begin{matrix} +\text{cons} \\ / \text{alveolar} / \\ /d/ \end{matrix} \longrightarrow \begin{matrix} +\text{cons} \\ \left[\text{palatal} \right] \\ [dʒ] \end{matrix} \begin{matrix} +\text{high vowel} \\ \text{-----} i \end{matrix}$

(b) $\begin{matrix} +\text{cons} \\ / \text{alveolar} / \\ /d/ \end{matrix} \longrightarrow \begin{matrix} +\text{cons} \\ \left[\text{alveolar} \right] \\ [d] \end{matrix} \begin{matrix} \text{Elsewhere} \end{matrix}$

(c) $\begin{matrix} +\text{cons} \\ / \text{post alveolar} / \\ /ʈ/ \end{matrix} \longrightarrow \begin{matrix} +\text{cons} \\ \left[\text{palatal} \right] \\ [ɟ] \end{matrix} \begin{matrix} +\text{high vowel} \\ \text{-----} i \end{matrix}$

(d) $\begin{matrix} +\text{cons} \\ / \text{post alveolar} / \\ /ʈ/ \end{matrix} \longrightarrow \begin{matrix} +\text{cons} \\ \left[\text{post alveolar} \right] \\ [ʈ] \end{matrix} \begin{matrix} \text{Elsewhere} \end{matrix}$

2.3. Post-nasal obstruent voicing

This section deals with the phonological process known as post-nasal obstruent voicing. As indicated above, Luumbu has underlying voiced and voiceless obstruents. The examples in (6) below illustrate voiceless obstruents:

(6)

UF	SF	Gloss
/-patula/	[-patula]	‘to extract’
/-k̥aanga/	[-k̥a:ŋga]	‘to tie’
/-t̥ala/	[-t̥ala]	‘to look at’
/-f̥uta/	[-f̥uta]	‘to pay’
/-ʃ̥alila/	[-ʃ̥alila]	‘to work for’

In the examples in (6) above, phonemes /p/, /k/, /t/, /f/ and /s/ are all voiceless obstruents both underlyingly and in their surface forms: [p], [k̥], [t̥], [f̥], and [ʃ̥]. Consider now the examples in (7):

(7)

A	B	C	
UF	N Assimilation	Obstruent voicing	Gloss
/N-patula/	→ [mpátúla]	→ [mpátúla]	‘extract me’
/N-k̥aanga/	→ [ŋk̥á:ŋga]	→ [ŋk̥á:ŋga]	‘tie me’
/N-t̥ala/	→ [nt̥ála]	→ [nt̥ála]	‘look at me’
/N-f̥uta/	→ [mf̥úta]	→ [mf̥úta]	‘pay me’
/N-ʃ̥alila/	→ [nʃ̥álíla]	→ [nʃ̥álíla]	‘work for me’

Stage A in (7) stands as the underlying representation of voiceless obstruents /p/, /k/, /t/, /f/ and /s/. At stage B, the process of Nasal assimilation takes place. At stage C, which is our main focus here, Obstruent voicing applies.

The two processes can be seen as taking place in a feeding relationship whereby the prior application of one rule opens up the possibility of applying another (Katamba, 1989:1128).

A look at examples in (7, stage C) shows that when a voiceless obstruent follows a nasal, it becomes voiced. Put otherwise, words that have a sequence nasal plus a voiceless obstruent have the voiceless obstruent as voiced. The language therefore, has the phonological process which is widely referred to as post-nasal voicing in Bantu (Mtenje 1991 and Ngunga 1997 on Yao and Clements 1985 on Kikuyu).

It should be noted that the instances where the nasal precedes a voiceless obstruent occurs as a result of verb morphological combinations because Luumbu does not have prenasalized voiceless obstruents as phonemes, except /ns/ (recall from the consonants chart).

