EDITORIAL NOTE

We are happy to present as our first supplement and companion to volume 1 Edward M. Fresco's Topics in Yoruba Dialect Phonology. Aside from its obvious interest for the study of Yoruba and West African Linguistics, we feel Mr. Fresco's work is also of great interest for students of Dialectology and comparative studies in Phonology. With the publication of this first supplement to the Journal, we hope to initiate a custom that will be continued in the following volumes.

The Editors

STUDIES IN AFRICAN LINGUISTICS

Supplement to Volume 1,

December, 1970

Topics in Yoruba Dialect Phonology

by

Edward Max Fresco

For John and Sophie

and the six million who did not survive

I owe a debt of gratitude to many people--too many to properly acknowledge here. Most especially I want to thank my informants, without whom this non-native speaker would still be a babbling infant; Professor William Welmers, who introduced me to the study of African languages and to the discipline of field work, and who allowed me to find my academic stride without losing patience; and Professor Vicki Fromkin, who gave so much of her time and interest to see this work through from its beginning to its final form.

To the Institute of African Studies of the University of Ibadan and its Director, Professor Robert Armstrong, my sincere thanks for their hospitality and for extending Associate Membership in the Institute to me during the 1967-68 academic year. This year in the field was made possible in part by an NDEA fellowship from the U. S. Department of Health, Education and Welfare. Additional support for this research was provided by the National Science Foundation.

E. M. F.

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Introduction

0.0 Yorùbá is one of the three major languages of Nigeria. The Yorùbá-speaking people live in southwestern Nigeria, in the area roughly coextensive with the Western and Lagos States, in southern Dahomey, and in enclaves in Togo. Their overall population is unknown. [1] Within Nigeria, the Yorùbá community numbers approximately 10 million. The language is a member of the Kwa branch of Greenberg's Niger-Kordofanian family (1963, Chapt. VII).

0.1 This is a study of selected topics in Yorùbá dialectology, using observations from eight dialects, seven of which are spoken in Nigeria and one on both sides of the Nigeria-Dahomey border.

The theoretical point of departure is that the synchronic analysis of a dialect must be motivated by dialect-internal considerations. Evidence from other dialects can be used in two limited functions: it can serve a heuristic function, that is, it can guide the search for internal evidence relevant to deciding some issue. And it can be used to decide among alternative analyses that have been reached on the basis of dialect-internal considerations, but which appear to be equal in complexity. This is a fairly traditional stand. To a greater or lesser extent it has been the implicit theoretical and methodological assumption in grammars that follow the transformational-generative model; Becker (1967) explicitly argues for this approach in his study of three German dialects.

The alternative approach, that of admitting dialect-comparative evidence into the analysis of any single dialect, or, more usually, of considering that the optimal grammar is one which achieves pan-dialect validity, has been a subject of recent discussion, particularly with respect to phonology. C-J. Bailey (1968) has given this view its most explicit formulation. Among the postulates which he considers as axiomatic for descriptive linguistics are

> 3) During ten to fifteen years of language acquisition a child normally gains some knowledge of a large number of dialects--viz. the multiple of the age, regional, ethnic and other class idioms that he has to deal with--including those on the communication media.

> 4) Rather than supposing that the child formulates separate grammars for the separate idioms just mentioned, it is to be assumed that the child constantly revises a single mental representation of the underlying reality...in question.
>
> 5) The resulting communicational competence and one's speaking competence constitute but a single competence. (1)

He goes on to note that the resulting grammar constructed by the child could scarcely be different from the comparativist's grammar based on internal reconstruction using the same dialectal information available to the child.

Chomsky and Halle (1968), although they do not seem to take the position that pan-dialect validity for the grammar is a theoretical necessity, do appear to find merit in this position. One finds a number of statements throughout The Sound Pattern of English in which their assumptions with respect to dialect variation are given:

> ...it seems to us very likely that the underlying lexical (or phonological) representations must be common to all English dialects, with rare exceptions, and that much of the basic framework of rules must be common as well. (x)
>
> ...very different dialects may have the same or a very similar system of underlying representations. (49)
>
> There has...been little change in lexical representation since Middle English, and, consequently, we would expect (though we have not verified this in any detail) that lexical representation would differ very little from dialect to dialect in Modern English. (54)

Dialects, in their view, differ mainly in rule ordering and low-level rules which spell out phonetic detail.

However, they do not deny that some forms may receive different underlying phonological representation. For instance they state that in some varieties of British English the noun corollary should have the base form /kɒrɔl+Ar + y/, rather than the American English /kɒrV̆l + Ar + y/. (137) And

it seems that they also do not rule out the possibility of different dialects requiring different (though clearly not radically different) feature-sets. This is my interpretation of the statement that 'for any particular dialect, **the** feature specifications and the appropriate phonetic rules [for the phonetic realization of [ə]] can be established.' (110)

Thus it is unlikely that Chomsky and Halle would subscribe in whole, perhaps or even in large part, to Bailey's position that the competence of the native speaker is a **pan-dialect** competence, and that the grammar, as a theory of competence, must capture this tacit knowledge. To the extent that the positions converge with respect to the role of dialect information in the formulation of a grammar, however, they are open to criticism on a number of fundamental issues. One needs to ask of the resulting grammar such questions as: How does the native speaker arrive at underlying representations and rules? Where does the grammar stand with respect to claims reflecting competence? Can it claim, post hoc, that it characterizes competence in the usual sense on the assumption that, in order for the speaker to have arrived at the posited underlying form or P-rule, he must have been exposed to the dialect(s) which contain the proper clue? If only a geographically distant dialect furnishes such a clue, is this assumption weakened? Some languages contain dialects which are mutually unintelligible, but the gradation from one dialect to another is such that all contiguous areas can communicate effectively with each other (e.g. the gradation from De to Tchien, with the intervening dialects of Bassa, Kru, and Krahn, is such a case in the complex linguistic situation of Liberia). How are these matters to be incorporated into a single pan-dialect description?

These and many others are issues to which the approach which I have rejected must address itself, and which the approach taken in this study largely, but not entirely, avoids (not, for example, in the case of possible counter-examples to some posited regularity, where an explanation in terms of unassimilated borrowing from another dialect may seem reasonable). Concomitantly, no attempt is made to formulate pan-dialect rules, nor to arrive at underlying representations that are shared by all dialects, for this, as Bailey points out, would not be different from doing a comparative reconstruction of Proto-Yorùbá.

0.2 The first three chapters are devoted to a number of issues in Yorùbá phonology that have received attention in recent literature, both published and unpublished. It is shown that the independent analysis of various dialects sheds light on hitherto unclear problems of general interest. Often, previous analyses are called into question and other solutions proposed, which are hopefully better motivated.

Chapter 1 discusses vowel harmony in a number of dialects and analyzes this phenomenon in terms of the feature [± Tense]. Previous work on this problem, beyond simply stating the limitations on vowel cooccurrences, includes Ladefoged (1964), Awobuluyi (1967a), and Courtenay (1968). It is Ladefoged who, to my knowledge, was the first to give the label tense-lax to the vowel harmony system of Yorùbá (1964, 37-8). Awobuluyi briefly discusses how vowel harmony can be seen to operate in derived nouns, the nominalizing prefixal elements obeying the same constraints on cooccurrence between prefix and stem vowels which characterize the harmony system within lexical nouns. Courtenay contains a brief analysis of the vowel harmony which operates over the first two vowels of nouns. The feature [Tense] is used in the description of constraints on vowel sequences, but, it is suggested here the motivation for this feature is inadequate. Chapter 1 attempts to present a well-motivated analysis of the surface structures over which this phenomenon operates and of the features which are used to characterize it.

A number of linguists have concerned themselves recently with the general question of vowel harmony. Kiparsky (1968a) has dealt with this phenomenon in relation to the abstractness of lexical representation, with particular reference to 'neutral' vowels. Others who have published their views on the subject in recent years are Zimmer (1967), Aoki, (1968), and Schachter and Fromkin (1968).

It is hoped that this detailed description of the vowel harmony systems found in a number of dialects of Yorùbá will contribute in some measure to an area which is currently of great interest because of its potential for contributing to the advancement of phonological theory.

Chapter 2 analyzes the so-called subject pronouns in the light of evidence for their derivation on dialect-internal grounds in several dialects. Included is a reevaluation of the problem as first presented by Stahlke (1969). Stahlke attempts to show that these pronouns are derived, bimorphemic

elements, and that in their underlying form they are directly relatable to the corresponding independent pronoun set. While agreeing with Stahlke on the derived nature of these pronouns, I indicate in this chapter that the claim of direct relatability cannot be motivated.

Chapter 3 takes up four further issues in Yorùbá phonology: secondary nasalization of vowels; the analysis of consonant-initial nouns; the permissibility of various vowel sequences in nouns at the level of lexical representation; and the analysis of nasal consonants and the nasalized vowels which follow them. Each of these issues has received some attention in the literature. Each problem is now examined in the light of the analysis it requires independently within dialects. An attempt is made to see how some of the problems raised help to shed light on matters of general concern in the theory of phonology, such as constraints on underlying forms, the 'naturalness condition', and the role of morpheme structure conditions within a theory of the lexicon.

Chapter 4 focuses on a number of points in the phonological structure of individual dialects. The issues discussed are of interest in that they involve phenomena unique to a single dialect or shared by a small number of dialects, but not by the majority. As in the earlier chapters, problems are raised which have not received satisfactory resolution in generative phonological theory, and some attempt is made to arrive at possible solutions.

Appendix 1 is a wordlist of approximately 1,000 forms -- nouns, verbs, adjectives, adverbs, and particles -- in the eight dialects covered in this study. The number beside the gloss of an item when it is cited in the text refers to the number of that item in Appendix 1. Appendix 2 contains lists of nouns whose sequences of vowels constitute violations of tenseness agreement. Appendix 3 is a speculative excursus on why Yorùbá contains no nasalized vowel prefixes.

0.3 As implied above, the theoretical position taken in this study is that diachronic considerations ought not to influence the synchronic analysis. But the reverse procedure, of drawing historical inferences from the contemporary analysis, is, I believe, legitimate and viable. Throughout this study such inferences will be made. One result of this procedure is a new insight into the effects

which historical changes may have on the subsequent grammar, namely, that the deletion of rules, the deletion of segments by a rule, or the simplification of a rule, at an earlier stage in the grammar, leave behind their effect in the form of morpheme structure constraints that must be formalized as conditions on morpheme structure in the synchronic grammar. (see sec. 0.4.2 below). Thus, for example, the effect of a tenseness assimilation rule which has been dropped from a number of Yorùbá dialects is retained in the form of a constraint on tenseness in sequences of vowels in the lexical representation of nouns. This is a way of viewing the relation between historical rule-change and synchronic description which, to my knowledge, has not received attention before.

0.4.1 The model which I follow is that of generative phonology, in particular the recent reconsiderations and revisions of phonological theory by Stanley (1967), Chomsky and Halle (1968), Postal (1968), and Kiparsky (1968a, 1968b). According to these recent formulations of the theory, phonological matrices (i.e., lexical representations), in their most abstract form, are given largely in the form of M(arked) and U(nmarked) feature values. A set of Universal Markedness Conventions (UMCs) then converts M-U specifications into plus-minus values. After all Ms and Us have been so converted, dictionary entries are fully specified in their phonological matrices. A partially ordered set of phonological rules (P-rules) operates on these binary-valued abstract matrices and, in principle, converts them into phonetically specifiable matrices, in which at least some features appear in terms of scalar values.

0.4.2 Postal (1968, 177-179) accepts as given that, with the notion of markedness incorporated into the lexicon, and the attendant requirement of full phonological specification, there is no longer any need for a formal statement of morpheme structure constraints. The function of these constraints in the earlier form of the theory was to capture the notion 'possible morpheme in the lexicon'. He suggests that this notion is now to be viewed as inherent in M-U markings, the class of possible morphemes now being defined as 'that class of M-U matrices which can be fully specified as +, - matrices without making use of any universal interpretation rule for M values which is not used in interpreting the M-U matrices of [language L]'. (178) And thus, 'the impossible phonological matrices are necessarily those which involve M specifications for features in positions where all actual morphemes contain only U specificiations'. (179) But,

he notes, not only must all M and U values be taken into account, but also 'the full set of language particular phonological rules' (178n), since these rules can permute, delete, add to, and otherwise distort underlying segments and sequences. Note that, under Postal's interpretation, if we wish to ascribe any psychological reality to the notion of possible/impossible morpheme, as I think we must, [2] we must take this claim not only for all underlying matrices, but correspondingly for all UMCs and for each language-specific P-rule we posit. Although this may be one of our ultimate aims, given the present state of our knowledge of the range of possible phonological systems and processes, I feel we need to be more circumspect in the claims we make for our linguistic descriptions. Furthermore, it is not necessary to rely on the present rudimentary knowledge of markedness in this matter. It is my suggestion, to which I shall adhere in the present study, that morpheme structure constraints can still be explicitly stated in the grammar by incorporating into the lexicon a set of Morpheme Structure Conditions (MS Conditions. Cf. Stanley (1967)). These conditions are in the form of partially specified phonological matrices which give a formal characterization of permissible segments and sequences of segments at the level of lexical representation. The present study employs (1) Positive MS Conditions (PCs), and (2) If-Then MS Conditions. Both types may be either segment or sequence structure conditions. These four sorts of MS conditions may be schematically presented as follows, each X,Y, and Z representing a partially specified systematic phonemic matrix, and w representing a feature or set of features:

Positive Segment Structure Condition

PC $\quad [_{C} \quad [X]$

The initial segment of syntactic category C consists of the partially specified phonological matrix [X]. In the lexical structure of Yorùbá, this schema can be illustrated by the following condition :

All dialects: Positive Segment Structure Condition

PC $\quad \left[_{N} \begin{bmatrix} +\text{Voc} \\ -\text{Cons} \\ -\text{Nasal} \end{bmatrix}\right.$

The intial segment of a noun is a non-nasalized vowel.

Positive Sequence Structure Condition

$$PC \quad [_C \quad [X] \quad [Y] \quad [Z]$$

The initial three segments of syntactic category C consist of the partially specified phonological matrices [X], [Y], and [Z]. For Yorùbá, this schema is exemplified by:

Oǹdó: Positive Sequence Structure Condition

$$PC \quad [_N \; [V(C)V(C)V] \;]_N$$

In the dialect of Oǹdó, nouns may consist of any of the following sequences: VCVCV, VCVV, VVCV, and VVV.

If-Then Segment Structure Condition

$$\begin{array}{lll} \text{If} & [_C & [X] \\ & & \Downarrow \\ \text{Then} & & [w] \end{array}$$

If the initial segment of syntactic category C consists of the partially specified phonological matrix [X], then[X] receives the further feature(s) [w]. To illustrate with Yorùbá:

Common Yorùbá, Kétu: If-Then Segment Structure Condition

$$\begin{array}{ll} \text{If} & \Big[_N \begin{bmatrix} +\text{Voc} \\ -\text{Cons} \\ +\text{High} \end{bmatrix} \\ & \quad\Downarrow \\ \text{Then} & \;[-\text{Back}] \end{array}$$

In the dialects of Common Yorùbá and Kétu, if the initial vowel of a noun is [+High] (i.e., i or u), then it will be [-Back] (i.e., i). This is the way in which it is predicted in these two dialects that there are no nouns in their lexicons which begin with /u/.

If-Then Sequence Structure Condition

$$\begin{array}{llll} \text{If} & [_C & [X] & [Y] \\ & & & \Downarrow \\ \text{Then} & & & [w] \end{array}$$

If the intial two segments of syntactic category C consist of the partially specified phonological matrices [X] and [Y], then matrix [Y] receives the further feature(s) [w].

Oǹdó: If-Then Sequence Structure Condition

If $\begin{bmatrix}+\text{Voc}\\-\text{Cons}\end{bmatrix}$ $\begin{bmatrix}+\text{Voc}\\+\text{Cons}\end{bmatrix}$ $\begin{bmatrix}+\text{Voc}\\-\text{Cons}\end{bmatrix}$

$\Downarrow$

Then [+Anter]

In the dialect of Oǹdó, if a liquid ($\begin{bmatrix}+\text{Voc}\\+\text{Cons}\end{bmatrix}$) occurs in intervocalic position, then it will be /l/ ([+Anter]),not /r/ ([-Anter]).

No Negative MS Conditions (cf. Stanley (1967, 427-428)) are employed.

0.5.1 The Universal Markedness Conventions mentioned in sec. 0.41 are intended to reflect what is 'more natural', 'more to be expected' in phonological systems and processes in human language. Thus in many languages it has been noted that vowels which are [+Low] function as [+Back] segments with respect to phonological processes. For example, in several dialects of Yorùbá there is a process which converts /ã/ to [õ] in a given context. If the [+Low] vowel a̲ were [-Back] in its underlying lexical representation, the P-rule converting /ã/ to [õ] would be more complex to state, since it would need to state not only the change from [+Low] to [-Low], but also the change from [-Back] to [+Back]. It is in this sense that [+Low] vowel segments are more naturally seen as [+Back] than as [-Back] segments. And it is observations such as this which the UMCs attempt to capture.

The notion of markedness is directly relevant to the linguistic concept of complexity of the grammar. Systems and processes which are more natural, in the sense of the paragraph above, ought to make the overall description of any particular language less complex, less 'costly'. It is for this reason that lexical matrices, in their most abstract form, are specified to the greatest extent possible in terms of Marked and Unmarked configurations. Each U value appearing in a lexical matrix is without cost in terms of the complexity of the lexicon. Only M values and + and - values

add to the complexity. The UMCs have the interpretive function of taking the M and U values in the lexicon as input, and interpreting them as plus and minus specifications. These +, - values then form the input to the phonological component of the grammar.

It should be pointed out that the UMCs, as they are presently viewed within the theory of grammar, are really nothing more than descriptive devices, formalizations of and generalizations from observed phenomena in language. They are not in any clear sense explanations of these phenomena.

0.5.2 The following UMCs for vowels are used in this study (Conventions 1-6 are Chomsky and Halle's Conventions (VI)-(XI) (1968, 405)):

1. (VI) [ULow] → $\left\{ \begin{matrix} [+\text{Low}] \ / \left[\begin{matrix} \overline{\text{UBack}} \\ \text{URound} \end{matrix} \right] \\ [-\text{Low}] \end{matrix} \right\}$

2. (VII) [+Low] → [-High]

3. (VIII) [UHigh] → [+High]

4. (IX) [+High] → [-Low]

5. (X) [UBack] → [+Back]/[$\overline{+\text{Low}}$]

6. (XI) [URound] → $\left\{ \begin{matrix} [\alpha\text{Round}]/\left[\begin{matrix} \alpha\text{Back} \\ -\text{Low} \end{matrix} \right] \\ [-\text{Round}]/[\overline{+\text{Low}}] \end{matrix} \right\}$

7. [UTense] → $\left\{ \begin{matrix} [-\text{Tense}]/[\overline{+\text{Low}}] \\ [+\text{Tense}] \end{matrix} \right\}$

8. [UNasal] → [-Nasal]

Conventions for liquids, glides, and consonants will be referred to in the text as they are used.

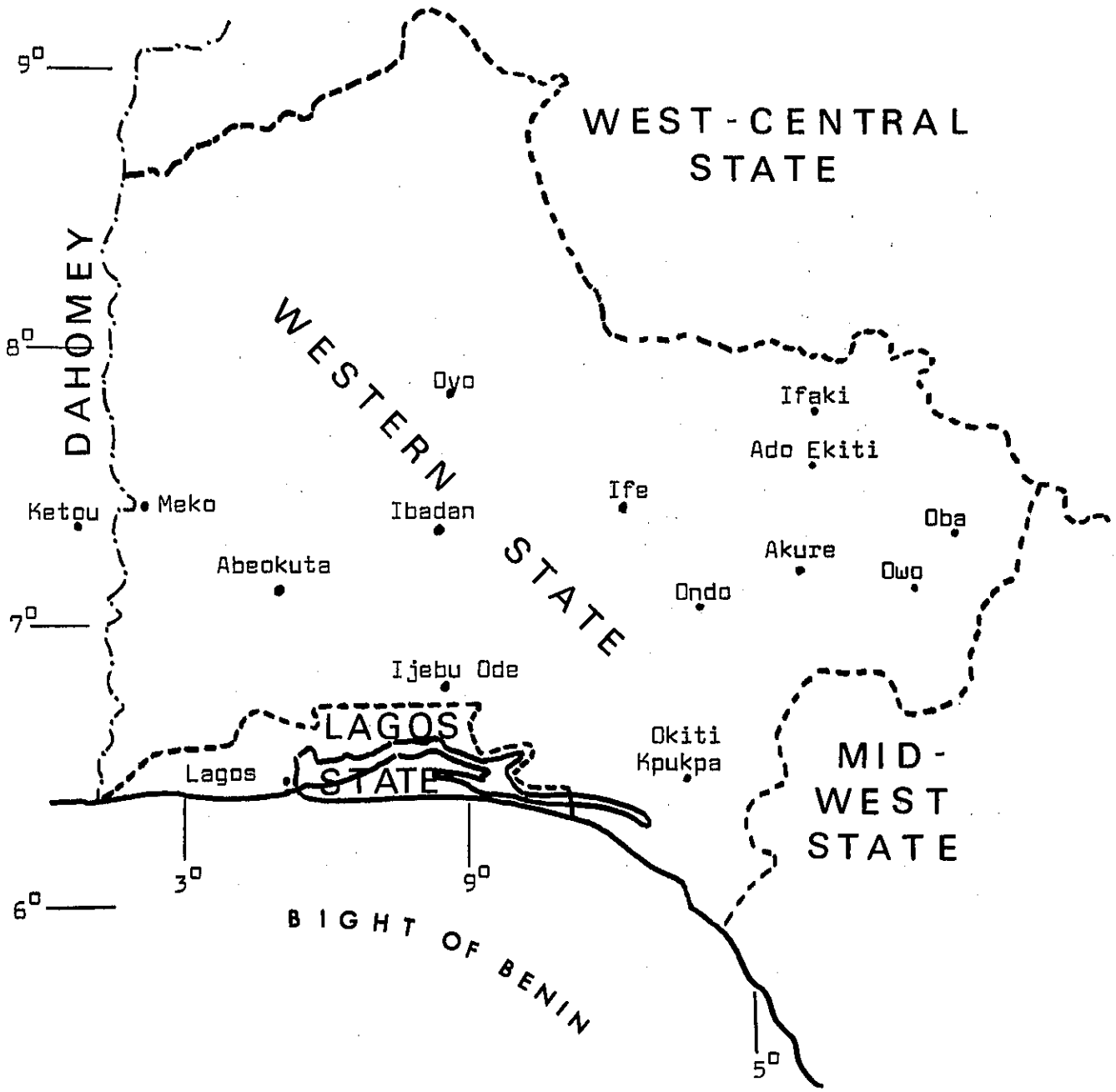
0.6.1 The following are the dialects on which this study is based (for the values of the tone symbols, see below):

Dialect	Abbreviation used in text
Common Yorùbá	CY
Kétu	K
Oǹdó	Oǹ
Ifàkì	If
Òkìtì Kpukpa	Òk
Àkúré	Àk
Ɔ̀wɔ̀	Ɔ̀w
Ɔ̀bà	Ɔ̀b

0.6.2 Some comment is in order concerning the choice of names. For Oǹ, Ìf, Òk, Àk, Ɔ̀w, and Ɔ̀b, I have simply used the name of the home town of the informant. Each of these towns contains the largest concentration of speakers of that linguistic area. The dialect spoken in Oǹdó is known locally as Ekímògún [ɛkímôgũ̀]. Speakers of Yorùbá living in and around the town of Òkìtì Kpukpa consider their dialect to be a separate language and call it Ìkálẹ̀ [ìkálê].

The center of the Kétu-speaking community is more diffuse, being divided between the towns of Mẹ̀kọ [mɛ̀ɛ̀kɔ] [3] in the Western State of Nigeria, and Ketou [4], in Dahomey, some 25 miles by trail from Mẹ̀kọ. Kétu is the generally recognized name for the dialect in both towns. On the Nigerian side of the border, this dialect is also spoken in the villages of Ìjàká, Iwoyè, Ìlárǎ, and Ìdọ̀fà. [5]

The dialect I am calling Common Yorùbá is usually referred to as Standard Yorùbá. No study has been undertaken of this dialect with a view to determining its homogeneity, its areal spread, and the sociolinguistic factors affecting its use and acceptance. It is often said that CY is based on the dialect of Òyọ́, a town 33 miles north of Ìbàdàn. (cf., e.g. Armstrong (1965, 52), Courtenay (1968, 1)). On the other hand, the lack of standardization of CY has been noted by a number of linguists (Stevick, (1963,x), Bamgbọse (1966, 8), Adetugbo (1967, 9), and Courtenay (1968, 1)). This dialect is partially reflected in the orthography, spelling, and syntax of Yorùbá school texts. But it is obvious that complete standardization has not been agreed upon. [6] CY is also the form in which the Western Nigeria Broadcasting Corporation (WNBC) broadcasts its Yorùbá language programs.


9°
8°
7°
6°
3°
9°
5°
DAHOMEY
WEST-CENTRAL STATE
WESTERN STATE
MID-WEST STATE
LAGOS STATE
Oyo
Ifaki
Ado Ekiti
Ife
Ketou
Meko
Ibadan
Oba
Akure
Abeokuta
Owo
Ondo
Ijebu Ode
Okiti Kpukpa
Lagos
BIGHT OF BENIN

Radio is a means by which CY receives wide dissemination, particularly through Rediffusion [7] [rɛdɪfyuwžn], which reaches a great number of villages which would otherwise not receive much exposure to CY. Since the WNBS has its studios in Ìbàdàn, this city may in some sense be said to be the focus and center of CY.

Chapter 4, sec. 4.3, discusses a phonological issue which clearly indicates that CY consists not of a single, homogeneous dialect, but rather of a set of sub-dialects. These things considered, perhaps some agreement may still be found among linguists and other interested investigators on the use of the term koiné for this variety of Yorùbá. [8] The term 'standard' seems at present to be somewhat premature, and 'common' is therefore suggested as more descriptive of the current state of knowledge. [9]

0.7 There is a fair amount of dialect mixing in my raw data. That is, the informant, having understood that the investigator wished information about his own dialect, would unconsciously use a lexical item, alone or in a construction, which was not from his dialect. Sometimes he would catch the slip immediately; sometimes on re-elicitation the dialectal form would be given. At times the investigator was able to call attention to the fact that the form in question was identical in shape in one or more other dialects, with the same or a related meaning. Such observation could serve to call forth the alternate form proper to the dialect. Generally the items for which the parallel form in the informants own dialect would later emerge would be from the dialect of intercommunication, CY. Some instances of this dialect mixing:

K	šùgbɔ́	'but'	(ʿCY)	later changed to K àmɔ́
Oǹ	àkùkɔ	248 cock	(ʿCY)	" Oǹ àkìkɔ
ɔ̀b	ɛrũ	60 mouth	(?ʿɔ̀w, Àk)	" ɔ̀b aũ

In a few instances two forms exist side by side, one form having been borrowed or partially borrowed from another dialect, the other belonging to the dialect proper. For example, the Òk informant gave both méèsã̀ and méèhã̀ as the numeral '9', with the explanation that méèhã̀ is the 'older' form.

ȍk has [h] wherever other dialects have [s], whereas ȍk [s] occurs where most other dialects have [š]. I thus take mɛ́ɛ̀sá̋ to be a form which indicates the substitution of [s] for [h] through borrowing. Whether the source dialect is CY cannot be determined.

The observation that borrowing seems to be largely in the direction of the dialect of intercommunication receives support from Gumperz' study of the sociolingistic structure of the northern Norwegian town of Hemnes (Gumperz (1966)). He states:

> ...it would seem that dialectal variation and intergroup differences...indicate two different but simultaneous on-going processes within the same community. Dialectal variation reflects a long-term gradual adaptation in speech habits. The trends observed in Hemnes lead us to predict a gradual reduction of phonetic differences between the dialect and the standard, accompanied by gradual assimilation of dialect grammatical forms to the standard. Specific symbols of separateness may be maintained, but the total language distance appears to be decreasing. (38)

0.8 All dialects studied have three systematic phonemic tones (pitch levels): high, mid, and low. As part of the universal phonetic alphabet of features, they are designated as [+HIGH], $\begin{bmatrix}-\text{HIGH}\\-\text{LOW}\end{bmatrix}$, and [+Low], respectively. These features are not to be confused with those indicating vowel height, which are given in lower case letters. The representing symbols for these tones, marked over all vowels and syllabic nasal consonants, are : V́ (accute accent) = [+HIGH] tone; V̀ (grave accent) = [+LOW] tone; V (unmarked over vowels) and N̄ (macron over syllabic nasal consonants) = $\begin{bmatrix}-\text{HIGH}\\-\text{LOW}\end{bmatrix}$ tone. Phonetically, an extreme tone (i.e. [+HIGH] or [+LOW] tone) is a gliding tone after the opposite extreme tone. Thus, [+HIGH] after [+LOW] is a glide from low to high, and [+LOW] after [+HIGH] is a glide from high to low. Due to various deletion rules, a tone may also be a gliding tone, phonetically, when these conditioning factors are absent. Where necessary for exposition of phonetic detail, these gliding tones will be indicated by V̌ (glide from low to high), and V̂ (glide from high to low). Other matters of phonetic detail with

respect to tone are discussed as they arise in the text.

These tones may be illustrated in forms of the sequence vowel-{consonant / glide / liquid}-vowel (citations are from Common Yorùbá):

high + high	ó mṹ	he carried (452 carry mṹ)
high + mid	ó mũ	he drank (426 drink mũ)
high + low	ó gbà	(phonetically, ó gbâ) he obtained (543 obtain gbà)
mid + high	awó	249 guinea fowl
mid + mid	awo	secret
mid + low	awò	eyeglasses (<nominalizing prefix a- + S.335 look at wò)
low + high	ìlú	(phonetically, ìlǔ) town, city
low + mid	ìlu	awl (<nominalizing prefix ì- + S.413 pierce lu)
low + low	ìlù	295 drum (<nominalizing prefix ì- + 447 beat lù)

0.9 Citations throughout this work are given in broad phonetic transcription, unless otherwise noted. Systematic phonemic notation is enclosed in slant lines.

0.10 Field work for this study was carried out in Nigeria during the 1967-1968 academic year, while I was an Associate Member of the Institute of African Studies, University of Ibadan. Information on the principal informants with whom I worked is contained in Appendix 4.

Footnotes

1. Westermann and Bryan (1952, 84) cite Parrinder (1947) as estimating the Yorùbá-speaking population of Dahomey at 100,000.

2. Even if not in terms of the dichotomous possible/impossible opposition, but along a gradient from one to the other.

3. This is the name used by younger persons. Its traditional name, and the one still used by elderly people in the area, is Ìmèkọ [ìmɛ̀ɛ̀kɔ].

4. The French spelling has been retained for most place-names in the post-independence period.

5. The spellings ọ and ẹ represent [ɔ] and [ɛ], respectively, in Yorùbá orthography. Nasalized vowels are indicated by a following n. Fresco (1968b) contains grammar notes and an interlinear translation of a short story in the Kétu dialect.

6. There have been several recent efforts at standardizing the orthography. Perhaps the most comprehensive proposals are those made by Bamgbọṣe in his pamphlet Yoruba Orthography (1965a).

7. A commercial scheme whereby one rents, at a nominal monthly charge, a speaker which is installed in one's house. This speaker is wired to receive only the national broadcasting network, of which WNBC is an affiliate. It has only an on-off-volume control.

8. Adetugbo (1967) was the first to apply this term to CY.

9. Armstrong (1965) refers to it as Central Yorùbá, whereas Adetugbo (1967) uses Central to designate the geographic area of a group of Yorùbá dialects. The inherent geographical connotation of 'central' renders it a less useful designation for CY.

Chapter 1

Vowel Harmony

1.0 The dialects of CY, K, Onà, Òk, Ɔ̀w, and ɔ̀b have the system of seven oral vowels in terms of which Yorùbá is generally described:

i u
e o
ɛ ɔ
a

There are systematic constraints on the sequence of vocalic segments within nouns in these dialects. The high-mid vowels (e, o) do not cooccur with the low-mid vowels (ɛ, ɔ), and the low vowel (a) does not occur following e or o. [1] Nouns are basically of the shape VCV, and by violating the constraints, non-permissible, non-occurring sequences result:

*efɛ	*ɛle
*erɔ	*ɛgbo
*ojɛ	*ɔše
*okɔ	*ɔbo
*ekpa	
*oda	

1.1 But how is a system containing these two constraints to be characterized? Courtenay (1968, 12) uses the Feature [tense] to distinguish /e,o/ ([+Tense]) from /ɛ,ɔ, a/ ([-Tense]). Thus a partial feature specification of the vowels would be:

	i	e	ɛ	a	ɔ	o	u
High	+	-	-	-	-	-	+
Low	-	-	-	+	-	-	-
Tense		+	-	-	-	+	
Back	-	-	-	+	+	+	+

She then formulates a Morpheme Structure condition [2] (Sequence Structure Condition 3, p. 26):

(1) IF $\left[\begin{bmatrix}+\text{Voc}\\-\text{High}\\-\text{Low}\\\alpha\text{Tense}\end{bmatrix}_N\right]$ X $\left[\begin{bmatrix}+\text{Voc}\\-\text{High}\end{bmatrix}_N\right]^3$

THEN $\Downarrow$ $[\alpha\text{Tense}]$

The condition states that (a) if a non-high vowel follows a tense, non-high, non-low vowel, it must also be a tense vowel. Thus, e and o can only be followed by e or o (i and u, of course, are not excluded by the condition, since they are both [+High]). The condition also states that (b) if a non-high vowel follows a lax (i.e. [-Tense]), non-high, non-low vowel, it must also be a lax vowel. Thus, ɛ and ɔ can only be followed by ɛ or ɔ or a (again, the conditon says nothing about i and u).

Courtenay states that 'tenseness is only relevant for the mid vowels' (p. 17). But since a has to be excluded from occurrence after e and o, she also uses the feature [Tense] for a. It is important to see that this is an arbitrary use of [Tense]. e and o must be distinguished from ɛ, ɔ, and a by some feature. But if one uses [Tense] there arises the problem of the specification of the high vowels i and u. Within this vowel system there is no motivation to specify them as either [+Tense] or [-Tense]. Given the assumption that at the systematic phonemic level all matrices are fully specified, the choice of specification for the feature [Tense] for the high vowels is totally arbitrary. However, as will be shown below, there does exist justification for an analysis incorporating this feature. Courtenay is thus intuitively correct in her choice of features, but her analysis permits no non-arbitrary decision.

1.2.1 As an alternative to the use of [Tense], the vowels can be distinguished using the feature [Round], resulting in the fully specified matrices:

	i	e	ɛ	a	ɔ	o	u
High	+	–	–	–	–	–	+
Low	–	–	+	+	+	–	–
Back	–	–	–	+	+	+	+
Round	–	–	–	–	+	+	+

The sequence structure condition to capture the constraints on succession of vowels within disyllabic nouns would then be:

(2) IF $\left[\begin{bmatrix}+\text{Voc}\\-\text{High}\\ \alpha\text{Low}\\ \beta\text{Back}\\ \beta\text{Rnd}\end{bmatrix}_N \quad X \quad \begin{bmatrix}+\text{Voc}\\-\text{High}\end{bmatrix}\right]_N$

THEN $[\alpha\text{Low}]$

This condition states that (a) if a non-high vowel follows a $\begin{bmatrix}-\text{High}\\-\text{Low}\end{bmatrix}$ vowel which is specified alike for backness and rounding (i.e., e or o), it must also be [-Low]. That is, e and o can only cooccur with e and o. And (b) if a non-high vowel follows $\begin{bmatrix}-\text{High}\\+\text{Low}\end{bmatrix}$ vowel which is specified alike for backness and rounding (i.e., ɛ or ɔ), it must also be [+Low]. That is, ɛ and ɔ can only cooccur with ɛ, ɔ, and a. Neither (a) nor (b), of course, excludes i or u from second vowel position, since neither of these vowels is specified as [-High].

But clearly the $\begin{bmatrix}\alpha\text{Back}\\ \alpha\text{Round}\end{bmatrix}$ specification is added baggage for the condition. The sequential redundancy which needs to be captured is one based on vowel height or some feature of which vowel height is a concomitant. The fact that e, o, ɛ , and ɔ are the same in backness and rounding is really beside the point here, and the use of these two features to state the condition has a little of the flavor of using distinctive features as diacritics.

1.2.2 Since on grounds of phonetic specifiability there is no motivation for using the feature [Tense], and since on phonetic grounds [a] is a low vowel, while [e,ɛ, o,ɔ] are neither high nor low, we might try to formulate the constraint based on matrices in which the vowels are divided into four heights. Following Wang's proposal (1968, 700-701) the vowels are assigned plus and minus values using the features [High] and [Mid]:

	i	u	e	o	ɛ	ɔ	a
High	+	+	+	+	-	-	-
Mid	-	-	+	+	+	+	-
Back	-	+	-	+	-	+	+

But the two constraints that must be captured by MS condition are unstatable in terms of these features. [4] On this ground alone they must be rejected. There are, however, deeper objections to them as well. The system provided for by these features is completely symmetrical. That is, it is impossible to relate any one segment (or level) any more naturally to another segment (or level) than to any arbitrarily chosen segment (or level). Thus, for example, [i] and [u] can be combined by the feature combination $\begin{bmatrix}+\text{High}\\-\text{Mid}\end{bmatrix}$. But either one of them,or both, can combine with [a] by the features $\begin{bmatrix}\alpha\text{High}\\-\text{Mid}\end{bmatrix}$. The same is true of any one vowel height matched with any other. Thus: [5]

i,u + e,o $\begin{bmatrix}+\text{High}\\ \alpha\text{Mid}\end{bmatrix}$

i,u + ɛ,ɔ $\begin{bmatrix}\alpha\text{High}\\ -\alpha\text{Mid}\end{bmatrix}$

i,u + a $\begin{bmatrix}\alpha\text{High}\\ -\text{Mid}\end{bmatrix}$

e,o + ɛ,ɔ $\begin{bmatrix}\alpha\text{High}\\ +\text{Mid}\end{bmatrix}$

e,o + a $\begin{bmatrix}\beta\text{High}\\ \alpha\text{Mid}\end{bmatrix}$

ɛ, ɔ+ a $\begin{bmatrix}-\text{High}\\ \alpha\text{Mid}\end{bmatrix}$

These considerations lead us to reject the four-height system and the feature-set used to describe it, and to search for a more satisfactory way to account for the facts of these dialects of Yorùbá. The next sections contain an examination of some of the phonological processes in various dialects which will provide the necessary justification for the use of the feature [Tense] to make the required distinction among the vowels, which justification Courtenay's analysis lacks.

1.3 A natural question to ask is why it should be that the high-mid vowels cooccur to the exclusion of the low-mid vowels, and vice versa. In other words, why is it that the two non-peripheral sets of vowels occur mutually exclusive of each other, and not some other combinatory possibilities?

So far only the vowel system of dialects with seven oral vowels has been looked at. A more illuminating picture emerges from a look at the dialect of Ifàkì (If). It is noted that this dialect has a pervasive vowel harmony operating within the noun. The noun, in If as in all Yorùbá dialects, consists of a prefix, in the form of a single vowel, and a stem, of the shape CV(CV). [6] In If noun stems the following vowels occur: [i, e, ɛ, a, ɔ, o, u, ĩ, ẽ, ã, õ, ũ]. As prefix vowels, the following occur: [i, ɪ, e, ɛ, a, ɔ, o, ʊ, u]. There are no nasal prefix vowels. [ɪ, ʊ] appear only as prefix vowels, never in stems. Between the two vowels of V+CV nouns, there is near-complete harmony ([a] appears to violate harmony, but see below). The vowels divide into two sets of oral and two sets of nasal vowels:

I		II		III		IV	
i	u	ɪ	ʊ	ĩ	ũ	ẽ	õ
e	o	ɛ	ɔ				õ
		a				ã	

All vowels within a set can cooccur; vowels from I and III can cooccur; and vowels from II and IV can cooccur. Again, there is the restriction that no nasal vowels occur as prefix vowel (see App.3 for a discussion of this assymetry). [a] as a prefix vowel is neutral with respect to I, III and IV. 7 But as stem vowel it takes prefixes only from II, as indicated below: 8

[a] as prefix vowel			[a] as stem vowel		
abíyá	74	armpit	ɩlá	270	okra
àwé	128	friend	èka	166	branch
àgbò	236	ram	abà	182	village
àbú	36	jr. sibling	ɔra	97	body
alɛ́	148	evening	ɔdà	294	sword
aš̌ɔ	335	clothing			
àyà	67	chest			
àdá	203	bat			
àgɔ̃tà	235	sheep			

Limiting the discussion to the oral vowels, it appears that there is a seven-vowel system in stems and a nine-vowel system in prefixes. The seven-vowel set is the one cited throughout the literature as the vowel system of Yorùbá. It will here be argued that If has a set of seven underlying oral vowels (/i, e,ɛ , a, ɔ, o, u/) with a vowel harmony system based on the feature [Tense]. Sets I and III, above, will be specified [+Tense], and sets II and IV [-Tense].

Perhaps Yorùbá, like Akan, has a vowel harmony based on advanced vs. retracted position of the tongue root, for which Stewart (1967) has proposed the feature [Advanced], and Chomsky and Halle (1968, 314-15) the feature [Covered]. Like Schachter and Fromkin (1968, 57-8), and Schachter (1969, 350, n16), I prefer to retain the traditional terminology until evidence becomes available to indicate whether the two terms define distinct ranges of acoustic or perceptual space. 9

The motivation for recognizing seven systematic oral vowels will become clear once the direction of the tenseness assimilation in this If harmony system is determined. I claim that it is the stem vowels which determine the value of the feature [Tense] in prefix vowels. Evidence is adduced from two facts: (1) [ɪ,ʊ] are absent in stems, 10 but appear in prefixes as harmonizing vowels with stems which have [-Tense] vowels. E.G., the following If nouns:

ɪ̀yɛ́	259 feather	ʊ̀rɔ̀lɛ́	151 early evening
ɪ̀tɔ̀	105 urine	ʊdà	294 sword
ɪlá	270 okra	ʊrĩ	196 iron
ɪ̀rɪ̀	138 dew	ʊ̀sõ	191 spring
ɪrõ	52 hair	ʊtã	94 thigh
ɪkã́	207 termite		

(2) [a], which occurs as a prefix vowel with either [+Tense] or [-Tense] stem vowels, itself requires [-Tense] prefix vowels (cf. earlier in this section).

It must be the case, then, that the vowels appearing in stems are determinative of prefix vowels, but not vice versa. The system is unidirectional. It is therefore only necessary to recognize seven oral vowels at the systematic phonemic level: /i, e, ɛ, a, ɔ, o, u/.

A corollary of the claim that stem vowels determine the value of the feature [Tense] in prefix vowels is that prefix vowels can be represented in their underlying form in one of two ways, either all [-Tense] (i.e. as /ɪ,ɛ, a,ɔ,ʊ/), or as the four [+Tense] oral vowels plus the neutral /a/ (i.e. as /i,e,u,o,a/). I claim it is the latter set which constitutes the set of systematic phonemic prefix vowels. One reason for this choice has already been alluded to: the occurrence of the lax high vowels [ɪ,ʊ] is predictable from stem vowels. They occur only as prefix vowels and only preceding lax stem vowels. If the set of [-Tense] prefix vowels were set up as the basic set, the erroneous claim would be made that this situation is not predictable. Further justification will be deferred until tenseness has been shown to be an assimilation process of wider scope, not limited only to noun stems and prefixes (sec. 1.5.1)

Given,then, that /i,e,u,o,ạ/ appear as lexical representations of prefix vowels in Ìf, the lax counterparts of the [+Tense] segments are derivable by an assimilation rule which laxes the prefix vowel in the environment of a lax stem vowel. A first approximation to the rule is:

(3) Ìf: Prefix Assimilation $V \rightarrow [-\text{Tense}] / \_\_\_\ X \begin{bmatrix} +\text{Voc} \\ -\text{Cons} \\ -\text{Tense} \end{bmatrix}_N$

Since /a/ is already [-Tense], 11 the rule applies to it vacuously.

Before PA	After PA		
/itó/	ɪtó	108	saliva
/irõ/	ɪrõ	52	hair
/ùgbɛ́/	ɔ̀gbɛ́	106	feces
/unã́/	ɔnã́	160	fire
/erã/	ɛrã	268	meat
/ejó/	ɛjó	8	eight
/osɛ̀/	ɔsɛ̀	82	leg
/ogbã̀/	ɔgbã̀	22	thirty

1.3.1 It could be claimed, as Courtenay has done for CY, that PA is properly a MS condition, with prefix vowel agreeing with stem vowel. 12 This solution suffices to capture constraints on vowel sequences in dialects such as CY. But in Ìf it is descriptively inadequate. In CY we must state a MS condition to capture these contraints; in Ìf the sequential tenseness constraints are brought about by P-rule. 13

Ìf cannot contain a sequence structure condition predicting that vowels in nouns will agree in tenseness. Note, firstly, that such a condition requires that [ɪ,ɔ] be recognized as underlying sounds, since MS conditions apply to

lexical matrices. Secondly, since it has been tentatively established that it is the stem vowel which determines the tenseness or laxness of the prefix vowel (cf. sec. 1.3), the solution in terms of a MS condition on the structure of vowel sequences is rather counterintuitive. That is, I am claiming that we are dealing with an assimilation process rather than a condition on morpheme structure. However, this is not to say that Prefix Assimilation ((3)) in Ìf is not reflected by a MS condition which predicts the structure of a class of morphemes. The dialect must contain a segment structure condition which makes the prediction that noun prefix vowels are lexically unmarked for the feature [Tense] (i.e., are [UTense] cf. note 1, p. 23) [14]

(4) Ìf: Noun Prefix Vowels. Positive Segment Structure Condition

$$PC \quad \left[\begin{matrix}+\text{Voc} \\ \text{UTense}\end{matrix}\right]_{N\ \text{Pref}}$$

The different facts captured by the sequential constraint in CY and the segmental constraint in Ìf constitute a major difference in their phonological structures.

1.3.2 However, the sequence structure condition I have so far accepted as characterizing tenseness constraints in CY -- that formulated by Courtenay (1968, 26. Cf. sec. 1.1) -- bears closer examination. It assumes that the prefix vowel determines the tenseness of the stem vowel. Courtenay states: 'It is clear that simplicity of rules now favors assimilating the stem vowel to the prefix.' (26) Synchronically this statement has no meaning, since the condition can be formulated in two alternative ways, using the same number of features. One alternative formulation is as a Negative Sequence Structure condition (cf. Stanley (1967, 427-8, 432-3)):

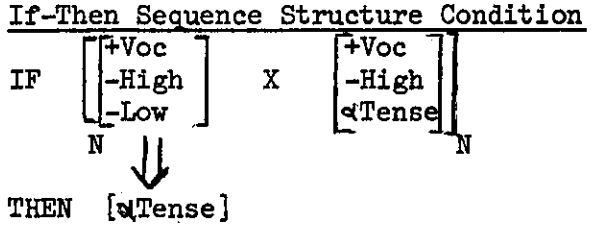
(5) Negative Condition

$$NC \sim \left[\left[\begin{matrix}+\text{Voc} \\ -\text{High} \\ -\text{Low} \\ \alpha\text{Tense}\end{matrix}\right]_{N}\right] \quad X \quad \left[\begin{matrix}+\text{Voc} \\ -\text{High} \\ -\alpha\text{Tense}\end{matrix}\right]_{N}$$

This condition implies no directionality at all. It disallows the sequences ɛ-e, ɔ-e, ɛ-o, ɔ-o, e-ɛ, o-ɛ, e-ɔ, e-a, and o-a -- just those which we want to disallow.

Alternatively, an If-Then condition can be stated which implies that the prefix vowel assimilates to the stem:

(6) If-Then Sequence Structure Condition



This condition, which is simply Courtenay's condition with tenseness agreement in the opposite direction, says precisely the same thing. It allows the following sequences:

[+Tense]	X	[+Tense]
e		e
o		e
e		o
o		o
[-Tense]	X	[-Tense]
ɛ		ɛ
ɔ		ɛ
ɛ		ɔ
ɔ		ɔ
ɛ		a
ɔ		a

and it says nothing about (i.e., does not disallow) the following sequences, which are permissible:

i-i	u-i [15]	a-i [16]
i-u	u-u	a-u [16]
i-e	u-e	a-e
i-o	u-o	a-o
i-ɛ	u-ɛ	a-ɛ
i-ɔ	u-ɔ	a-ɔ
i-a	u-a	a-a

Courtenay's assumption of the direction of assimilation is no doubt historically wrong, since the vowel harmony system of Ìf clearly shows what the system of CY must have been like at an earlier time, at least as far as the direction of assimilation is concerned.

1.3.3 We now have a choice among three MS conditions to capture the CY constraint on disyllabic nouns. I claim it is the last condition, Sequence Structure Condition (6), and not Courtenay's condition, that correctly captures tenseness agreement in CY. I base this choice admittedly on cross-dialectal evidence, but only because any decision based purely on dialect-internal considerations would be totally arbitrary. I would perhaps reject the negative condition ((5)) in any event, but only on the intuitive feeling that the theoretical foundation for these conditions is weaker than for the other (non-negative) types of conditions, and since, in the case at hand, it cannot be shown that a negative condition is the only one (or the cheapest one) that will do the job.

