

## YORUBA VOWEL CO-OCCURRENCE RESTRICTIONS<sup>1</sup>

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### 1. Introduction.

In a recent paper, Isaac George summarizes what we might now refer to as the Orthodox view of the vowel co-occurrence restrictions in the Yorùbá language. Briefly the view holds that the observable co-occurrence restrictions in the language are no more than the effect of the dropping of certain earlier vowel harmony phonological rules (P-rules); that at this earlier stage, Yorùbá, like the present day Igbirra, had nine vowels,

i, I, e, ε, a, ɔ, o, U, u

divided into two vowel harmony grades:

1. i, e, a, o, u
2. I, ε, a, ɔ, U

the vowel a being neutral in the sense specified by Greenberg [1963]. The orthodox view holds further that "standard" Yoruba (CY, henceforth) operates two types of vowel harmony restriction: the high/low restriction by which members of the two grades above except i and a mutually exclude one another. Thus ɔdɛ 'hunter' and εrò 'antidote', odè 'place where customs duties are collected' and èrò 'thought', occur in CY but not \*ɔde or \*ore. The front/back (or labiality) harmony is the second type of vowel harmony observed in Yorùbá. This apparently operates relevantly only in polysyllabic formatives in which the form CVCV is a part of the structure (Bangboṣe [1967]; Awobuluyi [1967]; Awobuluyi and Bangboṣe [1967]; Stewart [1969; 1971]), as in the following examples:

gbéré	'kind of vaccination'
poro	'furrow'
àbúrò	'younger sibling'
agbede	'center'

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<sup>1</sup>Materials presented in this paper substantiate postulates outlined in my dissertation Yorùbá Phonology (Stanford, 1971).

Edward Fresco's work [1970], which Isaac George also discusses, states explicitly that vowel harmony in Yoruba operates from right to left, that is, regressively. This view is implicit in Bamgboṣe's work, too, although it is not so stated. The importance of this observation is forced upon Fresco by facts of the Ìfàkí dialect of Yorùbá, by the need to account for the difference between CY and this dialect, and by the need to explain certain apparent irregularities in the varieties of Yorùbá which both represent. Ìfàkí, like Ìjẹṣà and Èkítí of Bamgboṣe's work, has nine oral vowels: i, I, e, ε, a, ɔ, o, U, u, and the nasal vowels apparently include [ĩ] [ũ]. Interestingly, however, I and U do not occur in any formative unless followed by ε, a, or ɔ in the next syllable. However, both ĩ and ũ occur apparently wherever the other nasal vowels may also occur, that is, without the restriction that applies to I and U. Since Ìfàkí does not have nasal vowels as the first segment of any formative, Fresco concludes that where an Ìfàkí formative consists of a vowel prefix and stem, all the vowels i, e, ε, a, ɔ, o, u, ĩ, Ì, ã, ẽ, ũ, ù may occur in the stem, that is to the exclusion of I and U, whereas only the nasal vowels may not occur as prefix. Ìfàkí has, therefore, two mutually exclusive vowel harmony grades:

- |     |   |   |   |   |     |   |   |   |   |
|-----|---|---|---|---|-----|---|---|---|---|
| (1) | i | ĩ | u | ũ | (2) | I | ĩ | U | ũ |
|     | e |   | o |   |     | ε |   | ɔ | ẽ |
|     |   |   |   |   |     | a |   | ã |   |

These facts make sense only if the vowel harmony restriction applies regressively so that prefixes take the grade of the stem vowels. As a corollary, therefore, underlying vowel prefixes are necessarily i, e, u, o, a (Fresco, p. 23), and, I and U must be eliminated from Fresco's grade (2), leaving

- |   |     |
|---|-----|
| ĩ | ũ   |
| ε | ɔ ẽ |
| a | ã   |

Fresco considers the grade feature to be tenseness. Then, he suggests the formative stem in *Ìfàkí* is characterized by the following morpheme structure condition (MSC) (p. 26):

If-Then sequence structure condition:<sup>2</sup>

$$\text{IF: } \left[ \begin{array}{c} +\text{vocalic} \\ -\text{high} \\ -\text{low} \end{array} \right]_N \quad X \quad \left[ \begin{array}{c} +\text{vocalic} \\ -\text{high} \\ \text{atense} \end{array} \right]_N$$

↓

THEN: [atense]

Given this MSC, the surface form of the *Ìfàkí* formative is assured by the following P-rule (p. 39<sup>a</sup>):

Tenseness assimilation:<sup>3</sup>

$$V \rightarrow [-\text{tense}] / [ \text{---} ]_1 X_0 \left[ \begin{array}{c} +\text{syllabic} \\ -\text{tense} \end{array} \right]_N$$

The MSC proscribes just those combinations which will violate the vowel harmony restriction, but says nothing about formatives in which the first vowel may be *i*, *u*, or *a*, an unsatisfactory state of affairs, to say the least.

As it turns out, sequences with *i*, *u*, after *ɔ* or *a* do not occur in *Ìfàkí*; and *i* and *u* may be preceded by *ɛ* (e.g. *èrí* 'testimony'; *erù* 'load') in CY, where incidentally the following formatives also exist:

<i>ɔfí</i>	'alcoholic beverage'
<i>àfi</i>	'except'
<i>àti</i>	'and'

<sup>2</sup>I have argued elsewhere (Oyelaran [1970; 1971]) in favor of replacing the feature Vocalic with Syllabic. Accordingly in the rest of the present paper we shall use Syllabic.

<sup>3</sup>Apparently this rule applies not only to noun prefixes but also to the verbal group consisting of the pronominal proverb and its verb in certain dialects. Such dialects include *Ìfàkí*, *Akúré* and *Ketu* (Fresco, p. 37).

Moreover, in CY nominal derivations, such forms as a-dú 'one or something that is black', a-tú 'that which easily falls apart' continue to be regarded as natural. The point here is that if in fact Ìfàkí for one, shows the earlier forms of formatives in CY, how do we explain the presence of these items in CY, and their absence in Ìfàkí, Ìjẹ̀ṣà, and Èkítí, and so on, which purportedly show the proto-forms? And how does one account for the fact that the CY nominal derivation violates the MSC?

This is not all. The following formatives occur in Ìfàkí:

ɔdÚ	'year'
ɔrÚ	'neck'
IrŪ	'hair'

and in Ìjẹ̀ṣà and Èkítí (Bamgboṣe [1967:271]), in addition to

SÚ	'move away'
SĪ	'serve'
ɪdŪ	'bedbug'
ŪrĪ	'iron'

From formatives such as these, both Bamgboṣe and Fresco conclude that Ī and Ū are autonomous phonemes in the dialects of Yorùbá concerned, and that, as stated above, I and U are not. But no explanation is offered. In other words, is there any basis for considering Ī and Ū autonomous "phonemes" in these dialects? Or better still, what explanation can we offer for the observed fact that I and U never occur without being followed in the same formative by at least one non-tense vowel? ɛrĪrà, ɛrŪkpé, and ɔsŪkpá exist in these dialects, for example, but no formative exists in which I and U are in the final position.