The rules that govern this change take the following form:

(8)

(a) +cons +cons +cons
/-voice/ → [+voice]/ Nasal-----

(b) +cons
/-voice/ $\longrightarrow$ [-voice] / ^{+cons} elsewhere

2.4 Nasalisation

This section is devoted to the phonological process known as nasalization. This is a process whereby an oral segment acquires nasality from a neighboring segment. For the sake of this analysis, we partially recapitulate data in (6) above in (9) below:

(9)

A	B	C	
UF	N Assimilation	Oral Nasalization	Gloss
/N-patula/	→ [mpátúla]	→ [mpǎtúla]	‘extract me’
/N-kaanga/	→ [ŋká:ŋga]	→ [ŋkǎ:ŋga]	‘tie me’
/N-tala/	→ [ntála]	→ [ntǎla]	‘look at me’
/N-futa/	→ [ɱfúta]	→ [ɱfǔta]	‘pay me’
/N-salila/	→ [nsálíla]	→ [nsǎlíla]	‘work for me’

As presented in (6) above, data in (9) has three stages. Stage A in (7) stands as the underlying representation of oral voiceless obstruents /p/, /k/, /t/, /f/ and /s/. At stage B, the process of Nasal assimilation takes place. At stage C, which is our main focus here, Orals Nasalization applies. Here again, the two processes take place in a feeding relationship.

A look at the phonetic representation in (9, stage C) shows that when an oral voiceless obstruent follows a nasal, it becomes nasalized. Put otherwise, words that have a sequence nasal plus an oral voiceless obstruent have the oral voiceless obstruent as nasalized, hence nasalization.

This process occurs in Luumbu as a result of verb morphological combinations whereby the 1st person singular (object) marked [N] in the prefix subject position of a finite verb (see the section on key linguistic features) precedes a verb root beginning with a consonant. The rules that govern this change take the following form:

(10) (a) $\begin{array}{ccc} +\text{cons} & & +\text{cons} \quad +\text{cons} \\ / \text{Oral} / & \longrightarrow & [\text{Nasal}] / \text{Nasal} \end{array}$

(b) $\begin{array}{c} +\text{cons} \\ / \text{Oral} / \end{array} \longrightarrow \begin{array}{c} +\text{cons} \\ [\text{Oral}] / \text{elsewhere} \end{array}$

2.5 Rounding

This section focuses on the phonological process known as labialization as illustrated in (11) below:

UF	SF	Gloss
(a) /-nú+úngi/	→ [-nú:ŋgi]	'field'
(b) /mu-ána/	→ [mwána]	'child'
(c) / bu-ála /	→ [bwála]	'village'

- (d) /-su+ɛya/ → [-swɛya] 'to hide'
 (e) /-nu+ana/ → [-nwana] 'to fight'
 (f) /-mbu+étísíla/ → [-mbwétísíla] 'star'

The examples in (11) are worthy of attention. First, in each case in (11), the vowel /u/ is underlyingly preceded by a consonant and is followed by another vowel either similar to itself as in (11a) or different from it as in (11b, c, d, e & f).

In the example in (11a) where /u/ combines with a similar vowel, it has undergone no change in its surface form. In examples in (11b, c, d, e & f) however, where /u/ combines with a different vowel, /u/ has semivocalized to be realized as [w].

In the case where /u/ becomes [w]; the word is said with some degree of secondary lip rounding. Anticipating the next segment, which is a rounded vowel, the speaker starts rounding the lips before the articulation of the consonant is completed, hence Rounding (Katamba 1989: 88).

This process of rounding is common in Luumbu across the noun classes (but also in stems as in 11d, e & f) when noun prefixes with the high-back vowel /u/ are juxtaposed with a noun that begins with a vowel. This is observed in two instances. Firstly, the vowel /u/ in prefixes such |mu-| in (11b) and |bu-| in (11c) is elided and attaches itself as secondary articulation and is superimposed on to the preceding consonant. The Luumbu labialization rule therefore is:

- (147)
- (a) +cons /-round/ → [+round] / ----- w +semi-vowel
- (b) +cons /-round/ → [-round] / elsewhere

Conclusion

To conclude, this paper has presented the different consonants attested in Luumbu language together with their associated phonological processes. 21 consonants and 10 vowels have been identified. Moreover, most consonants can occur both stem initially and medially, whilst vocalic phonemes can occur in initial, mid and final positions. In addition to their identification, we have discussed five (05) phonological processes that apply to consonants including notably homorganic nasal assimilation, palatalization, post-nasal obstruent voicing, nasalization and rounding. It comes out that Luumbu mainly attests assimilation process, which, according to Leiber (57) “is such a process, where a segment becomes more like some neighboring segment, is known as an assimilation”.

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