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Ọlasope Oyediji Oyelaran

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YORUBA PHONOLOGY

A DISSERTATION

SUBMITTED TO THE DEPARTMENT OF LINGUISTICS

AND THE COMMITTEE ON GRADUATE STUDIES

OF STANFORD UNIVERSITY

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

By

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September 1970

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I certify that I have read this thesis and that in my opinion it is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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Whatever inadequacies this work may contain, they remain my sole responsibility, not of those from whose suggestions I have benefited so much.

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INTRODUCTION

When we began our investigation into the phonology of Yoruba, our original purpose was to collect enough material from existing descriptions of the language as part of the data for a constractive phonological study of Yoruba and French. We had assumed that Yoruba, being one of the most intensively studied of the African languages, would not have to be freshly analyzed. But our investigations showed that existing descriptions of Yoruba contained accounts which could not be considered adequate for Yoruba. In addition, certain observations about phonological facts of Yoruba raise questions about certain assumptions of phonological theory. The present study, then, is an attempt to explain those aspects of the phonology of Yoruba earlier accounts of which appear to be inadequate either because of certain theoretical assumptions, or because certain observations about the language have been overlooked or misinterpreted.

This study, however, is not just an inventory of problems in Yoruba phonology. Rather, we attempt to present a phonological description of the language, treating each issue, either in phonological theory, or in the phonology of Yoruba, in its appropriate place.

The study consists of eight chapters. Chapter I is a brief statement about the model of description we are employing. This chapter merely presents the essential feature of the model. For an explicit account, reference must be made to the sources cited.

Chapter II introduces the Yoruba language. Chapter III presents the phonological units of Yoruba: the segments, the distinctive features, and their definitions. This chapter does not state how we arrive at

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these units, nor is this stated anywhere else in the study. In this respect, we have used earlier descriptions of the language for heuristic purposes as will be observed throughout the study. We have also exploited own native speaker intuition, and have supplemented both of these sources with data from other native speakers, and from literary works in Yoruba.

Chapter IV states the restriction on the feature composition of Yoruba phonological segments, and the sequential restrictions on the formatives of the language. Chapter V states the phonological rules that account for the pronunciation of the variety of Yoruba commonly understood all over the Yoruba speaking area of West Africa. Chapters VI and VII deal with theoretical issues. VI considers the phonetic realization of tone registers, and how it should be handled within an integrated phonological theory. VII discusses the implications, for liquids and nasal consonants, of introducing the feature [±syllabic] into phonology. It then reconsiders the phonological status of both in Yoruba, as this is still a burning issue in the description of the language.

Other issues--feature definition, contraction, and consonant deletion in Yoruba, etc.--need not be enumerated here but are taken up in later chapters beginning with Chapter III.

One thing, however, will be found to be conspicuously missing in this study: that is, the phonology of the utterance, or, in Praguian terminology, "la phonologie de la parole." We presume that a treatise--and a treatise it has to be--on the phonology of the utterance must include and, in fact, center around sentence intonation. If it is true as Bierwisch (1965) suggests, that phonological properties of elements

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of proper bracketing do contribute in a principled way toward a global sentence intonation, then, it is essential to have a precise notion of what these properties are, with specific reference to each element. It is one of the goals of the present study to provide this kind of information. That is to say, to the extent that the information provided in this study on specific aspects of Yoruba is verifiable and explanatory, to that extent shall we be prepared to embark on a study of the phonology of the utterance in Yoruba. Perhaps such a study will throw some light on sentence intonation in other related languages that are also tonal.

The following is a list of symbols used throughout the study.

List of Symbols[1]

Conventional Notations

SY: abbreviates "Standard Yoruba."

Italics is used for non-English orthography: *apá*;

Single quotes mark off glosses in English: 'arm';

Parallel vertical lines are used for phonetic representations: |ākpá|

Parallel diagonal lines are used for underlying, or systematic phonemic representations: /akpá/

→ "Rewrite as, goes to,": A → B. Rewrite A as B.

/ 'In the environment of'. A → B/X___Y, is interpreted as 'Rewrite A as B when A is preceded immediately by X and followed immediately by Y.

---

1. The format of the inventory of items in here is inspired by Schane's in his French Phonology and Morphology. (M.I.T. Press, Cambridge, Mass. (1968)).

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( ) In rules, parentheses are placed around optional elements, thus: A → B/____(C)V, is interpreted as rewrite A as B when followed by either CV, or V. The example just given is equivalent to rules

a) A → B/____CV.

b) A → B/____V.

In transformational generative grammar, rules abbreviated by means of parentheses are said to be disjunctively ordered. That is to say, during a given transformational cycle, if any one of the rules in the expansion of the schema applies, then no other rule of the expansion can apply in that cycle. Thus in the expansion above, if a) applies in a given cycle, b) cannot, and vice versa.

{ } Braces are placed around disjoint elements: $A \rightarrow B/X\_\_\_\begin{matrix} C \\ V \end{matrix}$.

This is equivalent to the rules c) A → B/X____C.

d) A → B/X____V.

Rules abbreviated by this schema are said to be conjunctively ordered. That is, in a given transformational cycle, after c) applies, d) can still apply, provided that the Structural Description of the string meets the condition under d).

[ ] Square brackets enclose bundles of phonological features; thus

$\begin{bmatrix} F_1 \\ F_2 \\ \vdots \\ F_\eta \end{bmatrix}$ specifies a phonological segment whose features are $\alpha_1 F_1$, $\alpha_2 F_2 \ldots$, $\alpha_\eta F_\eta$, where the value of α is '+' or '-'.

← "Is derived from": A ← B, is interpreted as A is derived from B, or B is the source of A.

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* As superscript preposed to any element indicates that that element is not attested. Thus Yoruba *Zawndz means that the utterance is unattested in Yoruba.

= Morpheme boundary marker. |oní=àdá| where oni is an 'associative morpheme' in Yoruba, and àdá matchet is another.

\+ Word boundary. |+oní=àdá+| 'one who owns (a) matchet'.

\# Phrase boundary. |#+oní=àdá+lɔ́#|. 'One who owns matchets went'.

< > Angled brackets. As in $\begin{bmatrix} X \\ \langle Y \rangle \end{bmatrix}$. This refers to all segments with the property X, and the subset of these with the additional property Y. Thus the following rule states that all nonsyllabic liquids, nasals, and glides are non-low, non-back; but of these, only liquids and nasals are necessarily anterior and non-high.

$$\begin{bmatrix} +\text{sonorant} \\ -\text{syllabic} \\ \langle +\text{consonant} \rangle \end{bmatrix} \rightarrow \begin{bmatrix} -\text{low} \\ -\text{back} \\ \langle [+\text{anterior} \\ -\text{high}] \rangle \end{bmatrix}$$

α, β, Variables with the coefficients "+", or "-":

I $F_1 \rightarrow \alpha F_1 / \text{------} \alpha F_2$, is interpreted as "If the feature F_2 is +, then the F_1 immediately preceding it is +; if F_2 is -, then F_1 is -.

II II asserts that if F_2 has the value "+", then F_1 has the value "-", and vice versa.

Consonant Symbols

Standard IPA: t k kp b d g gb f s z ʃ ʒ j

m n ɾ l h j w

In place of Standard IPA: ʃ ʒ j we use

š ž y̌ respectively.

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These substitutions are for purely typographical convenience.

C: Canonic notation abbreviating a bundle of phonological features dominated by [+Consonantal].

Vowel Symbols

Standard IPA: i e ɛ u o ɔ a ĩ ɛ̃ ɔ̃ ũ ã

V: Canonic notation abbreviating a bundle of phonological features dominated by [+syllabic].

´ Placed over a segment indicates a high tone. In feature format, the high tone is symbolized [+H].

` Similarly marks a segment as low-toned [+L].

- Marks a segment as mid-toned $\begin{bmatrix}-H\\-L\end{bmatrix}$.

All tone notations are placed over the segment to which they are inherent.

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CHAPTER I

THEORETICAL FOUNDATIONS

1.1 The model of grammar adopted in this study is the interpretive transformational generative (TG) model developed by Chomsky (1965, 1968, 1969).[1] The view of phonology reflects the version of phonological theory within the interpretive model as is contained in Stanley (1967)[2], Postal (1968)[3], and Chomsky and Halle (1969).[4]

The interpretive model assumes that a grammar is a system of rules that expresses the correspondence between sound and meaning (Chomsky, 1969). This refers "both to the system of rules represented in the mind of the speaker-hearer, a system which is normally acquired in early childhood and used in the production and interpretation utterances, and to the theory that the linguist constructs as a hypothesis concerning

---

1. Chomsky's model is now referred to as the Standard Theory, and is developed in the following works: Aspects of the Theory of Syntax (M.I.T. Press, 1965); Sound Pattern of English (Harper and Row, 1968); and "Deep Structure, Surface Structure, and Semantic Interpretation" (Reproduced by the Indiana University Linguistics Club, January, 1969). A different model of the TG has been proposed by Charles Fillmore (1968), J. D. McCawley (1968a, 1968b, and 1969), G. Lakoff (1968), and William Chafe (1967). (See bibliography.)

   The criticisms of the Standard Theory which have led to the proposal of the new model are directed specifically against the Standard Theory's conception of the place and function of the semantic component of grammar. In phonology, the net effect of modifications proposed by recent works has been to enrich the original TG model, so that one can still point to only one model of TG phonological component of grammar.

2. "Redundancy Rules in Phonology" (Language, 43, 2 (1967), 393-436).

3. Aspects of Phonological Theory (New York, 1968).

4. The Sound Pattern of English (Harper and Row, 1968).

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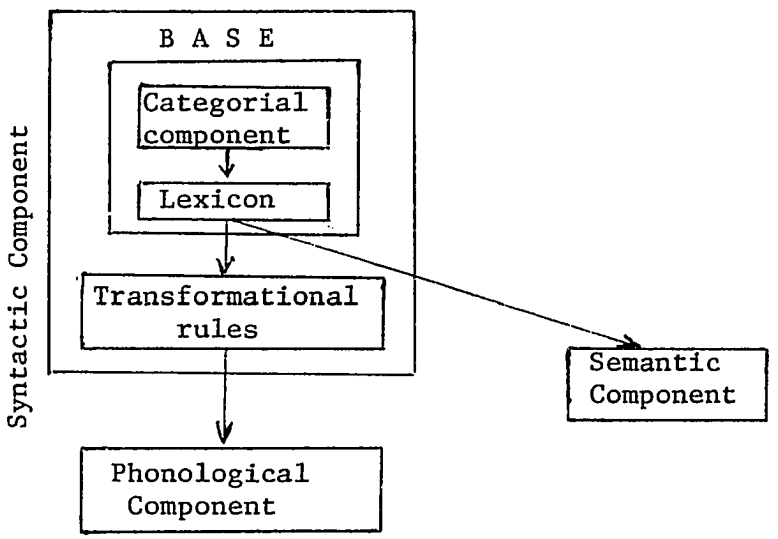
the actual internalized grammar of the speaker-hearer" (Chomsky and Halle, 1968, p. 4).

A grammar consists of three components: the syntactic component, the phonological component, and the semantic component. Schematically, this is represented as follows:



The syntactic component (as in the chart above) is made up of a base and a set of transformational rules. The base itself has two subcomponents, namely, a categorial component, and a lexicon. The categorial component is a set of rules which defines the grammatical function and order of constituents, while the lexicon is an inventory of formatives plus the contextual features which determine how lexical items can be entered into structures specified by the categorial component. The output of the categorial component and the lexicon is the deep structure.

The rules of the categorial component are of the following type:

1. S → NP AUX VP

   VP → V(NP)

   AUX → (Modal) Tense,

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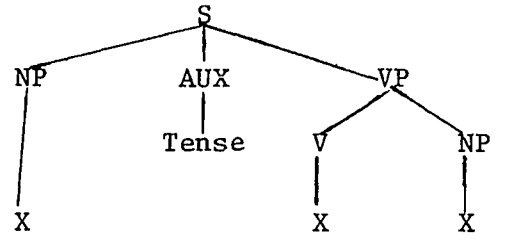
so that before lexical insertion, a structure representable with a tree (Phrase-Marker) as in (2) is specified by the categorial component.

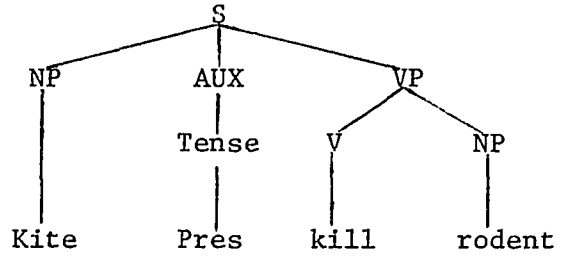
2.



X is a dummy symbol

The lexical insertion rules substitute for the dummy symbols appropriate morphemes that meet all the features specified in the last nodes of (2) provided by (1). Thus (2) after lexical insertion is converted into (3).

3.



(3), then, is the deep structure phrase-marker underlying the sentence "Kites kill rodents." The transformational rules perform operations such as deletions, permutation, and other operations on deep structures of the type of (3) to convert them into "surface structures," that is, into more superficial structures.

The structure of the semantic component is still poorly understood. But it is assumed to be a system of rules which assigns a semantic interpretation to the phonological representation of each syntactic description specified by the syntactic component and by another set of rules referred

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as readjustment rules (see below). Since it is now recognized that the surface structure also contributes to the semantic interpretation of syntactic descriptions, the connection between the semantic and the syntactic components in the chart above is only tenuous.

The phonological component of grammar is itself a system of rules. These rules (P-rules) apply to a surface structure and assign "to it a certain phonetic representation drawn from the universal class provided by general linguistic theory" (Chomsky and Halle, p. 9).

The following is a summary of how the grammar works. An abstract phrase-marker (P_1), like (1) above, specified by the categorial component serves as input into the lexical component of the base. The post-lexical structure (P_i), for example (2), is the deep structure. P_i is the input into the transformational subcomponent. The terminal string after the application of a given set of transformational rules (T-rules) is the surface structure (P_n). A structural description on the surface structure level is a string of formatives subdivided into 'phrases', each being a certain continuous substring of the string of formatives. The analysis of strings into phrases is a 'proper bracketing' in the sense that phrases can overlap only if one is contained in the other. (Chomsky and Halle, p. 7). In order, however, to "be appropriate for the rules of phonological interpretation" P_n must undergo another set of rules referred to as readjustment rules.[5] The output of these rules is a still more superficial structure analyzed into phonological phrases, or as Chomsky and Halle (1968, p. 10) put it:

---

5. Presumably, readjustment rules apply somewhere before P-rules. It is not clear, however, whether they constitute a set within the syntactic component or a set within the phonological component but distinct from the set of the P-rules. Since the output of the readjustment rules is the phonological representation which serves as input into both the semantic and the phonological component (see footnote 6) the second possibility appears to be ruled out.

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> ...It appears that the syntactic component of the grammar generates a surface structure S which is converted, by readjustment rules that mark phonological phrases and delete structure, to a still more superficial structure S'. ...These readjustment rules may somewhat modify the labelled bracketing of surface structure. They may also construct new feature matrices for certain strings of lexical and grammatical formatives.[6]

1.2 Phonological Component: Morpheme Structure Rules

Prior to Stanley's (1967) work, characterizations of the lexicon assume that lexical formatives are incompletely specified, that is, that they are specified only with respect to those (syntactic, semantic, phonological) features[7] which are not predictable. They assume further that in order for the phonological rules to apply to any item, that item must be completely specified, because only a complete specification assures that an item meets all the conditions under which the rules apply.

---

6. The following is Chomsky's latest statement of how the grammar works (1969, p. 35)

   base: $(P_1, \ldots, P_i)$ (P_1 the K-initial, P_i the post-lexical (deep) structure of the syntactic which is a member of K)

   transformations: $(P_i, \ldots, P_n)$ (P_n the surface structure; $(P_1, \ldots, P_n)$ K)

   phonology: $P_n \rightarrow$ phonetic representation

   semantics: $(P_i, P_n) \rightarrow$ semantic representation (the grammatical relations involved being those of P_i, that is, those represented in P_1).

   Notice, incidentally, that it is, strictly speaking, not P_n that is subject to semantic interpretation but rather the structure determined by phonological interpretation of P_n, with intonation center assigned.

7. Syntactic features are categories such as Noun, Verb, Adjective, etc.; semantic: [±animate], [±count], [±human], etc.; phonological: "consonantal","syllabic", "high", etc. In addition to these, lexical items are also specified for rule features which state exceptions to particular rules.

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The features which have not been included in the lexical entry are filled in by a set of rules called redundancy rules. Thus, before the applications of the redundancy rules, a formative is a lexical entry in the form of an incompletely specified matrix.[8] After the application of the rules each lexical entry contains fully specified features which determine the phonetic form of the item in all contexts.

The redundancy rules are usually referred to as Morpheme Structure Rules (MS rules, henceforth). There are two types: the segment structure rules (SgS rules), and the sequence structure rules (SqS rules). A SgS rule is context free, and makes a statement about the feature composition of individual phonemes, that is, it gives information about the phonological redundancy of systematic phonemes in isolation. The following would be a SgS rule for Yoruba.

1. $[+\text{syllabic}] \rightarrow \begin{bmatrix} -\text{cons} \\ -\text{cor} \\ -\text{ant} \\ -\text{lateral} \\ +\text{continuant} \\ +\text{sonorant} \end{bmatrix}$

This is an instruction to specify the matrices of all vowels with the coefficient of the features indicated on the right hand side of the arrow in 1. In the lexicon, then, the features on the right hand side need not be specified, because they are entirely predictable from the feature [+syllabic].

---

8. See below (1.7) on the controversy about the representation of the unspecified features. The question is whether the unspecified features should be left blank, or represented with zero. In the latter case, how does one prevent zero from being considered a third value, in addition to "+", and "-" of the specified features?

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A SqS rule, on the other hand, is context sensitive. It makes a statement about possible sequences of phonemes, that is, about a redundancy due to sequential constraints. 2, for example, would be a SqS rule for Yoruba:

2. $[+\text{syllabic}] \rightarrow [-\text{nasal}] / \left[\underline{\quad}\right]_{\text{MORPH}}$

Rule 2 states that a vowel in the morpheme initial position must be non-nasal. In the lexicon, then, all morpheme initial vowels are simply entered as [+syllabic], and the feature on the right hand side of the arrow which is considered redundant, are not specified.

1.3 Morpheme Structure Conditions

Stanley (1967) proposes that MS rules be replaced with Morpheme Structure Conditions (MSC). The MS conditions have certain advantages which recommend them (especially for the purpose of the present study) over the MS rules. In contradistinction to MS rules, MS conditions suggest that lexical entries may be fully specified with regard to features. We shall see soon the implications of this suggestion if it is adopted.[9]

Stanley explains the principle underlying the MS conditions as follows:

> ...To say that a certain fully specified matrix is highly redundant in some language is actually to say that many of its feature values are interrelated in ways determined by the constraints of the language,

---

9. See especially 1.71.

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> and it is simply the statement of these constraints (in the MS conditions) which constitutes the most natural characterization of the redundancy of the language.[10]

There are three types of MSC: If-then Conditions, Positive Conditions, and Negative Conditions.

The "If" (I(C)) part of an if-then condition is parallel to the structural description (SD) part of a transformational rule (or to the left hand side of a MS rule), while the "Then" (T(C)) part corresponds to the structural change of a transformational rule (or to the right hand side of a MS rule). But there is a functional difference between a MS condition and a MS rule. For example, (3) restates (1) in "If-Then" format.

---

10. Op. cit. p. 435. Typical of the interrelationship which Stanley has in mind here is that of entailment. For example, in Yoruba, the presence of [+consonantal] entails that of [-syllabic], and [+H] entails [+syllabic] in any segment.

    In Stanley's original proposal there is a theoretical option to have a dictionary in addition to a lexicon. In the dictionary, entries will be incompletely specified as in the earlier version. Then, MSC's can function like the MS rules to convert a dictionary into a corresponding lexical entry. However, Stanley does not make clear the advantage of this extra representational level. It may be that he is allowing for the extra level in order to accommodate the theory of Markedness which is still being investigated. In this study, we limit ourselves to the lexicon, and instead of using MSC's as blanking-filling rules, we assume that

    1. they define the set of systematic phonemes (in lexical representations);
    2. they define the set of allocable sequences of "possible morphemes."

    We are grateful to Dr. Richard A. Diebold for passing on to us Stanley's Nov. 1, 1968 mimeographed handout, "Redundancy and Unmarkedness in Phonology" (U.C. Berkeley Linguistics Colloquium).

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3. I(C): [+syl]
   ↓↓
   I(T): [-cons, -cor, -ant, -lat, +cont, +son]

While (1) is an instruction for filling in blanks, (3) states the interrelationship between the feature value in the "If" and those in the "Then" parts.[11] (see footnote 10)

Each positive condition is simply an incompletely specified matrix. Its use is limited to stating the constraints on the permissible sequences of segments. (4) is a positive condition which abbreviates (5), where both happen to make a statement about the fundamental structure of Yoruba formatives, namely, that a Yoruba formative may consist of a single vowel, or of an alternation of consonant and vowel (theoretically) to any length. A consonant is never the last segment.

4. P(C): $[(C)V(CV)_o]_{FORM}$

5. P(C): $[[(+cons)][+syl]([+cons][+syl])_o]_{FORM}$

The third type of MS condition is the Negative Condition, abbreviated N(C). A negative condition for a language L states simply that all matrices that meet its specifications do not occur in L, and so must be considered not well-formed for L. (6) is a negative condition for Yoruba.

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11. Ibid. The vertical double arrows may be interpreted to mean "entail" where I(C) is an incomplete specification of a submatrix, and T(C) the complementary specifications of submatrices of the same set of matrices to which I(C) belongs.

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6. N(C): $\sim\left[\begin{matrix}+\text{syl}\\+\text{nas}\end{matrix}\right]_{\text{FORM}}$

(where "$\sim$" is a logical symbol of negation). According to (6), initial segments of formatives in the variety of Yoruba we are describing is never a nasal vowel.

Like the earlier MS rules, MS conditions define only the segments with respect to their feature content and the possible sequences these segments for a given language. But in addition, the MSC's require that lexical entries be fully specified. Consequently, once the readjustment rules have applied to a terminal string, what we have is phonological representation. That is, there will be no blanks to fill, and no zeroes to interpret.

1.4 Phonological Rules

The MS conditions differ from phonological rules. The latter map strings of formatives at the systematic phonemic level (that is, at the level of phonological representation) onto the representation at the systematic phonetic level. P-rules may change the value of features ('-' to '+', or '+' to '-'), add, or delete whole segments, or permute segments. MS conditions, on the other hand, only state feature relations at a single level, at the systematic phonemic level. Phonological rules may be in the form of (7).

7. $\left[\begin{matrix}+\text{cons}\\+\text{high}\\+\text{back}\\-\text{voice}\end{matrix}\right] \rightarrow \left[\begin{matrix}+\text{continuant}\\+\text{coronal}\end{matrix}\right] / \text{—} \left[\begin{matrix}+\text{syllabic}\\-\text{low}\\+\text{front}\end{matrix}\right]$

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(7) is a P-rule in French, and interpreted as /k/ becomes, or is pronounced as |s| when followed immediately by /i/ or /e/.

1.5 Phonological and Phonetic Features

Phonetic features are realized from phonological (underlying) features through the application of P-rules of type (7). Thus the features of |s| in (7) will be considered realizations of the features of phonological segment /k/ and distinct from the features of phonological segment /s/ which, incidentally, may be realized |z| in French under definable conditions.

Two fundamental problems have hampered serious work based on the concept of distinctive features. One of these is raised by attempts to incorporate redundancy rules into the grammar. The other is essentially raised by inadequacies in the concept of binarism as it has been used in phonology and in relation to the mapping of features from one level to the other as mentioned in the last paragraph.

1.51 Having proposed redundancy rules, early TG theories suggested that non-idiosyncratic features be entered into the lexicon as zero, to mean roughly 'no information' (or 'taxonomically not criterial').[12] Stanley (1967) has pointed out the undesirability of using zero, '0', as a third state (or value) in addition to the presence ('+') or absence ('-') of features. Postal (1968) sees the principle of Markedness as providing a possible solution to this problem. This principle requires that the lexicon be represented as consisting of two levels.

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12. Term in parentheses suggested by Diebold, private communications.

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> ...On the deeper, or more abstract level, features have only two possible values, M(arked) or U(nmarked). U markings are without cost, M markings have a cost. Thus, where the early version of the theory allows dictionary matrix cells with three states for a given presence, absence, or no information, the current version allows only two 'normal' and 'not normal'. There is, in addition, a less abstract level of matric representation in which every cell contains either + or - marking. But the crucial and fundamental assumption is that this level is entirely the function of universal rules which operate on the level of M-U representation to successively derive + and - markings.[13]

Postal goes on to suggest certain criteria for deciding U and M in a way reminiscent of Greenberg's criteria in Language Universals.[14] Postal emphasizes, perhaps unlike Greenberg, that "in the new theory the only rules which apply to M-U representations are universal. Language particular rules apply at the stage when all values are '+' and '-'". This theory (further developed in Chomsky and Halle (1968), Ch. 9) seems to offer a promising approach to the problem of specification, and to many other problems in phonology.

Meanwhile, it is to the credit of Stanley's proposal (with its suggestion that segments be fully specified in the lexicon) that the problem of using zero as a third value need not arise,[15] and that the MS conditions capture the notion of redundancy for which the earlier MS rules were designed to begin with.[16]

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13. Postal. op. cit. p. 166.

14. Mouton and Co., The Hague (1966).

15. See Stanley, op. cit., pp. 433ff. "The role of blanks."

16. The requirement of full specification deprives linguists of the much abused concept of neutralization. For example, any underlying representation posited for any two or more units at a given level of description must now be shown to be preferable on some reasonable grounds. McCawley's (1968c, p. 43) attempt to save the use of blanks in the lexicon is very reasonable, but does not appear to solve

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1.52 By the early 1960's the controversy on the use of binarism in phonology has shifted to the correspondence between the distinctive features, on the one hand, and the phonetic reality, on the other. The question is put: how does one account for the lack of a one-to-one correspondence between units of the phonological representational level and those of the phonetic level, given the structural specification for a particular utterance? There have been two attempts at providing an answer to this question. The first is a "Two-level theory of phonology" proposed by Šaumjan.[17] The other is contained in Chomsky and Halle (1968). Both proposals provide plausible accounts of the phonetic realization of phonological features. We shall see how these work in chapter VI below, and in particular how they account for the transfer of phonological tone registers to phonetic tones (pitch), at least, in Yoruba.

But let us now turn, in the chapters that follow, to the object of the present work, which is the Yoruba language. We shall see how the theory just outlined serves to explain observable phonological data of the language.

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the fundamental problem. He puts the following constraint on grammar: "The dictionary entries and rules must be such that if the blanks in the dictionary entries are filled in with pluses and minuses in a random fashion, the rules will yield the same output regardless of how the blanks have been filled in." Notice also that McCawley does not make the distinction between the dictionary and the lexicon as Stanley does.