1.3.4 Further evidence that vowel harmony is not simply a condition on morphemes, but is an assimilatory process at least over subsections of the phonologies of other dialects as well as Ìf, is adduced from the observation that tenseness agreement is not limited to nouns but extends to verb stems and the vowels of certain morphemes which precede them. Thus, in K, Ìf, and Àk there are the following alternations of subject pronouns in the singular:

	K		Ìf, Àk	
	[+Tense]	[-Tense]	[+Tense]	[-Tense]
1p sg	mò	mɔ̀	mo	mɔ̃
2p sg	ò	ɔ̀	o	ɔ
3p sg	ó	ɔ́	ó	ɔ́

The [+Tense] vowel occurs with verb stems which have [+Tense] vowels; the [-Tense] vowel with stems which have [-Tense] vowels:

1p sg	mo	jí	(Ìf)	I stole	mɔ̃	mɔ̀	(Ìf,Àk)	I know
	mò	jí	(K)		mɔ̀	mɔ̀	(K)	
2p sg	o	jó	(Ìf)	you danced	ɔ	tà	(Ìf)	you sold
	ò	jó	(K)		ɔ̀	tà	(K)	
3p sg	ó	kú	(K, Ìf, Àk)	he died	ɔ́	yã̀	(K,Ìf)	he yawned

Superficially it would appear that the pronouns are not dominated by the category verb (i.e., are independent words). If this were the case, then the assimilation process would have to extend over the word boundary and be of wider scope than that covered by Prefix Assimilation ((3)). Recent investigations in Yorùbá and Akan, however, indicate that it is pre-verbal categories within the verb that are involved. For Akan, Schachter and Fromkin (1968, 118-22) observe that what appears to be a pronoun is in fact the Subject Concord marker, resulting from an obligatory transformation which copies certain features of the non-emphatic independent pronoun (which is dominated by NP) into the Subject Concord marker (which is dominated by V). The lexicon then provides the appropriate phonological matrix. The authors call the Subject Concord marker a prefix to the verb. Stahlke (1969) attempts to show that the o of the singular pronouns in Yorùbá is in fact not an integral part of the pronouns but rather a part of the aspectual system, and thus within the verb. I will for the moment

assume the correctness of the proposals of these authors in placing the harmonizing segments under discussion here within the dominance of the verb. 17

What follows from this is that the scope of the Prefix Assimilation rule can remain at word level. In order to include the pronoun harmony illustrated here within the rule, it is only necessary to add the category Verb to the right-hand bracket. This involves, then, a generalization of a process which has hitherto been seen as applying within nouns only. The rule can now be given, with the appropriate dialect restrictions added, as: 18

(7) Prefix Assimilation

$$V \rightarrow [-\text{Tense}] \,/\, \underline{\quad} \; X \begin{bmatrix} +\text{Voc} \\ -\text{Cons} \\ -\text{Tense} \end{bmatrix} \begin{matrix} N \;\; (\grave{I}f) \\ V \;\; (If, K, \grave{A}k) \end{matrix}$$

A corresponding change must be made in Segment Structure Condition (4). It will now predict that Noun Prefix and Verb Prefix vowels will be lexically [UTense] in If, and that Verb Prefix vowels will be lexically [UTense] in K and Ak:

(8) Prefix Vowels: Positive Segment Structure Condition

$$PC \quad \begin{bmatrix} +\text{Voc} \\ \text{UTense} \end{bmatrix} \; \begin{matrix} N \text{ Pref } (\grave{I}f) \\ V \text{ Pref } (If, K, \grave{A}k) \end{matrix}$$ 19

It is noteworthy that the authors working on the syntax and phonology of the subject pronouns of Akan and Yorùbá did not propose their solutions to facilitate the formulation of vowel harmony rules. And yet the rule of Prefix Assimilation is statable as a word-level rule, as it is, applying to nouns and verbs alike, only in terms of an analysis of the harmonizing pronouns as being dominated by V.

1.4 In summary, Courtenay, dealing only with the dialect CY, has rightly given the tenseness restrictions in nouns in that dialect as a MS condition. Tenseness agreement in nouns is not an assimilatory process in CY. It is a static

fact. The language learner need not posit a rule for it. He only needs to be able to predict that disyllabic nouns in his dialect do not violate the constraint. Any disyllabic nouns which run counter to this prediction he will label exceptional in some way. It is precisely this predictive knowledge which is captured in the MS condition. In If, tenseness agreement was seen to be an assimilatory process over nouns and verbs and their prefixes; in K and Ak as the same process but applying over verbs and their prefixes only. This could not be given as a MS condition since these cannot change features (cf. Stanley (1967, 422)), but had to be accounted for by P-rule.

The historical inference is that a productive process became fixed in some dialects, and restricted to subparts of others, leaving its effect on the lexicon in the form of a constraint on the sequence of vowels within given grammatical categories. The synchronic residue of a once active process thus appears in the form of a petrified vowel harmony. It is clear, then, that the effects of P-rules, once they drop from the grammar, can become embodied in the MS conditions of a language or dialect.

1.5.1 We now turn to the justification for considering the vowel harmony of If nouns and verbs, and of K and Ak verbs, as a process which laxes an underlying [+Tense] segment in a given environment. It has already been observed that the set of [-Tense] oral vowels in If contains the vowels [ɪ,ʊ], and that these occur only in prefixes. If [-Tense] vowels are set up as the systematic set of prefix vowels, the claim being made is that, phonologically, these vowels are not a subset of the vowel sounds of stems, but are a different, overlapping set. I.e., the prefix vowels would comprise the set: ɪ ʊ / ɛ ɔ / a , while the stem vowels comprise the set:

i u / e o / ɛ ɔ / a . If the prefix vowels are /i,e,u,o,a/, as I claim,

then the set of prefix vowels is a subset of the set of stem vowels with which it harmonizes, namely: i u / e o / a is a subset

of i u . Intutively this seems a preferable and more
e o
ɛ ɔ
a

natural account of harmony processes. It may eventually be possible to state a general condition on harmony systems which embodies this intuition. The metatheory could perhaps state: between two (or more) alternate representations for a harmonizing set of segments, select that set whose feature specification is, or most closely approximates to, a subset of the set of feature specifications which enumerates the segments bringing about the harmony. Such a metatheoretic condition should make it cheaper, in terms of some evaluation metric, to select as the underlying harmonic set those vowels which are [+Tense], as against those which are [-Tense], for the harmony system discussed here. Chomsky and Halle (1968, 405) give without justification, the marking convention:

(9) [UTense] → [+Tense]

saying they have not investigated sufficient data which is pertinent to this convention to enter into a discussion of its substantive claim (409). In note 1, p.23,it was noted that Halle and Steven's acoustic investigations and my analysis of tenseness harmony in Yorùbá converge on the same conclusion, namely, that the marking convention for tenseness in vowels is

(10) $$[\text{UTense}] \rightarrow \left\{ \begin{matrix} [\text{-Tense}] \\ [\text{+Tense}] \end{matrix} / \left[\frac{\quad}{\text{+Low}} \right] \right\}$$

This convention makes it costless to posit /i,e,u,o,a/ as the underlying prefix vowels. All of them will be U for the feature [Tense].

1.5.2 All of the dialects I have investigated have the sequential constraint on high-mid and low-mid vowels which says that vowels must have the same value for the feature [Tense]. The difference is that in some dialects this is a condition on the lexicon, that is, on systematic phonemic segments, while in others it is the result of a harmony process brought about by P-rule from segments which I claim are lexically [UTense]. Note that in the high vowels [i,ɪ, u,ʊ] this constraint is absent from dialects such as CY, K, Onì, and Ok

because they lack the [ɪ] and [ʊ], while in Ìf high vowels are subject to the constraint:

	CY	K	Oǹ	Òk vs	Ìf
94 thigh	itɔ̃	itã	ugbatã	uta	ʊtã[20]
108 saliva	itɔ́	itɔ́	utɔ́	itɔ̃́	ɪtɔ́
160 fire	inɔ̃́	inã́	unã́	unã́	ʊnã́
223 louse	inɔ̃́	inã́	inã́	inã́	ɪnã́

Note now that the phonetic difference between Ìf and these other dialects is that If has two parallel sets of oral vowels, a tense and a lax set (i.e. [i,e,o,u], and [ɪ,ɛ,ʊ,ɔ], respectively), while the others lack the [-Tense] counterparts of [i, u]. And where there is a gap in the parallelism, it is the [+Tense] member of the pair which appears, not the [-Tense].

1.5.3 Finally, I draw the same conclusion from the fact that, in those dialects which have no harmony between the vowel of the subject pronoun and the vowel of the verb stem, the pronoun is always [+Tense] o, never [-Tense] ɔ.

Sample derivations showing the operation of the Prefix Assimilation rule in Ìf:

Before PA	After PA	
imɔ̃́	ɪmɔ̃́	53 nose
ègbã́	ègbã́	36 senior sibling
oɔ́	ɔɔ́	69 hand
ɔ́ tà	]ɔ́tà	509 he sold
ɔ́ kɔ̀	]ɔ́kɔ̀	478 he refused
mo mɔ̃	mɔ̃ mɔ̃	426 he drank
o rɪ̀	ɔrɪ̀	436 you (sg) walked

1.6 It is not the intention to discuss the nasal vowels here. They contribute few new insights into the workings of vowel harmony, yet present problems of analysis which are irrelevant to the harmony question. Generally, the nasal vowels are the [+Nasal] counterparts of the oral vowels. As underlying segments they are restricted to occurrence in stems and in the first person singular and third person plural subject pronouns in all dialects studied.

Chapter 3, sec. 3.1, takes up aspects of the analysis of nasal vowels in various dialects; their restriction to stems, and the process of vowel nasalization.

1.7 If we look at the prefix vowels of nouns across dialects, we often note that while the noun stem remains identifiably the same, the prefix changes. It is extremely rare, however, for the prefix vowels to be opposite in tenseness. When they are, it may be taken as prima facie evidence that a sound change has taken place involving one or a group of dialects. The following is a sample list of nouns whose prefix vowels differ across dialects.

I. <u>Prefix Vowels Same in Tenseness:</u>

[e] and [o]	(i)	erúkú	(K)	orṹkṹ	(CY)	84 knee
		eékṹ	(CY)	oókṹ	(Oǹ, Ɔ̀w)	
				orókṹ	(Ìf, Òk)	
	(ii)	erí	(K)	orí	(CY, Ìf, Òk, Ɔ̀w, Ɔ̀b)	51 head
	(iii)	eó	(Ìf)	owó	(CY, K)	328 money
		eɣó	(Ɔ̀w)	oɣó	(Oǹ, Òk, Ɔ̀b)	
[ɛ] and [ɔ]	(iv)	ɛyà̃	(Ok)	ɔyà̃	(CY, K, Oǹ, Ìf)	68 breasts
	(v)	ɛsɛ̃̀	(CY, K)	ɔsɛ̃̀	(Oǹ, Ìf, Ɔ̀w, Ɔ̀b)	82 leg, 86 foot
		ɛhɛ̃̀	(Òk)			
	(vi)	ɛ̀šɔ́	(CY,K)	ɔ̀šɔ́	(CY)	S518 jewellery

[ɛ] and [a]	(vii)	ɛ̀gbɔ̀̃	(K)	àgbɔ̀̃	(CY, Ìf)	58 chin
				àgbɑ̀̃	(Onˋ)	
	(viii)	ɛnũ	(CY)	aũ	(ɔ̀b)	60 mouth
		ɛnɔ̃	(K)			
		ɛũ	(Onˋ)			
		ɛrɔ̃	(Ìf)			
		ɛrũ	(Òk,ɔ̀w)			
[i] and [e]	(ix)	igbĭ	(K)	egbĭ	(CY)	241 Kob antelope
	(x)	ìyí	(Onˋ, ɔ̀w, ɔ̀b)	ʻeyí	(CY)	402 this (noun)
		ìí	(K)			
	(xi)	igi	(CY, Onˋ, Ìf, Òk)	egi	(K)	163 tree
		igĭ	(ɔ̀w,ɔ̀b)			

II. Prefix Vowels Opposite in Tenseness:

[i] and [ɪ]	(i)	irũ	(CY)	ɪrɔ̃ (Ìf)		52 hair
		irɔ̃	(K)			
		ĭɔ̃	(Onˋ)			
		irɔ̃	(Òk,ɔ̀b)			
	(ii)	imű	(CY)	ɪmɔ̋ (Ìf)		53 nose
		imɔ̋	(K)			
		imɔ̋	(Onˋ, Òk, ɔ̀w,ɔ̀b)			
[e] and [ɛ]	(iii)	erú	(K, Ìf)	ɛrú	(CY)	123 slave
				ɛú	(Onˋ)	
	(iv)	ešĭ	(K,ɔ̀b)	ɛšĭ	(CY, Onˋ)	237 horse
		ečĭ	(ɔ̀w)	ɛsĭ	(Òk)	

	(v)	etu	(K, Ìf)	ɛtu	(CY, Oǹ)	240	Maxwell's duiker
	(vi)	enĭ́	(Ìf)	ɛnĭ́	(CY, K, Oǹ)	297	mat
[o] and [ɔ]	(vii)	òwúrò	(CY, Òk)	ɔ́rò	(Ìf) [19]	149	morning
		oúò	(Oǹ)				
	(viii)	òníyà	(K)	òníyà	(Ìf)	112	person
	(ix)	orĭ́	(CY, Òk)	ɔrĭ́	(K)	S173	chewstick
		oĭ́	(Oǹ)				

I make no attempt to explain how prefix vowels came to diverge among the dialects, nor to derive them synchronically from a single base form. Comparative evidence of a much wider range will be needed in order to determine if historically this is a phenomenon limited to Yorùbá or whether parallel changes occurred in related Kwa languages, thus dating it to an earlier period. [21] However, some tentative historical inferences bearing on the discussion of tenseness harmony may be made. From the observation that the large majority of pairs of prefix vowels do not differ in tenseness it may be inferred that what caused the 'shifting' was something happening within an already developed vowel harmony system, and moreover, a system based on the feature [Tense], just as the system is characterized synchronically. Also, since the prefix generally retains its tenseness specification irrespective of whether its realization in any given dialect is back or front, high or mid, etc., we have added support for the claim that the direction of the harmony is from stem to prefix. Stem vowels do not participate in this kind of shifting.

The opposite tenseness of [i] and [ɪ] in II. (i)-(ii) is explained by the fact that the vowel harmony system does not encompass the high prefix vowels ([i] and [u]) in CY, K, Oǹ, Òk, ɔ̀w, and ɔ̀b, while in Ìf it does. Historically this would seem to be a case of rule simplification. The rule of Prefix Assimilation ((7)) applied only to non-high prefix vowels at one time, and has been generalized in Ìf so that it now laxes all prefix vowels before lax stem vowels. For discussion of this point, see sec. 1.10.

For a discussion on the forms of the prefix in II. (iii)-(vi) and (ix), see sec. 1.9.

1.8 The [o] vs [ɔ] in II. (vii)-(viii) forces a re-examination of the tenseness harmony system as discussed so far. The difference in tenseness in these nouns is brought about by a difference in the scope of the assimilation process in If as opposed to the other dialects (the examples are repeated here for reference).

II.	(vii)	ɔ̀wúrɔ̀ oúɔ̀	(ÇY, Ɔ̀k) (On)	ɔ́rɔ̀ (Ìf)	149 morning
	(viii)	ɔ̀nǐyǎ	(K)	ɔ̀nǐyǎ(Ìf)	112 person

Notice that the nouns are trisyllabic, consisting of a prefix vowel and a (C)V(C)V stem. [22] In If all vowels are the same in tenseness. In CY, K, On, and Ok only the prefix vowel and the first stem vowel agree in tenseness. It is clear that the scope of the assimilation rule has to be extended in If to include all vowels of nouns of the (systematic phonemic) shape /VCVCV/. [23] Some further examples from this dialect:

All vowels [+Tense]			All Vowels [-Tense]		
84	knee	oróḱṵ́	61	lip	ɷkpɔ̃rɔ̃
96	navel	udodo	75	finger	ɔ̀kɪ̀ka
103	bone	egigũ	83	heel	ɛ̀tɛ̀kpá
139	fog	ɔ̀kɪ̀kú	84	knee	ɷkɔkɔ
144	sun	orɪ̀rṵ̀	110	name	ɔrɔ́kɔ
180	dust	erùkù	113	man	ɔkɔ̃̀rĩ̀

1.8.1 It was shown earlier that tenseness assimilation in V+CV nouns is brought about by the stem vowel. In dealing now with nouns which have disyllabic stems, there is no reason to alter this conclusion. However, for most dialects the tenseness constraint embodied in MS condition (6) remains unchanged. That is, the constraint applies only to the first two vowels of a noun, irrespective of the value

of the feature [Tense] in the final vowel. In Ìf, there must be a rule which states that all vowels agree in tenseness. This could be done in the form of a cyclical rule, taking the tenseness specification of the final vowel as basic. The first cycle would bring about harmony between the final vowel and the vowel to the left of it, and the second cycle would in turn cause the next vowel to the left (i.e., the prefix vowel) to harmonize with the vowel which had undergone harmony in the previous cycle. Thus to give an example:

Posited underlying form	erùkpɛ̀	'soil'
Cycle 1	erɔ̀kpɛ̀	
Cycle 2 (surface form)	ɛrɔ̀kpɛ̀	

It seems to me, however, that what we have here is not a cyclic but rather a simultaneous application of a rule. In terms of what claims we want to make about what the native speaker of Ìf Yorùbá knows about trisyllabic nouns, we are on safe ground when we claim that he 'knows' that the vowels are either all [+Tense] or all [-Tense] in their surface phonetic output. We are, it seems to me, on much less sure ground when we claim that the speaker reaches this surface output by the cyclical application of a rule. Table 1 gives a sample listing of trisyllabic nouns across dialects.

1.8.2 The Prefix Assimilation rule ((7)) must now be revised to account for the facts of Ìf trisyllabic nouns. It is now no longer only a rule which assimilates [+Tense] prefixes to [-Tense] stems, but a rule which causes all vowels within the noun to agree in tenseness. A more appropriate mnemonic designation for the rule is thus simply Tenseness Assimilation.

Chomsky and Halle (1968, 343-4) show that the simultaneous application of a rule to more than one segment is subject to the following convention:

> To apply a rule, the entire string is first scanned for segments that satisfy the environmental constraints of the rule. After all such segments have been identified in the string, the changes required by the rule are applied simultaneously. (Convention (39), 344)

		CY	K	Oǹ	Òk	Ɔb	Ìf
73	shoulder	èjìká	èjìká	èjìká	èjìká	èjìká	ɷgãrãká
110	name	orúkɔ	eékɔ	oúkɔ	orúkɔ	orúkɔ	ɔrókɔ
112	person	èníyã̀	ònìyã̀	(iáyé)	(iáyé	èníyã̀	ònìyã̀
145	moon	òšùkpá	òšùkpá	òšùkpá	òsũ̀kpá	òšùkpá	òšòkpá
149	morning	àwúrò òwúrò	àárò	oúò	òwúrò	òwúrò	òórò
321	truth	òtító	òótó	òtító	òtító	òtító	òtító
338	ring	òrùka	òrùka	òùka	òròka	òrùka	òròka

Table 1. Examples of trisyllabic nouns in which tenseness agreement extends only over the first two vowels in CY, K, Oǹ, Òk, and Ɔb, and over all vowels in Ìf.

It is clear from their discussion and the examples they provide that only rule schemata standing for infinite sets of rules can be subject to simultaneous application of a structural change. Thus, Tenseness Assimilation will need to be reformulated so that the above convention will apply:

(11) Tenseness Assimilation

$$V \rightarrow [-\text{Tense}] \; / \; \_\_\_\_ \; X \; (V)_0 \; X \; \begin{bmatrix} +\text{Voc} \\ -\text{Cons} \\ -\text{Tense} \end{bmatrix}_N \; (\grave{\text{I}}\text{f})$$

1.8.3 But this rule is not as general as its earlier form, which applied also to the category Verb in Ìf, Àk, and K. We must now determine if the simultaneous application convention applies to verbs as well.

Earlier I discussed the tenseness agreement of pronouns with the Verb in Ìf, Àk, and K. In Ìf and Àk harmony extends over the Completive marker ti as well. For example, in the Ìf sentence

(12) ó ti o. It has become heavy

3p sg Compl heavy

all vowels are [+Tense]. But in the Ìf sentence

(13) ɔ́ tɪ kpɛ́. He has become old

3p sg Compl be of long duration

all vowels are [-Tense].

The same contrast is seen in the following Àk sentences:

(14) ó ti dé. He has arrived

(15) ɔ́ tɪ á. He has come

However, in K, tenseness agreement is limited to the pronouns:

Thus (16) ó rì. He walked

and (17) ɔ́ lɔ He went

show the harmonizing pronoun. But when the Completive marker ti intervenes between pronoun and verb, no agreement takes place:

(18) ó ti lɔ. He has gone

(19) *ó tɪ lɔ. (impossible)

Tenseness assimilation thus apparently applies simultaneously to the Verb and its prefixes in Ìf and Àk, just as it does to the vowels of the Noun in Ìf. [24] The limited applicability of the rule in K must be provided for. This is done by specifying the category to which the harmonizing vowel belongs, and indicating that this limitation holds only for K by means of angled brackets. The new form of the Tenseness Assimilation rule is now:

(20) Tenseness Assimilation

$$V \rightarrow [-\text{Tense}] \; / \; \left[\frac{\quad}{\langle +\text{Pron} \rangle}\right]_1 \; X_o \; \begin{bmatrix} +\text{Voc} \\ -\text{Cons} \\ -\text{Tense} \end{bmatrix} \begin{matrix} N & (\text{Ìf}) \\ V & (\text{Ìf, Àk, } \langle K \rangle) \end{matrix}$$

The rule claims, as did the earlier version, that it is the final vowel which causes the laxing of a preceding vowel. I will present some arguments below for this claim as it applies to Ìf trisyllabic nouns. To state the claim for trisyllabic nouns clearly: it is the final vowel of the noun stem which brings about the laxing of preceding vowels in Ìf. The arguments:

(1) It has been argued previously that the systematic phonemic specification of the noun prefix vowels is [UTense]. Tenseness assimilation has thus been seen as the assimilation of a [+Tense] vowel to a [-Tense] vowel. It is a fact that there are no lax high vowels ([ɪ,ʊ]) in the stems of V+CV nouns in Ìf. They do appear on the surface, however, in trisyllabic nouns, e.g.: 75 finger ɔ̀kɪ̀ka; 110 name ɔrɔ́kɔ. However, if we assume that it is the final [-Tense] stem vowel which brings about laxing of the non-final vowels, then all non-final surface [-Tense] vowels can be represented as systematically [UTense]. Thus, just as the disyllabic Ìf noun 259 feather ɪ̀yɛ́ will be entered in the lexicon as /ɪ̀yɛ́/, so the trisyllabic Ìf noun 110 name ɔrɔ́kɔ will be entered as /orúkɔ/.

(2) Further evidence in support of the claim comes from two observations concerning compounding in nouns: (a) some If trisyllabic nouns are the result of compounding. If we can find a trisyllabic compound whose vowels are all [-Tense], but whose first component has all [+Tense] vowels when appearing as an independent word, we will have substantive evidence that the speaker of If laxes all vowels in the environment of a final lax vowel in nouns. The noun 145 moon ɔ̀ʃ̌ɔ̀kpá is such a compound. The first component appears independently as oʃ̌ù (156 month), with all [+Tense] vowels. [25] oʃ̌ù is itself a nominalization from the verb ʃ̌ù 'be spherical', according to Abraham (1958). On the change from mid to low tone in the nominalizing prefix, I can only speculate that it comes about by a rule applying to this formative when it is prefixed to particular compounded structures. Comparison with all other dialects investigated shows the identical tonal alternation to be present in this noun. (b) There are exceptions to the constraint that all vowels of a trisyllabic noun in If must agree in tenseness. A majority of these exceptions (five out of a total of seven found) appear to constitute a subregularity, and it is this subregularity which lends indirect support to the claim that it is the final vowel of the noun which laxes preceding vowels. The exceptions are:

79	liver	ɔ̀dɔ̀(ki) [26]	
118	youth	ɔmɔ̃dé	(<ɔmɔ̃ 38 child + ?)
201	animal	ɛrãko	(<ɛrã 268 meat + oko 192 farm)
241	baboon	ì̀nã̀kí́	
253	pigeon	ɛyɛlé	(?<ɛyɛ 258 bird + ulé 183 house)
57	beard	urugbɔ̃̀	(<? + àgbɔ̃̀ 58 chin)
218	lizard	ɔ̀dɔ̀gba	

If we assume that the first five nouns are compounds (118 and 201 most certainly are; 79 and 253 very likely are), we need only apply the appropriate rules of compounding, one of which is

(21) $V \rightarrow \emptyset \; /]_N [_N \_\_\_ X]_N \;]_N$

Nothing further applies. The lax vowels do not become tense even though, as is claimed, the final vowel determines tenseness, because there is no mechanism by which [-Tense] vowels can assimilate [+Tense] vowels. The final vowel, being [+Tense], causes no changes in preceding vowels. We will see in sec. 2.5 that this is an explanation which throws light on an otherwise puzzling fact about subject pronouns also. It thus receives independent support.

The last two exceptions must be marked with an exception feature exempting them from the Tenseness Assimilation rule. They are forms which are subject to the rule but do not undergo it.

There are far too many trisyllabic nouns in Ìf which obey the rule to be misled into deciding that these seven instances constitute damaging counterexamples. The first five are only apparent exceptions, since they are explicable in terms of the general tenseness assimilation rule. As has often been pointed out, phonology is not an airtight compartment. Leaks occur. But they are tolerated because the greater part of the system is rule-governed. They are rather peripheral to the system and do not seem to create an intolerable burden on the learner.

1.9 Undoubtedly in most dialects there are nouns which violate tenseness harmony between prefix and stem vowel. If we discount prefix [i] and [u] in those dialects in which the high vowels don't participate in the harmony system, and recall that [a] has no [+Tense] counterpart, the prefix vowel in the nouns which constitute the violations is always either ɛ̲ or ɔ̲, and the stem vowel (or the first vowel of a disyllabic stem) is always i̲,u̲,ĩ̲, or ũ̲. Below is a sample list of such forms. A dash indicates that my data are incomplete at that point.

		CY	K	Gǹ	Ìf	Òk	Àk	Ɔ̀b
S48	family	ɛbí	ɛbí	ɛbí	___	ɛbí	___	___
123	slave	ɛrú	erú	ɛ́ú	erú	ɛrú	erú	ɛ́rű
240	Maxwell's duiker	ɛ́tu	etu	ɛ́tu	etu	ɛ́tu	etu	etu
328	load	ɛ́rù	erù	ɛõ̀	erù	ɛrũ̀	erù	ɛ́rũ̀
S149	liquor	ɔtį́	ɔtį́	ɔtį́	___	ɔtį́	___	ɔtį́
S153	gunpowder	ɛtʉ̀	ètù	ɛtù	___	ɛtù	ètù	___
S265	shirt	èwù	èwù	èwù	èù	èwù	èwù	èwù

These forms could be taken as invalidating the claim that prefix and stem vowels agree in tenseness. However, harmony is far too general both within and among dialects to be discarded without first looking at what these forms may indicate about the structure of nouns and the overall development of the harmony process in Yorùbá. [27]

1.9.1 There appear to be several compelling reasons to treat these nouns as in some way exceptional. Looking at two of the nouns in the table, ɛbí and ɛrù, these are seen to consist of a verb stem, bí 'give birth to', and rù 'carry', respectively, plus a nominalizing prefix ɛ. There is some indirect evidence that the stem vowels were lax and nasal at an earlier stage. A comparison across dialects of ɛrù with 'liquor' indicates that three dialects (Onà, Ok.ɔ̀b) have the lax nasal vowel ĩ, ɔtĩ, while CY and K have tense non-nasal i, ɔtí. ɔtí violates vowel cooccurrence constraints; ɔtĩ́ does not. What can be inferred historically is that /ĩ/ merged with /i/ in CY and K. Further evidence of such a merger is seen in such forms as 216 crocodile If ònĩ, CY ònĩ; 261 egg If ɛĩ, CY ɛyĩ. Further, nasalization was dropped in the stem vowels of a small number of nouns, for reasons unknown. [28] However, to posit an ĩ-denasalization rule for CY and K seems ad hoc. Notice that it would complicate rather than simplify matters. All forms with surface [ĩ] would need to be marked [- ĩ-denasalization] in the lexicon. This would in effect be saying that a few exceptional forms proceed through the P-rules routinely, while the vast majority of perfectly regular nouns with stem vowel ĩ are the exceptions.

1.9.2 A much more satisfactory solution suggests itself in terms of M-U values within markedness theory. The prefix vowels of such forms as ɔtí, which violate tenseness agreement will be specified as [MTense] in the lexicons of CY and K. Universal Marking Convention 7 (Introduction, sec. 0.5.2) will convert this to [-Tense]. The M-U matrices are set up in such a way that it is more costly to list in the lexicon non-low segments which are converted by the UMC's into [-Tense] segments than to list those which are converted into [+Tense]. Thus a greater cost is assigned to the form /ɔtí/ than to a form that does not violate harmony, e.g. 51 head /orí/. These two nouns are given below with the appropriate M-U values for their vowels:

	ọ t í [29]		ọ r í	
High	M	U	M	U
Low	U	U	U	U
Back	+	-	+	-
Rnd	U	U	U	U
Tense	M	U	U	U
Nasal	U	U	U	U
Complexity	3	1	2	1

1.9.3 An identical solution to the problem of the systematic phonemic specification of the prefix vowel of ɛrù seems called for. We notice that just those three dialects which have the nasalized vowel [ĩ] in ọtĩ also have a nasalized vowel in ɛrù. It seems highly unlikely that the parallel presence of nasal vowels in these two words in the same three dialects, and the parallel absence of nasal vowels in the same two words in CY and K, can be accidental.

There are other nouns which, like ɛrù, appear to consist of a nominalizing prefix vowel and a verb stem. ɛbí has been mentioned. S265 shirt èwù may consist of Nom Pre è + wù 'please'. Abraham (1958) cited a noun ɛwù 'a pleasurable feeling', and gives as its component parts ɛ + wù. Although he lists èwù as an unanalyzable noun, he recognizes the existence of è as a Nom Pre in the noun èbi 'guilt', claiming it derives from an obsolete verb bi 'evil' (p. 197. Possibly this indicates a predicative meaning 'be evil', or 'do evil'. This stem, according to him, is also found in ebi 330 hunger). He thus recognizes at least three noun-forming prefixes: ɛ, è, e.[30] Derivational processes are beyond the scope of this study, however. Nominalization in Yorùbá is still a wide open area and is certainly in need of detailed investigation.[31]

1.9.4 To summarize, the solution which does least damage to the generalizations that can be made about vowel sequences in nouns, and which at the same time is most revealing, is to treat those relatively few nouns which violate the constraints as exceptions. For some of these, such as

ɔtí, a reasonable etymology can be constructed from comparative dialect evidence so that we have at least a fairly good idea how they came to acquire their synchronically exceptional status. Some, such as nouns which are nominalized forms of verbs, may be exceptional only because of our ignorance with respect to the phonological behaviour of nominalizing prefixes. For all these nouns -- including those for which neither of the foregoing explications is valid, e.g. CY, Oṅ, Òk 240 Maxwell's duiker ɛtu -- their status as exceptions can be most simply marked by specifying their prefix vowels as [MTense].

In Appendix 2 are listed all nouns in Abraham (1958) which have ɛ or ɔ as prefix vowel and i or u as only stem vowel. [32]

1.10 We are not in a position to make some assumptions about why it is that in most dialects [33] the high prefix vowels do not participate in tenseness harmony. Obviously this is a historical question since synchronically there is no motivation to recognize an underlying ɪ or ʊ, neither in Ìf, where these vowels occur on the surface, nor in other dialects, where they are totally absent. Some examples in dialects which lack harmony with high prefix vowels, compared with Ìf:

	CY	K	Oṅ	Òk	ɔ̀b	vs	Ìf
75 finger	ɪ̀ka	ɪ̀ka	ʊ̀ka	ɪ̀kaɔ́	(ɔ̀ka)		ɔ̀ka,ɔ̀kɪ̀ka
62 tongue	(awɔ̃́)	(ɛkpɔ̃)	iwã́	iwã́	iŋɔ̃́ [34]		ʊɔ̃́
94 thigh	itã	itã	ugbatã	utã	utã		ʊtã
105 urine	ɪ̀tɔ̀	ɪ̀tɔ̀	ɪ̀tɔ̀	ɪ̀tɔ̀	ɪ̀tɔ̀		ɪ̀tɔ̀
151 evening	ɪ̀rɔ̀lɛ́	(alɛ́)	ʊ̀wɔ̀lɛ́	ʊ̀rɔ̀lɛ́	ɪ̀rɔ̀lɛ́		ɔ̀rɔ̀lɛ́

1.10.1 There are two possible developments that will account for the current cross-dialect evidence. One (development A) is that ɪ and ʊ existed in all the above dialects and then merged with /i/ and /u/. That is, all dialects may at one time have had the set of surface prefix vowels now seen only in Ìf. The other development (development B) which will account for the contemporary distribution of the high prefix vowels is that tenseness harmony affected only the [-High] prefix vowels, and that Ìf generalized the process to include the [+High] prefix vowels. This course involves

the assumption that a simplification of a rule of more restricted applicability took place in If. Thus an earlier rule

(22) $\begin{bmatrix} V \\ -High \end{bmatrix} \rightarrow$ [-Tense]/ _____ X $\begin{bmatrix} +Voc \\ -Cons \\ -Tense \end{bmatrix}$

was simplified to

(23) V → [-Tense]/ ____ X $\begin{bmatrix} +Voc \\ -Cons \\ -Tense \end{bmatrix}$

which (excluding proper bracketing) is the rule of Tenseness Assimilation as it now applies to If (rule (20)).

1.10.2 Development A assumes two events in the histories of the non-ɩ, o dialects: (1) if we assume for these dialects a similar underlying set of prefix vowels as present-day If, namely that they were [UTense], accompanied by a Universal Markedness Convention and a rule of tenseness assimilation which produced [-Tense] prefixes in the appropriate environments, then this rule must have undergone a change so that it now excluded the [+High] prefix vowels. That is, it must have lost some of its generality. Schematically, the rule

(24) V → [-Tense]/ _____ ....

must have become restricted to the rule

(25) $\begin{bmatrix} V \\ -High \end{bmatrix} \rightarrow$ [-Tense]/ _____ ....

(2) At a later stage this rule now dropped from the grammars of these dialects altogether, leaving behind a sequence structure condition to the effect that only [-High] vowels agree in tenseness.

1.10.3 Development B obviates the necessity of positing event (1). This leaves rule (25) and event (2) as the simplest historical explanation for the present-day non-ɩ, o dialects. But what is gained? Account B removes a rule change from a group of dialects, but it adds one to another dialect. The difference is that what is added to the grammar of If is a generalization of a rule of more limited application, whereas account A claims that a narrowing down of a very general rule took place. The generalization effected

by the change from rule (22) to rule (23) is a simplification of (22). This is more the expected sort of change which a rule undergoes within the development of a single dialect.[35] Moreover, account A must assume a shared innovation among a large number of dialects, to the exclusion of Ìf. Ìf is by no means a geographically isolated area. Thus account A would be hard-put to give a plausible reason for the omission of the Ìf area from the rule change. Just as inexplicable under this account is the fact that the new rule is a more complex, less general form of the posited earlier rule. Kiparsky (1968b, 190) points out that in the diffusion of a rule a narrowing down of its scope often takes place, but he cites Bach as suggesting that rules are never reduced in scope in diffusion across dialects (190, fn.7).

All things considered, the account which ascribes the innovation to Ìf probably gives the more accurate historical development.[36]

1.11 All dialects studied are subject to rules which delete vowels in certain environments. One such environment is the sequence transitive verb + noun object. The vowel of the verb stem and the prefix vowel of the noun abut, and one of the two vowels is optionally deleted.[37] The literature on Yorùbá terms this process 'vowel contraction'.[38] The deleted vowel may be the vowel of the verb, as in

(26) /sá/ 439 run + /uré/ race, sports contracts to súré (Ìf)

(27) /mì/ 427 swallow + /ègbà/ 290 groundnut " " mẹ̀gbà (K)

(28) /kó/ 466 gather + /edé/ shrimp " " kédé (CY)

In those dialects in which some verbal prefixes agree in tenseness with the vowel of the verb stem, they also agree with the first vowel of the contracted form of a verb and its noun object. This can be illustrated by supplying a singular pronoun to both the uncontracted and the contracted forms of examples (26) and (27), Ìf and K being dialects in which singular pronouns agree in tenseness with the verb. The forms to the left of the arrow have already undergone Tenseness Assimilation (rule (20)):

(29) ó sá uré $\xrightarrow{\text{contrac.}}$ ó súré he ran (Ìf)
He ran race

(30) ó mì èkpà $\xrightarrow{\text{contrac}}$ ó mɛ̀kpà he swallowed a groundnut (K)
He swallowed groundnut

The order of rules implied here for these structures is (a) Tenseness Assimilation, (b) the rules which account for the process of vowel contraction. Under this ordering it would appear that for tenseness assimilation to be maintained it is necessary for the pronoun prefix in the contracted form to shift from lax to tense, or from tense to lax, depending on the following vowel. And this would entail a further rule, following (b), above, in which the pronoun assimilates to an [αTense] following vowel.

That is, in example (29) the vowel of the verb is [-Tense], and thus T.A. has applied to convert the pronoun from an underlying [+Tense] to surface [-Tense] to agree with the verb. The vowel of the verb is now (optionally) deleted, and the [-Tense] pronoun vowel now precedes the [+Tense] u of uré. Since tenseness agreement must be restored, a new assimilation rule is apparently needed to convert the pronoun from [-Tense] back to [+Tense]. Example (30) shows that this new assimilation rule must also convert a [+Tense] vowel to [-Tense]. The deleted vowel of the verb is [+Tense], and T.A. has thus not applied to the underlying [+Tense] pronoun vowel. But the pronoun vowel now precedes the [-Tense] ɛ̀ of èkpà, and tenseness agreement must now be restored by converting the pronoun vowel to [-Tense]. 39

1.11.1 These observations must now be related to the earlier discussion of the rule of Tenseness Assimilation (cf. sec. 1.8.2f). I repeat the rule here for ease of reference:

(31) (=(20)) Tenseness Assimilation

$$V \rightarrow [-\text{Tense}] \;/\; \left[\frac{\quad}{\langle +\text{Pron}\rangle}\right]_1 \; X_o \; \begin{bmatrix} +\text{Voc} \\ -\text{Cons} \\ -\text{Tense} \end{bmatrix}$$

N (If)
V (If, Ak, ⟨K⟩)

There is clearly a functional equivalence between T.A. and the rule which seems to be required after the rules of verb-noun contraction. T.A. brings about tenseness agreement between a prefix and its stem, and the new rule serves to restore this agreement if it has been destroyed through

the process of vowel contraction. Can this functional duplication be avoided by collapsing the two rules into a single tenseness assimilation rule which does not necessitate [αTense] in its structural change, but retains the [-Tense] SC of T.A. (rule (31))? The answer is that there are extremely compelling reasons to do so, and that any other means of accounting for tenseness agreement leads to difficulties of various sorts. In order to see this, it will be necessary to examine two alternative possibilities. The rules which will be cited are Tenseness Assimilation (abbreviated T.A.), Vowel Deletion (abbreviated V.D.), and the rule of tenseness assimilation which requires [αTense] in its structural change, as discussed in the preceding section (abbreviated ¬αT.A.). The derivation provided are for the dialect of If.

Alternative possibility 1: The ordering of rules is T.A. - V.D.

Underlying form	/ó sá uré/	/ó jí èkpà/
	he ran race	he stole groundnuts (489 steal) (290)
T.A.	ó sá uré	ó jí èkpà
V.D.	ó sØ uré	ó jØ èkpà
Other verb-noun contraction rules	ó súré	ó jéèkpà
Phonetic output	*[ósúre]	*[ó jéèkpà]

With this ordering, the phonetic output contains the impermissible sequences lax pronoun vowel + following tense vowel, and tense pronoun vowel + following lax vowel. Thus this ordering is inadequate to account for the data.

Alternative possibility 2: The ordering of rules is T.A. - V.D.-¬T.A.

Underlying form	/ó sá uré/	/ó jí èkpà/
T.A.	ó sá uré	ó jí èkpà
V.D.	ó sØ uré	ó jØ èkpà
T.A.	ó sØ uré	ó jØ èkpà
Other verb-noun Contraction rules	ó súré	ó jéèkpà
Phonetic output	[ó súré]	[ó jéèkpà]

With this ordering, the correct phonetic output is obtained, but there are several overriding objections to the ∝T.A. rule. These are as follows:

1) In sec. 1.8.3 it was claimed that in If trisyllabic nouns it is the final vowel which brings about laxing of all preceding vowels. The existence of such nouns as 201 animal ɛrãko, and 253 pigeon ɛyɛlé, do not constitute exceptions to this claim on the assumption that they are the result of compounding in which the first constituent is a noun which has undergone T.A. so that the prefix vowel has already been laxed (thus, the first constituent of ɛrãko is assumed to be ɛrã (268 meat), and the first constituent of ɛyɛlé is assumed to be ɛyɛ (258 bird). The systematic phonemic forms of these two nouns is, respectively, /erã/ and /eyɛ/). With the posited ∝T.A. rule, these compounds would no longer constitute evidence for the correctness of the claim with respect to If trisyllabic nouns. They would, in fact, now be exceptions to the ∝T.A. rule, and would require the exception feature [- ∝T.A.].

2) It will be shown in Chapter 2 that there is much evidence in favor of representing the singular subject pronoun vowels as underlying [+Tense]. They may then be laxed by a following verb stem if its vowel is lax, in accordance with the T.A. rule. The plural subject pronouns, however, must be represented as underlyingly [-Tense]. And these pronouns do not assimilate in tenseness to a following verb stem if its vowel is tense. The reason is that there is no mechanism to tense underlying lax vowels, since T.A. only laxes underlying tense vowels. If we posit the rule ∝T.A., there is no longer an explanation available for why these pronouns remain [-Tense]. Like the compound nouns above, they now constitute exceptions to the ∝T.A. rule, and must be marked [- ∝T.A.].

3) Both T.A. and ∝T.A. perform the same function, that of maintaining tenseness agreement between prefix and stem vowels. It will be shown below that the positing of two separate tenseness assimilation rules is an unnecessary complication of the phonology, that a single rule, applied cyclically, captures the relevant linguistically significant generalization and at the same time avoids the unfortunate consequences of the ∝T.A. rule.

1.11.2 It is clear that the rule orderings T.A.-V.D., and T.A.-V.D.-αT.A. are inappropriate to the data. It must now be shown that the order V.D.-T.A. - with T.A. applying cyclically to nouns and their prefixes and verbs and their prefixes - is the correct one. Firstly, it is evident that T.A. must be a cyclical rule even if V.D. (and the other rules which account for the verb-noun contraction process) were absent from the grammar. The laxing of noun prefix vowels in If, which is accounted for by T.A., must apply to structures larger than a single noun in the case of trisyllabic nouns which arise from the compounding of two nouns. Thus the noun 145 moon ɔ̀sɔ̌kpá is analyzed as consisting of the noun 156 month osǔ, and the (perhaps obsolete) noun Vkpá, in which both prefix vowels are lexically [UTense]. The bracketing for ɔ̀sɔ̌kpá would presumably be

(32) $[_N [_N [_{Pref} [\text{UTense}]] [_{Stem} \text{sǔ}]]_N [_N[_{Pref} [\text{UTense}]] [_{Stem}\text{kpá}]]_N]_N$

T.A. now applies first to the two Noun Prefixes.[40] The brackets are then removed by a convention on the cyclical application of rules (cf. Chomsky and Halle (1968, 20)), and T.A. now applies to the outermost noun, simultaneously laxing all vowels that precede the [-Tense] final stem vowel.

Another structure to which the T.A. rule must apply cyclically is that exemplified by the If nouns 159 dry season ɔ̀gbɛlɛ̀ and 333 light ɔ̀mɔ̃lɛ̀. Their categorial composition is Nominalizing Prefix - Verb Stem - Noun Prefix - Noun Stem. Thus, for example, ɔ̀gbɛlɛ̀ consists of the Nominalizing Prefix /ù/, the Verb Stem 372 be dry /gbɛ/, and the Noun 177 ground /alɛ̀/, which in turn consists of the Noun Prefix /a/ and the Noun Stem /lɛ̀/. In bracket notation, ɔ̀gbɛlɛ̀ is represented as:

(33) $[_N[_{Nom\ Pref}\text{ù}] [_{VStem}\ \text{gbɛ}] [_N [_{Pref}\ \text{a}] [_{NStem}\ \text{lɛ̀}]]_N]_N$

T.A. first applies (vacuously) the the innermost bracketed formative, the Noun Prefix. the brackets around the Prefix are erased; then T.A., in its second cycle, applies to the Nominalizing Prefix, assimilating it in tenseness to the lax Verb Stem. In the third cycle, T.A. applies to the structure as a whole, converting (vacuously, in this case) to [-Tense] any [+Tense] vowels which precede the [-Tense] final vowel of the Noun.

1.11.3 Let us now consider how T.A., cyclically applied, will derive the correct phonetic output for the type of structure exemplified in sec. 1.11, namely, the Verb Phrase, consisting of Subject Pronoun - Verb Stem - Noun Prefix - Noun Stem. The If Verb Phrase ó súré 'he ran a race' has the surface structure

(34) $[_{VP}[_{V}[_{SP}$ó$][_{VStem}$sá$]]_{V}[_{NP}[_{N}[_{Pref}$ u$][_{NStem}$ ré$]]_{N}]_{NP}]_{VP}$

The following derivation applies to this structure: [41]

Underlying form	/ó+sá##u+ré/
V.D.	ó sØ u ré
T.A. (cycle 1)	ó sØ u ré
Other verb-noun Contraction rules	ó s ú ré
Phonetic output	[ó súré]

The T.A. applies (vacuously, in this case) to the innermost bracketed strings. In this maximally simple derivation there is no environment in which a prefix vowel can be laxed. V.D. has deleted the lax vowel of the Verb Stem prior to the T.A. cycle, so that during the cycle the SP never directly precedes a lax vowel. The final phonetic string, after further post-cyclic rules which transfer the high tone of the deleted vowel of the Verb Stem to the following vowel, is the Verb Phrase ó súré, with all [+Tense] vowels.

The next derivation contains a noun whose prefix vowel must undergo laxing. The structure is the one underlying the If Verb Phrase ó jéèkpà 'he stole groundnuts'.

(35) $[_{VP}\ [_{V}[_{SP}$ ó$]\ [_{VStem}$ jí$]]_{V}\ [_{NP}[_{N}\ [_{Pref}$ è$][_{NStem}$kpà$]]_{N}]_{NP}]_{VP}$

Underlying form	/ó+jí##è+kpà/
V.D.	ó jØ è kpà
T.A. (cycle 1)	ó jØ è kpà
T.A. (cycle 2)	ó jØ è kpà
Other verb-noun Contraction rules	ó jé è kpà
Phonetic output	[ó jéè kpà]

In this derivation. the Noun Prefix vowel is laxed in cycle 1, the brackets are erased, and the Subject Pronoun is laxed in cycle 2. A post-cyclic rule then assimilates the

high tone segment which remains after V.D. (i.e., the segment $\begin{bmatrix}+\text{HIGH}\\+\text{Segment}\end{bmatrix}$)to the following vowel, and the final phonetic string is the Verb Phrase ó jɛ́ɛ̀kpà, with all [-Tense] vowels. To take a somewhat more complex example, the If Verb Phrase ó rɛ́yɛlé ' he saw a pigeon' has the following surface syntactic structure:

(36) $[_{VP}[_{V}\ [_{SP}\ \acute{o}][_{VStem}\text{r}\acute{\text{i}}]]_{V}\ [_{NP}[_{N}[_{NPref}\ \text{e}][_{NStem}\text{y}\varepsilon]]_{N}[_{N}[_{NPref}\text{u}]$

$[_{NStem}\ \text{l}\acute{\text{e}}]]_{N}\ ]_{NP}\ ]_{VP}$

The following derivation applies to this structure:

Underlying form	/ ó+rí##e+yɛ##u+lé/
V.D.	ó rØ e yɛ u lé
T.A. (cycle 1)	ó rØ e yɛ u lé
T.A. (cycle 1)	ó rØ ɛ yɛ u lé
T.A. (cycle 2)	ó rØ ɛ yɛ u lé
Rule (21)	ó rØ ɛ yɛ Ø lé
Other verb-noun contraction rules	ó r ɛ́ yɛ Ø lé
Phonetic output	[ó rɛ́yɛlé]

In the first cycle, T.A. fails to apply to u since the stem vowel of the Noun Stem lé is [+Tense]. However, the prefix vowel e of the other noun is laxed. In the second cycle the SP is laxed by the lax following vowel, the vowel which was laxed in cycle 1. Rule (21) is the posited noun compounding rule mentioned in sec. 1.8.3. A post-cyclic rule then transfers the high tone of the deleted Verb vowel to the following vowel. The phonetic form of the phrase contains a final [+Tense] vowel, but all the preceding vowels are [-Tense]. This is exactly what we would expect on the basis of the T.A. rule, which claims that [+Tense] vowels assimilate to [-Tense] vowels, but not the reverse.

