ON THE HIGH NON-EXPANDED VOWELS IN YORUBOID*

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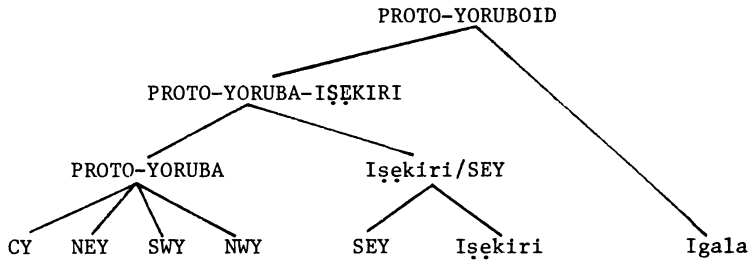
A current debate going on among Yoruba linguists is the exist-
ence and phonological status of the high non-expanded vowels.
Indeed while Igala, Iṣẹkiri and many Yoruba dialects exhibit a
seven-vowel system, other Yoruba dialects exhibit a nine-vowel
system (including ɩ and ɔ), both types showing however in-
teresting vowel co-occurrence restrictions. Given this situ-
ation, some scholars argue that proto-Yoruba and proto-Yoru-
boid had a nine-vowel system with cross-height vowel harmony,
while others claim that they had a seven-vowel system. The
present paper reviews both positions and suggests another al-
ternative; in particular it shows how cross-height vowel har-
mony came about in Yoruboid.

1. Introduction

1.1. <u>The Yoruboid language complex</u>. In this paper the term Yoruboid is used to

refer to a compact language complex including Yoruba, Iṣẹkiri, and Igala. Ac-

cording to Hoffmann [1976] as amended by Williamson [1982, 1983], the Yoruboid

complex is a major branch of the Yoruboid-Akokoid unit of the Benue-Congo divi-

sion of the Volta-Congo languages. It is a member of the so-called (old) Kwa

languages [Greenberg 1963] but not of the (new) Kwa [Stewart, to appear]. In

terms of actual genetic relationship, Yoruba, Iṣẹkiri, and Igala (with their

more or less long tradition of writing) are not, strictly speaking, three sister

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languages. According to Akinkugbe [1976:16], a more accurate picture can be de-
picted by the following diagram:

PROTO-YORUBOID

PROTO-YORUBA-IṢẸKIRI

PROTO-YORUBA   Iṣẹkiri/SEY

CY   NEY   SWY   NWY   SEY   Iṣẹkiri   Igala

Yoruboid family tree [Akinkugbe 1976:16]

Note that, according to Akinkugbe [1976:3-8], CY [Central Yoruba] consists of
the Ifẹ, Ijẹṣa, and Ekiti dialects; NEY [North-eastern Yoruba] comprises the di-
alects of Yagba, Gbẹdẹ, Ijumu, Ikiri, etc.; SWY [South-western Yoruba] includes
Tsabẹ with Ketu and Ifẹ (Togo) dialects; NWY [North-western Yoruba] is made up
of Ọyọ, Ẹgba (Abẹokuta, Ilaro, etc.), and Ọsun (Oṣogbo, Ogbomọṣọ, Ẹdẹ, etc.)
areas; whereas SEY [South-eastern Yoruba] comprises Ondo, Ọwọ, Ijẹbu, and dia-
lects spoken in and around Okitipupa (Ikalẹ, Ilajẹ, Ijọ-Apọi, etc.).

1.2. The problem. Studies in Yoruboid dialectology have revealed some interest-
ing vowel co-occurrence restrictions which some authors, e.g. George [1973], in-
terpret as relics of certain earlier vowel harmony rules. Another interesting
element of comparative Yoruboid studies is that some present-day Yoruba dialects,
e.g. Ijẹṣa, Irun, Ifaki, and Ekiti, exhibit a nine-vowel system (if tones and na-
sality are not taken into consideration) and display cross-height vowel harmony.
Other Yoruba dialects, e.g. Ikalẹ, Ilajẹ, Tsabẹ, Ukarẹ, 'Standard' Yoruba [SY],
etc., as well as Iṣẹkiri and Igala exhibit some vowel co-occurrence restrictions,
but have a seven-vowel system (if tones and nasality are not taken into consider-
ation). This situation has led to two conflicting positions as to the vowel sys-
tem of proto-Yoruba and proto-Yoruboid. On the one hand, Oyelaran [1973, 1977],
among others, claims that proto-Yoruba (and presumably proto-Yoruboid) did not
have a nine-vowel system, nor the classic cross-height vowel harmony. On the
other hand, Akinkugbe [1978], among others, argues that proto-Yoruba and proto-
Yoruboid had them.

