

On the reduction of vowel harmony in Nkɔ̀rɔ̀.

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Abstract

Proto-Ijoid has been reconstructed as having nine vowels that fall neatly into two harmonic sets based on the size of the pharynx. **i e o u** are produced with an expanded or a wide pharynx, **ɪ ɛ ɔ ʊ** are produced with a non-expanded or narrow pharynx, while **a** is considered an opaque vowel because of its ability to co-occur with both sets. These two sets do not co-occur in simple words. Williamson (1973) posits that in Nkɔ̀rɔ̀, an Eastern Ijoid lect, there is a reduction in the vowel harmony system as a result of vowel mergers. The vowels most affected are **ɪ** and **ʊ** which seem to be disappearing from the speech of older speakers and is presently non-existent in the speech of younger speakers. **ɛ** and **ɔ** are sometimes substituted for **e** and **o** and may well be on their way to merging with **e** and **o**. This paper seeks to ascertain the extent of reduction in the vowel harmony system three decades later by comparing data from Nkɔ̀rɔ̀ with data from two Eastern Ijoid lects; Kalabari and Iɓani.

1. Introduction

According to Crystal (1997:180), harmony is a term used in phonology to refer to the way the articulation of one phonological unit is influenced by another unit in the same word or phrase. The two main processes are consonant harmony and vowel harmony. In languages with vowel harmony systems, all the vowels in a word share certain features and are divided into harmonic sets.

Iwara (1994:10) defines vowel harmony as the “suprasegmental process whereby the vowels of a language are divided into two sets according to some phonetic feature or features, such as \pm tongue root advancement and front/backness, such that vowels from the same set occur together, minimally within a simple disyllabic word”.

Vowel harmony may also be defined as “the sharing of a feature, typically by non-contiguous vowels separated by at least one consonant. The vowels may share the feature in the lexicon or one vowel can trigger a change in another” (Childs, 2003:68).

Vowel harmony is found in all major phyla of Africa. Niger Congo languages often show vowel harmony based on the size of the pharynx, which is controlled by the advancement or retraction of the root of the tongue and the raising or lowering of the larynx. In a maximal system of

this type, the expanded or [+ATR] vowels are /i e ə o u/ and the non-expanded or [-ATR] vowels are /ɪ ɛ a ɔ ʊ/. It is also common to find systems in which /a/ is opaque, combining with either set (Williamson and Blench, 2000:36).

In ATR harmony, “there are two sets of vowels that differ mainly in the size of the pharynx. In one set, there are vowels in which the root of the tongue is drawn forward and the larynx is lowered, so that the part of the vocal tract in the pharynx is considerably enlarged. In the other set, there are vowels in which there is no advancement of the tongue root or lowering of the larynx. The terms tense and lax are sometimes used to describe these differences in vowels” (Ladefoged, 1993:226).

Most languages that are characterised by ATR vowel harmony have reduced vowel systems lacking /ə/ and often /ɪ ʊ/ as well, yielding nine and seven vowel systems. Such reduced systems often result from a merger of these relatively rarer vowels with their more widely occurring counterparts, e.g. /ə/ may merge with /a/ or a mid vowel, /ɪ/ may merge with /i/, /e/, or /ɛ/ and /ʊ/ with /u/, /o/, or /ɔ/. These mergers often create opaque vowels that can occur with vowels of either harmonic set in roots (Clements, 2000:137). Thus, languages with reduced vowel harmony do exhibit some kind of partial harmony. Consider the examples below from Urhobo, a seven vowel Edoid language that exhibits partial vowel harmony.

1. *Partial vowel harmony in Urhobo*

ukē	'egg'	ikē	'eggs'
utiē	'orange'	itiē	'oranges'
ɔso	'hawk'	eso	'hawks'
ode	'name'	ede	'names'

(Aziza, 1994:7)

2. **Vowel harmony in Ijoid**

In Ijɔ dialects, the vowels are distinguished by the size of the pharynx in their production. The set of vowels produced with an expanded pharynx are known as expanded, wide or [+ATR] vowels, while those produced with a narrowed pharynx are called non-expanded, narrow or [-ATR] vowels. There is a restriction on the co-occurrence of expanded and non-expanded vowels in simple words, thus exhibiting vowel harmony. So we can say that the vowels are divided into two sets based on the feature [±expanded] or [±ATR]. The nine vowels evident in Proto-Ijɔ form a kind of triangular system (Williamson, 2000:1) that consists of an equal number of back and front vowels

with one open vowel [a] as shown in Fig.1 below. [+ palatal] refers to front vowels, while [+ labial] refers to back vowels. In Ijoid lects, all back vowels are [+ labial].