17. In Proceedings of the 4th International Congress of Phonetic Sciences (Helsinki, 1961). 757-161.

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I. MAP OF NIGERIA SHOWING THE STATES

after May 27, 1967

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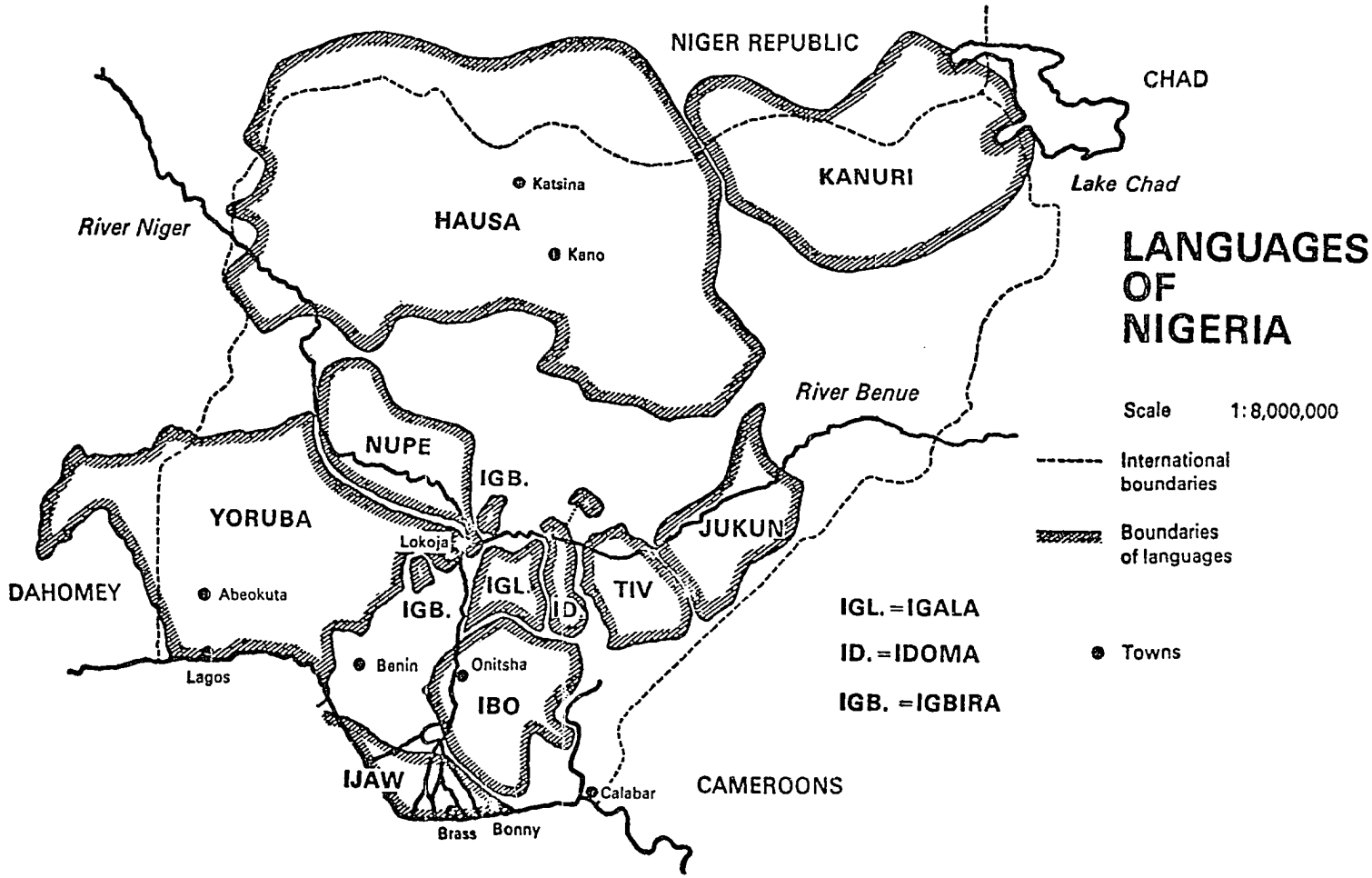

MAP II

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CHAPTER II

THE YORUBA LANGUAGE

Yoruba belongs to the Kwa group of the Niger-Congo family in Greenberg's classification of the languages of Africa.[1] Languages of the Kwa group are found on the West Coast of Africa, from eastern Sierra Leone to Eastern Nigeria. Yoruba itself is spoken mainly in the Western State and in the Lagos State of the Federal Republic of Nigeria. In the State of Kwara (West-Central State) Yoruba is also the majority language. The population of these three states (See Map I) are estimated as follows:[2]

State	Population in millions
Western State	9.5
Lagos	1.4
Kwara	2.4
Total	13.3

However, the state of demographic data in Africa is such that one should accept all these figures with caution. Nevertheless, the fact that Yoruba is spoken as a first language not only within Nigeria, but also in Dahomey (See Map II) as well as by settled Yoruba emigrants in other maritime countries of West Africa, gives one a good idea of the importance of the language. If the figures given above are any indication, one would

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1. The Languages of Africa. Indiana, Bloomington, 1966.

2. This estimate taken from government sources was quoted in West Africa, April 27, 1968.

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conclude that Yoruba has over 12 million speakers.

Yoruba is one of the three main languages of Nigeria, the other two being Hausa, and Igbo. The Yoruba described in this study has often been referred to as Standard. If we use the label, it should be understood that we mean no more than "the dialect of Yoruba that enjoys a wider currency than any other." It is understood by speakers of the other dialects, but it is by no means a 'register' that is a result of some deliberate linguistic policy. In this so-called standard form, then, Yoruba has an appreciable amount of literature, and it is used for educational purposes (in the school, on the radio, and in the newspapers).

2.1 Studies on Yoruba

The Yoruba language is one of the best documented of the languages of Africa. P. E. H. Hare has provided a most useful, and probably the most complete bibliography of studies of the language up to the 1890's, in The Early Study of Nigerian Languages.[3] Ida Ward's Introduction to the Yoruba Language (1952), a hundred years after the first grammar of the language by Rev. Samuel Ajayi Crowther,[4] and Abraham's Dictionary of Modern Yoruba (1958), mark advances in serious studies of Yoruba in the 1950's. Since 1964, native speakers of Yoruba have embarked on a new and promising cycle of scholarly works on the language. Most notable of these are: Ayọ Bámgbóṣé's A Grammar of Yoruba (1966) a Hallidayan view of Yoruba; and A. O. Awobuluyi's unpublished The Phonology and

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3. West African Language Monograph, F., Cambridge University Press (1967).

4. A Grammar of the Yoruba Language (Seeleys, London).

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Morphophonemics of Yoruba (1964). Both have since written scholarly articles in various publications, and Awobuluyi has contributed Studies in the Syntax of the Yoruba Verb (1967) (also unpublished), which we think is less successful than his first study.[5] In 1968, Miss Karen Courtenay completed a transformational generative phonology of Yoruba.[6] Not being a native speaker, Courtenay has had to rely not only on her own data but also on earlier studies, including those of Bámgbósé, and Awobuluyi. However, her systematic statement of facts of the language as she sees them reveals a remarkable insight.

2.2 Tone Languages

Yoruba is a tone language. In this study, such a statement will be taken to mean no more than that Yoruba is one of those languages in which pitch is a distinctive feature. Attempts to look at the phenomenon of tone in other than this light have resulted in several difficulties, some of which will occupy us later in this study. Tone languages are found all over the world, notably in southeastern Asia (in China, Burma, Indo-China, and Siam); in Africa, where a vast majority of the indigenous languages are tone languages; and, in North and Central America, including the United States, where a large number of the Amerindian languages are tone languages. In Europe, efforts are still being made to show that languages such as Norwegian, Lithuanian and Serbo-Croatian, are not tone languages. The indeterminacy in this sphere calls for a sharpening of

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5. A complete reference to these works is given in the general bibliography.

6. A Ph.D. Thesis for the University of California, Los Angeles.

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tools for making typological decisions. Efforts along this line have already begun to show promise, and the type of conceptual tools developed in the works of scholars such as Greenberg are quite pertinent here.[7]

Tone languages are usually subclassified into two types: register tone languages, and contour tone languages.[8] In register tone languages, only definite (punctual) levels of pitch, in a manner analogous to the musical harmonic scale, are distinctive. Such languages often have two or three registers: if two registers, then they are the two polar opposites high, and low; if three, a third level between these is added. Quite often languages with two registers use the third, mid tone, as a conditioned variant of the other two. Syntagmatically, tone registers can, and do, in several languages (e.g. Yoruba) combine into some types of glide, which are always interpretable as a composite of two separate registers. This is not the case with contour-tone languages. In these languages, the pitch features which are melodic need not be resolved in this manner.

It turns out that contour tones are found mostly among the languages of southeastern Asia. The nature of tone contours seems to make the tone paradigms of these languages more complex than those of the languages of America, and Africa. According to Wang (1967),[9] typically

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7. A good example of such work is a preliminary report on Word Prosodic Systems, by Greenberg and Kaschube, Stanford University (1968). It is conceivable that criteria of isolating accentual systems from non-accentual ones will help settle the question of tone language or non-tone language one way or the other.

8. Kenneth L. Pike, Tone Languages (Ann. 1948).

9. "Phonological Features of Tone," (in IJAL 33, 2).

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six or seven tone features are found, and ten have even been reported in Cantonese. On the other hand, the languages of the other two areas have, simply, two or three register (noncontour) tones, with the possibility of glide formations as is described in the preceding paragraph.

Wang also points out two more typological differences between the languages of Asia, on the one hand, and those of Africa and America, on the other. The former use tones almost exclusively lexically, with "no correlation with the syntactic or morphonological aspects of the language." Such non-lexical uses as may be found "are marginal when they are compared to the extensive load that tones carry in declensional and conjugational morphology of many languages in America and Africa."[10]

In contrast to this aspect of the languages of Africa, tone sandhi in the languages of Southeast Asia is paradigmatic. As Wang put it "Characteristically, tone x is replaced by tone y when it is within some linguistic environment, and it is irrelevant whether tone y is present elsewhere in the sequence of tones. Frequently the phonological environment in which tone x occurs is also irrelevant for the sandhi."[11]

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10. Ibid., pp. 93-94.

11. Ibid., p. 94.

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CHAPTER III

PHONOLOGICAL FEATURES AND SEGMENTS OF YORUBA

3.11 Features

The set of feature terminologies involved in this study is a subset of those presented by Chomsky and Halle in chapter seven of their Sound Pattern of English (1968). However, we propose certain fundamental changes which are not merely terminological. These will be pointed out as we proceed. For our purpose, the vocal tract is the set of cavities defined by the true vocal folds and the anatomical structures of the supraglottal parts of the speech mechanism. These include the pharyngeal cavity, the nasal cavity, and the buccal (oral) cavity.

Following Chomsky and Halle, our parameters for defining the features are basically physiological, and the definitions are given with reference to a neutral position or configuration of the vocal tract just prior to phonation.[1] The neutral position has the following characteristics: 1) In the breathing state, "the velum is lowered, thereby allowing air to pass through the nose; in the neutral position, on the other hand, the velum is raised, and the air flow through the nose is shut off" (Sound Pattern, p. 300). 2) The body of the tongue is raised to about the level that it occupies in the articulation of the cardinal vowel |ɛ|.

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1. The authors do not give any reference to any experiment by themselves, or by any other articulatory phonetician to support the defining parameters which follow. However, on the basis of the works of Gordon E. Peterson and June E. Shoup, at the University of Michigan, for example in A Physiological Theory of Phonetics, MSS (Communication Sciences Laboratory. The University of Michigan, Ann Arbor, July 1, 1965), their definition appears well founded. The manuscript has since been published. Features defined below are strictly classificatory.

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3) The blade of the tongue remains in about the same position as in quiet breathing. 4) The pulmonic pressure is considerably increased. 5) The glottis is sufficiently narrowed so as to be caused to vibrate spontaneously by normal air flow (as during breathing). Voicing is characterized by this type of vibration of the vocal cords.

3.12 Distinctive Features of Yoruba:Definitions

± Sonorant. (Son)

Sonorant sounds are produced by means of a vocal tract configuration which enables spontaneous voicing to take place. Sonorant sounds are vowels, glides, liquids, and nasal consonants.

± Syllabic. (Syl)

From a structural point of view, it would seem best to define this feature in relative terms, that is, functionally, with reference to the structure of the formative of each language. It appears to be the case, however, that those sounds may be syllabic which are produced by a vocal tract configuration conducive to spontaneous vibration of the vocal cords, and to unimpeded air flow in at least one essential part of the vocal tract.[2]

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2. The feature Syllabic has a doubtful status in the system of features of Chomsky and Halle (1968, 354). We consider it to be a universal feature. It would be noticed that the feature vocalic is not even considered in this work. Chomsky and Halle do not provide an explicit articulatory definition for the feature "syllabic" as they have done for all other features they proposed. But from what one may infer from their statement that 'the feature "vocalic" might be replaced by a feature "syllabic" which characterize all segments constituting a syllabic peak' (354) their implicit definition appears to be functional, and could even be considered a phonetic definition. In Chapter VII below, we shall pursue the consequences of this definition.

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We cannot overemphasize the purely conceptual nature of this definition. However, by "conceptual," we do not mean lacking physiological correlates, for these are precisely the pivot of the feature's definition. We mean simply that such a definition specifies a theoretical construct broad enough to take account of all syllabic segments in any language. The definition claims basically that any segment produced with a configuration which does not meet the specifications given here cannot be inherently syllabic. It does not claim that all segments produced by the specified vocal tract configuration are syllabic in all languages.

Optimally, vowels are syllabic, but nothing prevents nasal consonants (characterized by an unimpeded air flow through the nose), and liquids with lateral free air passage, from being syllabic in particular languages.

The conditions in the definition above are not met in the production of nonsyllabic sounds.[3]

On the universal level optimal syllabic sounds are vowels; nonsyllabic sounds are all others: stops, fricatives, affricates, glides, liquids, and nasal consonants.

± Consonantal. (Cons)[4]

Consonantal sounds are produced with an obstruction, in the midsagittal region of the oral cavity, sufficiently narrow to produce turbulence or a

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3. The limit of syllabicity in segments appears to be voiced continuants that are nonsonorant. Examples are |z| in Lendu (an African Language), and in Mandarin Chinese. Both examples have been brought to our attention by Greenberg (personal communication). However, as in the case of syllabic nasals and liquids, these are probably subject to specific phonological rules of each of these languages. See further Chapter VII on nasal segments.

4. Throughout this study the terms 'consonant' and 'non-syllabic' will be used interchangeably where we believe such usage will not lead to ambiguity.

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complete stoppage of air flow. Sounds produced this way include: stops, fricatives, affricates, liquids, nasal consonants.

Nonconsonantal sounds are produced without such constriction, and include glides and novels.

± Coronal. (Cor)

Coronal sounds are produced with the blade of the tongue raised from its neutral position.

Coronal sounds are those characterized by Ladefoged (1964), for the languages of West Africa, as dental, alveolar, and post-alveolar.

± Anterior. (Ant)

Sounds produced with an obstruction in front of the post-alveolar region are anterior. These include, then, all the sounds that are coronal (except post-alveolar sounds), plus labials.

± High.

High sounds are produced by raising the body of the tongue above its neutral position. Palatals and velars are high sounds.

± Low.

Low sounds do not mean non-high sounds but all low sounds are necessarily non-high. Low sounds are produced by lowering the body of the tongue below its neutral position level. In Yoruba, only vowels can be low. Articulatorily only |a| would be describable as low in Yoruba. However, the constraints within the language show that it belongs with |ɛ| and |ɔ|. We consider all three relatively low in relation to other vowels in the system.

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± Back.

In producing back sounds, the body of the tongue is retracted from the neutral position. With respect to Yoruba (and French, incidentally), we cannot work with the bi-polar reference back-nonback, because it does not give us adequate distinction. For examples, both |a| and |ɛ| can be described as nonback. We, therefore, need another feature to distinguish between these two. Such a feature is the one which follows.

± Front.

We shall define front sounds as those produced with the body of the tongue relatively pushed forward. |a| and back vowels are nonfront.

± Nasal. (nas)

Nasal sounds are produced with the velum lowered in order to allow an unimpeded air flow through the nose. Nonnasal sounds are produced with the velum raised to close off the nasal passage, so that air flow can be only through the mouth. Nasal sounds of Yoruba are |n|, |m|, and nasal vowels.

± Lateral. (lat)

In producing lateral sounds, the mid-sagittal section of the tongue makes contact with the roof of the mouth, and results in a complete blockage along the line of contact. Either one or both sides of the tongue are, however, lowered, thus creating at least one free air passage. In Yoruba, air flow is on both sides of the tongue. |l| is the only lateral sound in the language.

± Continuant. (cont)

Continuant sounds are produced with a configuration that does not allow a complete blockage of air flow in the vocal tract. In other words,

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in producing continuants, there may be turbulence, so long as air flow is not completely stopped. Vowels, glides, fricatives, liquids, and nasal consonants are continuants.

± Voiced. (vcd)

Sounds whose production is accompanied by quasi-periodic vibration of the vocal cords are voiced. Nonvoiced sounds are produced without such a vibration, or without any vibration at all.

± Tone Registers.

Tone is phonologically relevant pitch in fundamental frequencies. Acoustically, all voiced sound have fundamental frequencies. However, the only fundamental frequencies relevant to tone in most tone languages, and definitely in Yoruba, are those which characterize syllabic sounds.[4]

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4. Welmers, in an article, "The Phonology of Kpelle" (Journal of African Languages, Vol. 1, Part 1, 1962) assigns tone registers to consonants. He criticizes Westermann and other who have described his tone-bearing consonants as sequences of syllabic nasals and nonsyllabic segments. But it is open to question whether such a criticism is justified. First, it does not appear that both Welmers and Westermann are working with the same basic assumptions about grammatical description. Welmers assumes "that a phonemic analysis must be justifiable on phonologic grounds, without resort to considerations of morphology or syntax," and his own "analysis presented here, whatever its history or its convenience for describing the grammar of the language, is justifiable on phonologic grounds alone, at least as a possible alternative analysis" (p. 70, no. 0.3).

   The phrase "at least as a possible alternative analysis" is a judicious safeguard, for, most of the data provided by Welmers in his study admit of at least an alternative analysis which would presuppose the use of lexical and syntactic criteria. Compared to this type of description, Welmer's would appear to deal only with phonetic data. Indeed, this appears to be what Westermann and others have done.

   In other respects, it is probable that Welmers is right, and that nonsyllabic segments have phonological tone registers in Kpelle. The matter has not been systematically investigated for Yoruba. Our present investigations have not suggested, however, that this is so for Yoruba. If, on the phonetic level, voiced nonsyllabic segments echo the tone of neighbouring vowels, this can be handled by low-level, post-cyclical P-rules in the same way as the nasalization of nonsyllabic sonorants below. But even this kind of tone assignment does not appear to be plausible for Yoruba, at least from our limited investigations. It is, accordingly, not considered in this study.

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Three levels of fundamental frequencies are relevant in Yoruba; namely, the raised register which we shall symbolize with H, the mid register represented by M and the lowered register designated L. Only two features are required. H and L are naturally the logical choice. Phonological tone registers are themselves classificatory (binary) features like any other phonological feature we have proposed so far. This has some interesting theoretical implications for phonological theory as we shall see below.

Investigations into the physiological correlates of pitch by Peter Ladefoged (1967, 1970) lead one to hope that a precise articulatory definition of tone registers will be possible. It appears from these works that the innervation (tension) of the laryngeal muscles is crucial to the production of pitch. Differential innervation, therefore, characterizes distinctive registers. For example, the innervations which characterize H and L would be different, and would be measurable, given a set of well delimited parameters.

3.13 Redundant Features

± Implosive. (impl)

Strictly speaking, implosive sounds are accompanied with ingressive air flow (suction) when a particular closure in the mouth is released. However, the sounds |kp| and |gb|, that have this feature in Yoruba, also have the peculiarity of being accompanied simultaneously by an eggressive pulmonic air flow, as is shown in the chart below (from Ladefoged (1964) p. 8). The same characterization had been given earlier by Siertsema (1958).

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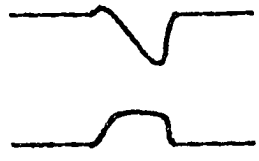
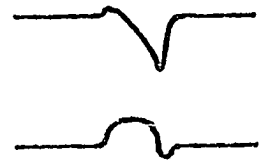
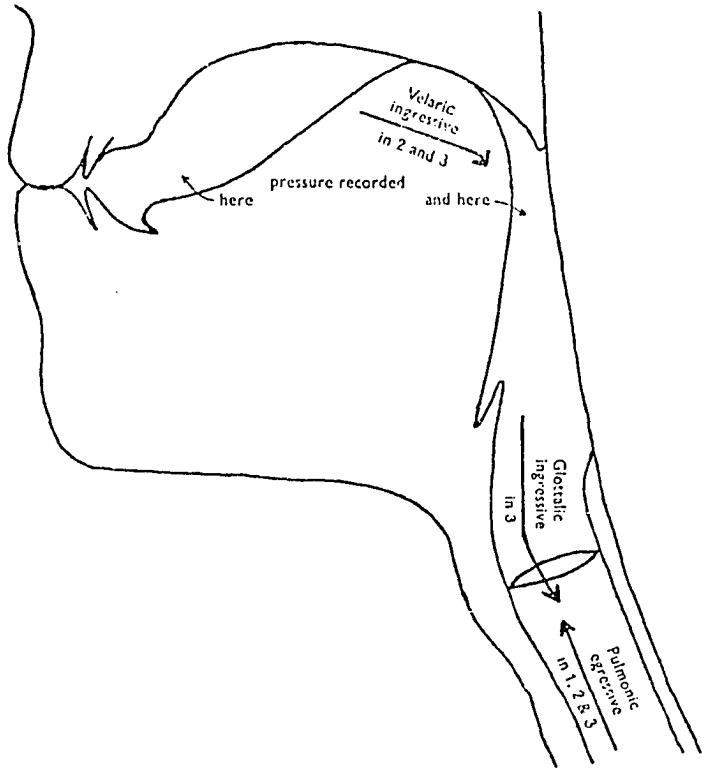
AIRSTREAM MECHANISMS	PRESSURE RECORDS	EXAMPLES
1. Pulmonic egressive only	Oral pressure; Pharyngal pressure	some Guang languages
2. Velaric ingressive plus pulmonic egressive	 Oral pressure; Pharyngal pressure	Yoruba
3. Velaric ingressive plus glottalic ingressive plus pulmonic egressive	 Oral pressure; Pharyngal pressure	Idoma



Types of airstream mechanisms involved in forming k͡p. The numbers by the arrows refer to the types listed above.

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± Tense. (tns)

The exact physiological correlates of this feature is not entirely clear. It is generally accepted that it involves the "entire articulatory gesture of a given sound" executed by the supraglottal musculature (Sound Pattern, p. 324). Tense sounds are thought of as involving a greater deviation of the vocal tract from the neutral, or rest position. Ladefoged (1964) suggests more specifically that it may involve the advancement of the body of the tongue. This would accord well with Yoruba in which only non-low vowels can be tense. However, it is not clear how French vowels, for example, can be characterized in terms of Ladefoged's criterion. If the amount of displacement determines the amount of force in the production of a given sound, then Chomsky and Halle's condition of greater deviation will probably serve, even for French. However, no amount of deviation in the retraction of the body of the tongue seems to endow certain vowels of West African Languages with tenseness.[5]

Even in those dialects of Yoruba where tenseness is distinctive, it is relevant only to syllabic sounds, and appears to correlate with relative

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5. pp. 36 ff. Ladefoged believes that the label tense/lax is simply for convenience, "and should not be interpreted as having a precise physiological meaning."

   Discussing the vowel harmony system of Igbo, which we represent as follows,

   (1) i u (2) ɨ u

   e o a ɔ

   Ladefoged states that "the most striking difference between the vowels in the two sets is that in each case the body of the tongue is more retracted for the vowels of set 2."

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height in a similar fashion as in foot note 5.

± Strident. (str)

Strident sounds are produced with greater noise. In Yoruba, non-sonorant sounds that are continuant are strident.

± Round.

Rounded sounds are those produced with both lips protruded and narrowed. In Yoruba, the feature "round" is relevant only to vowel segments, and correlates with the feature "back." In other words, all Yoruba back vowels are rounded.

3.14 Non-Segmental Features

[+Segment] units are systematic phonemes, while [-segment] marks boundary units. Examples of the latter are word boundary, and phrase boundary.

3.2 Phonological segments of Yoruba

3.21 Consonants

An account of nonsyllabic segments of SY involve problems of a different genre from that of syllabic segments. It is probable, for example, that some of the nonsyllabic segments in Table I below may be justifiably considered as surface structure phenomena. Our present investigations do not permit us to make any definite statement in this regard.

Segments that are for the moment suspect include |w|, and the pairs |g| and |k|, |s| and |š|.[7] |w| not only alternates with |h| in SY, but it

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is also elided in certain words through syncopation, a process which we shall discuss fully in Chapter V, under consonant deletion.

Examples

awọ́n	$\|\bar{a}\tilde{w}\acute{o}\|$	∿	ahọ́n	$\|\bar{a}\tilde{h}\acute{o}\|$	'tongue'
awun	$\|\bar{a}\tilde{w}\bar{u}\|$	∿	ahun	$\|\bar{a}\tilde{h}\bar{u}\|$	'tortoise'
jòwó	$\|\check{j}\grave{o}w\acute{o}\|$	∿	jòó	$\|j\grave{o}\acute{o}\|$	'please'[8]

|g| and |k| alternate in certain words

Examples

gé	|gé|	∿	ké	|ké|	'to cut'[9]

As for |s| and |š|, one finds a considerable amount of confusion in their usage. Wande Abimbọla (in his introduction to Ìjìnlẹ̀ ohùn ẹnu Ifá, Glasgow, 1968) finds that |s| has practically replaced |š| in the Ọyọ

---

7. The case for the nasal segments is presented fully in Chapter VII.

8. To complicate matters |h| itself alternates with |j| in certain words

Examples:	èhìn	$/\grave{e}\tilde{h}\grave{i}/$	∿	èyìn	$/\grave{e}\tilde{j}\grave{i}/$	'back'
	ìhìn	$/\grave{i}h\tilde{i}/$	∿	ìyìn	$/\grave{i}j\grave{i}/$	'praise'

It is not clear whether internally to SY, this alternations are due solely to phonological environment (for examples nasal vowels, and frontness or backness of the conditioning vowels), or specifically more fundamentally to some phonological changes yielding dialectal correspondences.

9. There is admittedly a slight semantic difference between these two forms, even though they are often used interchangeably. For example ké is often used to mean 'to cut by chipping away,' while gé has the exact opposite meaning as in 'to cut into two with one clean stroke.'

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(including the Ogbomọsọ) variety, of Yoruba. This confusion is even more observable in large urban centres such as Ibadan. For example the same speaker may use

Ọse	|ɔ̄ʃ̌ɛ̄|	and	ọse	|ɔ̄sɛ̄|	'soap'
Se	|ʃ̌ē|	and	se	|sē|	'do'

Such a fluid situation results often from dialectal mixing where certain (group of) individuals indulge in hypercorrection, or are simply confused. Indeed, it appears that in SY the phonological distinction between |s| and |š| is being seriously curtailed.

The following, then is a list of the consonants of SY.

TABLE I

Segment	Example in Phonological Representation	Yoruba Orthography	English Equivalent
kp	ākpá	apá	arm
t	ātā	ata	pepper
k	āká	aká	barn
b	àbɔ̃̀	àbọ̀n	unripe
gb	àgbɔ̃̀	àgbọ̀n	chin
d	àdɔ́	àdán	bat
ǰ	àǰà	àjà	loft
g	āgà	agà	ladder
m	āmɔ̃	amọ̀	clay
n	ànɔ̃́	àná	yesterday
f	ɔ̄fà	ofà	arrow
w	àwɔ̃	àwọ̀n	net
s	àsɔ̃́	àsọ́n	afternoon
š	àšà	àṣà	custom
h	āhá	ahá	calabash
j	àjà	àyà	chest
l	àlá	àlá	dream
ɾ	àɾá	àrá	thunder

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3.22 Vowels

A phonological account of Yoruba vowels raises several problems. First, since tone registers are themselves classificatory features in the language, how many vowel segments does the language have? Second, the co-occurrence restrictions on the vowel segments strongly suggest that a shift has taken place in the vowel system of the language, so that while the underlying (phonological) system may not be numerically vastly different from the phonetic system, the dictionary entries of a considerable number of formatives must differ from their phonetic representations.[10]

With respect to the first problem, tone registers obviously increase geometrically the number of phonological vowels that Yoruba would have if tone were not distinctive in the language. Unfortunately, while practically every consonant segment symbol implies one distinctive feature (or a bundle of distinctive features) no such adequate provision exists for every vowel distinctively marked (by a tone register) from all other segments including vowels. Under normal circumstances, then, we would require a unique symbol with a diacritic for the vowel of each of the following lexical formatives of Yoruba:

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10. We owe this observation and the following discussion to Greenberg. The implications of his suggestion are not limited to the question of phonological representation. Indeed, it appears that further work on the comparative phonological description of languages related to Yoruba will make Greenberg's suggestion better appreciated.

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rí	'see'	ri	'cry weep incessantly'	rì	"submerge'
ré	'pull down'	re	'pluck'	rè	'go'
ré	'to cut'	rɛ	'soak'	rè	'to tire'
rá	'to crawl'	ra	'rub'	rà	'to rot'
rɔ́	' crackle'	rɔ	'wither'	rɔ̀	'to become soft'
ró	'to sound'	ro	'to pain'	rò	'to think'
rú	'to blossom'	ru	'boil over'	rù	'carry'
rín	'laugh'	rin	'pamper'	rìn	'walk'
rọ́n	'to sew'	rọn	'to spin'	rọ̀n	'expand'
rún	'crumple'	run	'to ruin'	rùn	'to excude an odour'

Previous descriptions do not however, consider tone registers to be classificatory features. They, therefore, invariably represent Yoruba vowel segments as in Table II.