1.3. <u>Expanded and equivalents</u>. Thus the problem centers on the existence and phonological status of ɩ ĩ o õ , i.e. the high non-expanded vowels, also referred to as the [-ATR] or [-tense] or [+covered] high vowels[1] in proto-Yoruboid as well as in the so-called nine-vowel present-day Yoruba dialects. The purpose of this paper is to make a contribution to the debate by reviewing past positions and suggesting an alternative hypothesis, taking full advantage of the nasal vowels.

2. Background Information

We shall present successively oral vowels, nasal vowels, patterns of vowel co-occurrence restrictions, and the cross-dialectal correspondence series.

2.1. <u>Oral vowels</u>. As far as oral vowels are concerned, Yoruboid dialects are divided into two typological groups, viz. the seven-vowel dialects and the nine-vowel dialects.

(a) The Yoruboid dialects having a seven-vowel system include Iṣẹkiri, Igala and many Yoruba dialects, e.g. Ikalẹ, Ilajẹ, Ijọ-Apọi, Tsabẹ, Ukarẹ, Yagba, Gbẹdẹ, Ijumu, Ikiri, etc. The system is made up of i e ɛ a ɔ o u .

(b) The Yoruboid dialects having a nine-vowel system are found among Yoruba dialects only, viz. Ijẹṣa, Irun, Ekiti, Ifaki. The system is made up of i ɩ e ɛ a ɔ o ọ u .

2.2. <u>Nasal vowels</u>. In respect of nasal vowels, the system varies from one dialect to another.

(a) Yoruba dialects such as Ijẹṣa, Irun, Ekiti, and Ifaki have the following six-vowel system: ĩ ɩ̃ (ɛ̃) ɔ̃ õ ũ . Note that this group includes all the so-called nine-vowel dialects and that some of them do not have ɛ̃ .

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[1]We do not intend to discuss in this article the adequacy or otherwise of the feature labels adopted by different Yoruba scholars to refer to these vowels, especially [expanded] [Lindau 1978; Akinkugbe 1978], [tense] [Courteney 1968; Fresco 1970; Oyelaran 1973]; [advanced tongue root] [Oyelaran 1977; Stewart 1983]; and [covered]. We have given preference to [expanded] simply because it seems the latest. In any case, it is useful to know how these labels correspond to one another.

(b) Iṣẹkiri and Yoruba dialects such as Ikalẹ, Ilajẹ, Ijọ-Apọi, etc., have the following five-vowel system: ĩ ɛ̃ ã ɔ̃ ũ .

(c) Yoruba dialects such as Tsabẹ, Ukarẹ, SY, etc., have the following four-vowel system: ĩ ɛ̃ ɔ̃ ũ .

(d) Yoruba dialects such as Yagba, Gbẹdẹ, Ijumu, Ikiri, etc., have the following three-vowel system: ĩ ɔ̃ ũ .

(e) Present-day Igala has no nasal vowels.[2]

   Note that none of the Yoruboid dialects described so far is shown to have ẽ or õ .

2.3. <u>Vowel co-occurrence restrictions</u>. Although we take into consideration, for the purpose of presenting the vowel harmony grades, both oral and nasal vowels, our reference to dialect types is based on oral vowels only. Thus we talk of seven vowel and nine-vowel dialects.

(a) In the seven-vowel dialects, vowels fall into two sets:

      set 1   i ĩ e a (ã) o u ũ
      set 2   i ĩ ɛ (ɛ̃) a (ã) ɔ ɔ̃ u ũ

      Thus, to mention oral vowels only, i a u are neutral in that they belong to both sets; however, a as a stem vowel takes a set 2 vowel as prefix. Note also that in Igala there are a few VCV nouns showing co-occurrence between o and ɛ .

(b) In the nine-vowel dialects, vowels fall into two sets:

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[2]Armstrong [1965, personal communication] reports the occurrence of one nasal vowel in Igala, viz. ũ (which he alternatively notes as ũⁿ). It occurs in a small but quite important group of morphemes, most of which have Yoruba cognates that also have ũ , e.g., ɛ́ũ 'thing' and ùjéũ 'food'. It seems that synchronically this Igala ũ is better analysed as a syllabic nasal ŋ̩ or a NV structure. Note, moreover, that Igala does exhibit nasalised vowels, but only after a nasal consonant; and because of this restriction, its nasalized vowels are treated as underlying oral vowels (see data in Akinkugbe [1978], as reinterpreted by me).

set 1   i ĩ e a o u ũ

set 2   ι ῖ ε (ε̃) a (ã) ɔ ɔ̃ o̩ õ̩

Thus, to comment on oral vowels, only a is neutral in that it belongs to
both sets. Note that in the nine-vowel dialects, ι and o̩ never occur
in stem-final position (*a fortiori* in word-final position) whereas ῖ and
õ̩ may occur in such a position. Hence ῖ and õ̩ are considered as "au-
tonomous" phonemes whereas ι and o̩ are not.