	[+palatal]		[+labial]
[+high]	i		u
[+high, +mid]	ɪ		ʊ
[+mid]	e		o
[+mid, +low]	ɛ		ɔ
[+low]		a	

Fig. 1: Proto-Ijoid vowel system

/i e o u/ are [+ expanded], while /ɪ ɛ ɔ ʊ/ are [- expanded] as shown in the distinctive feature matrix below.

Features	i	ɪ	e	ɛ	a	ɔ	o	ʊ	u
high	+	+	-	-	-	-	-	+	+
mid	-	+	+	+	-	+	+	+	-
back	-	-	-	-	-	+	+	+	+
expanded	+	-	+	-	-	-	+	-	+

Fig. 2: A distinctive feature matrix for Proto-Ijoid vowels

The feature [mid] has been used in line with Williamson (1999). This distinguishes /a/ as the maximally unmarked vowel. In Ijoid, /a/ is considered an opaque vowel because it co-occurs with both sets of vowels. The data in (1) below illustrates this with examples from Kalaḅari and Iḅani. The Kalaḅari data cited in this work are from Jenewari, 1973, 1980 and 1989, while the Iḅani data are from the author's research and knowledge as a speaker of the lect.

2. Examples of [a] co-occurring with both sets of vowels in Kalaḅari and Iḅani.

<i>Kalaḅari</i>	<i>Iḅani</i>	<i>English gloss</i>
lòliá	lòliá	'star'
ètèlá!á	ètèlàá	'path, road'
ósúká	ósúká	'grass, weeds'
àkídi	àkídi	'beans'
ḅèlémá	ḅèlémá	'love' (v)
dáwó	dáwó	'dream' (n)

áɾɔ́

áɾɔ́

'canoe, boat'

In Ijoid, ATR harmony is seen within the root and across morpheme boundary, for instance, between possessive pronouns and their host nouns. However, in Nkɔ̀rɔ̀ɔ̀ there is an almost total collapse of the vowel harmony system as we shall see in the following sections. We will begin with a brief description of the Nkɔ̀rɔ̀ɔ̀ people and dialect.

3. The Nkɔ̀rɔ̀ɔ̀ people and their dialect

The Nkɔ̀rɔ̀ɔ̀ people are located in Opobo/Nkɔ̀rɔ̀ɔ̀ local government area of Rivers State, Nigeria. Nkɔ̀rɔ̀ɔ̀¹ is an endangered minority language spoken in Nkɔ̀rɔ̀ɔ̀ town alongside Defaka (another endangered language) and in some other smaller villages. In official records, Nkɔ̀rɔ̀ɔ̀ is the name of the people and the dialect they speak but the people refer to themselves and their dialect as Kirika, so named after their ancestor who led the migration to their present location. Kirika has no semblance with Okrika which is the anglicised form of **wá kirikéé** meaning 'we are the same' in Okrika dialect.

Linguistically, Nkɔ̀rɔ̀ɔ̀ has been classified as an Eastern Ijoid dialect (Jenewari, 1989; Williamson and Blench, 2000) alongside the dialect cluster of Kalabari, Iḡani and Okrika. Ijoid is a small family belonging to the Niger Congo phylum and spoken only in the Niger Delta region of Nigeria. It consists of Defaka and Iḡo, a language cluster comprising four isolated dialects and three dialect clusters which are defined in terms of mutual intelligibility. Although Ijoid is closely related internally, it is quite distinct from all other Niger Congo families. Some of the features that distinguish Ijoid include; a Subject-Object-Verb word order, postpositions, masculine-feminine-neuter gender distinction in the third person singular pronoun and in determiners.