TABLE II

Segment	Example in Phonological Representation	Yoruba Orthography	English Equivalent
i	ìrì	irì	dew
e	Ire	ire	goodness
ɛ	ìrè	irè	cricket
a	ìrà	irà	Western Hartebeeste
ɔ	Irɔ́	irɔ́	lie
o	iró	iró	news
u	Irú	irú	kind
ĩ	Irĩ	irin	metal
ɔ̃	ìrɔ̃	irọn	(a) show
ũ	Irũ	irun	hair

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Apart from the implications that tone-registers-as-classificatory features might have for the number of Yoruba vowels, we are still confronted with the problem of the underlying representation of these vowels. It appears that an examination of the co-occurrence restrictions on the vowel segments would be a step in the right direction. Table III is a statement of such restrictions in polysyllabic formatives of the language.

TABLE III[11]

V2 / V1	a	ɛ	ɔ	e	o	i	u	ĩ	ɔ̃	ũ
a	+	+	+	+	+	-	-	+	+	+
ɛ	+	+	+	-	-	+	+	+	+	+
ɔ	+	+	+	-	-	-	-	+	+	+
e	-	-	-	+	+	+	+	+	-	-
o	-	-	-	+	+	÷	+	+	-	+
i	+	+	+	+	+	+	+	+	+	+

In Table III, the rows represent first vowels (V_1) of formatives while the columns are second vowels (V_2); plus sign (+) means that the

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11. The discussion that follows is owing to Greenberg's insight upon examining a table of Yoruba vowels similar to our Table III. In exploring this insight, however, we remain responsible for all errors of judgement in what follows in the text.

    The arrangement of the vowel segments as in Table III is adopted simply because we have found it particularly useful in referring to features. In addition, feature co-efficient show some symmetry that might not be there if the conventional order were adopted.

    Finally, throughout this study a full array of SY vowels which would take tone-registers into account will not be used where (as in Table III) the presence of the registers can be implied.

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sequence of the particular $V_1 - V_2$ occurs in SY, while the minus sign (-) means that the sequence in question is not attested.

Examples

V_1 V_2	
ajà	'dog'
ɛja	'fish'
ɔjà	'market'
ìjà	'(a) fight'

are attested, but not

*eja

*oja

or any such sequences. Presumably these co-occurrence restrictions apply not just to disyllabic, but to all polysyllabic formatives, in spite of the attestation of forms such as akíkanjú 'a brave person.'[12] But we shall have occasion to explain such examples below.

---

12. Loanwords such as fótò |fótò| (← - Eng. 'photo'), télò |télɔ̀| (← - 'tailor') alubosa (a loanword for 'onion' from Arabic through Hausa), suggest that loanwords in general may violate the vowel harmony restrictions of SY. See Awobuluyi, 1967, Awobuluyi and Bamgbose, 1967. These two works have sought to explain in terms of front/back harmony the co-occurrence pattern of polysyllabic formatives which phonetically constitute exceptions to the restrictions just observed in the present work.

While loanwords may constitute real exceptions, it may yet be that polysyllabic formatives such as orúko |ɔ̄rúkɔ̄| ('name'), àbúrò |àbúrò| ('younger sibling') will be explanable in terms of the co-occurrence restrictions to be presented here, in addition, perhaps, to the phonetic front/back harmony.

It is interesting that affixal harmonization that is currently productive in SY,/oni/+Noun, for example (see Chapter V below), requires complete assimilation. Is this an indication of a more far-reaching simplification of the underlying co-occurrence restriction of the language?

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Oral Vowels

Consider the oral vowels of Table III first. One observes that every column has exactly four pluses. Greenberg observes further that "in every known Niger-Congo language with prefixes, there are no limitations on the stem vowels, but the same prefix may show variant forms depending on the vowel of stem." This means that only certain vowels may occur as affixes to stems of formatives which internally show a very wide latitude, or no restrictions at all.

Table III also suggests that the high backvowel u and the nasal vowels may not occur in the initial position, and that /i/-initial may be followed by any vowel. But /ɔ/ and /o/, on the one hand, /ɛ/ and /e/, on the other, co-occur strictly according to relative height, that is to say open with open, and closed with closed: /o/ and /e/ may precede /o,e,i,u/; while /ɔ/ and /ɛ/ may be followed only by /a,ɛ,ɔ/.

Such co-occurrence restrictions strongly suggest some underlying regularity, say, a system of prefixes, which may have a historical explanation. Let us represent these prefixes with the archisegments /A,E,O,I/.

If this is accepted, then, it becomes significant that the ɛ-row in the matrix above has plusses precisely at the two positions (on the matrix) where the a-row has minuses. We posit, that when /i/ and /u/ follow an A-prefix, the /A/ is fronted to /ɛ/.

Examples:	/ɛ̀rí/	←	*/àrí/,	'testimony'
	/ɛ̄bí/	←	*/ābí/	'relatives'
	/ɛ̄rū/	←	*/ārù/	'load'

Thus for the oral vowels of SY, we assume that a MSC must state the following facts: that /I/ and /A/ may precede any stem vowel; and that

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/E/ and /O/ are necessarily nonlow when followed by any of the stem vowels /o,e,i,u,/, but must be low when they precede /a,ɛ,ɔ/. Then, we require the following phonological rule (P-A) to front /A/-prefix before high vowels.

$$\text{P-A}: \begin{bmatrix}+\text{syl}\\-\text{back}\end{bmatrix} \rightarrow [+\text{front}] / \text{——} \; \text{K} \; \begin{bmatrix}+\text{syl}\\+\text{high}\end{bmatrix}^{13}$$

Where K is nonsyllabic

If we now number the four archisegments (/I,O,E,A,/) 1, 2, 3, 4 in that order, Table IV presents the co-occurrence of the oral vowels by SY.

TABLE IV

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

Nasal Vowels

Table III states that SY has only three nasal vowels. These vowels however, cannot pretend to be the phonological (or underlying)

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13. The segments /ɛ/, /a/, and /ɔ/ are all low as will be confirmed in the account of nasal vowels and the use of the feature [± tense].

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representation of the nasal vowels of SY for the following reasons. In the first place, the feature [±back]/ is no longer distinctive for low nonfront vowels of SY. That is to say |ã| and |ɔ̃| are not distinct phonological segments of SY. Thus

rón |r̃ɔ́|

rán |r̃á|

would both mean 'to sew' even in the speech of the same SY speaker.

In the second place, as will be shown below, considerations regarding the vowel harmony system, parallel to those for the oral vowel, suggests that there are five underlying nasal vowels. These are /ã/, /ɛ̃/, /ɔ̃/, ĩ/, /ũ/. The three nasal vowel of Table III are thus the SY phonetic representations of the five plausible underlying representations.

But how do we explain the co-occurrence restrictions on nasal vowels as suggested by Table III?

TABLE V

	ĩ	ɔ̃	ũ
a	+	+	+
ɛ	+	+	+
ɔ	+	+	+
e	+	-	-
o	+	-	+
i	+	+	+

If the same restrictions (the MSC sketched above) apply to nasal vowels as to oral vowels, then why does the sequence e - ũ not occur in SY? Or

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why both

adùn	|ādũ̀|	'sweetness', and
edun	|ɛ̄dũ̀|	'thunderbolt';
àfín	|àfĩ́|	'albino', and
erín	|ɛ̀rĩ́|	'laughter' ?

or again, why

ògbìn	|ɔ̀gbĩ̀|	'(act of) planting'
ògbun	|ɔ̀gbū̃|	'a chasm', (or 'a type of calabash') ?

The first could be explained as an accidental gap, since the segment |ũ| occurs after |o|, as in

okun	|ōkū̃|	'might' (as in "with might and main")
osùn	|ōsũ̀|	'Camwood'
oyún	|ōyṹ|	'Pregnancy'.

etc.

The other two cases presuppose some phonological changes. First, then, we assume that the P-rule proposed for oral vowels applies also to nasal vowels. Notice that in this case it will not at all be necessary to mention nasality in the P-rule in order to account for the nasal vowels. The P-rule will state simply that initial /a/ becomes /ɛ/ before high vowels. Thus |ɛ̄dū̃| and |ɛ̀rĩ́| ('laughter') must have the underlying form */ādū̃/ and */àrĩ́/ respectively.

On the other hand, given the co-occurrence restrictions, the occurrence of |ādũ̀| and |àfĩ́| and of items such as

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ọ̀fun	|ɔ̀fṹ|	'throat'
ọ̀fìn	|ɔ̀fĩ̀|	'a deep round hole made into the ground for catching rodents'
ọ̀tún	|ɔ̀tṹ|	'right hand'
ọkín	|ɔkĩ́|	'pea cock'

may be accounted for in part by the raising of /ɛ/ and /ɔ/. The P-rule that raises these nasal vowels is of the following form, we call it P-B:

$$\text{P-B:} \quad \begin{bmatrix} +\text{syl} \\ +\text{nas} \\ +\text{front} \\ +\text{back} \end{bmatrix} \rightarrow [+\text{high}]$$

The P-rule applies vacuously to /ĩ/ and /ṹ/, but raises /ɛ̃/ to /ĩ/ and /ɔ̃/ to /ũ/. It must be ordered to precede the rule that backs /a/, otherwise we would be claiming that SY has no nonhigh nasal vowel. This would be contrary to fact.

Another consequence of P-B is that certain formatives now have two possible underlying structures. Consider the following items:

Phonetic Rep.	Structure 1	Structure 2
|àfĩ́|	/àfĩ́/	*/àfɛ̃́/
|ādũ̀|	/ādũ̀/	*/ādɔ̃̀/
|ɛ̄dũ̄|	*/ādũ̄/	*/ɛ̄dɔ̄/
|ɛ̀rĩ́|	*/àrĩ́/	*/ɛ̀rɛ̃́/

All the forms under type 1 and type 2 structures are plausible on the basis of the co-occurrence restrictions. But in addition, type 2 structures for the first two items of the left-hand column are accounted for by P-B. The last two items of the phonetic representation may derive from type 1 structure through P-A, or from type 2 structure by the

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application of P-B. However, only P-B account for the derivation of items such as

$$|ɔ̀f\tilde{\bar{u}}| \quad \leftarrow \quad /ɔ̀f\bar{ɔ}/$$
$$|ɔ̀f\grave{\tilde{ɪ}}| \quad \leftarrow \quad /ɔ̀f\grave{\tilde{ɛ}}/ \ ,$$
$$\text{etc.}$$

that is, apart from the co-occurrence restrictions.

In short, the five underlying nasal vowels of SY are realized phonetically as /ĩ, ũ, ɔ̃/ through the application of two P-rules (P-A, and P-B). This is interesting in view of the fact that, as Adetugbo (1969 b) has shown, most of the other dialects of Yoruba (for example, Ijẹ̣ṣa, Ekiti, and Ondo) still have all five phonological nasal vowels realized phonetically.

In summary, SY has seven phonological non-nasal vowel segments, and five phonological nasal vowel segments. These are:

non-nasal	/i, e, ɛ, a, ɔ, o, u/
nasal	/ĩ, ɛ̃, ã, ɔ̃, ũ/

It has an underlying prefix system which consists of the four archisegments /I, E, O, A/. Of these /I/ and /A/ may occur with any stem vowel segment of the formative. But /E/ and /O/ must harmonize with respect to the feature "low" with the stem vowel that follows it in the formative.[15]

Table VI can now represent the co-occurrence pattern of the phonological (as distinct from the phonetic) vowel segments of SY. The table takes account of the MSC above.

15. It must be emphasized that our prefix theory by no means suggests that all vowel initials of Yoruba formatives are prefixes, which would also mean that there were no nominal formatives in proto-Yoruba since all nouns would have to have been derived from verbs (or from verb stems with the feature [+nominal] (cf. Awobuluyi, 1967). Our theory claims, however, that the co-occurrence constraints apply necessarily to all derived nouns. It may be that a subsequent phonological simplification (or generalization) spreads the constraints to all formatives with vowel initials. But see further below on prefixes.

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Table VI[16]

	a	ɛ	ɔ	e	o	i	u	ã	ɛ̃	ɔ̃	ĩ	ũ
a	+	+	+	+	+	+	+	+	+	+	+	+
ɛ	+	+	+	-	-	-	-	+	x	x	-	-
ɔ	+	+	+	-	-	-	-	+	+	+	-	-
e	-	-	-	+	+	+	+	-	-	-	+	-
o	-	-	-	+	+	+	+	-	-	-	+	+
i	+	+	+	+	+	+	+	+	x	x	+	+

The phonological rule that fronts initial /a/ before high vowels applies generally, that is, both to nasal and nonnasal vowels. This rule is our P-1.

P-1: /a/-fronting

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

P-2: Nasal vowel raising

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

16. The encircled x in table V means that we cannot at present provide a plausible ground for choosing between the two derivations posited for those formatives whose underlying nasal vowels may supposedly have been raised. Further investigation will undoubtedly shed more light on this particular problem.

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It states that both front and back row nasal vowels become high when preceded by low vowels other than /ɛ/.

A third rule backs all low nonfront nasal vowels. This accounts for the merger of /ã/ and /ɔ̃/ in SY.

P-3: Nasal backing

$$\begin{bmatrix} +\text{syl} \\ +\text{low} \\ -\text{front} \end{bmatrix} \rightarrow [+\text{back}] \; / \; \begin{bmatrix} \underline{\quad} \\ +\text{nas} \end{bmatrix}$$

These phonological rules together account for the differences between tables III and V. The former is a phonetic representation of the latter. The same relationship exists, then, between the corresponding representations of SY formatives.

Major Grouping.

The phonological segments of Yoruba can be grouped tentatively into four categories, using the first three of the distinctive features defined above. We shall call these three "major class features" (after Chomsky and Halle, 1968).[17]

(a) (-Sonorant, -Syllabic, +Consonantal):

b, f, s, ṣ, t, d, j, k, g, gb, kp.

(b) (+Sonorant, -Syllabic, +Consonantal):

m, n, l, ɾ.

17. The major class features are in parentheses. /ɾ/ will be represented with /r/ in the rest of this work, where no ambiguity is likely.

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(c) (+Sonorant, -Syllabic, -Consonantal):

j, w, h.

(d) (+sonorant, +syllabic, -consonantal):

i, e, ɛ, a, ɔ, o, u, ĭ, ɛ̃, ɔ̃, ũ, ã.

3.23 Fully Specified Phonological Matrix

Each of the segments explicitly given or implied (as the tone-register distinguished syllabic segments) in 3.2 is to be considered an abbreviation of a single-column matrix, as posited in the introduction to this study. Table VII presents each matrix fully specified.

No particular significance may be attached to the order in which the features appear in this matrix. It may yet be possible to present such a list based on an independently established hierarchical relationship among features. For the present, this is not the case.

Since tone registers are themselves phonological features table VIII complements table VII. Table VIII further specifies syllabic segments which are the only ones marked for tone registers. Table does not propose anything unusual. Consider, for example, the opposition "back-front," or again the opposition "high-low." Both will be found not to be significantly different from the opposition "H-L" in table VIII. Just as the segment /a/ which is nonback, and nonfront cannot for that reason be put in the same class as a nonsyllabic segment which itself is nonback and nonfront, so is a syllabic segment no less tonal just in case it is non-H and non-L. A syllabic segment of the latter type will have a phonetic mid-tone. More on this in Chapter VI.

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Table VII

	b	f	s	š	t	d	j	k	g	kp	gb	m	n	l	r	j	w	h	i	e	ɛ	a	ɔ	o	u	ɪ	ɛ̃	ã	ɔ̃	ũ
sonorant	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
syllabic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+
consonantal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
coronal	-	-	+	+	+	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
anterior	+	+	+	-	+	+	-	-	+	+	+	+	+	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
high	-	-	-	+	-	-	+	+	+	+	-	-	-	-	-	+	+	-	+	-	-	-	-	-	+	+	-	-	-	-	+
low	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+	+	-	-	-	+	+	+	+	-
back	-	-	-	-	-	-	+	+	+	+	+	-	-	-	-	+	-	+	-	-	-	+	+	+	+	-	-	-	+	+	+
nasal	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+
front	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	+	+	-	-	-	-	-	+	-	-	-	-
lateral	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
continuant	-	+	+	+	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
voiced	+	-	-	-	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+

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Table VIII

	H	L
T1	-	-
e1	-	-
s1	-	-
a1	-	-
c1	-	-
o1	-	-
u1	-	-
T2	-	-
s2	-	-
a2	-	-
c2	-	-
u2	-	-
T3	+	-
e3	+	-
s3	+	-
a3	+	-
c3	+	-
o3	+	-
u3	+	-
T4	+	-
s4	+	-
a4	+	-
c4	+	-
u4	+	-
T5	-	+
e5	-	+
s5	-	+
a5	-	+
c5	-	+
o5	-	+
u5	-	+
T6	-	+
s6	-	+
a6	-	+
c6	-	+
u6	-	+
T7	+	-
e7	+	-
s7	+	-
a7	+	-
c7	+	-
o7	+	-
u7	+	-
T8	+	-
s8	+	-
a8	+	-
c8	+	-
u8	+	-

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3.24 Comparison with Earlier Studies

The inventory of phonological segments we have presented in the last three sections shows a marked departure from the practices in recent studies of Yoruba. For example, we recognize the nasal consonants /m/ and /n/ as phonological segments of Yoruba. In so doing, we re-establish conclusions reached by Yoruba studies prior to 1964, that is, the findings of studies such as Ward's (1952). Awobuluyi and Ladefoged both assert in their respective studies of 1964 that /n/ may not be phonological in Yoruba. Courtenay (1968) goes even further. She asserts that neither /m/, nor /n/ is phonological in the language. In chapter VII we shall show that Ward's intuition is highly justifiable, while the stands taken by more recent studies are less satisfactory.

Two other features of the present study must be re-emphasized, namely, the discarding of the feature [±vocalic], and the awareness that tone-registers are themselves classificatory features. Later on, in chapter V, we shall consider the role in SY of the tense-lax opposition which Courtenay (1968) may have wrongly considered phonologic (that is, distinctive) in Yoruba.

The following section presents the redundancy rules of Yoruba in the form of Stanley's (1967) Morpheme Structure Conditions, as defined in Chapter I above.

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CHAPTER IV

MORPHEME STRUCTURE CONDITIONS OF YORUBA

4.1 Two important points must be constantly kept in view about Morpheme Structure Conditions. First, they appeal to syntactic as well as to morphological categories.[1,2] Secondly, there is no evidence that redundancy rules (or MSC's for that matter) are ordered (Stanley, 1967). Given this second point, therefore, no specific significance should be

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1. Awobuluyi (1964) avoids appealing to syntactic features by setting up a unique morphophoneme. He represents this as "/V/ for any vowel with any tone; /v/, /v́/, /v̀/ stand for vowels the vocalic quality of which varies with the context, but which always have a midtone, a hightone, and lowtone respectively." p. 5.

   It can be seen that Awobuluyi's concept of morphophoneme encourages arbitrariness in descriptive statements. He himself has recourse to it on all occasions. He says for example:

   > The morphophoneme {V} ... has the following morphemic values: (i) the past tense morpheme... (ii) the 3rd person singular object pronoun. The same morphophoneme has a simple phonemic value /vyi/, and alternant of the 2nd person plural object or possessive pronoun morpheme... (iii) /-v_1 + v-/ where the morphophoneme {v} is always distinguishable from the ordinary single-valued formulaic /v/ by having no numerical exponent." p. 79.

   It is not clear why the syntactic categories discussed here need an unmotivated element in the form of a morphophoneme which does everything everywhere. It seems that Awobuluyi adheres to the strict separation of levels, which the phonemic model he uses enjoins.

2. Cf. also Courtenay (1968), p. 3 f.:

   "...Thus in the lexicon each formative will be represented by a matrix including phonological, syntactic, and semantic features. For our purposes, only the phonological and morphophological features are necessary."

   It appears that Courtenay means syntactic features in writing "morphological features."

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attached to the order in which the MSC's are given below.

There exists the theoretical problem of whether the relation of a feature or features of a given segment to other features should be stated by more than one condition. For example, /l/ is the only lateral in Yoruba. Is it justifiable to have SgSC's 3, 6, 12, and 16 state this fact? The only obvious justification we can muster at present is that segments do belong to more than one class, and each class has its own defining feature or bundles of features which it does not share with any other class. Now, it may be that with ordering, a particular feature relation needs be mentioned only once, so that SgSC 12 can be prevented from referring to /l/ since it says nothing not already contained in SgSC's 3, 6, and 16. In this specific case, this would amount to describing the group /s,t,d,n,l,r/ without referring to /l/. At this stage of our investigations we do not see any way out. But it will be noted that the same problem does not arise with the sequence structure conditions.

4.2 Segment Structure Conditions of Yoruba

These will come in two groups: general, and group specific. The latter will be understood to apply to major groups and cross-groupings. The convention is that I(C) is given first (on top), and T(C) second at the end of the double arrows.

4.21 General:SgSC's (cf. universal SgSC's in Chomsky and Halle (1968), 4.21):

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SgSC 1. [+high]
↓ ↓
[-Low]

SgSC 2. [+Front]
↓ ↓
[-Back]

SgSC 3. [+Sonorant]
↓ ↓
[+Cont]

There are languages in which the converse of 1 and 2, and possibly, of 3 would be true. But it is necessarily the case that 1 to 3 are true in all languages.

4.22 Group Specific SgSCs.

The rest of the segment structure conditions apply strictly in Yoruba. For some, it is not clear whether we would want also to classify them as universal, or near universal. Consider, for example, SgSC 4.

4.221 Major Classes.

SgSC 4: [+cons]
↓ ↓
$\begin{bmatrix} \text{-front} \\ \text{-Syl} \\ \text{-Low} \end{bmatrix}$

Apparently, the feature [±front] is relevant only to vowels, in which case, it should not be entered at all for sonsonantal segments.

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SgSC 5:

$$[+\text{Syl}] \rightarrow \begin{bmatrix} -\text{cons} \\ -\text{cor} \\ -\text{ant} \\ -\text{lat} \\ +\text{vcd} \\ +\text{son} \end{bmatrix}$$

SgSC 5 distinguishes vowels from glides and consonants. We have stated, above, the case for considering the feature [±syllabic] universal.[3] Courtenay (1968) provides additional reasons to suggest that the feature [±vocalic] is inadequate for classifying sounds of particular languages. She thus gives us the ground to believe that [±syllabic] is more adequate. She says of [±syllabic]:

> ...This feature is non-distinctive on the systematic phonemic level, but is necessary for a correct systematic phonetic output.[4,5]

SgSC 6:

$$\begin{bmatrix} +\text{son} \\ +\text{cons} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{low} \\ -\text{back} \\ -\text{high} \\ +\text{ant} \\ +\text{vcd} \end{bmatrix}$$

---

3. See under [±syllabic] in the section on the definition of features.

4. Courtenay (1968) p. 9.

5. See chapter VII for a further discussion of these features.

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Condition 6 specifies the subclass of /m,n,l,r/ as nonlow, nonback, nonhigh, anterior, and voiced. Nonhigh entails nonpalatal for consonants.

SgSC 7:

$$\begin{bmatrix} \cdot\cdot\text{syl} \\ -\text{cons} \\ \alpha\ \text{low} \\ \beta\ \text{ant} \end{bmatrix} \downarrow\downarrow \begin{bmatrix} +\text{son} \\ -\text{cor} \\ -\text{lat} \\ -\text{nas} \\ -\text{front} \\ -\alpha\ \text{vcd} \\ -\alpha\ \text{high} \\ \beta\ \text{back} \end{bmatrix}$$

Condition 7 specifies feature content of glides /j,w,h/. Any of them has, for "voiced" and "high," the opposite of its value for the feature [±low], but the same values for the features [±ant] and [±back]. Thus /h/ is low, nonvoiced, nonhigh, nonanterior, and nonback.

4.222 Consonants (Nonsyllabic segments)

SgSC8:

$$[-\text{son}] \downarrow\downarrow \begin{bmatrix} +\text{cons} \\ -\text{syl} \\ -\text{nas} \\ -\text{lat} \end{bmatrix}$$

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Conditions 8 is a statement on the feature content of the segments /b,f,s,š,t,d,ǰ,k,g,kp,gb/.

SgSC9:
$$\begin{bmatrix} -son \\ +cont \end{bmatrix} \rightarrow \begin{bmatrix} -back \\ -vcd \end{bmatrix}$$

Condition 9 provides features specifications for /f,s,š/. The two features of the I(C) completely identifies the three segments, which happen to be the only strident sounds in Yoruba.

SgSC 10:
$$\begin{bmatrix} -son \\ +back \end{bmatrix} \rightarrow \begin{bmatrix} -cor \\ -cont \\ -high \end{bmatrix}$$

SgSC 10 states that /k,g,kp,gb/ are noncoronal, high nonnasal, nonlateral, noncontinuant.

SgSC11:
$$\begin{bmatrix} +ant \\ -cor \\ \langle -high \rangle \end{bmatrix} \rightarrow \begin{bmatrix} -syl \\ -low \\ -lat \\ \langle \begin{bmatrix} +cons \\ -back \end{bmatrix} \rangle \end{bmatrix}$$

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Condition 11 states that /b,m,f,kp,gb,w/ are nonsyllabic, nonlow, and nonlateral. In addition, it states that /b, m, f/ are consonantal, and nonback.

SgSC 12:
$$\begin{bmatrix} +\text{cor} \\ +\text{ant} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{cons} \\ -\text{high} \\ -\text{back} \\ -\text{low} \end{bmatrix}$$

By SgSC 12, /s,t,d,n,l,r/ are consonantal, nonhigh, and nonback. Notice that SgSC 4 has already stated the condition for consonantal segments. This makes 7 more strongly classificatory than it looks.

SgSC 13:
$$\begin{bmatrix} -\text{cor} \\ -\text{back} \\ -\text{ant} \\ -\text{syl} \\ +\text{high} \end{bmatrix} \rightarrow [+\text{vcd}]$$

Condition 13 specifies the palatals /ǰ, j/ as redundantly voiced.

SgSC 14:
$$\begin{bmatrix} -\text{son} \\ -\text{cor} \\ +\text{ant} \\ -\text{high} \\ -\text{cont} \end{bmatrix} \rightarrow [+\text{vcd}]$$

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SgSC 14 states that the labial stop /b/ is redundantly voiced.

SgSC 15:
$$\begin{bmatrix} +\text{cor} \\ -\text{ant} \end{bmatrix} \downarrow\downarrow \begin{bmatrix} -\text{son} \\ +\text{cons} \\ +\text{high} \\ +\text{cont} \end{bmatrix}$$

Condition 15 partially specifies the segment /š/.

SgSC 16:
$$[+\text{lat}] \downarrow\downarrow \begin{bmatrix} +\text{son} \\ +\text{cons} \\ +\text{cor} \\ -\text{nas} \end{bmatrix}$$

SgSC 16 implies that /l/ may be entered in the dictionary as lateral cnly, but that a complete specification must take account of features in the T(C) part.

4.223 Syllabic Segments.

SgSC 17:
$$\begin{bmatrix} +\text{syl} \\ -\text{high} \\ -\text{low} \end{bmatrix} \downarrow\downarrow [-\text{nasal}]$$

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SgSC 17 states that neither /e/, nor /o/ has a nasal counterpart in SY.

SgSC 18:

$$\left[\left\{\begin{matrix}[+H]\\ [+L]\end{matrix}\right\}\left[\begin{matrix}-H\\ -L\end{matrix}\right]\right]$$

↓ ↓

[+syl]

The awkwardness in the form of Condition 18 stems from the fact that we would like to say that if a segment of Yoruba is specified for tone, then it is syllabic. Thus in the first approximation, no vowel of Yoruba occurs without a tone-register, and no consonant occurs with a tone-register. By implication, as will be more explicitly stated in the following chapters, the so-called syllabic consonants are no longer consonants in the sense of being $\left[\begin{matrix}+cons\\ -syl\end{matrix}\right]$, once they have undergone the syllabification rule.

SgSC 19: Tone registers:

[+H]

↓ ↓

[-L]

Although [+H] and [+L] are mutually exclusive in Yoruba, condition 19 appears to be an adequate statement of observable fact of the language.

Given the above segment structure conditions, table IX is a matrix showing the amount of redundancy in the structures of the phonological

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segments of Yoruba.

Table IX raises a very interesting problem about the relevance of statements of redundancy. As stated earlier on in this study, MSC's are statements of relations among features. If then the relation of mutual presupposition among features (as in SgSC 18) is a valid phonological relation, how should this be translated into a statement of redundancy? In other words, which do we consider redundant for the syllabic segments of Yoruba (in Table IX) syllabicity or tone? Or are we to suppose that an MSC need not imply redundancy?