The present paper reconsiders therefore the vowel co-occurrence restrictions in CY, and, using data from other dialects of Yorùbá for heuristic purposes, offers an explanation for the problems which the foregoing questions raise. In addition, the data which will be presented presently lead to one conclusion, that is, that CY forms are undoubtedly more archaic than those of the present day Ìfàkí, Ìjẹ̀ṣà, and Èkítí. In other words, it is these dialects that have innovated, not CY, at least with respect to vowel co-occurrence restrictions.

## 2. Some theoretical considerations.

I would like to propose that the following matrix (Table 1) completely specifies the oral vowels of Yorùbá

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

The nasal counterparts differ only in respect of the feature of nasality and need not be presented. Table 1 claims that the Yorùbá vowel system has only three functional levels of tongue height: high, low, and mid ([-low, -high]). There exist many reasons to support this claim. First, observe that like  $\epsilon$  and  $\text{ɔ}$ ,  $a$  takes a low vowel whenever it occurs in the stem formative. Thus the formative MSC (above) proscribes the sequence  $\text{oCa}$ , as it does  $\text{oCe}$ , and  $\text{oCɔ}$  (where C represents any non-syllabic segment). And this sequence never occurs in CY either. Notice also that when we say that  $a$  is neutral in the vowel harmony of Yorùbá, this can be meaningful only if  $a$  may be followed in the formative by  $i$  and  $u$ . Now this is not the case with any of the dialects Ìfàkì, Ìjèṣà, and Èkítì. That is  $a$  is never followed by either  $i$  or  $u$  in these dialects. CY itself has only three formatives (already cited) showing this sequence. But then, they are not unique, because  $i$  also occurs after  $\text{ɔ}$  in at least one instance, in  $\text{ɔtí}$ . In other words, these facts do not show  $a$  to be anymore neutral than  $\epsilon$  or  $\text{ɔ}$ .

Further, Fresco agrees with other students of the Yorùbá language in considering  $a$  as the only low vowel in the language. Thus in the Universal Marking Condition (UMC)  $a$  is [U tense] with the assigned value of [-tense], where both  $\epsilon$  and  $\text{ɔ}$  are [M tense] with the value [-tense].<sup>4</sup> It is clear that Fresco addresses himself here to the

<sup>4</sup>Fresco, p. 57; f.n. 11

$$[\text{U tense}] \rightarrow \left\{ \begin{array}{l} [-\text{tense}] / [+low] \\ [+tense] \end{array} \right\}$$

Unfortunately, the Halle and Stevens [1969] passage cited in support of  $a$  as [U tense]  $\rightarrow$  [-tense] equally supports  $\epsilon$  and  $\text{ɔ}$  as [U tense]  $\rightarrow$  [-tense], which would leave  $[e, o]$  as [M tense]  $\rightarrow$  [-tense].

phonetic symbol rather than the facts of the language. In Fresco's system e, o, ε, and ɔ are marked for "tenseness", and all together they have a very high functional yield in comparison to the other three vowels. Whereas an approach which assigns the feature [+low] to all three vowels ε, ɔ, and a claims, in accordance with observable facts of the language, that only e and o are [M tense], and the unmarked vowels should have higher functional yield both severally and jointly. As will be shown below, this is just what happens in CY, where i, u, and a, which may be considered maximally unmarked, show exceptionally high functional yield.

Notice, finally, that the proposal to put a with ε and ɔ is also supported by J.M. Stewart's [1969;1971] suggestion that tongue root advancing and not tongue height is pertinent for Kwa languages: all three vowels, a, ε, and ɔ, are inherently advanced tongue root.

### 3. CY vowel co-occurrence restrictions.

Given the generally accepted CY vowel harmony grades:

(1)	i	u	(2)	i	u
	e	o		ε	ɔ
	a			a	

Table II presents the surface co-occurrence constraints on CY vowels in bisyllabic words:

Table II<sup>5</sup>

$V_1$	$V_2$	a	ε	ɔ	e	o	i	u	ɿ	ɔ̃	ũ
a		x	x	x	x	x	o	o	x	x	x
ε		x	x	x	o	o	x	x	x	x	x
ɔ		x	x	x	o	o	o	o	x	x	x
e		o	o	o	x	x	x	x	x	o	o
o		o	o	o	x	x	x	x	x	o	x
i		x	x	x	x	x	x	x	x	x	x

<sup>5</sup>The order in which the vowels are arranged is merely for convenience. It has no theoretical relevance at all.

$V_1$  is the first vowel in any given sequence, and  $V_2$  is any other vowel occurring after it within the formative. "x" indicates that the sequence occurs, "o" that it does not.

All the observations of the orthodox view of CY may be read off from Table II, namely that in CY neither u nor any nasal vowel may occur as the initial segment of formatives; that ɔ and o, ε and e co-occur only with vowels of the same relative height. As remarked above one would expect i and u to occur after a. But instead Table II shows zeros just in the places where one expects x's. Add to these Greenberg's [1963:35] observation with particular reference to the Niger-Congo languages:

"If all the vowels occur in roots, then when a vowel occurs in derivation or inflection, it must have variants to go with the different principal grades of vowels in the roots."

This statement applies to Table II except for the occurrence of i and u after ε, and the non-occurrence of ũ after e. Clearly, then, the pattern shown in Table II needs a historical explanation.<sup>6</sup>

First, assume a system of prefixes consisting of i, o, e, a numbered 1, 2, 3, 4, in that order.<sup>7</sup> In order to explain the first anomaly, one could plausibly suggest then that whenever i and u are preceded at an earlier stage of Yorùbá by a, the a goes to ε. Thus the following statements should be true:

<u>Hypo.</u>		<u>CY:</u>	
<u>Rec.</u>			
*àrǐ	>	èrǐ	'testimony'
*abǐ	>	ebǐ	'relatives'
*arù	>	erù	'load' <sup>8</sup>

<sup>6</sup>I owe this lead to Professor Joseph H. Greenberg's suggestion [personal communication].

<sup>7</sup>This assumption in no way suggests that all initial vowel segments of CY formatives are necessarily prefixes.

<sup>8</sup>Starred forms are to be considered hypothetical. These hypothetical forms, though now supported by dialectal materials presented below, were merely posited in my thesis, Yorùbá Phonology [1971] without supporting data.