In the following derivation, V.D. deletes the prefix vowel to the noun, and the SP assimilates in tenseness to the vowel of the Verb Stem. The phrase is ó kɔ̀wé 'he wrote (a book)'. The constituents are Subject Pronoun /ó/ - Verb Stem /kɔ/ (465 write) - Noun /ìwé/ (S246 book), which consists of Noun Prefix /ì/ and Noun Stem /wé/. This phrase occurs in all three dialects which contain the T.A. rule, If, Ak, and K.

Underlying form	/ó+kɔ##ì+wé/
V.D.	ó kɔ Ø wé
T.A. (cycle 1)	ó kɔ Ø wé
Other verb-noun contraction rules	ó kɔ̀ wé
Phonetic output	[ó kɔ̀wé]

The rules of verb-noun contraction are not obligatory, as noted. The contracted form is a stylistic option, although in normal speech the rules are generally applied. However, the application or non-application of the Vowel Deletion rule does not alter the cyclical property of the T.A. rule. Thus, if we have both a verb and a noun which have [-Tense] stem vowels in Ìf, T.A. will apply in a cycle to lax both the prefix to the verb and the prefix to the noun. An example is the Ìf Verb Phrase ó sõ èkpà 'he roasted groundnuts' (469 roast sõ, and 290 groundnuts èkpà).

Underlying form	/ó+sõ##è+kpà/
T.A. (cycle 1)	ó sõ è kpà
Phonetic output	[ó sõ è kpà]

Summary of Chapter 1

1.12 We have attempted to provide adequate justification for the use of the feature [Tense] in arriving at a descriptively and explanatorily adequate account of vowel-harmony in a number of dialects of Yorùbá. Various alternative feature combinations were rejected.

Harmony is a process of tenseness assimilation, brought about by P-rule in nouns and verbs in Ìf, and in verbs in K and Àk. In the nouns of all dialects except Ìf harmony is no longer an active process, but rather a constraint on permissible sequences of vowels. The historical inference is that Yorùbá contained a rule of tenseness assimilation at an earlier stage, and that this rule was dropped in most dialects. This has the wider implication that rules, when dropped from the grammar, can have a continuing effect on the grammar in the form of morpheme structure constraints.

Tenseness assimilation is a process which laxes underlying [+Tense] vowels. It is regressive. In Ìf it is the final vowel of the noun stem and verb stem which brings about laxing of all preceding tense vowels within the word. In K and Ak it is the final vowel of the verb.

The rule of Tenseness Assimilation laxes all vowels to which it applies simultaneously and cyclically across the word boundary.

Ways of handling various types of exceptions to the general phenomenon of tenseness agreement are proposed by means of Marked feature values and exception features.

The exclusion of i and u as prefix vowels from tenseness agreement in most dialects is inferred to reflect an earlier state in which Yorùbá contained a rule of tenseness assimilation that laxed only non-high vowels. The rule which accounts for the present-day harmony process in If is, then, an historically later innovation.

Footnotes

1. There are nouns whose surface forms violate the constraint on e-a and o-a. They are very few in number and are not taken as evidence which disconfirms this constraint. Their status is discussed in Appendix 2.

2. Cf. Stanley (1967).

3. Wherever it is used in a rule or condition, X indicates that there may be intervening segments which are irrelevant. Slightly more formally, X in this sequence structure condition contains no instance of the feature [Vocalic] which has the same value as the feature [Vocalic] given in the next relevant segment. A formal definition of the notion 'irrelevant intervening segment(s)' will no doubt include the major class features, e.g. [Vocalic, Sonorant, Consonantal]. It must, however, await further investigation, especially into the antecedent notion of feature hierarchy.

Kiparsky (1968a, 38-9) considers several ways other than that suggested here for treating irrelevant segments in rules.

4. The problem is that e and o cannot be excluded from occurring after ɛ and ɔ while at the same time permitting i and u to so occur. This is so because e and o differ from ɛ and ɔ in being [+High]; but so do i and u. Thus the same feature that excludes e and o must also exclude i and u. The fact that i and u are [-Mid] cannot be used to exclude them from non-occurrence after ɛ and ɔ because ɛ and ɔ, which are [+Mid], must be allowed to occur as second vowel

when first vowel is *ɛ* or *ɔ*. We would therefore have to allow both [+Mid] and [-Mid], i.e. [αMid], in the second vowel. But, now, in order to provide for the constraint on succession of [+Mid] vowels, namely that only *e*, *o* can follow *e* and *o*, and only *ɛ*, *ɔ* can follow *ɛ* and *ɔ*, we must state that they have the same specification for the feature [High], i.e. that they be $\begin{bmatrix}\alpha\text{High}\\ +\text{Mid}\end{bmatrix}\begin{bmatrix}\alpha\text{High}\\ +\text{Mid}\end{bmatrix}$. This is incompatible with allowing the second vowel to be either plus or minus [Mid]. To illustrate:

$$\begin{array}{llll} \text{If} & \begin{bmatrix}\alpha\text{High}\\ +\text{Mid}\end{bmatrix} & \text{X} & [\beta\text{Mid}] \\ & & & \Downarrow \\ \text{Then} & & & [\alpha\text{High}] \end{array}$$

In the case of *ɛ* or *ɔ* as first vowel, this condition says

$$\begin{array}{llll} \text{If} & \begin{bmatrix}-\text{High}\\ +\text{Mid}\end{bmatrix} & \text{X} & [\beta\text{Mid}] \\ & & & \Downarrow \\ \text{Then} & & & [-\text{High}] \end{array}$$

Only *ɛ*, *ɔ*, and *a* will fit into second vowel position, the [βMid] part of the condition being completely redundant, and the [+High] vowels *i* and *u* are still excluded. There seems to be no way within this set of features to capture the required constraints while allowing permissible sequences through.

An analogous argument applies if the features [Mid] and [Low] are used instead of [High] and [Mid].

5. It should be noted that the situation described is inherent in the binary-valued feature system and seems incapable of being remedied within the present theory. In an n-ary valued system for vowels, as has been proposed, for example, by Ladefoged (1967, 67-9), vowels appearing on a single high-to-low scale could be more easily shown to be related to vowels immediately above or below them.

6. There are also nouns without a prefix vowel. Their description as exceptions will be taken up later. They are irrelevant to the present discussion.

7. There is some evidence that [a]-[i] and [a]-[u] are impermissible sequences. See discussion in sec. 3.3.

8. In a number of other Kwa languages, the neutrality of [a] in vowel harmony has been pointed out, e.g. in Ijọ (Williamson (1965, 14-16)); in Igbirra and Idoma (Ladefoged (1964, 37-8)); in Twi (Fromkin (1965, 606-7)).

9. Halle and Stevens in a recent article entitled 'On the feature "Advanced Tongue Root" ' (1969), state: 'It appears ...that the features tense-lax and covered-uncovered have in common one and the same phonetic mechanism and should therefore be regarded as a single feature in the phonetic framework.' (209).

10. There are two apparent counterexamples in my list of some 500 examples:

tɔɔ̀ 445 to taste wɔ́lí 516 to follow

Neither is a real counterexample, but rather an instance of a tenseness assimilation process operating on the vowels of (at least) the following types of structure: verbs in serial order, and the contracted forms of verbs and their noun objects. Thus the derivation of tɔɔ̀ will be:

lexical entry $[[tɔ]_V\ [ù]_V]_V$ (Cp. CY tɔ́wɔ̀ tɔ́ touch tentatively + wɔ̀ look at; K tɔ́wù)

progressive tenseness assimilation tɔ + ù → tɔɔ̀

The exact derivation of wɔ́lí cannot be given because the constituent morphemes are not known. However, it seems quite certain that the [ɪ] derives from /i/ by a progressive assimilation rule of the sort to which tɔɔ̀ is subject. Strong supporting evidence comes from the If verb-noun contraction kɔrĩ̀ 471 sing (a song). The components are kɔ 'sing', with a [-Tense] vowel, and orĩ́ 'song', with [+Tense] vowels. Verb-noun contraction deletes the prefix vowel of the noun, thus yielding kɔ rĩ́. This construction is then subject to progressive tenseness assimilation. The same process is seen in dáɔ̃̀ 476 to answer, the components of which are dá 'to cause' and oũ 112 voice. The [+Tense] vowel ũ is laxed following the deletion of the prefix vowel o. The rule is roughly:

$$V \rightarrow [\text{-Tense}] \ / \ \left[\begin{bmatrix}\text{+Voc}\\ \text{-Cons}\\ \text{-Tense}\end{bmatrix}\right]_V \qquad X \ \_\_\_\_$$

The bracket is entered tentatively. All three of the examples, tɔ̀ɔ̀, kɔrĩ, and dáɔ̃̀ involve assimilation to the vowel of a verb. It is not known whether this progressive assimilation goes beyond structures involving verbs as first component.

11. In its lexical matrix, /a/ is [UTense]. I assume the following Universal Marking Convention:

$$[\text{UTense}] \rightarrow \left\{ \begin{matrix} [-\text{Tense}] \\ [+\text{Tense}] \end{matrix} \right\} / \left[\frac{\quad}{+\text{Low}} \right]$$

Halle and Stevens (1969), approaching the problem of the specification of the low vowel [a] in markedness theory from the point of view of acoustic information, make the same assumption. They state:

> Such considerations [formant frequency measurements correlated with size of oral cavity] lead to the conclusion that unmarked or "natural" high vowels are produced with tongue-root advancing... One would assume that unmarked low vowels do not have tongue-root advancing, since they are characterized by a maximally high F_1. (212)

They further note that 'tongue-root advancing is clearly a feature that distinguishes between vowel pairs in West African languages displaying vowel harmony.' (212)

See also fn1, p. 57.

12. Courtenay assumes that agreement is in the opposite direction in CY. For discussion, see sec. 1.3.2.

13. It appears from this condition that rather than listing morphemes in terms of plus and minus feature values in all MS conditions, at least some must be permitted to use M and U values. I will not pursue this theoretical innovation here, but simply note that it seems a natural extension of markedness theory, since MS conditions are a part of the lexicon and reflect what the speaker knows concerning many of the phonological regularities in the lexicon.

14. Actually there is no u as a prefix vowel in CY, so these sequences are non-occurring. For discussion of this point and the MS condition which disallows initial u, see Chapt. 3, sec. 3.2.1.

15. For a discussion of a-i and a-u sequences, see Chapt. 3, sec. 3.3.

16. The derivation of the subject pronouns is the topic of Chapter 2.

17. There is a contradiction in the theory as presently constituted, in the way it views this rule. The addition of the category Verb to the rule entails the addition of the feature [+V] to every segment which appears to the right of the arrow, by Chomsky and Halle's convention which assigns to all segments of a formative the categorial label(s) of the formative as a whole (Chomsky and Halle, 1968, 173-5). The extension of the rule to verbs is a generalization. However, the additional feature [+V] makes this rule "more complex" in terms of the number of features mentioned, than the earlier version which was limited to nouns only. Any proposed evaluation metric will, apparently, need to treat features introduced into the lexical matrix by the spreading convention differently from the phonological features mentioned by a rule.

18. In this section only the pronominal verbal prefixes have been cited. There are a number of others. See sec. 1.8.3 and the discussion of the derivation of the subject pronouns in chapter 2. Although not all prefixes have been investigated in these dialects, the MS condition properly extended to include verbal as well as nominal prefixes predicts that all such prefixes will be [UTense] in their underlying form. This is clearly correct since among the verbal prefixes there is a marker of the Future à, as in:

mà à á	I will come (Àk)
I Fut come	
ma à wá	I will come (K)
I Fut come	

Cf. also secs. 1.3.1 and 1.5.1.

19. The difference in prefix vowel ([i] vs. [u]and [ɑ]) is the result of an historical shift from [+Back] to [-Back] in high vowels in dialects which lack an [u] prefix. See sec. 3.2.1.

20. ɔ́rɔ̀ has been subject to further leveling by a rule which assimilates the first stem vowel to the prefix vowel in all features but tone.

21. Similar phenomena are found in Akan, another Kwa language, even in such closely related dialects as Akuapem, Asante and Fante (Fromkin, personal communication).

22. For the Ìf form, see p. 38, fn.20 and sec. 4.1.2. For Òn ɔ́ú̀ɔ̀, see the discussion of Òn vocalic clusters, sec. 4.4.

23. There are a few four-syllable nouns in Ìf, as well as in all other dialects. These appear to be compounds or ideophones. The component morphemes of compounds will be listed separately in the lexicon. A few examples of four-syllable nouns in If:

115 boy ɔmɔkɔ̀rĩ̀ (<ɔmɔ̃ child + 113 man ɔkɔ̀rĩ̀)

120 old man àgbàlagbà (< àgbà adult + (?) lĩ particle of identification + àgbà)

255 turkey tòlótòló (ideophone)

257 cat ológìnĩ̀ (<?)

A study of the composition of such nouns and the rules of harmony which operate upon them must await an analysis of Yorùbá derivational morphology. I restrict myself to rules for nouns of two and three syllables, making reference to their morphological composition when necessary.

Courtenay (1968, Appendix II) has made a preliminary study of ideophones in Yorùbá.

24. The applicability of this rule to pre-verbal categories other than ti has not been investigated in Ìf and Ak, so it is not known whether it applies to all sequences of prefixes to the Verb.

25. Abraham (1958) says 'It seems probable that ɔšù is derived from the primary idea òšùkpá.' (192) This seems to be a rather unfruitful sort of speculation into semantic origins.

26. The informant indicated that both ɔ̀dɔ̀ and ɔ̀dɔ̀ki are in use.

27. Recall that neither Courtenay's MS condition on tenseness agreement in nouns (condition(1)), nor the condition I propose (condition (6)), excludes a lax prefix vowel followed by a [+High] stem vowel.

28. Another example: 138 dew Ìf ìrî, CY ìrî, K irî. u in K seems also to have undergone the same change in a number of nouns as well as verbs, e.g. 20 twenty K ogú CY, Oǹ, If ogǔ
107 sweat K òógù CY, òógǔ
457 sleep K sù CY, Oǹ, Ìf sǔ

29. The marking convention proposed in fn.12,p. 24, specifies all nonlow vowels which are [UTense] in the lexicon as [+Tense]. In order to be assigned a [-Tense] specification, /ɛ/ and /ɔ/ must be entered as [MTense]. But this is just what is desired. To say that ɔtí is an exception is to say it is more complex in some way than a noun whose prefix vowel is specified as [UTense]. The proposed marking convention, which was arrived at on the basis of other, unrelated, phonological facts, gives just the right results here, by increasing the complexity of the lexical representation of ɔtí by 1.

30. There are a number of other Nom Pre's listed as well. Cf. Abraham (1958, 263-4).

31. For some discussion of this topic, cf. Ward (1952, 412), Bamgbose (1966, 103-4), Awobuluyi (1967a, 2).

32. Some remarks are in order here about this list. ɔtí is the only native Yorùbá noun of the form ɔCi. There are no nouns of the form ɔCu listed at all(the listing òdù is probably an error in cross-referencing; cf. pp505 and 533). This extreme poverty of ɔC{i/u} forms lends substantial empirical support to the claim that the nouns under discussion are exceptions. Of the ɛCi and ɛCu nouns there is a larger number, although not nearly as many, I suspect, as the number of nouns containing any arbitrary permissible sequence of two lax or two tense vowels. The non-occurrence of a number of consonants as the intervening consonant between ɛ and i or u is also noteworthy: d, f, gb, h, j, kp, š do not occur between ɛ and i;gb, j, kp, s, š, y do not occur between ɛ and u. Six out of the 15 ɛCi nouns in the list and four out of the 27 ɛCu nouns are given as Nom Pre + Verb Stem.

The three partially assimilated English borrowings which Abraham lists under ɔCi may indicate that, in the dialect of his informants (three out of four came from Ìbàdàn),

the sequence ɔCi may be losing its exceptional status. It may, however, simply indicate that this sequence is tolerated in nouns of three or more syllables.

The noun, ɛhuru was unknown to my K, Onà, Ìf, and Òk informants. Ok has a possibly cognate noun, ehorọ ' a goose-like bird'. But ehoro also glosses as 'hare' in Ok, and as 'rabbit' or 'hare' in other dialects (cf. item 246, Appendix 1).

33. In fact, in all dialects studied except Ìf.

34. ɔ̀B has two forms: iŋ̃́ and aŋ̃́. The informant says that iŋ̃́ is the older of the two.

35. The concept of rule simplification is discussed at length in Kiparsky (1968b), especially pp. 189-96.

36. Notice that had there been written records for these Yorùbá dialects this change would not have been reflected if the writing system had been morphophonemic, for only prefix vowels which were [UTense] would have had representing symbols.

37. In reality, the process of contracting a verb and its noun object is not one of simple vowel deletion, but of deletion of segmental features, leaving intact both tonal features and the specification [+Segment]. Some dialects then transfer the tone, if it is [+High], and delete the segment; others assimilate it to the non-tonal features of an adjoining vowel.

38. A good deal of work has been done on the description of vowel contraction in Yorùbá in recent years (cf. Bamgbose (1964, 1965b); Fresco (1966); and Courtenay (1968)). The central problem in contraction, however, that of determining which of the two abutting vowels is deleted, has not been solved. The only strictly phonologically determined deletion which has so far emerged is that, with very few exceptions, an i occurring as either first or second vowel (i.e., i-V or V-i) is deleted. In sequences of vowels other than these, the deletability of one of the two segments seems to be morphologically determined. It is Courtenay's tentative conclusion that the choice 'may be a question of performance rather than competence since the lack of regularities makes it difficult to construct rules of any generality with our

present knowledge. On the other hand, the regularities which exist seem to be morphologically conditioned, which would require the marking of verbs in the lexicon by special features specifying the rule which is applicable.' (80-81).

The rules governing the behaviour of tone in contraction are straightforward. They are dealt with in Fresco (1966) and Courtenay (1968), and will not be repeated here.

39. Example (30) is taken from K, in which tenseness agreement in nouns is a condition on the lexicon (cf. Sequence Structure Condition (6), sec. 1.3.2). Thus the underlying form of [ɛ̀kpà] is /ɛ̀kpà/. If does not contain Condition (6), but instead contains Condition (4), which states that noun prefix vowels are systematically [UTense]. Thus [ɛ̀kpà] is /èkpà/ in its lexical form in If. T.A. then converts this to [ɛ̀kpà].

40. There is no principle which determines to which of two (or more) coordinate brackets, such as the two inner Nouns of (32), a cyclical rule must apply first. I know of no evidence on which to base such a principle. Chomsky and Halle (1968, 16), in deriving the stress contour of, e.g. the structure

$$[_N\ [_A\ \text{black}\ ]_A\ \ [_N\ \text{board}]_N\ \ ]_N$$

state simply 'According to the principle of the transformational cycle, the phonological rules apply first to the strings dominated by A and N, the lowest-level categorial nodes'.

41. ## represents word boundary. If the underlying string were to be fully marked, it would appear as:

/##ó+sá###u+ré###/

Chapter 2

The Derivation of Subject Pronouns

2.0 In Chapter 1 I accepted the claim of Schachter and Fromkin (1968) and Stahlke (1969) that the non-independent, subject pronouns are dominated by the category Verb. Here I will offer some additional evidence for the correctness of this claim in the course of presenting an analysis of the set of singular subject pronouns. My analysis and conclusions differ in several important respects from those of Stahlke, both because crucial information from several dialects was not available to him, and because of facts which have come to light in the investigation of vowel harmony presented in chapter 1.

The independent pronouns are dominated in the surface structure by NP. They are phonologically and syntactically nouns, with a prefix vowel and a CV stem. Hence the traditional opposition between the independent and the 'dependent', or 'subject'pronouns. The latter pronouns have various realizations depending on the verbal construction in which they occur. To take the CY first person as example (SM = Subject Marker):

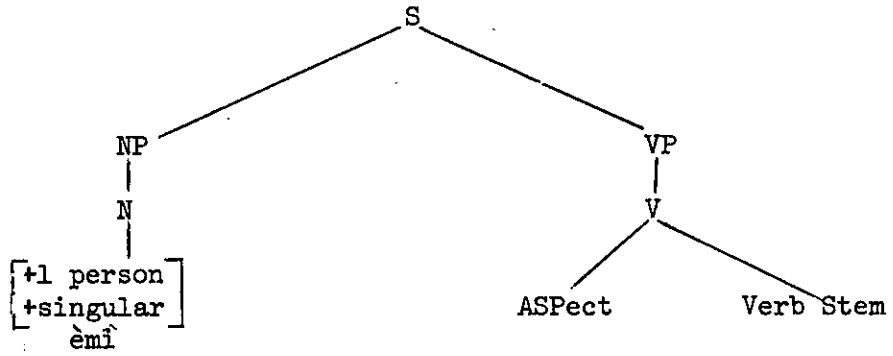
Independent Pronoun	ènĩ ènĩ ĩ še é tã́ I SM do it finish	I finished it	(1)
	]ènĩ ò gbàgbé è I Neg forget its	I didn't forget it (emphatic use)	(2)
Subject Pronoun Preterite	mo mo še é tã́ I do it finish	I finished it	(3)
Pret. Neg.	mĩ mĩ ĩ še é tã́ I Neg do it finish	I didn't finish it	(4)
	ŋ ŋ ò še é tã́ I Neg do it finish	I didn't finish it	(4a)
Future I	mà mà á še é tã́ I Fut do it finish	I will finish it	(5)
Future II	mĩ mĩ óò še é tã́ I Fut do it finish	I will finish it	(6)

Continuous mo/mò mò/mò ń dáñá I'm lighting a fire (7)
I Cont light+fire

Completive mo mo ti ǰe é tá I've finished it (8)
I Compl do it finish

Stahlke's aim is to show that the subject pronouns are directly derivable from the corresponding independent pronouns. To substantiate this claim he posits the presence of several abstract formatives in the underlying structure of the verbal auxiliary. It will be part of my aim to show that there is a way to generate the subject pronouns from a single base form, which posits a less complex syntactic structure and fewer and better motivated phonological rules. [2] I will discuss the singular pronouns in detail since they constitute the area of indeterminacy. The plural pronouns will receive only peripheral consideration since their derivation is for the most part straightforward. Tonal alternations such as in example (7), above, are not considered here.

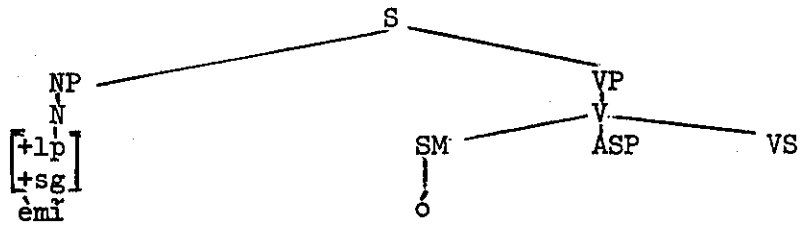
2.1 In agreement with Schachter and Fromkin, I posit a base structure of approximately the following sort:



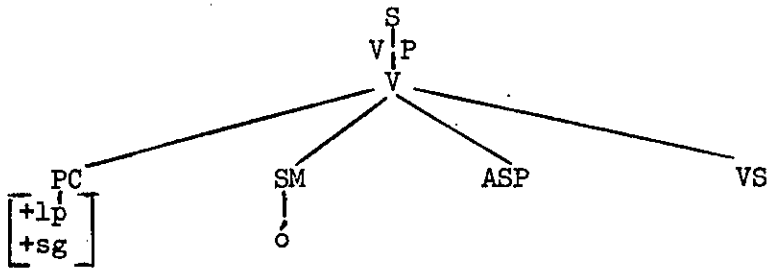
The first person singular (1p sg) independent pronoun has been inserted under NP to exemplify what the proposed rules will operate upon. Given such a structure, a Subject Marker (SM) node is added by transformation as the left-most constituent of the main verb. The tree must have a subject NP at this stage in the derivation. SM-Insertion does not apply to structures underlying imperatives. It must therefore be ordered to follow NP-Deletion. A conditon on its operation is that ASPect must be either Preterite or Completive, although some dialects appear to optionally allow SM-Insertion with Continuous also. This restriction on the

transformation is simply noted here. No formalization is attempted for lack of sufficient data across the dialects.

The SM is posited as being ọ́, irrespective of which pronoun is the subject. The derived tree resulting from SM-Insertion is:



When a non-emphatic pronoun functions as subject NP, i.e., when an optional EMPhasis node is not present in the base structure, an optional transformation copies the features of this pronoun onto a node directly to the left of SM, and erases the NP. I will call this transformational and the new node Pronoun Copy (PC). [3] The output of the Pronoun Copy transformation is:



The derivation posited here differs from the one posited by Schachter and Fromkin (119) in that in Akan there is apparently no need to create a separate SM node. There is just a feature-copying transformation (which they label Subject Concord). In Yorùbá, it must be the case that PC and SM exist as separate categories in the surface structure of VPs if a satisfactory explanation is to be given for two observations: (1) the nearly universal occurrence of the vowel ọ in the 1st, 2nd, and 3rd person singular Pronoun Copies when followed by Preterite or Completive Aspect; (2) the appearance of the Subject Marker on the surface along with the Pronoun Copies in the dialects of ɔ̀w and ɔ̀b, also when followed by these same two aspectual categories.

The following table lists the paradigm of the independent pronouns:[4]

1p	sg	èmĩ
2p	sg	ìwɔ
3p	sg	òũ
1p	pl	àwa
2p	pl	èyĩ
3p	pl	àwɔ̃

The PCs which are inserted as the left-most constituent of the Verb as a result of the Pronoun Copy transformation have, I claim, the following systematic phonemic form:

1p	sg	/ mĩ /
2p	sg	/ wo/
3p	sg	/ Ø /
1p	pl	/ a / [5]
2p	pl	/ ɛ /
3p	pl	/ wɔ́ /

For purposes of clarity of exposition, I list below the surface phonetic forms of the PCs which the P-rules to be posited will derive:

		CY	K	Ìf	Àk	Òn	Òk	ɔ̀w	ɔ̀b
1p	sg	mo	mò	mó	mo	mɔ̃	mɔ̃	mò ó	mũ̀ ṹ
2p	sg	o	ò	o	wo	wo	wo	wò ó	wò ó
3p	sg	ó	ó	ó	ó	ó	ó	ó	ó

TABLE 1

Note: ɔ̀w and ɔ̀b 1p sg and 2p sg PCs are shown followed by the SM

2.2 The following set of P-rules will partially derive the above PCs:

Assimilation of PC to SM

$$(9)\quad \begin{bmatrix} +\text{Voc} \\ -\text{Cons} \end{bmatrix} \rightarrow [\alpha F] \;/\; \left[\frac{\quad}{+\text{sg}}\right]_{PC} \quad [\alpha F]_{SM}$$

This rule regressively assimilates the segmental features of the vowel of the singular PC to the SM ó. The operation of (9) results in the following changes:

		Before (9)	After (9)
1p	sg	mĩ + ó	mo + ó
2p	sg	wo + ó	wo + ó
3p	sg	ø + ó	ó + ó

(10) SM-Deletion

$$\acute{o} \rightarrow \emptyset \;/\;]_{PC} \qquad [\underline{\quad\quad}]_{SM}$$

This rule deletes the SM when it follows any PC. However, in Ɔw and Ɔb the SM appears on the surface. That is to say, (10) is absent from these two dialects. The fact that the SM does not appear following 3p sg PC in ƆW and Ɔb is discussed below (cf. sec. 2.10)

		Before (10)	After (10)
1p	sg	mo + ó	mo
2p	sg	wo + ó	wo
3p	sg	ó + ó	ó

CY, K, and Ìf require a rule deleting the w of the 2p sg PC.

(11) CY, K, Ìf:[6] w-Deletion

$$w \rightarrow \emptyset \;/\; \left[\underline{\quad\quad}\;\overline{2p\ sg}\right]_{PC}$$

		Before (11)	After (11)
2p	sg	wo (K wò)	o (K ò)

In most dialects the o in the singular PCs undergoes no further changes.

2.3 Before discussing those PCs which are not fully derived by the above rules, we need to say something about the choice of underlying forms of the PCs as given in the table on p.3. The 2p sg PC is given as /wo/,[7] that is, with a [+Tense] underlying vowel. Rule (9) serves to assimilate the vowels of the singular PCs to the SM ó. It thus applies vacuously to the 2p sg /wo/. Could it not instead be listed as /wɔ/, since like 1p sg /mĩ/, it seems to be in some way directly derivable from the corresponding independent pronoun? This is in fact the position take by Stahlke. The problem is that there is no non-ad hoc way to derive all occurrences of wo from an underlying /wɔ/, since wo is not limited to cooccuring with the SM, but appears with certain aspects from which the SM is absent, for example, Future II, and Preterite Negative:

(12) o óò rí i nĩ́'bɛ̀ you will find it over there (lit. you Fut. II find it at that-place) (CY)

(13) o ò rí i you didn't find it (lit.you Neg. find it) (CY)

A unified explanation ought to be found for both this occurrence of the 2p sg. PC and its occurrence in the presence of the SM. We may therefore rule out a priori a solution which recognizes two separate underlying representations, namely /wɔ/ and /wo/. Out of the two candidates one must be chosen.

I claim that the base form is /wo/, and furthermore that it cannot be /wɔ/, for the following reasons:
(1) If /wɔ/ were posited as the base form, we might appeal to assimilation to the following particle to derive wo in examples (12) and (13). But this would turn out to be a rule motivated only to account for wo in this environment. If we look at the behaviour of 1p sg PC /mĩ/ with those same particles, it will be seen that it behaves rather differently. Before Future II it remains unchanged:

(14) mĩ óò rí i nĩ́'bɛ̀ I will find it there (CY)

while with the Negative, the assimilation is to the pronoun,

rather than from the pronoun to the particle, as might be assumed by looking just at example (13):

(15) mĩ ɪ́ rí i I didn't find it (CY)

Supporting evidence for the claim that (15) involves true progressive assimilation comes from the plural subject pronouns:

(16) a à rí i We didn't find it (CY)

(17) ɛ è rí i You (pl.) didn't find it (CY)

(18) wɔ̃ ɔ̀ rí i They didn't find it (CY)

(2) Stahlke (1969, 9-10) tentatively sets up /wɔ/, and gives as the probable explanation for wo the rule of tenseness harmony which I call Tenseness Assimilation (rule (20) of chapter 1). It has been shown in the discussion of vowel harmony in chapter 1, however, that the assimilation process is unidirectional. Prefix vowels begin as [UTense]; the non-low vowels are converted to [+Tense] by universal marking convention, and are then laxed by this rule. There has been no evidence up to this point that assimilation in the reverse direction may have to be recognized in structures containing prefixes. There seems no compelling reason to consider the 2p sg PC as evidence in favor of reverse assimilation. The only motivation, it seems to me, would be that of substantiating a claim that the subject pronouns were directly derivable from the independent pronouns.

The underlying representation which leads us into no difficulties whatsoever is /wo/, with [+Tense] vowel. For with this representation, the tense pronoun in examples (12) and (13) no longer appears anomalous; there is no need to appeal to an ad hoc assimilation process; and the 2p sg PC proves not to be a counterexample to the claim of unidirectionally for tenseness harmony. The only thing we need to give up is the direct derivability claim. What has clearly happened is that a restructuring of the subject pronouns has taken place. No doubt historically they derive from the independent pronouns. But a synchronic analysis must assign them an independent status, with independent listings in the lexicon.

2.4 The 2p sg PC does appear on the surface as wɔ, but only as a harmonizing prefix in those dialects in which verbal constituents participate in vowel harmony. And then it is not only wɔ which can occur, but also 1p sg mɔ̃, and 3p sg ɔ́. Independent evidence has established the underlying form of harmonizing prefix vowels as [UTense] (cf. Chapt. 1). But here, in the case of the singular PCs, we are dealing only partly with underlying representations; we are dealing mainly with outputs of P-rules (9)-(11). 1p sg /mĩ/ is converted to mo: 3p sg /Ǿ/ is converted to ɔ́; only the underlying form of the 2p sg, /wo/ (~/o/) remains unaffected by the rules. But now note that the effect of these P-rules is, in a sense, to fulfill the prediction of the Segment Structure condition on prefix vowels in dialects in which vowel harmony is an active process, namely that such vowels are [UTense] in their underlying form. The P-rules involved here exhibit a clear instance of rules of phonology cooperating, as it were, with MS conditions to preserve constraints operating within the phonology, and thus preventing the development of exceptions to some extent.

The PCs which are the outputs of these rules are now available for laxing by the rule of Tenseness Assimilation in the dialects of K, Ìf, and Àk (cf. secs. 1.3.4, 1.8.2 and 1.11). There is thus a 'feeding' relationship,[8] as well as an extrinsic ordering relationship, between the rules applying to the Pronoun Copies and the rule of Tenseness Assimilation. The earlier rules create new segments and sequences which meet the structural description of the later rule. Hence they feed the later rule. The rules are extrinsically ordered with respect to each other since any other ordering of them will yield inappropriate results. For example, if the Pronoun Copy rules were to follow Tenseness Assimilation, the PCs in K, Ìf, and Àk would not harmonize with the other constituents of the Verb.

Some derivations in K, Ìf, and Àk, in which vowel harmony operates over the singular PCs:

	2p sg PC		Kétu	
Underlying form	ò + rí	441 see	ò + lɔ	331 go
PC + SM	ò + ó + "		ò + ó + "	
Rule (9)	ò + ó + "		ò + ó + "	
Rule (10)	ò + "		ò + "	
Tenseness Assimilation			ɔ̀ + "	
	ò rí	you saw	ɔ̀lɔ	you went

Ìfàkì

3p sg PC

Underlying form	ǵ	+ kéré	356 be		ǵ	+ kɔ̀	478 refuse	
PC + SM	ǵ + ó	+	"	narrow	ǵ + ó	+	"	
Rule (9)	ó + ó	+	"		ó + ó	+	"	
Rule (10)	ó	+	"		ó	+	"	
Tenseness Assimilation					ǫ́	+	"	
	ó kéré it is narrow				ǫ́ kɔ̀	he refused		

Àkúré

1p sg PC

Underlying form	mĩ	+ didé	525 stand		mĩ	+ jɛ	425 eat	
PC + SM	mĩ + ó	+	"		mĩ + ó	+	"	
Rule (9)	mo + ó	+	"		mo + ó	+	"	
Rule (10)	mo	+	"		mo	+	"	
Tenseness Assimilation					mõ	+	"	
	mo didé I stood up				mõ	jɛ I ate		

2.5 The question must now be raised as to why the plural Pronoun Copies do not participate in vowel harmony in these dialects. It was seen that the rules applying to the singular PCs were ordered before Tenseness Assimilation, and that at the point where Tenseness Assimilation applied, all singular PCs were [+Tense]. This is not so for the plural PCs. Their underlying forms are:

1p	pl	PC	/a/
2p	pl	PC	/ɛ/
3p	pl	PC	/wǫ́ /

that is, their vowels are all [-Tense]. The reason they retain their [-Tense] form and do not participate in vowel harmony is that no rules apply to tense them. So they remain unchanged and therefore unaffected by the rule of Tenseness Assimilation, which accepts only [+Tense] prefix vowels as input.

The fact that the plural PCs do not harmonize constitutes indirect support for the claim that the lexical form of harmonizing segments is [UTense], and that the harmony process is unidirectional. If harmony were bidirectional the fact that the plural PCs do not harmonize would be an anomaly. The explanation is simply that there is no mechanism

available to tense underlying lax vowels so that they harmonize with a following [+Tense] vowel.

Because the /ɛ/ and /ɔ́/ of the 2nd and 3rd person plural PCs are lexically [MTense], these PCs will have to be marked as exception to the MS condition (condition (8) of chapt. 1) which predicts that, in the dialects of Ìf, Àk, and K, verbal prefixes are [UTense].

2.6 Continuing with the discussion of the reasons for the choice of underlying representations of the PCs as they are listed on p.3, the third person PCs are posited with high tone, 3p sg as /Ǿ/, i.e. $\begin{bmatrix}+\text{Seg}\\+\text{HIGH}\end{bmatrix}$, and 3p pl as /wɔ́/. I argue against the proposal made by Stahlke (1969, 3-5) that the 3p sg PC is null and that the 3p pl PC is /wɔ̃/, with an inherent mid tone. His claim is that both of these PCs derive their high tone from the following ó of the Subject Marker.[9] My main objection is that this proposal requires a rather specific rule which says that only the third person subject pronouns assimilate the tone of the SM. There are no instances in any dialect studied in which either first or second person subject pronouns assimilate in tone to the SM.

Note furthermore that if the underlying form of 3p sg PC is to be null, tonal assimilation alone would yet not yield the surface form ó. Stahlke fully realizes this. He posits that the [o] of the singular PCs is not a part of the pronoun, but an independent formative within the verbal auxiliary. Thus, in deriving the 3p sg PC, he begins with a base form /Ø/. It receives its segmental features by a coalescence of Ø with the posited [o] element. And this in turn derives its high tone from the Subject Marker. No rules are in fact given for these processes, however, so the question of ordering cannot be raised.

It seems to me preferable to enter the 3p sg and 3p pl PCs in the lexicon as /Ǿ/ and /wɔ́/ [10], respectively. Note once again that what must be given up is the claim that the Pronoun Copies are directly derivable from their corresponding independent pronouns. In the case of the third person PCs, as in the case of the second person singular discussed above, restructuring seems to have taken place, accounting for the lack of fit synchronically between the two sets of pronouns.

The lexical representation for the 3p sg PC which I propose may seem open to question because it has no surface realization when the Subject Marker is absent, as in:

Future 2	yóò dé'bí l'ólã̀	he will arrive tomorrow (CY)
Preterite Negative	kò fó o	he didn't break it (K)

A rule deleting /Ǿ/ is required. But this rule is already in the grammar to provide for the deletion of tone-bearing segments which have no segmental features. [11] These segments arise throughout the grammar in the course of the derivation of a number of structures, such as the contracted forms of Preposition+-Noun, Verb+Noun, and Noun+Noun. E.g.,

Underlying form	lí ìbàdã̀	at (Prep) Ibadan (Noun)
After other P-rules	ní Øbàdã̀	
After Ø-Deletion	ní bàdã̀	
Final Phonetic Output	níbâdã̀ (CY)	
Underlying form	wá ilé	look for (Verb) house (Noun)
After other P-rules	wá Ølé	
After Ø-Deletion	wá lé	
Final Phonetic output	wálé (CY)	

Ø-Deletion is a rule not sensitive to any environment. It can be stated as: [12]

(19) $\begin{bmatrix} -F \\ +Seg \end{bmatrix} \rightarrow \quad Ø$

2.7 I would not like it to appear that my proposals for deriving the subject pronouns fill in all the holes in Stahlke's analysis,nor that they have none of their own. Stahlke's o-element may serve to explain an otherwise puzzling alternation in the Negative between kì and kò. Kì appears as the Negative particle before the Future II marker yóò, and before the Customary marker í. Kò occurs with the Preterite and with the Continuous. The 3p pl base form /wǒ/, with high tone, which I posit, leaves unexplained the question of its mid tone alternant before the Negative and before the yóò Future. Neither of our analyses thus exhaustively accounts for all the data. But perhaps more than this cannot be expected at the moment. The area being dealt with is a prime instance of the fact that phonological analysis often cannot be separated from morpho-syntactic analysis. Only very recently has such

integrated work been begun in Yorùbá [13] and in West African languages as a whole, for that matter.

2.8 There remain three Pronoun Copies which the proposed rules have not yet derived: 1p sg mõ in Onà and Ok; 1p sg mù in ɔ̀b; and 3 p sg ó in ɔ̀w and ɔ̀b (cf. Table 1 on p. 69). The assimilation of the vowel of 1p sg /mĩ/ to the SM ó by rule (9) results in the irregular sequence of nasal consonant followed by oral vowel (i.e., mo) on the surface in the dialects CY, K, If, Ak, and ɔ̀w. Since this derived form of /mĩ/ comes about by P-rule, and not directly from the lexicon. the generalization remains valid that at the systematic phonemic level only nasalized vowels appear following nasal consonants (cf. Sequence Structure (39), sec. 3.4.3).

2.8.1 In Onà and Òk, however, mo undergoes a further rule which laxes and nasalizes the vowel. This operation could as well be viewed as the function of the same sequence structure condition. But this would be using MS conditions as output constraints on P-rules, indicating that they are either interspersed among the P-rules - which Stanley (1967, 402-4) has shown to be unworkable - or that they reapply whenever a P-rule (or set of P-rules) produces segments to which MS conditions are applicable. There seems to be nothing to logically eliminate this second possibility, and in fact Stanley opts for this solution in the functioning of segment structure conditions (404-5). But we are here dealing with a case involving sequence structure, about which Stanley has nothing to say. The empirical evidence from Yorùbá seems to shed some light on the question of whether sequence structure conditions reapply.

Since a number of dialects have the surface form mo, and there is no motivated way to derive Onà and Òk mõ directly from /mĩ/, this indicates that mõ must be accounted for by a P-rule present in these latter two dialects but absent from the rest [14] :

(20) Onà, Òk: 1p sg PC mo → mõ

$$\begin{bmatrix} +\text{Voc} \\ -\text{Cons} \\ -\text{High} \\ -\text{Low} \\ +\text{Back} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{Tense} \\ +\text{Nasal} \end{bmatrix} \quad / \ \underline{\text{m}} \ \_\_\_\_$$

What can probably be inferred to have happened historically is that when vowel harmony ceased to be an active process in these two dialects, the prefix mo became re-analyzed as an independent formative, it was subject to MS constraints, among which is the sequence structure condition on the succession of nasal consonant-nasalized vowel. But it may be asked why this re-analysis of mo took place at all. A plausible explanation seems to lie in the assumption that the sequence structure condition re-applied, forcing a change from oral vowel to nasalized vowel in the newly-created form. I use the term re-apply here not in the strict sense of predicting that a new lexical formative will not violate a given phonological constraint, but in the sense of bringing about a P-rule which removes exceptions to the prediction which the condition makes.

This interpretation of the notion re-application of MS condition is, I believe, new with me. After having arrived at this analysis, Kisseberth's paper entitled 'On the functional unity of phonological rules' (to appear) was brought to my attention. He sees the need for extending our notion of what constitutes 'similar' rules. He uses the term 'functional unity' to describe rules of the phonology which are alike in having a common effect, and cites a number of convincing examples of rules in Yawelmani which 'conspire' (his term) to prevent tri-consonantal clusters. Such rules function alike, in that the outputs they produce all have the same aim, but they need not be alike with respect to their formal structure.

It seems to me that the discussion of mõ in Òǹ and Òk indicates that the notion of functional unity ought now to be extended to the interrelation between MS conditions and P-rules.

2.8.2 The 1p sg PC in ɔ̀b is mũ̀. The same arguments as applied to Òǹ and Òk mõ apply here. There is no non-ad hoc way to derive mũ̀ directly from /mĩ/. Yet mũ̀ itself cannot be the underlying form since mĩ is also an occurring form of the 1p sg PC, appearing when the SM is absent, as in the Preterite Negative:

(21) mĩ ì rí i I didn't see it (ɔ̀b) (cf example (15),p.5)

Clearly ɔ̀b, like the other dialects, contains rule (9), which assimilates the segmental features of an underlying /mĩ/ to the SM ó, resulting in the output sequences mo.

The sequence structure condition now applies, forcing a change from mo to m + Ṽ. Observe that the condition makes no prediction about how this vowel is to be specified other than that it will be [+Nasal]. In Òn and Òk the change to a nasalized vowel is from [o] to [õ]. This is a two-feature shift, from $\begin{bmatrix}\text{+Tense}\\\text{-Nasal}\end{bmatrix}$ to $\begin{bmatrix}\text{-Tense}\\\text{+Nasal}\end{bmatrix}$. In ɔ̀b, the change is from [o] to [ũ]. This is also a two-feature shift, from $\begin{bmatrix}\text{-High}\\\text{-Nasal}\\\text{o}\end{bmatrix}$ to $\begin{bmatrix}\text{+High}\\\text{+Nasal}\\\tilde{\text{u}}\end{bmatrix}$. There does not appear to be any systematic reason for the shift o → õ in Òn and Òk, nor for the shift o → ũ in ɔ̀b. Òn and Òk both have morphemes of the shape m + ũ, e.g. 452 carry mú. And ɔ̀b has morphemes of the shape m + õ, e.g. 374 be clean mó. It is no accident, however, that the posited re-analysis of mo, in Òn and Òk on the one hand and in ɔ̀b on the other, should produce the nasal vowels õ and ũ, and not some other nasal vowels. õ is not a possible candidate since it is absent from these dialects.[15] But had it been available it would have entailed a shift of three features: $\begin{bmatrix}\text{-High}\\\text{+Tense}\\\text{-Nasal}\\\text{o}\end{bmatrix} \rightarrow \begin{bmatrix}\text{+High}\\\text{-Tense}\\\text{+Nasal}\\\tilde{\text{o}}\end{bmatrix}$. And the potential shift to ã would have involved four features: $\begin{bmatrix}\text{-Low}\\\text{+Rnd}\\\text{+Tense}\\\text{-Nasal}\\\text{o}\end{bmatrix} \rightarrow \begin{bmatrix}\text{+Low}\\\text{-Rnd}\\\text{-Tense}\\\text{+Nasal}\\\tilde{\text{a}}\end{bmatrix}$. The front nasal vowels would entail in addition the feature [Back].

2.9 The proposed rules (9) - (11) derive singualr pronoun copies which are all [+Tense]. Thus these rules may be said to 'cooperate with' or 'conspire with', in Kisseberth's terms -- the condition which states that prefix vowels are [UTense] in the lexicons of those dialects in which vowel harmony is an active process (condition (8) of chapt. 1). For the dialects of Òn and Òk there is no reason to posit this condition since vowel harmony is not an on-going, active process. Thus a potential conflict between two MS conditions is removed. That is, the above condition on tenseness of prefix vowels (condition A) -- absent from Òn and Òk -- predicts

that prefix vowels are [UTense]; a potentially conflicting condition (condition B) -- present in Ọ̀n and Ọk -- predicts that only nasalized vowels will occur following nasalized consonants. Since ũ meets both conditions, but Ọ̀n and Ọk 1p sg PC mõ does not, it is likely that these dialects first dropped the rule of Tenseness Assimilation (rule (31) (=(20), chapter 1), and concomitantly, condition A, then added the rule mo → mõ ((20)). For ɔ̀b this same assumption about historical ordering cannot be made (for the ũ of mũ meets both conditions) and thus the rule mo → mũ (not given) could have been added while the tenseness assimilation rule and condition A were still present in the grammar.

Where both conditions are present -- in the dialects of K, Ìf, and Àk -- it may be that condition A prevents condition B from reapplying, although there would seem to be nothing preventing mo from shifting to mũ , as in ɔ̀b. In the dialects of CY and ɔ̀w condition A is absent, and yet condition B has not applied, since both dialects manifest mo.

Note that the two conditions are of different types. Condition A is a segment structure condition. Condition B is a sequence structure condition. It seems from the evidence adduced in these Yorùbá dialects that MS conditions may be subject to the following restrictions on re-application:

1. Segment structure conditions re-apply (confirming Stanley's findings (1967, 404-5)). But they re-apply in the wider sense of bringing about P-rules whose effect is to guarantee the predictive value of the conditions.

2. Sequence structure conditions may re-apply under circumstances not clear at present.

The evidence presented here in support of the conclusion that sequence structure conditions may re-apply is meagre, to be sure. Further evidence from other languages is certainly needed.

2.10 The remaining Pronoun Copy which has not been derived by the rules to this point is the 3p sg in ɔ̀w and ɔ̀b. It will have been noted that because of the absence of (10) -- the Subject Marker Deletion rule -- from the phonologies of these two dialects, the SM ọ́ has been retained throughout the set of singular PCs, thus giving ọ́ + ọ́. But in ɔ̀w

and ɔ̀b, as in all other dialects, the 3p sg PC is ó, without a following Subject Marker. Thus it would appear that in ɔ̀w and ɔ̀b (10) applies in the environment of the 3p sg PC, but not in the environment of the other singular PCs. (10) could have been complicated in order to delete the SM under the above conditions. However, this is unnecessary. Already present in the grammar is a rule which deletes a final mid or high tone vowel of nouns before a SM (after the SM has been assimilated to the final vowel of the noun. Cf. Courtenay (1968, 74)). By adding the bracket $]_{PC}$ the rule will accommodate just those cases in ɔ̀w and ɔ̀b in which only a single ó appears in surface structure. It will not apply to the PCs in the other dialects since (10) has already deleted the SM. It will apply only to the 3p sg PC in ɔ̀w and ɔ̀b because the vowels of 1p sg and 2p are [+LOW].