The answer to these questions will decide for example whether the type of evaluation measure devised by Stanley (1967)[6] applies universally or only to descriptions of certain languages. Since the measure counts feature specifications saved in any dictionary matrix, the decision on which feature to save in a case of mutual presupposition is entirely arbitrary. To the extent then that our description of Yoruba is motivated it seems that Stanley's evaluation measure is inadequate, at least in the sense that it cannot compare the present description with any other which does not make the same claims.

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6. It states that

> For every MS condition C, we can talk about how many feature specifications C allows us to save in any dictionary matrix D: this is just the number of additional specifications that D would require to select a single matrix from the set M'(U) where M' is the set of M with the condition C removed. Since we can talk about the number of feature specifications each MS condition save in the dictionary, it follows that we can use the same kind of evaluation procedure as that used for MS rules, since this procedure is based on the number of feature specifications that each MS rule saves us in the dictionary. (p. 430f.)

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Table IX

	b	f	s	š	t	d	j	ǰ	k	g	kp	gb	m	n	l	ɾ	j	w	h	i	e	ɛ	a	ɔ	o	u	ɪ̈	ɛ̃	ã	ɔ̃	ũ
sonorant	-	-	-										+	+		+															
syllabic					-	-	-								-		-	-	-	+	+	+	+	+	+	+	+	+	+	+	+
consonantal							+	+	+	+	+	+	+	+	+	+	-	-	-												
coronal	-	-	+	+	+	+	-						-	+		+															
anterior	+	+	+	-	+	+	-	-	-	-	+	+					-	+	-												
high	-	-					+												-	+	-					-	+	+			+
low																						-	+	+	+	-			+	+	
back							-	+	+	+	+	+												-	-				+	+	+
nasal													+	+	-					-	-					-	+	+	+	+	+
front																				+	+	+	+					+	+	+	
lateral													-	+	-																
continuant	-	+	+		-	-	-																								
voiced	-	+			-	+			-	+	-	+																			

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Another problem is the double-edged question of how to state noncriteriality as a classificatory (binary) concept, and once stated, how to evaluate noncriterial coefficients of features. Consider, for example, the features "lateral," "front," and tone registers. How does one distinguish between nonlateral consonants and vowels which are inherently nonlateral in Yoruba? Also a consonant is [-H, -L], but is not for that reason mid-tone; and, finally, the feature "front" is irrelevant to nonsyllabic segments in the language. It is not clear how one should state these facts in terms of classificatory features. Hopefully, the markedness theory which, as stated earlier, is still being developed (Halle, 1967; Postal, 1968; Chomsky and Halle, 1968), will provide some guidelines.

4.3 Sequence Structure Conditions

In addition to the items in Tables I and II (3.21), the following items are further examples of formatives of SY. It should be borne in mind that as an entry into the dictionary, each item is fully specified with respect to features as in Tables VII and VIII. The sequence structure conditions (SgSC) which follow are constraints on the use of segments in the language. They specify in effect the definitions of possible morphemes in the language, and account for the structure of the formatives in the lists that follow.

Nouns

/ī̀lé/	'house'
/àkpá/	'scar'
/àkpà/	'(a) spendthrift'

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/ɔ̀rɛ́/	'friend'
/ɔ̄rǔ̀/	'neck'
/ɛ̄fɔ̋/	'a strip of the bark of palm branch'
/ōǰú/	'eye'
/kpákpá/	'field (open grassy field)'
/gèlè/	'women's headwear'
/fèrèsé/	'window'
/kòkòrò/	'insect'
/òtítɔ́/	'truth'
/ēs̄ūs̄ū̄/	'mushroom'
/èsúsú/	'traditional form of credit system'
/àlúkpàjídà/	'magic'
/àgbámìréré/	'roan antelope'
/òsùmàrè/	'rainbow'
/ìkpérèrè/	'goose-flesh'
/ɔ̀dǎ/	'grassland'
/ɛ̄gǎ/	'arable land that is semi-forest, semi-grassland'
/ɔ̄dű́/	'year', 'festival'

Function Words:

/àfī/	'except'
/àtī/	'and'
/sí/	'to' (cf. Lat. ad)
/ní/	'in'

Verbs:

/rɛ́/	'slice'
/rɛ̀/	'tire'

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/rɛ̄/ 'soak'

/tà/ 'sell'

/tā/ 'sting'

/gb̄ū/ 'be crooked'

/kpā́/ 'be ripe'

/fī́/ 'carve ornamentally'

/kéré/ 'be small'

/kpūkpā/ '(be) red'

/wò/ 'look'

/jó/ 'be sated (as with food)'

/tù/ 'to sooth'.

Other categories:

/ākɔ̄/ 'male'

/ābō/ 'female'

/fɛ́rɛ̀/ 'almost'

/ǰɔ̄ǰɔ̄/ (an intensifier equivalent to 'very much')

/kpúkpɔ̀/ 'much'

/kótó/ 'hollow'

A most important fact of Yoruba morphology is that any of the major categories (including adjectives and adverbs) can be derived from at least one of the other categories. This derivation may take the form of prefixation, reduplication, compounding, and so on. Examples:

wò 'look' :: āwò 'eye-glasses' (prefixation)

wíwò 'for looking'; 'looking' (reduplication)

kéré 'be small' :: kékeré 'small' (reduplication)

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ọdún 'year' :: l'ọ́dún 'in the year'

l'ọ́dọọdún 'yearly';'everyyear' (juxtaposition: ← ní ọdún ọdún)

The derivational power thus increases the lexical resources of the language beyond what a mere inventory of formatives may lead one to believe. Since we shall discuss the phonology of some of these processes, we add here only one more example. Given the verb tà 'sell', the following items can be derived:

ìtà 'the act of selling'

títà 'to be sold'

In addition, both the verb and the derived forms can combine with nominals or other verbs and undergo further derivation. Given the verb pa 'kill', we may derive

patà	'slaughter for sale'
àpatà	'the enterprise of slaughtering for sale'
alápatà	'a butcher'
pípatà	'the act of slaughtering for sale', etc.

Mindful of this productive power of Yoruba and of the existence of genuine polysyllabic formatives, we would not go so far as to specify the maximum number of segments formatives may have in the language. For even if it were possible to specify it, it certainly would not be very useful, because such a specification would not provide any additional structural information not obtainable otherwise.

In addition, some of the so-called derived forms are no longer transparent in the sense that earlier accounts (for example, Courtenay, 1968)

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imply. Some of these forms have been unjustifiably called ideophones; unjustifiably because there is no single rule or block of rules to set them apart from other comparable "non-ideophonic" forms.

In order to allow for a class of formatives to be called ideophone Courtenay's first positive condition[7] defines "the" form of optimum lexical formatives in Yoruba as in (21)

21. PC [+(V)CV(CV)+]

She remarks that

> ...The sequence of segments in all Yoruba lexical formatives except ideophones (...) is alternating consonants and vowels.

First, all Yoruba formatives without exception (that is, ideophone or not) consisting of more than one segment are made up of sequences of alternating consonants and vowels. In addition, we have reservations about the formal restriction of six segments placed on Yoruba lexical formatives, as can be seen in part from the partial list above. In Courtenay's account, verbs are of the form CV, while nouns are derived from verbs by adding prefixes and/or by a reduplication of the rootstem. We are told without evidence that all trisyllabic nouns are so formed, and that items with more than three syllables are simply ideophones. The following

22. (a) /àtɛ́lɛsɛ̀/ 'sole of the foot', and

(b) /ālágbá['lizard'

---

7. Courtenay (1968), pp. 22ff.

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would then be considered as ideophones, or simply as being derived from some basic verbs. But as far as we know the only attempt to explain all noun initial vowels as prefixes to some earlier forms of the verbs[8] remains only tentative. For example, while 22(a) can be considered the nominalized version of the compound verb /télɛ̄sɛ̀/ one would have to assume that 22(b) is derived from some noun /àn̄gbá/. In either case, searching for the derivation of -ɛsɛ̀ 'foot' in 22(a) and of /àn̄gbá/ in 22(b) would yield nothing. One would similarly be hard put to it trying to find the derivation of /òdùmārè/ 'the Almighty'[9] or /òsùmàrè/ 'rainbow'.

8. Awobuluyi (1967), "Vowel and Consonant Harmony in Yoruba" (Journal of African Languages 6, 1).

9. But, see Rev. Samuel Johnson's History of the Yorubas (p. 143) for a kind of folk etymology of "olódùmarè." He writes:

> Oduduwa the reputed founder and ancestor of the race is really a mythical personage. The etymology of the term is from odu(ti o) da Iwa. Whatever is unusually large as a large pot or container is termed odu: the term then implies, the great container, the author of existence. According to Ife mythology Oduduwa was the son of Olodù mare, i.e., the father or Lord of Odu; ma rè implies cannot go beyond i.e. the Almighty.

Certain facts in Yoruba, however, raise doubts about Rev. Johnson's etymology. Consider the following formatives of Yoruba:

odù |ōdù|
òdù |òdù|

The first generally refers to themes and subthemes in Ifa divination, and is exactly the first constituent of the Odùduwà, sometimes pronounced Odùdúwà |ōdùdúwà|. This conceivably could have been derived from Odù tí ó dá Iwà as suggested by Rev. Johnson. It is also conceivable that it is the same formative odu that occurs in Olodùmarè which name is normally given as the equivalent of 'Almighty', but which in actual fact connotes "mysticism."

It is òdù and not odù of the last paragraph that connotes magnitude. For example, in the game of ayò, the collections of more than ten seeds in one cup is called odu, which means simply 'more numerous than normal'. In addition, odu is used for anything extraordinarily large as in òdù òyà |òdù òjà|, a kind of guinea pig (a large rodent) when it is much bigger than usual.

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It seems then that the derivational capacity of Yoruba by no means permits one to generalize where there is no justification to do so. In particular it must be recognized that certain general phonological processes operate regardless of whether we call an item an ideophone or not. On this usage "Ideophone" becomes only a repository where we can relegate anything we perceive as peculiar or inexplicable.

4.31 Global SgS Conditions.

In this study, we define formatives as functional morphemes, where "functional" means either semantic, or grammatical ('grammatical' in the traditional sense of the term). In Yoruba the minimum formative may be a syllabic segment. For example, /o̅/ in /kpèlɛ̀ o̅/ (a form of greeting) renders the greeting polite and sympathetic. A nonsyllabic segment is, however, never by itself a formative. For the rest, and as suggested by the list of formatives above, Yoruba formatives consist of "alternating consonants and vowels" (Courtenay, passage cited above). These observations on the general structure of Yoruba formatives are expressed by 23. It will be noticed that the sequence structure condition does not impose a limit as to the number of segments a formative may contain.

23. SqSC 1. General Structure of Yoruba Formative:

$$\underset{\text{FORM}}{[\ } (C)V(CV)_{o} \underset{\text{FORM}}{\ ]}$$

In terms of features, 24 stands for 23

24. $P(C):\left[\underset{\text{FORM}}{\ }\right.$ ([-syl]) [+syl] ([-syl] [+syl])$_{o}$ $\left.\underset{\text{FORM}}{\ }\right]$

9, cont. Finally, Rev. Johnson's interpretation of ma rè is obscure. rè means 'go', and one would expect that a simple prohibition of this would be má rè, 'don't go'. Phonetically, màrè in Òdùmàrè (shortened form for Olódùmarè or Olódùmàrè) is identical with màrè in osùmàrè 'rainbow'. Do both forms have any semantic relationship? We do not know. But it appears that this should be the direction in which to look for the etymology of the form màrè, or marè.

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where both segments are further specified, for example, by SgSC's 4 and 5. SqSC 1 implies that Yoruba lexical entries have no vowel sequences, and no dipthongs. Items such as 25 are derived forms. 25 consists of four rather than three "syllables."

25. |àìlárá| 'the state of having no relatives or friends'. /à/ is a privative prefix, and occurs only before the nominalizer /ì/. Thus 25 can be said to derive from the sequence of à + ì and the compound verb lárá ('have relatives and friends').

All vowel sequences are derived through rule-governed phonological processes. Thus, the sequences |éè| in 26, and |èè| in 27 are two phonetic syllables, not one, so that 26 consists of four syllables, while 27 has three.

26. ìkpéèrè (←/ìkpérèrè/) 'goose-flesh'.

27. èèwɔ̀ (←/èwìwɔ̀/) 'taboo'.

Condition 2 following is, like condition 1, a general constraint on the structure of Yoruba formatives.

28. SqSC 2: Formative structure:

$$N(C) \sim \left[\begin{array}{l} \left[\begin{array}{l} +syl \\ \left\{\begin{array}{l} [+nas] \\ \left[\begin{array}{l} +high \\ +back \end{array}\right] \end{array}\right\} \end{array}\right] \\ \text{FORMATIVE} \end{array}\right]$$

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SqSC 2 is a negative condition. It states simply that the vowel initial of formatives can be neither nasal nor /u/. It must be emphasized that this condition applies strictly to SY, as certain formatives of the Ijẹ̀ṣà dialect violates the condition on both counts. Bamgbose provides the following examples[10]:

29.	Ijesa	SY	English glossed
	/ī́jɔ̃́/	/ɪ́jɔ̃́/	'pounded-yam'
	/ù̃jɔ̀/	/ɪ̀jɔ̀/	'famine'
	/ūlé/	/ɪ̄lé/	'house'
	/ùgbɨ̀/	/ɔ̀gbɨ̀/	'plant'

We have seen in 3.22 that there is a constraint on the co-occurrence of vowels in SY formatives, namely, 30.

30. SqSC 3 - Vowel co-occurrence:

$$P(C): \quad \left[([-syl]) \left(\begin{bmatrix} +high \end{bmatrix} ([-syl][+syl])_{o} \;\middle|\; \begin{bmatrix} +low \\ -front \\ -back \end{bmatrix} \;\middle|\; \begin{bmatrix} -high \\ -low \end{bmatrix} ([-syl]\begin{bmatrix} +syl \\ -low \end{bmatrix})_{o} \;\middle|\; \begin{bmatrix} +low \\ +front \\ +back \end{bmatrix} ([-syl]\begin{bmatrix} +syl \\ +low \end{bmatrix})_{o} \right) \right]_{FORM}$$

10. "Vowel Harmony..." p. 8. Just as in the case of "consonants" and "non-syllabic" we shall be using the terms "formatives" and lexical item" (and sometimes even "morphemes") interchangeably in the rest of this study, except where this is likely to lead to ambiguity. The first of the three terms is to be considered the most general.

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We will show later that this constraint has been generalized in some dialects of Yoruba (in Ijẹ̀ṣà and Èkìtì, for example) so that the feature [±low] is no longer the mark of vowel harmony but rather [±tense] or root-advancing (Stewart, 1969). As a result of this generalization nasal vowels which are lax (centralized) with respect to their oral counterparts are nontense like all low vowel segments.

Examples:

31. (a) /ā̌šɔ̄/ 'clothes'
    (b) /ējò/ 'snake'
    (c) /àtǔ̀kpà/ 'lamp'
    (d) /òrùlé/ 'roof'

The vowels of 31 (a) and (c) would be marked -tense in the lexicon of these dialects, while those of 31 (b) and (d) would be marked +tense.

4.32 Major Categories

We will now consider the sequence conditions with particular reference to the syntactic categories "noun" and "verb." In singling out these two categories, we are not following earlier students of Yoruba who seem to classify all formatives in the language with either one or the other of these two. Courtenay for example seems to suggest that 21 above accounts for all morphemes of Yoruba, except the so-called "ideophones." It so happens, according to her, that the formative of maximum length is a noun, and the minimum, a verb. Thus she is silent about non-nouns that are also non-verbs, and cannot be called ideophones, that is, adjectives, adverbs and functionals. We do not see any justification for such a

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point of view. Since the notion of maximum-minimum formative does not appear to be useful in the phonology of SY, conditions 4 and 5 presented here make no mention of it.

32. SqSC 4. Nouns:

$$P(C): \left[\left[\left\{\begin{matrix}[-syl] \\ [+syl \\ -H]\end{matrix}\right\}\right]\right]$$

NOUN

Condition 4 states simply that a noun may have a consonant as first segment, but if it has a vowel initial, then that vowel does not have a high register. But, notice that this implies one of two things, either that other syntactic categories may have a vowel initial with a high register, or that only nouns may have a vowel initial in SY. Neither of these is, of course, true, since there are a few non-nouns with vowel initials. Examples of such non-nouns are

33. (a) /àfī/ 'except'

(b) /àtī/ 'and'

(c) /àbɔ̀/ 'unripe'

It is of interest, however, that vowel initials of formatives tend not to have high register in Yoruba. We can then restate condition 4 as 4' to make it more general.

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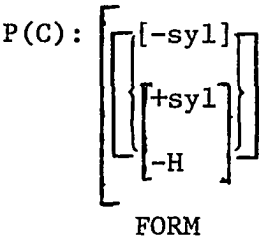
34. SqSC 4' - Formatives:



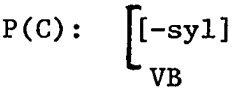
SqSC 4' asserts that the initial vowel of formatives in Yoruba does not have a high register. Examples:

35. (a) /kókó/ '(a) knot'
(b) /àkpārò/ 'bushfowl'
(c) */àbǔ̀/ 'gift'
(d) /èmí/ 'heart'
(e) /ōrúkɔ̄/ 'name'

Verb

A verb in Yoruba cannot be described simply as an optimum Syllable as some would have it (See 5.5). The only constraint on the sequence structure of the verb to be noted here is stated in SqSC 5:

36. SqSC 5. Verb Structure:



which says that a verb always has a consonant initial, where the term "consonant" includes glides.

Examples:

37. (a) /ká/ 'to pluck'
(b) /jà/ 'to sketch'

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(c) /wà/ 'to dig up; 'to drive'

(d) /kpā/ 'to kill'

(e) /kéré/ 'to be small'

4.33 Nasal Segments Sequence

In SY when a vowel follows a nasal consonant, that vowel may be nasalized. If the nasal consonant is coronal, then the vowel (with the possible exception of /i/ (chapter VIII)) is obligatorily nasal. This restriction is expressed by 38.

38. SqSC 6. Post Nasal vowel:

$$N(C) :\sim \left[X \begin{bmatrix} +cor \\ +nas \end{bmatrix} \begin{bmatrix} +syl \\ -nas \end{bmatrix} \right]_{FORM}$$

Condition: X may be empty.

SqSC 6 is a negative condition. It states that the sequence of /n/ plus nonnasal vowel does not occur in SY. This constraint also applies across morpheme boundaries. (In Stanley, 1967, MSC's do not apply across formative boundaries). Thus after the elision of post nasal vowels we have the following changes:

/ní ōkō/ ('on the farm') - |l'óko| but not |n'ókō|

/tāā ní ó dé/ ('who arrives?') |tāā l'ó dé| not |tāā n'ó dé|

More will be said about this phenomenon in the next chapter. The effect of the MS Conditions proposed in the present chapter will also be seen as we turn to the phonological rules of the language.

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CHAPTER V

PHONOLOGICAL RULES (P-RULES)

5.1 Scope

In the following presentation, no separate section is devoted to tones as most treatises on Yoruba have done. This is fundamentally because we do not consider tone operatively different from other distinctive features. Accordingly, tones are treated where they fit in the scheme of things. The P-rules are organized under two broad rubrics: global, and categorial. By "global" we mean those rules which apply regardless of syntactic considerations. In reality, such phonological rules are not very common in Yoruba. However, rules that apply to several syntactic categories are not infrequent.

Categorial phonological rules are those which apply just in case the structural description to which they apply is dominated by a given syntactic category such as Noun, Pronoun, or Verb, or even an NP.

5.21 Global P-Rules.

The three rules of 3.22 belong in this category. These rules apply before any other phonological rules. We list them here again for completeness

P-1 /a/-fronting.

$$\begin{bmatrix}+\text{syl}\\-\text{back}\end{bmatrix} \rightarrow [+\text{front}] \;/\; \underline{\quad} \; [-\text{syl}] \begin{bmatrix}+\text{syl}\\+\text{high}\end{bmatrix}$$

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P-2 Nasal Vowel Raising.

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

P-3 Nasal Backing.

$$\begin{bmatrix} +syl \\ +low \\ -front \end{bmatrix} \rightarrow [+back] \; / \begin{bmatrix} \underline{\quad} \\ +nas \end{bmatrix}$$

5.22 Elision and Glide Formation.

Elision is a fairly general phonological process in Yoruba. It does not always involve whole segments, and it often sets off other phonological processes by eliminating only certain segments or features of individual segments. Feature elision is most characteristic of the processes involving tone registers as we shall see.

Glide formation is another phonological process of a fairly general application which we shall consider below. It is a phenomenon of the syllabic segment.

5.221 Elision.

Segment sequence conditions 1 and 3 (4.3) state two fundamental facts of SY: first, that SY formatives have no consonant finals, and second, that SY formatives have no consonant clusters. As a result of the first of these characteristics, when a word with vowel initial follows another word, there is a juxtaposition of two vowels. In certain of these cases, elision takes place: non-tonal features of one of the vowels in

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contact are deleted. Tone Register deletion and substitution in such a case are governed by a set of rules independent of those applying to non-tonal features. Consider the following examples:

/wá ɛ̀fɔ́/	→	/wɛ́fɔ́/	'look for edible greens'
/sí ábà/	→	/sábà/	'to the farmhouse'
/ní ìlú/	→	/nílú/	'in the town'
/nī́ īlɛ̀/	→	/nílɛ̀/	'on the ground'
/gū̄ àǰà/	→	/gàǰà/	'climb up into the lofe'
/sī̄ òkú/	→	/sì̀kú/	'to bury the dead'
/kā ìwé/	→	/kàwé/	'to read (a book).'

Register elision and substitution, as in these examples, are governed by the following phonological (P-) rules:

P-4 Tone transformation (i):

$$[-H] \rightarrow \phi \;/\; \begin{Bmatrix} [H] \\ [\text{——}+T_i] \end{Bmatrix} \qquad \begin{matrix} (a) \\ (b) \end{matrix}$$

P-5 Tone transformation (ii):

$$\begin{bmatrix} +syl \\ \phi T_j \end{bmatrix} \rightarrow [+T_i] \;/\; \begin{bmatrix} \phi F \\ +T_i \end{bmatrix}$$

P-6 Tone transformation (iii):

$$\begin{bmatrix} \phi F \\ +T_i \end{bmatrix} \rightarrow \phi \;/\; \begin{bmatrix} +syl \\ +T_i \end{bmatrix}$$

Conditions: $\underline{i}$ is a variable over the values [+H], [+L], and $\begin{bmatrix} -H \\ -L \end{bmatrix}$. T_j is necessarily [-H] from P-4, and T_i may be any of the three registers. ϕT_i means that the register T_i is deleted. ϕF means that the nontonal features of that syllabic have been deleted.

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P-4 is an abbreviation of two rules, (a) and (b). (a) is interpreted as: "a non-high tone is elided before or after a high tone." (b) states that a low tone, or a mid tone is dropped before any tone. Such statements are possible only on the strength of SgSC 4 which states that no formative in SY has a high tone vowel initial. See also the above examples.

Rule 5 states simply that where a syllabic has lost its tone (by P-4), or has not been assigned any specific tone at all (P-8, below), it assumes the tone of a juxtaposed segment whose quality features have been deleted. Rule 6 which complements the first two, states that the tone of a segment whose quality features (nontonal or f-features) have been deleted is simply dropped, if a juxtaposed syllabic has the same tone. With the application of P-6, SgSC 17 it is satisfied. (See derivation 1 below.)

It is of the utmost importance to bear in mind, as stated in the opening paragraph of 5.221, that vowel elision takes place only across formative boundaries.

5.222 Other Elisions.

Certain formatives always have the F-features (nontonal features) of their vowel final deleted before the vowel initial of the following item. Most of these formatives are what would be called function words in Bloomfieldian linguistics. All Yoruba formatives that behave this way have a front, non-low vowel final. Examples:

/sí/	'to':	/sí ābà/	→ /sábà/	'to the farmhouse'
/ní/	'in':	/ní ìlú/	→ /nílú/	'in the town'
/nǐ́/	'to have':	/nǐ́ ōwó/	→ /n'ówó/	'to have money' (to be rich'

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/nĩ̄/ 'is (of identity)': /tātā nĩ̄ ìrɛ̀/ → /tātā nìrɛ̀/

'cricket is grasshopper (a cricket is a grasshopper)'

/èkó nĩ̄ īlé/ → /èkó nīlé/ 'Lagos is home'

/šé/ (interrogative particle): /šé ɔ̄bā nĩ̄/ → /śɔ̄bā nĩ̄/

'Is he a king?'

/bí/ (conditional marker): /bí ɔ̄bā bá nĩ̄/ → bɔ́bā bá nĩ̄/

'If he were a king'

/kí/ (modality marker): /kí ɔ̄bā kpɛ́/ → /kɔ́bā kpɛ́/

'may the king live long'

The following rule accounts for the normal phonetic representation of this class of formatives in an SY utterance.

P-7' Generalizable F-feature deletion:

$$\begin{bmatrix} +\text{syl} \\ -\text{low} \\ +\text{front} \end{bmatrix} \rightarrow \phi \;/\; \underset{1}{\begin{bmatrix} \text{———} \\ +T_i \end{bmatrix}} + \underset{2}{\begin{bmatrix} [+\text{syl}] \end{bmatrix}} .$$

Condition: 2 is either lower than 1, or is of the same vowel height. Notice that rule 7' leaves the tones of all segments intact. In a derivation, then, it precedes rules 4 to 6 above. We shall see below that some description of Yoruba have tried to generalize rule 7' to all cases of elision involving a front high vowel (that is, including verb-noun collocations). It will be shown that, attractive as such a generalization seems, it is not completely satisfactory. The basic problem with rule 7' as it stands is whether or not to specify the first part of its structural condition for function words (grammatical formatives) thus:

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$$\begin{bmatrix}+\text{syl}\\-\text{low}\\+\text{front}\end{bmatrix} \rightarrow \phi \;/\; \begin{bmatrix}\overline{}\\+T_i\end{bmatrix}_1 \Bigg]_{\text{GR. FORM}} \qquad + \Big[[+\text{syl}]_2 \;.$$

This specification now obliges us to invent a rule feature (or a diacritic) for non-function words that undergo the same rule; for example, for the verb /ní/ 'to have', a homophone of the locative /ní/ 'at' (in the examples given above). Alternatively, one might give a full inventory of the items that undergo this rule. This will, however, falsify the very concept of rule-grammar, since, by implication, no item not included in the inventory would then be allowed to undergo rule 7'. But we want to be able to say, for example, that any new function word in the language whose structure meets the specification given in rule 7' can automatically undergo the rule. We shall leave this question open for the time being. Perhaps further research will suggest a useful approach.

A limited number of the items which undergo rule 7' also undergo rule 7".

P-7" /i/-F-feature deletion:

$$\begin{bmatrix}+\text{syl}\\+\text{high}\\+\text{front}\end{bmatrix} \rightarrow \phi \;/\; \begin{bmatrix}-\text{syl}\\+\text{nas}\end{bmatrix} \begin{bmatrix}\overline{}\\+T_i\end{bmatrix}(]+[) \Big[[-\text{syl}]$$

The rule states that the segment /i/ loses its F-features when it occurs after a non-syllabic nasal, and is followed by any non-syllabic. The rule applies across (as well as within) word boundaries, that is, the second nonsyllabic may be the initial segment of a following word.

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Notice that the left-hand side of rule 7" is a special case of the left-hand side of 7'. Moreover, some of the products of rule 7' undergo rule 7". Consequently, in order to avoid restating in 7" the conditions for these products of 7', we allow both 7' and 7" to be conjunctively ordered with respect to the structural conditions satisfying the rules. Rule 7, then, abbreviates both 7' and 7".

P-7 F-feature deletion:

$$\begin{bmatrix} +\text{syl} \\ -\text{low} \\ +\text{front} \end{bmatrix} \rightarrow \phi \;/ \left\{ \begin{array}{ll} \left[\begin{bmatrix} \underline{\quad\quad} \\ +T_i \end{bmatrix}\right] \;+\; [\,[+\text{syl}] & \text{(a)} \\ \begin{bmatrix} -\text{syl} \\ +\text{nas} \end{bmatrix} \begin{bmatrix} +[\; \\ -[\,[+\text{syl}] \\ +T_i \end{bmatrix} (]+[)\; [-\text{syl}] & \text{(b)} \end{array} \right\}$$

7 (b) is optional, especially when it applies to a sequence of a preposition plus a noun. (See derivation 1.)

Where an item undergoes rule 7 (b), its conditioning nasal segment is assigned the same tone register as the floating one by P-8. SgSC 18 automatically applies to the product of P-8 to create a syllabic nasal.