2.4. <u>Vowel correspondences in Yoruboid stems</u>. A decisive factor in our present
discussion is the systematic vowel correspondence series that one finds across.
Yoruboid dialects. For more consistency, we shall restrict ourselves to stems
for two reasons: (i) in the prefix and other non-final positions, vowels are
often subject to various phonological rules; (ii) vowels in the prefix position
usually constitute a sub-set of the vowels occurring in stems. The correspond-
ence series (in Table 1 on the next page) are taken from Akinkugbe [1978]; how-
ever, instead of her reconstructions, we simply identify the columns as 1a...7a
(for oral vowels) and 1b...7b (for nasals). Note that for the nasal set, Akin-
kugbe [1978] has two additional columns in which one finds vowel sequences in
proto-Yoruba and proto-Yoruboid (rows excluded by us from the table). Similar-
ly, for the oral set, she has two additional columns in which one finds *ι and
*o̩ in proto-Yoruba and proto-Yoruboid without reflexes in any of the present-
day dialects (with which our own table deals). We set aside these four columns
and concentrate on the fourteen columns presented in Table 1.

3. <u>The Controversy: Seven vs. Nine Vowels in Proto-Yoruba and Proto-Yoruboid</u>
     Given the background information just presented, we can now approach the
controversy, highlighting the arguments advanced by each camp and making prelim-
inary evaluation of them as we proceed.

3.1. <u>Main arguments for a nine-vowel system</u>. Five main arguments have been put
forward to defend the thesis that proto-Yoruboid had a nine (oral) vowel system
(including *ι and *o̩) with the classic cross-height vowel harmony. A sixth
one, provided by Adetugbọ [1967], would put an end to the controversy as it
shows that some Central Yoruba dialects do have oral phonemic ι and o̩ occur-
ring in stem-final position; unfortunately his data have not been confirmed and

Table 1:   <u>Vowel correspondences in Yoruboid stems</u> [Akinkugbe 1978]

| | ORAL VOWELS | | | | | | | NASAL VOWELS | | | | | | |
	1a	2a	3a	4a	5a	6a	7a	1b	2b	3b	4b	5b	6b	7b
Igala	i	e	ɛ	a	ɔ	o	u	ĩ	ɛ	ɛ	a	ɔ	ɔ	u
Iṣekiri	i	e	ɛ	a	ɔ	o	u	ĩ	ɛ̃	ɛ̃	ã	ɔ̃	ɔ̃	ũ
Ikalẹ	i	e	ɛ	a	ɔ	o	u	ĩ	ɛ̃	ɛ̃	ã	ɔ̃	ɔ̃	ũ
Ilajẹ	i	e	ɛ	a	ɔ	o	u	ĩ	ɛ̃	ɛ̃,ɛ	ã	ɔ̃	ɔ̃	ũ
Ijọ-Apọi	i	e	ɛ	a	ɔ	o	u	ĩ	ɛ̃	ɛ̃,ɛ	ã	ɔ̃	ɔ̃	ũ
Gbẹdẹ	i	e	ɛ	a	ɔ	o	u	ĩ	ĩ	ɛ,ĩ	ɔ̃	ɔ̃,ũ	ũ,ɔ̃	ũ
Ijumu	i	e	ɛ	a	ɔ	o	u	ĩ	ĩ	ɛ,ĩ	ɔ̃	ɔ̃,ũ	ũ,ɔ̃	ũ
Ikiri	i	e	ɛ	a	ɔ	o	u	ĩ	ĩ	ɛ,ĩ	ɔ̃	ɔ̃,ũ	ũ,ɔ̃	ũ
Yagba	i	e	ɛ	a	ɔ	o	u	ĩ	ĩ,ɛ̃	ɛ,ĩ	ɔ̃	ɔ̃,ũ	ũ,ɔ̃	ũ
Ukarẹ	i	e	ɛ	a	ɔ	o	u	ĩ	ĩ,ɛ	ɛ̃,ɛ,ĩ	ɔ̃	ɔ̃,ũ	ũ	ũ
SY	i	e	ɛ	a	ɔ	o	u	ĩ	ĩ	ɛ,ĩ	ɔ̃	ɔ̃,ũ	ũ	ũ
Tsabẹ	i	e	ɛ	a	ɔ	o	u	ĩ	ĩ,ɛ̃	ɛ,ĩ	ɔ̃	ɔ̃,ũ	ɔ̃,ũ,ã	ũ
Ifẹ(Togo)	i	e	ɛ	a	ɔ	o	u	ĩ	ĩ,ɛ̃	ɛ̃,ɛ	ã,ɔ̃	ã(?)	ɔ̃,ũ,ã	ũ
Ijẹṣa	i	e	ɛ	a	ɔ	o	u	ĩ	ĩ	ɛ,ĩ	ɔ̃	ɔ̃,ũ	õ	ũ
Irun	i	e	ɛ	a	ɔ	o	u	ĩ	ĩ,ɛ̃	ɛ,ĩ	ɔ̃	ɔ̃,ũ	õ,ũ	ũ

are therefore ignored in this paper.