3.1. Vowel Inventory

From personal observation on the field, we can identify seven (7) oral vowels /i e ε a ɔ o u/ and seven (7) corresponding nasal vowels /ĩ ē ẽ ã õ ù/ in Nkɔ̀rɔ̀ɔ̀ as shown below:

Oral vowels		Nasal vowels	
[i] as in fii	'die, death'	[ĩ] as in fiĩ	'fly, soar'
[e] as in bébé	'mouth'	[ē] as in bêĩ	'be full'
[ε] as in sè	'clan'	[ẽ] as in tẽĩ	'shoot'
[a] as in áká	'tooth/teeth'	[ã] as in mãĩ	'disappear'

1 Studies resulting in this work is part of the author's doctoral research and is funded by NSF grant 0553971 awarded to Akin Akinlabi and Bruce Connell to document Nkɔ̀rɔ̀ɔ̀ and Defaka.

[o] as in ɓó	'come'	[õ] as in ɓóõ	'drink' (v)
[ɔ] as in ɔ́ɔ	'phelgm'	[õ̃] as in fõ̃	'ashes'
[u] as in fùrò	'abdomen'	[ũ] as in fũ:	'salt'

3.2. Tone

Like the other Eastern Ijoid lects, Nkoroo operates a register tone system made up of two level tones, a high ['] and a low [ˊ] plus a downstepped high [!]. In the Ijoid orthography, the low tone is left unmarked, while the downstepped high is marked with a macron (ˊ). In this paper, all tones and sound segments are represented phonetically using IPA symbols.

4. Vowel Harmony in Nkɔrɔɔ

Williamson (1973) considers Nkɔrɔɔ a six or seven vowel language which may be reduced to five vowels if the language survives. She postulates an almost complete disintegration of the vowel harmony system in Nkɔrɔɔ where **ɪ** has merged with either **i** or **e**, and **ʊ** has merged with either **u** or **o**. **ɛ** has at least partially merged with **e** and **ɔ** with **o**. This paper is a follow up to this hypothesis and seeks to investigate the extent of the mergers and consequently the reduction in the vowel harmony system of Nkɔrɔɔ three decades later. The shift seems to be from the use of [-ATR] vowels to [+ATR] vowels as the data below shows.

4. *Words with [-ATR] vowels in Eastern Ijoid lects corresponding with [+ATR] vowels in Nkɔrɔɔ.*

<i>Nkɔrɔɔ</i>	<i>Kalabari</i>	<i>Ibani</i>	<i>English gloss</i>
á!kú	á!kʊ	á!kʊ	'be bitter'
ɓú!ú	ɓʊrʊ	ɓʊrʊ	'be rotten'
fɪni	fɪni	fɪni	'fire'
fúm	-	fʊm	'faint'
fúru	fʊ!rʊ	fʊrʊ	'smell, smell bad, stink'
fũ:	fʊ̃	fʊ:	'salt'
íkákí	íkákí	íkákí	'tortoise'
kàsì	-	íkàsì	'chair, stool'
órí	éri	ári	'see'
pìri	pìri	pìri	'give'
ófiri	ó!firi	ófiri	'be hot'

From the data above, it seems that in Nkqorq, the vowel [ɔ] has merged with [u] and [ɪ] has merged with [i]. My personal observation on the field has been that one could occasionally hear the vowels [ɪ] and [ɔ] in the speech of native speakers within the age range of 70 and above. Though the more you listen to them, the less of these vowels you hear. This is not the case with speakers in their sixties and below. [ɪ] and [ɔ] are totally lost in their speech. We postulate that there is a complete merger of [ɪ] with [i] and [ɔ] with [u]. The data in (4) and (5) below further strengthens this hypothesis.

5. [ɪ] and [i] merger

<i>Nkqorq</i>	<i>Kalabari</i>	<i>Ibani</i>	<i>English gloss</i>
àɲì	àɲì	àɲì	'egg'
àrì	àrì	àrì	'witchcraft'
ɓilà	ɓilà	ɓilà	'elephant'
íkákí	íkákí	íkákí	'tortoise'
kíní	kíní	kíní	'person'
kìrì	kìrì	kìrì	'slice' (v)
fì	fì	fì	'death'
fìrì	fìrì	fìrì	'work, duty'
fìní	fìní	fìní	'fire'
ɓélekí	ɓélekí	ɓélekí	'fat' (n)
dèrì	dèrì	dèrì	'laugh'
dʒèrì	dèrì	dèrì	'sell'
mèní	mèní	mèní	'swallow' (v)
pìrì	pìrì	pìrì	'give'
sèní	sèní	sèní	'grow'
sèŋgì	sèŋgì	sèŋgì	'catfish'
wárí	wá!rì	wá!rì	'house'