P-8 Syllabic Nasal:

$$\begin{bmatrix} -\text{syl} \\ +\text{nasal} \end{bmatrix} \rightarrow [T_i] \;/\; \underline{\quad\quad} \begin{bmatrix} \phi F \\ +T_i \end{bmatrix} (]+[)\; [-\text{syl}]\; [+\text{syl}]$$

Rule 8 makes a claim which may sound fantastic: namely, that all syllabic nasals in Yoruba are derived through rules such as 7(b) and 8. For example, in words like <u>aláǹtakùn</u> |āláǹtāākū̀| 'spider'; <u>āláǹgbá</u> |āláǹgbá| 'lizard'; <u>pāḿpɛ́</u> |pāḿpɛ́| 'steel trap'; <u>ńlá</u> |ńlá| 'big', P-8 claims that the syllabic nasals are derived from a sequence of some nasal

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consonant (which we shall represent by the archiphoneme /N/) and the vowel /i/ followed by a (word-initial) nonsyllabic. It will become clear in a moment why we choose to use the archiphoneme. First, let us see, by means of examples, an application of rules 4 to 8. Consider the following underlying strings /ɔ̄lú + wà + ní + ɪ̄lé/ 'Olu is at home', /šé + ɛ̄šɪ̄ + nɪ̄ + ó + jɔ̄́/ 'is it a horse that neighs?', /àwā + mí + lɔ̄/ 'we are going'. The following derivation yields the phonetic representation

Derivation 1:

	/ɔ̄lú + wà + ní + ɪ̄lé/	/šé + ɛ̄šɪ̄ + nɪ̄ + ó + jɔ̄́/	/àwā + mí + lɔ̄/.
P-7(a)	/ɔ̄lú + wà + nɸ + ɪ̄lé/	/šɸ + ɛ̄šɪ̄ + nɸ̄ + ó + jɔ̄́/	--
P-7(b)	/ɔ̄lú + wà + nɸ + ɸ̄lé/	--	/àwā + mɸ + lɔ̄/.
P-4(a)	/ɔ̄lú + wà + nɸ + lé/	/sɸ + ɛ̄šɪ̄ + n + ó + jɔ̄́/	--
P-4(b)	--	--	--
P-8	/ɔ̄lú + wà + n̥ɸ + lé/	--	/àwā + m̥ɸ + lɔ̄/.
P-5	/ɔ̄lú + wà + n̥ɸ + lé/	/šɸ + ɛ́šɪ̄ + n + ó + jɔ̄́/	/àwā + m̥ɸ + lɔ̄/.
P-6	/ɔ̄lú + wà + n̥ + lé/	/š + ɛ́šɪ̄ + n + ó + jɔ̄́/	/àwā + m̥ + lɔ̄/.

The last row of the derivation above is not yet a phonetic representation of the original strings. In particular, no /n/ is ever found before an oral vowel in spoken SY (SqSC 6), and nasals are always homorganic with the non-syllabic they immediately precede. In this study, we consider both phenomena as cases of partial assimilation. In the first case (P-9) /n/ assimilates to the following oral vowel by having its nasality feature deleted. The second (P-10) case is more general. It applies to <u>all</u> non-syllabic <u>nasals</u> in preconsonantal position, hence we have used the archiphoneme /N/ above. The archiphoneme is simply a nonsyllabic nasal as in rule 10.

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P-9. /n/ denasalization:

$$\begin{bmatrix}+\text{cor}\\+\text{nas}\end{bmatrix} \rightarrow [+\text{lateral}] \;/\; \text{——} \; + \left[\begin{bmatrix}+\text{syl}\end{bmatrix}\left\{\begin{bmatrix}-\text{high}\\-\text{front}\end{bmatrix}\right\}\begin{bmatrix}-\text{nas}\end{bmatrix}\right]_{\text{FORM}}$$

We must emphasize the observation that laterality is purely incidental to the product of P-9. What is essential is that in losing the unique feature of nasality, the segment remains continuant, non-syllabic, and consonantal, without becoming strident.

P-10. Homorganic assimilation:

$$\begin{bmatrix}-\text{syl}\\+\text{nas}\end{bmatrix} \rightarrow \begin{bmatrix}\alpha\ \text{ant}\\\beta\ \text{cor}\\\gamma\ \text{back}\end{bmatrix} \;/\; \text{——} \; \begin{bmatrix}-\text{syl}\\\alpha\ \text{ant}\\\beta\ \text{cor}\\\gamma\ \text{back}\end{bmatrix}$$

In common parlance, by rule 10, a nasal consonant assimilates to the following consonant in point of articulation. In this position, the nasal nonsyllabic always maintains its nasality.

A word on the application of P-9 and P-10. The format of P-9 is possible because of the same convention which makes it possible that SgSC 18 apply to the product of P-8, namely, that "the output of each P-rule is automatically subjected to the segment structure rules" (Stanley (1967), p. 402). Thus, by SgSC 16, the [+lateral] segment that results from P-9 automatically loses the feature [+nas].

As for the application of P-10, if we recall SgSC 5, we will remember that it specifies syllabic segments as necessarily nonconsonantal. For

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this reason, the last row of derivation 1 (above) cannot meet the condition for the application of P-10, since the nasal consonants have already become syllabic. If, however, P-10 is allowed to apply before P-8, all the homorganic allophones of /m/ and /n/ (by P-10) naturally become syllabic (by P-8)[1] without having to have recourse to some ad hoc device in order to derive homorganic nasal segments from syllabic nasals. This would be the case if P-8 were allowed to precede P-10.

The following is the derivation of the phonetic representation of the earlier strings after rule 4(a) has applied. Rule 9 apparently can apply anytime after rule 4(a).

Derivation 2: (after the application of P-4 in Derivation 1)

P-rule 9	--	/šɸ + ɛ̄šī + 1 + ó + jɔ́/	--
P-rule 10	/ōlú + wà + nɸ + 1é/	--	/àwā + nɸ + 1ɔ̄/.
P-rule 8	/ōlú + wà + ṇɸ + 1é/	--	/àwa + ṇɸ + 1ɔ̄/.
P-rule 5	/òlú + wà + ṇɸ + 1é/	/šɸ + éšī + 1 + ójɔ́/	/àwā + ṇɸ + 1ɔ̄/.
P-rule 6	/ōlú + wà + ṇ + Íe/	/š + éšī + 1 + ó + jɔ̄/	/àwā + ṇ + 1ɔ̄/.
	|ōlú wà ṇ 1é|	|šéšī 1ó jɔ́|	|àwā ṇ 1ɔ̄|

5.223 Glide Formation.

Glide formation is a very controversial subject in Yoruba phonology. There have been as many proposals as there are students of Yoruba, and they all subscribe to different descriptive models. At the risk of being cryptic, we shall not dwell on other treatments of glide formation for the present.

---

1. See 5.44: /mī kò tà/ → /n̄ kò tà/ → |n̄ ò tà| 'I don't sell'.

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Bamgboṣe and Pike[2] resemble each other in their approach to this phenomenon. We shall tentatively call their approach "prosodic." Both are troubled by the problem of how phonemicity is maintained when a conditioning feature (low-tone, in this case) is deleted. They cannot accept assigning a phonemic status to a phonetic representation the way phonemicists do and preach. For Pike, as for Bamgboṣe, there are no more than three phonologically relevant 'tonemes' (to use their terminology) in the language. Analysts like Olmsted[3] who posited nine 'tonemes' for Yoruba have, therefore, gone too far. We will attempt to show that the phonemicists' error is no more serious than that which one may justifiably attribute to both Bamgboṣe and Pike themselves.

In this study, "glide" refers to the conditioned change by which a "syllable" with a mid-register or a high-register vowel is phonetically realized as a juxtaposition of two vowels the first of which is low toned. The conditioning segment must be present for the phonological process to take place. The phenomenon has been well described by Bamgboṣe (1965, p. 9ff). Consider the following examples:

/jóò wá/ → |jóò wàá| 'he will come'

/èjí/ → |èjìí| 'this'

/ìwɔ̄/ → |ìwɔ̀ɔ̄| 'you (sg.)'

---

2. Bamgboṣe, "The Assimilated low-tone ..." (Lingua vol. 16. 1 (1966)) pp. 1-13, Kenneth L. Pike, "Supra-segmentals in reference to Phonemes of item of Process, and of Relation" (in To Honor Roman Jakobson, vol. II, The Hague (1967)) pp. 1545-1554.
   Bamgboṣe is a prosodist of the Halliday School of Thought (Pre-1965 Halliday,that is). Pike subscribes to the tagmemic theory, and his concept of Item, Process and Relation is a part of his long tradition of an integrated approach to language. Bamgboṣe's "prosody" is Pike's phoneme of process. Both will be defined in Chapter VI.

3. "The Phonemes of Yoruba" (Word, (1951), 245-9).

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/ɔ̀kɔ̄/ → |ɔ̀kɔ̀ɔ̄| 'one (as in "one of them")'

/ìwé/ → |ìwèé| 'a book'

/àgbàdō/ → |àgbàdòō| 'corn'

Rule 11 accounts for glides in Yoruba.

P-11 Glide Formation:

$$\phi \rightarrow \begin{bmatrix} +\text{syl} \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ +\text{L} \end{bmatrix} / \begin{bmatrix} +\text{syl} \\ +\text{L} \end{bmatrix} \; [-\text{syl}] \; \underline{\quad} \; \begin{bmatrix} +\text{syl} \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ +T_i \end{bmatrix}$$

Condition: $T_i \neq +\text{L}$.

Rule 11 states that where a syllable in an utterance is preceded by a low tone syllabic segment, the vowel of the syllable is duplicated; and the first of the duplicate has a low tone, like the conditioning syllabic. As has been observed, the conditioning vowel is often dropped in case of contraction. When this happens, the glide carries the burden of maintaining phonological distinction. (It must be emphasized that this is most true of SY). Examples:

/ní ìlú/ |nílùú| 'in the town'

/sú ìrē/ |súrèē| 'invoke blessings'

This is what prompts phonemicists to set up glides as phonemes in Yoruba. But the phonemicists' approach has been criticized by Bamgboşe and Pike as mentioned above.

It is to Ida Ward's credit that, working as early as 1952 on Yoruba, she recognizes this phenomenon. She considers glide formation (quite

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rightly, we think) a surface structure phenomenon; she writes:

> ...The juxtaposition of high and low tones, either high-low or low-high, needs some comment .... It should be noted, ... that though we mark the tone of each syllable separately, the whole of a phrase is continuous: this involves gliding between the syllables as the voice passes from one to another. Such glides occur in all languages, and are heard if speech is deliberately "slowed up." This slight fall, however, on the low tone is heard as a more or less deliberate glide. ...Similarly, the relationship of low followed by high requires a glide up to the high tone.

Ward would not be pre-occupied, then, with the phonemicity or non-phonemicity of glides in the following examples (slightly adapted) from Bamgboṣe (Lingua, 1966). We share her view in this respect.[4]

1	(a)	(ó fɛ́ ɪ̄gbá>)	ó fɛ́gbá	'he wants a calabash
	(b)	(ó fɛ́ ìgbá>)	ó fɛ́.gbá	'he wants a garden egg'
2	(a)	(ó fɛ́ ā̄gbō̄>)	ó fágbō̄	'he wants a circle'
	(b)	(ó fɛ́ àgbō̄>)	ó fá.gbō̄	'he wants an infusion'
3	(a)	(ó fɛ́ ɔ̄gbā̄>)	ó fɔ́gbà	'he wants a fence'
	(b)	(ó fɛ́ ɔ̀gbà>)	ó fɔ́.gbà	'he wants an equal

---

4. An Introduction to the Yoruba Language (Cambridge, 1956) #78, paragraphs (e) and (f).
As we shall see below, 'glide', to Ward, covers more than just the phenomenon we have defined here. She recognizes a glide just about anywhere there is a juxtaposition of two vowels. Since cases of juxtaposition have different motivations, some syntactic, some lexical, others phonological, we limit our definition to the latter. Above all, phonetic results of all three types of juxtaposition are more often than not dissimilar.
In other matters, Greenberg (personal communication) has suggested that perhaps the question of phonemicity does not arise for Ward "because she was pre-phonemic." This may be so. However, given the time she was writing (about 1950), it appears that she deliberately chose not to do a phonemic analysis.

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The dot in the derived version (b) of each number is Bamgboṣe's "prosody" (and Pike's phoneme of process) which is supposed to remind the reader, (i) that a low tone has been elided here (where the dot stands), and (ii) to pronounce a glide in the next syllable.

In the transformational generative approach, this problem does not arise. This is not to say that the problem is avoided, rather that it is accounted for more naturally. The model explains how the phonetic (surface structure) representation is derived, and implicitly insists that all facts at this level be represented. It is not necessary to invoke phonemicity, nor is there any independent motivation for replacing an underlying segment with an arbitrary symbol (be it a dot, or an exclamation mark) while at the same time declaring that the underlying segment is not there. The TG approach thus provides, for practical purposes, a reasonably sound basis for a more satisfactory orthographic representation than we have at present.

A partial derivation (after P-11) of some sample utterances follows. We say 'partial' because we have not yet proposed any rule to account for contractions such as are shown in Bamgboṣe's examples above, although the tone elision rules already proposed apply in these cases, as in any other in the language. Examples: <u>ṣé ìgbá wà</u>, 'are there, garden eggs?'; <u>yóò wá</u>, 'he will come' <u>*ìbí èjì</u> 'twin births'; <u>ó fɛ́ àgbo</u> 'he wants an infusion'.

Derivation 3:

	/šé ìgbá wà/	/jóò wá/	/ìbí èǰì/	/ófɛ́ ágbō/
P-11	/šé ìgbàá wà/	/jóò wàá/	/ìbìí èǰì/	/ófɛ́ ágbóò/
P-4	/šé igb̀áa wà/	/jóò wàá/	/ìbìí eǰì/	/ófɛ́ agbòō/

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It will be observed that P-11 does not generate a glide from a sequence of two low tone syllables. In short, only the sequence of a low tone followed by either a high tone or a mid tone in the next syllable yield glides. This runs counter to what others claim, namely (see, for example, Bamgboṣe's example (3) above) that low register also participates in glide formation. P-11 claims, then, that (a) and (b) of example (3) become homophonous after elision, but items in the pairs (1) and (2) remain distinct. Moreover, on a more abstract level, if the low tone segment participates in the glide formation, there would be nothing in the language to prevent a regression ad infinitum in the application of a glide formation rule. Thus the rule would re-apply in subsequent cycles to the products of derivation 3, yielding non-existent forms such as:

*/sé ìgbààá wà/ */jóò wààá/ */ìbìlí èǰìlì/

*/sé ìgbà$_n$...àáá wà, and so on, where n is the number of times the P-rule applies. One would then be forced to invent a condition saying that the glide formation rule applies only once to a given string. But see derivations 5 and 6(b) below. In the former, |òòótɔ́| and |èèésú| derive normally (Cf. Abimbọlā, 1968. p. 23: nwọn láwọn óò kéèésúu tiè náà fún, where kéèésu ← kó èèésú). In 6(b), if P-11 applies as proposed, we would have |àkèèé| (←/àkèé/), which is correct. But if it were to apply as envisaged by Bamgboṣe, then we would derive the non-occurring *|àkèèèé|, nor would this be the end. In addition, items such as /àgɔ̀jí/ / ('a barren woman') would yield, in the first approximation, *|àgɔ̀ɔ̀jì̀ì̀|. For these reasons, we remain skeptical about any attempt that suggests that low tone participates in glide formation.

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It has been observed that in certain cases of elision, depending on the dialect of Yoruba, the high tone that replaces the elided low tone, is itself changed to a mid-tone. Bamgboṣe mentions this interesting phenomenon in his discussion of the "assimilated low tone" (1966). Consider the following examples which are given in that article:

(1) |ìbē.ǰì| (</ìbí èǰì/) 'twin birth' or 'twins'

(2) |àgbò kā.gbò| (</àgbò kí àgbò/) 'any ram whatsoever'

Unfortunately, none of the earlier descriptions provide an explanation for what is going on. All the examples which we have suggest that this transformation takes place only where there is a juxtaposition of formatives independently undergoing P-11, as in the case of /ìbìí èǰì// in the derivation above. This transformation is optional, though some words display no other form in some dialects. Thus (1) above is an SY pronunciation, while the Ijẹṣa form of the same utterance |ìbé.ǰì|[5] has not undergone that transformation. Conversely, SY has |àgbò ká.gbò|, while Ijẹsa has |àgbòkāgbò| . Also, within the same dialect, the transformation does not always take place. Thus, /èdákíèdá/ 'any creature' has a single form for all dialects, since it does not undergo the transformation under discussion in any of the dialects. P-12 accounts for this tone change.

P-12: High tone transformation:

$$[+H] \rightarrow \begin{bmatrix}-H\\-L\end{bmatrix} / \begin{bmatrix}+syl\\+L\end{bmatrix} [-syl] \underset{1}{\begin{bmatrix}+syl\\+L\end{bmatrix}} \underset{2}{\left[\begin{bmatrix}+syl\\ \end{bmatrix}\right]} + \left[\begin{bmatrix}+syl\\ \phi L\end{bmatrix} [+seg][+seg],\right.$$

Conditions: 1 results from glide formation;
ϕL means a low tone is elided.

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5. We have used Bamgbose's dot notation just to maintain uniformity for the time being. We do not subscribe to it.

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Applied to the last row of the derivation 3, P-12 yields the following output.

P-12: /šé igbàá wà/ /jóò wàá/ /ìbìī eǰì/ /ò fé agbòō/.

P-12 follows P-4. We shall have more to say about these rules below as we turn to our categorial phonological rules. But before we move on, we have further comments on the functioning of P-11 in spoken SY. In SY, there seems to be a tendency to get around obligatory glide formation. For example, instead of using the Future aspect particle /ǰóò/ which renders glide formation necessary, some speakers substitute an alternative Future particle /á/, thus, /á wá/, instead of /jóò wàá/, 'he will come'.

5.3 Categorial P-Rules:

5.31 Nominals[6]

Examples of Yoruba Nouns:

/fìlà/ 'cap'

/fèrè/ 'whistle'

/dòdò/ 'fried plantain'

/kpákpá/ 'field (as in the grassland)'

/jɔ̄gí/ 'gravel'

/fèrèsé/ 'window'

/wúńdíá (←*/wúnídíá/) 'girl adolescent (of marriageable age)'

/ɔ̄mɔ̄/ 'child'

/ɔ̀dɔ́/ 'adolescent' (/ d m kuri/ 'male adolescent')

/ētí/ 'ear'

/òdē/ 'outside'

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6. Our use of the term 'nominal' here excludes pronouns, but includes some type of adjectives. Adjectives may be derived from nouns and verbs (#5.35).

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/ōdò/	'river'
/ɪ̌šɛ́/	'task'
/ālɛ́/	'evening'
/ɪ̄rɔ́/	'(a) lie'
/ɪ̄mṹ/	'nose'
/āgōgō/	'bell'
/ōdídɛrɛ́/	'parrot'
/ɔ̀dɛ̀dɛ̀/	'verandah'
/ōrúkɔ̄/	'(a) name'

The first three sequence structure conditions of SY apply to all formatives. But SqSC4, and especially the second part of this condition, applies more to nouns than to any other class of formatives, since this class has by far the largest proportion of items with vowel initials. Following is SqSC.4., for ease of recall.

SqSC 4: $\left[\left[\left\{\begin{matrix}[-syl] \\ [+syl \\ -H\end{matrix}\right]\right]\right]_{FORM}$

This condition states simply that nouns may have a consonant or a vowel initial in Yoruba. We would like to go further and suggest that it is premature to posit a prefix theory for the vowel initials of nouns, that is, that all vowel initials of nouns are prefixes, and that nouns without vowel initials have simply lost their prefixes. Before we examine the reasons some earlier students of Yoruba have for positing the noun-prefix theory, it seems to us that the notion of 'affixation' is a functional one in the description of languages. By 'functional' we mean that an

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affix is not just an empty space filler, devoid of content, be it semantic or syntactic. Now, as far as the class of nouns goes in Yoruba, no satisfactory account has been given of the prefixes usually posited, to make explicit the function they perform.[7] Moreover, it is difficult to postulate affixal derivation for all nouns even in class languages, since not all vowel initials can be assigned to class prefixes. We do not deny the possibility (cf Ch. III (ftn. 14)) that all vowel initials of nouns in Yoruba are earlier prefixes; we do suggest, however, that it is too early to be dogmatic about such a hypothesis. A casual examination of the argument in earlier descriptions of Yoruba on this score forces one to reject their claims.

The theory of the vowel-prefix-of-nouns in Yoruba dates back to Ida Ward (Introduction to the Yoruba Language. #101-#111), and is probably even earlier. But Ward in her usual disciplined moderation has not gone so far as to suggest that all nouns in Yoruba must have had vowel prefixes at one time or another. She simply says that

> ...The great majority of nouns in Yoruba begin with a vowel which is frequently a prefix added to a verb root. (#109).

She makes this statement in trying to explain the extra syllable heard between two nouns of which the last modifies the first, the last, again, having a consonant initial in other contexts. Examples: /ēwé ē kókò/ 'cocoyam leaf' but /kókò títóbī/ 'a large cocoyam'.

Pursuing her argument, Ward adds that

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7. The only discussion of this to our knowledge is by Awobuluyi in "Vowel and Consonant Harmony in Yoruba." (Journal of African Languages vol. 6. Para. 1, (1967), pp. 1-8).

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> ...It is not possible to see why (sic) this extra glide is felt to be necessary: it may be to supply the want of a prefix, since the normal build of a noun is prefix plus root. Note that the glide is on a mid tone in every case. (#111).

Rowlands (1954)[8] writes of the extra vowel: (Ward's glide, and Rowlands' "extra length"):

> ...This extra length can best be interpreted morphonologically as the vowel initial of the second nominal. We may say that the Independent form of this type of nominal has a vowel initial which is realized as zero in some contexts and which is always assimilated to the vowel final of the leading nominal in a nominal combination. (p. 378).

Moreover, Rowlands calls combinations such as

|ōǰúdē|	(≠ /ōǰú òdē/)	'front of the house'
|ētídò|	(≠ èti ōdò/)	'river bank'
|ɔ̀mɔ̀bǐrǐ̀|	(≠/ɔ̀mɔ̀ ōbǐrǐ/)	'a girl' (a female child)

"closed compounds" that are always written together (≠ stands for "not the same as").

We differ with Rowlands on two counts: First, we believe that the extra vowel does not belong to the second noun in, for example,

|fìlà ā látǘdé| 'Latunde's cap'.

Secondly, it does not seem that Rowlands is correct in his characterization of his closed compounds. We will show below (#5.35) that the process that derives those forms is an ongoing process in SY, and that the compounds need not be written together.

Siertsema in her article, "Long vowels in a tone language,"[9] has also disagreed with Rowlands, claiming that the extra vowel belongs to the

8. "Types of Word Junction in Yoruba." (BSOAS, XVI, Part 2 (1954), pp. 376-388.

9. "Problems of Phonemic Interpretation II, Long Vowels in a Tone Language" (Lingua 8, 1959), pp. 42-64.

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first noun of a nominal combination.

In 1964, Awobuluyi defends a view that is equivalent to Ward's.[10] He posits "a vanishing /i/" for all Yoruba nouns which do not show any trace of vowel initial. He thus goes further than Rowlands who merely posits some unidentified vowel as the lost initial of these nouns. Awobuluyi gives three reasons to support his postulate:

1. Privilege of backward assimilation[11];
2. Existence of variants /ībùsǜ̀/ ∿ /bùsǜ̀/ 'bed'.
3. Morphological alternations: /títà/∿ /ūtítà/ 'the act of selling'.

Awobuluyi's postulate should carry weight, coming from a native speaker of Yoruba. We would like to believe that our disagreement with Awobuluyi is due to the fact that we both speak different dialects of Yoruba,[12] and so, have dissimilar native speaker's intuition! But it does not seem that the mere fact of speaking, or of simply knowing different dialects explains the difference between his and our stand on this score.

In the first place, the second of the examples in footnote 11:

/kú išɛ́/ → |kú ušɛ́|

shows simply that Awobuluyi overlooks some details of the data he uses. Most of the nouns that follow the element /kú/, as in the example above,

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10. Phenology and Morphophonemes of Yoruba, pp. 73ff.

11. Ibid. Awobuluyi's examples, using his convention and notation, are:
{ilé ìlọ̀rí} > /ilé èlɔ̀rí/ 'ilori's house'
{kú isɛ́} > /kú ušɛ́/ (a greeting addressed to somebody working)

12. The present writer was born and grew up at Ajawa, a small town exactly half way between Oyo and Ogbomoso. (See above). The speech of this area is fairly close to SY. Dr. Awobuluyi hails from Affa, and speaks, in addition to SY, the dialect of his home town which, he claims, is less 'evolved' than SY.

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denote action or state of being, and are derived from verbs by prefixing the nominalizer /ì/ to verbs. Other nouns that follow this element are locative nominals (both spatial and temporal), and nouns denoting states of being. It is clear, then, that though these last two classes may not have /i/ initial, they, too, do denote action, or simply, state of being. Examples:

/kú ɔ̄dṹ/	'greeting during an annual festival'
/kú ālɛ́/	'good evening'

as against:

/kú ìjèdṹ/	'congratulations for having lived through another year'
/kú ìbī kɔ̄/	'greeting to one who is bed-ridden because of illness'.

Awobuluyi is correct in stating that a large number of nouns derive from verbs, and that, of these, an appreciable number have /i/ as their derivational prefix. This does not, however, imply that all nouns with /i/ initial are derived from verbs. Any suggestion that it does will have to show how

/īrɔ́/	'(a) lie'
/īšɛ́/	'task'
/īmṹ/	'nose'
/ìkpā/	'dishonesty'

are derived from verbs, and what types of verbs. It is not clear, then, how we get from /i/-initial nouns to positing /i/ initial for all nouns that do not have vowel initials.

Awobuluyi's second reason also appears to be untenable. We do not know of the type of alternation he suggests in Yoruba.

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Before we consider the third reason, let us look at some data similar to those which Awobuluyi (1964, 73f) discusses. For example, Olasope /ɔ̄lásō̄kpé/, Lasope /lásō̄kpé/, and Sope /sō̄kpé/, are variants of the same name, without a change in its implicit meaning. Now, if we want to say Olasope's book, we are equally free to use any of the three forms, depending, of course, upon our relationship with him, which is another matter. At any rate, the last two, but not the first will call for this mysterious mid-tone vowel. Thus, in those three cases we will have:

|ɪ̄wé ɔ̄lásō̄kpé|

|ìwé ē lásō̄kpé|

|ìwé ē sō̄kpé|

Now, there does not seem to be any reason to suggest that the "extra vowel" in the last two cases (1) belongs to the name, or (2) must be a lost /i/ (with whatever tone that may be).

The stumbling block seems to be that analysts have often expected too much from grammatical terminology. If, for example, instead of considering the construction under discussion as purely genitival, we substitute the notion of determination, it becomes clear that the phenomenon is not limited to nouns without vowel initial, but that it is the normal way to express determination with nominals, excluding adjectives, in the language.[13] It can be suggested, therefore, that it is the non-linguistic context of empirical relations that subclassifies the syntactic usage. To borrow from logic, one can paraphrase the syntactic device thus: x is

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13. Cf. French de + nominals. This, too, in French is an area that has not, to our knowledge, been well studied, but, at least the usage is more glaringly that of determination that is not necessarily genitival.
The notion of determination also helps to explain Awobuluyi's third reason as we shall see presently.

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in the relation R to y (xRy). This, empirically, could mean: x is owned by y (or any number of other relations), etc. At first sight, it seems that Awobuluyi agrees with this point of view when he states that

> ...Hardly any native speaker would agree that /kú ɪ̄šɛ́/ and /ìlùú u dàdàa/ 'Dada's town' represent the same type of construction. That is, for the native speaker the notion of possession is neither involved nor implied in /kú išɛ́/, /kú ūtítà/ and /kú ūtí.../ (that is between these two words only, and not taking the words that follow /ti/ into account). In view of this, it does not seem that this 'extra' syllable is the genitive construction marker. (74)[14]

In reality Awobuluyi believes that the construction is genitival except when it occurs between the element /kú/ and the following noun. Witness almost the very next statement he makes:

> ...Contrary to the belief of earlier analysts, I think that what we are dealing with in the genitive construction is not a case of tone change but rather of simple progressive assimilation.