   <u>Argument 1</u>: Bamgboṣe [1967] argues that a dialect with nine vowels is more complex than one with seven; therefore, the former should be more archaic than the latter. He then concludes that proto-Yoruba (and presumably proto-Yoruboid) had *ι and *ο . However, it is now generally admitted that complexity is not measured in terms of inventories of sounds, but in terms of how generalised the observed patterns within a language/dialect are and the number, nature and power of the rules required to account for them [Fromkin 1971]. In this regard, the so-called nine-vowel dialects, with their generalised vowel harmony rule (see below, section 4.4), are less complex than the so-called seven-vowel dialects of Yoruboid.

   <u>Argument 2</u>: The major argument advanced by Akinkugbe [1978] is as follows:

because */ĩ/ and */õ/ have to be postulated for proto-Yoruba and proto-Yoru-
boid (on the basis of columns 2b and 6b of Table 1 on facing page), then one
should assume that their oral counterparts */ɩ/ and */ɔ/ also existed at
those stages of the language complex, because nasal vowels usually constitute a
sub-set of the oral vowels. It is pertinent to observe that the postulation of
the nasals, */ĩ/ and */õ/ , is not unquestionable and that it is not, in any
case, the only plausible hypothesis in respect of columns 2b and 6b. If one
thinks of alternatives, then the argument becomes invalidated.

Argument 3: Stewart [1983] claims that the most likely source of ɛ̃,ɔ̃ :
ĩ,õ : ĩ,ũ (columns 2b and 6b of Table 1) is *ĩ,*õ because ɩ,ɔ are highly
marked, and consequently both of the sound changes posited, namely *ɩ,*ɔ > e,o
and *ɩ,*ɔ > i,u are highly plausible phonetically. This argument is only ir-
resistible on the surface. Its basic defect is that from a correspondence ser-
ies involving nasal vowels, Stewart [1983] switches over to oral vowels to advo-
cate phonetic plausibility for rules which, evidently, do not affect oral vowels.
At a theoretical level, it might also be possible to think that ɩ,ɔ can be
seen as the intermediary stage in a development *e,*o > ɩ,ɔ > i,u as Guthrie
[1967] does.

Argument 4: To give more weight to argument 2, Akinkugbe [1978] also in-
vokes the fact (?) that so many present-day (old) "Kwa" languages operate an
eight, nine, or even ten vowel system; she adds that Stewart [1971] has even sug-
gested that the latest common ancestor of the (old) "Kwa" languages probably op-
erated a ten-vowel system. This argument takes for granted that the existence
of ɩ and ɔ must be a *genetic* characteristic of the "Kwa" languages, which
need not be the case. It also takes for granted proto-Volta-Congo reconstruc-
tion (arrived at without Yoruboid) and now tries to "mould" proto-Yoruboid to
conform to it, instead of looking for substantive comparative data, the *prima
facie* condition of any conclusion having genetic implication or interpretation.
This argument is therefore weak, to say the least.

Argument 5: Akinkugbe [1978] also advances that the fact that the present-
day nine-vowel dialects of Yoruboid have phonemic ĩ and õ without (clearly)
phonemic ɩ and ɔ is an indication of a transition stage from a clear nine-

vowel system to a seven-vowel system by reduction. This argument does not car-
ry much weight because in the process of historical change, one normally ex-
pects the nasal vowels (marked as they are according to Chomsky and Halle
[1968]) to disappear before their oral counterparts.

3.2. <u>Main arguments for a seven-vowel system</u>. Three main arguments have been
put forward to defend the thesis that proto-Yoruboid had a seven (oral) vowel
system.

 <u>Argument 1</u>: The most crucial of the arguments, as emphatically stated by
Oyelaran [1973], 1977], is that present-day Yoruboid (in fact, Yoruba) dialects
with ι and ọ do not have them in stem-final position and so these vowels
could as well be interpreted as conditioned variants of /i/ and /u/ (when
the stem-final vowel is non-expanded). Akinkugbe [1978], a champion of the nine-
vowel system interpretation, has no serious objection against this synchronic
analysis.[3] There is, however, the fact that ι̃ and õ are attested in stem-
final position and contrast with ĩ and ũ on the one hand, and ɔ̃ (and ɛ̃)
on the other. Now Oyelaran's [1973, 1977] interpretation of these ι̃,õ as de-
riving from *ɛ̃,*ɔ̃ is not satisfactory in that, even if the diachronic raising
rule were attested, it simply states the origin of present-day ι̃ and õ but
does not deny their phonemicity.[4] We shall come back to it below.