6. [ɔ] and [u] merger

<i>Nkqorq</i>	<i>Kalabari</i>	<i>Ibani</i>	<i>English gloss</i>
àkàlú	àkàlɔ	àkàlɔ	'moon, month'
á!kú	á!kɔ	á!kɔ	'be bitter'
árú	árɔ	árɔ	'canoe, boat'

dùò	dʋò	dʋò	'farm'
férú	férʋ	fórʋ	'air, wind, breeze'
fúló	fʋló	fʋló	'soup'
kúrá	kʋrá	kʋrá	'year'
kùrò	kʋrò	kʋrò	'be strong, hard'
núnḡó	nʋḡó	nʋḡó	'compound/courtyard'
ófúrú má	-	ófʋrʋ má	'shark'
tórú	tʋrʋ	tʋrʋ	'sea, river'

In examples (4) and (5) above, [i] and [u] in Nkɔrɔɔ consistently correspond with [ɪ] and [ʊ] respectively in both Kalabari and Iban. Apart from /i/, /ɪ/ may have merged with /e/ in some words in word-medial and word-final positions.

7. /ɪ/ and /e/ merger

<i>Nkɔrɔɔ</i>	<i>Kalabari</i>	<i>Iban</i>	<i>English gloss</i>
tébé	síbí	síbí	'head'
ḡéḡé	bíbí	ḡíbí	'mouth'
gbéké	bíí	ḡíkí	'fall'

4.1. The status of [ɛ] and [ɔ] in Nkɔrɔɔ

Unlike [i] and [u], [ɛ] and [ɔ] in Nkɔrɔɔ still correspond to themselves to some extent in Kalabari and Iban. However, there may be a partial merger as noted by Williamson (1973). This seems to be more obvious for [ɔ] than for [ɛ]. The data in (8) shows words in which [ɔ] has completely merged with [o] in word-initial position.

8. [ɔ] merging with [o] in word-initial position in Nkɔrɔɔ

<i>Nkɔrɔɔ</i>	<i>Kalabari</i>	<i>Iban</i>	<i>English gloss</i>
ófiri	ó!firi	ófiri	'be hot'
ókí	ókí	ákí	'take; receive'
òfi	ófí	ófí	'sweep'
òsù	ósʋ	ósʋ	'vomit'
òpùpòli	-	òpʋpòlí	'boil' (n)
òbù, òwù	òwù	òmʋ	'war'
ó!lò	ó!lò	ó!lò	'hold'

ògbògbò	-	-	'middle'
ògbòtì	-	-	'hand net' (used in fishing)

The process of [ɔ] becoming [o] in word-initial position in Nkɔrɔɔ is still an ongoing one, for there are some words in which [ɔ] and [o] are used interchangeably in word-initial position as seen in example (9) below.

9. [ɔ] and [o] used interchangeably in word-initial position in Nkɔrɔɔ

<i>Nkɔrɔɔ</i>	<i>Kalabari</i>	<i>Ibani</i>	<i>English gloss</i>
ògòno ~ ògòno	ògòno!o	ògòno	'above, top, sky'
òmòmó ~ òòmòmó	òmòmó	òmòmó	'fly' (n)
òŋ ^w ɔi ~ òŋ ^w ɔi	òwɪ	òŋwɪ	'smoke'
òŋ ^w ɔi ~ óŋ ^w ɔi	ówɪ	óŋwɪ	'bite'
òròosi ~ òròosi	àròosi	òròosi	'rice'

There are a few words in which [ɔ] still retains its status word-initially, but it is likely that they will also undergo the merger process. Probably, in the next decade or two, [ɔ] may have completely merged with [o] in word-initial position.