(22) Deletion of non-LOW vowel preceding Subject Marker

$$\begin{bmatrix} +\text{Voc} \\ -\text{Cons} \\ -\text{LOW} \end{bmatrix} \rightarrow \emptyset \quad \underline{\quad}]_{N,\ PC} \quad [_{SM}$$

Before (22)	After (22)	
Délé é wá	Dél é wá	Délé (personal name) came (CY)
ɛrú ú kú	ɛr ú kú	a slave died (CY)
ɔ̀jó ó yã	ɔ̀j ó yã	ɔ̀jó (personal name) yawned (CY)
Kɛ́mĩ́ ĩ́ lɔ	Kɛ́m ĩ́ lɔ	Kɛ́mĩ (per.name) went (CY)
ata á mú	at á mú	pepper is sharp (CY)
èfã á bù mĩ́ jɛ	èf á bù mĩ́ jɛ	a mosquito bit me (CY)
ɔ̀ŋɔ̃ ɔ́ ti wá	ɔ̀ŋ ɔ́ ti wá	they (independent pronoun) have come (ɔ̀w,ɔ̀b)
ó ó rí mĩ	órí mĩ	he saw me (ɔ̀w, ɔ̀b)

The 1p sg and 2p sg PCs in ɔ̀w and ɔ̀b remain unaffected:

mɔ̀ ó rí i	I saw him (ɔ̀w)
wɔ̀ ó ti wá	you have come (ɔ̀w)
mù ú rí i	I saw him (ɔ̀b)
wɔ̀ ó rí mĩ	you saw me (ɔ̀b)

2.11 To conclude, we have posited a number of transformations and phonological rules which derive the Pronoun Copies in a number of dialects from an underlying base form. The claim that the PCs are directly derivable from their corresponding independent pronouns has had to be abandoned, since, when formalized, it was shown to require several unmotivated rules. There remains the unsolved issue of the different tones --mid and low-- on which 1p sg and 2p sg appear on the surface in the

dialects. For example, the K, ɔ̀w, and ɔ̀b first and second person singular PCs occur on low tone. In ɔ̀w and ɔ̀b, where the SM ó appears on the surface, the fact that these PCs are on low tone (ɔ̀w mò, wò; ɔ̀b mũ, wò) accounts for the non-deletion of their vowels before the SM, whereas the third person singular PC ó is deleted because it is not on low tone. But in K the SM does not appear on the surface, so the low tone of mò and ò does not serve, as it does in ɔ̀w and ɔ̀b, to exempt them from any phonological rule. There may be an historical explanation, but there seems to be no synchronic nor cross-dialectal motivation for setting up either mid tone or low tone as basic and deriving one from the other. Rules (9) - (11) do not depend on the tonal features of PCs. Thus this issue would be with us whether we adopt the solution proposed here, or retain the former item-and-arrangement listing of pronoun paradigms.

Both Stahlke and I analyze the singular subject pronouns as consisting of underlying forms which, in certain syntactic constructions, assimilate their vowels to an o element. This element Stahlke sees as an independent morpheme within the verbal auxiliary, and I see as the Subject Marker, whose base form is /ó/. We both agree, however, that the two alternant shapes in which the singular subject pronouns appear, depending on the verbal aspect they cooccur with, are related by rule. A consequence of the failure to recognize this fact is that one is then forced to assume that there are actually two sets of subject pronouns which show partial (but unexplainable) similarity and partial suppletion:

Subject Pronouns with Aspects which require the Subject Marker: (CY)

1p sg	mo
2p sg	o
3p sg	ó

Subject Pronouns with Aspects which do not require the Subject Marker: (CY)

1p sg	mĩ
2p	o
3p sg	∅

This is the position taken by Courtenay (1968, 75). She analyzes the 3p sg PC ó as the Subject Marker itself; but

since the other PCs do not cooccur with it (in CY), she must also consider them to be subject markers (her term is subject concord Marker). Since the second set occurs with aspects which do not take the Subject Marker, she must not only recognize two sets of pronouns, but must call them by different names: 'subject concord markers' and 'subject personal pronouns', respectively, thereby making the gap between the two appear even wider.

Footnotes

1. The syllabic nasal, ŋ, on mid tone, is the result of rules which transfer the tone of the vowel to the consonant, delete the vowel, and make the consonant homoroganic with a following consonant. In this case the following consonant is k since the form of the Negative particle at the stage in the derivation where mĩ is converted to ŋ is kò.

2. This transformation is optional since both of the following sentences occur, the first with an independent pronoun, the second with a Pronoun Copy:

1. èmĩ í še ẹ́ tã́ I finished it (=1, p.1a)
2. mo še é tã́ " (=3, p.1a)

3. The independent pronouns listed here are those occurring in CY. My data are not complete for the other dialects. Below is a partial listing. The transcription, as usual, is broad phonetic.

	K	Òǹ	Ìf	Òk	Àk	Ɔ̀w	Ɔ̀b	Ìlàjɛ
1p sg	ò̄m	èmĩ	___	èmĩ	èmĩ	èmĩ	èmĩ	èmĩ
2p sg	ìwɔ	ùwɔ	___	ùwɔ	ùwɔ	ùwɔ	ùwɔ	ùwɔ
3p sg	òɔ̃	òũ	___	òwũ	òũ	òŋũ	òŋ̄	òũ
1p pl	àwa	àwa	___	___	___	àwa	àwa	àwa
2p pl	ɛ̀yɛ̃	àwã	___	___	___	ɛ̀yɛ̀	ɛ̀ŋʷɛ	àŋã
3p pl	àɔ̃	àwã	___	___	___	ɔ̀ŋɔ̃	ɔ̀ŋɔ̃	àŋã

Ìlàjɛ is a dialect spoken in the town of Ìdí Ɔ̀gbà, in Òkìtì Kpukpa Division. The data was put at my disposal by R. G. Armstrong, Director of the Institute of African Studies, University of Ibadan, who did the collecting. It is included here because it is a dialect which seems not too divergent from Ok in its pronoun system, and may therefore give some indication of what the plural independent pronouns may be like in Ok. For example, the 2p pl and 3p pl object pronouns are both [ŋã] in Ìlàjɛ, and both [ɲã] in Ok. It is thus likely that in the independent series as well, Òk does not distinguish between 2 and 3p pl. Note that Onì, a dialect close to Òk in other respects (cf. sec. 2.8), also has no distinction in these pronouns.

1p sg in K, and 3p sg in Ɔ̀b have syllabic nasal consonants. It is fairly certain that syllabic nasal consonants derive in most cases from nasal consonant plus a following nasalized vowel (cf. Courtenay (1968, 106-7)). I would thus be inclined to set up K ò̀m̄ as /ò̀m̃V̆/, and Ɔ̀b ò̀ŋ̄ as /ò̀ŋ̃V̆/. The obvious candidates for the unspecified vowels are /ĭ/ and /ŭ/, respectively. I have not, however, investigated syllabic nasals in K and Ɔ̀b and therefore can offer no dialect-internal motivation for the choice of vowel quality. Comparative evidence from other dialects can lend support to a hypothesis arrived at on the basis of internal evidence; it cannot be used as sole justification for a position.

4. The plural Pronoun Copies are those occurring in CY.

5. True to the naturalness condition (cf. Postal (1968)), we should in fact dispense with this rule and simply recognize /o/ as the dictionary form of the 2p sg subject pronoun in these three dialects, since there is no dialect-internal reason to deduce that the pronoun is wo at a deeper level. (11) thus has more historical relevance than diachronic. Cy and K do, however, appear to require a rule of w-deletion elsewhere, to account for such words as 149 morning àárò, of which the source, àwúrò, is also in current use in CY.

6. The form is /wo/ in Àk, Onì, Òk, Ɔ̀w and Ɔ̀b. It is /o/ in CY and Ìf, and /ò/ in K (cf. fn. 1). All references to /wo/ in the following discussion are to be understood as applying to /o/ and /ò/ as well.

7. The term was coined by Kiparsky (1968b, 196ff).

8. Stahlke calls the high tone which he claims is the source of the high tone of the third person PCs 'preverbal high tone'. He assigns it no segmental qualities, so presumably its systematic phonemic form would be /Ø/. Its syntactic function is identical to what I term the Subject Marker.

9. Actually 3p pl PC will be entered as /wã́/. There is a rule in a subdialect of CY that realizes /ã/ as [õ] following labial consonants (cf. sec. 4.3.11).

10. The device is actually one of first deleting the segmental features by P-rule so that a low-level rule of very general applicability can then delete all segments which now are specified only as [+Seg] with the prosodic tonal features. Since this rule does not discriminate between underlying and intermediate segments with this combination of features, /Ø/ meets its structural description and is deleted by it.

The device was introduced by Schachter and Fromkin (1968, 111-15) to handle tone contours in Akan. It was subsequently adopted by Courtenay for Yorùbá (1968, 49-51, and rules P-9, 12, 14, 22, 30).

11. This is a slightly revised form of the Ø-Deletion rule given by Courtenay (1968, 51).

12. Cf. Awobuluyi (1967b); Courtenay (1968).

13. The towns of Ọ̀ndó and Ọ̀kìtì Kpukpa are located a distance of some 50 road miles apart. They both lie within the Province of Ọ̀ndó. Ọ̀ndó is the Divisional Headquarters of Ọ̀ndó Division. Ọ̀kìtì Kpukpa is the Divisional Headquarters of Ọ̀kìtì Kpukpa Division. They can hardly be said to be geographically close together. However, the area covered by each dialect is not known, and it may well be that the two dialects are, or were, contiguous.

14. It occurs in several nouns in Ọ̀n, but these are likely to be dialect borrowings.

15. Stahlke's paper is a preliminary version. It contains neither syntactic nor phonological rules, nor derivations from the base forms which are posited. I have therefore had to make a number of assumptions based on the informal discussion in the paper.

Chapter 3

Further Phonological Issues Elucidated by Dialect Evidence (for short, FFIEBDE)

3.1 Nasalized noun prefix vowels

Adetugbo (1967, 175) cites a form ãwã '3p pl independent pronoun' as characteristic of a dialect group which he calls Southeast Yorùbà ('SEY'). He contrasts ãwã with àwã and àã, forms found in other dialects. The contrast is given as partial substantiation of his claim that Proto-Yorùbá *ã became denasalized in many dialects. [1] I wish to show that the nasalized prefix vowel of ãwã is not inherently [+Nasal], but is derivatively nasalized by a rule of nasal assimilation.

In most dialects a nasal vowel brings about the nasalization of some or all preceding non-consonantal elements (vowels, liquids, glides) within the word. Sometimes only the preceding liquid or glide takes on this secondary nasalization. These processes are in the nature of fairly low-level phonetic detail, and undoubtedly vary somewhat from speaker to speaker and perhaps even in the speech of a single person.

I give these rules as they might be formulated for five dialects. They are not given as definitive statements, but as indications of what a deeper analysis of the subject would have to take into account. The author is not a native speaker. Adetugbo is. However, whatever reluctance to offer counterevidence to that brought forward by a native speaker there may be is offset by the vast amount of evidence against the claim implicit in citing ãwã and àwã/àã as evidence that there is a contrast in nasality in the initial vowels of nouns, namely the claim that nasalized noun prefix vowels exist.

3.1.1 The evidence from Onìdó

In Onì, high vowels and glides seem to be subject to secondary nasalization. Note the forms:

52	ĩõ	62	ĩwã
196	ũɛ̃	63	eỹí
307	ụ̃ũ	68	ɔỹà
266	ũàdí		

Compare with the following which nasalization does not take place: [2]

212	eĩ	144	oũ̀	
60	ɛ̃ũ	63	eỹĩ́	(prefix vowel not nasalized)
64	ɔõ	68	ɔỹã́	" " "

There is no reason to order the nasalization of the high vowels and glides consecutively. In fact, imposing an ordering would be quite arbitrary. Thus what is called for is a rule which simultaneously nasalizes both sets of segments:

$$(1)\quad \begin{bmatrix} -\text{Cons} \\ +\text{High} \end{bmatrix} \rightarrow [+\text{Nasal}] \;/\; \left[\frac{\quad}{+\text{Seg}}\right]_1 \begin{bmatrix} -\text{Cons} \\ +\text{Nasal} \end{bmatrix}$$

Both the glides w and y and the vowels i and u, and only these segments, meet the SD of the rule; and all nasalized glides and vowels and only these, meet the environmental restriction. Thus the rule provides the following contexts for the nasalization of the relevant segments (G = glide):

a. $V \rightarrow [+\text{Nasal}] \;/\; \_\_\_\; \tilde{V}$ c. $G \rightarrow [+\text{Nasal}] \;/\; \_\_\_\; \tilde{V}$

b. $V \rightarrow [+\text{Nasal}] \;/\; \_\_\_\; \tilde{G}$ d. $G \rightarrow [+\text{Nasal}] \;/\; \_\_\_\; \tilde{G}$

Context d is disallowed by a MS condition (not given) which states that no succession of two or more non-vocalic segments is permitted in Òn.

Before (1)	After (1)
iwã́	ĩw̃ã́
eyĩ́	ẽỹĩ́
iõ	ĩõ
ùãdí	ùãdí

3.1.2 The evidence from Òkìtì Kpukpa

In Òk, the only vowel which is nasalized is u, apparently, and then only preceding the liquid r. [3] Thus, secondary nasalization occurs on the first two segments of 196 ũr̃ĩ
307 ũr̃ũ

but not on the first two segments of 52 irõ
60 ɛrũ
64 ɔrõ

It is clear that r and u must be simultaneously nasalized, as are the glides and high vowels in Ọ̀n. But u and r in no way constitute a natural class, u being [+High, +Back] and r being [-High, -Back]. These specifications cannot be combined as [+Voc, ∝High, ∝Back], since this feature set includes the nonhigh front vowels e and ɛ, which are not subject to secondary nasalization. The desired simultaneous nasalization of u and r can be achieved by a transformational P-rule:[4]

(2) S.I. [+Voc, +High, +Back]$_1$, [+Voc, +Cons, -Anter]$_2$, [+Voc, -Cons, +Nasal]$_3$

S.C. 1, 2, 3 ⇒ [1 +Nasal] [2 +Nasal] 3

Ọ̀k thus has a severely restricted process of secondary nasalization.

3.1.3 The evidence from Ìfàkì

Nasalization in Ìf is somewhat less restricted than in Ọ̀k. All high vowels (i, ɪ, u, ʊ) can undergo it when preceding a nasalized r or any nasalized vowel. r is simultaneously nasalized with a preceding high vowel; within the same word it is not nasalized in the context #__Ṽ. A transformational P-rule nearly identical to the rule for Ọ̀k produces this nasalization:

(3) S.I. # [+Voc, +High]$_1$ ([+Voc, +Cons, -Anter]$_2$) [+Voc, -Cons, +Nasal]$_3$, $_4$

S.C. 1, (2), 3,4 ⇒ 1 [2 +Nasal] [3 +Nasal] 4

	Before (3)	After (3)
52	ɪrõ	ɪ̃r̃õ
196	ʊrĩ	ʊ̃r̃ĩ
62	ʊɔ́	ʊ̃ɔ́
307	uũ	ũũ

But excluded from the rule are, e.g.:

60	ɛrõ	436	rĩ̀
212	erĩ	490	rà

Also excluded is 144 orìrũ̀. We would expect the i + r to be nasalized, but they are not. This is accounted for by adding the word boundary to the left of the segment undergoing the change. Thus the rule claims that only word-initial high vowels can be nasalized by this process. Should this turn out to be false on further investigation, then the boundary must be eliminated and orìrũ̀ listed in the lexicon of If with a rule exception feature for rule (3).

3.1.4 The evidence from Kétu

Nasalization in K is far more pervasive than in Oǹ, Òk, and Ìf. It affects the liquid r, the three glides w, y, h, and apparently the immediately preceding vowel, whatever its height, within the word. As with the preceding dialects, there seems to be no justification for any ordering except simultaneous. There are a few nouns of the shape VV in K, in which the prefix vowel is not nasalized:

109	voice	oõ̀
3p sg independent pronoun		òõ[5]
3p pl independent pronoun		àõ

This indicates that vowels may not be nasalized by a following nasal vowel. [6] The nasalization of vowels thus requires a glide or liquid in its environment. Yet glides and the liquid r are nasalized in verbs, e.g.

436	walk	r̃ĩ̀
527	yawn	ỹà
544	weave	ñõ

Thus r and the glides do not require a preceding vowel in order to undergo secondary nasalization. I have no information on whether or not a preceding subject pronoun vowel is also nasalized, [7] but verbs occur with subjects other than these pronouns, so this information is not crucial here. The rule thus must simultaneously nasalize (a) an optional vowel, and (b) r and the glides w, y, and h, in the environment before a nasalized vowel:

(4)

$$\text{S.I.} \quad \begin{bmatrix} +\text{Voc} \\ -\text{Cons} \end{bmatrix} \quad \begin{bmatrix} \alpha\text{Voc} \\ \alpha\text{Cons} \end{bmatrix} \quad \begin{bmatrix} +\text{Voc} \\ -\text{Cons} \\ +\text{Nasal} \end{bmatrix}$$
$$\qquad\qquad 1 \qquad\qquad 2 \qquad\qquad 3$$

$$\text{S.C.} \quad (1),\ 2,\ 3 \Rightarrow \begin{bmatrix} 1 \\ +\text{Nasal} \end{bmatrix} \begin{bmatrix} 2 \\ +\text{Nasal} \end{bmatrix} \quad 3$$

	Before (4)	After (4)
5	àrṍ	ã̀r̃ṍ
62	iwą́	ĩw̃ą́
63	eyĩ́	ẽỹĩ́
261	ɛhĩ	ɛ̃h̃ĩ
490	rą̀	r̃ą̀
measure	wọ̀	w̃ọ̀
527	yá	ỹá
544	hõ	h̃õ

3.1.5 The evidence from Common Yorùbá

3.1.51 CY is not a single, homogeneous dialect. It no doubt comprises a range of sub-dialects. This can be seen in the phenomenon of secondary nasalization under discussion here.

Abraham (1958) apparently had as informants speakers of CY who nasalized w and y, but not h and r.[8] Whether the vowel before w and y is also nasalized is not indicated by his transcription conventions. Without the nasalization of the preceding vowel, the rule for this sub-dialect of CY (CY_a) is

$$(5) \quad CY_a\text{:} \quad \begin{bmatrix} -\text{Voc} \\ -\text{Cons} \\ +\text{High} \end{bmatrix} \rightarrow [+\text{Nasal}] \ / \ \underline{\qquad} \begin{bmatrix} +\text{Voc} \\ +\text{Nasal} \end{bmatrix}$$

	Before (5)	After (5)
62	awṍ	aw̃ṍ
111	iwĩ	iw̃ĩ
63	eyį́	eỹį́
68	ɔyɔ̃	ɔỹɔ̃

3.1.52 A very similar pattern of secondary nasalization can be seen in the variety of CY spoken by my informant. Only w and y are nasalized by a following [+Nasal] vowel; no vowel preceding the glides receives nasalization. The

difference between CY_a and this sub-dialect (CY_b) is that the oral form of [ỹ] is not [y] but [ž]. This makes the statement of nasal assimilation considerably more complex, since w and ž do not form a natural class:

(6) CY_b: $\begin{bmatrix} -\text{Voc} \\ +\text{High} \\ +\text{Voice} \\ +\text{Cont} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{Nasal} \\ \langle -\text{Cons} \rangle \end{bmatrix}^9 / \begin{bmatrix} +\text{Nasal} \\ \langle -\text{Cons} \rangle \end{bmatrix}^9 / \begin{bmatrix} \_\_ \end{bmatrix} \begin{bmatrix} \overline{\langle +\text{Cons} \rangle} \\ +\text{Strid} \end{bmatrix} \begin{bmatrix} +\text{Voc} \\ +\text{Nasal} \end{bmatrix}$

This could be easily be remedied by considering the underlying form of [ž] to be /y/. The nasalization rule would then be that of CY_a, and a subsequent rule would rewrite /y/ as [ž] if an oral vowel followed. However, this solution is open to question on two grounds: (1) it violates the invariance condition on the relation between deep and surface representation in phonology. [y] does not appear as a surface segment in this sub-dialect of CY; so we must choose between an abstract representation /y/, with rules for /y/ → [ỹ] and /y/ → [ž] in appropriate environments, and a concrete representation /ž/, with rule (6). (2) The rule required to convert /y/ to [ž] before oral vowels seems a very unnatural rule:

(7) $\begin{bmatrix} -\text{Voc} \\ -\text{Cons} \\ +\text{High} \\ -\text{Back} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{Cons} \\ +\text{Coron} \\ +\text{Strid} \end{bmatrix} / \_\_ \begin{bmatrix} +\text{Voc} \\ -\text{Nasal} \end{bmatrix}$

What is gained in the simplification of the nasal assimilation rule is thus offset by the necessity of having to posit a rule one would rather avoid if possible. The nasalization rule of CY_b (6) requires ten features, while the same rule for CY_a (rule (5)) uses six features. But the rule to convert /y/ to [ž] requires nine features, and lacks naturalness in an intuitive sense. Oral vowels simply do not seem to bring about changes in preceding non-vowels such as would be claimed by rule (7). I thus analyze CY_b as having (synchronically) a /ž/ and no /y/, contrasting with CY_a which, of course, has only /y/. It must be pointed out that the solution of setting up /y/ in CY_b receives its chief support from evidence drawn from another (sub-)dialect. There is little reason internal to CY_b for doing so. As I have stated earlier, it is my opinion that dialect comparative evidence cannot force an analysis not supportable by dialect-internal facts. The most it can do is perform a heuristic function.

3.1.53 There are other sub-dialects of CY which display nasal assimilation over r, w, y, h, as well as over a preceding vowel, within the word, unless it is e or o. The process thus extends over the class of liquids [10] and glides, i.e. $\begin{bmatrix} \alpha\text{Voc} \\ \alpha\text{Cons} \end{bmatrix}$, and the disjoint class of vowels $\begin{bmatrix} +\text{Tense} \\ +\text{High} \end{bmatrix}$ (/i, u/) [11] and [-Tense] (/ɛ, a,ɔ /). This is a slightly less general process than in K, in which all vowels can potentially become nasalized, but it is a great deal more general than in CY_a and CY_b.

3.1.6 What is noticeably absent from all of the dialects mentioned is the nasalization of vowels which precede true nasal consonants. Thus, there is no particular nasal quality in the articulation of the prefix vowels of nouns such as those in the following list:

	CY	K	Oǹ	Òk	Ìf
44	àn͂ã	àn͂ã	àn͂ã	àn͂à	àn͂à
53	imű́	imṍ	imɔ́	imɔ́	ımṍ
160	iná	iná	uná	uná	ɔná
188	ɔ̀n͂à	ɔ̀n͂à	ɔ̀n͂à	ɔ̀n͂à	ɔ̀n͂à
297	ɛní	ɛní	ɛní	ɛní	ení

It is not known whether there is any tendency in or among the dialects of Yorùbá to broadening the application of this type of assimilatory nasalization. One can, however, imagine a maximally general process applying to all vowels, liquids, and glides before all [+Nasal] segments:

(8) [+Sonorant] → [+Nasal] / ____ [+Nasal]

3.1.7 Since it is predictable that there will be no nasalized prefix vowels in these dialects (and presumably in dialects not covered here as well) which are not [-Nasal] in their underlying form, there must be a MS condition to state this fact:

(9) Positive Segment Structure Condition (presumably for all Yorùbá dialects)

$$PC \left[\begin{bmatrix} +\text{Voc} \\ -\text{Cons} \\ -\text{Nasal} \end{bmatrix}_{N} \right]$$

3.1.8 It should now be clear that the prefix vowel ã̀ of ãwã'they', which Adetugbo sees as a reflex of a Proto Yorùbá nasalized noun prefix vowel, is simply the result of a process of regressive nasalization that is shared in one form or another by most if not all dialects. More convincing evidence for the existence of nasalized prefix vowels would have been to find a dialect in which such vowels were followed by true consonants and oral stem vowels, e.g. *ĩbà, *ẽ̀gbé, *ãkɔ.

3.2 There is a small number of consonant-initial nouns in each dialect. They are exceptions to the canonical form of nouns, which is VCV(CV). Courtenay (1968, 55) handles this problem by analyzing all such nouns as containing an underlying initial /u/. This /u/ is deleted by the first of the set of P-rules applying to nouns:

(10) $$\begin{bmatrix} V \\ +\text{High} \\ +\text{Back} \end{bmatrix} \rightarrow \emptyset \; / \; [\_\_\_]_{N}$$

She justifies this rule (for CY) by stating that it 'simultaneously eliminates the need for a special class of consonant-initial nouns and a rule [i.e., MS condition: EMF] to indicate the absence of nouns beginning with u- .'(55) The above rule and the quoted justification for it must be rejected on a number of grounds. I will summarize the objections here and then discuss each in more detail below: (1) The absence of an initial u- in nouns in CY is not due to a synchronic rule which deletes it, but to an historical shift from u- to i-. (2) Consonant-initial nouns subdivide into a number of sets which have different derivations. They cannot be treated alike. (3) The rule makes a false claim about the speaker's knowledge of these nouns, as well as about his knowledge with respect to the non-occurrence of initial u-. (4) The rule is formally inadequate and presents a serious difficulty even within the framework of the analysis itself.

3.2.1 (1) Cross-dialectal comparison indicates that i- initial nouns in CY may be either i- or u- initial in other dialects. Table I is a partial listing of such nouns. An historical shift brought about the collapsing of *i and *u as i in initial position in nouns. This process apparently affected both CY and K, since neither dialect contains initial u-, while all other dialects do. [12]

Comparative evidence, to be sure, cannot by itself be used in the synchronic analysis of CY and K. But its heuristic function is quite clear in this case: it points up the inadequacy of Courtenay's solution and makes one look elsewhere for evidence which will bear on the problem.

	CY	K	On	If	Ok	Ak	Ob
89 buttocks	ìdí	ìdí	ùdí	ùdí	ìdí	ùdí	(ùbɔ)
151 evening	ìrɔ̀lɛ́	(alɛ́)	ùwɔ̀lɛ́	ɔ̀rɔ̀lɛ́	ùrɔ̀lɛ́	ìrɔ̀lɛ́	ìrɔ̀lɛ́
160 fire	inɔ̃́	inã́	unã́	ɔnã́	unã́	unã́	unã́
181 forest	igbó	igbó	ugbó	ugbó	(agijù)ugbó		ugbó
52 hair	irũ	irɔ̃	iɔ̃	ɪrɔ̃	irɔ̃	ɪrɔ̃	irɔ̃
105 urine	ìtɔ̀	ìtɔ̀	ìtɔ̀	ɪtɔ̀	ìtɔ̀	ɪtɔ̀	ìtɔ̀
163 tree	igi	egi	igi	igi	igi	igi	igĩ
233 louse	inɔ̃́	inã́	inã́	ɪnã́	inã́	——	inã́

TABLE I. Cross-dialectal comparison of i- and u-initial nouns

(2) Consonant-initial nouns fall into several sets, and cannot all be treated alike:

(a) some are verb-noun compounds, e.g.

	CY	K	Oṅ	Òk	Ɔb	
(11)	yɛrí	yɛrí	yeí	yerí	yetí	338 earring
(12)	kpàkúté	(àjɑ̀kpá)	——	kpàkúté	tàkúté	rat trap
(13)	tɔ̃nɔ̃́ tɔ̃nɔ̃	dánɑ́ dánɑ́	(àfòkpunɑ́)	dúnɑ́ dúnɑ́	——	firefly
(14)	kparamɔ́lɛ̀	kparamɔ̃́lɛ̀	kpaamɔ́lɛ̀	kparamɑ́lɛ̀	——	night-adder
(15)	šɛ́lɛ̀rú	(ìsɔ̃)	——	——	šɛ́lɛ̀rú	191 spring

The constituent morphemes of these compounds are as follows:

(11) yɛ 'befits, is suitable for' + {51 head (CY orí, K erí, Oṅ ?, Òk orí) / 54 ear (Ɔb etí [13])}

(12) {448 kill kpa / 508 shoot ta (also 'pierce')} + 251 rat èkúté (CY, Òk) (Ɔb)

(13) {tɔ̃ 'shine' / dɑ́ 'create'} + 160 fire {inɔ̃́ / inɑ́ / unɑ́} + REDuplication (CY) (K) (Ok)

(14) 448 kill kpa + 97 body ara + {mɔ̃́ rest (CY, Oṅ) / mɔ̃́ " (K) / ma " (Òk) [14]} + 177 ground {ilɛ̀ (CY,K,Òk) / alɛ̀ (Oṅ)}

(15) šɛ́ burst forth + 177 ground {ilɛ̀ / alɛ̀} + ru sprout (CY) (Ɔb)

Thus these nouns have basically the following bracketing, and must be so entered in the lexicon: $[_N\ [_V\ ]_V\ [_N\ ]_N\ ]_N$. [15]

(b) Some consonant-initial nouns are better seen as ideophones. [16] Phonologically they deviate from the canonical norm for nouns not only in lacking an initial vowel, but in having a greater number of syllables, or containing a syllabic nasal, or otherwise violating MS constraints or P-rules. E.g.

	CY	K	Oṅ	Ìf	
(16)	mɔ̃̀nɔ̃̀mɔ́nɔ̃́	(àrá)	(àá)	mɔ̃̀nɔ̃̀mɔ́nɔ́	141 lightning
	Òk	Àk	Ɔb		
	ìmɑ̃̀nɑ̃̀mɑ́nɑ́	mɔ̃̀nɔ̃̀mɔ́nɔ̃́	mɑ̃̀nɑ̃̀mɑ́nɑ́	"	"

	CY	K	Oṅ	Ìf		
(17)	gbɔ̀ŋ̀gbɔ́	gbɔ́ŋ̀gbɔ́	(egbîgbɔ́)	gbɔ́ŋ̀gbɔ́	165	root
	Òk	Àk	Ɔ̀b			
	gbɔ́ŋ̀gbɔ̀	gbòŋ̀gbò	(irî̀ (=104))			"
	CY	K	Oṅ	Ìf		
(18)	kpɛ̀tɛ̀kpɛ́tɛ̀	yɛ̀kpɛ̀	(amã̀)	——	179	mud
	Òk	Àk	Ɔ̀b			
	ìkpɛ̀tɛ̀kpɛ́tɛ̀	yɛ̀kpɛ̀	iyɛ̀kpɛ̀			"
	CY	K	Oṅ	Ìf		
(19)	kɛ́tɛ́kɛ́tɛ́	kɛ́tɛ́kɛ́tɛ́	kɛ́tɛ́kɛ́tɛ́	kɛ́tɛ́kɛ́tɛ́	239	donkey
	Òk	Àk	Ɔ̀b			
	kɛ́tɛ́kɛ́tɛ́	——	kɛ́tɛ́kɛ́tɛ́			"
	CY	K	Oṅ	Ìf		
(20)	tòlɔ́tòlɔ́	tòlɔ́tòlɔ́	tòlɔ́tòlɔ́	tòlɔ́tòlɔ́	255	turkey
	Òk	Àk	Ɔ̀b			
	tòlɔ́tòlɔ́	——	tòlɔ́tòlɔ́			"

Ideophones will be marked with the morphological feature [+Ideophone]. They will need to be exempted from the MS conditions as well as from various P-rules. Just how this ought to be formalized is still an open question.

(c) Loan words constitute a third subset of consonant-initial nouns, and will be marked with the feature [+Foreign] (or [-Native]). The preponderance of loan words in Yorùbá derives from English and Hausa. E.G.

	CY	K	Oṅ	Ìf	Òk		
(21)	(àmū́ga)	(àmṓga), sòòsì	(àmga)	(àmṓga)	sòòsì	302	scissors (<English)

	CY	K	Onì	Ìf	Òk	
(22)	(òótó), gàsíkíá	(òótó), gàsíkíá	(òtító)	(òtító)	(òtító)	321 truth (<Hausa)
(23)	mṍńgòrò	mã́ńgòrò	mã́ńgòrò	——	mã́ńgòrò	mango (<English)
(24)	(àkpá)	gorodóm̀	——	——	(àgbá)	oil drum(<English)

(d) Some consonant-initial nouns cannot be classed into any of the above groups. They are simply exceptions to the MS condition which states that nouns are of the form VCV(CV), and will receive the exception feature [-MS Condition n]. [17] E.g.

		CY	K	Onì	Ìf
(25)	30 father	baba,bàbá[18]	baba	bài	àbá
		Òk	Àk	ɔ̀b	
		iba	aba	iba	
		CY	K	Onì	Ìf
(26)	31 mother	yèyé,[18] ìye, ìyá	ìyá	yèi,iye	èyé
		Òk	Àk	ɔ̀b	
		yeye,[18] iye	èyé	iye	
		CY	K	Onì	Ìf
(27)	142 sky	sṍmɔ̀̃	(ojú òrõ)	(ojúɔ̃)	sɔ̃́mɔ̀̃
		Òk	Àk	ɔ̀b	
		(òfúrufú)	(òrõ)	(òrɔ̃)	
		CY	K	Onì	Ìf
(28)	190 well	kɔ̃̀ga	kã̀ga	kã̀ga	kã̀ga
		Òk	Àk	ɔ̀b	
		kã̀ga	——	kɔ̀ga	

		CY	K	Oṅ	Ìf
(29)	336 shoe	bàtà	bàtà	bàtà	bàtà
		Òk	Àk	Ɔb	
		bàtà	——	bàtà	
		CY	K	Oṅ	Ìf
(30)	337 hat	fìlà,(ate)	fìlà	(àkòó)	fìlà
		Òk	Àk	Ɔb	
		fìlà, (àkòró)	——	fìlà, (ate)	
		CY	K	Oṅ	Ìf
(31)	spoon	šíbí	šíbí	šíbí	——
		Òk	Àk	Ɔb	
		síbí	——	——	
		CY	K	Oṅ	Ìf
(32)	pit	kòtò	kòró	ukòtò[19]	——
		Òk	Àk	Ɔb	
		ukòtò[19]	——	——	

(3) Courtenay's rule claims that the native speaker of CY posits an underlying initial /u/-. Since there is no initial /u/- on the surface in any noun, nor, a forteriori, any alternation of /u/- with Ø, the language learner has no basis for arriving at this underlying representation. The analysis involves the absolute neutralization of /u/- and Ø- as surface Ø-, which, as Kiparsky (1968a) has argued, is a violation of the strong form of the alternation condition, and ought to be disallowed in phonological description. It also violates Postal's naturalness condition (1968) since there is no motivation to posit a deep phonological representation that is different from the surface form (other

than a desire for pattern congruity and to avoid stating a MS condition).

The desire to avoid having to posit a MS condition I find a bit strange. Since these conditions make generalizations concerning segments and sequences in underlying lexical representations, they serve a predictive function. And one presumably wants to capture as many generalizable facts about morphemes in the lexicon as possible. Looked at in this way, Courtenay's analysis of consonant-initial nouns prevents rather than avoids the making of a valid generalization and prediction. The MS condition on the non-occurrence of initial /u/ in CY(and K) nouns is a necessary part of their lexicons:

(33) CY, K: If-Then Segment Structure Condition

IF $\left[\left[\begin{array}{l}+\text{Voc}\\-\text{Cons}\\+\text{High}\end{array}\right]_{N}\right]$

THEN $\Downarrow$ [-Back]

This condition came about as the result of the merging of initial *u- with /i/- in these two dialects. In chapter 1, sec. 1.4, I cited a case in which the dropping of a rule left behind a constraint on morpheme structure. Here we have an instance of an historical merger resulting in a constraint. That is, the merger of *u- and *i- as /i/- has eliminated a segment from a given position, and this has resulted in a synchronically predictable fact about what segment can occur in that position.

(4) Courtenay's rule presents a difficulty even within the framework of her analysis. All vowels in the lexicon are specified for a given tone. If the rule is to delete initial /u/-, it must delete not only its segmental features but also its tone. This can be done by including in the SD the specification [αLOW], to indicate that the tone is mid or low (there are no high-tone initial vowels in nouns in Yorùbá.) But the fact is that the tone of this /ù/- is indeterminate. This is so because it alternates with no real segment. It is merely a phonological fiction. There is no basis for assigning it either a low or a mid tone in the lexicon. And its lexical specification cannot be [αLOW] since this does not meet the requirement of full phonological

specification required by the theory. Courtenay avoids this dilemma by quite illegitimately writing a mid-tone /u/- in her sample derivations (1968, 55).

3.3 Are a-i and a-u permissible sequences in nouns?

I have mentioned several times that a study of derivational morphology in Yorùbá may well help to provide answers to unresolved issues that arise at the phonological level. The question of whether to consider a-i and a-u permissible or impermissible sequences is another such issue.

When one looks at the occurring sequences of vowels in VCV nouns, one is struck by the fact that a-i and a-u are virtually non-existent. I have found only three such nouns, each possibly unique to a single dialect:

	CY	K	Oǹ	Ìf	Òk	Àk	Ɔ̀b
36 jr. sibling	àbúrò	àbúrò	àbúò	àbú	àbúrò	àbó	àbúrò
287 type of oil	àdí(~àdí)[20]	ekpo	ekpo	ekpo	ekpo	ekpo	ekpo
S175 fish net	àwɔ̃̀	àwɔ̃̀,àdù	——	——	——	——	——

We can speculate about the etymologies of these nouns. Ìf àbú probably stems from the trisyllabic noun àbúrò. CY àdí~àdí may consist of a nominalizing prefix à + the verb dí 'fry'. There are a number of trisyllabic nouns which have àdí as the first element, and which are clearly nominalization, e.g. àdídù 'type of fried meat' (dù 359 be sweet); àdígbɛ 'thing fried without oil' (gbɛ 372 be dry); àdíjó 'thing burned while being fried' (jó 468 burn). K àdù may be a nominalization of the verb dù'scramble, compete'. But whether these guesses are accurate or not does not seem to be crucial. Their correctness would only give added support to the conclusion to be drawn from the paucity of examples, namely, that a-i and a-u are probably not permissible sequences in disyllabic nouns.

Examples of a-ĩ and a-ũ are not hard to find. Thus one is not surprised at the occurring nouns àmì 'distinguishing mark on something', amí 'scout, spy', àmũ 'water pot.'[21] Note, however, that an analysis of nasalized vowels which follow nasal consonants as underlyingly oral would be faced with the then anomalous fact that a-i and a-u is so rare with oral consonants in intervocalic position (cf. next section).

When we look at nouns of three or more syllables we find an abundance of instances in which a is the first vowel and i or u the second. E.g. :

	CY	K	Oǹ	Ìf
74 armpit	abíyá	abíyá	abíyá	abíyá
	Òk	Àk	Ɔ̀b	
	abíyá	àbíyá	abíyaká	
	Cy	K	Oǹ	Ìf
247 chicken	adìɛ adìrɛ	edìɛ	ajìɛ	adìyɛ
	Òk	Àk	Ɔ̀b	
	ɛdìyɛ	adìyɛ	ajìɛ	
	Cy	K	Oǹ	Ìf
248 cock	àkùkɔ	àìkɔ	àkìkɔ	àkìkɔ
	Òk	Àk	Ɔ̀b	
	àkùkɔ	——	àkìkɔ	
	CY	K	Oǹ	Ìf
120 old man	arúgbó	arúgbó	àgbàlagbà	àgbàlagbà
	Òk	Àk	Ɔ̀b	
	arúgbó	arúgbó	arúgbó	
	CY	K	Oǹ	Ìf
235 sheep	àgùtɔ̃	àgùtã̀	àgũ̀tã̀	àgɔ̃̀tã̀
	Òk	Àk	Ɔ̀b	
	àgũ̀tã̀	——	àgùtã̀	

	CY	K	Oǹ	Ìf
S46 ward, quarter	àdúgbò	àgó	àdúgbò	——
	Òk	Àk	Ɔ̀b	
	àdúgbò	——	——	
	CY	K	Oǹ	Ìf
S167 lamp	àtùkpà	àtùkpà	àtùkpà	——
	Òk	Àk	Ɔ̀b	
	àtùkpà	——	——	

This difference between the minimum VCV structure of nouns and nouns consisting of a larger number of segments points up the acute need for an investigation of the morphological composition of nouns, of such processes as nominalization, reduplication, compounding, and perhaps pre- and suffixation. Perhaps in a large number of cases we are simply confronted with the synchronic residue of derivational processes which are no longer productive. I suspect, however, that many nouns will lend themselves to synchronic analysis into smaller constituents.

The probability that occurring a-i and a-u sequences in disyllabic nouns are violations of a constraint which disallows these sequences brings with it the question of how the constraint is to be captured by MS condition. The condition which up to now has characterized dialects which, unlike If, do not require a P-rule of tenseness assimilation, is Sequence Structure Condition (6) sec. 1.3.2. It is repeated here for convenience of reference:

(34) (=(6))

$$\text{IF} \quad \left[\begin{bmatrix}+\text{Voc}\\-\text{High}\\-\text{Low}\end{bmatrix}_N \quad X \quad \begin{bmatrix}+\text{Voc}\\-\text{High}\\\alpha\text{Tense}\end{bmatrix}\right]_N$$

$$\Downarrow$$

$$\text{THEN} \quad [\alpha\text{Tense}]$$

The condition which states that a-i and a-u are impermissible is [22]

(35) IF $\begin{bmatrix}[+Voc]\\ N\end{bmatrix}$ X $\begin{bmatrix}+Voc\\ +High\\ -Nasal\end{bmatrix}_N$

THEN ⇓ [-Low]

It does not appear that the condition needs to mention the tenseness of either of the two segments involved. To do so would only add redundant information, since the [-Low] segment is not dependent for its tenseness on the tenseness value of the [+High] segment, but may be either plus or minus Tense. The constraint is one which synchronically is based simply on height. There is no way to collapse this condition with the condition on tenseness agreement. It will therefore have to be stated separately. Note that it is a constraint which applies to Ìf as well, whereas the tenseness agreement condition is absent from this dialect (cf. Chapt. 1).

Courtenay (1968, 135) lists a-i and a-u as permissible sequences. She apparently failed to notice the extreme poverty of exemplification. As the example of a-i she lists adìrɛ 'chicken', a noun of three syllables and thus exempt from the constraint. And as the example of a-u she gives atú 'a soft type of yam', which is not lexically a noun, according to Abraham (1958), but a nominalization of the derivational prefix a- plus the verb tú 'crumble'.

3.4 Nasalized vowels following nasal consonants.

In all dialects, only nasalized vowels follow nasal consonants.

E.g.	CY	K	Oǹ	Ìf	Òk	Àk ɔ̀w		ɔ̀b
38 child	ɔmɔ̃	ɔmɔ̃	ɔmɔ̃	ɔmɔ̃	ɔmã	ɔmɔ̃	——	ɔmɔ̃
44 in-law	ànɔ̃	ànã	ànã	ạ̀nã̀	ànã̀	ànɔ̃̀	——	ànã
160 fire	inɔ̃́	inã́	unã́	ɔnã́	unã́	unã́	unã́	unã́
426 drink	mũ	mɔ̃	mɔ̃	mɔ̃	mɔ̃	mɔ̃	mɔ̃	mɔ̃
493 know	mɔ̀	mɔ̃̀	mã̀	mɔ̃̀	mã̀	mɔ̃̀	mã̀	mɔ̃̀
S361 stretch	nɔ̃̀	nã̀	nã̀	——	nã̀	——	——	——

Only those vowels occur after the nasal consonants (m and n) which are inherently nasalized. For example, the sub-dialect of CY spoken by my informant has the systematic phonemic nasal vowels /ĩ, ũ, õ/, and only these vowels occur following m and n; /e, ɛ, a, o/ do not. [23] On the other hand, there are relatively few occurrences of nasal vowels after b. Courtenay (1968, 14-15) uses this observation about distributional limitation to analyze all phonetic sequences of m + $\tilde{V}$ as underlyingly /b$\tilde{V}$/. A low-level rule converts /b/ to [m] (as well as nasalizing liquids, glides, and /l/) before nasal vowels.

3.4.1 The analysis of m as underlyingly /b/ must be challenged on several grounds. Let me first point out that Courtenay and I are in agreement that the environment m ___ is not one of contextual neutralization. Oral vowels which have no [+Nasal] counterpart do not occur in this position. Thus, the vowels that do occur are inherently [+Nasal]. This is clearly evident in If, which has the nasal vowels /ĩ/ and /õ/, but no underlying oral vowels /ɪ/ and /ɷ/. therefore, forms such as 53 nose ɪmõ, 216 crocodile ɔ̀nĩ, and 426 drink mõ, can only by sequences of nasal consonant + nasal vowel. The same deduction must be made from the study of a-i and a-u sequences of section 3.3. It was concluded there that the grammar must contain a MS condition which disallows these sequences. But the sequences aCĩ and aCũ are not excluded. Thus, the nasalized ĩ and ũ of nouns of the shape [amĩ] and [amũ] are underlyingly [+Nasal]. They cannot derive from underlying oral vowels.

This defines what the problem is not: it is not simply a matter of a P-rule which nasalizes vowels after nasal consonants. It has been necessary to state in which direction the solution does not lie to make explicit what in Courtenay's treatment is left implicit.

3.4.2 The criticism of the /b + $\tilde{V}$/ analysis is as follows:

(1) There are a number of cases of b + $\tilde{V}$ in the surface (all citations are from CY, unless otherwise noted):

bũ̀ 506 (> ɪfibũ̀, n. the giving: ɛ̀bũ̀ gift; ɪbũ̀ forms compounds, e.g. ɪbũlaye, n. giving a chance to someone)

ɪb̀õ type of disease

ɪb̀õ S150 gun (K ɪb̀õ, Oǹ ab̀ã, Ok̀ ɪb̀ã, Àk ɪb̀õ, ɔ̀b ɪb̀õ)

obɪ̀ri 114 woman (K obɪ̀ri, Oǹ obɪ̀ɛ̃, If ɔ̀bɪ̀rĩ, Òk obɪ̀rĩ, Ak ɔ̀bɪ̀rĩ, ɔ̀w obɪ̀ɛ̃, ɔ̀b obɪ̀rĩ) [24]

Bĭtù female name (<Hausa <Arabic 'daughter')

There are also a number of ideophones with b + $\tilde{V}$, although, as Courtenay has rightly noted, ideophones are not subject to many of the P-rules which characterize the rest of the phonology.

It will be seen that all three nasal vowels of CY are represented in the environment b ___.

In the dialect of Ɔb there is a pair of verbs which leave no doubt, at least with respect to that dialect, that the underlying representation of m cannot be /b/: 381 sharp, 505 take (homophones) mṹ, and 449 abuse, insult bṹ.

To Courtenay, the examples in CY (the dialect she treats) are taken as exceptions, which presumably receive the rule feature [- b→ m]; not as infirming the analysis. I take them as one of various considerations which, taken together, do lead to a disconfirmation.

(2) There is no alternation of m and b. In contractions of a verb and its noun object the segmental features of the vowel of the verb are usually deleted. Thus the preceding consonant of the verb comes to adjoin the initial (prefix) vowel of the noun. This vowel is always an oral vowel (cf. MS Condition (9), sec. 3.1.7). E.g.

(36) mṹ + oògũ̀ → móògũ̀ [25]

take medicine

Thus in the course of a derivation m can come to stand before an oral vowel without that vowel being nasalized, and without the m alternating with b. The absence of alternation where an analysis of m as underlying /b/ would lead one to expect such alternation is no disconfirmation of the analysis, to be sure. But it gives additional support to the suspicion that the analysis may be in error.

(3) Courtenay's rule for /b/ → [m] is (105):

(37)
$$\left\{\begin{bmatrix}+\text{Voc}\\+\text{Cons}\end{bmatrix}\right.$$
$$\left.\begin{bmatrix}-\text{Voc}\\+\text{Cons}\\+\text{Anter}\\-\text{Coron}\\-\text{Back}\end{bmatrix}\right\} \rightarrow \quad [+\text{Nasal}] \;/\; \underline{\quad}\begin{bmatrix}\text{V}\\+\text{Nasal}\end{bmatrix}$$

This rule also nasalizes the glides w, y, h, and the liquids l and r.[26] The SD itself makes obvious that no natural class is involved.

(4) Beside the analysis of [m] as /b/, there are two other solutions possible:

(a) instead of deriving [m] from /b/, [b] could be equally well derived from /m/. Thus, /m + V/ would be rewritten as [b + V]; /m + V/ would remain unchanged, just as /b + V/ is in Courtenay's analysis. No more features are required to state this process than is required for the reverse change:

(38) $$\begin{bmatrix} -\text{Voc} \\ +\text{Cons} \\ +\text{Anter} \\ -\text{Coron} \\ +\text{Nasal} \end{bmatrix}_{\underline{m}} \rightarrow [-\text{Nasal}]_{\underline{b}} \; / \; \underline{\quad} \begin{bmatrix} V \\ -\text{Nasal} \end{bmatrix}$$ [27]

(b) $\underline{m}\tilde{V}$ could be derived from an underlying /$p\tilde{V}$/, although this would require an additional feature, since p is [-Voice] (cf. Awobuluyi (1964, 31), who entertained this as a possible alternative to m from b). This would fill the gap in the pattern of systematic phonemic stops:

b	d	g	gb.
-	t	k	kp

But there is no evidence for p at all; no morphophonemic alternations, no skewed distributions, no positions of neutralization, no borrowed forms with p. If symmetry were the goal of synchronic linguistics, this would be a proper solution. But without evidence for p it is a highly unnatural solution.

(5) What may partially have motivated an analysis of m as /b/ is a desire to eliminate nasals at the systematic phonemic level. This seems to be part of a desire for underlying symmetry, for n is analyzed as /l/, and for this there is better justification (see below for discussion). But there is, in my view, perhaps equally compelling motivation to eliminate b as a systematic segment. For without an underlying b there would be no gap in the system which cries out to be

filled by p. The only counter which there may be to this argument is that there are languages without m but few, if any, which do not have oral labial stops.

The question is what kind of claim are we implicitly making by setting up underlying /b/ + nasal vowel? It cannot be a claim that the native speaker recognizes all surface m's to be underlyingly /b/. There is not a single case of m-b alternation, and b's could equally well be underlying /m/'s. The only claim possible, it seems to me, is one based on the notions of gap-filling and system symmetry. Put in psychological terms this claim might say: the speaker is aware that m is followed only by nasal vowels and that b, discounting such surface forms as bũ and ɨ̀bõ, is followed only by oral vowels. This systematic imbalance in some way forces him to conclude that one of the two sounds is superfluous and must be eliminated at the level at which he formulates lexical representations. He eliminates m, possibly parallel to his elimination of n as underlying /l/.