 <u>Argument 2</u>: Another argument used by both Fresco [1970] and Oyelaran [1973,
1977] is that the present-day nine-vowel dialects have innovated ι,ι̃,ọ,õ by
greatly simplifying the vowel co-occurrence restrictions, i.e. extending the fea-

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[3]Her position on this issue is as follows:

> In terms of phonetic analysis, one may want to regard ι and ọ as allo-
> phones of /i/ and /u/ respectively... The above phonemic analysis is,
> however, rejected on the following grounds. Since vowels, by the universal
> markedness convention, are marked for nasalisation (Chomsky and Halle
> [1968]), a system which has underlying nasal vowels without their non-nasal
> counterparts is counter-intuitive. (p.76)

Note that Oyelaran [1973] and the present writer (see below) use the same argu-
ment of markedness to invalidate the phonemicity of ι̃ and õ .

[4]The raising rule mentioned here is stated as P-B by Oyelaran [1973:165;
1977:7] as follows:

ture specification [-expanded] which was restricted to, and redundant with, the feature specification [+low][5] to high vowels also (in Oyelaran's specification reproduced below, Table 2a). Akinkugbe [1978] agrees basically that the Ijẹṣa-type nine-vowel system is less complex than the seven-vowel system, but argues that the crucial point is the process that has brought about the complexity. We do not see, however, how she has proved the process that has brought about the complexity; rather we see the issue of the direction of change as a crucial one, as long as one can explain or point out the motivation, as we shall attempt below.

Argument 3: In his 1977 paper, trying to explain how the nine-vowel system came about in Yoruboid, Oyelaran states that the nine-vowel dialects are mainly eastern dialects which have maintained contact with the Edoid languages and Igbirra (clearly attested cases of nine-vowel or ten-vowel languages/dialects with cross-height vowel harmony) for millenia; it is certainly through this contact that the feature [expanded] has been "acquired". This explanation is quite acceptable. In fact, Stewart, who once wrote that "it can never be shown that the member with the harmony acquired it, and it can nearly always be shown that the member without the harmony lost it" [1976:8], now admits that "it is cer-

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P-B: Nasal vowel raising

$$\begin{bmatrix} +syl \\ +low \\ +nas \\ \{ \begin{matrix} +back \\ +front \end{matrix} \} \end{bmatrix} \rightarrow [+high]$$

He comments thus: "P-B has been shown to recapitulate a *historical change* in the language... In short the so-called phonemes ĩ and õ result from *changes* recounted by P-B. Hence they have no oral counterparts" [Oyelaran 1973:179] (my emphasis, H.C.). Unfortunately, by talking of underlying forms instead of proto-forms, Oyelaran [1973, 1977] seems to suggest that P-B is a synchronic rule, but he does not justify it.

[5]In the seven (oral) vowel system, Oyelaran [1973] specifies /ɛ a ɔ/ as [+low] and admits that, according to Stewart [1969, 1971], "all three vowels a ɛ ɔ are inherently non-advanced tongue root" [1973:160]. This implies that all other vowels, viz. /i e o u/ are [-low] and [+expanded]. See below, Tables 2a and 2b.

tainly wrong to exclude the possibility that some Kwa languages might some day
be shown to have acquired CHVH [cross-height vowel harmony]" [1983:33].

In all, it seems as if the seven (oral) vowel system thesis is more accept-
able than the nine (oral) vowel system thesis. We shall now go on to prove this
with our own interpretation of the data at hand.

4. In Search of a More Acceptable Hypothesis

4.1. Another look at the vowel correspondence series. Let us consider more
carefully the vowel correspondence series presented in Table 1 (section 2.4
above). When one applies all known criteria to the oral set, one cannot but
postulate /*i *e *ɛ *a *ɔ *o *u/ for columns 1a, 2a, 3a, 4a, 5a, 6a and 7a re-
spectively, as Akinkugbe [1978] has done. For the nasal set, Akinkugbe's [1978]
reconstruction of */ĩ/ and */ũ/ for columns 1b and 7b is unquestionable.
For columns 3b and 5b, we agree with her reconstructing */ɛ̃/ and */ɔ̃/ re-
spectively: dialects showing ɛ and ɔ have denasalised the proto-Yoruboid
vowels whereas those showing ĩ and ũ have raised the proto-Yoruboid vowels,
through mergers. For columns 4b, Akinkugbe [1978] reconstructs understandably
*/ã/ ; Igala has denasalised the proto-Yoruboid vowel whereas those dialects
showing ɔ̃ have rounded and backed the proto-Yoruboid vowel. The columns that
interest us most here are 2b and 6b. While Akinkugbe [1978] reconstructs them
as */ɪ̃/ and */õ/ respectively, our surmise is that reconstructing them as
*/ẽ/ and */õ/ is more plausible.