The remark in parentheses in the first passage remains obscure. The entire quotation underlies Awobuluyi's third reason for positing /i/ as the initial segment of all Yoruba nouns that otherwise show no trace of a vowel initial. But in the first place, it is not clear in what sense to take "alternation," for we cannot find in SY a context where the two forms in reason (3) alternate. Awobuluyi supports his argument by supplying the information (1964, p. 75 f.n. (1)):

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14. Awobuluyi's (1968) p. 374: It is difficult to be asked to consider the underscored elements as words, and at the same time to be told that the initial /u/ of the second part of the utterance is a mere prefix. Besides, we are skeptical of such words as uti + plus, whatever Awobuluyi may have in mind.
The underscoring in the above quoted passage is mine.

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> ...That in the Affa dialect of my home town, the genitive construction involves the juxtaposition of two nouns--first object possessed, then the possessor, without any other markers than the order and context. My arguments above imply that the same situation obtains in Yoruba.

The following are some facts of the Affa dialect provided by the author (f.n. (2), p. 73):

> ...All Yoruba words which apparently begin with a consonant are still (because I think I have reasons to believe that this dialect is more archaic than many of the more familiar dialects) pronounced with an initial /i/ with the mid tone, e.g. Yoruba /sòkòtò/ 'trousers' is Affa /ɪ̄sòkòtò/, and Yoruba /dàdà/, a male name, is Affa /ɪ̄dàdà/, etc.

This, in fact, seems like a strong argument, except that in slow or formal speech, even nouns with vowel initial do participate in the construction in which the 'extra' vowel shows up in SY.

Still on the question of noun prefix, Courtenay (1968),apparently rejecting all these earlier approaches, posits an underlying /u/-initial for all nouns that have non-syllabic initials on the surface level. We suspect that Courtenay bases her claim on the facts of dialects such as Ìjẹ̀ṣà and Èkìtì where a considerable proportion of SY /i/-initial nouns occur with a /u/ initial. If we are right, then, Courtenay's argument reduces to Awobuluyi's, and must be equally received with reservations, pending further evidence.

But Courtenay's accounts are inadequate in other respects. Her first phonological rule has all underlying /u/ initials of nouns deleted before any other rule applies. Now, on the basis of the dialect material just mentioned, along with evidence of internal reconstruction within the SY itself, it would be necessary to posit an underlying /u/ not only for

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the nouns with non-syllabic initial, but also for a large number of nouns with /i/ initial. If Courtenay's P-1 then applied, the vowel initials of all these nouns would be indiscriminately deleted. Subsequent rules would then generate mostly non-Yoruba sequences. Thus, we would have the following cases:

Postulated Underlying Form	SY Surface Form	
/ūkōríkō/	(|kōríkō|)	'grass'
/ūjɔ̄gí/	(|jɔ̄gí|)	'gravel'
/ūlé/	(|īlé|)	'house'
/ūró/	(|īró|)	'a lie'
/ùgbà/	(|ìgbà|)	'period of time'

After Courtenay's P-1, these would become

|kōríko|

|jɔ̄gí|

|lé|

|ró|

|gbà|

especially, since her rule is generalized. As we can see, this rule accounts artificially for the first two items, but destroys the structure of the others. Notice also that in the case of nominal determination (NP serving as determinant) of the type we have been discussing here, both the third and the fourth items would also be acceptable, provided, of course, we agree that the extra vowel belongs to the closing noun. But this harks back to Awobuluyi's argument. It must be rejected simply because a large number of nouns like the fifth item here would be given non-occurring forms in all contexts, since they lose their vowel initial

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low tone by Courtenay's P-1. Examples:

After Courtenay's P-1	SY Form	
|ìwèé ē lé|	|ìwèé eìé|	'tax receipt'
|lé è mĩ|	|ĩlé è mĩ|	'my house'
|lé ē rɔ́|	|ĩlé ē rɔ́|	'house of lie'
|rɔ́ kékēré|	|ĩrɔ́ kékēré|	'petty lies'
|gbà òjò|	|ìgbà òjò|	'rainy season'

(For our own view of the "extra vowel" phenomenon, see #5.33).

Courtenay's postulate is untenable for yet another reason: All nouns to which her P-1 applies would now occur without vowel initial everywhere! This fact is all the more remarkable, because Courtenay herself rejects the idea that the extra vowel in our "noun determination" (#5.33) belongs to any of the participating nouns (Courtenay, 1968, p. 61).

To sum up, we cannot accept the postulate that all nouns in Yoruba used to have vowel prefixes on the basis of the evidence available at present. The phenomenon of extra vowel in the noun+noun combination is a syntactic device which we shall call complementation, or determinant construction. The 'extra' vowel, then, is the complementizer, or rather the determinant marker. We may even call it the associative vowel, after Courtenay, if not for the reason that we find that terminology a little cumbersome, and somewhat restrictive. We would like, for example, to extend the notion of complementation to cases such as the element /kú/ plus the following noun. Finally, the appeal to the notion of Awobuluyi's all purpose "morphophoneme" (1964, p. 79), and Courtenay's archisegment (1968, p. 61) is both inadequate and not sufficiently motivated.

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5.311 Consonant Deletion

5.3111 In Yoruba, a class of trisyllabic nouns contract by deleting their first consonant. The following are examples of such nouns:

/ēgũ̄gũ̄/	'bone'
/ògũ̀gũ̀/	'medication'
/ōdídɛ́rɛ́/	'parrot'
/èbìbɛ̄/	'peel'
/ɔ̀dɛ̀dɛ̀/	'verandah'
/āgōgō/	'bell'
/òtútù/	'chill'
/èdìdì/	'enchantment'
/èsúsú/	'traditional form of banking (or credit union)'
/ēnĭnĭ/	'dew'

A large proportion of these nouns are verb-based. Characteristically, all the nouns of this class have a vowel initial which is, on purely observational criteria, non-high. The second vowel of the verb-based ones is high, more often than not high front. When the final vowel is high nasal, the second vowel may be either the normal high front, or identical with the final vowel. The last two vowels of those nouns whose second vowel are not high are identical. Generally speaking, the two consonants of each noun are identical. P-13 deletes the first of these consonants. It appears that there are exceptions to the second part of rule 13. Example:

/ātótó ārére/ 'pray, be silent'

in which no elision ever takes place. Such exceptions are, however, too few to invalidate the rules.

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P-13 Consonant deletion:[15]

$$[\text{-syl}]_1 \rightarrow \phi \;/\; \left[([\text{+syl}])_N \begin{bmatrix}\text{+syl}\\ \text{-high}\end{bmatrix} \right] \text{———} \left[\left\{ \begin{bmatrix}\text{+syl}\\ \text{[+high]}\end{bmatrix}, \left\langle \begin{bmatrix}\alpha_1 F_1\\ \vdots \\ \alpha_n F_n\end{bmatrix} \right\rangle \right\} \right] [\text{-syl}]_2 \left[\left\{ \begin{bmatrix}\text{+syl}\\ [\quad]\end{bmatrix}, \left\langle \begin{bmatrix}\alpha_1 F_1\\ \vdots \\ \alpha_n F_n\end{bmatrix} \right\rangle \right\} \right]$$

Condition 1 = 2.

P-13 states that in a 'trisyllabic' (i.e., a noun with five or six segments) noun with a vowel initial, the first consonant is deleted if it is identical with the second consonant, and if either the second vowel (that is, the vowel following the first consonant) is high, or the second and the third vowels are identical. "[ ]" means any vowel at all.

Example: Derivation 4.

Underlying	After P-13	English Gloss
/ògũ̀gũ̀/	/òũ̀gũ̀/	'medication'
/òtítɔ́/	/òítɔ́/	'truth'

---

15. Cf. Courtenay's P-2 and P-3 which are consonant deletion rules. Courtenay's P-3 is unnecessary, as it is devised to account for a few items for which her P-2 proves inadequate. Her P-2 applies to nouns with /i/ initial. This is not true in Yoruba. Its application /ìrírā/ would yield *|ìírā|. It is for the same reason that she has been compelled to invent *|*ìĩ̄sĩ̀| or *|*ìĩ̄sĩ̀| (P-5), supposed to be derived from /ìsĩ̄sĩ̀/ 'now'. The first two forms are unknown to us.

Our P-13 also differs from Courtenay's P-2 in that the latter applies only to cases where the second vowel is high non-back.

As far as the /i/ ∿ /ĩ/ alternation mentioned in our discussion is concerned, the following can be observed in the language:
/ũ/

|tīt̄ũ̄|	|tũ̄tũ̄|	'new'
|dídí́|	|dĩ́dí́|	'frying' (as in frying chicken = fryer)
|ēgīgũ̄|	|ēgũ̄gũ̄|	'bone'

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/èdìdì/	/èìdì/	'enchantment'
/èsúsú/	/èúsú/	'traditional form of banking'
/āgōgō/	/ā ōgō/	'bell'
/ōtútù/	/ōútù/	'chill'
/ēnĪnĪ/	/ē ĪnĪ/	'dew'
/*ōrìrũ/	/ōìrũ/	'sun'

As indicated by our convention of slanting slashes, column 2 is not in phonetic representation. As Courtenay has well observed, the second vowel of the items in column 2 assimilates to the preceding vowel with regard to quality features. Then, a fact Courtenay has not observed, if the initial vowel is mid tone, and is followed in the word after P-13 by a low tone vowel, the initial vowel optionally assumes low tone. This tonal assimilation is a specific case of P-4 (b)[16]. The non-tonal feature assimilation is progressive, while that of tone feature is regressive. Notice also that the vowel assimilation is that of relatively high to relatively low. P-14 and P-15 apply to the product of P-13 to derive the phonetic representation of the items in column 1 above.

P-14 Nontonal feature assimilation:

$$[+syl]_2 \rightarrow \begin{bmatrix} \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix} \; / \; \begin{bmatrix} X \\ N \end{bmatrix} \begin{bmatrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix}_1 \text{——} [-syl]$$

Condition: 1 is of a lower vowel height than 2. X may be empty.

---

16. Courtenay's P-5 generates non-Yoruba forms. For example,
/oótù/ > |óótù|.
Not only does the high tone vowel initial violate the sequence structure constraints of the language, the form simply does not exist, at least, not to our knowledge.

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P-15 Mid-tone assimilation:

$$\begin{bmatrix}-H\\-L\end{bmatrix} \rightarrow [+L] \;/\; \begin{bmatrix} \begin{bmatrix}+syl\\ \hline\end{bmatrix} \begin{bmatrix}+syl\\+L\end{bmatrix} \\ N \end{bmatrix}$$

Derivation 5:

P-13	P-14	P-15	P-11	Phonetic Representation
/òùgù̀/	/òògù̀/	-	-	|òògù̀|
/òítɔ́/	/òótɔ́/	-	/òòótɔ́/	|òòótɔ̄|
/èìdì/	/èèdì/	-	-	|èèdì|
/èúśú/	/èésú/	-	/èèésú/	|èèésú|
/ōútù/	/ōótù/	-	-	|ōótù|
/ēī̄nī̄/	/ē ēnī̄/	-	-	|ē ēnī|
/ōìrù̀/	/ōòrū̄/	/òòrù̀/		|òòrù̀|
/ā ōgō/	/ā ōgō/	-	-	|ā āgō|

5.3112 r-Deletion

There are other types of consonant deletion which apply to Yoruba words, mostly nouns. The commonest of these is the dropping of /r/ in certain positions, as in the following words:

/fèrèsè/	'window'
/ōrúkɔ̄/	'(a) name'
/wárákpá/	'epilepsy'
/fɛ́rɛ̀/	'almost'
/òfūrūfú/	'firmament'
/àkèré/	'a type of edible frog'

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/āgbárā/ 'strength'

/ɔ̄lɔ́rū̃/ 'God'

/dárā/ '(be) good'

P-16 defines the deletion. We shall leave P-16 in the canonic form, because further research may yield a greater generalization that will also account for the deletion of /w/ and /j/ sketched below.

P-16 /r/ Deletion:

$$/r/ \rightarrow \phi \;/\; \left[\begin{array}{l} \left\{ \begin{array}{l} ((V)C) \quad V\_\_\_\_VCV(CV)_{o} \\ (V)CV\_\_\_V \end{array} \right\} \\ \text{FORM} \end{array} \right] \begin{array}{l} (a) \\ (b) \\ \text{FORM} \end{array}$$

V is a syllabic segment as defined in the list of conventions. C represents a nonsyllabic segment. If V is formative initial, then it is necessarily non-high, otherwise the rule does not apply. P-16 abbreviates rules 16(a) and 16(b) in a conjunctive ordering. 16(a) and 16(b) expand into disjunctively ordered rules, such that if any rule into which 16(a) expands applies to a string in a given cycle, no other rule of 16(a) may apply in the same cycle. The same for 16(b).[17]

16(a) i. VCV___VCVCV.

ii. VCV___VCV.

iii. CV___VCVCV.

iv. CV___VCV.

*v. V___VCVCV.

vi. V___VCV.

16(b) i. VCV___V.

ii. CV___V.

17. On conjunctive and disjunctive ordering see Chomsky's "Some General Properties of Phonological Rules" (Language 43, 1. 1967), 102-128.

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Of these, only 16(a)v seems not to occur in SY. 16(b)ii applies only to non-nouns.

Derivation 6:

(a)	'name'	'epilepsy'	'large wide'	'firmament'	'woman with a defective sex organ'
	/ōrúkɔ̄/	/wárákpá/	/fɛ̀rɛ̀gɛ̀dɛ̀/	/òfūrūfú/	/ākíríbōtō/
16(a) i.	-	-	-	-	/àkííbōtō/
ii.	-	-	-	/òfū ūfú/	-
iii.	-	-	/fɛ̀ɛ̀gɛ̀dɛ̀/	-	-
iv.	-	/wáákpá/	-	-	-
vi.	/ōúkɔ̄/	-	-	-	-
P-14	/ōókɔ̄/	-	-	-	-
	|ōókɔ̄|	|wáákpá|	|fɛ̀ɛ̀gɛ̀dɛ̀|	|òfū ūfú|	|ākííbōtō|
(b)	'edible frog'	'strength'	'God'	'good'	'to play'
	/àkèré/	/āgbárā/	/ɔ̄lɔ́rū̄/	/dárā/	/šīré/
16(b) i.	/àkèé/	/āgbáā/	/ɔ̄lɔ́ū̄/	-	-
ii.	-	-	-	/dáā/	/šīé/
	|àkèèé|	|āgbáā|	|ɔ̄lɔ́ū̄|	|dáā|	|šīé|

We have mentioned ideophones in passing (Ch. IV). At least three of the words in Derivation 6 would qualify as ideophones by the criteria of linguists who accept the autonomous existence of this category. It is clear, however, that these items are part and parcel of the language, and there is little justification for treating them separately, except, perhaps inability to provide an explanatory account for them. Courtenay (1968, appendix II) claims to provide probably the first published work on Yoruba ideophones. But clearly there are no absolute criteria for defining ideophones in Yoruba. We have just shown, for instance, that

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they behave phonologically like the rest of the formatives of the language. But also, from a grammatical point of view, one may not assign them a unique function, since formatives that, on Courtenay's criteria, for example, would be ideophones may be nouns,

e.g., labalábá 'butterfly'

mònòmónó 'lightening'

líìlíí 'hedgehog'

adverbs,

kíákíá 'fast', as in

ó rìn kíákíá 'he walks very fast'

fáfá a kind of superlative adverb used as in

ó yára fáfá lit. 'he is quick very' (he is very quick)

or verbs,

gbòòrò '(be) wide' as in

"etí gbõrò o ri gbògàgboga"

'ears (are) wide they appear [untranslatable]'

(See Fagunwa, op. cit., p. 103, et passim).

It is reasonable to assert that languages make use of certain processes in word formation, among which sound symbolism and reduplication, for example. Beyond this, it appears that definitional criteria for categories such as ideophones are statistical. For example, one might say that adverbs have more reduplicated forms in Yoruba than nouns, and nouns as much as adjectives, or as the case may be. In short "ideophones" should probably be defined for each language, and even then with care to make sure that one is in fact dealing with a genuine independently definable category of formatives. Notice that not all adverbs, for example,

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have reduplicated forms in Yoruba, so that on both phonological, semantic, and structural grounds, our statement of definition of 'ideophones-as-adverbs' must be made with circumspection.

5.3113 /w/- and /j/-Deletion.

There are still problems in accounting for the elision of /w/ and /j/ in certain contexts in Yoruba. The following is an attempt that has yielded some substantial results. Consider the following lists of items which are typical of contexts in which those two segments are elided:

(a)	(1)	/òwúrɔ̀/	'morning'
	(2)	*/ɔ̄wɔ́ɔ̀kɔ̃̄/	'one numismatic unit (formerly two cowries)
	(3)	/àgɔ̃̄wɔ́/	'a type of hardwood tree'
	(4)	/ǰɛ̀wɔ́/	'please'
	(5)	*/ɔ̄wɔ́ǰì/	'two numismatic units'
(b)	(1)	/bájì́/	'in this manner'
	(2)	/àgɔ̃̄jɪ̃̀/	'a barren woman'
	(3)	/àjɪ̃̀dé/	(a male name)
	(4)	/àlúpàjídà/	'transformation by enchantment'
	(5)	/ɔ̄jèdɔ̄jɪ̃̄/	(a female name)

The first remarkable fact is that they can be accounted for by rules similar to those in the expansions of P-16. It is interesting that the bisyllabic examples in lists (a) and (b) are not nominals, exactly the case with forms to which P-16b(ii) applies. Secondly, the examples with more than two syllables are most often transparent compounds and the segments /w/ and /j/ become subject to elision only when they occur in such compound words. Take (a5) and (b5) for example, the segments are never elided when /ɔ̄wɔ́/ 'money', /ɔ̄jè/ 'chieftaincy' and /ɔ̄jɪ̃̄/ 'honey' occur in isolation.

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The third remarkable fact is that both segments elide only when followed by vowels that share their respective point of articulation as in the items above. Moreover, to be eligible for elision both segments may not be preceded by high vowels with the same points of articulation. When /w/ is elided, the resulting combination is pronounced as if with dieresis (i.e. with separate syllables), while in the case of /j/ the result is pronounced like a diphthong. In both cases, even where an assimilation takes place after elision, the two identical vowels are distinctly articulated. Accordingly, we propose the following rules as a first approximation:

P-17 /w/-deletion:

$$\begin{bmatrix}-\text{syl}\\-\text{cons}\\+\text{ant}\end{bmatrix} \rightarrow \phi \;/\; \left\{ \begin{array}{ll} \left[\left[\begin{bmatrix}+\text{syl}\\+\text{back}\\-\text{high}\end{bmatrix} \text{ —— } \begin{bmatrix}+\text{syl}\\+\text{back}\end{bmatrix}\right]_{N}\right. & \text{(a)} \\ \left(([+\text{seg}])\ [+\text{seg}]\ \begin{bmatrix}+\text{syl}\\-\text{front}\\-\text{high}\end{bmatrix} \text{ —— } \begin{bmatrix}+\text{syl}\\-\text{front}\\-\text{high}\end{bmatrix}\right) & \text{(b)(i,ii)} \end{array} \right\}$$

Condition: b(ii) is not a noun.

P-18 /j/-deletion:

$$\begin{bmatrix}-\text{syl}\\-\text{cons}\\-\text{ant}\end{bmatrix} \rightarrow \phi \;/\; \left\{ \begin{array}{ll} \left[\begin{bmatrix}+\text{seg}\end{bmatrix}_{\text{FORMATIVE}}\ \begin{bmatrix}+\text{syl}\\-\text{high}\end{bmatrix} \text{ —— } \begin{bmatrix}+\text{syl}\\+\text{front}\end{bmatrix}\right]_{\text{FORMATIVE}} & \text{(a)} \\ \left[\begin{bmatrix}([+\text{seg}])_{\circ}\end{bmatrix}_{N}\ \begin{bmatrix}+\text{syl}\\-\text{high}\end{bmatrix} \text{ —— } \begin{bmatrix}+\text{syl}\\+\text{front}\end{bmatrix}\ ([+\text{seg}][+\text{seg}])\right]_{N} & \text{(b)} \end{array} \right\}$$

Condition: (1) If the vowel following /j/ is low, then the preceding vowel, too, must be low.

(2) (a) is not a Noun.

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Given these two rules, we have the following derivation of the items from the preceding lists.

Derivation 7:	/òwúrɔ̀/	/ōwóèǰì/	/jɔ̀wɔ́/	/bájìí/	/ōjèdōjī̌/
P-17(a)	/òúrɔ̀ /	/ōóèǰì/	-	-	-
P-17(b)(i)	-	-	-	-	-
P-17(b)(ii)	-		/jɔ̀ɔ́/	-	-
P-18(a)	-	-	-	/báìí/	-
P-18(b)	-	-	-	-	/ōèdōjī̌/
P-14	/òórɔ̀/	-	-	-	-

During a second cycle the last column becomes |ōèdōī̌|.

The second and the last columns show a common phenomenon in SY, that is, the juxtaposition of vowels of the same height, either in the derivation of compounds, or as a result of the deletion of a consonant. When this type of juxtaposition takes place, vowel assimilation follows, and it is the back vowel that assimilates to its front counterpart. We recall that in P-14, it is high vowel that assimilates to a lower one. As we shall have occasion to observe, a high vowel never assimilates regressively to a lower one, nor does a nonfront ever assimilate progressively to front vowels. P-19 describes a regular regressive assimilation.

P-19 Back-front vowel assimilation.

$$[-\text{front}] \rightarrow [+\text{front}] \;/\; \begin{bmatrix} +\text{syl} \\ \alpha\text{high} \\ \beta\text{low} \\ \text{———} \end{bmatrix} \begin{bmatrix} +\text{syl} \\ \alpha\text{high} \\ \beta\text{low} \\ +\text{front} \end{bmatrix}$$

Applying rule 19, then, the second and the last items in derivation 7 further yield:

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P-17(a) and 18(b)	P-19	Phonetic Representation
/ōóèǰìi/	/ēéèǰìì	|ēéǰì| (see #5.35)
/ōèdòĩ/	/ēèdōĩ/	|ēèdōĩ|

5.32 Phonology of a derivational process: Noun

Given a noun in Yoruba, other nouns can be derived from it. Such derived nouns imply a variety of relationships: ownership, membership, class or constituency, and so on. The process we will discuss has nothing structurally to do with the noun combination discussed above in the opening paragraphs of this chapter. Here, we are dealing with a relational element prefixed to a noun to derive some other noun, to which one or more of the above enumerated types of modus relationis can be attributed. What interests us mainly is the phonological process the prefixation triggers.

The underlying (phonological) representation of the formative of relation is /ōní/. The following things happen when this formative is prefixed to a noun: (1) if the noun has a consonant[18] initial, then, the formative undergoes no change.

Example:	/jɔ̃gí/	'gravel'
	/ōnijɔ̃gí/	'one "associated" with gravel'
	/īlé ōníjɔ̃gí/	'a house made of gravel' (relation of constitution).

18. We have been using the term 'consonant,' where there is no ambiguity, to include both consonantal segments as well as glides. We will continue to do so.

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(2) if the noun has a vowel initial, then we have a case of a juxtaposition of vowels, which induces elision. Consider again the following examples: /ōwó/ 'money', |ɔ̄gbà| 'fence', |ì̀gbà| 'period of time', |ī̀lé| 'house'. When /ōní/ is prefixed to each of them, the rules in derivation 8 may apply.

Derivation 8:	(a)	(b)	(c)	(d)
	/ōníɔ̄gbà/	/ōníì̀gbà/	/ōníī̀lé/	/ōníōwó/
P-7(a)	/ōnɸ́ɔ̄gbà/	/ōnɸ́ì̀gbà/	/ōnɸ́ī̀lé/	/ōnɸ́owó/
P-7(b)[19]	-	-	-	-
P-4(a)	/ōnɸ́ɔgbà/	/ōnɸ́igbà/	/ōnɸ́ilè/	/ōnɸ́owó/
P-9	/ōlɸ́ɔgbà/	/ōnɸ́igbà/	/ōnɸ́ilé/	/ōlɸ́owó/
P-5	/ōlɸ́ɔ́gbà/	/ōnɸ́ígbà/	/ōnɸ́ílé/	/ōlɸ́ówó/
P-6	/ōlɔ́gbà/	/ōnígbà/	/ōnílé/	/ōlówó/

Gloss:

(a) 'ground keeper'

(b) figuratively 'the happy man, who is influential and respected'

(c) 'owner of house'

(d) 'a rich person'.

But this is not all. In 4.31, SqSC 3 has specified the vowel co-occurrence in polysyllabic formatives. When a formative of this type is involved in a derivation of type 9, the affix (necessarily a prefix in SY) agrees with the nearest vowel of the radical formative. In addition, harmonization in this case (and probably in all other cases in SY) demands an identity, with respect to all other features except tone, with

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19. This is a case where we use our option in applying P-7(b). We do it deliberately here to underscore derivational differences between nouns with different vowel initials.

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the first vowel of the construction head, as specified by P-20. This marks a considerable simplification of the co-occurrence condition SqSC 3. The derivation is very productive in the language.

P-20 Harmonization:

$$[+\text{syl}] \rightarrow \begin{bmatrix} \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix} / \begin{bmatrix} \begin{bmatrix} \text{———} \\ -\text{H} \\ -\text{L} \end{bmatrix} \\ \text{N} \end{bmatrix} [+\text{lateral}] \begin{bmatrix} \begin{bmatrix} +\text{syl} \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix} \\ \text{N} \end{bmatrix}$$

Condition: [+lat] result from P-9.

In Derivation 8, rule 20 applies to (a) and (d), but not to (b) and (c). It applies to (d) vacuously in Derivation 9.

Derivation 9:	(a)	(b)	(c)	(d)
P-6	/ōlɔ́gbà/	/ōnígbà/	/ōnílé/	/ōlówó/
P-20	/ɔ̄lɔ́gbà/	/ōnígbà/	/ōnílé/	/ōlówó/
Phonetic Rep.	|ɔ̄lɔ́gbà|	|ōnígbà|	|ōnílé|	|ōlówó|

In short, the prefix /ōní/ behaves differently before two classes of nouns with vowel initial (P-9 and P-20 in derivations 8 and 9). We must note that the subclassification into (i) nouns with /i/-initial, and (ii) those with underlying vowel initial other than /i/ stands even if P-7(b) had applied in derivation 8. In the latter case, (b) and (c) of derivation 9 would have simply yielded:

(b) /óṇ́gbà/

(c) /ōṇ́lé/

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through the intervention of P-8 ('syllabic nasal').[20]

We now turn in the following section to the phonology of the category 'noun' in association with other nouns or with members of other

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20. Miss Rebecca Agheyisi, personal communication, has suggested a possible alternative description for this derivational process, an alternative which would be more general. She observed that, as in Bini, Yoruba derives agent nouns by vowel-prefixation. For example in SY the following would be plausible derivations:

/ɔ̀rɛ́/ 'friend' (←/rɛ́/ 'to be intimate')

/ɔ̀dá/ 'drought' (←/dá/ 'to stop (as of rain)')

/ā̌jɛ́lɛ̀/ 'a consular administrator' (←/ǰɛ́lɛ̀/ 'to act in a consular capacity')

/ɔ̀lɛ̄/ 'a slothful person' (←/lɛ̄/ 'to be lazy')

/ōbí/ 'parent' (←/bí/ 'to give birth')

/ātā/ 'pepper' (←/tā/ 'to sting')

By implication, then, one should describe the noun derivational process which we have presented above not in terms of the prefixation of a derivational formative /ōní/ to a noun, but as the prefixation of the vowel /ō/ to a compound verb "ni ('to have') + Noun". Or one could then generalize by positing an unspecified underlying vowel prefix, and a series of derivations to account for individual classes of derived nouns.

One clear advantage of this approach is that P-20 would not be a unique case as is implied in our proposal above by the conditioning lateral, instead of any non-syllabic.

There are, however, several difficulties which make it premature to adopt this alternative. Although the approach makes no claim that all nouns that have a vowel initial are derived by prefixation, it runs into the same types of problems as the nominal prefixation principle. As in the case of the latter, no general semantic basis is discernible. For example, prefixation may mean a result of the action expressed in the verb, e.g. /ɔ̀dá/; or an agent: /ɔ̀bí/; / ā̌jɛ́lɛ̀/. Secondly, there does not seem to be a principled way of explaining the variation in the tones of the prefixes; and thirdly, we would not know how to explain the phonetic difference between, for example, the prefixes of /ɔ̀dá/, above, and /ɛ̀dá/ 'creature' (←/dá/ 'to create'). (The root-verbs dá are simply homophones in this case).