That is to say, Table II results from a phonological change which applies the rule

P-A: a-fronting before high oral vowels:

$$a \rightarrow \varepsilon / \text{--- } C \begin{Bmatrix} i \\ u \end{Bmatrix}$$

Or, in terms of features:

$$\begin{bmatrix} +\text{syllabic} \\ +\text{low} \\ -\text{back} \end{bmatrix} \rightarrow [+front] / \text{---} [-\text{syl}] \begin{bmatrix} +\text{syl} \\ +\text{high} \\ -\text{nasal} \end{bmatrix}$$

P-A applies to a matrix like Table III.

Table III

	a	ε	ɔ	e	o	i	u
a	4	4	4	4	4	4	4
ε	3	3	3	-	-	-	-
ɔ	2	2	2	-	-	-	-
e	-	-	-	3	3	3	3
o	-	-	-	2	2	2	2
i	1	1	1	1	1	1	1

The CY co-occurrence restrictions at this earlier stage were as follows:

- (1) a and i may precede any stem vowel, but
- (2) e and o are necessarily [+low] when they precede a, ε and ɔ in the formative.
- (3) There is no sequence of ε followed by i or u.

Now, turning to the nasal vowels, Table IV (same as in Table II) suggests that the feature [±back] is no longer distinctive for nasal vowels in CY.

Table IV

	ɪ	ĩ	ũ
a	x	x	x
ɛ	x	x	x
ɔ	x	x	x
e	x	o	o
o	x	o	x
i	x	x	x



ĩĩ 'sew' may, for example, be pronounced ĩĩ and in some dialects of Yorùbá (Ìfàkí, for example, Fresco [1970]) the alternation follows labiality in the preceding consonants. Thus one may say:

iká 'termite', but  
 ìbĩ 'gun'

One would like to posit, then, five underlying nasal vowels for CY, namely ĩ, ě, ǎ, ỹ and ũ since there is no evidence of nasalized e or o in the language. Then the following questions must be answered: why do the sequences [ɛCĩ], [ɛCũ] and [eCĩ] occur and not [eCũ]?

Examples:

CY

edũ 'stone celts, mythical missiles of Sango,  
 the god of thunder'  
 èrĩ 'laughter'  
 erĩ 'elephant'

And how does one explain the occurrence of formatives of the form  $\begin{Bmatrix} \text{ɔ} \\ \text{a} \end{Bmatrix} \text{C} \begin{Bmatrix} \text{ũ} \\ \text{ĩ} \end{Bmatrix}$  as in:

ɔrũ 'neck'  
 ɔfĩ 'a pot hole'  
 adũ 'sweetness'  
 àfĩ 'albino'?

In Yorùbá Phonology [1971:46], I suggested that there is no structural reason for the non-occurrence of formatives of the form eCũ. And since formatives of the form oCũ do occur,

okũ 'might'  
 ojũ 'pregnancy'

one might ascribe the omission to accidental gaps. This conclusion is similar to Fresco's (p. 133, footnote 12) on Kétu dialect of Yorùbá that:

"There are no instances of any eCũ nouns in my data. This is presumably an accidental rather than a systematic gap."<sup>9</sup>

<sup>9</sup>"[Ketu] has only the nasalized vowels [ĩ, ǎ, ũ]. It has neither ỹ nor ũ." (p. 121)

"[Ketu] /ũ/ is also cognate with /ũ/ in other dialects, and with both /ũ/ and /U/ in [Ìfàkí]." (p. 122)

It turns out that the gap observed in Ketu (namely eCũ) corresponds

On the other hand, in accounting for the occurrence of CY of forms such as  $\varepsilon C \begin{Bmatrix} \tilde{i} \\ \tilde{u} \end{Bmatrix}$ , Fresco [1970:42] has this to say:

"There appear to be several compelling reasons to treat these nouns as in some way exceptional. Looking at two of the nouns  $\varepsilon b\acute{f}$  and  $\varepsilon r\grave{u}$  these are seen to consist of a verb stem,  $b\acute{f}$ , 'to give birth', and  $r\grave{u}$  'carry', respectively, plus a nominating prefix  $\varepsilon$ . There is some indirect evidence that the stem vowels were lax and nasal at an earlier state...What can be inferred historically is that / $\tilde{i}$ / merged with / $\tilde{I}$ / in CY and K[etu]."

Fresco's indirect evidence happens to be the occurrence of  $\varepsilon b\acute{f}$  in CY and Ketu with non-nasal  $i$ , but of either  $\varepsilon b\acute{f}$  or the absence of any correspondent in other dialects. But the reconstructed proto-Bantu form for  $b\acute{f}$  is  $*vi$  (Greenberg [1966:32]), or  $*b\acute{f}$  'child' (Hyman [1972:187]), whose variants in West African languages have the vowel  $i$  which is neither lax nor nasal. In other words, we must seek the explanation for the occurrence of the form  $\varepsilon b\acute{f}$  in CY in some other direction.

To account for high nasals after  $\varepsilon$  I should like to propose that a rule similar to P-A' which applies to the sequence of underlying followed by high oral vowels  $i$  and  $u$ , applies to the sequence of high nasal vowels after  $a$ . Thus CY formatives such as  $\varepsilon d\tilde{u}$  'thunderbolt', and  $\varepsilon r\tilde{i}$  'laughter', should derive from underlying forms  $*ad\tilde{u}$  and  $*ar\tilde{i}$ , respectively, through P-A".

P-A": a-fronting before high nasal vowels:

$$\begin{bmatrix} +\text{syl} \\ +\text{low} \\ -\text{back} \end{bmatrix} \rightarrow [+front] / \text{ \_\_\_\_ } \begin{bmatrix} -\text{syl} \\ +\text{high} \\ +\text{syl} \\ +\text{nasal} \end{bmatrix}$$

Notice however that the feature of nasality need not be mentioned since P-A" and P-A' differ only in that the conditioning high vowel in one is nasal, and nonnasal in the other. Both rules collapse therefore into P-A.

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to gaps in other dialects of Yorùbá.

P-A: a-fronting:

$$\begin{bmatrix} +\text{syl} \\ +\text{low} \\ -\text{back} \end{bmatrix} \quad \text{-->} \quad [+front] \quad / \quad \text{---} \quad [-\text{syl}] \quad \begin{bmatrix} +\text{syl} \\ +\text{high} \end{bmatrix}$$

In short, in the underlying representation, CY high vowels do not occur after low vowels except a. It is being claimed again that a before high vowels became fronted to ε, which is widely attested in CY. From the structural point of view, however, the high vowels may occur after any other vowel, and any gap in the latter case must be accidental. If this is so, how then do we explain the occurrence of a large number of formatives such as:

àrú	'illness'
ɔrũ	'neck'
adũ	'sweetness'
áfí	'albino'?