3.4.3 The solution which avoids these objections is to recognize underlying sequences of /m/ + /V/. Because /m/ can be followed only by nasal vowels, there must be a MS condition in the grammar which predicts this. I believe this condition is valid for all dialects I have investigated (for apparent exceptions, see below):

(39) If-Then Sequence Structure Condition

If $\begin{bmatrix} C \\ +\text{Nasal} \end{bmatrix}$ $\begin{bmatrix} V \\ \Downarrow \end{bmatrix}$

Then [+Nasal]

There is no corresponding condition to claim that sequences of /b/ + /V/ are impermissible.

3.4.4 The forms which appear to violate this condition are shown in all but one case to be the result of vowel assimilation or deletion rules.

1p sg Pronoun Copy mo [mo]: this derives from /mĩ/ by assimilation in non-tonal features to the Subject Marker ó. This derivation was discussed in Chapter 2.

1p sg Pronoun Copy mà [mà]: this also derives from /mĩ/ when it precedes the marker of Future 1 á, by assimilation in non-tonal features to the marker (the tone change has not yet been accounted for).

The attributive forms of the numerals: méjî [méjî] '2', méta̋ [méta̋] '3', mérĩ̋ [mérĩ̋] '4', márũ̋ [márũ̋] '5', etc. These derive from the cardinal numbers (phonologically and syntactically nouns) èjì, èta, èrĩ, àrũ̀, etc. when these are prefixed by a form (perhaps once a verb) which consists of /m/ + a high tone nasal vowel. [28] The high tone of this vowel displaces the low initial tone of the numeral, and the vowel itself is deleted.

mélɔ̌ [mélɔ̌] 'how much/many' is also an attributive quantifier, as in

ɔ̀kpá	mélɔ̌	1-	o	fɛ̀?	How many walking sticks
walking-	how	Focus	2p sg	want	do you want?(the hyphen
stick	many	Marker	PC		indicates morpheme division)

Its nominal form is [èlɔ̌] 'how much/many'. Presumably its derivation is identical with that of the attributive numerals.

The noun màlû [màlû] 231 cow appears to be a genuine exception in that it is not synchronically capable of being decomposed into constituent morphemes. It thus requires a feature exempting it from MS condition (39) (sec. 3.4.3).

All of the above forms except màlû are the result of P-rules, and thus do not constitute counterexamples since MS conditions apply to dictionary matrices.

3.4.5 I have so far not discussed the analysis of the other surface nasal consonant, n. It too is followed only by nasal vowels. The liquid l is never followed by nasal vowels. Moreover, there is some evidence for the morphophonemic alternation of n and l. As first suggested by Ladefoged (1964, 23-4) and Awobuluyi (1964), these facts seem to call for a single base representing sound, and both investigators suggest /l/, as does Courtenay. [29]

Courtenay's rule (1968, 105) (rule (37), sec. 3.4.2, above) to derive n from /l/ only nasalizes /l/ (along with the other liquid, /r/, and the glides /w, y,h/). Thus we have intermediate forms such as

(40) ĩĺ 'have' (from /lĺ/)

ĩl̀ã̀ 'stretch' (from /l̀ã/)

ĩl̀ũ̀ 'wipe' (from /l̀ũ/)

From here she proceeds with a series of rules deriving syllabic nasals (106-7) from certain intermediate forms of the shape l̃ + f. But no rule is provided which converts all other l's to n's. Presumably the rule is:

$$(41)\quad \begin{bmatrix} +\text{Voc} \\ +\text{Cons} \\ +\text{Cont} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{Voc} \\ -\text{Cont} \end{bmatrix} \;/\; \_\_\_ \begin{bmatrix} V \\ +\text{Nasal} \end{bmatrix}$$

The fact that two rules are required to convert underlying /l/ to surface [n], while the conversion of /b/ to [m] requires a single rule, shows quite clearly that what may be implied in the analysis of m and n as /b/ and /l/, respectively, namely that parallel phonological processes are at work, is in fact no parallel at all.

I accept the analysis of n as /l/ because (1) there are cases of n-l alternation, (2) there is surface complement distribution of nasal and oral vowels after n and l, and (3) there are no exceptions to this distribution of which I am aware. None of these conditions are true of m and b, and thus these two sounds must receive separate systematic phonemic representation.

Footnotes

1. Adetugbo must clearly be referring here to the prefix vowel, since all three forms contain ã in the stem. The only other example he gives of this alleged ã-a contrast is the verb 527 yawn: SEY yã̀, other dialects yá. Neither the distribution of the 3p pl pronoun nor that of yá-yá is borne out by my data. He draws an isogloss only for yã̀-yá (fig. 5.19, 174). The isogloss indicates that the area covered by SEY yã̀ includes Ok, for which I have yá; and that the area covered by yá includes CY and K, which have yã̀ in my data. Although Adetugbo does not give the distribution of ãwã̀, my data do not indicate a nasalized prefix vowel in any dialect (cf. Chapt. 2, p.69, fn.4 for a listing of the realizations of the independent pronouns).

2. Some anticipatory nasalization no doubt takes place in the transition from non-nasal to nasal segment. To my

knowledge, no instrumental study in Yorùbá has been done of this or any area of assimilatory nasalization.

3. l is also an occurring liquid, but does not precede nasalized vowels. It may be that glides are also nasalized in this dialect, but I have no clear indication of this.

4. See Chomsky and Halle (1968, 360) for a discussion of the necessity of incorporating this type of rule into phonological theory.

5. Syntactically and phonologically the independent pronouns are nouns. Cf. sec. 2.1.

6. Comparison with other dialects indicates that an h has been lost in o$\tilde{\omega}$, and a back glide or a velar nasal in ò$\tilde{\omega}$ and à$\tilde{\omega}$. But it will be argued in sec. 4.2.1 that there is no synchronic justification for recognizing underlying intervocalic segments in these nouns.

7. Subject pronouns are included within the word since they are analyzed as being dominated by the same V as the verb. See chapt. 2.

8. He describes the w and y which precede nasal vowels as 'velarised n' and 'palatilised n', respectively (p.vi), and writes them as ẇ and ẏ, explaining that these symbols represent unit n͡w and n͡y. Whether this is articulatorily accurate is open to question, but the point is that nasalization of the glides w and y before nasal vowels is a feature of the speech of his informants. Assuming Abraham was consistent - and I have no reason to doubt that he was - if h and r had been similarly nasalized, he would have symbolised them as ḣ and ṙ, perhaps calling them glottalised n and retroflexed n, respectively. On p. 180 one finds a pair of alternate forms 'ɛhin ɛẏin' (76 back), in which are clearly contrasted a 'palatalised n' and a plain h.

9. This segment (i.e., $\begin{bmatrix}-\text{Voc}\\-\text{Cons}\\+\text{Nasal}\\\text{etc.}\end{bmatrix}$) must link with a Universal Marking Convention which switches stridency, all glides being [-Strid]. Chomsky and Halle's UMC (XV) (1968, 405) cannot be used because it takes as input only consonantal segments (i.e., $\begin{bmatrix}-\text{Voc}\\+\text{Cons}\end{bmatrix}$) which are [+Nasal] and makes them [-Cont], as well as [+Sonorant, -Strid]. True nasal consonants

are predictably [-Cont], so a rule which creates these segments need not state this fact, but will link with UMC (XV). The nasalized glide which rule (6) creates is predictably [+Cont], as are all glides. A UMC for [+Nasal] segments other than true nasal consonants (i.e. nasalized vowels, liquids, and glides) needs to state the following redundancies:
$[+\text{Nasal}] \rightarrow \begin{bmatrix} +\text{Sonorant} \\ +\text{Continuant} \\ -\text{Strident} \end{bmatrix}$.

10. l is also an occurring liquid, but it does not occur before nasal vowels. There will thus never be an l to which the rule could apply.

11. u never occurs as a prefix vowel in CY; therefore there is never any u available as input to the rule.

12. Note in the table that Òk, Àk, and Ɔ̀b are inconsistent in that they sometimes display an i- where other u-dialects have u-. There is also a lack of consistency across dialects, e.g. Ok has ìdí where Ak has ùdí; but Òk has ùrɔ̀lɛ́ where Ak has ìrɔ̀lɛ́. Because of this irregular vertical and horizontal comparability, and because other dialects (e.g. Òn, Ìf) are fairly consistent in the u-forms, my feeling is that such i-initial nouns as Ok ìdí and Ak and Ɔ̀b ìrɔ̀lɛ́ are borrowed, probably from the inter-dialect communication medium, CY. But dialect internal conditioning factors, perhaps no longer in evidence, cannot be ruled out in attempting to account for this distribution of u- and i-. I have no evidence which could shed light on this issue.

13. Ɔ̀b 54 ear is etí. Most other dialects have etí. What yetí reflects about the contemporary form etí is not known.

14. This verb was not separately elicited in Òk, but because 177 ground is ilɛ̀ in this dialect, and the i- has been deleted, the á of kparamálɛ̀ indicates that the verb is má.

15. Firefly will require, in addition, the feature [+REDuplication]. Night-adder will need to be bracketed as $[_N\ [_V\ ]_V\ [_N\ ]_N\ [_V\ ]_V\ [_N\ ]_N\ ]_N$. Spring contains two verbs in serial order. Presumably these are contiguous in the deep structure, and are moved to their correct position by transformation. The lexical entry for 'spring' will thus

be: $[_N\ [_V\ \ ]_V\ [_V\ \ ]_V\ [_N\ \ ]_N\ \ ]_N$.

16. For a preliminary discussion of ideophones in Yorùbá, see Courtenay (1968, 138ff).

17. See Courtenay (1968,24) for this positive sequence structure condition.

18. Comparison with other dialects would indicate that baba and bàbá, yeye and yèyé all derive from VCV bases by reduplication, according to the following formula: $\left[\begin{matrix}V_1\\ \propto LOW\end{matrix}\right] C_1V_2 \rightarrow C_1 \left[\begin{matrix}V_2\\ \propto LOW\end{matrix}\right] C_1V_2$. But I do not posit this as a synchronic account of these consonant-initial nouns because of lack of dialect-internal evidence. Possibly in Òk this reduplication process is still productive. Note that both yeye and iye are current. But positing a rule to derive yeye from iye is still unwarranted unless it can be shown to apply to more such pairs.

19. This is the only noun to my knowledge that could be used to argue in favor of Courtenay's analysis of consonant-initial nouns as having an underlying initial /u/. It is hardly sufficient to establish the correctness of the analysis, even if one were to admit evidence from other dialects as the sole justification for an analysis; and it must, in my view, be discounted in the face of the evidence being presented here which argues strongly against Courtenay's position.

20. These two forms are from Abraham (1958). The C.M.S. dictionary (1913) also lists them. They are evidently alternates of the same noun meaning 'oil from the kernel of the palm-nut'. Both dictionaries also list ekpo, the noun meaning 'palm oil', or 'oil' in general. Unfortunately, I did not elicit for this specific type of oil from my informants.

The C.M.S. dictionary also lists the alternants aki~ akĩ 'bravery, a brave person'. Abraham gives only akĩ.

21. These nouns are from Abraham (1958). C.M.S. (1913), also lists àmĩ 'sign, omen', which is not in Abraham, and àmĩ 'amen', which Abraham gives as ààmĩ. I elicited for àmũ 'water pot' in four dialects: CY àmũ, K ìkòkò àmõ (cf. 306 pot ìkòkò), Òn ùkọ̀kò omĩ (cf. 306 ùkòkò, 133 water omĩ), Òk ùsà.

22. This can also be given in the form of a negative condition:

$$NC \sim \underset{N}{\left[\begin{bmatrix}+\text{Voc}\\+\text{Low}\end{bmatrix} \quad X \quad \begin{bmatrix}+\text{Voc}\\+\text{High}\\-\text{Nasal}\end{bmatrix}\right]} N$$

As stated earlier (sec. 1.3.3), until it can be shown that the need for negative conditions is well-justified, and that such conditions are to be preferred over the various non-negative conditions when their cost in features is equal, I will avoid their use.

23. There are a few apparent counterexamples. These are discussed below in sec. 3.4.4.

24. This noun is no doubt the result of compounding. Whether the component morphemes can still be recovered is doubtful. Abraham (1958) gives them as abo 'female' + ĭrĩ with no gloss. This must be viewed with considerable suspicion. It cannot be ruled out that the ĭ that follows b is perhaps nasalized by the final vowel.

25. Elicited from Oyěkà̃ Owómóyèlá, a speaker of CY whose home town is Ošogbo.

26. The $\begin{bmatrix}+\text{Voc}\\+\text{Cons}\end{bmatrix}$ in the SD of the rule is no doubt a typographical error, and should read $\begin{bmatrix}\alpha\text{Voc}\\\alpha\text{Cons}\end{bmatrix}$.

27. Since m is $\begin{bmatrix}+\text{Voice}\\-\text{Back}\end{bmatrix}$, this rule will not erroneously change m to kp (which is $\begin{bmatrix}+\text{Anter}\\-\text{Coron}\\-\text{Voice}\\+\text{Back}\end{bmatrix}$) instead of to b.

28. Armstrong (1962, 36) calls this an 'm- prefix'. The tonal shape of the attributive numerals shows that its form must be mV.

29. Morphophonemic alternation of n and l appears to be limited to formatives of the shape n + ĭ. Thus, surface n is realized as l when, by deletion of the ĭ, it precedes an

oral vowel in various constructions. E.g.

(i) nĩ́ 'have'
nĩ́ + ìwě̌ → nĩ́-wě̌ (the hyphen indicates morpheme division
books

but nĩ́ + edé → 1-édé
shrimp

(ii) nĩ́ 'say'
ó nĩ́ kpé He said that...
3p sg PC that

but ó 1- ó He said that he (another third person)...

(iii) nĩ̌ 'Focus Marker (FM)'
edé nĩ̌ Kúlé rà. It was shrimp that Kúlé bought
shrimp FM proper name buy

but edé 1- ó rà It was shrimp he bought
shrimp 3p sg PC buy

This alternation does not apply to n + other nasal vowels. Thus, for example, the verb S361 stretch nã̀ has no alternant in l when, by deletion of its vowel, it directly precedes an oral vowel:

(iv) ó nã̀ ɛsɛ̀ He stretched (his) legs
3p sg PC legs

The verb and the noun object can be optionally contracted in two ways:

(v) nã̀-sɛ̀
(vi) n-ɛsɛ̀

In the second contracted structure, n precedes the oral vowel [ɛ].

This limitation of the n-l alternation to n + ĩ sequences has apparently been overlooked by previous investigators. (The alternate contracted forms in (v)-(vi) were elicited from Timothy Ilòrí, a speaker of CY whose home town is Ɔ̀yó. This subdialect of CY distinguishes ã and õ phonetically (cf. sec. 4.3 for discussion of ã and õ in CY).

Chapter 4

Some Remarks on Individual Dialects, or

(Some) Aspects of Individual Dialects

4.0 This chapter makes some relatively unsystematic remarks concerning aspects of individual dialects which do not contribute insights into more general problems in Yorùbá phonology, such as were dealt with in chapters 1-3, but which merit discussion because of their dialect specific nature. There will necessarily be some overlap between this and preceding chapters since it is difficult, and often unhelpful, to view phonology as if it were composed of separate, autonomous compartments.

4.1 Ìfàkí

4.1.1 The inventory of surface vowels in Ìf is [i,ɪ , e,ɛ , a,ɔ , o,ʊ , u, ĩ,ɪ̃ , ã,õ ,ɔ̃ , ũ]. The systematic phonemic representation of the oral vowels was discussed in connection with the description of tenseness agreement in Chapter 1. The relationship between [ã] and [õ] will be taken up in sec. 4.1.12.

The following set of underlying nasalized vowels is recognized:

[+Tense] /ĩ,ũ/

[-Tense] /ɪ̃,ɔ̃,ã/

The relationship between systematic /ĩ, ũ/ and their phonetic realizations is a direct one, needing no mediating P-rules.

I have considered the systematic phonemic forms of [ɪ̃, ɔ̃] to be /ɪ̃, ɔ̃/. There are thus more lax than tense nasalized vowels. This is somewhat odd. It could be argued that the representation of [ɪ̃,ɔ̃] ought to be /ɪ, ʊ/, which is then converted into its phonetic form by the rule:

(1) $\begin{bmatrix} V \\ +High \\ -Tense \end{bmatrix} \rightarrow$ [+Nasal] / ___ #

In deciding between these two alternatives one must decide the relative merits of two types of argument. One type is based on an appeal to pattern gaps and pattern congruity. This argument would say that since (a) in stems there is no surface [ɪ, ʊ], (b) nasal vowels do not occur in prefixes at all, and (c) [+Nasal] sounds are more marked than [-Nasal] sounds, /ɪ,ʊ/ is the proper lexical representation.

Arguments for underlying /ĩ, ũ/ are of the type advanced by Postal (1968, 53-77 et passim) and Kiparsky (1968a). Postal's contention is that language - and hence the linguist's description - is governed by the 'Naturalness Condition', a condition on the form of grammars which argues that unless there are language-specific motivations for violating linearity and invariance, these conditions obtain, since they are the most direct, least abstract, and therefore the most natural mediation between the systematic phonemic and the systematic phonetic levels of representation. It thus follows that, since there is no internal motivation for a rule which turns [ɪ, ʊ] into [ĩ, ũ], invariance ought not to be violated. One could go to to argue that inside the speaker's mind there is not likely to be an analogue of such a rule, since the child exposed to the Ifàkí dialect has no need for positing abstract [ɪ, ʊ] anywhere in his grammar (all surface [ɪ] and [ʊ] deriving by rule from /i/ and /u/), while he does need to posit other underlying nasal vowels, namely /ĩ, ũ, ã/.

Looking at the rule given to account for /ɪ/ → ĩ and /ʊ/ → ũ , there is no doubt as to the unusualness of its structural change in the environment of a boundary. It is a strange rule, and in an intuitive sense, an unnatural rule.[1] The burden of justifying it must fall upon the proponents of the pattern congruity solution in the face of counter arguments for the maintenance of natural relations between deep and surface phonology.[2]

It is my feeling that the arguments in favor of the Naturalness Condition are more compelling than those based on patterning, because they permit us to make reasonably well-motivated claims about the native speaker's internalized knowledge

of the grammar of his language. The argument from pattern congruity either has to dismiss such claims, or attempt to make them in more indirect ways.

An argument somewhat similar to the pattern-gap argument can be brought against the /ĩ, õ/ solution, namely, that the existence at the systematic phonemic level of /ĩ,õ / necessarily implies the existence of /ɪ/ and /ʊ/. We counter this in the same way we countered the pattern-gap argument. The maintenance of a natural relation between systematic phonemic and systematic phonetic elements dictates against the recognition of /ɪ,ʊ / but for the recognition of /ĩ,õ / in a synchronic description of If. Arguments from implicational necessity such as this, as they apply to synchronic grammar, do not receive empirical support with respect to the nasal vowels of If.

4.1.11 The fact that the lax high vowels are nasalized in stems, i.e. that there are no [ɪ, ʊ] in stems, is captured in an If-Then morpheme structure condition:

(2) If: If-Then Segment Structure Condition

$$\text{If} \quad \left[\begin{matrix}+\text{Voc}\\ -\text{Cons}\\ -\text{Tense}\\ +\text{High}\end{matrix}\right]_{N,V}$$

$$\Downarrow$$

Then [+Nasal]

4.1.12 In section 4.1.1 it was argued that the synchronic facts of If do not warrant recognition of /ɪ/ and /ʊ/. It is likely, however, that these sounds were historically part of the inventory of underlying stem vowels, and that they merged with some other front-back pair. But there is no synchronic residue to give a clue to their former existence, nor with which vowels they merged. The opposite assumption, however, that /ɪ/ and /ʊ/ never existed, entails the much less plausible claim that /ĩ/ and /õ/ developed independent of their oral counterparts.

4.1.2 If has both [ã] and [õ]. [õ] occurs following labial consonants, i.e. consonants which are $\left[\begin{matrix}+\text{Anterior}\\ -\text{Coronal}\end{matrix}\right]$; [ã] occurs everywhere else. E.g.

	[õ]		[ã]
22 thirty	ɔgbɔ̀̃	11 eleven	ɔ̀kã̀lá
36 sr. sibling	ɛ̀gbɔ́̃	44 in-law	ànà̃
38 child	ɔmɔ̃	68 breasts	ɔyà̃
58 chin	àgbɔ̀̃	77 heart	ɔkà̃
93 testicles	ɛkpɔ̀̃	104 vein	ɩ̌ʂ̌ã
493 know	ɔ́ mɔ̀̃ he knew	362 sour	ɔ́kã it is sour

I set up /ã/ as the representative of the non-high nasal vowel both because it has a wider distribution,and because, parallel with the oral vowels, /ã/ is less marked than /õ/. /õ/ is both [MHigh] and [MTense], while /ã/ is U for these features. Thus the respective complexities of these two segments in terms of M and U values reflects the feeling that a nasal vowel system such as that posited for If:

ĩ ũ
ɪ̃ õ

ã

is more natural in some meaningful sense than one which contains /õ/ instead of /ã/. [4] That this non-high vowel must be [-Tense] is seen from the fact that it requires a harmonizing vowel which is [-Tense]. The Universal Marking Convention suggested in chapter 1, secs. 1.3 and 1.5.1, automatically assigns /ã/ a [-Tense] value. Thus the choice between /ã/ and /õ/ is quite clear, and the rule for deriving [õ] from /ã/ is:

(3) Ìf: ã → õ

$$\begin{bmatrix}+\text{Voc}\\+\text{Low}\\+\text{Nasal}\end{bmatrix} \rightarrow [-\text{Low}] \;/\; \begin{bmatrix}-\text{Voc}\\+\text{Anter}\\-\text{Coron}\end{bmatrix} \_\_\_\_$$ [5]

4.1.21 There are a few exceptions to the distribution of ã and õ in Ìf. These are of two sorts: õ appearing in the absence of labial consonants, and ã appearing in the presence of labials.

142 sky sɔ́̃mɔ̀̃, and 178 sand rɔ́̃yɪ̀̃ have õ preceded by

non-labial consonants. It is not possible to say that this õ receives its nasalization from the final vowel by nasal assimilation because, as was noted in sec. 3.1.3, only high vowels assimilate in nasality to following vowels. Nor is it possible that the first õ of sómò is nasalized by the following nasal consonant. No nasalization of this sort occurs in If at all. Thus it is clear that both nouns are exceptional. But they can be exceptions to either the rule of secondary nasalization (Rule (3) of sec. 3.1.3), or to the ã → õ rule (Rule (3) of the preceding section). In the former case they would be listed as /sóma/ and /róyĩ/; in the latter as /sãmà/ and /rãyĩ/. Perhaps, if Schachter (1969, 348) is correct in his hypothesis concerning 'natural assimilation rules', [6] it will be cheaper to state the rule that assimilates a vowel to the nasality of a following vowel, than to state the ã → õ rule. Correspondingly, the rule feature which forces a lexical item to undergo a natural assimilation rule might be made less costly, in some sense which is at present far from precise than rule features whose arbitrariness remains unmitigated. At present this is my only basis for choice, and I therefore list these nouns as /sóma/ and /róyĩ/, with the plus rule feature [+Rule (3)] (cf. Chapt. 3, sec. 3.1.3).

The noun 62 tongue appears in Ìf as either ɷã́ or ɷṍ. [7] As will be seen in the following section, vowel clusters derive historically from the sequence VwV, so we are not surprised at the form with õ. It may be viewed as the synchronic residue of a sound change, and will be represented as /uã/, with the exception feature [+Rule (3)] (cf. sec. 4.1.12, above). The effect of the deleted w has clearly been removed in ɷa, so that it requires no exception feature, and can simply be represented in the lexicon as /uã/.

296 basket agbã̀ must be listed with the feature [- Rule (3)] to keep the final ã from being rounded by the preceding labial. This is the only example of a labial consonant followed by ã which I have in If. It may be a mishearing for agbò (compare 58 chin àgbõ̀), but I am unable to reconfirm the data.

4.1.3 Ìf generally lacks a w where it is found in the other dialects, with a small number of exceptions (but see sec. 4.4.24 for a discussion of w in Òn). This causes If to have vowel clusters and verbs which consist of a vowel with no initial consonant. The table below compares some CY and K nouns and verbs in which w is present with If forms in which it is absent.

	CY	K	Ìf
A. Nouns			
69 hand	ɔwɔ́	ɔwɔ́	ɔɔ́
98 skin	awɔ	awɔ~àwɔ̀	aɔ
146 star	ìràwɔ̀	ìràwɔ̀	ìràɔ̀
233 goat	ewúrɛ́	ewúrɛ́	ɛɔ́rɛ́
320 hole	ihɔ̀	ihɔ̀	uɔ̀
326 money	owɔ́	owɔ́	eɔ́
B. Verbs			
339 heavy	wúwo	wo	o
432 come	wá	wá	á
445 taste	tɔ́wɔ̀	tɔ́wù	tɔɔ̀
C. Exceptions			
464 read	kàwɛ́	kà	kàwɛ́
465 write	kɔ̀wɛ́	kɔ	kɔ̀wɛ́
472 say	wí	(sɔ)	wí
516 follow	(tɔ̀)	(tɔ̀)	wɔ́lí

The question is whether w should be posited at a deeper level. Are the forms in C to be taken as indicating the systematic presence of w? Asked in another way, should forms which are in a minority be used to wag the tail of the majority? Arguments from pattern congruity would indicate that the answer should be yes: the nouns and verbs in A and B should be provided with a w in their underlying matrices because vowel clusters and one-vowel verbs do not occur anywhere

in the dialect except where comparative evidence shows a w to be present in other dialects. But comparative evidence alone is insufficient grounds for deciding among alternative analyses. Even within the facts internal to Ìf - where one could argue that since w does exist in some words, why not use it where a consonant is needed to preserve the canonical CV syllable - the appeal to analogy seems a weak argument. In English we posit underlying /gn/ in verbs such as sign, malign because of the [g] in signatature, malignant. But it is questionable whether this gives us a reason to set up shine and dine as /šĭgn/ and /dĭgn/, respectively, by analogy.

The only solution which does not violate the naturalness condition, and the one I propose, is to include a systematic /w/ only in those cases where it occurs on the surface and omit it where it does not. This avoids making spurious claims about what has been internalized by the speaker. But notice that it also avoids having to use a device that is costly in terms of an evaluation metric. If we posit /w/, in accordance with the pattern pressure argument, and then formulate a general w-deletion rule for Ìf, exceptions to this rule must be marked with the feature [- w-Deletion] in the lexicon. Such a feature is what Postal (1968, 134-6) calls an exception feature. In terms of the differential arbitrariness of the usual three types of features (phonological distinctive features, morphological features, and exception-to-rule features), it is the most arbitrary and should therefore have the most cost attached to it. It follows that its use is to be minimized or avoided whenever possible. And it is clear that in the analysis of w in Ìf just the desired result, both in naturalness and in the minimization of exceptional features, is obtained by the proposed solution.

There is no doubt that historically w-deletion took place. But there is little point in trying to formalize this historical process into a rule in Ìf in the absence of better insight into its range of applicability.

4.2 Kétu

4.2.1 The nouns 109 voice oõ̀, he (3p sg independent pronoun) ọ̀õ̃, and they (3p pl indep pronoun) àõ̀, are unusual in that they do not have a consonant, glide, or liquid between the two vowels. They thus violate the MS condition in K which states that nouns are canonically of the form VCV(CV). Schematically, as a positive sequence structure condition:

(4) K: Positive Sequence Structure Condition

PC $[_N \quad [VCV(CV)] \quad]_N$

Comparative evidence from other dialects indicates that the missing segment may be h in oõ, and a back glide or a velar nasal in òõ, and àõ. This would give ohõ, ówõ or òŋõ, and àwõ or àŋõ, respectively. Since K at present has no velar nasal, let us assume the velar segment is w. Is there any justification for setting up underlying forms which contain h and w in these cases? One is here again confronted with the often conflicting arguments from pattern congruity and from naturalness. These were discussed as they related to the positing of underlying nasal vowels in If (sec. 4.1.1).

The gap in the pattern here is the absence of some non-vowel segment in the environment $\begin{Bmatrix} o \\ a \end{Bmatrix}$ ___ õ. The question of the preceding paragraph is are we justified in claiming that for the speaker of K there is such a segment present in this environment at some level of representation? Let us look at the dialect-internal data.

4.2.11 w and h occur preceding õ if the vowel before them is not ɔ or o.[8]

fish net	àwõ̀	221	ahõ
prison	èwõ̀	307	ihõ

Thus àõ 'they' is an exception.

4.2.12 w and h occur freely when the following vowel is not õ.

proverb	òwe	246	ehoro
249	awó	63	ɛhí
98	awɔ	purdah	èhá
111	iwí	behaviour	ìhùwà

4.2.13 y(the other glide) and r (the liquid occurring before nasalized vowels) do occur preceding õ and following o and o, as well as following other vowels.

pregnancy	oyṍ	64 orõ̀
file	ayõ̀	316 àrõ̀

Thus the gap in the pattern is constituted by the absence of w and h from the environment $\begin{bmatrix} V \\ +Rnd \end{bmatrix}$ ——— $\begin{bmatrix} V \\ +Rnd \\ +Nas \end{bmatrix}$.

4.2.14 Is this sufficient evidence to allow the positing of a w or an h in the lexical matrices of oṍ and òõ̀? I believe the answer is no, even if the posited segment is not w or h, but the archisegment $\begin{bmatrix} -Voc \\ -Cons \\ +Back \end{bmatrix}^9$ which covers both. We cannot make linguists of every native speaker of a language. Because there is a hole in the occurrence of non-vowels in a set of intervocalic positions, and because we determine that the candidates for filling the hole are w and h, this is not sufficient motivation for making the claim, via systematic phonemic base forms and synchronic P-rules, that the speaker's internal grammar posits either w or h, or an archisegment. Note that what would be ascribed to this internalized grammar is a rule of absolute neutralization in a given environment, followed by a rule deleting the neutralized segment. There is no synchronic evidence for this.

As an historical development in K it is no doubt a valid explanation, the deletion rule having been

(5) K: $\begin{bmatrix} -Voc \\ -Cons \\ +Back \end{bmatrix} \rightarrow \emptyset \; / \; \begin{bmatrix} V \\ +Rnd \end{bmatrix}$ ——— $\begin{bmatrix} V \\ +Rnd \\ +Nasal \end{bmatrix}$

But a synchronic phonology of K must treat oõ̀, òõ̀, and àõ̀ as exceptions (àõ̀ on independent grounds as well, as indicated in sec. 4.2.11). This means that their lexical matrices will contain the exception feature [-MS (4)], the positive MS condition given in sec. 4.2.1.

The historical deletion of w and h has left a gap in the VCV pattern of nouns. òõ̀ and oõ̀ are thus the synchronic residue of historical rule (5). We should make explicit in

the grammar that this gap is regular throughout the lexicon, and not fortuitous. That is, within a morpheme, whenever the sequence [V, +Round] [-Voc, -Cons] [V, +Round, +Nasal] occurs, the intervocalic glide can only be y. This explicitness is provided by the following MS condition:

(6) K: If-Then sequence structure condition

If [+Voc, -Cons, +Rnd] [-Voc, -Cons] [+Voc, -Cons, +Rnd, +Nas]

then ⇓ [-Back] [10]

4.2.2 K has only the nasalized vowels [ĩ, ã, õ]. It has neither o̰ nor ṵ. ã occurs only following non-labial consonants and glides, and after the liquid r. Both back nasalized vowels are [-Tense], as evidenced by the singular Pronoun Copies which precede them:

(7) mò̰ mṍ ṍ I drank it (426 drink mṍ)

I drank it

(8) ɔ́ yã́ He yawned (527 yawn yã́)

He yawned

õ occurs following both labial and non-labial consonants and glides, and after r:

(9) 36 sr. sibling ɛ̀gbṍ

(10) 157 year ɔdṍ

(11) 64 neck ɔrõ̀

We must thus recognize one [+Tense] underlying nasal vowel, /ĩ/, and two underlying [-Tense] nasal vowels, /ã/ and /õ/. And there must be a MS condition predicting that there are no sequences of [+Anterior, -Coronal] consonant or glide (i.e.,

labial consonant)or glide plus /ã/:

(12) K: If-Then Sequence Structure Condition [11]

If $\begin{bmatrix}-\text{Voc}\\+\text{Anter}\\-\text{Coron}\end{bmatrix}$ $\begin{bmatrix}+\text{Voc}\\-\text{Cons}\\+\text{Nasal}\end{bmatrix}$

Then ⇓ [-Low]

Since there are no $\begin{bmatrix}+\text{Anter}\\-\text{Coron}\end{bmatrix}$ liquids, these need not be mentioned in the condition.

4.2.21 This rather odd inventory and distribution of nasalized vowels is quite clearly the result of a historical merger. The present limitation on the distribution of /ã/, and comparative evidence from dialects having ã following non-labials and õ following labials, makes it reasonable to assume that K once had the same distribution of *ã and *õ. Compare the following Ìf and K forms:

	Ìf	K
22 thirty	ɔgbõ̀	ɔgbɑ̃̀
36 sr. sibling	ègbṍ	ɛgbɑ̃́
38 child	ɔmõ	ɔmɑ̃
493 know	mõ̀	mɑ̃̀

K /õ/ is also cognate with /ũ/ in other dialects, and with both /ũ/ and /õ/ in Ìf:

	CY	Onì	Ìf	Òk	Àk	ɔ̀w	ɔ̀b	K
109 voice	ohũ̀	oũ̀	oũ̀	oũ̀	oũ̀	—	oũ̀	oɑ̃̀
144 sun	oòrũ̀	oũ̀	orìrũ̀	oòrũ̀	oòrũ̀	oòrũ̀	oòrũ̀	oòrɑ̃̀
307 thing	ohũ	uũ	uũ	urũ	uũ	—	uũ	ihɑ̃
452 carry	mṹ	mṹ	mṹ	mṹ	—	(gbé)	(rũ̀,gbé)	mɑ̃́
60 mouth	ɛnũ	ɛũ	ɛɑ̃	ɛrũ	ɛrũ	ɛrũ	aũ	ɛnɑ̃
124 God	ɔlórùũ	ɔlóũ̀	ɔlórɑ̃̀	(oge)	ɔlórũ̀	—	ɔlóòrũ	ɔlórɑ̃̀

4.2.22 The question now is whether K historically had */õ/. Although no clear answer can be given, it would seem that it did not. The noun prefix vowel /o/ is [+Tense], and does not cooccur with any of the [-Tense] stem vowels /ɛ, a, ɔ, ã/. Yet it does cooccur with stem /õ/, as in 109 voice oõ̀, and pregnancy oyó (<yó be pregnant). [12] This is not conclusive evidence, since K is among those dialects which do not have tenseness agreement between lax prefix vowels and [+High, +Tense] stem vowels, /ɛ/ and /ɔ/ occurring as prefixes with stem /i/, /ĩ/, and /u/.[13] A more convincing argument for the absence of */õ/ derives from the observation that K has, at present, /ĩ/ but no /ũ/, and /õ/ but no /ĩ/. If */õ/ existed as a systematic phoneme historically, would */ĩ/ not also have existed? But no trace of an */ĩ/ remains. Neither is there a trace of an */ũ/. Rather than make assumptions about the fate of these hypothetical segments, it is clearly much simpler to assume that synchronic /õ/ is the result of an historical merger of ũ and the õ which followed labials. This posited historical development simultaneously accounts for the synchronic absence of /ü/ and the limited distribution of /ã/. The rule of merger was:

(13) K: Historical merger of ũ and õ as õ

$$\begin{bmatrix} \alpha\text{High} \\ -\text{Low} \\ +\text{Back} \\ +\text{Nasal} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{High} \\ -\text{Tense} \end{bmatrix}$$

Again it will be seen that a diachronic rule can have an effect on the synchronic grammar in the form of a MS condition. The merger of ũ and õ as õ, and the consequent loss of complementary distribution between ã and õ, left the systematic phoneme */ã/ with occurrence only after non-labials. This distribution of */ã/ has continued down to present-day /ã/, and must be accounted for by the MS condition ((12)) which was given in sec. 4.2.2, above.

4.3 Common Yorùbá

I suggested in the Introduction, and in Fresco (1968a, 1968b), that this dialect be called Common Yorùbá rather than the name which is usually given to it, Standard Yorùbá. The discussion in this section of the nasal vowels [ã] and [õ] makes it clear that CY is not a single, homogeneous speech form,

but rather a set of sub-dialectal forms which together have been classed as a single variety of Yorùbá.

4.3.11 A number of investigators have described one form of CY in which /ã/ is rounded to [õ] following labial consonants (cf. Siertsema (1958, 363), Stevick (1963, x), and Courtenay (1968, 108)). Others hedge the issue of the distribution of these two sounds somewhat. Abraham (1958, vi) states that ã and õ are 'usually interchangeable', and uses õ to represent both (his symbolization is on, in accordance with Yorùbá orthography in which o is [ɔ] and n following a vowel indicates that the vowel is nasalized). [14] Bamgbose (1966, 8 fn 20) proposes that the phonemic representation be /õ/, with the rather vague explanation that '[ã] does not contrast with [õ] in single words in the speech of many Yorùbás.'

There appears to be, then, a sub-dialect of CY in which ã and õ are in complementary distribution, with õ occurring after the labial consonants (/b, gb, kp, m/) and the labial glide (/w/): e.g.

44	in-law	ànã	36	sr. sibling	ègbó
213	bush cow	ɛfà	S150	gun	ìbõ
446	hit	jà	493	know	mò
469	roast	yã	437	go up, climb	kpó

These sounds are the systematic phonetic realizations of systematic phonemic /ã/. The choice of /ã/ instead of /õ/ is based on considerations of relative markedness and distribution, as discussed with respect to If ã and õ in sec. 4.1.2.

The rule is:

(14) $$\begin{bmatrix} +\text{Voc} \\ +\text{Low} \\ +\text{Nasal} \end{bmatrix} \rightarrow [-\text{Low}] \; / \; \begin{bmatrix} -\text{Voc} \\ +\text{Anter} \\ -\text{Coron} \end{bmatrix} \_\_\_\_$$ [15]

4.3.12 The subdialect spoken by my CY informant has no [ã]. All [-High] nasal vowels are õ: e.g.

44	in-law	ànõ
213	bush cow	ɛfò
446	hit	jò
469	roast	yõ

This appears to be a case of rule generalization. The environment of rule (14) was deleted historically. Synchronically there is no need to posit a rule at all.

The resulting nasal vowel series, it is to be noted, is no longer an optimal series when seen in terms of the notion 'maximal differentiation':

ĩ ũ

õ

whereas the set from which it derives historically is one which is maximally differentiated:

ĩ ũ

ã

What one can make of this is difficult to say. There exists one item in which [ɛ̃] occurs: ìyɛ̃ 'that (one)'. This noun is probably a borrowing, [16] which at the present time must be listed as an exception. We can hypothesize that the shift from /ã/ to /õ/ in this subdialect of CY will predispose it to accept the introduction of more forms containing [ɛ̃]. This hypothesis should be readily testable at some future time. [17]

4.3.13 It is the impression of the informant, and of others whom I questioned concerning the use of ã and õ versus the exclusive use of õ, that õ appears to be gaining while ã after non-labials and õ after labials appears to be receding among persons whom they recognize as speakers of Common Yorùbá.

4.3.2 Bamgbọṣe (1965a, 10-11) mentions the two spellings on and an for the low nasal vowel following h: e.g. ahón [ahõ] 62 tongue, and fihàn [fihã] 532 show (verb). It is difficult to tell what these spellings reflect about the distribution of these nasal vowels in CY. One possibility is that the on spelling in such words merely shows the encroachment of the exclusive use of õ on the territory formerly held by ã. But this is probably not the explanation, for an appears to be the only spelling for the low nasal vowel after all other non-labial consonants: e.g. àdán 'bat', gán 'type of drum', jàn 'hit', òkan 'one', inán 'fire', ràn 'help', sàn 'be good, healthy', tán 'be finished', yan 'roast'.

Comparison with other dialects shows that they all have w in place of CY h in ahǫ́n. Abraham (1958) lists both ahǫ́n and awǫ́n. Thus one or more of his CY informants used [awɔ̃], or both [ahɔ̃] and [awɔ̃].

Assuming that forms spelled non-labial-plus-ǫn, such as ahǫ́n, occur in that subdialect of CY which has both [ã] and [ɔ̃], an assumption which is reasonable since the orthography is based on this speech form and not on the one from which [ã] is absent, there are two solutions possible. Either set up a labial glide or consonant followed by /ã/; or set up underlying /h/ + /ã/ and add an exception feature to indicate that the form in question must undergo rule (14), the ã → ɔ̃ rule. What is implied in these two alternatives? The first solution requires that we find a labial which will be converted to [h] by P- rule. w is the natural candidate for this. But note what this solution entails. It involves absolute neutralization of /w/ and /h/; and it requires the use of an exception feature for every morpheme with systematic phonemic /w/ which does not undergo the rule /w/ → [h]. And these morphemes are in the vast majority.

The second solution, that of setting up /h/ + /a/, requires much less machinery. All underlying forms which appear on the surface as h + ɔ̃, and only these, will need a diacritic feature to indicate that they must undergo a rule which the grammar predicts they will not undergo. The saving in terms of the number of costly exception features necessary is great.[18]

4.4 Onàdó

4.4.1 In section 4.2.14 it was concluded that the few nouns in K which are VV instead of the canonical VCV(CV) must be listed as exceptions, with an exception feature exempting them from the sequence structure condition that predicts the structure of nouns. The problem of whether to insert some non-vowel in the underlying representation of nouns which have surface vowel clusters is greatly increased in Onà. In this dialect there is a large number of nouns whose structure is either VV(CV) or VCVV: e.g.

VV		VVCV		VCVV	
52 hair	ĩõ	51 head	oĺyo	36 jr. sibling	àbúò
60 mouth	ɛũ	56 cheek	èɛ̀kɛ́	61 lip	ukpã́ũ
64 neck	ɔɔ̃̀	84 knee	oókṹ	185 wall	ògii
123 slave	cú	107 sweat	aĺfú	227 toad	àkɛ̀é
138 dew	eì	180 dust	euku	243 var. of antelope	abɔ̃̀ĺ́
140 thunder	àá	187 room	òùlĺ	246 rabbit	ehoo
268 meat	ɛã	201 animal	ɛãko	296 basket	akpɛè

For each of the VV and VCVV nouns, and for most of the VVCV nouns, a cognate with an intervocalic r can be found in other dialects.[19] Oǹ itself is not lacking in r, but it appears only in verbs. So, as in K, the question arises whether there is justification for recognizing an underlying intervocalic consonant, or if, alternatively, vowel-clusters must be admitted at the systematic phonemic level. And again, as in K, there is only comparative evidence to tell us just which non-vowel sound is missing. True, the fact that r is found in verbs but not in nouns is some indication that r may be the missing segment, but it is not sufficient to be able to claim that the language-learning child arrives at the conclusion that the lexical form of each VV sequence is /VrV/. If one admits dialect-external information only as a heuristic device, or in deciding among alternative analyses of equal complexity, as I do, then we must conclude that the evidence that can be brought to bear on this issue is insufficient, and we lack the proper motivation to recognize an intervocalic segment. Moreover, comparison with other dialects indicates that r is not in fact the segment which historically intervened between all surface vowel-clusters (see following sections).

4.4.2 Having admitted underlying VV sequences in Oǹ, the dialect-comparative evidence which could not be used in a synchronic analysis of Oǹ can now be used to make inferences about the historical rules which have led to this synchronic situation.

4.4.21 Most vowel-clusters are cognate with nouns in VrV in other dialects, e.g. all Oǹ nouns which are VV and VCVV, and such VVCV nouns as 51, 56, 84, 112, 180, 187, 201, 206, and 208 (cf. Appendix I). I thus assume that for these nouns Oǹ had an r- deletion rule. This rule deleted r in the following environments:

(15) $_{N}[VrV]_{N}$

(16) $_{N}[VrVCV]_{N}$

(17) $_{N}[VCVrV]_{N}$

Using the usual convention, these environments are combined as

(18) $_{N}[VrV(rV)]_{N}$

Thus, the segment to be deleted occurs either following the initial V or preceding the final V of the noun. That is, the environment may be either $_{N}[V$ ___ or ___ $V]_{N}$. We can use Langacker's (1969) mirror image rule convention to state the deletion:

(19) Oṅ: r-Deletion

* X, $[_{N}$, V, r, Y → 1, 2, 3, Ø, 5

1, 2, 3, 4, 5

4.4.22 But, now, there are some trisyllabic nouns which in various other dialects have two r's:

206	chameleon	arírọ (Ọk), ariro (Ɪf), aírọ (Ɔb)	Oṅ aíyọ
208	ant	ɛrɪ̀rà (Ɪf), eèrà (from /erɪ̀rà/) (CY, Ɔb)	Oṅ eèyà
325	fatigue	àárɛ̀ (from /àrírɛ̀/) (CY, Ọk, Àk, Ɔb)	Oṅ àáyɛ̀
144	sun	orɪ̀rũ̀ (Ɪf), oòrũ̀ (from /orɪ̀rũ̀/) (CY, Ọk, Àk, Ɔw, Ɔb)	Oṅ oũ̀
162	ashes	erírú (Ɪf, Àk), erúrú (Ọk)	Oṅ eú

There is no reason to assume that there was a consecutive deletion of r's in Oṅ, so the r-Deletion rule (19) applies simultaneously to all r's in the noun.[20] Since I do not admit an underlying r segment in nouns in Oṅ, the contemporary systematic phonemic form of these nouns is the same as their surface form. Assuming that at an earlier stage their underlying form was identical with the base form I would posit synchronically for other dialects, namely /VrirV/, I infer the following rules in the history of Oṅ:

1. r-Deletion
2. i-Deletion in the environment ____ {u, ũ}
3. y-Insertion in the environment i ____ V

i-Deletion is necessary to derive (historically) oũ̀ from */orìrũ̀/, and eú from */erírú/:

(20) Oǹ: i-Deletion

$$\begin{bmatrix}+\text{Voc}\\+\text{High}\\-\text{Back}\end{bmatrix} \rightarrow \emptyset \;/\; \underline{\quad} \begin{bmatrix}+\text{Voc}\\+\text{High}\\+\text{Back}\end{bmatrix}$$

There are no i + {u, ũ} sequences in Oǹ. However, this rule is not a 'triphthong simplification' rule, because there are surface triphthongs: e.g. 149 morning oúò.

	oũ̀	eú
Base form	*orìrũ̀	*erírú
r-Deletion	oìũ̀	eíú
i-Deletion	oũ̀	eú

Now there must follow a rule which inserts a y following all remaining i's when these immediately precede another vowel:

(21) Oǹ: y-Insertion

$$\emptyset \rightarrow \begin{bmatrix}-\text{Voc}\\-\text{Cons}\\+\text{High}\\-\text{Back}\end{bmatrix} / \begin{bmatrix}+\text{Voc}\\+\text{High}\\-\text{Back}\end{bmatrix} \underline{\quad} \begin{bmatrix}+\text{Voc}\\-\text{Cons}\end{bmatrix}$$

	aíyo	eèyà	ìyàwò (146 star)
Base form	*arírо	*erìrà	*ìràwò
r-Deletion	aío	eìà	ìàwò
y-Insertion	aíyo	eìyà	ìyàwò

4.4.23 Most dialects have a rule applying to initial VV sequences in nouns (which come about through the deletion of the intervocalic consonant under conditions of identity of certain segments) which assimilates the segmental features (but not the tone) of the second vowel to those of the first (cf. Courtenay (1968, 55-7)). In Oǹ the large majority of vowels in initial VV sequences are not identical in quality. And of those which are identical, many are simply the result of r-Deletion from an historical base form V_1CV_1CV, where $V_1 = V_1$. E.g. 56 cheek ɛ̀ɛ̀kɛ́ (<*/ɛ̀rɛ̀kɛ́/); 84 knee oókű (<*/orókű/). There are nouns, however, which have an initial cluster of identical vowels which, according to comparative evidence, must have undergone the vowel assimilation rule. I have found three such nouns: 126 medicine oògű, 208 ant eèyà, and 325 fatigue àáyɛ̀. We would expect Oǹ to have oìgű, eìyà, and àíyɛ̀, respectively.

If the assimilation rule was present at an earlier period in Oǹ, we must make one of two assumptions: either (1) it applied only to this small set of nouns, so that the vast majority of trisyllabic nouns which had initial vowel-clusters (at a stage in their derivation) were exceptions to the rule; or (2) the rule applied to all relevant trisyllabic nouns, but when it dropped from the grammar only a handful of these nouns retained the effect of the rule, the others again exhibiting their underlying vowels. Both of these hypotheses are highly suspect. (1) entails positing as an historical phenomenon a situation which is rare or non-existent in synchronic descriptions. (2) claims that the dropping of a rule will leave its effect on only a small fraction of the forms to which it applied. As we have seen several times, the more reasonable inference about a rule which has dropped from the grammar is that it leaves its effect on all forms which met its SD, this effect being in the form of a morpheme structure constraint. Thus, if the rule of initial vowel assimilation was historically a part of Oǹ phonology, it is reasonable to expect contemporary forms to reflect its former presence by exhibiting initial sequences of vowels which are identical in quality, and that exceptions would be few in number. Instead, in present-day Oǹ we see exactly the reverse.

It is my guess that the vowel assimilation rule never existed in Oǹ. oògű is probably borrowed; CY, Òk, and Ɔ̀b have this form of the noun. It is more difficult to make the assumption of borrowing for eèyà and àáyɛ̀ because the rule of y-Insertion (21) is limited to Oǹ and must have i in its environment. The best I can do is assume tentatively that the initial identical vowels are the result of borrowing. eèrà occurs in CY and Ɔ̀b; àárɛ̀ in CY, Òk, Àk, and Ɔ̀b. Such partial borrowing is parallel to the English pronunciation of garage, mirage, massage as [gərá:ž], [mərá:ž], [məsá:ž], in which the unstressed vowel is reduced, according to the rule of vowel reduction in English, but in which the stressed vowel and final consonant receive the French pronunciation.