4.2. Justifying our */ẽ/ and */õ/ . Having accepted */ɛ̃/ and */ɔ̃/ as
the sources of columns 3b and 5b, and */ĩ/ and */ũ/ as those of columns 1b
and 7b, it is no longer tenable to trace columns 2b and 6b to either */ɛ̃/ and
*/ɔ̃/ or */ĩ/ and */ũ/ . By postulating */ɪ̃/ and */õ/ for columns 2b and
6b, Akinkugbe [1978] assumes that the proto-phonemes must have been retained un-
changed by at least one present-day dialect such as Ijẹṣa. She admits, however,
that there is no (direct) evidence for reconstructing oral */ɪ/ and */o/ ,
and she should logically arrive at a proto-Yoruboid vowel system made up of sev-
en oral vowels and seven nasal vowels as follows:

/*i *e *ɛ *a *ɔ *o *u/
/*ĩ *ɪ̃ *ɛ̃ *ã *ɔ̃ *õ *ũ/ .

Note the doubly curious imbalance shown by this system in that (i) */e/ and
*/o/ are without nasal counterparts whereas */ĩ/ and */õ/ are without oral
counterparts and (ii) the nasal vowels do not constitute a sub-set of the oral
vowels. One obvious way out is to postulate the sources of columns 2b and 6b
as */ẽ/ and */õ/ respectively. We thus have a symmetric vowel system for
proto-Yoruboid as follows:

$$/\text{*i *e *ε *a *ɔ *o *u}/$$
$$/\text{*ĩ *ẽ *ε̃ *ã *ɔ̃ *õ *ũ}/ .$$

In addition to the symmetry argument, nothing prevents the occurrence of /ẽ/
and /õ/ . These vowels are attested in other West African languages such as
Basila, Giseda, Lelemi, Adele, Likpe, Santrokofi, Akpafu, Avatime, Nyangbo,
Bowili, Ahlo, Kebu, and Animere, all belonging to the Central Togo (old Togo
Remnant) languages as described by Heine [1968]; and Uvwie [Umukoro 1968], Agbon
[Kelly 1969], and Epie [Thomas and Williamson 1967] of the Edoid complex; and
Ika [Elugbe 1969], Ọhụhụ [Green and Igwe 1963], Ọgba [Olori, n.d.], and Ikwerre
[Williamson 1970] of the Igboid complex.[6] Moreover, if one admits that nasal
vowels derive diachronically from *CVN and *CNV structures (see Hyman [1972] and
Williamson [1973]), it becomes clear that nothing will prevent /e/ and /o/
from occurring in the V position of these structures [Capo 1983]. If one admits
our reconstruction, then the diachronic rules to be posited to account for the
reflexes are perfectly plausible. The dialects showing ε̃ and ɔ̃ have simply
lowered */ẽ/ and */õ/ (in terms of the matrix of Table 2a below) through mer-
gers; those showing ĩ and ũ have simply raised */ẽ/ and */õ/ through mer-
gers; those showing ĩ and õ have retained proto-Yoruboid */ẽ/ and */õ/
as we shall show in section 4.3 below.

Now the reason why */ẽ/ and */õ/ have shifted in most dialects is that
the lowering of the velum accompanying nasalisation would have both a physical
effect on tongue position and an acoustic effect on the vowel sound itself; thus,

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[6]The reference to other West African languages here has no genetic implica-
tion. We are simply arguing that no segment structure condition (or morpheme
structure condition) prevents the occurrence of ẽ and õ , contrary to a claim
made by Hyman [1972].

ẽ and õ are rather unstable. This leads us to the argument of markedness.
As already noted, Stewart [1983] states that ι and ɔ are more marked than
e and o . If an indirect way of measuring markedness is the relative frequen-
cy of the segments in the languages of the world, this statement cannot be dis-
puted. By the same argument, however, we are in a position to say that, as far
as nasal vowels are concerned, ĩ and õ are less marked than ẽ and õ .
Going through the vowel inventories of languages/dialects presented by William-
son [1973], some nine and ten (oral) vowel languages/dialects such as Grebo
[Innes 1967], Akan [Schachter and Fromkin 1968], Baoulé (Vogler as cited by Hy-
man 1972]) have ĩ and õ without ẽ and õ ; others such as Epie [Thomas and
Williamson 1967], Ịka [Elugbe 1969], Ọhụhụ [Green and Igwe 1963], Kalaḅari, Nem-
be, and Kolokụma [Williamson 1969] have both ĩ,õ and ẽ,õ ; whereas only Basi-
la [Heine 1968] has ẽ,õ but not ĩ,õ .