It is significant that these formatives have high nasal vowels after low vowels (or after low prefixes, so to say) including a which supposedly has been fronted by an earlier rule or phonological change. One plausible hypothesis is that these high nasal vowels result from the raising of certain nasal vowels subsequent to the phonological change represented in P-A. The two vowels thus raised can only be ě and Ǔ. It is however not clear at this point in our investigation the conditions under which this change occurs. The hypothetical change is storable as in P-B.

P-B: Nasal vowel raising:

$$\begin{bmatrix} +\text{syl} \\ +\text{low} \\ +\text{nasal} \\ \{ +\text{back} \} \\ [+front] \end{bmatrix} \quad \text{-->} \quad [+high]$$

Thus the apparently exceptional formatives above should derive from underlying forms: /àrǔ/, /ɔrǓ/, /adǔ/, /áfě/ through P-B.

If, as suggested above, CY has five underlying nasal vowels, namely  $\bar{ɪ}$ ,  $\bar{ɛ}$ ,  $\bar{a}$ ,  $\bar{ɔ}$ ,  $\bar{u}$ , and if P-B recounts a historical phonological change, then how account for the occurrence of  $\bar{ɔ}$  in CY and in other varieties of Yorùbá? To answer this question, consider the following facts: first, the feature distinguishing both  $\bar{a}$  and  $\bar{ɔ}$  is not distinctive in any of the present day dialects of Yorùbá from which we have some substantial material. Secondly, there exist dialects where  $\bar{a}$  simply does not occur, and in most dialects  $\bar{a}$  and  $\bar{ɔ}$  are conditioned variants, as discussed briefly above. In the latter group of dialects after labial, non-syllabic segments,  $\bar{ɔ}$  may occur, in all other contexts  $\bar{a}$ . For examples CY may be said to have the following forms:

$if\bar{ɔ}$	'a type of skin disease'
$ib\bar{ɔ}$	'gun'
$it\bar{a}$	'story'
$er\bar{a}$	'meat'

although some scholars claim all CY forms show  $\bar{ɔ}$ . Dialects such as Ondo, and Ketu (see further below, and Fresco [1970]) definitely show both forms. The Qyó dialect of Yorùbá has no  $\bar{ɔ}$ , and both  $ib\bar{ɔ}$  and  $if\bar{ɔ}$  are pronounced  $ib\bar{a}$  and  $if\bar{a}$  respectively.

For the CY and other dialects with  $\bar{ɔ}$ , then, one may justifiably posit P-C as a valid phonological shift.

P-C:  $\bar{a}$ -backing:

$$[+low] \text{ ---} \rightarrow [+back] / \begin{bmatrix} +syl \\ +nasal \\ -front \end{bmatrix}$$

P-C applies only after labial, non-syllabic segments in some dialects, while it does not apply at all in dialects such as Qyó.

In summary, the surface constraints on the vowel co-occurrence of CY represented by Table II result from an underlying matrix as in Table V through changes describable in terms of P-A, P-B, and P-C.

Table V

	a	ɛ	ɔ	e	o	í	u	ã	ẽ	õ	i	u
a	x	x	x	x	x	x	x	x	x	x	x	x
ɛ	x	x	x	o	o	o	o	x	x	x	o	o
ɔ	x	x	x	o	o	o	o	x	x	x	o	o
e	o	o	o	x	x	x	x	o	o	o	x	o
o	o	o	o	x	x	x	x	o	o	o	x	x
i	x	x	x	x	x	x	x	x	x	x	x	x

This has several implications for the problems posed at the beginning of this paper, and we have undoubtedly partially accounted for some of these problems in the course of our presentation. In what follows, a more explicit discussion of the problems is presented.

First, in contrast to Fresco's MSC and Tenseness Assimilation rule, the formatives of CY which implement the constraints underlying Table V is describable in terms of the following positive condition:<sup>10</sup>

CY Morpheme Structure Condition - I:

$([-\text{syl}])$	}	$\left[ \begin{array}{c} +\text{syl} \\ [+high] \\ [+low] \\ -front \\ -back \end{array} \right]$	$([-\text{syl}] [+syl])_o$	
$\left[ \begin{array}{c} +\text{syl} \\ -high \\ a\text{low} \end{array} \right]$	}		$([-\text{syl}] \left[ \begin{array}{c} +\text{syl} \\ a\text{low} \end{array} \right])_o$	
Formative			Formative	

This MSC assumes that relative height and definitely not tenseness is the vowel harmony feature in the deep structure of CY. It states that where a CY formative consists of more than one vowel, i, a, and u, may precede any other vowel. Since u may not occur as formative initial vowel in CY, the MSC merely suggests that there is no reason that it may not so occur. The MSC states more generally that a non-high vowel must agree with respect to the feature low, that is, as e and o before any non-low vowel, but as ɛ and ɔ otherwise. But this latter

<sup>10</sup>See Richard Stanley [1967] for an explicit discussion of positive condition and other types of morpheme structure conditions. The present MSC is a modified version of Sq SC (Sequence Structure Condition) 3 in Yorùbá Phonology (Oyelaran [1971:74]).

aspect is obviously not true, because the first part of the MSC already states that a may precede any vowel. For it is true, it means that one part of the MSC repeats some facts about a, for example, that a may precede ε and ɔ, but denies some other facts already stated by an earlier part, namely, that a may also precede high vowels. In order to avoid this kind of contradiction, it is therefore necessary to split the second part of the MSC to read:

$$\left\{ \begin{array}{l} \left[ \begin{array}{l} +\text{syl} \\ -\text{high} \\ -\text{low} \end{array} \right] \quad ([-\text{syl}] \left[ \begin{array}{l} +\text{syl} \\ -\text{low} \end{array} \right] )_o \\ \left[ \begin{array}{l} +\text{low} \\ \{ [+front] \} \\ \{ [+back] \} \end{array} \right] \quad ([-\text{syl}] \left[ \begin{array}{l} +\text{syl} \\ +\text{low} \end{array} \right] )_o \end{array} \right\}$$

This part of the MSC now states only that e and o may precede all non-low vowels, while ε and ɔ may precede only low vowels. Thus, in the underlying structure of CY formatives, forms such as ε or ɔ before i, u and their nasal counterparts should not occur. Thus ɔ́f must be considered a "freak". In this regard, it is interesting that anything that may be called ɔ́f in CY has a specific terminology. Thus

ɔ́f	eréé	is	bùrùkùtù	'bean beer'
ɔ́f	ògèdè	is	àgàdàhḡdḡf	'plantain beer'
ɔ́f	òkpè	is	emū	'palm wine'
ɔ́f	òkà	is	šèkèté	'sorghum/maize beer'
ɔ́f	ìko	is	ògùrò	'wine from raphia palm'

The basic question is this, then: is ɔ́f, as a generic term, borrowed into CY or not? If it is borrowed, from what source? Two facts offer conflicting evidence: CY has bò́f 'chaffs from corn processed for wine', which is undoubtedly related to ɔ́f, and is therefore a derivative of ɔ́f. But what kind of evidence does derivation offer for borrowing? Notice that CY also has dò́f 'dirty' and ìdò́f 'dirt', yet it is clear that the Yoruba forms are mere transliterations of the English words, though the words have undergone specific grammatical reanalysis in Yoruba: dò́f behaves like any other Yoruba verb derivable from a verb + noun contraction. Therefore bò́f does not necessarily show ɔ́f to be a native Yoruba lexical item.