4.4.24 Comparison with other Yoruba dialects indicates that with one sequence of initial vowels o + u, either an r or a w could have been the intervocalic segment:

	CY	K	Ìf	Òk	Ɔb	vs.	Oǹ
149 morning	àwúrɔ̀, àárɔ̀, òwúrɔ̀, òórɔ̀	àárɔ̀	ɔ́rɔ̀	òwúrɔ̀	òwúrɔ̀		oúɔ̀
187 roof	òrùlé, òòlé, òwùlé	òkèilé	òrùlé	òrùlé	òrùlí, orúulí		òùlí
338 ring	òrùka, òòka	òrùka	òròka	òròka	òrùka		òùka

In all other vocalic environments w has been retained, e.g. 151 evening ùwòlé, 106 feces iwĩ, 146 star ìyàwɔ̀, 233 goat ewúé, 320 hole uwò. This indicates that there was a w-Deletion rule, and that it shared its o - u environment with r-Deletion.

(22) Oǹ: w-Deletion

$$\begin{bmatrix} -\text{Voc} \\ -\text{Cons} \\ +\text{High} \\ +\text{Back} \end{bmatrix} \rightarrow \emptyset \; / \; \begin{bmatrix} +\text{Voc} \\ -\text{High} \\ -\text{Low} \\ +\text{Back} \\ +\text{Tense} \end{bmatrix} \; \underline{\quad} \; \begin{bmatrix} +\text{Voc} \\ +\text{High} \\ +\text{Back} \\ +\text{Tense} \end{bmatrix}$$

oúɔ̀ is thus historically the result of both r- and w-Deletion; òùlí of either r- or w-Deletion (the preponderance of r's in the other dialects may indicate that it was r); and òùka is historically the result of r-Deletion.

4.4.3 Since I analyze Oǹ nouns as synchronically permitting vocalic clusters in the deep phonology in nouns, there must be several MS conditions that predict this, corresponding to the several rules which

have brought clusters about historically.

(a) There must be a condition that states that vowel sequences exist in underlying matrices:

(23) Onì: Positive Sequence Structure Condition

PC $[_{N}\ V(C)V(C)V]_{N}$

This condition differs rather markedly from the condition which characterizes most other dialects, namely that nouns in these dialects are of the shape VCV(CV). This is one of the gross differentiators of Onì from other Yorùbá linguistic areas.

(b) There must be a MS condition that states that /r/ does not appear in nouns. This can be given in the form of an If-Then condition which limits intervocalic liquids in nouns to /l/:

(24) Onì: If-Then Sequence Structure Condition

If $\begin{bmatrix}+\text{Voc}\\-\text{Cons}\end{bmatrix}$ $\begin{bmatrix}+\text{Voc}\\+\text{Cons}\end{bmatrix}$ $\begin{bmatrix}+\text{Voc}\\-\text{Cons}\end{bmatrix}$

Then $\Downarrow$ [+Anter]

Thus we find Onì 312 dream òlá, but 289 fat (noun) òá (<*òrá. Cf. òrá in CY, K, If, Ok).

(c) And there must be a MS condition which reflects the historical rule of w-Deletion in the context o ___ u (rule (22)). Since Onì has no h, [21] the condition can state that in this context a glide must be /y/:

(25) Onì: If-Then Sequence Structure Condition

If $\begin{bmatrix}+\text{Voc}\\-\text{High}\\-\text{Low}\\+\text{Back}\\+\text{Tense}\end{bmatrix}$ $\begin{bmatrix}-\text{Voc}\\-\text{Cons}\end{bmatrix}$ $\begin{bmatrix}+\text{Voc}\\+\text{High}\\+\text{Back}\\+\text{Tense}\end{bmatrix}$

Then $\Downarrow$ [-Back] [22]

Footnotes

1. Investigation of the notion natural/unnatural rule is still at an elementary stage, but gives promise that a formalisation is possible. Schane (to appear) has given a number of natural/unnatural rule pairs and attempted to show how intuitions in this area often have an empirical basis. Schachter (1969) proposes a formalisation for one kind of natural phonological process.

2. Note that arguments for the Naturalness Condition are not necessarily arguments against 'unnatural' rules. The two types of argument are logically distinct. They seem to converge here to support the /ĩ,õ / analysis.

3. It can be argued from the distribution of these nasal vowels that the feature [Labial] should be added to the inventory of universal phonetic features. Lyle Campbell has found a number of examples showing the need for this feature (personal communication).

4. For some discussion of 'natural' vowel systems, cf. Chomsky and Halle (1968, 402,409).

5. There is no need to spell the input or the output segment more fully. The SD links with Universal Marking Conventions which will add the features [+Back] (UMC (5)) and [-Round] (UMC (6)). The SC links with UMC (6) which makes $\begin{bmatrix}+\text{Back}\\-\text{Low}\end{bmatrix}$ vowels [+Round].

6. He states as a convention to which P-rules are subject: 'The natural value of a feature is the marked value of that feature when an adjoining segment shows the marked value of the feature, and when, further, the marked value is the same for both segments' (Convention 8a, p.348). As pointed out to me by Vicki Fromkin, this convention may reflect physiological, articulatory constraints which are no doubt universal.

7. The informant produced one form on one occasion, and the other in a different work session.

8. u is theoretically excluded as well, but K contains no u noun prefix vowels.

9. Chomsky and Halle (1968, 177) give h as [-Back], thus grouping it with y. In their system there is no way for w and h to be classed together. It seems likely, however, that we will want to form a class of w and h to the exclusion of y. Certainly the evidence from K and other Yorùbá dialects supports this claim. (see below) What is entailed is a change in the specification of h from a [-Back] glide to a [+Back] glide.

w and y still form a class from which h is excluded, through the feature [High]. w and y are [+High], h is [-High].

10. Cf. note 9, p.123

11. While this condition states that if a $\begin{bmatrix}+\text{Anter}\\-\text{Coron}\end{bmatrix}$ consonant or glide is followed by a nasal vowel, that vowel will be [-Low] (i.e., will not be /ã/), the constraint is also formulable in another way. It can be stated that if the consonant or glide which precedes /ã/ is specified as a [+Anter] segment, it will be further specified as [+Coron]. That is, it will not be a $\begin{bmatrix}+\text{Anter}\\-\text{Coron}\end{bmatrix}$ segment. More formally:

$$\text{If} \quad \begin{bmatrix}-\text{Voc}\\+\text{Anter}\end{bmatrix} \begin{bmatrix}+\text{Voc}\\-\text{Cons}\\+\text{Low}\\+\text{Nasal}\end{bmatrix}$$

$$\Downarrow$$

$$\text{Then} \quad [+\text{Coron}]$$

The same number of features is required by the alternative conditions. It is not difficult to decide between the two conditions, however. The current limitation on the distribution of /ã/ was very probably brought about, historically, by a P-rule which realized */ã/ as [õ] after labial consonants and glides (see next sections). Condition (12) captures the fact that the distribution of /ã/ is contingent upon the feature composition of the preceding segment in a much more natural way than does the condition given in this note.

12. There are no instances of any eCõ nouns in my data. This is presumably an accidental rather than a systematic gap.

13. For a discussion of nouns of the shape aCi and aCu, see section 3.3, chapter 3.

14. Siertsema, considering the issue from the point of view of introducing a standardized spelling system recommends that 'the spelling an could be used in all cases to represent this phoneme [/ã/:EMF].'

15. Courtenay (1968, 108) gives this rule in a somewhat different version:

$$\begin{bmatrix} +\text{Voc} \\ +\text{Low} \\ +\text{Nasal} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{Low} \\ +\text{Back} \end{bmatrix} / \begin{bmatrix} +\text{Anter} \\ -\text{Coron} \end{bmatrix} \_\_$$

The environment must be [-Voc] because [õ] occurs after /w/, which is a glide, as well as after true consonants. [+Back] in the structural change can be eliminated. A Universal Marking Convention specifies a and ã as [+Back], so the change from ã to õ involves no change in backness. She, however, has considered a and ã as front vowels, stating (17): 'This is an arbitrary decision, since they are phonetically low central vowels and behave neutrally in rules which specify different behavior of front and back vowels'. Clearly a motivated decision exists in terms of the above rule to consider a and ã as [+Back].

The change from [+Low] to [-Low] in this rule is a rather indirect way of indicating the actual phonological process, namely rounding of a vowel after labial consonants and glides. If the feature [Labial] were countenanced within the theory, this process could be stated rather more naturally as:

$$\begin{bmatrix} +\text{Voc} \\ +\text{Low} \\ +\text{Nasal} \end{bmatrix} \rightarrow [+\text{Labial}] / \begin{bmatrix} -\text{Voc} \\ +\text{Labial} \end{bmatrix} \_\_\_$$

Cf. also note 3, p. 117.

16. Adetugbo (1967, 187-9) seems to think it originated in an area generally southeast of Ibadan.

17. However, as pointed out to me by Vicki Fromkin, we may be wrong in what we consider a maximally differentiated vowel system. The notion may need to be refined to include alternative sytems which are equally maximally differentiated.

18. Note that the use of positive rule features, such as the feature [+ ã → õ], in which segments which do not meet the SD of a rule must undergo the SC, presents a problem for phonological theory for which, to my knowledge, there is as yet no answer.

19. There is one adjective in my data with VV - 349 small (same as 356 narrow) kéé. The corresponding form in other dialects in kéré.

20. For a discussion of simultaneous application of rules, see sec. 1.8.2, and Chomsky and Halle (1968, 343-4).

21. Folarin (1967, 23), in his study of the Òǹ dialect, found only two instances of h (ehoo 'hare', há 'be choked up'), both of which he feels are borrowings from CY (18).

22. Cf. note 9, p. 123.

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APPENDIX I

Word List

The numbers in this word list correspond to those in the Word List for African Languages, which has been in use by the West African Linguistic Society for a number of years. This appendix is thus compatible with other publications of word lists in West African languages, such as Armstrong (1965, 1967), and Thomas and Williamson (1967). Gaps in the numbering occur where there are items on the Word List for African Languages which proved not very useful in my elicitations. A few additions have been made. They are marked with a letter following the item number (e.g. 69a).

The transcription is broad phonetic. The tone marking conventions are explained in the introductory chapter. The mark ˬ over a vowel indicates a 'lowered-mid' tone - a tone somewhere between low and mid. The mark ˷ over a vowel indicates a 'raised-mid' tone - somewhere between high and mid. An unmarked vowel following a vowel on lowered - or raised-mid tone carries this same lowered or raised tone, e.g. Ak alábaše 127 guest of honour. In this word the e carries the same tone as the preceding a.

The list is divided into two parts, the second being a supplement to the first. Numbers for entries in the second part are preceded by S.

APPENDIX 1: Word List

	CY	K	Oh	Ìf
1. *one*	ɔ̀kɔ̃,enɪ̃́	ɔ̀kã̀,enɪ̃́	ɪnɛ̃́	inɪ̃́
2. *two*	èjì	ejì	èjì	ejì
3. *three*	èta	èta	èta	ɛèta
4. *four*	èrɪ̃	èrɪ̃	mɛ̃́ɛ̃̀,ɛ̀ɛ̃	ɛèrɪ̃
5. *five*	àrʊ̃́	àrɔ̃́(márɔ̃)	mɛ́ʊ̃̌,èʊ̃́	èrɔ̃́
6. *six*	èfà	èfà	èfà,méèfà	ɛèfà
7. *seven*	èje	èje	èje	ejé
8. *eight*	èjɔ	èjɔ	èjɔ	ɛjɔ́
9. *nine*	èsɔ̃́	èsã́ (mésã)	èsã́	ɛèsɪ̃́
10. *ten*	èwá	èwá (méwa)	ègwá,èwá	ɛèwá
11. *eleven*	oókɔ̀lá	mókã̀lá	mókã̀lá, ɔ̀kã̀lígwá	ɔ̀kã̀lá
12. *twelve*	eéjìlá	méjìlá	méèjìlá, èjìlígwá	eèjìlá
13. *thirteen*	ɛétàlá	métàlá	méètàlá, ètàlígwá	ɛètàlá
14. *fourteen*	ɛérɪ̀lá	mérɪ̀lá, méìlá	mɛ́ɛ̀lá,ɛ̀ɛ̀lígwá	ɛèrɪ̀lá
15. *fifteen*	èédogʊ́,ɛédógʊ́	méɛdógú	mɛ́ɔ̃̌dógʊ́,èɔ̃́dógʊ́, ɛɛ́dógʊ́	èrɔ̃́dógʊ́
16. *sixteen*	ɛérɪ̀dɪ́lógʊ́	méìdɪ́lógú	mɛ̃̀ɛ̀dɪ́lógʊ́,ogʊ́ dɪ́ mɛ́ɛ̃	ɛèrɪ̀dɪ́lógʊ́
17. *seventeen*	ɛétàdɪ́lógʊ́	métàdɪ́lógú	méètàdɪ́lógʊ́,ogʊ́ dɪ́ méèta	ɛètàdɪ́lógʊ́
18. *eighteen*	eéjìdɪ́lógʊ́	méjìdɪ́lógú	mɛ́èjɪ̃dɪ́lógʊ́,ogʊ́ dɪ́ méèjì	ejìdɪ́lógʊ́
19. *nineteen*	oókɔ̀dɪ́lógʊ́	mókã̀dɪ́lógú	mókã̀dɪ́lógʊ́,ogʊ́ dɪ́ kà	ɔ̀kã̀dɪ́lógʊ́
20. *twenty*	ogʊ́	ogú	ogʊ́,okòó	ogʊ́
21. *twenty-one*	oókɔ̀lélógʊ́	mókã̀lélógú	ɔ̀kã̀lénógʊ́, ɔ̀kã̀logʊ́	ɔ̀kã̀lélógʊ́
22. *thirty*	ogbɔ̃̀,ogbɔ̃̀ ɔ̀ó	ogbɔ̃̀	ogbã̀	ogbɔ̃̀
23. *forty*	ogójì	ogójì	——	ogóòjì
24. *fifty*	àádótà̀	àádótà̀	——	èwádótà̀

	Òk	Àk	Ɔ̀w	Ɔ̀b
1.	mĩnḗ	inḯ	inḗ	inḗ
2.	méèjì	èèjì	méèjǐ̀	èjǐ̀
3.	méèta	èèta	méèta	èta
4.	méèrẽ	èèrĩ	méèrẽ	èrĩ
5.	máàrṹ	èrṹ	méèrú	àrṹ, èrṹ
6.	méèfà	èfà	méèfà	èfà
7.	méèje	èje	méèje	èje
8.	méèjɔ	èjɔ	méèjɔ	èjɔ
9.	méèhā́, méèsā́	èsā́	méèsā́, èsā́	èsā́
10.	méègwá	èwá	méègwá	ègwá
11.	mókàlá	òkɔ̃̀lá	móòkàlá, òkàlá	mókàlá, òkàlá
12.	méjìlá	——	——	méjìlá
13.	métàlá	——	——	métàlá
14.	mérɛ̃̀lá	——	——	mérɛ̃̀lá
15.	márṹdĩnɔ̃́gṹ	èɛ́dógṹ	ɛúdogṹ, ɛrúdogṹ	àrṹdógṹ, èrṹdógṹ
16.	mɛ́rɛ̃̀dĩ́lógṹ	——	——	èrɛ̃̀dĩ́lógṹ, èrɛ̃̀dógṹ
17.	métàdĩ́lógṹ	——	——	ètàdĩ́lógṹ, ètàdógṹ
18.	méjìdĩ́lógṹ	——	——	èjɛ̃̀dĩ́lógṹ
19.	mɔ̃́kàdĩ́lógṹ	——	——	òkàdĩ́lógṹ
20.	ogṹ	ogṹ	ogṹ	ogṹ
21.	mókã̀lógṹ	——	——	òkã̀lélógṹ
22.	ɔgbã̀	ɔgbɔ̃̀	ɔgbã̀	ɔgbɔ̃̀
23.	ogójì	ogóòjì	ogóòjǐ̀	ogóòjǐ̀
24.	àádótà	àádótà	àádóòta	ègwádótà

	CY	K	On	If
25. *sixty*	ɔgótà	ɔgótà	——	ɔgɔ́ɔ̀ta
26. *seventy*	àádórĩ̀	àádórĩ̀	——	èwádórĩ̀
27. *eighty*	ɔgórĩ̀	ɔgórĩ̀	——	ɔgɔ́ɔ̀rĩ
28. *ninety*	àádórùũ̀	adórõ̌	——	èwádórõ̌
29. *one hundred*	ɔgórùũ̀,òrṹ	ɔgórõ̌	——	ɔgɔ́ɔ̀rṍ
30. *father*	bàbá,baba	baba	bàì	àbá
31. *mother*	ìzá,iže (cf. S85),žèzé	ìyá	yèi,iye	èyé
36. *sr.sibling*	ègbṍ	ègbṍ	ɛgĩ́,ɛgbõ̀ bàà mĩ (father's sr.brother)	
jr.sibling	àbúrò	àbúrò	àbúò	àbú
38. *child*	ɔmõ	ɔmõ	ɔmõ	ɔmõ
40. *grandson*	ɔmõ ɔmõ ɔkũ̀rĩ	ɔm̄ ɔmõ̀ m̄ (my g'son)	ɔmõmõ̀ mĩ(my g'son)	——
42. *grand-father*	bàbá àgbà, baba àgbà	baba àgbà	íbábaà mĩ (my g'fa)	àbá àgbà
43. *grand-mother*	ìžá àgbà	ìyá àgbà	íyéyeè mĩ (my g'mo)	yeye,èyé àgbà
44. *in-law*	ànõ	ànã	ànã	ànã̀
48. *face*	ojú	ojú	ojú	ojú
49. *skull*	agbárí (<? 305+51)	ìšèkú	agbá íʁo	agbárí
50. *brains*	ɔkpolɔ	ɔkpolɔ	ɔkpolɔ,àtàbútõ̀	ɔkpolɔ
51. *head*	orí	erʃeého (>ého)	oíʁo	orí
52. *hair*	irũ	irõ̃	iõ	ɪrõ
53. *nose*	imṹ	imṍ	imṍ	ɪmṍ
54. *ear*	etí	etí	etí	etí
55. *eye*	ojú	ojú	ojú	ojú
56. *cheek*	èrèké,èèké	ègbó ìgò	èèké	èrèké
57. *beard*	irũgbõ̀ (cf.58)	irõgbõ̀	uãgbã̀	urùgbõ̀

	Òk	Àk	Ɔ̀w	Ɔ̀b
25.	——	——	ɔgóòta	ɔgóòta
26.	——	——	àádóòrɛ̃	ègwádóòrĩ
27.	——	——	ɔgóòrɛ̃	ɔgórĩ
28.	——	——	àádóòrṹ	ègwádóòrṹ
29.	——	——	ɔgóòrṹ	ɔgóòrṹ
30.	iba	àbá	——	iba
31.	iye,yeye (to very old woman)	èyé	——	iye
36.	ègbã́	ègbɔ̃́	——	ègbɔ̃́
	àbúrò	àbó,àbúrò	——	àbúrò
38.	ɔmã	ɔmɔ̃	——	ɔmɔ̃
40.	ɔmã ɔkɔ̀rĩ	ɔmɔ̃	——	ɔmɔ̃
42.	iba àgbà	àbá mĩ àgbà (my g'fa)	——	ibabà mĩ (my g'fa)
43.	iye àgbà	èyéè mĩ àgbà (my g'mo)	——	iyeyè mĩ (my g'mo)
44.	ànã̀	ànɔ̃̀	——	ànã
48.	ojú	ojú	——	ojú
49.	agbárí	agbárí	——	orí
50.	ɔkpɔlɔ	ɔkpɔlɔ	——	ɔkpɔlɔ,ɔròbótò (=bone marrow)
51.	orí	orí	orí	orí
52.	irɔ̃	ɪrɔ̃	——	irɔ̃
53.	imɔ̃́	imṹ	imɔ̃́	imɔ̃́
54.	etí	etí	etĩ́	etĩ́
55.	ojú (but cp.441)	ojú	ojú	ojú
56.	ìgbà	èrèké	——	ìrèké
57.	urã̀gbã̀,irã̀gbã̀ (cf.S368)	irugbɔ̀	——	irɔ̃ àgbɔ̀

	CY	K	Oñ	Ìf
58.*chin*	àgbɔ̀̃	èɡbɔ̃̀	àɡbɔ̃̀	àɡbɔ̀̃(cf.296)
59.*jaw*	àgbɔ̀̃ ìsàlè (lower)	ìsàlè gbɔ̃̀ (lower)	àgbɔ̃̀ kè(upper) àgbɔ̃̀ dò(lower)	èrèkɛ́
60.*mouth*	ɛnũ	ɛnɔ̃	ɛũ	ɛrɔ̃
61.*lip*	ètè	ètè	ukpɔ̃́ ũ	ɷkpɔ̃́rɔ̃
62.*tongue*	awɔ̃́, ahɔ̃́	èɛkpɔ̃,ɛkpɔ̃	iwɔ̃́	ɷɔ̃́, ɷɔ̃́
63.*tooth*	eyɪ́,ehɪ́	ɛhɪ́	eyɪ́	eyɪ́
64.*neck*	ɔrù	ɔrɔ̃̀	ɔù	ɔrɔ̃̀
65.*nape*	èhɪ̀ ɔrù	ìhɪ̀ ɔrɔ̀	èyɪ̀ ɔù	èyĩ ɔrɔ̃̀
66.*throat*	ɔ̀fũ, ɔ̀nɔ̃̀ɔ̀fũ	góɡóngò	ugɔ̀gɔ̀fã	ɔ̀fɔ̃
67.*chest*	àžà	àyà	àyà	àyà
68.*breasts*	ɔyɔ̃̀ , ɔmɔ́	ɔyɔ̃̀	ɔyɔ̃̀	ɔyɔ̃̀
69.*hand*	ɔwɔ́	ɔwɔ́	ɔwɔ́	ɔɔ́
69a.*arm*	akpá	akpá	aká	——
70.*fingernail*	èékɔ̃́nɔ̃́,èékɔ̃́	àíkɔ̃́nɔ̃́	ìkíkɔ̃́nɔ̃́	èkíkɔ̃́nɔ̃́
72.*elbow*	ìgbɔ̃́wɔ́	ìgbɔ̃́kpá	——	ɷgãrãká
73.*shoulder*	èjìká	èjìká	èjìká	ɔ̃gãrãká
74.*armpit*	abížá,ihò abížá	abíyá	abíyá	abíyá
75.*finger*	ìka,ìkawɔ́	ìka	ùka	ɔ̀kìka, ɔ̀ka
76.*back*	èhɪ̀,èyɪ̀(cf.S455)	ìhɪ̀	èyɪ̀	èyɪ̀
77.*heart*	ɔkɔ̃̀	ɔkɔ̃̀	ɔkɔ̃̀	ɔkɔ̃̀
78.*belly*	ɪnɔ́,ikù	ikù	ukù	ɪnɔ́,ukù
79.*liver*	èdɔ̀kì, èdɔ̀	èdɔ̀kì,ogúnɔ́	ɔ̀dɔ̀	ɔ̀dɔ̀, ɔ̀dɔ̀kì
81.*guts*	ìfũ,agbèdu, ìwóróku	ɔ̀wókù, ikù	ìfũ	ìfũ
82.*leg*	ɛsè	ɛsè(agɔ̃lower leg)	ɔsè	ɔsè
83.*heel*	gìgìrísè,gìgísè	gìgìlésè	èjìjasè	ètèkpá

	Òk	Àk	ɔ̀w	ɔ̀b
58.	igbɑ̃́dò	àgbɔ̃̀	——	àgbɔ̃̀
59.	ìgbɑ̀	àgbɔ̃̀ ìsàlɛ̀ (lower)	——	àgbɔ̃̀
60.	ɛrũ	ɛrũ	ɛrũ	aũ, ɛrũ
61.	ùkpɑ́rũ	ètè	——	ètè
62.	iwɑ̃́	uwɑ̃́,uɑ̃́	iwɑ̃́	iŋɔ̃́ , aŋɔ̃́
63.	eyĩ́	eyĩ́	ɛyĩ́	eyĩ́
64.	ɔrɔ̃̀	ɔrɔ̃̀	——	ɔ̀fɔ̃
65.	ɛ̀yĩ̀ ɔrɔ̃̀	ɛ̀yĩ̀ ɔrɔ̃̀	——	ɛ̀yĩ̀ ɔ̀fɔ̃
66.	ɔ̀nɔ̃̀fɔ̃ , ɔ̀fɔ̃	ɔ̀nɔ̃̀fũ	——	ɔ̀nɑ̃̀ ɔ̀fɔ̃
67.	àyà	àyà	——	àyà
68.	ɛyɑ̃̀	ɔyɑ̃̀	——	ɔ̃yà
69.	ɔwɔ́, ikɑ́	ɔɔ́	ɔwɔ́	ɔwɔ́
69a.	owɔ́, ikɑ́	akɑ́	——	akɑ́
70.	èkíkɑ̃́nɑ̃́ ɔwɔ́	èɛ́kɑ̃́nɑ̃́ ɔɔ́	——	èékɑ̃́nɑ̃́, èékɑ̃́
72.	orókɑ̃́ ɔwɔ́	ìgɑ̃́kɑ́	——	ùgɑ̃̀rɑ̃̀kɑ́
73.	èjìkɑ́	èjìkɑ́	——	èjɪ̀kɑ́
74.	abíyɑ́	àbíyɑ́	——	abíyakɑ́
75.	ɔmɑ̃ ɔwɔ́, ɔmɑ̃ ikɑ́	ìka ɔɔ́	——	ɔ̀ka
76.	ɛ̀yĩ̀	ɛ̀yĩ̀	——	ɛ̀yĩ̀
77.	ɔkɑ̃́	ɔkɔ̃̀	——	ɔkɑ̃̀
78.	ukù	ukù	ukɑ̃̀	ukù
79.	ɔ̀dɔ̀	ɛ̀dɔ̀	——	ɔ̀dɔ̀(older form), ɛ̀dɔ̀(newer form)
81.	ìfũ	ìfũ	——	ìfũ(àkpò lúkù large bowel)
82.	ɛhɛ̀	ɔsɛ̀	——	ɔsɛ̀
83.	èjìjà	ɛ̀yĩ̀ jìjà ɔsɛ̀	——	ɛ̀yɔ̃sɛ̀ (76+86)

	CY	K	Onˀ	Ìf
84.*knee*	ìkṹ,orókṹ, oóku,eékṹ	erúkú	oókṹ	orókṹ,ɑkɔkɔ
85.*toe*	ɔmɔ̃ ɛsɛ̀(38+86)	ìka ɛsɛ̀(75+86)	ɔmɔ̃sɛ̀	ɑ̀ka ɔsɛ̀
86.*foot*	ɛsɛ̀ (cf.82)	ɛsɛ̀	ɔsɛ̀	ɔsɛ̀
87.*ribs*	ɛfɔ́̃hà	ekuku àyà (cf.103)	ogũgũ àyà	iyè
88.*lungs*	èdɔ̀foro, fùkú	imí̀ (<mĩ breathe)	——	ɔ̀dɔ̀ fóró
89.*buttocks*	ìdí	ìdí	ùdí	ùdí
90.*anus*	fùrɔ̀ ,fùrɔ̀ ìdí	fùrɔ̀	——	ɔ̀nà̃ mũ̀ŭ̃u
91.*penis*	okó	okó	——	okó
92.*vagina*	ɔ̀bɔ̀	ɔ̀bɔ̀	——	ɔ̀bɔ̀
93.*testicles*	ɛkpɔ̃̀,kóró ɛkpɔ̃	ɛkpɔ̃̀	——	ɛkpɔ̃̀
94.*thigh*	itɔ̃	itã	ugbatã	ɑtã
95.*hips*	ìbàdí,ìgbarɔ̀kó	ìbàdí,ekuku ìdí (103+89)	àgó	ègbé
96.*navel*	ìdɑdo	ìwó	udodo	udodo
97.*body*	ara	ara	ègbé	ɔra
98.*skin*	awɔ	awɔ (of animal), àwɔ̀ (of human)	àɣɔ̀	aɔ
100.*blood*	èjè	èjè	èjè	ìjè
101.*bladder*	ilɛ́ètɔ̀ (183+105), àkpɔ̀tɔ̀(S164+105)	ilé ìtɔ̀	——	akpɔ̀ro ìtɔ̀
102.*gall*	oroɔ̀ro,ɔ̀rónro	ɔ̀rórɔ̌	oró n̄ ro(bile)	ɔ̀rínɔ̀
103.*bone*	egũgũ	ekuku	ogũgũ	egigũ
104.*vein*	išɔ̃ èjè	išã	išã	ɪšã
105.*urine*	ìtɔ̀	ìtɔ̀	ìtɔ̀	ìtɔ̀
106.*feces*	imí̀	imí̀	iwí̀	iyí̀
107.*sweat*	ɔ̀ógù̀	ɔ̀ógù	afífú	àfífó
108.*saliva*	itó	itó	utó	ɪtó

	Òk	Àk	ẁ	ḃ
84.	orókṹ	orókṹ	oókṹ	urókṹ
85.	ɔmą̃ ɛhɛ̀, òmũ̀ka ɛhɛ̀	ìka ɔsɛ̀	——	òka ɔsɛ̀
86.	ɛhɛ̀	ɔsɛ̀	ɔsɛ̀	ɔsɛ̀
87.	ugbá àyà	ɛ̀hà	——	ìšíšà
88.	ɛ̀dɔ̀ fóró	fùlù	——	ɔ̀dɔ̀ fɔ̀rɔ̀fóró
89.	ìdí	ùdí	——	ùbɔ, ɔ̀kṳ̀
90.	uwòdí (320+89)	——	——	umṳ̀šṳ̀, ɔ̀nà̀ mṳ̀šṳ́
91.	okó	——	——	okó
92.	òbò	——	——	umũ
93.	ɛkpã̀	ɛkpɔ̃̀	——	ɛrɔ̃̀yó (cf.S142) (iyó scrotum)
94.	utã	utɔ̃	——	utã
95.	àgó (waist)	ùbàdí	——	àgó (hips,waist)
96.	ùɣó	udodo,udumũ	——	udodo
97.	ara,ègbé	ara	——	ara
98.	ara (aɣò complexion)	aɔ ,ara	ara	àɣò(àwò colour, complexion)
100.	èjè	èjè	èjè	èjè
101.	àkpòtò	——	——	akòótò
102.	oríìro	òrírò	——	àkpàárò
103.	egũgũ	egigũ	ogũgũ	ugũgũ
104.	irì	išã	——	ušã
105.	ìtò	ìtò	——	ìtò
106.	iwí	iyí	——	iwí
107.	àfífó	oógṳ̀	——	òógṳ̀
108.	itɔ̃́	ɪtɔ́	——	itɔ́

	CY	K	Onˋ	Ìf
109.*voice*	ohũ̀	oɔ̃̀	oũ̀	oũ̀
110.*name*	orúkɔ,oókɔ	eékɔ	oúkɔ	orókɔ
111.*ghost*	iwĩ̀,ọ̀kú, egúgu	iwĩ,àǹjònɔ̃́	èšèkú	egbére
112.*person*	ɛnĩ,èníyɔ̀,èdá	ònĩ̀yà	iáyé	ànĩ̀yà
113.*man*	okùrĩ	okɔ̃̀rĩ, okɔ̃̀ĩ	okũ̀ɛ̃	okɔ̃̀rĩ
114.*woman*	obĩ̀rĩ	obĩ̀rĩ,abíléko (married woman)	obĩ̀ɛ̃	obɔ̃̀rĩ
115.*boy*	omɔ̃ kũ̀rĩ(38+113)	omɔ̃ okɔ̃̀rĩ	omɔ̃kũ̀ɛ̃	omɔ̃kɔ̃̀rĩ
116.*girl*	omɔ̃bĩ̀rĩ (38+114)	omɔ̃ obĩ̀rĩ	omɔ̃bĩ̀ɛ̃	——
117.*baby*	ìkókó	omɔ̃ kékeé	omɔ̃ titɔ̃ (38+370)	àròbó
120.*old man*	arúgbó	arúgbó	àgbàlagbà	àgbàlagbà
121.*old woman*	arúgbó	arúgbó	àgbàlagbà	àgbàlagbà
122.*king,chief*	oba,olú	olóyè	oba	oba,ìjòyè (chief)
123.*slave*	ɛrú	erú	ɛú	erú
124.*God*	olórũ̀,olúwa, olọ́dùmarè	olórɔ̃̀	olóũ̀	olóòrɔ̃, abáríšà
125.*doctor*	onísègũ	àšègù	dókítà(<English)	adáɷše,babaláo
126.*medicine*	oògũ̀,ewé(cf.164)	oògù	oògũ̀	ogìgũ̀,oìgũ̀
127.*guest*	àlejò,òlojò	àlejò	àlejò	àlejò
128.*friend*	òrɛ́	òrɛ́	òɛ́, onũ̀keèjî	òrɛ́,ogbè,àwé
129.*hunter*	odɛ(cf.S482)	odɛ	lódɛ	odɛ
130.*weaver*	ahũšɔ(544+335)	ahɔ̃šɔ	òŋɔ̃šɔ	aɔ̃šɔ
131.*potter*	amɔ̀kòkò(S362+306)	amɔ̀kòkò	amɔ̀kòkò	amɔ̀šà
132.*thief*	olè	olè	olè	olè
133.*water*	omĩ	omĩ	omĩ	omĩ
134.*river*	odò,oža	odò	omĩ	odò
135.*rain*	òjò	òjò	òjò	òjò

	Ọk	Àk	Ɔw	Ɔb
109.	oṵ̀	oṵ̀	——	oṵ̀
110.	orúkɔ	ɔrúkɔ	ókɔ	orúkɔ
111.	iwĩ	èšùkú	——	iwĩ,ɛmí̀, egbére
112.	iáyé	ɔnĩ,ɔnì̀yà̃	——	ɔnĩ,ènì̀yà̃,iráyé
113.	ɔkɔ̀rĩ	ɔkṵ̀rĩ	ɔkṵ̃ɛ̃	ɔkṵ̀rĩ
114.	obì̀rĩ	obì̀rĩ	obì̀ɛ̃	obì̀rĩ
115.	ɔmãdé kɔ̀rĩ	ɔmɔ̃kṵ̀rĩ	——	ɔmɔ̃kṵ̀rĩ
116.	ɔmãdé bì̀rĩ	ɔmɔ̃bì̀rĩ	——	ɔmɔ̃bì̀rĩ
117.	ìkókó, ɔmã titɔ̃	ɔmɔ̃ɔ́ó(38+69), ɔmɔ̃ tutũ	——	ɔmɔ̃ titɔ̃
120.	arúgbó kɔ̀rĩ	arúgbó	——	arúgbó kṵ̀rĩ
121.	arúgbó bì̀rĩ	arúgbó	——	arúgbó bì̀rĩ
122.	ɔba, òjòyè(chief)	ɔba,ìjòyè(chief)	——	ɔba, ìjòyè
123.	ɛrú	erú	——	erṵ́
124.	ɔlóṵ̃, olúwa	ɔlórṵ̃	——	ɔlóòrũ, olódùmarè
125.	onísègṵ̀,babaláwo	olíšègṵ̀,alábéré	——	olóògṵ̀,babaláwo
126.	oògṵ̀	ogìgṵ̀	——	oògṵ̀
127.	àlejò	àlejò,alábàše (g.of honour)	——	àlejò
128.	òré,òtú(equals)	òré	——	olùkṵ̀
129.	ɔdɛ	ɔlɔdɛ̀	——	ɔdɛ,ɔlódɛ
130.	aŋãsɔ	aũšɔ	——	aŋũšɔ
131.	amãrũ(s362+307)	amɔ̀kòkò	——	amɔ̀kòkò
132.	olè,jàgùdà	olè	——	olè, ɔlóšà
133.	omĩ, ɛri	omĩ	omĩ	omĩ
134.	ɛri (cf.S429)	odò	——	omĩ
135.	òjò	òjò	——	òjò,ejĩ

	CY	K	Onˀ	Ifˀ
136.*cloud*	ìkuukuu	ojú òrɔ̃(=142)	ùkùukùu	ikúùkù
137.*smoke*	èéfĩ́,èɛ́fĩ́	èéfĩ́	euku(=180)	èfífí
138.*dew*	ìrì,enĩnĩ,eenĩ	irì	eì	ìrɪ̀
139.*fog*	kùrukùru	kùùku	eì	òkìkú
140.*thunder*	àrìrá,àárá,	àrá	àá	àkpaàrà
141.*lightning*	àkpârà mɔ̀nɔ̃̀mɔ́nɔ̃́	àrá,àrá ń sá	àá	mɔ̀nɔ̃̀mɔ̃́nɔ̃́
142.*sky*	sɔ̃́mɔ̀,òde òrũ	ojú òrɔ̃	ojú õ	sɔ̃́mɔ̀
143.*wind*	atɛ́gũ̀, èfûfù,	atɛ́gù	oyì	òyì
144.*sun*	afɛ́ɛ́fɛ́ oòrũ̀,òòrũ̀	oòrɔ̃̀	oũ̀	orìrũ̀
145.*moon*	òšùkpá	òšùkpá	òšũ̀kpá	òsɔ̀kpá
146.*star*	ìràwò	ìràwò	ìyàwò	ɪ̀ràò
147.*day*	ojó,ijó	ojó	ojó	ojó, ɪjó
148.*night*	òru	òru	alɛ́,òŋ̄gã̀jó	orú,alɛ́
149.*morning*	àwúrò ,àárɔ́,	àárò	oúò	ɔ́rò
150.*noon*	òwúrò,òórò òsɔ̃́	òsɔ́	òsɔ̃́ gãgã	òsɪ̃́
151.*evening*	ìròlɛ́,alɛ́	alɛ́	ùwòlɛ́	òròlɛ́, ojú rò
156.*month*	ošù	ošù	ošũ̀	ošù
157.*year*	odṹ	odɔ̃́	odṹ	odɔ̃́
158.*rainy season*	ìgbà òjò (324+135)	àsikò òjò	ìgòjò	ùgbòjò
159.*dry season*	ògbɛlɛ̀,ìgbà èrũ̀	àsikò èrɔ̃̀	ìgɛ̀ũ̀	ògbɛlɛ̀
160.*fire*	inɔ́	inã́	unã́	ɔnã́
161.*coal, charcoal*	ɛyĩ́, èédú	èdúdúnã́, èédúnã́(342+160)	èdúdú	èdídú,èédú
162.*ashes*	eérú	eérú	eú	erírú,eírú
163.*tree*	igi	egi	igi	igi

	Òk	Àk	ɔ̀w	ɔ̀b
136.	òfúrufú(=142)	òkúkuú	——	ìkùúku (=139)
137.	èfífí	èfífí	——	èéfĩ́
138.	èrì	ìrì̃	——	èrì
139.	èrì	ìrì̃	——	ìkùúku
140.	àkpáàrà	àrá	——	àrá,àkpáàrà
141.	ìmànã̀mã́nã́	mɔ̃̀nɔ̃̀mɔ̃́nɔ̃́	——	mã̀nã̀mã́nã́
142.	òfúrufú	ɔ̀rɔ̃	——	ɔ̀rɔ̃, ojúufĩ́
143.	òyì	òyì	——	atɛ́gũ̀, òyĩ̀
144.	oòrũ̀	oòrũ̀	oòrũ̀	oòrũ̀
145.	òsũ̀kpá	ɔ̀šɔ̀kpá	òčùkpá	ošũ̀,òšùkpá
146.	ìràwò	ìràwò	——	ìràwò
147.	ɔjó	ìjó	——	ɔjó
148.	òrũ	òru,alɛ́,ɔ̀gɔ̃̀jó	ìgã̀jã́	alɛ́,ɔ̀gɔ̃̀jã́,òrũ
149.	òwúrò	ɔ̀ɔ́rò	——	òwúrò
150.	ɔ̀hɔ̃́	ɔ̀sɔ̃́	——	ɔ̀sã́
151.	ùrɔ̀lɛ́, alɛ́	ìrɔ̀lɛ́	——	ìrɔ̀lɛ́, ojú alɛ́
156.	osũ̀	ošù	——	ošũ̀
157.	ɔdɔ̃́	ɔdṹ	——	ɔdɔ̃́
158.	ùgbà ɔ̀jò	ùgbà òjò	——	ùgbà òjò
159.	ùgbà ɛ̀rũ̀, ɛ̀ɛ̀rũ̀	ùgbà ɔ̀gbɛlɛ̀	——	ɔ̀gbɛlɛ̀
160.	unã́	unã́	unã́	unã́
161.	èdídṹ	èdúdú	——	èdúdṹ,èrèdúdṹ
162.	erúrú	erírú	——	eérṹ
163.	igi	igi	igĩ	igĩ

	CY	K	Onì	Ìf
164. *leaf*	ewé	ewé	ewé	ɛríràˋ
165. *root*	egbò, ɛkɔ̃, gbòŋ̀gbò	gbòŋ̀gbò, èta (edible root)	egbìgbò	egbò, gbòŋ̀gbò
166. *branch*	ɛ̀ka, ɛtṹ, akétú	ɔwó egi (69+163)	èkìkagi	ɛ̀ka, kpatɔ̃ igi
167. *bark*	eèkpo, èèkpo	èŋkpo	eìkpo	ekpìkpo, eèkpo
168. *seed*	irú, kórṍ	èso (=170)	èso	èso
170. *fruit*	èso	èso	èso	èso
171. *flower*	òdòdó, ìtɔ̃nɔ̃	ìtãnã́	òdòdó	àdòdó
172. *thorn*	ègṹ (cf. S413)	egúgú (cf. S23)	ègṹ	egṹ
173. *grass*	koríko, kooko, ìgbé	kóóko, ìgbé	koíko, ùgbé (bush)	ògbé, ugbó (bush)
174. *mountain, hill*	òkè	òkè, òkìtì (hill)	òkè	òkè, kpakìtìˋ
176. *earth*	ilè, ažé (world)	ayé (world)	alè	———
177. *ground*	ilè	ilè	alè	alè
178. *sand*	iyɔ̃rĩ̀	yãrĩ̀	alè	rɔ̃yì
179. *mud*	kpètèkpétè, ɛrè	yèkpè, amɔ̃̀ (clay)	amã̀	———
180. *dust*	ekuru, eruku, eeku	eruku	euku (=137)	erùkù
181. *forest*	igbó	igbó	ugbó	ugbó
182. *village*	abúlé, ilétò, ìletò	abílé	oko (=192)	abà, ùlú
183. *house*	ilé	ilé	ulí	ulé
184. *room*	iža̍rá, žàárá	ìdòdò	oúkpò	orúkpò
185. *wall*	ògiri, ìgɔ̃̀nɔ̃	ògĩrĩ	ògii	òrò
186. *door*	ilèkṹ	ilèkù	ulèkṹ	ɪlèkɔ̃̀
187. *roof*	òrùlé, òwùlé, òòlé	òkè ilé (174+183)	òùlí, òùlé (newer form)	òrùlé

	Òk	Àk	Ɔ̀w	Ɔ̀b
164.	ewé	ɛ́rà	——	iwé
165.	gbòŋ̀gbò,irì (hair-roots)	gbòŋ̀gbò	——	irì (=104)
166.	ìka	èka	——	àka igĩ
167.	èkpìkpo	ekpìkpò, eèkpò	——	ekpìkpo,ikpà fo
168.	èho	èso,irúlá	——	èso
170.	èho	èso	——	èso
171.	ùtã̀nã́	òdòdó	——	àdòdó
172.	ègṹ	ègṹ	——	igṹ
173.	koríko, ùgbé (bush)	koríko	——	koríko,èlùjù (grass-land)
174.	òkeèkè (hill)	òkè, òkìtì	——	òkè
176.	ilè	alè	——	alè
177.	ilè	alè	alè	alè
178.	iyãrì	ɪrɔ̃yì	——	iyãrí
179.	ìkpètèkpétè, ɛrɔ̀fɔ̀	yèkpè	——	iyèkpè
180.	èkuùkù	erukutu	——	eruku
181.	agijù	ugbó,agĩjù (thick forest)	——	ugbó
182.	àgó	abà, aéré	——	ùlú
183.	ulé	ulé	ulí	ulí
184.	orúkpò	eàrá	——	ugbòlí (320+183)
185.	ògiri	ògiri	——	ògiri,ìgã̀nã́
186.	ilɛèkũ̀	ɪlɛèkũ̀	——	ilèkũ̀
187.	òrùlé	òrùlé	——	òrùlí, orúulí (51+183)

	CY	K	Oṅ	Ìf
188.*path*	ònn̄̀, ojú òn̄̀ (cf.48)	ìlà,ònã̀	ònã̀, ojú ugbó (48+181)	ònã̀
189.*road*	òn̄̀, ojú òn̄̀	ònã̀	ònã̀	ònã̀
190.*well*	kn̄̀ga	kã̀ga	kã̀ga	kã̀ga
191.*spring*	šélèrú	ìsõ	——	òsõ
192.*farm*	oko	oko	oko	oko
193.*hoe*	ɔkó	ɔkó	ɔkó	ɔkó
194.*sickle*	——	akɔ́kɔ́rɔ́	àŋ́kɔ́lɔ́	àkɔ̀rɔ̀
195.*stone*	òkútã̀	òkútã̀	òkútã̀	òkɔ́tã̀
196.*iron*	irĩ	kpáànõ̀	uɛ̃	ɷrĩ
201.*animal*	ɛrõ,ɛrõko (ɛrõ +192)	ɛrã	ɛãko	ɛrãko
202.*hyena*	kòrikò,kòokò, ìkɔkò	awáwa	ìkòokò	——
203.*bat*	àdõ̀, òòbè	àdã́	àdã́,lukùlí	àdã́
204.*scorpion*	àkerekèré, àkɛkèé	àkéèke,àgánta	akékɛ̌	akéekèé ɔdɛ
205.*worm*	arn̄̀,ìtalè,ejò inũ(219+412 tapeworm)	eèkòló	ìjè, kòló	kòló
206.*chameleon*	ògà, agɛmõ	ògà	áiyo	ariro
207.*termite*	ikṍ,etutu	etutu	ikã́	ɪkã́
208.*ant*	eèrà, èèrà	kòkòrò	eèyà	èrìrà
209.*anthill*	ògṍ,ekíti, okíti	ògã́	ikã́	èkìtí ògã́
210.*lion*	kìnĩ̀ṹ	kènẽ̀ṹ	kènẽ̀ṹ	kìnĩ̀ṍ
211.*leopard*	ɛkù̃, àmõ̀tɛ́kù̃	àmõ̀tɛ́kõ̀	ajáagbó (256+181)	àmõ̀tɛ́kõ̀
212.*elephant*	erĩ	eerĩ,àjìnãkú	eĩ	erĩ
213.*bushcow, buffalo*	ɛfõ̀	gàlà	ɛfã̀	ɛfã̀

	Òk	Àk	Ɔ̀w	Ɔ̀b
188.	ɔ̀nã̀	ɔ̀nɔ̃̀	ɔ̀nã̀	ɔ̀nã̀
189.	ɔ̀nã̀	ɔ̀nɔ̃̀	——	ɔ̀nã̀
190.	kã̀ga	——	——	kɔ̃̀ga
191.	——	ɔ̀sũ (cf.230)	——	šɛ́lɛ̀rú
192.	oko	oko	——	oko
193.	ɔkɔ́	ɔkɔ́	——	ɔkɔ́
194.	kɔ̀ɔ̀lɔ̀ (any curved blade)	——	——	dɔ̀jé, amṹkɔ́rɔ́
195.	ɔ̀kútã̀,ɛta (pebble)	ɔ̀kútã̀	ɔ̀kútã̀	ɔ̀kútã̀,ɔta (pebble)
196.	urĩ	urĩ	——	urĩ
201.	ɛrãgbɛ̃́(ɛrã+173)	ɛrãko	——	ɛrã, ɛrɔ̃ko
202.	kɔ̀rikɔ̀	——	——	kɔ̀rikɔ̀
203.	àdã́	àdã́	——	àdã́
204.	àkékɛ̀é	akéɛ̀ké	——	ùɤɛ̀rɛ̀
205.	arã̀	——	——	arã̀
206.	arírɔ	——	——	aírɔ
207.	ikã́	——	——	ikã́
208.	ejíjà	——	——	eɛ̀rà
209.	ɔ̀kɪ̀tɪ̀,ɔ̀kɪ̀tɪ̀ ɔ̀gã́	——	——	ɔ̀kɪ̀tɔ̀gã́
210.	kɛ̀nɛ̃̀ṹ	——	——	kɪ̀nɪ̃̀ṹ
211.	ɛkũ̀	——	——	ɛkũ̀, àmɔ̃̀tɛ́kũ̀
212.	erĩ	——	——	erĩ
213.	ɛfã̀	——	——	ɛfɔ̃̀