4.3. Another interpretation of the nine-vowel dialects. As said above, in the
so-called nine-vowel dialects of Yoruboid, ĩ and õ are autonomous phonemes
because they occur in stem-final position and as such may contrast with ĩ and
ũ as well as ɔ̃ (and ɛ̃). However, at the level of underlying representation,
we would like to treat them as phonetic realisations of /ẽ/ and /õ/ for the
same reasons as those advanced for proto-Yoruboid. Now the question is why /ẽ/
and /õ/ should be realised as [ĩ] and [õ] . We have already pointed out the
unstable nature of [ẽ] and [õ] . For this reason, in most cases /ẽ/ and
/õ/ are realised as [ɛ̃] and [ɔ̃] by a synchronic lowering rule, or sometimes
as [ĩ] and [ũ] by a synchronic raising rule (see Williamson [1973]; Capo
[1983, to appear]. Where the lowering rule applies, the contrast between /ẽ/
and /ɛ̃/ on the one hand and /õ/ and /ɔ̃/ on the other is lost. Similarly,
where the raising rule applies, the contrast between /ẽ/ and /ĩ/ on the one
hand and /õ/ and /ũ/ on the other is lost. Now suppose that a language/dia-
lect does not lose the three-term contrast /ɛ̃/∿/ẽ/∿/ĩ/ and /ɔ̃/∿/õ/∿/ũ/ , and
yet, its speakers are faced with the unstable nature of [ẽ] and [õ] ; then
they may realise /ẽ/ and /õ/ as [ĩ] and [õ] since, as we think, [ẽ,õ]
are more complex/marked than [ĩ,õ] . This is how, internally and spontaneously,
ĩ,õ could have emerged in the so-called nine-vowel dialects of Yoruboid in stem-
final position without ι,ɔ (their oral counterparts) also emerging. We thus

hold the view that synchronically, present-day Yoruboid dialects having [ĩ,õ] as stem-final vowels at the phonetic level, actually have /ẽ,õ/ at the level of underlying representation.

4.4. On the acquisition of cross-height vowel harmony. We have seen that most present-day Yoruboid dialects have a seven (oral) vowel system. We have also argued that this seven (oral) vowel system must be traced back to proto-Yoruboid. This system is fully specified by the following matrix (Table 2a) argued for by Oyelaran [1973:159-60].

Table 2a: Matrix specifying the Yoruboid oral vowels [Oyelaran 1973:159]

	i	e	ɛ	a	ɔ	o	u
high	+	−	−	−	−	−	+
low	−	−	+	+	+	−	−
front	+	+	+	−	−	−	−
back	−	−	−	−	+	+	+

One could add two other features, viz. [rounded] and [expanded] to those in Table 2a, but they are redundant in that they do not play unique roles. Indeed [αrounded] ↔ [αback], and [αexpanded] ↔ [-αlow] as one can see in Table 2b.

Table 2b: Feature specification of the vowels of the seven-vowel Yoruboid dialects, including redundant features [Capo]

	i	e	ɛ	a	ɔ	o	u
front	+	+	+	−	−	−	−
back	−	−	−	−	+	+	+
rounded	−	−	−	−	+	+	+
high	+	−	−	−	−	−	+
low	−	−	+	+	+	−	−
expanded	+	+	−	−	−	+	+

One could also use a different specification, such as the one used by Fresco [1970] and Courtenay [1968]; in that system [expanded] and [rounded] are no longer superfluous, as can be seen in Table 3 on the next page.

Table 3:   Feature specification of oral vowels of the seven-vowel Yoruboid
           dialects based on Fresco's [1970] matrix

	i	e	ɛ	a	ɔ	o	u
high	+	−	−	−	−	−	+
low	−	−	−	+	−	−	−
back	−	−	−	+	+	+	+
rounded	−	−	−	−	+	+	+
expanded	+	+	−	−	−	+	+

(We assume, of course, that the nasal counterparts differ only in respect of the
feature of nasality.)

As observed above (section 2.3), these seven vowel dialects operate some
vowel co-occurrence restrictions. In particular, the pairs [e,o] and [ɛ,ɔ]
are mutually exclusive, whereas [i,u,a] are neutral. The restriction can be
accounted for by a vowel harmony rule which is assimilatory in nature.[7] Using
Oyelaran's [1973] matrix of Table 2a, this rule can be stated as SPR_{1a}.

$$SPR_{1a}: \quad \begin{bmatrix} +syl \\ -high \\ -low \end{bmatrix} \rightarrow [+low]/\underline{\quad}X \begin{bmatrix} +syl \\ +low \end{bmatrix}$$

Using the matrix of Table 2b, we can replace [low] with [expanded], and SPR_{1a} can
be re-written as SPR_{1b}.

$$SPR_{1b}: \quad \begin{bmatrix} +syl \\ -high \\ +exp \end{bmatrix} \rightarrow [-exp]/\underline{\quad}X \begin{bmatrix} +syl \\ -exp \end{bmatrix}$$

(Note that SPR_{1b} will also be the version based on Table 3.)