10. [ɔ] occurring word-initially

<i>Nkɔrɔɔ</i>	
ò!gò	'in-law'
òròrò	'female' (animal or bird)
ò!kò	'hire'
òfúrúmá	'shark'
òkpòŋgò	'hut'
òmò	'pus'
òmòno	'mirror'

On the other hand, /ɛ/ cannot be found word-initially. Out of about 1,700 words collected using the SIL comparative African wordlist, not one word began with /ɛ/. It seems that not only /ɛ/ has merged with some other vowel in this position, but /e/ also as the data below reveals.

11.	<i>Nkɔrɔɔ</i>	<i>Kalabari</i>	<i>Ibani</i>	<i>English gloss</i>
	íríára/írébó	érebó	órúbó	'woman'

írétókùbò	éérébò	éérébò	'girl/daughter'
íré	ééré	ééré	'name'
ísém	ísám	ésém	'periwinkle'
ísíení	ésení(á)	éseníé	'nine'
ìbìd̀zì	-	èbèdzì	'ocean'
àdèlè	èdèlè	èdèlè	'vulture'
àkpó	èkpé	èkpè	'he-goat'
tùmò	ètèmi	òtùmè	'tail'
fèrè	éfèrè	éfèrè	'plate'
pèrè	-	èpèrè	'belch'

From the data above, two processes; vowel merging and vowel deletion, seem to have occurred to both /ɛ/ and /e/ at word-initial position:

- i) /ɛ/ and /e/ have merged with either /i/ or /a/;
- ii) /ɛ/ and /e/ have been deleted.

It is possible that these processes began with /ɛ/ merging with /e/. If we take a look at the Nkɔ̀rɔ̀ word for 'woman', we notice two forms: *íríára* and *írébò*. The second form *írébò* is sometimes realised as *éérébò* by elderly ones though this form is rarely used and some natives even dispute its use as an Nkɔ̀rɔ̀ word. Both /i/ and /e/ are [+ATR] and correspond to [-ATR] vowels in the Kalábarì and Ìbàní words for 'woman'. This merging of /ɛ/ with /e/ at word-initial position is total but may be an ongoing process in other positions in the word as seen in the Nkɔ̀rɔ̀ word *ímémé* 'nail' which speakers alternate with *ímémé*.

4.2. The Nkɔ̀rɔ̀ Pronominal system

Another evidence of the collapse of the vowel harmony system in Nkɔ̀rɔ̀ can be seen in its pronominal system. There are no non-expanded or [-ATR] vowels in any of the pronoun forms. This is unlike other Eastern Ìjò dialects where the first person singular, second person singular, second person plural and third person masculine singular personal pronouns have both [+ATR] and [-ATR] pronoun forms that agree with ATR feature of either the verb or noun roots with which they occur. The table below is a summary of the personal pronouns of Nkɔ̀rɔ̀, Kalábarì and Ìbàní.

12. *Personal pronoun forms*

<i>Nkọrọọ</i>	<i>Kalabari</i>	<i>Ibani</i>	<i>English gloss</i>
ì/ìrè (preconsonantal)	ì/ì (non-subject form)	ì/ì (non-subject form)	'1 st person singular'
je (prevocalic)			"
í (preconsonantal)	í/í (preconsonantal)	í/í	'2 nd person singular'
jé (prevocalic)	íjé/íjé (prevocalic)		"
ò	ò/ò (preconsonantal)	ò/ò	'3 rd person sg. masculine'
òrè (long form)	òrì/òrì (prevocalic)	òrì (long form)	"
á	á (preconsonantal)	á	'3 rd person sg. feminine'
áré!é (long form)	árì (prevocalic)	árì (long form)	"
à	à/à (preconsonantal)	à/à	'3 rd person sg. neuter'
àndè (long form)			"
wá	wá	wá	'1 st person plural'
wáré!é (long form)	wáminà (object form)	wáminì (long form)	"
ó	ó/ó (preconsonantal)	ó/ó (preconsonantal)	'2 nd person plural'
óré!é (long form)	óminà (object form)	óminì (long form)	"
òní/íní	ń (preconsonantal)	ń	'3 rd person plural'
	ínì/ínì (prevocalic)	ńnì (long form)	"

Table 1: *The personal pronouns in Nkọrọọ, Kalabari and Ibani.*

In Kalabari and Ibani, when any of the pronouns that have both [+ATR] and [-ATR] forms occur with a verb in a sentence, they must agree with the ATR feature of verb root. In Nkọrọọ, this agreement does not hold since all the pronoun forms are [+ATR].