We do not deny that the suggested alternative may be a morphological process in SY. It does not seem, however, that the process "non-high vowel + verb" is currently a productive derivational process in Yoruba. On the other hand, the process which we propose is psychologically real and currently productive. Finally, in our description we are concerned with the phonology of this one process. We are

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categories. The resulting construction is a sequence of a head plus a determinant. Hence we refer to the process as determination.

5.33 Determination

We are not concerned in this study with phrases (adjective clauses, adverb clauses, etc.) as determinants (traditionally, modifiers). This is not because problems of phrasal determinants do not belong in phonology, but simply because its discussion may take us farther into syntax proper than we think useful for our purpose. For the rest, determination in Yoruba is either by nominal collocation of the type that has been discussed above (#5.31), or else by mere juxtaposition of two lexical items of which the second would answer to the conventional term of 'adjective'. Examples:

/ìwé ɪ̄lé/	'tax receipt'
/ɪ̄lé ìwé/	'school (or library)'
/ɪ̄lé ɔ̄bā/	'the king's house'
/ɔ̄ǰà ɔ̄bā/	'the royal market (the king's market)'
/ɪ̄lé ē bàbà/	'a house of brass (a house made of brass)'
/ɔ̄ǰà ā bàtà/	'a market for shoes'

---

aware of the suggested alternative, but it appears that most of the words that can be said to be derived by this alternative can also be adequately considered as independent lexical items.

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/ìlù ū bàtá/ 'a bàtá drum'

/ìwé ē fūfū/ 'a book of the white one'

/ìwé fūfū/ 'a white book'

/ɪ̄lé ē gígā/ 'the house of the tall one'

/ɪ̄lé gígā/ 'a tall house'.

Both constructions have something in common, that is, the determinant follows the item determined.[21] Their dissimilarities are no less striking, however, although the dissimilarities have either been regarded lightly, or have been misinterpreted altogether. Earlier treatments of the first type of construction, for example--and these include treatments by practically all those whose works we have consulted, have insisted that in a Noun + Noun collocation, when this means the relation of possession, one of two things may happen: (1) either the extra vowel--discussed earlier (5.31)--is introduced between the nouns, when the second noun begins with a nonsyllabic, (2) or a 'marker' /tɪ̄/ is inserted between the two nouns.

The marker in (2) has been variously termed "the emphatic marker" (Courtenay, 1968, p. 60), or possessive particle:

> Ti... is used to express the relationship of possession. It occurs, for example, in tèmi, tìrɛ, tiwa, etc.

(Ida Ward, 1956, #305). We think these scholars are in error. The fact is, when the element /tɪ̄/ is preposed to a lexical item, usually to a noun or a "pronoun", the resulting phrase is itself a noun (or an NP). French offers a parallel construction in phrases such as celui de M. Untel,

21. This has some implications for the category DETerminant in the current descriptive models, esp. TG. We have claimed elsewhere that the English articles, adjectives and the so-called quantifiers, should probably be considered DET. (Af Test Grammar, Af-13 (Computer Science Center, Stanford Univ., Sept. 1967)). This will obviate the necessity to derive adjectives ad hoc from clauses; but will in no way deny that adjective can be so derived.

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le mien, etc., where the first is comparable to Ward's example tī Dàdā, 'that which is Dada's[22] (English equivalent mine: O.), and le mien is equivalent to Ward's tèmi 'mine', in the passage cited above.

This is not all. When the NP introduced by /tī/ follows another noun, the 'notorious' extra vowel is necessarily present. It is, therefore, misleading to maintain as do earlier scholars, that

> ...When two nouns occur together in a possessive relationship (the second noun being the possessor), the relationship can be indicated in two ways. The emphatic marker is ti, as in aṣọ ti ojè "Oye's cloth". ...When the emphasis morpheme is not selected, however, a marker is used which is the same that denotes other forms of nominal association: a mid tone between the nouns.
>
> ajá a délé "Dele's dog"
>
> èdè e yorùbá "Yoruba language"[23]

Courtenay has, we think, rightly rejected the prefix theory of the 'extra vowel' in nominal collocation.[24] She calls the vowel an "associative morpheme". However, we think that in considering the morpheme an "archisegment", whether following Awobuluyi (1964) or Welmers (1963), she has not gone far enough. She claims (1968, p. 61) that

> ...The underlying form of this associative morpheme is archisegment vowel with mid tone. It is probable, as $\begin{bmatrix} V \\ -L \\ -H \end{bmatrix}$,
>
> suggested by Welmers (1963, 439) that his form is all that is left in Yoruba of the Proto-Niger-Congo associative morpheme tentatively reconstructed as a (tone undetermined).

---

22. Ward, 1956, p. #305 (p. 140). Tr. of the French phrases: 'that of Mr. Untel ('So-and-so')'; 'mine'.

23. Courtenay, 1968, p. 60.

24. A sharp distinction should be drawn between Courtenay's claim that all nouns in Yoruba have an underlying vowel-initial, and her rejection of the theory that the 'extra-vowel' in a nominal collocation is this underlying initial. It is this distinction which makes it possible for her to reason that her associative marker precedes all nouns, whether with vowel initial or not, and that in the former case, the marker is optionally deleted.

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Having posited an archisegment, she now needs a rule (her P-6) to assimilate it to the vowel final of the first noun.

Our own approach recognizes a category, which we shall call "DETerminant MARker" (DM), presumably belonging to the same hierarchy with the categories PREP, PREverb, etc., vis-à-vis major categories such as Noun, Verb, etc. The DM is necessarily present, then, in the phonological representation of an NP that is a noun-noun collocation. Let us represent such an NP with the following format:

$$\left[\begin{array}{cccc} & [X] & DM & [Y] \\ N & N & & N \quad N \end{array}\right]_{NP} .$$

P-21 optionally deletes DM before nouns with vowel initial.

P21 Determinant Marker Deletion: (Optional)

$$DM \rightarrow \phi \; / \; \underline{\quad} \; \left[\begin{array}{c} \\ N \end{array}\right. [+syl]$$

P-22 then applies to specify the spelling of DM.

P-22 Determinant Marker Specification:

$$DM \rightarrow \begin{bmatrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ -H \\ -L \end{bmatrix} / \left[\begin{array}{c} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ +T_i \end{array}\right]_N \quad \underline{\quad\quad} \quad \left[\begin{array}{c} \\ \\ \\ \\ \\ \end{array}\right.{}_N$$

By P-22, DM assumes the f-features of the vowel final of the preceding noun.

Derivation 10 exemplifies an application of P-21 and P-22.

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Derivation 10:

Underlying Strings	P-21	P-22	English Gloss
		/ɪ̄lé+ē+tɛ́tɛ́/	'gambling house'
(1) $[_{N}[_{N}$ [ɪ̄lé] DM [tɛ́tɛ́]$_{N}]_{NP}$	-	-	
(2) $[_{NP}[_{N}$ [ɪ̄lé]$_{N}$ DM [tɪ̄+ɛɛ̀là]$_{NP}]_{NP}$	-	/ɪ̄lé+ē+tɪ̄+tɛ̀là/	'T la's house'
(3) $[_{NP}$ [āgbè]$_{N}$ DM [ōmɪ̄]$_{N}]_{NP}$	-	/āgbè+ē+ōmɪ̄/	'water gourd'
(4) $[_{NP}$ [ì̀wé] DM [ɪ̄lé]$_{N}]_{NP}$	/ì̀wé+ɪ̄lé/	-	'capitation receipt'

In Derivation 10, the underlying string of (2) is derived from a string of the type

$$[\text{ile}]_{N}\ \text{DM}\ [_{NP}[_{RT}\ [\text{tɛ̀là}]_{N}]_{NP}$$

Where RT (/tɪ̄/) is what we shall tentatively call a 'referential transformer' or definiteness marker, a type of normalizer belonging to the class of the relative particle /tí/('who', 'which'). This is not because they are orthographically similar (except for tones), but rather because they are functionally alike, from the point of view of syntax. For example, they both require an antecedent, though the structural presence of the antecedent or its place-holder is obligatory only in the case of a relative particle. As in the French example le mien, the NP with RT combines the notion of possessor with that of object possessed. We see equally that it may assume the role of 'subject of' without any antecedent. Cf:

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Le mien est le plus grand	/lə mjɛ̃ e lə ply grɑ̃/ (Fr.)	'mine is the biggest'
tèmí l' ó tóbĪ jù lo	/tèmí ló tóbĪ ǰùlɔ̄/	

or to take a familiar example:

celui de Telā aussi	/səlyi də tɛ̀là osi/ (Fr.)	'and that of Tela, too'.
àtĪ tĪ Tèla náà	/àtĪ tĪ tɛ̀là nɑ́ɑ̀/[25]	

In spoken SY, one hears rather infrequently, if at all, forms such as (4), after P-21, in Derivation 10. P-14 applies to outputs of P-21 where appropriate. As far as noun collocation goes, the application of P-14 (nontonal feature assimilation) appears at first to be limited to cases where the determining noun has a /i/-initial. A casual observation of SY, however, turns up examples such as the following:

/ìwé Ĭlé/ → /ìwé elé/ 'capitation receipt'

---

25. We think that it would be erroneous to suggest a complete correspondence between the French and the Yoruba constructions. But it is tempting to add to the paralletism pointed out here that it is conceivable that the French phrase is used as a determinant much the same way as the Yoruba example. Imagine a dialogue about bird pets between two housewives. As a rejoinder to a remark on the pets' beaks, one says:

    le bec du mien est bien taillé

    /la bɛk dy mjɛ̃ e bjɛ̃ taje/

    'mine's beak is well paired.'

    This farfetched example is, however, not necessary to illustrate what is of current usage in both languages as in the following passage from D. O. Fagunwa's Àdìitú Olódùmaré (p. 41)

    > o ra ojilugba iṣu, ãdọta apo èlubọ, ogoji apo gari, adọta grawa epo, Ogoji garawa ororu ẹpa ogoji garawa ororo egusí, agbọn obi gbanja mẹwa, ti abata mẹwa, ti orogbo mẹwa, apo iyọ mẹfa, ti ata mẹfa, ti alubọsa mẹfa, ti ata rodo mẹfa, ti ata wẽwẽ mẹfa, ati ti tomati mẹfa. (underscoring mine).

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/èbá ōdò/ → /èbó ōdò/ 'near the river'

/ātó òògǔ/ → /ātó òògǔ/ 'medicine dispenser'

but never, or hardly ever

*/Igó ōdó/ ← /IgI ōdó/ 'wood for making pestles or mortars'

*/ōdé èbà/ ← /ōdó èbà/ 'mortar for pounding eba'

*/èèkò ò bē/ ← /èèkù òbē/ 'a knife's handle'.

This distinction is very important because Bamgboṣe (1966, p. 160; and again in A Short Grammar of Yoruba, p. 58) claims like all other students of Yoruba, that, in nominal collocation, the only assimilation is that of the /i/-initial of the second noun to the vowel final of the leading noun. Such a claim does not account for observable facts of the language such as we have just pointed out.

As we have shown here, assimilation in nominal collocation is not only not limited to Bamgboṣe's examples, but it is also not a unique phenomenon. As far as we know, P-14 and P-19 apply wherever conditions for their application are met.[26]

---

26. Two things must be remarked before we leave this presentation of determinants. The first has to do with Courtenay's P-1 which deletes the underlying /u/-initial of all nouns. Such a rule will yield, as has been pointed out above, nonexistent forms such as

*/rɔ́/ (←SY/Irɔ́/) 'a lie'

*/gbà/ (←SY/ìgbà/) 'period of time'

Notice that her concept of an associative morpheme (in a nominal collocation) represented by an archisegment would "correctly" predict a combination such as

*/ilé ē rɔ́/ for 'house of lie' (a figurative expression, on the one hand, for lies told to protect one's reputation, and, on the other hand, for the fact that such a protective edifice is simply 'false', a self deception, and never achieves its goal.)

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5.34 Phonology of the "Subject".

It corroborates the argument of Case Grammar that, in Yoruba, the subject of the sentence, when followed immediately in the chain by the verb is always marked, regardless of its "underlying case."[27] We shall modify this general statement in a moment. Examples:

It is clear, however, that the correctness of the phonetic form is purely superficial, for the same series of rules generates

*/gbōgbō ō gbà/ for /gbōgbō ògbà/ 'all the time'. Courtenay's would again be accidentally homophonous with /gbōgbō ōgbà/ 'all the safety belts (for climbing)', which is not what the rules are supposed to generate.

Furthermore, the nouns given in this footnote, for example, would never occur outside the context of nominal collocation in the form they would take after Courtenay's P-1, because, then, they would have no vowel initial, and would, at best, not be meaningful.

Our second remark has to do with ordering the glide formation rule (P-11) with respect to assimilation and harmonization, and all three with respect to elision: (1) We have suggested in Derivation 3 that glide formation precedes elision, otherwise the conditioning vowel may be deleted, thus making the rule inapplicable. (2) We also know that if, for example, glide formation rules were to apply to /ìwé ilé/ before assimilation, the application of both in that order would yield

/ìwèé elé/ 'capitation (tax) receipt'

which is the desired output. In fact, it seems that ordering is irrelevant to both of these rules with respect to each other, since one can imagine a reverse order generating exactly the same output. It is therefore reasonable to suggest that both glide formation, and assimilation precede elision. Glide formation rule precedes assimilation.

However, it is not easy to order harmonization with respect to elision. We shall discuss the distinction between harmonization and assimilation later on in this study. We would like to recall that vowel harmony is mostly intra-lexical. It is not clear at present the relationship between the domain of vowel harmony on one hand, and that of glide formation, on the other. If it turns out, as we suspect, that they are this distinct, then rules of harmony may form a block by itself in the phonological component of a description of Yoruba. As has been shown in Derivations 9 and 10, elision precedes harmonization, a fact of no small significance, to which we will return below.

27. The definitive article for this view of grammar is by Charles J. Fillmore. "The Case for Case" in Universals in Linguistic Theory, ed., Emmon Bach and Robert T. Harms (N.Y., 1968), p.49; Subjectivalization, where it occurs, results from a neutralization of underlying case distinctions to a single form, usually called the 'nominative'.

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/ɔ̄ǰà á kṹ/ 'the market is full' (cf. /mō lɔ̄ s'ójà/ 'I went to the market')

/ɔ̄ǰà nɔ́ɔ̀ ɔ́ kṹ/ 'the (a particular) market is full' (cf. /mō lɔ s'ɔ̄ǰà nɔ́ɔ̀/ 'I went to the (particular) market)

/ɔ̄ǰà tí mō rà fṹ ɔ̄ ɔ́ bàǰɛ́/ 'the merchandise that I bought for you got spoiled' (cf. /šé ō rí ɔ̄jà tí mō rà fṹ ɔ̄/ 'Did you see the merchandise that I bought for you?).'

Consider also the following passage from Ijinlẹ ohùn ẹnu ifá (Wande Abímbọ́lá, p. 12). The marked segments are underlined.

Owó ẹyọ́ dúró fún bẹ́ẹ̀ ni, egungún sì dúró fún bẹ́ẹ̀ kọ́ nígbà tí a bá di ìbò béèrè nǹkan lọ́wọ́ ifá ('cowries stand for 'yes', and bones stand for 'no' when one consults ifa for a favor').

ẹyọ́ |ɛ̄jɔ́| ← ẹyọ ọ́ |ɛ̄jɔ̄ ɔ́| / ('small bit')

egungún |ɛ̄gū̄gṹ| ← egungun un /ɛ̄gū̄gū̄ ṹ/ ('bone')

One cannot help but be impressed with the insight which Ida Ward brought to her study of Yoruba, especially when her work is compared with later descriptions of Yoruba. Her statement of the fact on the marking of sentence subject has not proved an exception. She puts it very succinctly thus:

> ...This usage [that nouns change the tone of their vowel final] is a particular application of a general rule that the syllable preceding the verb, whether it be of a noun, a demonstrative, possessive or descriptive adjective (but not a pronoun), must have a high or rising tone. The dissyllabic form of the pronoun behaves like a noun.[28]

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28. Ida Ward, 1952, #101. See further below (#5.4) on dissyllabic form (or series I) of the 'pronoun'.

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In contrast to Ward, the statement of this phenomenon by later students of Yoruba seems unimpressive, since it depends often on the analyst's constructs instead of on facts of the language. Sometimes, however, facts of the language are simply misinterpreted.

Rowlands (1954), for example, believes that the high tone subject marker must be connected with the 3rd person singular pronoun /ó/. "The connection is, in fact, certain," he says (op. cit., p. 385),

> ...Since modification of tone does not occur in any situation where the 3rd person singular pronoun is zero, i.e., where the verb is preceded by the negative particles kò, kì, the future particles yíò (...), á, the habitual particle a, and forms of the verb with prefixed í or ì. The modification also does not occur where the nominal precedes verbals which cannot be preceded by pronouns of the Subject series, such as ní,'is, was', kó, 'is, was not', dà, 'where is?', kè, 'indeed'.

Courtenay seems to follow Rowlands' lead in identifying the subject marker with the 3rd singular pronoun of the form /ó/. They both posit an anaphoric construction of the type /ājò ó lɔ̄/ 'Ayo, he went' for Yoruba. But as Awobuluyi (1964) has well remarked, this construction is unknown in Yoruba, and infrequent in West African languages. Awobuluyi points out that it occurs in Hausa, which is, of course, unrelated to Yoruba. Awobuluyi's second reason for rejecting the notion of 3rd singular pronoun for this marker appears, however, not to be equally well motivated. He writes (1964, p. 76):

> ...In the first place, the vowel of this syllable usually assimilates back to the final vowel of the noun subject. But we have already seen (p. 72) that /o/ does not have the privilege of assimilating regressively.

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He then follows with a footnote which purports to give the lone exception in the language, the case of the contracted negative /ò/ assimilating back to the pronoun:

/ā ò lɔ̄/ > |ā à lɔ̄| 'we didn't go'.

The fact is, the example Awobuluyi gives is by no means isolated, even though there are rules (our P-14 and P-19, for example) which operate in the language to prevent it. Thus we have the contracted form of the 'future' marker (see f.n. 30 below) preverb assimilate back in a construction similar to Awobuluyi's example:

/ā ó lɔ̄/ >|ā á lɔ̄| 'we shall go'

In addition, depending on who is positing what as underlying form, one can have the 3rd pronoun assimilate exactly as Rowlands, and, later, Courtenay claim. In such a case assimilation backwards of /o/ would be a common feature of Yoruba.

In place of Rowlands' postulate, Awobuluyi has suggested that the subject marker is another realization of his polyvalent morphophoneme, and moreover, that the morphophoneme functions in this case as a preterit morpheme. But we find neither Rowlands' postulate nor Awobuluyi's suggested replacement satisfactory.

In the first place, it is questionable that 'tense' is grammatical in Yoruba. In our own opinion, Yoruba usage recognizes only a perfective-nonperfective (cf. Fr. accompli-nonaccompli) dichotomy, supplemented by a 'future' ('hypothetic') marker. This is not to deny that Awobuluyi's example /ājò ó lɔ̄/ 'Ayo went' exists structurally. On the contrary, we maintain that it exists, but that it is most commonly used with a temporal complement when it refers to an action in the past. Example:

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/ājɔ̀ ɔ́ lɔ̄ l'ánɔ̀ɔ́/ 'Ayo went yesterday'

/mō rí ɔ̄ l'áàárɔ̀ jìí/ 'I saw you (SY) this morning'.

In the second example, for instance, /mō rí ɔ̄/ cannot by itself be translated into past equivalent in English. It has to be 'I see you', unless the temporal complement is structurally present, or is implied in the non-linguistic context. French again offers an illustrative example. Contrary to what foreign speakers of French are often led to believe, the so-called simple past (passé composé) in that language is just not a past tense usage, it is rather a perfective. Examples:

J'ai terminé /ʒe tɛrmine/ 'I have finished, I am done';

J'ai mangé /ʒe mãʒe/ 'I have eaten'; but

Hier, J'ai mangé deux oeufs

/jɛr, ʒe mãʒe døzø/ 'I ate two eggs yesterday'

Of these, only the third is truly a past tense usage, and parallels Yoruba in that respect. Hans Wolff, a very careful student of the Yoruba language, has this to say in recommending that the Yoruba simple verb be translated into English as past tense:

> ...The simple verb forms in Yoruba definitely does not imply habitual activity; rather it refers to an activity, pure and simple, without specific reference to time, though more likely past than present. It is for this reason that, in most instances, a past tense rendition is best in English.[29]

It is even more revealing that in the negative, the difference between the Yoruba sentences example above, and their progressive counterparts is neutralized, both being represented, as, for example

/ajɔ̀ ɔ̀ lɔ̀/

/ajɔ̀ ńlɔ̄/ 'Ayo is going' } /ājɔ̀ kò lɔ̄/

The right hand side of the statement represents an action which simply does not exist, period.

29. Beginning Yoruba. (African Studies Center, Michigan State University, 1963), p. 79.

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Our second objection to Awobuluyi's suggestion is that the subject marker may occur in contexts which clearly involve neither the perfective nor the past, so that there is no possibility of mistaking one for the other.

Example:

/bí túlɛ̀ ɛ́ bá šīšɛ́ jóò jēgē/ 'If a student works he will succeed'.

where /túlɛ̀/ 'student' is followed by the subject marker. (See passage from Wande Abimbọla, above).

Finally, it is not clear what Awobuluyi means by referring to his 'morphophoneme' as a case of neutralization. It seems to us that neutralization presupposes more than one distinct entity which assume, in a given context, either the form of one of them; or two or more entities which assume the form of another entity which is not ordinarily a member of their set. Awobuluyi's text never explains what is being neutralized.[30]

---

30. (1) It is becoming increasingly clear that the formative /jóò/ (or /jíò/ with /o/ assimilated) is in fact, not a future marker in the sense that one would talk of 'future' in English. Notice that like the progressive marker /mī́/ it is used in the past (which would still be present in relative time). Examples:

/èmī̄ jóò lɔ̄ sókō lɔ́làā/ 'I shall go to the farm tomorrow'

/lánɔ̀ɔ̃́ mō sɔ̄ fū́ ū̄ kpé ēmī̄ jóò lɔ̀ɔ̄ sókō lɔ́sɔ̀ɔ̃́/ 'Yesterday, I told him that I would go to the farm in the afternoon'

/mō mī́ kɔ̀wêé/ 'I am writing'

/mo mī́ kɔ̀wèé nī́gbà tí ó dé/ 'I was writing when he arrived'.

/jóò/ connotes action not yet begun, without any regard for time dimension. It thus complements the other two concepts: action completed, action begun and still in progress.
(2) See $4.1, f.n.2. for the functions which Awobuluyi assigns to his "morphophoneme."

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As we have said above, Courtenay probably borrows a leaf out of Rowlands' book. However, her attempt to demonstrate that the subject marker is the 3rd singular pronoun /ó/ through the so-called emphatic sentence form of the type

/ōjè nĪ ó ńlɔ̄/ 'it is Oye who is going'

is not convincing. The structural device in this example is parallel to the so-called English "cleft sentence" (which is similar to the French syntactic device of the type:

c'est Oye qui est en train de partir.

/sɛt oje kietătrɛ̃ d(ə) partir/ 'It is Oye who is going').

If this is valid, then /ó/ after /nĪ/, in the Yoruba version of the sentence, is no more than a pronominal preverb or transform of the relative particle. Courtenay calls it "subject concord marker," /ó/, formally a member of the following series:

/mō/	'I'	/ā/	'we'
/ō/	'you (sg)'	/ɛ̄/	'you (pl)'
/ó/	'he/she/it'	/wɔ̄/	'they'[31]

Of this series she says:

> ...When the subject is an unemphasized noun phrase (including the case of independent 'pronoun'), the subject concord marker has a zero segmental form at the surface level. However, in most cases the subject concord is realized as a change in the final tone of the subject noun phrase.[32]

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31. Courtenay (1968), p.75.

32. Ibid., p. 73.

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But take the following sentences for example:

A

/èmĪ nĪ mō ńlɔ̄/	'I am the one who am going'
/ìwɔ̄ nĪ ō ńlɔ̄/	'you (sg) are the one who are going'
/{ðū / ōjè} nĪ ó ńlɔ̄/	{He / Oye} is the one who is going'
/àwā nĪ ā ńlɔ̄/	'We are the ones who are going'
/èjĪ nĪ ɛ̄ ńlɔ̄/	'You (pl.) are the ones who are going'
/àwā nĪ wɔ̄ ńlɔ̄/	'They are the ones who are going'

B

/èmĪ nĪ mō lɔ̄/	'I am the one who went'
/ìwɔ̄ nĪ ō lɔ̄/	'you (sg.) are the one who went'
/ðū nĪ ó lɔ̄/	'He is the one who went'

etc.

C

i	ii	
/èmĪ ńlɔ̄/	/mō ńlɔ̄/	'I am going'
/ìwɔ̄ ńlɔ̄/	/ō ńlɔ̄/	'you (sg.) are going'
/ðū ńlɔ̄/	/ó ńlɔ̄/	'He is going'

etc.

D

/èmĪ ́ lɔ̄/	/mō lɔ̄/	'I went'
/ìwɔ̄ ɔ́ lɔ̄/	/ō lɔ̄/	'you (sg.) went'
/{ðū / ōjè} {ú / é} lɔ̄/	/ó lɔ̄/	{He / Oye} went'

etc. etc.

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Sentence types A and B are Courtenay's emphatic sentences. Types Ci and Di are unemphatic by her definition, and should, therefore, substitute tone change for the "subject concord marker" of the series given above. But notice that Cii and Dii are equivalents of Ci and Di respectively. The difference between the two sets is of the same order as that between the French phrases:

moi, j'y vais /mwa živɛ/
'I am going'.
j'y vais /živɛ/

It is not clear from Courtenay's statement whether both sets of C and D, or only sets i should be considered unemphatic. If both, then why do sets ii have Courtenay's subject concord markers (mō, ō, etc.) like the emphatic? If just set i, then how do we explain the fact that Di but not Ci has the suggested change "in the final tone of the subject noun phrase"? Most importantly, notice that Courtenay has gone from considering our SM (Subject Marker) a form of the 3rd person singular to calling it just a change of tone.

It is fair then to say that Courtenay's attempt to save Rowlands' 3rd person singular marker, and Awobuluyi's preterit marker by introducing an alternative in the form of her own subject concord markers as special "subject personal pronouns," have not succeeded.

Our own stand on this matter is that the form in question is neither a personal pronoun (Rowlands, and Courtenay), nor a preterit morpheme (Awobuluyi). It is a subject marker, and occurs whenever a noun phrase is immediately followed by any element that is a verb. When anything at all intervenes, and these include the pronominal preverbs listed above, overt aspect markers, etc., the subject marker does not

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occur. In our model of description the subject marker is transformationally introduced into the underlying string. Phonological rules merely specify the spelling. P-23 is one of such rules.

P-23. Subject Marker (SM) Specification:

$$SM \rightarrow \begin{bmatrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ +H \end{bmatrix} / \begin{bmatrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ +T_i \end{bmatrix}_N + \text{———} + \begin{bmatrix} \\ \\ \\ \\ \\ VB \end{bmatrix}$$

Condition: $T_i \neq +H$.

This explains

(1) (a) /ājɔ́ ɔ́ lɔ̀/ (English approx.) 'Ayo went'

but

(b) /ājɔ̀ jóò lɔ̄/ 'Ayo will go'

(2) (a) /ɔ̄mɔ̄ ɔ́ lɔ̄/ 'the child went'

(b) /ɔ̄mɔ̄kékēré jɛ̄ ɛ́ lɔ̄/ 'that little child went'

(/jɛ̄/ 'that')

but

(c) /ɔ̄mɔ̄ kékeré jɛ̄ jóò lɔ̄/ 'that little child will go'

The following feature modifications of sentences may take place after P-23 (Hans Wolff, p. 79).