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[7]It is actually my view that we are not dealing with proper vowel harmony
rule(s), but with assimilation rule(s) except that the vowels involved may be
separated by a consonant. Most Yoruba scholars agree that the type of "vowel
harmony" discussed here operates regressively. In this regard, Fresco [1970:23]
states that underlying vowel prefixes are necessarily /i u e o a/ (note that
Yoruba has no suffixes); since the "harmony" can be stem-internal, I would like
to suggest that only the same vowels (and their nasal counterparts) also occur in
stem non-final position, while all the seven vowels of the language (and their
nasal counterparts) may occur in stem final position. This hypothesis, which can
only be understood in a non-autosegmental approach as used throughout this paper,
explains the formulation of the rule(s).

Since SPR_{1a} is exactly the same as SPR_{1b}, we can see that harmony based on [expanded] is already at work, except that it is co-terminous with vowel height here, restricted as it is to [-high] vowels.

We have shown above (section 4.3) how [expanded] starts playing a unique role when some dialects like Ijẹṣa, Irun, Ifaki, and Ekiti realise their /ẽ/ and /õ/ as [ĩ] and [õ] through a synchronic (raising) rule now stated as SPR_2.

SPR_2:
$$\begin{bmatrix} +syl \\ -high \\ -low \\ +nas \\ (+exp) \end{bmatrix} \rightarrow \begin{bmatrix} -exp \\ +high \end{bmatrix}$$

With the innovation of SPR_2 specific to the so-called nine-vowel dialects, [expanded] becomes pertinent in that, without it, [ĩ] and [õ] cannot be uniquely specified. In fact, at the systematic phonetic level, we now have high as well as non-high expanded and non-expanded vowels. With the addition of the two vowels [ĩ] and [õ], the so-called nine-vowel dialects generalise the proto-Yoruboid vowel harmony rule (retained by the so-called seven-vowel dia-lects) SPR_{1b} to read SPR_3.

SPR_3: $[+syl] \rightarrow [-exp]/\_X \begin{bmatrix} +syl \\ -exp \end{bmatrix}$

In view of the fact that, apart from /a/ , all vowel prefixes in Yoruboid are underlyingly [+expanded], i.e. /i e u o/ (see footnote 7), we now expect in that position [i e u o a] on the one hand and [ɪ ɛ ɷ ɔ a] on the other (and eventually in the stem non-final position also their nasal counterparts).

It is necessary, at this juncture, to state emphatically that the vowel har-mony rules are phonological rules, in fact assimilation rules. In the nine-vow-el dialects in particular, SPR_3 is crucially ordered after SPR_2. This way, we can argue that the cross-height vowel harmony shown by Ijẹṣa, Ifaki, Irun, and Ekiti might have been acquired "spontaneously", the prolonged contact with Edoid and Igbirra languages being only a catalyst. This hypothesis also indicates that the vowel harmony rule SPR_3 may change anytime from now to a morpheme struc-ture condition while SPR_2 becomes a diachronic rule. At this time it would not be strange to see some Yoruboid dialects developing underlying ɪ and ɷ in

stem-final position (perhaps through "borrowing"). These properly established nine (oral) vowel dialects will definitely confirm that a nine vowel dialect/ language may derive from a seven-vowel proto-language. That could have possibly been the case with the unconfirmed data reported by Adetugbọ [1967] in respect of some Central Yoruba dialects.

5. Concluding Remarks

An attempt has been made to show that

(i) proto-Yoruboid had a fourteen-vowel system made up of seven oral vowels and their nasal counterparts,

/*i *e *ɛ *a *ɔ *o *u/ and

/*ĩ *ẽ *ɛ̃ *ã *ɔ̃ *õ *ũ/ ;

(ii) the so-called nine-vowel Yoruboid dialects have in fact seven underlying vowels, /i e ɛ a ɔ o u/ ;

(iii) in the same dialects, the stem final ĩ and õ are phonetic realisations of /ẽ/ and /õ/ ;

(iv) in the same dialects, the non-final ι , (ĩ) , u , (ũ) , ɛ , ɔ are predictable variants of /i (ĩ) u (ũ) e o/ through a cross-height vowel harmony rule developed "spontaneously" or perhaps "acquired" from the neighbouring Edoid and Igbirra languages.

The implications of the present hypothesis as well as the problems it raises are yet to be fully explored.

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