13. *Pronoun + [+ATR] verb root*

Nkọrọọ

ó bó-sùkù 'Have you (pl.) come?/You (pl.) are welcome'

2PL come-CPL

ò (ák^wá) tú-máà 'He is singing (a song)'

3MSG song sing-PROG

Kalabari

ó bó-té 'Have you (pl.) come?/You (pl.) are welcome'

2PL come-CPL

ò (nùmè) sú-áɾì 'He is singing (a song)'
3MSG (song) sing-PROG

Ìbani

ó bó-má 'Have you (pl.) come?/You (pl.) are welcome'
2PL come-CPL

ò (númé) sú-áɾì 'He is singing (a song)'
3MSG (song) sing-PROG

14. *Pronoun + [-ATR] verb root*

Nkɔrɔɔ

ó tíɬimé-sùkù 'Are you (pl.) seated?'
2PL sit-CPL

ò mɛ̀ndi-máà 'He is walking'
3MSG walk-PROG

Kalaɓari

ó lɛ̀gi-té 'Are you (pl.) seated?'
2PL sit-CPL

ò mɛ̀ndʒí-áɾì 'He is walking'
3MSG walk-PROG

Ìbani

ó kpɔ̀rɔ̀fini-má 'Are you (pl.) seated?'
2PL sit-CPL

ò màṅgi-áɾì 'He is walking'
3MSG walk-PROG

When the pronoun occurs with a noun to show possession in *Kalaɓari* and *Ìbani*, it also agrees with the ATR feature of the noun. Again, this does not hold for *Nkɔrɔɔ*.

15. *Pronoun + [+ATR] noun*

Nkɔrɔɔ

í bɛ̀ri 'your (sg.) ear'

ò bɛ̀ri 'his ear'

Kalaḅari

í béri 'your (sg.) ear'

ò bəri 'his ear'

Iḅani

í bíri 'your (sg.) ear'

ò bíri 'his ear'

16. *Pronoun + [-ATR] noun*

Nkɔrɔɔ

í wári 'your house'

ò wári 'his house'

Kalaḅari

í wá!rí 'your (sg.) house'

ò wàrí!rí 'his house'

Iḅani

í wá!rí 'your (sg.) house'

ò wárí 'his house'

5. Conclusion

In this paper, we have established that Nkɔrɔɔ is a seven vowel language. This makes its vowel system different from other Ijɔ dialects which have nine vowel systems. The reason for this reduction is as a result of vowel mergers. The implication of this is that there is a collapse of the ATR vowel harmony system in the Nkɔrɔɔ dialect. Comparing Nkɔrɔɔ data with data from Kalaḅari and Iḅani, two other Eastern Ijoid lects, we observe that /ɪ/ and /ɔ/ have completely merged with /i/ and /u/ in all positions in the word. In addition, /ɪ/ has merged with /e/ in some words in non word-initial position. In some words, /ɔ/ has merged with /o/ word initially; in some other words, the process is still ongoing; yet in others /ɔ/ maintains its status in this position. /ɛ/ has completely merged with /e/ in word-initial position. /e/ in turn has merged with either /i/ or /a/. Where there is no merger, these vowels have been deleted word-initially.

Another evidence of the reduction in the Nkɔrɔɔ vowel harmony system is seen in its pronominal system which consists of pronoun forms with [+ATR] vowels only as opposed to Kalaḅari and Iḅani that have pronoun forms that agree with their host verb or noun in the ATR

feature.

The reduction of the Nkɔrɔɔ vowel harmony system begins at the word-initial position. With /ɛ/ and /e/ gone from this position, /ɔ/ on its way out, and /i/ and /ɪ/ having merged with other vowels, it is certain that the Nkɔrɔɔ vowel harmony system is on the verge of total collapse. If this merging process continues, it is likely that some time in the future there will be a complete merging of /ɔ/ with /o/ and /ɛ/ with /e/ in all positions in the word. This will result in a five vowel system for Nkɔrɔɔ.

Abbreviations

ATR	advanced tongue root
CPL	completive marker
PROG	progressive marker
2PL	2 nd person plural pronoun
3MSG	3 rd person masculine singular pronoun

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