The second kind of evidence is equally inconclusive: as mentioned earlier in this paper ɔ́f occurs either as ɔ́f or not at all in most dialects of Yorùbá. In other words, wherever it occurs, it conforms to the effective co-occurrence restrictions. Since this (like the first kind of evidence) neither denies nor supports borrowing, we would like to suggest that ɔ́f is a loan-word into CY, and like some other loan-words, violates the MSC of CY.

As regards forms such as εCi, εCu, etc. which occur in CY, and the suggested phonological change (P-A) resulting in them, Table IV<sup>11</sup> offers supporting comparative data from several dialects of Yorùbá. Where CY has ε before high vowels, Ifé (Togo), Igala, Eki, Idsumu, Qwórò, and Igbomina have a. The reverse appears to be the case in the case of aárú 'five'. In compounds, however, even

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<sup>11</sup>The following are the sources of the data presented in Table IV and other tables below, unless otherwise specified:

Òrò Àgò(Ìgbómìnà): Miss Dọja Dáda (18 years old). Dọja left Òrò Àgò in Kwara State for the first time in 1968 and still speaks the Òrò-Àgò dialect, even sometimes inadvertently when talking to non-Òrò-Àgò interlocutors.

Ifé (Togo) and Igala: Robert Armstrong [1965], "Comparative word lists of two dialects of Yorùbá with Igala". JWAL 2:2, 51-78.

Àwòrì and Ànàgó: data collected by Mr. Dansu, a 1971-72 Part I student of Yorùbá at the University of Ifé, using a word list which I had put at his disposal. Mr. Dansu comes from a small town near Ipokia in Egbado Division.

Yagba, Eki, Qwórò, Ifé, Ìjèsà, Ìjẹ̀bú: data derived from Koelle's Polyglotta Africana. The data for the last three dialects are rather fragmentary in Koelle, and have been complemented with additional data from my students who themselves speak these dialects of Yorùbá.

Ìfàkì: data from Fresco [1970].

Table VI

English	SY	Ifè (Togo)	Igala	Yàgbà	Eki	Idsumu	Owòrò
mouth	enu	arū	álu	árū	áárú	arū	arū
slave	erú	arú	ádú	erú	aru	aru	alu
family	ebí	-	-	-	-	-	-
five	aárú	méerú	elu	-	-	-	-
tooth	eyĩ/ehĩ	eyĩ	ényí	enyi	enyi	enyi	enyi
wind	efúúfú	awu	àfù	-	-	-	-
dry season	èèrú	Ūwòrè àrù arú ɣɔ	(Owò)	ārū	ārū	ārū	ārū
thorn	ègú	agúgú	ikéké	-	-	-	-
horse	esĩ	ačĩ	ànyà	asi edşi	adşi	aşi	adşi
Maxwell Duiker	etu	-	átu	-	-	-	-
gun powder	étù	-	-	etu	-	-	-
mat	ení	aní	(ulóko)	eni	áni	ani	-
load	erú	àrù	ádù	-	-	-	-
shirt (clothing)	èwù	àwù	(úkò)	ewu/ewu	awu	awu	awu
behind	lèhɾ	náàŋi	(ùbì)	-	-	-	-
laugh	rérĩf	ráàřf	ényányí	rārĩ	-	rārĩ	rani
leopard	ekù	-	-	-	-	-	-
monkey	edũ	-	-	-	ato	edu/ato	-



	Ànàgó	Ìgbómìnà	Àwòrì	Ìfàkì	Ifẹ̀	Ìjẹ̀ṣà	Ìjẹ̀bú
	erú	arū	eerú	εū	erū	erū	erū
	erú	arú	erú	erú	erú	erú	εlu
	ébf	abí	ebí	-	ebí	ebí	-
	-	Mérúú	-	-	eru	erū	àrú
	-	enĩ	-	-	enyĩ	enyĩ/eyĩ	enyĩ
	-	afúúfù	-	-	-	-	-
	-	ààrù	eru	-	erū	-	erūrū
	-	àgū	-	-	-	ègú	ègú
	-	ašĩ	edṣi	-	eṣi	esi/eṣi	-
	-	etu	-	-	etu	etu	etu
	-	ètù	etu	ètù	ètù	ètù	ètù
	eni	aní	eli	ení	ení	anyi/ení	ení
	érù	arù	erù	erù	erù	erù	-
	ewu	àwù	èwù	èù	ewu	èwù	èwù
	-	àpì	--	-	-	èyĩ	èyĩ
	erín	àrì(n)	erì(n)	-	rěrĩ	èrĩ	èrìn
	-	ekù	-	-	-	-	-
	edṣ	edū	edū	-	edō	edū	-

this word conforms to type. Thus:

márúúdílóǵú > méééǵǵú 'five less twenty'

Let us now turn to P-B (nasal vowel raising). Table VII and the last five words of Table IX (below) offer some supporting data, at least

Table VII

Some lexical items from Crowther's [1852] Yoruba Dictionary

	<u>English gloss</u>	<u>Crowther</u>	<u>Yorùbá</u> (present day)
1.	sickness	aròn	arùn
2.	nose-bleeding	amúròn	amúrùn
3.	axe	edòn	edùn
4.	accusation	èsòn	èsùn
5.	branch, bough	ettòn	etùn
6.	disease under the toes	eyòn	eyùn
7.	the bug	ídòn	ídùn
8.	hair	iròn	irùn
9.	fresh, new	tittòn/tittòn	titùn
10.	a saw	ayòn/ayùn	ayùn
11.	sweet, pleasant	dòn/dùn	dùn
12.	twin	edòn/edùn	edùn
13.	supplement	èkòn/èkùn	èkùn
14.	soundly	fòn/fòn	fòn fòn
15.	white	funfun/fufun	funfun
16.	to strew	fòn/fun	fòn fún
17.	to grow thin	fòn/fun	fòn
18.	to drink	mò/mu	mu
19.	to build	mò	mò
20.	to know	mò	mò
21.	to sink	mù	mù
22.	to ditch	ògbòn	ògbùn
23.	sense	qgbòn	qgbùn
24.	to weave, knit	wòn	wun hun
25.	them	wòn	wòn
26.	to itch	yòn;hòn	yùn;hùn
27.	to go; be pregnant	yùn	yùn
28.	bow	qrun	qrun
29.	neck	qron	qrun

for the raising of ɔ̃. In Table VII the following sets of items, 14 and 15; 18, 19, 20 and 21; 22 and 23; 24 and 25; 26 and 27; 28 and 29, suggest that contrast exists between ɔ̃ and ɔ̄ even in Crowther's day, and in the dialect (presumably, the Ọwu dialect) which formed the basis of his dictionary.