	CY	K	Oṅ	Ìf
214.*baboon*	irò, ìnɔ̀kɪ́	ìnɔ̀kɪ́	lágídò	ɪ̀nɔ̀kí
215.*monkey*	òbɔ, akítì	òbɔ	òbɔ	òbɔ
216.*crocodile*	ònɪ̀, ònɪ̄ ɛlɛ́gũgù̀	elégugù	ònɛ̃̀	ònɪ̃̀
218.*lizard*	aláàmù̀,aláŋgbá, amù̀rɪ́,awɔ́riwɔ́	àláŋgbara	láŋgbá, lódɔ̃ŋgbo	òdògba
219.*snake*	ejò	ejò	ejò	ejò
220.*crab*	akɔ̀̃,alákɔ̀̃	alákà	tɛ́jasù̀	akà
221.*tortoise*	ɪ̀jàkpá,alábahũ, ahũ, aũ	ɪ̀jàkpá, ògɪdá́, ahɔ̃̀	aŋɔ̃, onɪ̄yé	alábaɔ̃̀
222.*spider*	àláǹtakù̀	ɛlɛnǎnà	láǹtakù̀	aláǹtakɔ̀̃
223.*louse*	inɔ́̃	inǎ	inǎ	ɪnǎ
224.*flea*	inɔ́̃	ibà	inǎ	——
225.*mosquito*	èfɔ̃, yɔ̀mù yɔ̃mũ	ɪ̀jàko	èfã	ɛfɪ̃ fɪ̃
226.*fly*	ešɪ̄šɪ, eešɪ	ešɪ̄šɪ	ešɪ̄šɪ, àbàlé	ešiši
227.*bee*	oyɪ̄	oyɪ̄	oyɪ̄	oyɪ̄
229.*frog*	àkèré,àkèé, òkpòlɔ́ (toad)	kòŋkɔ̀,òkpòlɔ́ (toad)	òkpòlɔ́, àkèé (green toad)	àkèré, òyà
230.*squirrel*	òkɛ́rɛ́, òfòrò	šeše	ùsɔ̃	òsɔ̃, àkerese
231.*cow*	mààlúù	màlúù	màlúù	màlúù
233.*goat*	ewúrɛ́	ewúrɛ́	èkéègbè, ewúɛ́	ɛɔ́rɛ́
234.*he-goat*	òbúkɔ, òwúkɔ, òrúkɔ	òɔ́kɔ	òbúkɔ	òɔ́kɔ
235.*sheep(ewe)*	àgùtɔ̃̀	àgùtǎ	àgù̃tǎ	àgɔ̃̀tà
236.*ram*	àgbò	àgbò	àgbò	àgbò
237.*horse*	ɛšɪ̄	ešɪ̄	ɛšɪ̄	ɛšɪ̄
239.*donkey*	kɛ́tɛ́kɛ́tɛ́	kɛtɛkɛtɛ	kɛ́tɛ́kɛ́tɛ́	kɛ́tɛ́kɛ́tɛ́
240.*Maxwell's duiker*	ɛtu	etu	ɛtu	etu

	Òk	Àk	Ɔ̀w	Ɔ̀b
214.	ìnã̀kí	——	——	gbòògì
215.	lágídò, òbɔ lágídò	——	——	òbɔ
216.	ònì̀ léègũũgũ̀	——	——	ònì̀
218.	olódòŋgboro	——	——	amũ̀rí́
219.	ejò	ejò	ejò	ejò
220.	akã̀	——	——	akã̀
221.	aŋõ, ìjàkpá, àlùkelùké	ìjàkpá	——	olúyè, abaŋõ
222.	láàkpakpà	——	——	——
223.	inã́	——	——	inã́
224.	——	——	——	inã́
225.	èfã, emṹrí́	——	——	emṹrí́
226.	esĩsĩ	——	——	ešĩšĩ
227.	oyĩ	——	——	oyĩ
229.	àkèré, òkpòló (toad)	——	——	àkèré, àkpòtó (toad)
230.	ùhõgbí́	òsũ	——	akerese
231.	màlúù	——	——	màlúù
233.	èkéègbè, ikéègbè	idéègbè	odéègbè	òdéègbè, ewúré , ɛrã
234.	akɔ èkéègbè	——	——	òwúkɔ (older form), òbúkɔ (newer form)
235.	àgũ̀tã̀	——	——	àgùtã̀
236.	àgbò	àgbò	——	àgbò
237.	ɛsĩ	ɛšĩ	ečĩ	ešĩ
239.	kétékété	——	——	kétékété
240.	ɛtu	etu	——	etu

	CY	K	Oṅ	Ìf
242.*gazelle*	ìgalà	galà	ìgalà	——
246.*rabbit*	ehoro igbó	ehoro	ehoo	eoro
247.*chicken (hen)*	adìɛ, adìrɛ	edìɛ	ajìɛ	adìyɛ
248.*cock*	àkùkɔ	àìkɔ	àkìkɔ	àkìkɔ
249.*guinea-fowl*	ɛtù, awó,àkparò	awó	agó	aɷ́ró
250.*mouse*	èkúté ilé,èlírí, òlóo	èkúté ilé, èlú	òlóo	——
251.*bush-rat*	eku, òkété, ewú, ɛdá	èkété, èkúté ɛdá	òkété	òkété
251a.*cutting-grass(cane rat)*	òžà, ewújù	òyà	òyà,ewúdù	——
252.*dove*	àdàbà	ìdàbà	àdàbà	àdàbà
253.*pigeon*	ɛžɛlé (258+183)	ɛyɛlé	ɛyɛlé	ɛyɛlé
254.*duck*	kpékpéyɛ	kpékpéyɛ	kpékpéyɛ	kpékpéyɛ
255.*turkey*	tòlótòló	tòlótòló	tòlótòló	tòlótòló
256.*dog*	ajá	ajá	ajá,lókìlì	ajá
257.*cat*	ológbò	ológbò	lógbò	ológìnĩ́
258.*bird*	ɛžɛ	ɛyɛ	ɛyɛ	ɛyɛ
259.*feather*	ìžé	ìyé	ìyé	ìyé
260.*wing*	akpá (=69a)	aká	ìyé	ìyé
261.*egg*	ɛyĩ	ɛhĩ	ɛŋɛ̃	ɛĩ
262.*vulture*	igṹ, gṹnũ̃gṹ	igú	igṹ	ùgṹ
263.*hawk*	àšá,àwòdì	àšá kóŋ́kó, àwòdì	àšá	——
265.*horn*	ìwo	òwo	òʁo,ùwo (newer form)	òo
266.*tail*	ìrù, ìrṍ ìdí	——	ùãdí	ùrù
267.*food*	oń́jɛ	ó́ńjɛ	ũjíjɛ	jíjɛ
268.*meat(cp.201)*	ɛrõ	ɛrã	ɛã	ɛrã
269.*fish*	ɛja	ɛja	ɛja	ɛja

	Òk	Àk	Ɔ̀w	Ɔ̀b
242	ìgaàlà	——	——	ìgalà,àgbɔ̀rɪ̃́
246.	òkété(cp.S106)	eoro	——	iɤoɤo
247.	ɛdìyɛ	adìyɛ	adìɛ	ajìɛ
248.	àkùkɔ	——	——	àkìkɔ
249.	agó	——	——	ɛtù,aɤó
250.	èkűtelé	èkúté	——	èkúté,eku
251.	èkúté ùgbɛ́	òkété	——	òkété,ewú,ewúsà
251a.	òyà	——	——	ewújù,olóòrè
252.	àdàbà	àdàbà	——	urí
253.	ɛyɛlé	——	——	ɛyɛlí
254.	kpɛ́kpɛ́yɛ	——	——	kpɛ́kpɛ́yɛ
255.	tòlótòló	——	——	tòlótòló
256.	kítà	ajá	ajá	ajá
257.	ológbò	——	——	ológbò,mű̀sù̀
258.	ɛyɛ	——	——	ɛyɛ
259.	ìyɛ́	——	——	àìyɛ́
260.	iká	——	——	aká
261.	ɛŋɛ̃	ɛyĩ	ɛŋɛ̃	ɛŋĩ
262.	igű	——	——	igű
263.	àšá,àwòdì	——	——	igā́, àwòdì
265.	òɤo	ìo	——	ùwo,òɤo
266.	ùrɔ̀dí	——	——	ùrù̀
267.	ejíjɛ	——	nǹjɛ	ūù̀jɛ
268.	ɛrã	ɛrã	——	ɛrã
269.	ɛja	ɛja	ɛja	ɛja

	CY	K	Onˋ	Ifˋ
270.*soup*	ɔbɛ̀	ɔbɛ̀	ɔbɛ̀	ɔbɛ̀
272.*salt*	iž̀ò	iyò	iyò	ɪyò
273.*pepper*	ata	ata	ata,taɪ̀bó	ata
275.*yam*	iš̌u	išu	uš̌u	uš̌u
276.*guinea corn*	ɔkà,bàbà,ɔkà a bàbà	ɔkà i bàbà	ɔka bàbà	ɔkà babà
278.*oil palm*	ɔ̀kpɛ, ɔ̀kpɛ̀	ɔ̀kpɛ̀	ɔ̀kpɛ̀	ɔ̀kpɛ̀
279.*okra*	ilá,ɪ̀rɔ̀kɔ̀	ilá	ilá	ɪlá
280.*bean, cowpea*	erɛ̀é,ɛ̀wà (cooked)	ɛ̀wà	erɛ̀e, ɛ̀wà	erɛ̀
282.*corn, maize*	ɪ̀gbàdo,àgbàdo, ɔkà	ɪ̀gbàdo	àgbàdo	àgbàdo
283.*cassava*	ɛ̀gɛ́,gbágùdá, kpákí	kpákí	ɛ̀gɛ́, gàí (prepared)	ɛ̀gɛ́
284.*banana*	ɔ̀gɛ̀dɛ̀ wɛɛrɛ	ɛ̀gɛ̀dɛ̀	ɔ̀gɛ̀dɛ̀	ɔ̀gɛ̀dɛ̀
287.*oil*	ekpo	ekpo.ɔ̀rórɔ́ (groundnut oil)	ekpo	ekpo
289.*fat*	ɔ̀rá	ɔ̀rá	ɔ̀á	ɔ̀rá
290.*ground-nut*	ɛ̀kpà	ɛ̀kpà	ɛ̀kpà	ɛ̀kpà
291.*kola*	obì	obì	obì	obì àbàtà
292.*stick*	igi(=163), ɔ̀kpa,sɔnda	ɔ̀kpá	igi	igi
293.*spear*	ɔ̀kɔ̀	ɔ̀kɔ̀	ɔ̀kɔ̀	ɔ̀kɔ̀
294.*sword*	idà	idà	udà	ʊdà
295.*drum*	ìlù	ìlù	ùlù	ùlù
296.*basket*	agbɔ̃̀, akpɛ̀rɛ̀, ìkɔ̀	agbɔ̃̀	agbɔ̃̀a,akp ɛɛ̀	agbɔ̃̀
297.*mat*	ɛnɪ̃	ɛnɪ̃	ɛnɪ̃,èjìkò (prayer mat)	enɪ̃
298.*bow*	ɔrũ	ɔfà	ɔfà	ɔfà
299.*arrow*	ɔfà	akásì	ɔfà	ɔfà

	Òk	Àk	Ɔ̀w	Ɔ̀b
270.	ɔbɛ̀	ɔbɛ̀	——	ɔbɛ̀
272.	iyɔ̀	——	——	iyɔ̀
273.	ata	——	——	ita
275.	usu	uš u	——	iíjɛ
276.	ɔkà bàbà	——	——	ɔkà bàbà
278.	ɔ̀kpɛ̀	——	——	ɔ̀kpɛ̀
279.	ilá	ɩlá	——	ilá
280.	ɛ̀wà	——	——	erè,ɛ̀gwà(cooked)
282.	àgbàdo	àgbàdo,ɛkà	——	ɔkà
283.	gbáàgúdá,kpúkpúrú	——	——	kpákí,gbáàgúdá
284.	lóbótɩ̃̀ɩ̃̄[¯ ‿]	ɔ̀gɛ̀dɛ̀	——	ɔ̀gɛ̀dɛ̀ wɛ́ɛ́rɛ́, elékùtùkpé
287.	ekpo	ekpo	——	ekpo
289.	ɔ̀rá	——	——	ɛ̀rà
290.	ɛ̀kpà	ɛ̀kpà	——	ɛ̀kpà,ɛ̀kpàdó
291.	obì	obì	——	obì àbàtà, obì gbàǹja
292.	ɔ̀kpá	——	——	ɔ̀kpá, èké igĩ (log)
293.	ugaga	——	——	ɔ̀kɔ̄
294.	udà, udààbá	——	——	udà
295.	ùlù	——	——	ùlù
296.	akpèrè	——	——	agbɔ̃̀
297.	ɛní, ɔ̀ré	ɛní	——	ení
298.	——	——	——	ogirã
299.	ɔfà	——	——	ɔfà

	CY	K	Oǹ	Ìf
301. *knife (cp. S 204)*	ɔ̃bɛ	ɔ̃bɛ, abɛ	ɔ̃bɛ	ɔ̃bɛ
302. *scissors*	àmṹga, àlùmɔ̃́gàjí	sɔ̀ɔ̀sì, àmɔ̃́ga	àḿga	amɔ̃́ga
303. *axe*	àáké, ɛdṹ àrá (cf. 140)	àáké	ɛdɔ̃̀	àéké
304. *rope*	okũ, ɔ̃bárá, agba, ìjàrá, ɔš̃ɔ́	okù	okũ̀	okũ̀
305. *calabash*	igbá	igbá	ugbá	ɷgbá
306. *pot*	ìkòkò	ìkòkò	ùkòkò	ùkòkò, ɷ̀šà
307. *thing*	ohũ, ŋ̀ŋ́kɔ̃	ihɔ̃	uũ	uũ
308. *language*	èdè	èdè	èdè	èdè
309. *work*	išɛ́	išɛ́	ušɛ́	ɷšɛ́
310. *war*	ogũ	ogu	ogũ	ogũ
311. *sleep*	oorũ, ìsũ̀	ojú n̄ rɔ̃	ùsũ̀	ùsũ̀, sísũ̀
312. *dream (cf. 458)*	àlá	àlá	ɔ̀lá	àlá, ɩ̀lá
313. *death*	ikú	ikú	ukú	ukú
314. *corpse*	òkú	òkú	òkú	òkú
315. *life*	ɛ̀mí (cf. S508) ìžè, ažé	ayé	ayé	ayé, uũ (=307)
316. *sickness*	àìsɔ̃̀, àmódi, àrũ, òjòjò	àìsã̀, àrɔ̃̀	àìsã̀, àbòí	àìsã̀
317. *cough*	ikɔ́	ikɔ́	ukɔ́	ɷkɔ́
318. *fever*	ibà	ibà	ibà	ɩbà
319. *sore*	egbò, oojú	egbò	ojuju	egbò, ojiju
320. *hole*	ihò	ihò, kòró	uwò	uwò, uò
321. *truth*	òtító, òótɔ́, gàsíkíá	òótɔ́, gàsíkíá	òtító	ɔ̀tɩ́tɔ́
322. *lie*	irɔ́	irɔ́	uwɔ́, uɔ́	èké
322a *word, matter*	ɔ̀rɔ̀, ɔ̀rɔ̃̀	ɔ̀rɔ̀	ɔ̀ɔ̀	——
323. *place*	ibi, ibɛ̀	àyè	ubo	ibi

	Ọk	Ạk	Ṣw	Ṣb
301.	ọ̀bɛ	——	——	ọ̀bɛ, abɛ
302.	sọ̀ọ̀sị̀	——	——	——
303.	ɛdọ̃, àbálá	——	——	àkéké, ɛdṵ̃ àị̀ɾà
304.	okṵ̃	okṵ̃	okṵ̃	okṵ̃
305.	ugbá	——	——	ugbá
306.	ùkòkò	ùkòkò(=S524)	——	ùkòkò
307.	urũ	uũ	——	uũ
308.	èdè	——	——	èdè
309.	usɛ́	——	——	ušɛ́
310.	ogũ	——	——	ogũ
311.	oorũ	oorũ, sísṵ̃	——	oorũ
312.	ọ̀lá	àlá	——	ɛ̀lá
313.	ukú	——	——	ukú
314.	ọ̀kú	——	——	ọ̀kú
315.	ayé, ɛ̀mĭ́,àyè	——	——	ayé
316.	àbòrí	àị̀sạ̃̀, àrṵ̃, ọ̀jọ̀jò	——	àị̀sạ̃̀, ọ̀jọ̀jò
317.	ukó	——	——	ukó
318.	ibà	ɪbà	——	ibà
319.	egbò, ojuju	——	——	ujuju
320.	uwò	——	——	ugbò, usà
321.	ọ̀tító	——	——	ọ̀tító
322.	uró	——	——	uró
322a.	ɔfẹ̀(word), ọ̀rã̀ (matter)	ọ̀rẹ̀(word) ọ̀rõ(trouble)	——	ọ̀rò, ɔfò(ọ̀rã̀ trouble)
323.	ubo	——	——	ubo, ọ̀dò

	CY	K	Oṅ	Ìf
324.*time*	ìgbà, àsìkò, àkókò, àrókò	ìgbà, àsìkò	àsìkò,àkókò	òɡbà
325.*fatigue*	àárɛ̀	èérɛ̀	àáyɛ̀	ó rɛ̀ mí̀
326.*money*	owó, ajé	owó	oɤó	eó
327.*market*	ɔjà	ɔjà	ùgèlè	ɔjà
328.*load*	ɛrù	erù	ɛõ̀	erù
329.*boat*	ɔkò	ɔkò	òbèlè	ɔkò
330.*hunger*	ebi	ebi	ebi	ebi
331.*thirst*	òrũ̀gbɛ, òṅgbɛ	ègbĩ	òṅgbɛ	òfṍ í gbɛ mí̀ (cf.66)
332.*shadow*	òjìji,òɡìgi,òòji,òjì̀jĩ òòɡi		òjìjìi	òjìji
332a.*shade*	ìji (and all 332)——		uboòji(323+òji)	——
333.*light*	ìmṍlɛ̀	ìmṍlɛ̀	unã́ (=160)	òmṍlɛ̀,ɔnã́
335.*clothing*	ašɔ, èwù (=S265)	ašɔ, èwù	ašɔ,èwù	ašɔ
336.*shoe*	bàtà	bàtà	bàtà	bàtà
337.*hat*	fìlà, ate, àkɛtɛ̀	fìlà	àkòó	fìlà
338.*ring*	òrùka,òòka	òrùka	òùka	òrɔ̀ka
338a.*bracelet*	ìbɔkpá	èɛ̀gbà ɔwó	ùgbàwó	——
338b.*earring*	žɛrí, òrùka etí	yɛrí etí	yeí	——
339.*heavy*	wúwo, rĩlɛ̀	wo	wówo	ó o (it is heavy)
340.*light*	fúžé	fɛ́rɛ̀	éè wowo (neg. of 339)	fɛ́rɛ̀
341.*white*	fũfũ	fufu	fifũ	fifũ
342.*black*	dúdú	dúdú,òkùkù	dídṍ	dídú
343.*red*	kpukpa, kpíkpṍ	kpukpa	kpukpa	kpɔkpa
347.*big*	tóbi,ɡbórí́,ńlá	tóbi, lákú	lála	lála
349.*small*	kéré,kéreré	kéré	kéé,gwɛ́ɛ́	kéré

	Òk	Àk	Ɔ̀w	Ɔ̀b
324.	ùgbà,àsíkò	——	——	ùgbà, àkókò, àsíkò
325.	àárɛ̀	àárɛ̀	——	àárɛ̀
326.	oɣó	eó	eɣó	eɣó, ewó
327.	ùgèlè,òbɔ̃̀, ɔjà	ɔjà	ɔjà	ɔjà
328.	ɛrũ̀	erù	——	erũ̀
329.	ɔkò, olóbèlè (cf. S 187)	——	——	ɔkò, òbèlè
330.	ebi	——	——	ebi
331.	òŋ̀gbɛ	——	——	òŋ̀gbɛ
332.	òjíji	——	——	òjǐ̀jǐ̀
332a.	ubòji	——	——	ubòjĭ
333.	unã́	——	——	ímɔ̃́lɛ̀
335.	ašɔ,ɛ̀wù(= 265)	èwù	ačɔ	ašɔ, èwù, ašɔ bora
336.	bàtà	——	——	bàtà
337.	fílà, àkòró	——	——	fílà, ate
338.	òròka	òrùka	——	òrùka
338a.	ɛ̀gbà ɔwó	——	——	ɛ̀gbà
338b.	yerí	——	——	yɛtí
339.	òrǐ̀	——	——	wó
340.	fúyɛ́	——	——	fɛ́rɛ̀, fúyɛ́
341.	fifũ	fifũ	fũfũ	fũfũ
342.	dídű́	dúdú	dű́dű́	dúdű́
343.	kpukpa	kpukpa	kpukpa	kpukpa, kpɔ̃́
347.	lílá	títóbi	lála	lílá, lá, tóbi
349.	kéré	——	——	kéré, rí yɛ̃mɛ̃tĩ

	CY	K	Oh	Ìf
350.*many*	kpɔ̀, ɔ̀kpɔ̀lɔkpɔ̀	kpíkpɔ̀	yéye	yéye
351.*few*	díɛ̀~díyɛ̀	dékã̀	éè yeye (neg. of 350)	kékeré, é yẽye (neg. of 150)
352.*all*	gbogbo, olúkúlùkù	gbogbo	dede	kete
353.*thick*	ìkpõ(thickness)	líkpõ	nṹkpã	lɔ́kpõ
354.*thin*	tĩ́rĩ́, fɛ́lɛ́, rù joro	tĩ́rĩ̌	tĩ́ĩ̌, fɛ́lɛ́	tĩ́rĩ́
355.*wide*	rɛrɛ, bɛɛrɛ, fɛ̀ níbŭ	fɛ̀	lála (cp.347)	lála
356.*narrow*	tĩ́rĩ́ (cp. 354)	tĩ́rĩ́	kéé (cp. 349)	kéré
357.*hard*	le (resistant), šɔ̀ro (difficult), nĩkpá mɔ̃	le	nĩ̌	le
358.*soft*	dɛ̀, rɔ̀	rɔ̀	rɔ̀	rɔ̀
359.*sweet*	dũ̀, adũ̀ (sweetness)	dɔ̃̀	yɔ̃̀	dɔ̃̀
360.*bitter*	korò	korò	lúkú	rorò
361.*sharp (in taste)*	mṹ	mɔ̃́, ta	ta	——
362.*sour*	kɔ̃	kã	bàjé (spoiled)	kã
363.*deep*	jì̌ (cp.380), jĩlɛ̀	jì̌	jì̌	jì̌
364.*shallow*	šàijĩlɛ̀	kò jì̌ (neg. of 363)	éè jì̌ (neg. of 363)	éè jì̌ (neg. of 363)
365.*long*	gũ̀	gù	go, gbɔ	gũ̀
366.*short*	kúrú	kúrú	éè go (neg. of 365)	kúrú
367.*good*	dára, re, sɔ̀	dára	sã̀	sõã̀
368.*bad*	burú, búburú	kò dára (neg. of 367)	éè sã̀ (neg. of 367)	éè sõã̀ (neg. of 367)
369.*full*	kṹ	kɔ̃́	kɔ̃́	kɔ̃́

	Ok	Ak	ɔw	ɔb
350.	yéye,kpò	kpúkpò	yéye	yéye, kpò, yé rékété
351.	éè kpò (neg. of 350)	——	——	kéré, éè kpò (neg. of 350)
352.	dédé	kete	gede	gede
353.	gbúkpã	——	——	nĩkpɔ
354.	tĩĩrĩ	——	——	tĩrĩ, rù (lean)
355.	fè	——	——	gbòòrò
356.	tóóró	——	——	tĩrí
357.	nĩ, le, sòro	——	——	nĩ, le, šòro
358.	dè, rò	——	——	dè, rò
359.	yɔ̃, ayɔ̃ (sweetness)	——	——	yɔ̃
360.	korò, dũkũ	——	——	korò, rorò
361.	ta	——	——	ta
362.	kã	——	——	kã
363.	jɛ̃	——	——	jɛ̃
364.	éè jɛ̃ (neg. of 363)	——	——	éè jɛ̃(neg. of 363)
365.	go	gũ	gũ	gũ, gígũ (tall)
366.	kúrú	kúrú, kúkúrú	kúkurú, kúkuú	kúrú, kúkúrú
367.	hã	——	——	sã, sã
368.	búrú	——	——	burú, éè sã, éè sã (neg. of 367)
369.	kɔ̃	——	——	kɔ̃

	CY	K	Onˋ	Ifˋ
370.*new*	tũtũ,titũ	titõ	titõ	tɪtõ
371.*round*	ròbòtò,rìbìtì	yíkpo	roboto	róbótó
372.*dry (cp. 533)*	gbɛ, gbígbɛ	gbɛ	gbaɛ̀	gbɛ
373.*dirty*	kpṍ, ríríˊ	dòtí (<English)	dòtĩˊ	——
374.*clean*	mṍ, mĩmṍ, fĩ, féfé	mṍ	fĩˊ	mṍ
375.*fat*	sṍra (367 sṍ +97)	sãra	sàa	sãra
377.*expensive*	wṍ, gbowó (505 gbà +326)	hã́	ŋã́	ó ṍ (it is expensive)
378.*cheap*	kpò (also: numerous)	kpò	kpò	kpò
379.*near*	tòsí,wĩrì, èbá (proximity)	sṍmṍ ,èɡbá	wĩˊ	kĩˊ
380.*far*	jì̀nṍ	jì̀, jì̀nã̀	jì̀nã̀, éè wĩˊ (neg. of 379)	jì̀nã̀
381.*sharp*	mṹ	mṍ	mũ	——
382.*blunt*	kú lɛ́nũ	ku	éè mṹ (neg. of 381)	——
383.*beautiful*	ɛwà (beauty)	ɛwà (beauty)	sĩgwà, ɛgwà (beauty)	——
384.*ugly*	burɛ́wà (368+ 383)	kò lɛ́wà (neg. of 383)	éè sĩgwà (neg. of 383)	——
385.*hot*	gbónṍ	gbónã́	gbónã́	gbónã́
386.*cold*	túˊtù	tutù	tutù	tíitù, ètítù (coldness)
387.*strong*	le, agbára (strength)	agbára (strength)	agbáa(strength)	——
388.*weak*	láìle (neg. of 387)	bó	òlɛ (weakness)	——
389.*deaf*	ditíˊ	adetí (deaf person)	adĩtíˊ (deaf p.)	——
390.*dumb*	žadi, žodi	odi (dumb p.)	odi (dumb p.)	——
391.*blind*	fójú (547 fó + 55)	fójú, afójú (blind p.)	ojú fífó,òfójú (blind p.)	——

	Ɔ̀k	Àk	Ɔ̀w	Ɔ̀b
370.	titɔ̃	tutũ	——	titɔ̃
371.	róbótó	——	——	roboto
372.	gbɛ	——	——	gbɛ
373.	dɔ̀tí	——	——	dɔ̀tí
374.	fṹ	——	——	mɔ̃́
375.	hã̀ra	——	——	sãra
377.	ŋã́	——	——	ŋã́
378.	kpɔ̀	——	——	kpɔ̀
379.	wĩ́, hɔ̃́mã́	——	——	sɔ̃́mɔ̃́
380.	jĩnã̀	——	——	jĩ̀nã̀
381.	mṹ	——	——	mṹ
382.	kũ	——	——	éè mṹ (neg. of 381)
383.	hɛ̃gwà	——	——	sɛ̃gwà, ɛgwà (beauty)
384.	búrɛ́gwà	——	——	éè sɛ̃gwà, éè nɛ́gwà(neg. of 383), búrɛ́gwà
385.	gbónã́	——	——	gbónã́
386.	tutù	——	——	tutũ̀
387.	le, nã́gbára (have strength)	——	——	nágbára (have strength)
388.	éè le (neg. of 387)	——	——	dè, éè nágbára (neg. of 387)
389.	yà adetí	——	——	ditĩ́, aditĩ́ (deaf p.)
390.	yà odi	——	——	yadĩ, odĩ (dumb p.)
391.	fójú	——	——	fójú, afójú (blind p.)

	CY	K	Oṅ	Ìf
392.*today*	òní, èní	òní	òní	òní
393.*yesterday*	àn̄	òná	àná	àná
394.*tomorrow*	òla	òla	òla	òla
400.*here*	ibí, ìhí	ibí	ibé	——
401.*there*	ibè, òhú	ibɛè	ibè	——
402.*this*	èží	elé i, íí	íyí	——
403.*that*	èží ũ, íyɛ̃, nɔ̃ɔ̃	eléerã̀, ã̀, eérã	íyɛ̃	——
407.*everyone*	gbogbo èníyɔ̀ (352+112)	gbogbo inĩ (inclusive), gbogbo íĩ (exclusive)	dede wa	——
408.*everything*	gbogbo ŋ̀kɔ̃ (352+307)	gbogbo ihɔ̃	dede è	——
412.*inside*	inú	inɔ́	inɔ́	——
413.*outside*	òde, ìta	ìta	òde	——
414.*above,upon*	òkè (=175), orí (=51)	erí	òkè	——
415.*under*	abɛ́, ìsàlè	abɛ́	abɛ́	——
416.*front*	iwájú	iwájú	ugwájéú	——
417.*behind*	èhí	ìhì	èyì	——
418.*left*	òsi	òsi	òsi	——
419.*right*	òtú	òtɔ́	òtɔ́	——
420.*between*	ààrĩ	àihirĩ	èíí	——
425.*eat*	jɛ	jɛɔ̃	jɛũ	jɛɔ̃
426.*drink*	mũ	mɔ̃	mɔ̃	mɔ̃
427.*swallow*	gbé mì	mì, gbé mì	gbé wì	gbé mì
428.*urinate*	tò	tò	tò	tò
429.*defecate*	šu	šu	šũ	šu

	Òk	Àk	ɔ̀w	ɔ̀b
392.	èní	òní	——	òní
393.	àná	ána	——	àná, ànání
394.	òla	——	——	òla
400.	ibé yǐ	——	——	ibé ɛ̀, iyè yí
401.	òɣó	——	——	ibɛ̀ɛ, òúū
402.	ìyí	èyí	ìyí	èyi, ìyi
403.	ìyɛ̀	nì	èérɛ̀	yòŋɔ́o, ìyé, ɛérī
407.	dede yã	——	——	gede ɔnī
408.	dede urũ	——	——	gede uū
412.	inɔ́	inú	——	inɔ́
413.	òde	——	——	òde
414.	òkè	òkè	——	òkè, orí
415.	abé	——	——	abé, abéébé
416.	ugwájú	——	——	uwájú
417.	èyì	èyì	——	èyì
418.	òhì	——	——	òsì
419.	òtɔ́	——	——	òtɔ́
420.	àárí	àárí	——	èérí
425.	jɛũ	jɛũ	jɛũ	jɛ, jɛũ
426.	mɔ̃	mɔ̃	mɔ̃	mɔ̃
427.	wì, gbé wì	gbé mì	rɔwì	mì
428.	tò	——	——	tò
429.	sũ	——	——	šũ

	CY	K	Onì	Ìf
430.*do*	še	še	še	še
431.*go*	lɔ, rè, yṹ	lɔ	lɔ	lɔ
432.*come*	wá, bɔ̀	wá, bɔ̀, dé	wá	á
433.*return*	kpadà, dà	kpadà	kpadà	kpadà
434.*enter*	wɔ̀, wɔlé (wɔ̀ + 183)	wɔ̀	wɔ̀	ɔlé (ɔ̀+ 183)
435.*go out*	jádɛ̀ (já emerge + 413)	jádɛ̀, bó sítɛ̀	jáàde	jádɛ̀
436.*walk*	rĩ̀	rĩ̀	rĩ̀	rĩ̀
437.*go up*	gṹ, gɔ̀kɛ̀ (440 + 175) kpɔ̃	gùkè	gɔ̃kè	——
438.*go down*	sɔ̀, sɔ̀ kalɛ̀	sɔ̀ kalɛ̀	rɔ̀ alɛ̀	——
439.*run (cp. S 431)*	sá, sáré	sáé	sá, sáé	súré
440.*mount*	gṹ	gù	gṹ	——
441.*see*	rí	rí	rí	rí
442.*hear*	gbɔ́	gbɔ́	gbɔ́	gbɔ́
443.*smell*	gbɔ́ ɔ̀órũ̀	gbɔ́rɔ̃̀ (< ɔ̀órɔ̃̀)	gbɔ́ɔ̀ṹ (< ɔ̀ṹ)	gbɔ́ɔ̀rírṹ (< ɔ̀rírũ̀)
444.*touch*	kɔ̃̀, fɔwɔ́ kɔ̃̀, tɔ́	fɔwɔ́ kã̀	mũ ɔwɔ́ kã̀	mṹ ɔɔ́ kã̀
445.*taste*	tɔ́ wɔ̀, fɛnũ kɔ̃̀	tɔ́ wù	dã ɤɔ̀	tɔ ɔ̀
446.*hit*	jɔ̃, nɔ̃̀, lù, bá, bà	lù	lù	lù
447.*beat*	lù, kpa	lù	lù, nɔ̃̀	lùmí
448.*kill*	kpa	kpa	kpa	kpa
449.*insult, abuse*	bú	rí fí	í fí	rí fí
450.*pull*	wɔ́, fà	fà	fà	fà
451.*push*	tì, bì, sṹ, sɔ́, sógɔ̀ɔ́	tì	tì	tì

	Òk	Àk	Ɔ̀w	Ɔ̀b
430.	se	——	če	še
431.	lɔ	——	——	yú, gbɔ̃̀rè
432.	wá	á	wá	wá, dé
433.	kpadà, dèyì̃	——	——	kpadà, bò
434.	wò, wòlé	——	——	wò, wòlí
435.	jáàde	——	——	jáàde, wòde (434 + 413)
436.	rì̃	——	——	rì̀
437.	gɔ̃̀kè	——	——	gɔ̀̃kè
438.	wá hílè	rɔ sódò	rɔ sálè	gbɔ̃̀rè sódò
439.	háré	sáré	sá	sáré
440.	gũ̀	——	——	gũ̀
441.	rírã, réjú (441 + 55)	rí	rí	rí
442.	gbó	gbó	gbó	gbó
443.	gbóǒrũ̀ (<òórũ̀)	——	——	gbúǔrũ̀ (<òórũ̀). gbíìrírũ̀ (<ìrírũ̀)
444.	mɔ̃́wó kã̀	——	——	fɔwó kã̀
445.	tó, tólá	——	——	tó wò
446.	lù, kã̀	——	——	lù, bá
447.	lù, nã̀ (cane)	——	——	lù, nã̀
448.	kpa	——	——	kpa
449.	rí fì̃	——	——	bṹ, rí fì̃
450.	fà	——	——	fà
451.	tì	——	——	tì̃

	CY	K	Onˋ	Ifˋ
452.*carry*	rù, gbé, mű́, kó	rù, gbé, mṍ, kó	gbé, mű́, kó	gbé, mű́, kó
454.*lift*	gbé sókè	gbé	——	——
455.*put down*	gbé sílè, gbélè	gbé ńnè, fu ńnè	gbé alè	——
457.*sleep*	sũ̀	sù	sũ̀	sũ̀
458.*dream* (*cf. 312*)	lá, lálă	lála	lóòlá	lílaá
459.*rest*	sĩmĩ	sĩmĩ	sìmĩ	sĩmĩ
461.*open*	ší	ší	ší	ší
462.*close*	tì, sé (block, dam up)	tì	tì, sé	tì
463.*bury*	sĩ	sĩ	sĩ	si
464.*read*	kà (=S 454), kàwé (464 + S 246)	kà	kà	kàwé
465.*write*	kɔ, kòwé (465 + S 246)	kɔ	kɔ	kòwé
466.*gather*	kó, kójɔ (g. together)	kó	kójɔ	——
467.*accompany*	bá	bá lɔ, sĩ̀lɔ	sĩ̀ lɔ, kpé (escort)	bá lɔ
468.*burn*	jó, jónõ (468+ 160)	sõ, gú kpákpá (b. fields)	jó	jó
469.*roast*	yõ	sõ	yã, sõ(skewer)	sõ
470.*boil*	hó, ru, žakĩ, sè	sè	sè	sè
471.*sing*	kɔ, kɔ orĩ	kõrĩ	kɔĩ	kɔrĩ
472.*say*	sɔ, wí, fò, nĩ, kpé	sɔ, fò lí	fò, fò í	wí

	Ok	Ak	ɔw	ɔb
452.	gbé, mű, kó	——	gbé	gbé, mű, kó, rũ
454.	gbé hóòkè, gbé kúolè	——	——	gbé sókè
455.	gbé hílè	——	——	gbé sálè
457.	hũ̀	sũ̀	sũ̀	sũ̀
458.	lóòlá	——	——	lɛ́làá
459.	hĩ̀mĩ	——	——	sĩmĩ
461.	sí	——	——	šĩ́
462.	tĩ	——	——	tĩ̀, sé, dĩ́
463.	hi	——	——	sĩ
464.	kà	——	——	kà
465.	kɔ	——	——	kɔ
466.	kó jɔ	——	——	kó jɔ, gbá jɔ
467.	bá lɔ	——	——	bá yú, gwólé
468.	jó	——	——	jó
469.	dĩ́	——	——	sõ
470.	hè	——	——	yãkĩ, sè
471.	kɔrĩ	——	——	kɔrĩ
472.	fò, ji	sɔ, fò	fò	fò, wí

	CY	K	Oṅ	Ìf
473.*talk*	sòrò (472+322a)	sòrò	tò	fò
474.*tell*	so fṹ, wí fṹ	so, so wí kpé	so, gíŋ̀ã̀	wí ã̀
475.*ask*	bi léèrè, bèèrè	bérè	bíéè	bèrè
476.*answer*	dá ohṹ, fi èsì fṹ	dáã̀	dáũ̀	dáã̀
477.*wish*	fɛ́	rò	fɛ́	fɛ́
478.*refuse*	kò	kò	ŋɛ̃́ še	kò
479.*twist*	ló	ló	ló, ró	lɔ
480.*chop*	gé wɛ́ wɛ́	ké sí wéwé	gé	gé wɛɛrɛ
481.*cut*	gé, ké	ké	gé	gé
482.*tear*	ža, fà ža, bù	ha	ya	ya
483.*build*	kɔ́, mɔ̃	mɔ̃	kɔ́, mã (=S362)	kɔ́
484.*dress*	wò ašɔ	wò ašɔ	wàšɔ, mṹa	ɔ ašɔ
485.*undress*	bó ašɔ	bó ašɔ	bó ašɔ	bóra
486.*swim*	wɛ̀ (=bathe)	wɛ̀	gwɛ̀	kpubú
488.*hide*	kpamɔ̃́, fara kpalɛ̀	fu kpamɔ̃́	sa kpámã̀, lù kpáma	mṹ kóò
489.*steal (cp. S 334)*	jí, jalè	jí	jí, šolè	jí
490.*help*	rɔ̀̃, rɔ̀̃lówó	rã̀ lówó	rã̀	rã̀ lóó
491.*fall*	šubú, bó, sébú	šubú	šubú, bó	šubú
492.*think*	rò	ronɔ̃́ (rò + 412)	ròn̄ɔ̃́	rò
493.*know*	mɔ̀̃	mɔ̀̃	mà	mɔ̀̃
494.*remember*	rɔ̃́tí (rɔ̃́ + 54)	rã́tí	rã́tí	rã́tí
495.*forget*	gbàgbé	gbàgbé	gbàgbé	gbàgbé
496.*dig*	wà, tú, wú (dig up)	wà, rĩ	gwò	gbɛ́
497.*hoe*	roko (ro + 192) rolɛ̀ (ro + 177)	ro	kpako, kɔ ɛã̀	——

	Òk	Àk	Ɔ̀w	Ɔ̀b
473.	fɔ̀	——	——	fɔfɔ̀
474.	fɔ̀	——	——	sɔ, fɔ̀ ű
475.	bíîrè	——	——	bèèrè, gwáàdí (inquire)
476.	dáû̀	——	——	dáû, fèsì
477.	fɛ́	——	——	fɛ́
478.	kɔ̀	——	——	kɔ̀
479.	lɔ́	——	——	lɔ́, yí
480.	gé hí wéwé,ɣa	——	——	gé wéléwélé, ré wéléwélé
481.	gé	——	——	gé
482.	ya	——	——	yá
483.	kɔ́	——	——	kɔ́
484.	wɔ̀ asɔ	——	——	wɔ̀, wàšɔ
485.	bɔ́ asɔ	——	——	bɔ́, bášɔ
486.	gwè	——	——	lù gwè, kpu dèdè
488.	hé kpámã́	——	——	lèsè, gbé lèsè
489.	jí, jalè	——	——	jí
490.	rã̀ nɔ̃wɔ́	——	——	rã̀ lɔ̃wɔ́, bá še
491.	subú	——	——	šúbú
492.	rɔ̀	——	——	rɔ̀, rɔ̀nɔ̃(mull over)
493.	mà	mɔ̃̀	mà	mɔ̃̀
494.	rãtí	——	——	rãtí, yèrè
495.	gbàgbé	——	——	gbàgbé
496.	gwɔ̀	——	——	gwà, šɔ̀
497.	roko	——	——	roko

	CY	K	Oṅ	Ìf
498.*weed*	tu ekpo, tuko, šáko	tuko	šãko	ro
499.*teach*	kɔ́ nĭ́	kɔ́	kɔ́	kɔ́
500.*learn*	kɔ́	kɔ́	kɔ́ èkɔ	kɔ́
501.*cry*	sũkṹ, sɔkṹ	sɔkṍ	sɔ̃kṹ	sɔ̃kṍ
502.*laugh*	rĭ́ èrĭ́	rɛ́rĩ	rĭ́ èĭ́	rĭ́
503.*drive away*	lé, lé lɔ, šĭ́ kúrò	lé kóò	lé lɔ, gwà lɔ, šĭ́ kúò	lé
504.*seize*	mṹ, mṹ nĭ́	já gbà	——	gbà
505.*take* (*cp. 452*)	gbé, mṹ, kó, fi, gbà	gbé, mṍ, kó gbà	gbé, mṹ, kó, gbà	mṹ
506.*give*	fṹ, fṹ nĭ́, bṳ̀	fú nĭ́	mṹ kò	mṹ kò
507.*bite*	bùjɛ, já jɛ	bùjɛ, ké rṍ	bù jɛ, gé jɛ	bù jɛ
508.*shoot*	ta	yì̀ ìbõ(yì̀+S150)	lù àbã	yĩ̀ìbõ
509.*sell*	tà	tà	tà	tà
510.*buy*	rà	rà	rà	rà
511.*call*	kpè	kpè	kpè	késĭ́ (cp. S441)
512.*sit*	jókɔ̌	jóko	jókoó	jòkó
513.*give birth*	bĭ́ (human), bɛ́ (animal)	bĭ́	bĭ́	bĭ́
515.*throw*	jù, sɔ	jù	jù	fi òkò
516.*follow*	tò, tɛ̀lé	tò	tɛ̀lé, mṹ tìĭ́	wólĭ́
517.*die*	kú	kú	kú	kú
518.*forge*	rɔ	rɔ	rɔ	rɔ
521.*dance*	jó	jó	jó	jó, júnjó
522.*have, possess* (*cp. 531*)	nĭ́	lĭ́	nĭ̀	——

	Òk	Àk	Ɔ w	Ɔ b
498.	kpèkpò	——	——	tu, tòkpò
499.	kó	——	——	kó
500.	kó	——	——	kó
501.	hɔ̃kṹ, ké (cp. S441)	——	——	sɔ̃, sɪ̃kṹ
502.	rɪ̃, réèrɪ́	ré èrɪ́, réèrɪ́	——	rɪ́, rɪ́ìrɪ́
503.	lé lɔ	——	——	lé
504.	mṹ, já gbà	——	——	gbà, ja gbà (snatch)
505.	gbà	——	——	mṹ
506.	mṹ	fṹ	wṹ	fṹ nɪ́
507.	bù jɛ	——	——	bù jɛ, gé jɛ
508.	lù ìbã, yɪ̀ ìbã, ta ìbã	——	——	yɪ̀bɔ̃, tàbɔ̃
509.	tà	——	——	tà
510.	rà	——	——	rà
511.	kpè	kpè	ké	kpè, késí
512.	jóòkó	jòkó	jòkó	jòkó
513.	bí	——	——	bí, kpò (dogs)
515.	jù	——	——	sɔ òkò
516.	fi tɪ́ɪ́	——	——	tɛ̀lé, gwɔ́lé (=467)
517.	kú	kú	kú	kú
518.	rɔ	——	——	rɔ
521.	jó	——	——	jó
522.	nɪ́	——	——	nɪ́

	CY	K	Onˋ	Ìf
523. *fly*	fò	fò	fò	fò
524. *jump*	fò, bɛ́	fò	fò (j. up), bɛ́ (j. down)	tɔ
525. *stand*	dúró	dúró, didé dúró	dúó, didé dúó	dède, ró
526. *sneeze*	sĩ́	sĩ́	sĩ́	sí
527. *yawn*	yṍ	yã́	yã́	yã́
528. *finish*	kparí (448+51), žɔrí, tṍ, kpé, kpɛ̀kũ	tã́	kpaí, tã́	kparí
529. *begin*	bèrɛ̀, bèrɛ̀ sí	bèrɛ̀	bèɛ̀, bèɛ̀ sí	bèrɛ̀
530. *fill*	kṹ	kpõ	kṍ	kṍ
531. *marry (cp. 522)*	fɛ́, fɛ́ nížàwó, fɛ́ láža	gbé ìyàwó (505+S5)	fɛ́	fɛ́
532. *show*	fi hɔ̃̀	fu hã̀	mṹ ŋã̀	mṍ ã̀
533. *dry up (cf.372)*	gbɛ	gbɛ jù	gbáa è	gbɛ
534. *be rotten*	rà	yɛ̃kɛ̃̀	rà	rà
535. *surpass*	jù lɔ	jù lɔ	jù lɔ	——
536. *tie*	dì, dè, so	so	dì, so	dì
537. *untie*	tú	tú	tú	tú
538. *pour*	dà, tú	dà	dà	dà si
539. *be wet (cp.386)*	tutù	tutù	tutù	titù
540. *sweep*	gbá	gbá	gbá	gbá
541. *blow(of wind)*	fɛ́	jà	fɛ́	fɛ́
542. *blow(with mouth)*	fɛ́	fɛ́	fɛ́ yì	fɛ́ yì
543. *obtain(cp. 505)*	gbà	gbà	gbà	rí gbà
544. *weave*	hũ, wũ	hõ	ŋõ	õ
545. *plait(cp. 536)*	dì,dirũ(dì+52), dirí(dì+51)	dì	dì	dì
546. *divide*	kpĩ́, dá sí	kpĩ́	kpĩ́	kpĩ́
547. *break*	dá, šɛ, fó (shatter)	dá, fó, la	dá, fó, bù	dá,fó

	Òk	Àk	ɔ̀w	ɔ̀b
523.	fò	——	——	fò
524.	tᵒ	——	——	fò, tᵒ
525.	dúró, kóró, kòòró	dúró, didé	dúró	dụ́ró, dìde, kọ́ró
526.	hí	——	——	ši
527.	yá	——	——	yǎ
528.	kparí, tǎ	——	——	kparí, tǎ
529.	bèrè	——	——	bèrè, bèrè sí
530.	kɔ̃́	——	——	kɔ̃́
531.	fɛ ìyàwó, fɛ aya	——	——	nǐ́ àyà
532.	mú ŋ̀ǎ	——	——	fu ŋ̀ǎ
533.	gbɛ	——	——	gbɛ
534.	rà, gbè	——	——	kè
535.	jù	jù	jù	jù
536.	dì	——	——	dĩ̀, so, sǎ
537.	tú	——	——	tú
538.	dà	——	——	dà
539.	tutù, rɛ	——	——	tutũ̀, rɛ
540.	gbá	——	——	gbá
541.	fɛ́	——	——	fɛ́
542.	fòfó (blow away), fɛ́ kpa(blow out)	——	——	fɛ́
543.	gbà	——	——	gbà
544.	ŋɔ̃	——	——	ŋɔ̃
545.	dì, kó	——	——	dĩ̀, barɔ̃
546.	kpĩ́	——	——	kpĩ́
547.	fó, sɛ, bù, là, gwó	——	——	dá, šɛ́ (snap), fó, gé, bụ́, ya (rend), kǎ (be broken)

APPENDIX 1: Word List (S)

	CY	K
S2. *first*	èkíní, îkíní	èkéní
S3. *second*	èkejî, îkejî	èkéjî
S4. *third*	èkɛtà, îkɛtà	èkétà
S5. *wife*	îžàwó, aža	îyàwó
S6. *husband*	ɔkɔ, baálé	ɔkɔ
S7. *co-wife*	orogú	orogú (jr. wife)
S12. *in-law*	ànɔ̃	ànã
S13. *grey hair*	ewú	iwú
S14. *occiput*	îkpakó	îkpàkó
S15. *forehead*	iwájú orí (416+51)	iwájú erí
S16. *palm (of hand)*	àtélɛwó, àtéwó	àtéwó
S17. *wrist*	ɔrù ɔwó (64+69)	ɔrɔ̃ ɔwó
S18. *stomach*	ikú, inú	ikù
S19. *womb*	ibi ɔmɔ̃	ikù, inɔ́, agbàyá
S21. *sole*	àtélèsè, àtésè	àtésè
S22. *crowd*	ɔkpɔ èèyɔ̀, ogũlógò	óŋ́ kpariwo,ɔ̃ɔ̃ kpò
S23. *masquerade*	egũgú, eégú	eégú (cp. 172)
S24. *enemy*	òtá	òtá
S25. *blacksmith*	àgbèdɛ, alágbèdɛ	àgbèdɛ
S26. *trader*	oníšòwò	ašòwò
S27. *fisherman*	akpɛja, dɛja dɛja, kpɛja kpɛja	akpɛja
S28. *swamp*	irà, abàtà, ɛrɔ̀fò	atã