The five items in Table IX are even more interesting. All of the Qyq Yorùbá words in ɔ̄ have cognates in non-nasal ɔ̃ in Igala, and in either ɔ̃ or ɔ̄ in Ifé (Togo). This suggests that the shift ɔ̃ → ɔ̄ which is complete in Qyq (on which CY is assumed to be largely based) was in progress at the time the Yoruba speaking Ifé (Togo) migrated from the central Yorùbá speaking area, and the process has remained fixed since. Moreover this shift definitely applies to nasal vowels whose non-nasal counterpart can only be ɔ̃.

Table VIII, adapted from Fresco [1970], offers additional corroborating evidence in support of the raising of at least back nasal vowels:

Table VIII

	CY	K	On	If	Ok	A	ow	ob
hair	irũ	irũ	iɔ̃	Irũ	irɔ̃	irũ	-	irɔ̃
nose	imũ	imũ	imɔ̃	Imũ	imɔ̃	imũ	imũ	imɔ̃
testicles	ekpɔ̃	ekpũ	-	ekpɔ̃	ekpã	ekpɔ̃	-	-
axe	edũ	àáké	edũ	àáké	edɔ̃	-	-	edũ
full	kũ	kũ	kɔ̃	kũ	kɔ̃	-	-	kɔ̃
new	titũ	titũ	titɔ̃	tItũ	titɔ̃	tutũ	-	titɔ̃
far	jĩnɔ̃	jĩnã	jĩnã	jĩnã	jĩnã	-	-	jĩnã
inside	inũ	inũ	inɔ̃	-	inɔ̃	inũ	-	inɔ̃
drink	mũ	mũ	mɔ̃	mũ	mɔ̃	mũ	mɔ̃	mɔ̃
weave	hũ/wũ	hũ	ɲɔ̃	ũ	ɲɔ̃	-	-	ɲɔ̃
conceive	lɔ̃yũ	nɔ̃yũ	yɔ̃	-	yɔ̃	-	-	-

With respect to the posited  $\tilde{\epsilon} \rightarrow \tilde{\imath}$ , we cannot offer any systematic supporting data; we would like to point out, however, that a large number of occurrences of CY  $\tilde{\imath}$  have  $\tilde{\epsilon}$  correspondences in the Ijebu dialect. Examples:

$\acute{\text{og}}\tilde{\imath}\tilde{\text{n}}\tilde{\text{t}}\tilde{\text{t}}\tilde{\text{t}}$  (CY):                     $\acute{\text{og}}\tilde{\epsilon}\tilde{\text{n}}\tilde{\epsilon}\tilde{\text{t}}\tilde{\epsilon}$  (Ij) 'wet cold (usually experienced  
in the month of July)'  
and toponyms:

$\text{im}\grave{\text{u}}\tilde{\text{r}}\tilde{\epsilon}$  (Ij) (name of a town)

From the preceding discussion, it appears clear that P-A and P-B must be chronologically ordered. However, any ordering immediately raises embarrassing questions. Consider, for example, the following CY formatives:

$\acute{\text{a}}\tilde{\text{f}}\tilde{\text{t}}$	'albino'
$\text{ad}\tilde{\text{u}}$	'sweetness, pleasure'
$\text{e}\tilde{\text{d}}\tilde{\text{u}}$	'axe'
$\text{e}\tilde{\text{r}}\tilde{\text{t}}$	'laughter'

Since we do not know the conditions under which P-B applies, we are forced to posit the following underlying forms (set 1) for these formatives with respect only to P-B. (Set 1):  $/\acute{\text{a}}\tilde{\text{f}}\tilde{\epsilon}/$ ,  $/\text{ad}\tilde{\text{u}}/$ ,  $/\text{e}\tilde{\text{d}}\tilde{\text{u}}/$ ,  $/\text{e}\tilde{\text{r}}\tilde{\epsilon}/$ . On the other hand, on the basis of P-A, the last two items of the surface structure should derive from the following forms (set 2):  $/\text{ad}\tilde{\text{u}}/$  'axe',  $/\text{a}\tilde{\text{r}}\tilde{\text{t}}/$  'laughter', and the surface forms  $\acute{\text{a}}\tilde{\text{r}}\tilde{\text{t}}$  and  $\text{ad}\tilde{\text{u}}$  must be considered anomalous. One plausible suggestion is that these hypothetical forms co-existed synchronically at a particular stage of Proto-Yoruba. None of the forms posited violate the relative height co-occurrence restrictions. But they suggest that the changes recounted in P-A and P-B may have led to some kind of convergence, by which formatives of set 2 type converge with formatives like the last two of the items of set 1. Thus the two changes need not follow each other chronologically, they may be simultaneous. Interestingly enough both sets of hypothetical forms are attested in our comparative data (Tables VI, VII, and VIII). But it is equally remarkable that those dialects which have forms of set 1 type also have formatives in which high vowels

appear to have lost their nasality:

<u>CY</u>	<u>Ijebu/Egba</u>	
akī	aki	'the brave'
ègú	ègú	'thorn'

It is not clear just what this last observation should suggest in the development of the dialects concerned.

Table IX

<u>English gloss</u>	<u>Ifé (Togo)</u>	<u>Yorùbá (Qyq)</u>	<u>Igala</u>
testicles	ekpṣ̃	kóró ekpṣ̃	èkpá
animal	eřā	εřṣ̃	éla
bush cow buffalo	efṣ̃	εfṣ̃	éfà
flea	inā	inṣ̃	ítá
louse	inā	inṣ̃	íná
word, matter	àrṣ̃	òrṣ̃=òrṣ̃	ólá
yesterday	nṣ̃ṣ̃bé	ànṣ̃	óna
far	jīnò	jīnṣ̃	ṣ̃nájijí
leopard	ekṣ̃	ekú	ékṣ̃
bow	ṣ̃rṣ̃	ṣ̃rṣ̃	ṣ̃ṣ̃
axe	edū	edū àrṣ̃ ( 'stone axe, stone celt' )	édṣ̃
full (vb)	kú	kú	é-kṣ̃
new	titṣ̃	titū	é-titṣ̃

Table IX provides dramatically illustrative data in support of P-C. Notice that all low non-front nasal vowels in Qyq correspond to a in Igala and most often to ā in Ifé (Togo). This table as a whole suggests among other possibilities that before Igala and Qyq separated, the Proto-Yorùbá had both ṣ̃ and ā. Somehow, Igala denasalized these vowels, whereas Qyq, or rather the dialect which Qyq represents, raised ṣ̃ to ũ (by P-B), and backed ā (P-C). From all appearances, Ifé (Togo) separated from Qyq before both P-B and P-C became accomplished.<sup>12</sup>

<sup>12</sup>Armstrong [1965] takes ṣ̃ as the base form of low nasal vowel for Qyq. As already remarked, it is generally believed that CY is based on the Qyq dialect.

#### 4. Historical implications

We have so far accounted for only a part of the data presented in Table VI above, namely, that the forms in Ifé (Togo), Igala, Yagba, Eki, Idsumu, Qwórqò, and Igbomina represent an earlier stage of the  $\epsilon C \begin{Bmatrix} i \\ u \end{Bmatrix}$  observed in CY. The phonological change responsible for this shift is recapitulated by P-A. Let Ìjèṣṣà represent the five dialects Anago, Awori, Ìfàkì, Ifè, Ìjèṣṣà in Table VI, and Igbomina all the others except CY and Ìjèbù. Observe now that Igbomina formative initial a corresponds to  $\epsilon$  in CY, but to e in Ìjèṣṣà. Apparently, then, after P-A, Ijèṣṣà changes  $\epsilon$  to e before all high vowels as in P-D.<sup>13</sup>

P-D  $\epsilon$ -closing:

$$[+syl] \text{ ---} \rightarrow [-low] / \text{ \_\_\_\_\_\_ } [-syl] \begin{Bmatrix} +syl \\ +high \end{Bmatrix}$$

A look at other data from Ìfàkì, Ìjèṣṣà, and similar dialects in Bamgboṣe [1967] and Fresco [1970] however suggests a more pervasive phonological change than is suggested by P-D. Consider, for example, the following formatives which are characteristic of these dialects:

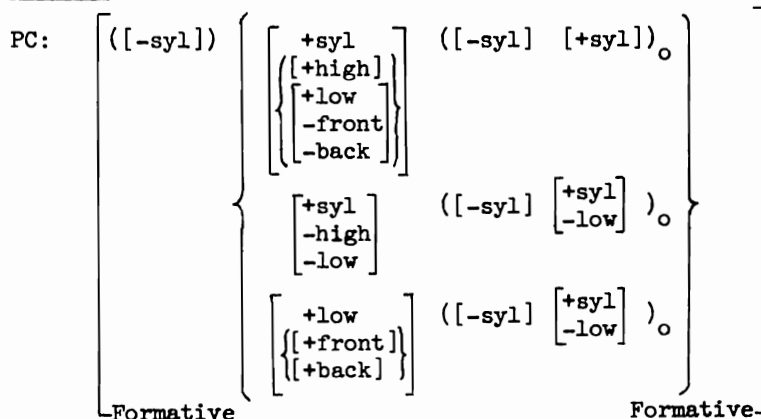
ɛŭrà	'water yam'
ɔwúrò	'morning'
ɛrìrà	'ants'
Ilá	'okra'
Ugbá	'calabash'
ɛúré	'goat'

In addition to the data in Table VI, these formatives lead to one conclusion, namely, that Ìjèṣṣà appears to have generalized the vowel occurrence restrictions in the underlying structure of CY (Table V). To achieve this it changes the restriction (or vowel harmony) feature from relative height of the tongue to tenseness, or tongue-root advancing

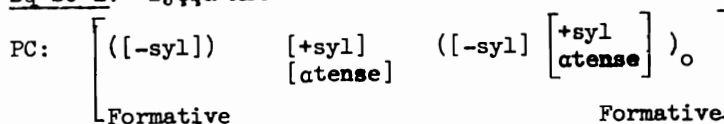
<sup>13</sup> Any other postulate, for example, that the Ijèṣṣà phonological change is independent of P-A, that is that (Igbomina) a ---> (Ìjèṣṣà) e, would not only involve more feature changes, but would also appear to be rather counter-intuitive.

(to follow Stewart [1967]). As a result the MSC which underlies Table V (call it Sq SC 1) now approximates Fresco's MSC (call this Sq SC 2) for Ìjèṣà:

Sq SC 1: CY MSC



Sq SC 2: Ìjèṣà MSC



(...)<sub>o</sub> means that the expression within the parentheses may be iterated any number of times or may be null. In any case, Sq SC 2 states that all the vowels in any formative must necessarily agree in tenseness.

Thus Ìjèṣà has

erú	'slave'
ebí	'family'
etu	'Maxwell's duiker'
ètù	'gunpowder'

but

erĩrà  
erÙkpè etc.

It is necessarily the case that all derived formatives in Ìjẹ̀ṣà (and the other dialects in its group) conform to Sq SC 2. In order therefore to avoid the theoretically implausible statement that Sq SC 2 re-applies "in the strict sense of predicting that a new lexical formative will not violate a given phonological constraint" (Fresco [1970:75]), we will assume that the constraints implied by Table V, and Sq SC 1 underlie all dialects of Yorùbá including Ìjẹ̀ṣà. Sq SC 2 must then be a phonological rule which applies in some dialects but not in others. The rule is as follows,

P-E: Ìjẹ̀ṣà vowel harmony generalization:

$$[+syl] \rightarrow [atense] / \text{---} ([-syl] \left[ \begin{array}{l} +syl \\ atense \end{array} \right] )_1$$

where (...) <sub>1</sub> means that the expression within the parentheses may be generated at least once.