	Onˋ	Òk	Ɔˋb
S2.	ukpò kénɛ̃́	èkǐ́nǐ́	òkǐ́nǐ́
S3.	ukpò kejì	èkeèjì	òkéèjǐ̀
S4.	ukpò kɛ̃́ɛ̃̀ta	èkɛɛ̀ta	èkɛ́ɛ̀ta, ìkɛ́ɛ̀ta
S5.	aya	ìyàwó, aya	ayà, obitɔ̃
S6.	ɔkɔ	ɔkɔ	ɔkɔ
S7.	onɔ̃̀keèjì (= 128)	orogɔ̃́	——
S12.	ànã	ànã	——
S13.	iɔ̃ (= 52)	irɔ̃ fifɔ̃	——
S14.	èyǐ̀ oírɔ (76 + 51)	ɛyĩ orí	——
S15.	ùtò gwájú	òtùgwá	——
S16.	àtɛ́lɛ̀wó	àtɛ́lɛ̀wó	——
S17.	ùgbɔ̃̀wó	ɔrɔ̃̀ ɔwó	——
S18.	ukù	ukù	——
S19.	àkpòlúkù	àkpòlúkù	——
S21.	àtɛ́lɛsɛ̀	àtɛ́lɛhɛ̀	atɛ́tɔsɛ̀
S22.	àgbájɔ iáyé	àgbájɔ iáyé, èrò	agbo, àwùjɔ, àjɔ, èrò
S23.	eégɔ́	egɔ́gɔ́, umãlɛ̀	egígɔ́
S24.	òtá, léènǐ̀nǐ́	òtá	——
S25.	lágbèdɛ	alágbèdɛ	——
S26.	òšòwò	olúsòwò	——
S27.	kpɛja kpɛja	akpɛja	——
S28.	uwɔòfò	àbàtà	——

		CY	K
S31.	*ocean*	agbamĩ, òkũ, ibú omĩ	òku
S34.	*breath*	èémĩ́	ìmĩ́
S35.	*rainbow*	òšùmàrè	ošùmarè
S37.	*harmattan*	ožé	oyé
S38.	*firewood*	igi ìdánṍ	egi ìdánã́
S40.	*soil*	erùkpè, žèkpè	ilè oko (177+192)
S41.	*world*	ažé	ayé
S45.	*yam heap*	ebè išu	ebè išu
S46.	*ward, quarter*	àdúgbò, akpá kõ̀	àgó
S47.	*compound*	agboolé	àgó
S48.	*family*	ɛbí	ɛbí
S51.	*verandah, hallway*	òdèdè, òɔ̀dè	èèdè, fàráńdà (<English)
S52.	*thatch*	——	èèkã, kóóko (=173), àtà ilé
S55.	*chair*	àga, ìjokŏ (seat)	àga
S59.	*bush pig*	ìmàdò	ɛlɛ́dè ìgbɛ́
S67.	*porcupine*	òòrè	èèrè
S68.	*pig*	ɛlɛ́dè	ɛlɛ́dè
S69.	*duck*	kpɛ́kpɛ́yɛ	kpɛ́kpɛ́yɛ
S72.	*kite*	àšá	àšá
S73.	*hawk*	àwòdì	àšá idì, àšádì
S74.	*owl*	òwìwí	òòwí
S75.	*parrot*	odídɛrɛ́, ažé kòòótó	ayé kɔ òótó, eédɛ
S80.	*varieties of frog*	àkèré, kòŋ̀kò	àkèré, kòŋ̀kò, tàntàlá
S83.	*cricket*	ìrè	èèrè
S84.	*varieties of ant*	èèrũ̀, ìjàlò, èèrà, ikṍ, tamõtiye, kɔĩ kɔĩ	ìjàlè, eèrà, eeràré, etutu, iká

	Oṅ	Ok	Ɔb
S31.	òkũ	òkũ	——
S34.	emĩ́	èmĩ́mĩ́	èémĩ́
S35.	èvádi	òsũ̀màrè	——
S37.	òkpàkpà	àkpàkpà	——
S38.	igi daánã́	igi ùdánã́	——
S40.	eùkpè	ilè	ɛrùkpè, alè
S41.	ayé	ayé	——
S45.	ɛã̀	ebè	ɔrã̀
S46.	àdúgbò	àdúgbò	——
S47.	ɔgbà (cp. S280,S217)	ɔgbà	agbolí, ùdílé
S48.	ɛbí	ɛbí	——
S51.	òdèdè	òdèdè	òdèdè
S52.	èbìbá	ikĩ́, òjìkò	——
S55.	ùjòkó	àga, ujoòkòó	——
S59.	esì	ehì, ìmàdò	——
S67.	ùùrè	ùrè (cp. S83)	ùùrè
S68.	lɛ́èdè	ɛlɛ́èdè	——
S69.	kpɛ́kpɛ́yɛ	kpɛ́kpɛ́yɛ	——
S72.	àšá	àsá	——
S73.	àwòdì	àwòdì	——
S74.	——	ògwìgwí	——
S75.	ayé kɔ òító, yókòító	ayé kòòótó	——
S80.	àkèé	àkèré	——
S83.	ùè	ùrè (cp. S67)	——
S84.	ikã́, jɛn̄tóógũ, lómɛũ, lígalígò, àka líiyɛ	eèrà, lómɛrũ, ikã́, ɛkpɛ́	——

	CY	K
S89. *firefly*	tõnṍ tõnṍ	dánã́ dánã́
S91. *bed bug*	ìdũ	ìdõ
S91a. *maggot*	ìdĩ	ìdĩ
S95. *snail (large,edible)*	ìgbĩ	ògbĩ́, àlákòšɛ
S96. *water snail*	ìšáwùrú, ìsṍ	òkòtó odò,ògòbè, káŋ́gó
S98. *turtle*	awũ	eléwùrì
S100. *wall-gecko*	ɔmṍnlé	ɔmṍné
S101. *varieties of snake*	erè, òka, kparamṍlè	ɔká, kparamṍlè, mánṍmanṍ, àgbà fúù fúù, àgbà ídú, olúfà
S106. *hare*	——	èsúó
S107. *scales*	ìkpé ɛja	ìkpékpé ɛja ìkpékpé aĩka
S125. *butterfly*	laba lábá	laba lábá
S126. *plantain*	ògèdè àgbagbà	àgbagbà
S129. *rice*	ìrɛsì	ráìsì
S131. *bitterleaf*	ewúrõ̀	ewúrõ̀
S132. *sugarcane*	ìrèké	ìrèké
S133. *cocoyam*	išu kókò, kókò	kóokò
S135. *alligator pepper*	ataare	ataire
S136. *orange*	osõ̀, òrombó	osã̀
S138. *mango*	mṍŋ́gòrò	mã́ŋ́gòrò
S141. *coconut*	àgbõ	àgbõ
S142. *palm kernel*	ɛyì̀, èkùró	ɛyì̀, èkùró
S143. *raffia palm*	ògòrò	ààko
S144. *oil palm*	òkpɛ	òkpè

	Oṅ	Òk	Ɔ̀b
S89.	àfòkpunã́	dúnã́ dúnã́	——
S91.	ìdõ	ìdõ	——
S91a.	——	ìdĩ	——
S95.	ùgbĩ́	ùgbĩ́, ilákòsɛ	——
S96.	òŋí ŋṍ	ùgbĩ́ omĩ, ìkpére	——
S98.	àlùkelùké	àlùkelùké (cp.221), ìnãkpó, ìjàkpá omĩ	——
S100.	ɔmõlílí	ɔmãlúlé	——
S101.	ɔká, òkìì, kpaamṍlè, jébútè, àgbèdɛ ídũ, mònšòhó, erè	ɔká, kparamã́lè, àgbàádú́, àjɛbú, mãnãmánã, erè	——
S106.	ehoo (cf. 246)	ehoro	——
S107.	ìkpé	ìkpé	——
S125.	laba lábá	laba lábá	——
S126.	òɡèdè àgbagbà, òɡèdè gwéé	àbàtíyã̀	——
S129.	iyéèsì	ìrɛhì	——
S131.	ewúò	ewúùro	——
S132.	ìyèké	ukpètè	——
S133.	lámbó	lámbó	kókò, ilègbè, kpòšò
S135.	ataiye	ìtayɛ	——
S136.	òoyìbó	ɔhã̀	——
S138.	mãńgóò	mãńgòrò	——
S141.	kòkojìyà	kòkodìyà	àgbõ, kpúrù
S142.	ɛyɛ̃̀, òkùó	ɛyĩ̀, èkùró	ɛyĩ̀, ɛrõ̀
S143.	òɡòò	òkpè ìko	òɡòrò
S144.	ɔkpè ɛyɛ̃̀	òkpè	——

	CY	K
S147. *palm wine*	ɛmũ, ògùrò	ɛmõ (from oil palm), ògùrò (from raffia palm)
S148. *gin*	ɔtí líle, ògógóró	ògógóró, akpɛtɛ
S149. *wine (general)*	ɔtí	ɔtí
S150. *gun*	ìbõ	ìbõ
S152. *bullet*	ɔta ìbõ	ata ìbõ
S153. *gunpowder*	ɛtù, ɛtùbõ, ètù	ètù
S154. *fish spear*	ìdɛja (cp. 527)	akasì
S156. *matchet*	àdá	àdá, òjá àgbá
S157. *needle*	abéré	abéré
S158. *prison*	èwò̀, ogbà èwò̀ (cf. S217)	èwò̀
S159. *chain*	èwò̀	wòrò
S160. *lock*	àgádá godo	kókóró
S161. *key*	kókóró	kókóró
S164. *bag*	àkpò	àkpò
S165. *box*	àkpótí	àkpótí
S166. *plank*	kpátákó, kpákó	abala
S167. *lamp*	àtùkpà	àtùkpà
S168. *match*	ìšánṍ	ìšánã́
S169. *darkness*	òkũ̀kũ̀	òkùkù
S171. *walking stick*	òkpá	òkpá
S172. *comb*	ìžarũ	ìyarõ, òìyà
S173. *chew-stick*	orĩ́, kpákò	orĩ́
S175. *varieties of fish net*	àwò̀, àwò̀ ɛja	àwò̀, òbiliŋkí, àdù, agáka
S179. *varieties of fish trap*	ìgèrè	ìgèrè, ògìgí

	Onˋ	Okˋ	Ɔbˋ
S147.	ɛmɔ̃	ɛmɔ̃, ògùrò	——
S148.	ògógóró	ɔtí líle, ògógóró, jeḅelejé	ɔtí
S149.	ɔtĩ	ɔtĩ	ɔtí
S150.	àbã	ìbã	ìbɔ̃
S152.	ɛta àbã	ɔta, ɛtù	——
S153.	ɛtù	ɛtù	——
S154.	òkò ɛja(293+269)	akáàsì, ugaga	——
S156.	ùkpɛ́kṹ	ùkpɛ́kũ, udaàbó	àdá
S157.	abɛ́ɛ́	abɛ́rɛ́	——
S158.	èŋà̃	èŋà̃	——
S159.	——	èŋà̃	——
S160.	kɔ́kɔ́ɔ́	kɔ́kɔ́ró	——
S161.	kɔ́kɔ́ɔ́	kɔ́kɔ́ró	——
S164.	àkpò	àkpò	——
S165.	àkpótí	àkpótí	——
S166.	kpákó	kpákó	——
S167.	àtùkpà	àtùkpà, unã́ (=160)	——
S168.	ùšánã́	ùsánã́	——
S169.	òkṵ̀kṳ̀	òkṵ̃kṳ̀	òkṵ̃kṳ̀
S171.	igi ìtilɛ̀	òkpá ùtilɛ̀	——
S172.	——	òyìyà	——
S173.	oĩ́, kpakò	orĩ́	——
S175.	——	awɔ̃̀	——
S179.	——	——	——

	CY	K
S182. *board*	ɔkpɔ̃́	ɔkpɔ̃́
S183. *nail*	ìšó	òšó
S184. *hammer*	òòlù	ìkàšó
S185. *broom*	ìgbálè, ɔwò	ìgbálè
S187. *paddle, oar*	àjè, ɔkpa (bamboo pole)	àjè
S193. *bottle*	ìgò	ìgò
S194. *water pot*	àmù̀	ìkòkò àmɔ̃̀, ìgé
S195. *cooking pot*	ìkòkò, ìšasù̀, akpɛ	ìkòkò ɔbè
S196. *wine jug*	šágo, agbè (gourd)	agbè
S197. *mortar*	odó	odó
S198. *pestle*	ɔmɔ̃ odó (38+S197), ɔmɔ̃rí odó	ɔmɔ̃rí odó
S199. *spoon*	šíbí, ìkpɔ̃	šíbí
S200. *ladle*	ìkpɔ̃, ìgbákɔ	ìkpɔ̃̀bè
S201. *enamel plate*	kpáànù̀, abó	abó
S202. *china plate*	àwo	àwò
S204. *razor*	abɛ	abɛ ìfárí (cp. 301)
S205. *bundle (e.g.of firewood)*	ìdì	ìdì
S206. *tobacco*	tábà	tábà
S207. *snuff*	aášà	àášà
S208. *tribal scarification*	ilà	ilà
S211. *soap*	ɔšɛ	ɔšɛ
S214. *rope for climbing palms*	igbà	igbà, ɔkpàkpà
S217. *fence*	ɔgbà	ɔgbàrà
S218. *bridge*	afárá	afá

	Oṅ	Ok	Ob
S182.	ɔkpã́	ɔkpã́	ɔkpṍ
S183.	ùšó	ùsó	ìšó
S184.	hámã̀	ùkã̀só	——
S185.	ɔɾò	ùgbálè	àíšá
S187.	——	òbèlè	——
S193.	ùgò	ùgò	ìgò, àkpálábá
S194.	ùkòkò omĩ	ùsà	ùšà
S195.	ùkòkò ɔbè	ùkòkò, akpɛ	——
S196.	jóògì	ugbègbè ɛmõ	——
S197.	òíšɛ́	ògṹyã́ (ò+S395+275)	——
S198.	ɔmã̀ íšɛ́	ɔmã ògṹyã́	——
S199.	šíbí	síbí	——
S200.	šíbí	ùgbákɔ	——
S201.	kpáànõ̀, lóòkpétɛ́	kpáànũ̀	kpáànũ̀
S202.	àwò òyìbó	àwò	àwòrɛ, tã́gãrã, tásа
S204.	ùwésà (?< English)	abɛ	——
S205.	odiⁿdi	ùdì igi	——
S206.	tábà	tábà	——
S207.	tábà	tábà	tábà, agírá
S208.	ilà	ilà	——
S211.	ɔšɛ	ɔsɛ	ɔšɛ
S214.	ugbà	ugbà	——
S217.	ogbè	ɔgbà	ɔgbà
S218.	ùkɔkò	afárá	afárá

	CY	K
S219. *ladder*	àkàbà, àkàsò, àtègũ	ìtèká
S220. *bell*	agogo, aago	aigo
S224. *flag*	àsíá ~ àsiá	àsíá
S225. *corner*	igũ, kòòrò	igõ
S226. *pit*	kòtò	kòró
S227. *grave*	kòtò, sàréè	kòtò òkú (cf. 314.)
S228. *coffin*	kpósí	kpósí
S229. *inheritance*	ogű	ogú
S230. *malaria*	ako ibà (S310+318)	ako ibà (tough fever)
S232. *smallpox*	šõkpònṍ	ìgbónã́
S233. *yaws*	òǵòdò	òǵòdò
S234. *wound*	ogbé, ìfarakpa(accident)	ìfarakpa
S235. *ulcer (on skin)*	egbò	egbò
S236. *boil*	éewo, óówo	oówo
S238. *dizziness*	òòžì	òòyĩ̀
S239. *scar*	àkpá	àkpá
S240. *story*	ìtõ̀	ìtã̀
S242. *proverb*	òwe	òwe
S243. *riddle*	àló	àló
S244. *case*	ɛjó	ɛjó
S245. *law*	òfĩ	òòfĩ
S246. *book*	ìwé	ìwé
S247. *middle*	àárĩ́, ààrĩ, agbede méjì	àìhirĩ (cp. 420)
S248. *side*	ègbé, ìhà	ègbé, ìhà

	Ọn	Ọk	Ọb
S219.	aɤɔ	àkàbà, àkàhɔ̀	——
S220.	augo	agogo, aago	agogo, aago
S224.	àsíá	àsíá	——
S225.	kónã̀ (<English)	igũ	kɔ̀rɔ̀
S226.	ukòtò	ukòtò	——
S227.	obojí	ukòtò, sàáréè	ugbĩ̀, orórí
S228.	kpósí	kpóhí	ukpósĩ́
S229.	ogṹ	ogṹ	——
S230.	ibà	ibà	——
S232.	bàbá	ètè	——
S233.	——	ígòdòbí	——
S234.	ojuju	ɔgbĩ́, egbò	——
S235.	kpétélé	ojuju	——
S236.	oɤíɤo	oɤíɤo	——
S238.	ìyèjú	ùyèjú	——
S239.	ifã̀	àkpá	——
S240.	ìtã̀	ìtã̀	ìtã̀
S242.	òwe	òwe	——
S243.	ìyé	èló	àló
S244.	ɛjó	ɛjó	——
S245.	òfĩ́	òfĩ́	òfĩ̀
S246.	ìwé	ìwé	ìwé
S247.	èĩ́ĩ́	àrĩ́rĩ́, àárĩ́	——
S248.	èg̣bé, ìɤáɤè (side of body)	èg̣bé, ùɤá (side of body)	——

	CY	K
S249. *edge*	ìkɔ̃́gũ, tɛ́ńtɛ́	ìkã́gu
S250. *bottom*	ìdí (cp.89), ìsàlɛ̀, abɛ́	ìdí, ìsàlɛ̀
S251. *end*	òkpí, ìkparí	ìkã́gu (=S249)
S253. *width*	fífɛ̀	fífɛ̀
S254. *part, fraction*	ìdá, akpá kɔ̃̄	ìdá
S255. *half*	ìdàjì, ìlàjì, àabɔ̀, ìdá méjì	ìlàjì, àìbɔ̀
S256. *oath, covenant*	ìbúra, májɛ̀mṹ	ìbúra
S257. *trick*	ìtɔ̃̀jɛ, ɛ̀tɔ̃̀	ìtã̀jɛ, ɛ̀rɔ, àrɛ́jɛ
S258. *suffering*	ìrora	ìrora, ìnĩra
S259. *trouble*	ìjɔ̀gbɔ̃̀, ìžɔnũ, ɔ̀rɔ̃̀	ìjã̀gbɔ̃̀, ɔ̀rã̀
S260. *shame*	ìtìjú, ìdójú tì	dójú tì
S261. *sacrifice*	ɛbɔ, ìrúbɔ	ɛbɔ, ìrúbɔ
S262. *age-grade*	ɛgbɛ́	ɛgbɛ́
S264. *adultery*	kpañšágà, àgbèrè	kpañšágà, àgbèrè
S265. *shirt*	ɛ̀wù	ɛ̀wù
S266. *undershirt*	àgbékɔ́	àwɔ̀tɛ́lɛ̀
S267. *headtie*	gèlè, ìdikù	gèlè, ìdikù
S269. *earring*	žɛrí etí, žɛtí	yɛrí
S270. *necklace*	ìkárũ̀	gbɛ̀dɛ̀
S271. *fish-hook*	ìwɔ̀	ìwɔ̀
S273. *cowry (cf. 326)*	owó ɛžɔ	owó ɛyɔ
S274. *manilla*	idɛ (precious metal)	idɛ
S275. *debt*	gbèsè	gbèsè
S276. *profit*	èrè	èrè

	Onì	Òk	Ɔ̀b
S249.	ùkpáũ	ùkáãgũ, etí (=54)	——
S250.	ùdí	ìdí, ìsàlè, abé	——
S251.	ùkpaí	òkpĩ	etĩ́ (=54)
S253.	ùbú	ùbú	——
S254.	akpá	ìdá, akpáà kã̀	——
S255.	ìdaàjì, àbò	ìdajì	——
S256.	ùbúa	ùbúra	——
S257.	ɔgbã́	ùtã̀jɛ, ètã̀, ɔgbã́	——
S258.	ùjùyà	ùyà, ùrora	——
S259.	òã̀	ìjã̀gbã̀, òrã̀, ùyɔrũ	——
S260.	ùtẽ̀jú	ùtèjú	——
S261.	ɛbɔ, ùɛ́bɔ	ɛbɔ, ìrúbɔ	ɛbɔ
S262.	ɔjó íɤo, ɛgbɛ́	èɡbɛ́, òtú	ɛgbɛ́, òɡbà (age-grade mate)
S264.	àgbèè	kpáńságà, àgbèrè	——
S265.	èwù	èwù	——
S266.	àwòtélè	àwòtélè	——
S267.	òjá (cp.S513)	gèlè	gèlè, ìdíìkù
S269.	yeí	yerí, yarĩ́ĩ̀nì̀	——
S270.	yàyá	èɡbà ɔrũ̀	——
S271.	ùɤò	ìwò	ùwò
S273.	ɛyɔ oɤó	oɤó ɛyɔ	ɛyɛwó
S274.	udɛ udɛɤó	udɛ oɤó	oíɤo~oíwo
S275.	ugbèsè	gbèsè	——
S276.	èè	èrèrè	——

	CY	K
S277. *cost*	iže, ože (amount)	iye
S278. *riches*	ɔlà, ɔrò	olówó (rich person)
S279. *poverty*	òšì, ìkpɔ́jú	òšì, táláká, àbìyà (poor person)
S280. *yam storage barn*	abà, ahéré, ɔgbà išu	abà, abílé, àhárà
S280a. *maize storage barn*	àká	àká
S281. *foam*	híhó	òfùtù
S283. *bamboo*	ɔkparũ	akparõ
S285. *varieties of grass*	koríko, kóoko, èèkõ (= S 52), irõ	kóóko, èèkã, ìyoro, airã, gbégi, ìlósù, òré, sèsé, àkpàkú
S292. *animal traps*	kpàkúté (rat trap, 448+ 251), kpaŋ̄kpé ~ kpáŋ́kpé	àjãkpa (rat trap), kpaákpé , olófà
S295. *rust*	ìkpɛtà	ìdálù kpakpa
S296. *umbrella*	agbòjò, agboòrũ, abụrądà	agba oòrõ
S298. *another*	òmírõ, ìmíì	òmíà
S300. *straight*	gbõrõ, tààràtà	tó, lí òkãkã
S301. *ripe*	kpõ	kpõ
S302. *mature (of fruit)*	gbó	gbó
S303. *old (cp. 120)*	dàgbà (grown up, adult) darúgbó	arúgbó (old person, = 120)
S304. *young*	òdó	òdó
S305. *right (correct)*	béènĩ, o gbà á (you got it right)	báànĩ, ɔ gbà á
S308. *different*	zàtò	yàtò
S310. *male*	akɔ	akɔ
S311. *female*	abo	abo
S312. *hot (as pepper)*	ta	ta

	Onì	Òk	Ɔ̀b
S277.	oyeɤó (amount of money)	oye oɤó	——
S278.	——	ɔlà	——
S279.	tálíkà	òsì	——
S280.	ɔgbà, àká (for cocoyam) abà	ugbà, àká	àkà, ɔgbà
S280a.	awóɛ́	——	——
S281.	èwíwó	èwíwó	——
S283.	ɔkpaõ	ɔkparũ	——
S285.	koíko	koríko	——
S292.	òkpa lósè, òkpa lóõ, líígbàgì	kpàkúté (rat trap)	tàkúté, kpaakpé, èbìtì, ùgĩ
S295.	ìkpáàtà	ìkpɛ̀ɛ̀tà	——
S296.	àmbwélà (<English)	agboòrũ	——
S298.	òwũ̀ɛ̃̀	òmṹrĩ̀	——
S300.	gṹ	gũ	——
S301.	kpã́	kpã	——
S302.	——	gɓó	——
S303.	augbó	darúgbó	——
S304.	ɔmãitõ, kékeé	òdó, ɔmãdé	——
S305.	gbà, (=505)	bɛ́ɛ̀nĩ, o gbàá	——
S308.	yàtò	yàtò	——
S310.	akɔ	akɔ	——
S311.	abo	abo	——
S312.	jà	ta	——

	Onˋ	Okˋ	Obˋ
S313.	lɛ, ɔ̀lɛ (lazy person)	lɛ, ɔ̀lɛ (lazy person)	——
S314.	aɔ (lame person)	arɔ(lame person)	——
S315.	iwĭ (cp. 106)	hĭ́wĭ́	——
S317.	àíjétà	ɨjɛɛ̀ta	——
S318.	ɔ̀tɔ̃́là	ɔ̀tɔ̃́la	——
S327.	jɛ, mɔ̃	jɛ, mɔ̃	——
S328.	rɔ̃́	rɔ̃́	——
S329.	fɔ̃́	fã́	——
S330.	kɔ̃́lɛ̀	kṹlɛ̀	kpã́lɛ̀
S331.	fà	fà	——
S332.	gbã̀ɛ̀	kɔjá, gbã̀rɛ̀	——
S333.	ká	yíkpo	——
S334.	jí	jí	jĭ́
S335.	ʷò	ʷò	wò
S336.	mɛ̃́tí álɛ̀	gbó, mɛ̃́tí hílɛ̀	——
S337.	——	rṹ	rṹ
S338.	tójú	sɔ̃́, tójú	——
S340.	bòí	bòrí	——
S341.	dákú	dákú	——
S342.	yɔ̃́	yɔ̃́	——
S343.	——	dá dòdò	——
S344.	——	kɛ́ɛ̀dṹ, sòfò	——
S347.	gbé lé	tò	——
S348.	——	mũ hínɔ̃́	——
350.	——	bɛ́	——

	CY	K
S351. *float*	lé fòó	fé sójú omĩ
S352. *paddle*	wà	wà
S353. *lock*	tí	há
S354. *cover*	bò	bò
S359. *leak*	jò	jò
S361. *stretch (trans.)*	nɔ̀̃	nã̀
S362. *mould (as, clay)*	mɔ̃	mɔ̃
S363. *weave (as, a mat)*	hũ	hɔ̃
S364. *plait a rope*	hũ	rã
S365. *twist, weave a rope*	ló	rã
S367. *fold*	ká	ká
S368. *shave*	fá, gɛ̀ (trim)	fá
S370. *wash*	fɔ̀	fɔ̀
S372. *bathe*	wɛ̀	wɛ̀
S373. *wrap*	wé ~ we	wé, kpɔ̃́
S374. *tie*	so, dì	dì
S375. *tie headtie (cf.S267)*	wé gèlè	ta erí, ta gèlè
S379. *lay eggs*	žé	yí
S380. *hatch*	kpa	kpa
S381. *curse*	šékpè, gégŭ, fibú	šékpè
S382. *quarrel*	jà (=S 386), yɔ̃ odì	bá ònĩà̀ še òtá
S385. *flog*	nɔ̀̃	nã̀
S386. *fight*	jà	jà
S387. *shake*	mĩ̀, gbò	mĩ̀

	Onì	Òk	Ɔ̀b
S351.	fò	lé òfó, lóòfó	——
S352.	gwà	gwà	——
S353.	tí	tí	——
S354.	bò, dé	bò, dé	bò, dé
S359.	jò	jò	——
S361.	nã̀	nã̀	——
S362.	mã	mã	mɔ̃
S363.	ŋɔ̃	ɤɔ̃	——
S364.	ŋɔ̃	ɤɔ̃	——
S365.	lɔ́	lɔ́	——
S367.	dì	ká	——
S368.	fá	fá	——
S370.	fò, gwè(=486,S372)	fò	fò
S372.	gwɛ̀	gwɛ̀	——
S373.	dì	wé	——
S374.	dì	dì	——
S375.	dì, gbà	wé	——
S379.	yɛ̃́	yɛ̃́	——
S380.	kpa	kpa	——
S381.	šɛ́ èkpè, šéèkpè	sɛ́ èkpè, sékpè	——
S382.	jà	jà, yã odì	gwí ɛjó
S385.	nã̀	nã̀	——
S386.	jà	jà	jà
S387.	jì, gbà owó , gbòwó	gbà	——

	CY	K
S388. *stir*	rò	rò
S389. *turn (cf. S392)*	ǯí, ǯí dà, ǯíkpo	yí, yí dà (flip over; turn round)
S390. *mix*	dá lù, kpò	kpò
S391. *snap, break*	šé, fó, dá	dá
S392. *roll*	ǯí	yí
S393. *crack*	fó, là, há, sṍ (intrans)	sã́ (intrans.)
S394. *grind (cp.S426)*	lò	lò
S395. *pound*	gũ	gu
S396. *grate*	rĩ	rĩ
S397. *mold (as, fùfú)*	šù	šù
S398. *squeeze*	fṹ	fṍ
S399. *peel by hand*	bó	hó
S400. *peel with knife*	hó, bɛ	hó, bɛ
S401. *slice*	ré	gé sí wéwé(cp. 480)
S402. *carve (with wood)*	gbé	gbé
S403. *butcher*	gé, rɛ, mèdúmbú, kpa tà (448+509)	kpa tà
S404. *flay*	fá	ku
S405. *split*	là	là
S406. *fry*	dĩ́	dĩ́
S407. *boil*	bò, sè (cook)	bò, sè (of water)
S408. *burn*	jó	jó
S409. *dry (meat,fish etc.)*	gbɛ, sá, so, yõ	gbɛ, yã
S410. *stab*	gú	gú
S413. *pierce*	gṹ, dá lu	gú

	Onì	Òk	Ɔ̀b
S388.	jì	jì	——
S389.	yí, yíkpo	yí dà	——
S390.	ji kpò	kpò	——
S391.	fó, gwó, kã́	sé, gwó	——
S392.	yí	yí	——
S393.	fó, lè (of voice)	fó, hã́ (intrans.)	——
S394.	lò	lò	——
S395.	gũ	gṹ	——
S396.	rĩ	rĩ	——
S397.	jì	sṳ̀, jì	——
S398.	fṍ	fṍ	——
S399.	bó, wó (cooked yam)	ʁá	——
S400.	bɛ́	wó	——
S401.	gé gwégwé	ré	——
S402.	gbɛ̃́	gbĩ́	——
S403.	láàkpatà (butchering)	rɛ, kpa tà	——
S404.	fó	fá	——
S405.	là	là	là
S406.	dɛ̃́	dĩ́	——
S407.	sè	bò, hè (of water, vegetables)	——
S408.	jó	jó	——
S409.	yã	gbɛ, yã	——
S410.	gṹ	gṹ	——
S413.	——	gṹ	——

	CY	K
S414. *pierce (ear)*	dá lu	lu
S415. *carry child on back*	kpõ̀	kpõ̀
S417. *feed*	yṹ, kpèsè	fú lóńjɛ
S418. *wipe*	nṹ	nõ̀ (clean)
S420. *massage*	wó	tò
S421. *itch*	yṹ	hṍ
S422. *scratch (oneself)*	yṹ	hṍ
S423. *scratch (as fowl)*	tõ̀	tã̀
S424. *pare (nails)*	ré	ré
S425. *draw (water)*	kpõ	kpõ
S426. *sharpen, whet*	gbé, kpõ̀	kpṍ, lò
S427. *sew*	rṍ	rã́
S428. *nail*	kõ̀ nĩ́	kã̀
S430. *escape*	bó, bó lówó	bó, bó lówó
S431. *play*	šeré (še eré)	šaré (še aré)
S432. *praise*	yĩ̀	yĩ̀ gbò
S433. *greet, salute*	kí	kí
S434. *beat (drum)*	lù	lù
S435. *sound (as, drum)*	dṹ	dṍ
S436. *judge (a case)* (*cf. S244*)	dá ɛjó	dá ɛjó
S437. *beg*	bè èbè, bèbè, tooro	bè èbè, bèbè
S438. *pray*	gbàdúrà	gbà àdúrà, gbàdúrà
S439. *speak (a language)*	so èdè, sèdè	so èdè, gbó èdè
S440. *believe*	gbà gbó	gbà gbó
S441. *shout*	kígbe, kégbe	kí igbe, kígbe

	Onˋ	Okˋ	Ɔˋb
S414.	lu	lu	——
S415.	gbé kpãˋ	kpãˋ	——
S417.	mű́ jíjɛ kòó	mű́ ejíjɛ ŋũ	——
S418.	nɔ̃̀	nɔ̃̀	——
S420.	ra	gwó	——
S421.	yɔ̃́	yɔ̃́	——
S422.	yɔ̃́	yɔ̃́, ɤɔ	——
S423.	gwalɛ̀	ya	——
S424.	ré	ré	——
S425.	kpã	kpã́	——
S426.	lɔ̀	lɔ̀	——
S427.	rã́	rã́	rã́
S428.	gbá	kãˋ	——
S430.	bó	bó	——
S431.	šié (še ié)	siré (se iré)	——
S432.	yɛ̃̀	yɪ̃̀	——
S433.	kí	kí	——
S434.	lù	lù	——
S435.	dɔ̃́	fò	——
S436.	dá ɛjó	dá ɛjó	——
S437.	bɛ̀	bɛ̀ ɛ̀bɛ̀, bɛ̀bɛ̀	——
S438.	gbàdúà	gbàdúrà	gbàdúrà
S439.	fɔ ɛ̀dɛ̀, fɛ̀dɛ̀	fɔ̀ ɛ̀dɛ̀, fɛ̀dɛ̀	——
S440.	gbà gbó	gbà gbó	——
S441.	ké, kédɛ̀ (ké +413)	ké elɛ̀, kélɛ̀	ké, kígbe

	CY	K
S442. *command*	kpa aš̌ɛ	kpa àš̌ɛ, kpàš̌ɛ
S443. *measure (length, quantity)*	wɔ̀̃	wɔ̃̀
S445. *choose*	yɔ̀̃	yɔ̀̃
S446. *fear*	bà ɛ̀rù, bɛ̀rù	bɛ̀rù
S447. *be afraid*	bɛ̀rù, fòžà, mĩkɔ̀̃	fo àyà, fòyà
S448. *please*	tɛ́ lórũ̀	tɛ́ lórɔ̃̀
S449. *desire (cp. 477)*	fɛ́	fɛ́
S450. *love*	fɛ́rɔ̀̃	fɛ́rɔ̀̃
S451. *resemble*	jɔ	jɔ
S452. *imitate*	farawé, sĩjɛ	farawé
S453. *hate*	kó ìríra	kó ìríra, kórĩrā
S454. *count*	kà	kà
S455. *follow*	tɛ̀lé, tɔ̀ lɛ́hĩ̀, tɔ̀ lɛ́yĩ̀	tɔ̀ nĩ́hĩ̀
S456. *meet*	kpàdé, bá (catch up with)	kpàdé, bá
S457. *gather*	kpè jɔ, kó jɔ	kó jɔ
S458. *join*	so,di, so kpɔ̀	so kpɔ̀
S459. *rock (to and fro)*	mĩ̀	rú tɛ́,rɛ̀
S461. *demolish*	wó lulɛ̀, kpa rũ	wó
S462. *thatch (roof)*	bò (=S 354)	bò (=S354)
S463. *plaster (wall)*	rɛ́	rɛ́
S464. *mud (wall)*	rɛ́	rɛ́
S465. *melt*	žɔ́	yɔ́
S466. *congeal*	di, sũ̀	sù
S467 *dissolve*	žɔ́	fɔ́

Ọn	Ọk	Ọ̀b
S442. kpàǎɛ	kpa àsɛ, kpàsɛ	——
S443. wã̀	wã̀	——
S445. yã̀, šã̀	yã̀	——
S446. bɛ̀ù	bɛ̀ ɛ̀rṳ̀, bɛ̀rṳ̀	——
S447. bɛ̀ù	bɛ̀rṳ̀	——
S448. tɛ́ ɔ̀	tɛ́ nɔ̃́rɔ̀	——
S449. tɔ́sí	fɛ́	——
S450. fɛ́ã̀	fɛ́rã̀	fɛ́ɛ̀rã̀
S451. jɔ	jɔ	——
S452. àfaawé	mṹ ara wé, mã́ra wé	——
S453. àìfɛ́ã̀ (neg of S450)	kó ɛ̀ríra, kɛ́ɛ̀ríra	——
S454. kà	kà	kà
S455. tɛ̀lé	fi tìí	——
S456. kpàdé	kpàdé, bá	——
S457. kó jɔ, gba jɔ	kpè jɔ, kó jɔ	——
S458. so	ho kpɔ̀	so, so kpɔ̀, sã, sã kpɔ̀
S459. ——	mĩ̀	——
S461. gwó	gwó	——
S462. mã ewé	tɛ́ ɔ̀rùlé	——
S463. rɛ́	rɛ́	——
S464. mã (=S362)	mã (=S362)	——
S465. yɔ́	yɔ́	——
S466. dì	dì, hṹ	——
S467. yɔ́	rɛ	——

	CY	K
S468. *shine*	dɔ̃́, tɔ̀̃, rɔ̀̃	dɑ̃́, rɑ̀̃
S469. *cure*	wò sɔ̀̃ (S 335+367)	wò, sɑ̀̃
S470. *heal (of wound)*	jinɔ̃́	jinɑ̃́
S471. *plant*	gbì̃	gbì̃
S472. *sow*	fú irúgbì̃	fɔ̃́ èso
S474. *clear the bush*	sũ ìgbɛ́, šɔ̃́ oko	sɔ̃ ìgbɛ́, šá, gbá, gú oko
S475. *pay someone*	sɔ̃ owó, sɔ̃wó	sɑ̃ owó
S477. *bargain*	nɔ̃́	yɔ wó
S478. *endure*	ró ojú	ró ojú, rójú
S479. *try*	gbì̃yɔ̀̃ jú, dɔ̃́ wò	gbì̃yɑ̀ jú, dɑ̃́ wò
S480. *be able*	lè	lè
S481. *know how to*	mɔ̀̃	mɔ̃̀ í
S482. *hunt (cf. 129)*	dɛ ɔdɛ, dɔdɛ, še ɔdɛ, šɔdɛ	še ɔdɛ, šɔdɛ
S486. *set trap*	dɛ tàkútɛ́	dɛ kpaákpɛ́
S488. *'dash' (cp. 506)*	fṹ nĩ́	fú
S489. *contribute*	dá	dá owó
S492. *flow (as, river)*	šɔ̀̃	šɔ̀
S493. *worship*	sì̃, bɔ	sì̃, bɔ
S494. *swear, curse*	šɛ́ èkpè	šɛ́ èkpè
S494a. *swear (before God, in court)*	bú ara, búra	bú ara, búra
S495. *complete, finish*	še tɔ̃́, kparí	tɑ̃́
S496. *be left, remain*	kù, šɛ́ kù	kù, šɛ́ kù
S497. *swell*	wú	wú

	Ọǹ	Ọ̀k	Ɔ̀b
S468.	tà̃ yãyã	dá̃, tà̃	——
S469.	sà̃, ɤò	ɤò sà̃	——
S470.	jiná̃	jiná̃	——
S471.	gbɛ̃̀	gbĩ̀, bò usu (S354+275)	gbɛ̀
S472.	——	fɔ́ èho	——
S474.	kpa oko	sá̃ koríko, gbĩ́ oko	——
S475.	sã	hã	——
S477.	ná̃	ná̃	——
S478.	——	ró ojú, rójú	——
S479.	šé ɤò (test)	gbìyà̃ jú, dá̃ ɤò	——
S480.	lè	lè	——
S481.	mà̃ í	mà̃ á̃	——
S482.	še ɔdɛ, šɔdɛ	se ɔdɛ, sɔdɛ	dɛ ɔdɛ še ɔdɛ
S486.	dɛ̀ ɔkpà	dɛ kpàkúté	——
S488.	mű̃ kò	mű̃ ɤű̃	——
S489.	dá̃ si	dá̃	——
S492.	——	sà̃	——
S493.	sɛ̃̀	hɛ̃̀, bɔ	——
S494.	——	sɛ́ èkpè	——
S494a.	búa	búra	——
S495.	kpaí	se tá̃, kparí	——
S496.	kù	sɛ́ kũ̀	——
S497.	lála	wú	——

	CY	K
S498. *wither*	rɔ	rɔ
S499. *change*	kpààrɔ̀, ží kpadà	kpàírɔ̀
S500. *point*	tɔ́ ìka, tɔ́kã̀	nã̀ owɔ́ sí (point at)
S501. *fit, suit*	bá mũ, še régí	bá mɔ̃
S502. *be present*	wà níbɛ̀	wà
S503. *stay, owell*	gbé	gbé
S504. *entertain*	še lálɛ̃jɔ̀ (430+127)	še àlejɔ̀
S505. *vomit*	bì	bì
S507. *look for*	wá	wɔ̀ (= S335)
S508. *breathe*	mí	mĩ́
S527. *file*	kpɔ̃́, yũ̀ (ayũ̀ noun)	yɔ̃̀ (ayɔ̃̀ noun)

	Ɔn	Ɔk	Ɔb
S498.	rɔ	rɔ	——
S499.	yí kpadà	kpààrɔ̀, yí kpadà	——
S500.	nã̀ ɔwɔ́ sí, nã̀wɔ́ sí	nã̀ ɔwɔ́, tɔ́kã̀ hí	——
S501.	yɛ	bá mɔ̃́	——
S502.	ɤa	ɤa nĩ́bɛ̀	——
S503.	ɤa nĩ́	gbé	——
S504.	fɛ́ ŋ̀ŋ̀kã kò, fɛ́ ŋ̀kò	se àlejò	——
S505.	bì, kpɔ̀	bì, kpɔ̀	——
S507.	fɛ́ (cp.477,S449)	fɛ́	gwá
S508.	mĩ́	mĩ́	mĩ́
S527.	——	yɔ̃̀ (ayɔ̃̀ noun)	——

APPENDIX II.

I. Nouns of the shape eCa (CV) and oCa (CV), as listed in Abraham (1958). Note: there are a number of nouns of the shape eeCV and ooCV, but these are analyzed as having an underlying form /$\left\{\begin{matrix}e\\o\end{matrix}\right\}$ CiCV/ or /$\left\{\begin{matrix}e\\o\end{matrix}\right\}$ C_1 $V_2C_1V_2$ /. Their analysis and derivation is discussed in Courtenay (1968, 55-60).

eCa(CV)

èjánṹ = ìjánṹ = àjánṹ (< já *snap* + inṹ *insides*) *peevishness, irritability*

erá(<rá *cause to disappear*) e.g. ó já sí erá *he disappeared*

èya ɔwɔ́ (< ɔwɔ́ *hand, arm*) *hangnail*

oCa(CV)

Obámájà *a title*

odáró = aláró = arɛró (< ?dá + aró *indigo used in dyeing*) *dyer*

òlàjà = ɔlàjà = onĭlàjà (< là *split*) *conciliator*

òrayè = òṳ̆rayè (< ra *perish*) *a fool*

II. Nouns of the shape aCi (CV) and aCu (CV) in eight dialects of Yorùbá. Cf. chapter 3, sec. 3.3.

		CY	K	Oǹ	Ìf
36.	*jr. sibling*	àbúròò	àbúròò	àbúòò	àbú
74.	*armpit*	abíyá	abíyá	abíyá	abíyá
107.	*sweat*	òógũ̀	òógù	aífú	àfífó
120.	*old person*	arúgbó	arúgbó	àgbàlagbà	àgbàlagbà
206.	*chameleon*	òga, agɛmõ	òga	aìyo	ariro
235.	*sheep*	àgùtõ̀	àgùtã̀	àgũ̀tã̀	àgõ̀tà
247.	*chicken*	adìɛ, adìrɛ	edìɛ	ajìɛ	adìyɛ
248.	*cock*	àkùkɔ	àìkɔ	àkìkɔ	àkìkɔ
287.	*oil*	ekpo, àdí,àdǐ	ekpo	ekpo	ekpo
316.	*sickness*	àìsõ̀	àìsã̀, àrõ̀	àìsã̀,àbòí	àìsã̀
		(Note: ai- is bimorphemic. Cf. Courtenay (1968,25) for discussion)			
S46.	*ward, quarter*	àdúgbò	àgó	àdúgbò	——
S167.	*lamp*	àtùkpà	àtùkpà	àtùkpà	——
S175.	*fish net*	àwõ̀	àwõ̀, àdù	——	——
S224.	*flag*	àsíá	àsíá	àsíá	——

	Ok	Ak	ɔw	ɔb
36.	àbúrò	àbó	——	àbúrò
74.	abíyá	abíyá	——	abíyaká
107.	àfífó	oógũ̀	——	òógũ̀
120.	arúgbó	arúgbó	——	arúgbó
206.	aríro	——	——	aíro
235.	àgũ̀tã̀	——	——	àgùtã̀
247.	ɛdiyɛ	adiyɛ	adiɛ	ajiɛ
248.	àkùkɔ	——	——	àkikɔ
287.	ekpo	ekpo	——	ekpo
316.	àbòrí	àisã̀	——	àisã̀
S46.	àdúgbò	——	——	——
S167.	àtùkpà	——	——	——
S175.	——	——	——	——
S224.	àsíá	——	——	——

III. Nouns of the shape ɛC{$^{i}_{u}$}(CV) and ɔC {$^{i}_{u}$}(CV), as listed in Abraham (1958).

The sequences ɛmi, ɛni, ɛmu, ɛnu, ɔmi, ɔni, ɔmu, and ɔnu are omitted since the stem vowels are analyzed as the systematic phonemic nasal vowels /ĩ/ and /ũ/ (cf. chapter 3, sec. 3.4). For a discussion of this list, see chapter 1, p. 47, fn. 32.

ɛCi(CV)

èbí (< è + bí *give birth to*) e.g. agbɛ̀bí *midwife*

èbi (< è + bi obsolete verb meaning *possibly do evil, be evil*) *guilt*

ɛbí (< ɛ + bí *give birth to*) *blood-relation*

èbìlì *snare for animals*

èɡi *isolated place*

ɛki agbàràjù *variety of tree*

èkìri *wild goat*

èlírí *type of tiny mouse*

èrí (< è + rí *find, see*)*evidence*

èèrí dòdò dòdò *hawker's cry*

ɛrikpa *place-name*

èsíèlè *title of person in king's palace*

ɛtì (< ɛ + tì *unable to*) *impossibility*

ɛwìrì *bellows*

èyi (< è + yi *tough*) *hardening of the skin, with itching*

ɛCu(CV)

ɛbu *place where palm oil is extracted*

èbùrú *short-cut*

èdú Àjàdí èdú, *an Oríkì name*

èfúùfù *wind* (ideophone?)

ègúsí *melon seeds*

ɛhuru *bird of the goose family; type of worm*

ɛkù *territory under the jurisdiction of a ruler*

ɛkù *rope snare*

èkú (< è + kú *die*) *costume worn by Egũgũ*

èkukù *type of viscous vegetable*

èkùlù *type of bird*

èlú *indigo*

èlukú (= Àlukú) *type of Egũgũ*

èluùlú *the Senegal Coucal (larkheeled cockoo)*

ɛ rù (< ɛ + rù *carry*) *load, baggage*

ɛrú *slave*

èrù *fear*

èrú (< è + rú *haft*) *haft* (noun)

èèrù *Ethiopian Pepper*

ɛrùgũ *name of a ceremony*

ètù *gunpowder*

ɛtù *guinea fowl*

ɛtù *type of cloth*

ɛtu *Maxwell's duiker*

ɛwù (< ɛ + wù *please*) (= ìwù) *a pleasurable feeling*

èwù (? < è + wù *please*) *clothing, shirt*

ɛwuru *type of animal trap*

ɔCi(CV)

ɔ̀fíìsì (< English) *office*

ɔlidé (< English) *holiday*

ɔsikpítù (< English) *hospital*

ɔtí *liquor*

ɔCu(CV)

ɔ̀dù (the cross-reference is to ɔ̀dù ɔ̀yà *large cane rat.* Cf. pp.505, 533)

APPENDIX III

Principal Informants

Common Yorùbá	Mrs. Àìná Fáyìnmínù. Teacher, St. Anne's Grammar School, Ibadan, and researcher, Institute of African Studies, University of Ibadan. Age 24. Home town: Abeokuta. Lived in Ibadan 1948-1961, Lagos 1962-1964, Ibadan 1965-.
Kétu	Mr. Augustine Adélékè. Student, St. Leo's Teacher Training College, Abẹokuta. Age 23. Home town; Mẹkọ. Lived in Mẹkọ until 1961. Returns home frequently and maintains farm there.
Òndó	Mr. Moses Aṣore. Student, Comprehensive High School, Aiyetoro. Age 16. Home town: Ondo. Lived in Ondo until 1967. Returns home on school vacations.
Ìfàkì	Miss Catherine Agúnbíadé. Graduate of Methodist Girls' High School, Ifaki. Age 19. Home town: Ifaki. Has lived in Ifaki all her life.
Òkìtì Kpukpa	Mr. Fidelis Olúṣọlá Ọlágbègì. Student, Comprehensive High School, Aiyetoro, Age 19. Home town: Okiti Kpukpa. Lived in Okiti Kpukpa until 1966. Returns home on school vacations.
Àkúré	Miss Yínká Béjidé. Student, Comprehensive High School, Aiyetoro. Age 19. Home town: Akurẹ. Lived in Akurẹ until end of primary school.
Ọ̀wọ̀	Miss Kéhìndé Atítčhí. Student, Comprehensive High School, Aiyetoro. Age 21. Home town: Ọwọ. Lived in Ọwọ until 1965. Returns home on school vacations.
Ọ̀bà	Mr. Lucas Bámikiyà. Student, University of Ibadan. Age 34. Home town: Ọba. Maintains home in Ọba.