Contrary to Fresco's assumption, then, it is Ìjẹ̀ṣà and the other dialects of Yorùbá in its group that have innovated by greatly simplifying the vowel co-occurrence restrictions. Notice, however, that while we thus arrive at the same conclusion with Bamgboṣe [1967:273] that vowel harmony is more "extensive" in Ìjẹ̀ṣà and Èkítì than in CY, and assume with him that "the more complex pattern represents the older form of the language", we differ from him in our own conception of complexity. First of all, Bamgboṣe's complexity is based on the number of vowel "phonemes" that can be attributed to a given dialect. Since he finds that CY has seven vowel phonemes to Ìjẹ̀ṣà's nine, he concludes that Ìjẹ̀ṣà must be more complex, and therefore older. But as we have just shown, Ìjẹ̀ṣà's so-called nine vowel system implements a vastly simplified co-occurrence restriction system statable in the form of a phonological rule which must be considered peculiar only to certain dialects of the language and absent in the others. These "others" are referred to by Fresco [1970:99] as "dialects which do not require a P-rule of tenseness assimilation" and include CY, Ìjẹ̀bú, Ondo, Qyq, among others. Ìjẹ̀ṣà and not CY is therefore the innovating dialect of Yorùbá.<sup>14</sup>

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<sup>14</sup>Dr. Kay Williamson [personal communication] has suggested the following as another plausible account of the data in Table VI. Suppose



We are now in a position to show that in fact Ìjẹ̀ṣà does not have nine phonological syllabic segments. As stated at the outset of this paper both Bamgboṣe [1967] and Fresco [1970] hold that Ì and Û are phonological segments in Ìjẹ̀ṣà as in Igbirra. They base their conclusion on formatives such as those already given above, namely:

Ìfàkì:	
odú	'year'
orú	'neck'
Irú	'hair' (see Table VIII)
Ìjẹ̀ṣà and Èkìtì:	
sú	'move away'
sì	'serve'
Ìdú	'bedbug'
Ūrī	'iron'

The fact that these dialects do not have I and U render this conclusion suspicious, in the first place. And the merger posited for I, i and U, u must be considered implausible because these pairs have never been shown to exist in any dialect of Yorùbá and at any stage.

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$\varepsilon \rightarrow \begin{Bmatrix} a \\ e \end{Bmatrix}$  instead of the proposed  $a \rightarrow \varepsilon \rightarrow e$ . The CY could still be retained as the Proto-form while we explain Ìjẹ̀ṣà forms with single P-rules each instead of two for Ìjẹ̀ṣà.

Dr. Williamson advanced two main reasons for this hypothesis. First her research on Nigerian languages suggests that  $\varepsilon \rightarrow \begin{Bmatrix} a \\ e \end{Bmatrix}$  changes are very common. Secondly a is the least marked in the Yorùbá vowel system. Hence it is reasonable for changes to be in the direction of the least marked vowel. It does not appear, however, that Dr. Williamson's proposal can provide a satisfactory account for the observed vowel co-occurrence restriction in Yorùbá. All the CY formatives with a followed by high vowels, as well as derived formatives of the same become exceptional. Secondly there is little argument to support the supposition that phonological changes tend to be in the direction of least marking. Assuming, for example, that a is the least marked among vowels, how does one explain the Germanic umlaut; the fronting of Latin a in French (Fr.) cité < (L) civitatem; (Fr.) fait < (L) factum; and a  $\rightarrow$  æ observed in the Akan languages (Schachter and Fromkin [1969]). This is not to say that Dr. Williamson's proposal has no substance. On the contrary, it has interesting possibilities if the difficulties it raises can be resolved.

Consider, on the other hand, the following facts: P-B has been shown to recapitulate a historical change in the language. Now this P-rule applies only to low vowels. That is to say, in terms of Universal Marking Conditions (as in Fresco [1970]), P-B raises only nasal vowels which are inherently [U tense], interpretable naturally as [-tense]. Now P-B changes only the feature [-low]. This means that in dialects such as Ìjẹ̀ṣà and Ìfàkì the formatives above have the following underlying forms: /ɔd̥ṣ̄/, /ɔr̥ṣ̄/, /l̥r̥ṣ̄/, /s̥ṣ̄/, /s̥ḗ/, /l̥d̥ṣ̄/, /ŭř̥ḗ/. After P-B, the vowels remain non-tense, or root-unadvanced (in Stewart's terminology). Formatives number 7, 8, and 29 in Table VII offer a partial confirmation of this account. It is possible that Ketu ũ which Fresco [1970] considers a merger of Ũ and ̄ is actually ̄ transcribed as ũ. There is some evidence that Ketu, like Ègbá, has denasalized Ũ but maintained ̄ with hardly any trace of ̄ (see Table VIII above). Otherwise such Ketu forms as

oŭ	(CY: oh̄)	'voice'
iHŭ	(CY: oh̄)	'thing'
enŭ	(CY: en̄)	'mouth'
ɔdŭ	(CY: ɔd̄)	'year'
íràwò	(CY: íràwò)	'star'
ewúré	(CY: ewúré)	'goat' (Fresco [1970:11])

would be inexplicable. In short the so-called phonemes Ĩ and Ũ result from changes recounted by P-B. Hence they have no oral counterparts.

##### 5. Conclusion

In conclusion, this paper has attempted to chart a new territory in the account of the Yorùbá vowel co-occurrence restrictions, incorporating data not available to Fresco in his important work. In particular, I have suggested that the vowel co-occurrence restrictions observable in common ("standard") Yorùbá represent an earlier stage than what obtains in dialects such as Ìjẹ̀ṣà, Ìfàkì, and so on. I have posited four phonological rules P-A, P-B, P-C, P-D and one morpheme structure condition (Sq SC 1) to account for the restrictions. On the basis of

these postulates I have suggested that any account which posits a nine vowel system for any dialect of Yorùbá is untenable; in short, that Ìjẹ̀ṣà like CY has a seven vowel system (i, e, ε, a, ɔ, o, u) plus 3 or 4 nasal vowels in the formative stem; a four or five (with the addition of u) vowel system (i, e, a, o, u) for the prefixes. The P-rules do not apply in all dialects of Yorùbá. Thus only the first three apply in CY, but all four in Ijẹ̀ṣà.

In the light of the foregoing we can now state emphatically that the vowel harmony grades of CY are

1. a, e, i, o, u, and
2. a, ε, i, ɔ, u;

a, i, and u are neutral, but with the condition that a as a stem vowel takes a second grade vowel as prefix. Compare this situation with Greenberg's [1963:35] observation that

In Proto-Bantu within the morpheme, e and o reciprocally exclude ε and ɔ. Further there are verbal derivatives in which alternations, o ~ ɔ and o ~ ε occur.<sup>15</sup> Since the remaining vowels a, i, and u occur with both sets, we have a system of two principal grades with three neutral members in each:

1. a, e, i, o, u
2. a, ε, i, ɔ, u.

The specific form of principal harmony in Twi with nine vowels, a as neutral but taking low harmony when a root vowel, is extremely widespread in Africa and is found in Kabre, a Voltaic language, Ijɔ, and Masai in East Africa, a fact which will ultimately have to be explained.

Needless to say that the last word is not yet said on the vowel harmony in Yorùbá, even with the conclusions we have reached in the present study. But hopefully we are now in a position to examine the vowel harmony restrictions in Kwa languages as a whole from a new perspective.

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<sup>15</sup>It appears that the ("o ~ ε") alternation in this passage is a typographical error, and it should be e ~ ε.

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