1. Nouns having mid-mid tone become mid-high, e.g.,

/ɔ̄mɔ̄/ → /ɔ̄mɔ́/, /ɔ̄bā/ → /ɔ̄bá/ ('king')

2. Nouns with a low-mid or low-low pattern become low-high,

e.g. /ɔ̀bɔ̄/ → /ɔ̀bɔ́/ 'monkey'

/àgbɛ̀/→/àgbɛ́/ 'farmer'

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3. Nouns with a mid-low pattern become mid-rising:

e.g. /ēǰò/ → /ēǰǒ/ 'snake'

/ɛ̄kǔ/ → /ɛ̄kǔ/ 'leopard'

4. Nouns which have a mid-high or low-high pattern remain unchanged,

e.g. /ī̄lé/ 'house'

/bàbá/ 'father', 'an elderly person'

/òǰǒ/ (a personal name)

These can be reformulated in terms of feature notation as (using only these last two vowels of the subject NP):

1. $\begin{bmatrix}-H\\-L\end{bmatrix}$ - $\begin{bmatrix}-H\\-L\end{bmatrix}$ → $\begin{bmatrix}-H\\-L\end{bmatrix}$ - [+H]

2. (a) [+1] - $\begin{bmatrix}-H\\-L\end{bmatrix}$ → [+L] - [+H]

(b) [+L] - [+L]

3. $\begin{bmatrix}-H\\-L\end{bmatrix}$ - L → $\begin{bmatrix}-H\\-L\end{bmatrix}$ - [+L] [+H]

4. (a) $\begin{bmatrix}-H\\-L\end{bmatrix}$ - [+H]

(b) [+L] - [+H] } unchanged

Wolff as well as Ward (p. 46, #101) believes, then, that, before a verb, the last vowel of a noun phrase must have either a high or a rising tone. In addition, Wolff, as can be seen from his statement above, seems to believe that, except in case of 3, the vowel final of the NP is simply replaced by the subject marker. If this is true, then the glide formation rule must apply after such a replacement in order to form glides, which, in spite of Wolff's claims, one hears in the derived form of 3(a), 3(b) and 4(b). But if we follow Wolff, we would be forced to treat (3) as an exception, because its NP's vowel final is not replaced, and it would thus have an exceptional glide.

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We prefer a description (hence, an output of P-23) which posits a juxtaposition of the SM to the NP (subject) as an input to P-24.

P-24 SM Adjustment:

$$\begin{bmatrix} +\text{syl} \\ \{[+\text{H}], [-\text{H}], [-\text{L}]\} \end{bmatrix} \rightarrow \phi \quad \text{———} \Big]_{\text{NP}} + \Big[_{\text{SM}}$$

After P-24 has applied, 2(b) and 3 still have their vowel final intact, and so form natural glides with the SM; 1 and 4(a) acquire their phonetic forms, but 2(a) and 4(b) must await the application of the glide formation rule, so that

/ɔ̀bɔ́ lɔ̄/ > |ɔ̀bɔ̀ɔ́ lɔ̄|

/bàbá lɔ̄/ > |bàbàá lɔ̄|[34]

34. In a mimeographed paper, "The pronoun in Yoruba: its function in three dialects," presented at the 8th Congress of West African Linguistic Society at Abidjan, March 1969 Abiodun Adetugbo argues that

> ...(It appears that) the vowel of the last syllables of the noun subjects have the same segmental identity with the third person singular pronoun for each of the particular tenses discussed. This vowel may be regarded as a formal fusion of the pronoun-aspect formative to which the last syllable of the nominal subject has been assimilated."

Adetugbo provides what could have been a convincing case for considering the vowel alternation of noun subjects in the southeastern dialects of Yoruba as an aspectual alternation. However, as we have argued above, and as Adetugbo's labels, too, go, the question of tenses does not arise. Secondly, it will be argued below that even this aspect marker is neutralized in SY for certain aspectual paradigm of the pronouns. Thirdly, Adetugbo's examples illustrating the claims in the above quotation are not sufficiently revealing:

Definite Tense

olɔ́ tà	olú + tà	'Olu sold'
adɔ́ tà	adé + tà	'Ade sold'
ojɔ́ tà	ɔ̀jɔ́ + tà	'Ojo sold'
ɔ́ tà		'he sold'

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5.35 Non-noun Modifiers

Before we leave the phonology of nominals, we shall consider very briefly the adjectives. We include among these all true modifiers, be they numerical or not.

Let us recall Rowlands' "closed compounds" already mentioned (#5.31). The following are further examples, including those already given.

I		II	
|ōǰú dē|	'facade, plus the open space in front of it'	*|ōjú òdē|	('face of outside')
|ētí dò|	'river bank'	|ētí ōdò|	'corner or edge of the river bank'
|ārúgbó kūrī|	'an old man'	|ārùgbó ɔ̄kūrī|	'the old age of a man'

Indefinite Tense

kólá tà	kólé + tà	'Kole will sell'
kólá tà	kólá + tà	'Kola will sell'
olá tà	olú + tà	'Olu will sell'
á tà		'he will sell'

Definite habitual

olé tà	olú + tà	'Olu sells'
kólé tà	kólá + tà	'Kola sells'
kólé tà	kólé + tà	'Kole sells'
òjé tà	òjó + tà	'Ojo sells'
é tà		'he sells'

The examples are from the southeastern (Ondo) dialects. Notice the conceptual incongruity in the collocation, definite/indefinite tense. What about habitual tense? It is unfortunate that all the examples cited are 3rd singular. We know that this so-called alternation is limited to the singular pronouns. But even then, these examples provide no information as to whether the 1st and 2nd persons singular have exactly the same alternation. If yes, we would have to be shown that the alternation given is different from that which characterizes 1st and 2nd singular ordinarily.

Moreover, it is not clear what exactly Adetugbo means by "segmental identity." Does this include tone, for example? We do not know how to interpret Adetugbo's surprise in the very next paragraph, that referential nouns, e.g. /èmī/, /ìwǭ/, /èjìí/, etc., in all dialects take our postulated SM (with high tone feature). If anything, Adetugbo's data suggest a new intertation of observed phenomena, from which we refrain for the present until some of the missing data can be provided. Till then our argument above shall remain valid. For further discussion see below on the phonology of the pronoun.

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|ēéǰì|	'two numismatic units	*|ōwó èǰì|	
|ɔ̄mɔ̄ bǐrī̀|	'a girl'	|ɔ̄mɔ̄ ōbǐrī̀|	'the child of a woman'
|ɔ̄mɔ̄ jìí|	'this child'	|ɔ̄mɔ̄ èjìí|	'the child of this one'
|ɔ̄mɔ̄ kēǰì|	'second child'	|ɔ̄mɔ̄ èkēǰì|	'the child of the second one'
|ɔ̀mɔ̄ wòó|	'which child?'	|ɔ̄mɔ̄ èwòó|	'which one's offspring?'
|ìdí lé|	'family'	|ìdí Ɪlé|	'the base of the house'
|ōrí kō|	'a hamlet'	|ōrí ōkō|	'upper part of a farm plot'
|ɔ̄mɔ̄ mìírɔ̀|	'another child'	|ɔ̄mɔ̄ òmíírɔ̀|	'the offspring of another'

In order to account for the second formative of each of the utterances in the first column, Courtenay simply sets up a subclass of nouns which she calls "vowel-eliding nouns" (p. 69f). But assuming that such a class is justifiable, other nouns participate in it beside demonstrative nouns, and numerical "pronouns."[35(a)] Clearly as can be seen from the examples just given, this class must not be limited to just these two subcategories. Also, as we have suggested earlier, calling the utterances in column I inseparable compounds, after Rowlands, is not acceptable, since we hold that orthographic representation is a mere convention, and Yoruba orthography notoriously reflects neither the syntactic nor the psychological reality of utterances in that language. (Notice that we do not say that the orthography is not phonetically acceptable, which is another matter.)

35(a). If we take the term 'noun' to mean 'proper nouns' like 'concept', 'table', 'water', 'John', then items like |èjìí| and |èkēǰì| can be justifiably referred to as pronouns. But syntactically, at least in SY, there is no justification for such a separation, since the latter can in turn be represented by the pronominal preverbs. Conceptually, too, there seems to be little justification for it. We accordingly consider these items to be referential nouns. (For further comment, see #5.4).

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The examples above are by no means isolated, as can be easily verified in the speech of native speakers. Items in column I are not equivalent to their counterparts in column II. We would like to claim that the difference is syntactically motivated. In particular, the second element in each of the utterances in I is an adjective, while in II we are dealing with a noun determinant before which the DM has been elided. We claim further that adjectival derivation is independent of the noun determinants discussed earlier, so that it is not just a question of deleting the DM, then further deleting the vowel initial of the determinant noun.

From this, we posit that there are two types of adjective derivation in SY. Both are presumably transformationally introduced into the underlying string (Cf: Transformational introduction of DM (#5.33)). P-25 and P-26 specify the phonetic representations of the two types of derivation.

P-26 Adjective derivation (a):

$$[+syl] \rightarrow \phi \; / \; [_{Adj} \quad [_{N} \; \_\_$$

P-26 Adjective derivation (b):

$$ADJM \rightarrow \begin{bmatrix} -syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix} \quad \begin{bmatrix} +syl \\ +high \\ +front \\ +H \end{bmatrix} \Big/ \left[\_\_\_\_ \; \left[\begin{bmatrix} -syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix} \right]_{VB} \right]_{Adj}$$

In the case of P-25, the phonological representation consists of a node Adj. introduced into the underlying string to dominate node N (see lists above for examples). For P-26, the node "Adj." dominates a Verb (VB) and an ADJM (Adjective Marker) transformational preposed to it. P-26 spells out ADJM. The following items exemplify P-26:

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ADJM + VB		P-26 (Adj.)	
/kéré/	'(be) small'	/kíkéré/	'small'
/kúrú/	'(be) short'	/kíkúrú/	'short'
/fūfū́/	'(be) white'	/fífūfū/	'white'
/ǰɛ̄/	'eat'	/ǰíǰɛ̄/	'to be eaten'
/tà/	'sell'	/títà/	'for sale'
/fɔ̀/	'wash'	/fífɔ̀/	'to be washed'.

The first and probably most important observation about these derived adjectives is that those produced by P-26 may be used as nouns. Some of them undergo further phonological changes to obtain one of their common forms. The first item, for example, assimilates its first vowel and changes the tone of the second vowel to mid, to make a doublet. Thus there exists /kíkéré/ along with /kékēré/, /pípɔ̀/ ('many') along with /púpɔ̀/, and /kíkúrú/ along with /kúkúrú/. There is, of course, a difference in usage between members of each doublet. The first of each pair (of these three examples) participates in the same usage with other similarly derived adjectives, namely, they can also be used as 'factitive' nouns in a manner corresponding to both the participle and to nouns of Romance origin ending in -(t)ion in English (e.g. Conclude-Conclusion; invent-invention, etc.) In fact, this form (in case of doublets) is often used almost exclusively for that purpose. Example:

|eyìí kíkéré nī mō fɛ́| 'it's the small one I like'

|kíkéré ɛ̄ rɛ̀ lɔ́ wù mǐ| 'it's its being small that appeals to me'.

The second member of the doublet may be used as an adjective, and also as a noun. In the latter case, it represents the noun it otherwise modifies

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when the noun itself has been deleted. Examples:

|ènịj̀ɔ̀̀ púpɔ̀ wà níbɛ̀| 'many people were there'

|púpɔ̀ kō lɔ̄ sílé| 'many didn't go home'

|kékēré ló wù mí| 'it's the small one that appeals to me'

A subgroup of adjectives derived through P-26 have a different kind of doublet. These reserve the derived form for factitive nominal uses, and their verb form for adjectival uses. For example, given the form /fũ̄fũ̄/ ('to be white'), the same form is used as adjective. Hence

|āšɔ̄ fũ̄fũ̄| 'white piece of cloth'

The derived form /fífũ̄fũ̄/ is most often used as a factitive nominal:

|fífũ̄fũ̄ āšɔ̄ ɔ̄wɔ̄̃ tú wɔ̄̃ sí| 'the whiteness of their clothes gives them away'.

In contrast to this double aspect of the derivation resulting from P-26, products of P-25 are exclusively adjectives. It appears however, that certain subgroup of nouns, mostly proper nouns, preferably take the DM when they modify another noun rather than undergo P-25. Put differently, one would like to say that the adjective function is largely subsumed under nominal determinant construction for a certain subgroup of Yoruba nouns.

5.4 Categorial P-Rules: The Pronoun.

The question of what is a pronoun and what is not has received incomplete treatment in the studies of Yoruba known to us. There appear to be at least four classes to consider. They are as follows:

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I	II[35(b)]	III	I,II,III	IV	IV
èmi /èmĩ/	Vmi /Vmĩ/	/mõ/	('I')	mi /mi/	'me'
ìwọ /ìwɔ̃/	Vrẹ /Vrɛ̀/	/õ/	('you (sg)')	ọ,ẹ /ɔɛ/	'you'
òun /òũ/	Vrẹ /Vrɛ̀/	/ó/	('he/she/it')	/3rd sg	'him'
àwa /àwã/	Vwa /Vwã/	/ã/	('we')	wa /wa/	'us'
èyin /ɛjĩ/	Vyin /Vjĩ/	/ɛ̃/	('you (pl)')	yín /jĩ́/	'you'
àwọn /àwɔ̃/	Vwọn /Vwɔ̃/	/wɔ̃/	('they')	won /wɔ̃/	'them'

5.41 Series I.

Our present knowledge is too meager to support a categorical statement concerning what transformational relation exists among these series. However, on the basis of the data the languages offers, we believe that the following account has certain advantages over earlier ones.

In this study, we have not made the distinction "dependent-nondependent" pronouns. Series I are nouns, and are normally considered "Pronouns" because they have always been discussed with the other three series. We would like to refer to Series I as referential nouns, and class them with the numerical and the demonstrative nominals discussed in the preceding section. All three form a subgroup of Yoruba nouns.

Referential nouns share identical behavior with other nouns. For example, they all take both the DM and the SM. Names such as Olúwa /õlúwã/

35(b). Courtenay suggests this series as the set of underlying forms of the so-called "possessive adjectives." She believes that "each is actually a noun joined to the noun it modifies by the associative mid tone." (p. 67).

We believe that the determinant forms of this series can, in fact, be described as adjectives for the reasons below. Hence we hesitate to label all four series conventionally as Independent Pronouns (IP), Possessive Pronouns, Dependent Pronouns (our pronoun subjects, or pronominal preverbs), and Object Pronouns, in that order. Sometimes the term Dependent Pronouns has been used to refer to all of the last three. These usages are not sufficiently enlightening as far as SY is concerned.

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'our lord', Olumide /ōlúmĪídé/ (literally) 'my lord (master) arrives', usually personal names, both suggest that there may even have been a time when the nominal derivation by prefixing /oni/ applied to series I. This derivation still applies to the numerical and the demonstrative nouns. Examples:

/ēlélìí/ 'this one'

/ēlékējì/ 'owner (bearer, keeper, etc.) of the second one'.

Where they behave differently from other nouns, referential nouns have suppletive forms. Series II, III, and IV are such forms.

5.42 Series II

Certain SY forms suggest leads to a reconstruction of the vowel initial of series II. One such form is the 2nd person singular /ìrɛ̄/ 'you (sg.)', which is frequent in the speech of older speakers of the Ọyọ (including Ogbomọṣọ) dialects of Yoruba. It is often used by an older person who does not feel like using the lowly form /ìwɔ̀/ to a younger person. It is also used by a master to an underling, under the same circumstances. Example:

ɪrɛ̣̄ nɪ̄ mō ńpè 'it's you I am calling!

|ɪrɛ̄ nɪ̄ mō ŋ́kpè|

instead of

ìwọ ni mo ńpè 'it's you I am calling'

|ɪwə̄ nī mō ŋ́kpè|

Moreover, the following doublets occur in SY:

2nd Sg.: tìrẹ |tìrɛ̄| :: tìwọ |tìwɔ́| 'yours', 'that which is yours'.

3rd Sg.: tirẹ̀ |tɪ̄rè| :: tòun |tòũ̄| 'that which is his'.

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In the first instance, the usage parallels that of the non-derived forms just described. That is, /tìrɛ̄/ is more polite than /tìwɔ̄/. In fact, the former tends to replace the latter entirely in the speech of younger people. In the second instance, /tòũ̄/ is most often used as reflexive referential noun. Example:

Ó ni tòun ti tọ́n
|ó ní tòũ̄ tĪ tɔ̃́| 'he says his own is finished (exhausted)'

Ó ní tirẹ̀ ti tọ́n
|ó ní tĪrɛ̀ tĪ tɔ̃́| 'he says his (another person's) is finished'.

Indeed, if the existence of similar doublets for the other persons provides any valid evidence, for example,

temi	|tèmĪ̄|	tèmi	|tèmĪ̄|	'mine'
tiwa	|tĪwā|	tawa	|tàwā|	'ours'
tiyin	|tĪjī́|	tẹ̀yin	|tɛ̀jĪ̄|	'yours (pl.)'
tiwon	|tĪwɔ̄|	tàwon	|tàwɔ̄|	'theirs',

and given the fact that the nomalizer ti /tī/ behaves as is specified by P-7, one would posit front, non-low vowel initial (i, or e) for the items in series II. It is immediately clear, however, that such a postulate does not solve the problem. We would like to say, for example, that it is the items of series II that serve as determinants. In that case, we have the option of saying either that the items, when used as determinants, have their appropriate front, non-low vowel initial intact, or that the reconstructed series II undergo P-25 (adj. derivation). In the former have a rule assimilate the vowel initials to the vowel final of the noun modified, since DM would have been dropped. Assuming that the following are the reconstructed forms of Series II:

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ènmi	assimilated in	|akpá àmĪ|	'my arm'
ìre		|akpá àrɛ̄|	'your (sg.) arm'
irè		|akpá ārè|	'his arm'
iwā		|akpá āwā|	'our arms'
iyín		|akpá ājí|	'your (pl.) arm'
iwōn		|akpá āwɔ̄|	'their arms'

such a process would assimilate the non-tonal features of /è/ of ènmi to those of the preceding vowel. This would be unique in the language. Thus, we would have the non-occurring form *|ākpá ādé| for the normal form |ākpé ēdé| (←/ākpá edé/), 'shrimp's leg'. Notice that, apart from this fact, the only thing that may stop us from considering the assimilated initials as occurrences of DM is that DM always has a mid-tone feature, whereas both the 1st and 2nd singular pronouns in the above phonetic representation have low tone features.

The matter is complicated by another dialectal fact found in the Ìjẹ̀bú and Ẹ̀gbá dialects, but quite common in Lagos Yoruba. It is this fact that recommends the second option over the first. In these dialects, items in Series II merely follow the noun they determine, without any vowel initial. Example:

|ākpá mĪ|

|ākpá rɛ̄|

|ākpá rè|

etc.

This suggests that in these dialects, items of Series II undergo P-25 (our second option), and are adjectivalized. We prefer to leave the matter of vowel initial for these items as presented here. Hopefully,

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further research will suggest a valid explanation.

One interesting fact about the use of the adjectival form of Series II is that the resulting NP seems to behave phonologically like a unique lexical item. Thus, in the first and second singular of the last set of examples above, the /r/ of the adjectives is dropped in accordance with the r-deletion rules. Furthermore, this is then followed by the assimilation of the nontonal features, exactly as after r-deletion in lexical items. In this case, P-19 applies. The following examples illustrate these processes.

		P-19	
Underlying forms	r-deletion	assimilation	Gloss
(i.e. after P-25)			
/ākpá rɛ̀/	/ākpá ɛ̀/	/akpɛ́ ɛ̀/	his arm
/ɪ̄lé rɛ̀/	/ɪ̄lé ɛ̀/	-	his house
/ōókɔ̄ rɛ̀/	/ōókɔ̄ ɛ̀/[36]	-	his name

5.43 Series IV

We shall skip Series III for the time being. Items in Series IV are object pronouns. First, we would like to represent the phonological structure of the string in which they occur prior to the application of pronoun P-rules, as follows:

---

36. Strictly speaking |ɔ| does not assimilate to |ɛ|. Rather it is replaced before |ɛ| by a glide-like sound, and one hears something close to |oókvɛ| or |ōókvɛ̀|. It seems, then, that assimilation is limited to cases where |ɛ| follows |a|. However, we'd like to claim, in spite of this evidence, that P-16 applies in case |ɛ| follows any vowel of the same level.

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$$_{VP}\left[_{VB}[X]_{VB} + \left[_{PRO.OBJ}\ Y\ \right]_{PRO.OBJ}\right]_{VP}$$

Condition: Neither X nor Y may be empty.

The pronoun must be further specified for number and person. Thus, after the verb X, Y may be the 3rd singular pronoun obj. But 3rd sg. has no specific underlying form in Series IV. P-27' specifies the spelling of the 3rd singular.

P-27' 3rd Singular Pro.Spelling:

$$\left[\ \right] \rightarrow \left[\begin{matrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{matrix}\right] / \left[\begin{matrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{matrix}\right]\Bigg]_{VB} + \left[\begin{matrix} +Pro \\ \hline 3rd\ Sg. \end{matrix}\right]_{3rd\ Sg.}$$

The form of 2nd plural in Series IV is also incomplete. For instance, when the 2nd plural follows a verb with a high tone vowel final, a vowel of the same timbre as the vowel final of the verb is heard immediately preceding the consonant initial of the pronoun object. P-27" introduces this vowel:

P-27" 2nd Plural Spelling:

$$\left[\ \right] \rightarrow \left[\begin{matrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{matrix}\right] / \left[\begin{matrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ +H \end{matrix}\right]\Bigg]_{VB} + \left[\begin{matrix} \hline 2nd\ Pl.\ Obj. \end{matrix}\right.$$

P-27" merely prefixes a vowel to the underlying form of the 2nd person plural pronoun, the form given in Series IV. P-27' and P-27" abbreviate to P-27:

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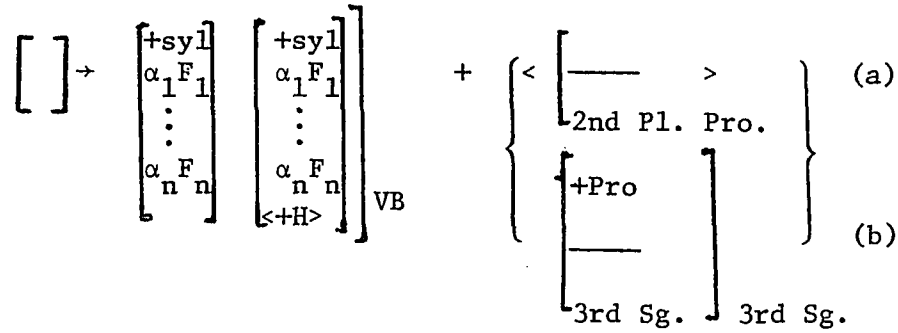
P-27. Pronoun Object Spelling:



Derivation 11 gives some examples before and after the application of P-27.

Derivation 11:

Underlying Form

#[ājɔ̀]N + [ɔ́]N SM + [rí]SM VB + [Pro]VB [3rd sg]3rd sg. # /#ājɔ̀ +ɔ́ + rí + i#/ 'Ayọ sees him'.

#[ājɔ̀]N + [ɔ́]N SM + [rí]SM VB + [jī́]VB 2nd pro. obj. # /#ajɔ̀ +ɔ́ + rí + jī́#/ 'Ayọ sees you (pl.)'

In Yoruba, the tone feature of the pronoun object varies according to the tone feature of the vowel final of the verb.[37] P-28 and P-29 assign tone features to pronoun objects.

---

37. It is very important to distinguish between pronoun object of Series IV, and the determinant form of the personal referential nouns (series II.) The latter occurs also after the so-called compound verbs (for which, see below). It is necessary, after the remarks above, to consider a noun and its determinant a lexeme. By implication, then, determination precedes compounding. Consequently, when one talks about pronoun objects, it should be understood that one excludes, for syntactic reasons (Series II) forms such as mi, re, etc., as in, for example:

/ājɔ̀ pàdé è rɛ̄/ 'Ayọ met you'
/ājɔ̀ rɔ̄́tí ì mī/ 'Ayọ remembers me'

where |pàdé| 'meet', and |rɔ̄́tí| are "compound verbs."

In other words, to get |rɔ̄́ti à mī|, the NP /ētí ì mī/ must be supposed. It is the combination of this noun (NP) with the verb /rɔ̄́/ that yields |rɔ̄́ti ì mī| in accordance with the contraction principles in #5.52.

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P-28. Pronoun tone assignment (a):

$$[+\text{syl}] \rightarrow \begin{bmatrix}-H\\-L\end{bmatrix} \;/\; \begin{bmatrix}+\text{syl}\\+H\end{bmatrix}\Big]_{VB} + \Big[_{\text{Pro. Obj.}}([-\text{syl}]) \quad [\text{——}]$$

Rule 28 assigns a mid tone to the first vowel of the pronoun object following a high tone verb. Thus, the two strings in derivation 11 are further specified as follows:

P-28

/# ājɔ̀ +ɔ́ + rí + Ī/

/# ājɔ̀ +ɔ́ + rí + Īj̄ī́/

P-29. Pronoun tone assignment (b):

$$[+\text{syl}] \rightarrow [+H] \;/\; \begin{bmatrix}+\text{syl}\\-H\end{bmatrix}\Big]_{VB} + \Big[_{\text{Pro. Obj.}}([-\text{syl}]) \quad [\text{——}]$$

Rule 29 assigns a high tone to the vowel of all pronoun objects following a verb whose vowel final has either a mid tone, or a low tone. It applies vacuously to the 2nd plural since its vowel has an inherent high tone. Recall that P-27 (a) prefixes a vowel to the 2nd plural only if it is preceded by a high-tone verb. It is evident from our approach that the pronoun objects behave in a generalized manner, contrary to the impression one gets from earlier treatments.

Examples:

|ōrí í rō mí| 'My head hurt' (Head pained me)'

|ōrí í rō ɔ́| 'your head hurt'

|ōrí í rō ó| 'his head hurt'

|ōrí í rō wá| 'our heads hurt'

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|ōrí í rō jḯ| 'your (pl.) head hurt'

|ōrí í rō wṍ| 'their heads hurt'

|ājɔ̀ ɔ́ rà á| 'Ayo bought it'

|ājɔ̀ ɔ́ wò wá| 'Ayo looked at us',

etc.

In prohibition expressed by the preverb /máà/, it is observed that the vowel final of the high verb is mid, and there is no overt representation for the 3rd singular pronoun object. It is usually said (Courtenay, 1968; Awobuluyi, 1964) that the vowel final of the verb is simply replaced by the pronoun. This is not really justifiable. What we have here is a special case of strings to which the glide formation rule (P-11) applies. First, any high vowel after the element /máà/ forms a glide in the syllable in which it occurs (by P-11). In this case, when sandwiched between such a glide-motivated low tone and a mid tone (resulting from P-25), a high tone is perceived as mid. In rapid, or even in normal speech tempo, one has the impression that one perceives only one vowel instead of two. Thus

	<u>After 11</u>	<u>After 12</u> (modified)	
máà + gé + ē →	máà gèé é →	máà gèē ē	'Don't cut it'
gé ē	-	-	'cut it'

It is the last utterance of the first row, that earlier scholars represent as <u>má ge</u>. It is no use splitting hairs; it seems, however, that what one perceives is far from being a single vowel rather than two or three.

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5.44 Series III

Let us now turn to Series III.[38] Items in this series may be referred to as pronoun subjects (or simply as preverbs). Our conclusion coincides with Adetugbọ's (1969) that earlier treatments of Yoruba pronouns have been inadequate. Our own findings do not always agree with his, however. We believe that the fact that we have not reached the same conclusions may be due in part to the lacunae in his data which we have remarked earlier (f.n.34). The table below is Adetugbọ's presentation of the pronoun subjects of SY (1969, p. 8).

TABLE X

Definite[39] 'I etc. sold'	Indefinite 'I etc. will sell'	Habitual 'I etc. sell'	Definite Negative 'I etc. did not sell'
mo tà	ma/mà á tà	mo Ń tà	mi ò tà
o tà	wo/mà á tà	o Ń tà	o ò tà
ó tà	á tà	ó Ń tà	kò tà
a tà	a tà	a Ń tà	a kò tà
ɛ tà	ɛ é tà	ɛ Ń tà	ɛ kò tà
wɔ́ tà	wɔ̃ á tà	wɔ́ Ń tà	wɔ̃ kò tà

One cannot help being impressed by the regularity of the vowel in the singular number (that is, of all the three persons of the singular) in

38. The discussion in this subsection takes advantage of Adetugbọ's paper (see f.n.34). We believe that Adetugbọ brings a new insight into the use of pronouns in Yoruba. However, some of his conclusions, as has been partly shown in f.n.34, are non-sequiturs, given his illustrations and arguments. More will be said about his presentation in the following paragraphs.

    Adetugbọ's article considers three dialects of Yoruba: The "South-east Yoruba (SEY) represented by Ondo, Central Yoruba represented by Ijẹṣha and the standardized language which (in this study) is seen as a socially delimited dialect as against the former two dialects which, by definition, are geographically defined."

39. Each column in this table stands for one distinct tense according to Adetugbọ: Definite tense, indefinite tense, habitual tense.

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the first three columns. Consider the following additional fact: All three dialects which Adetugbọ studied have similar vowels in the singular persons of the first two columns of table X. Both the Ondo (SEY) and the Ijẹ̀ṣà (CY) dialects differ from SY in that both have -e (or some form of it) as the vowel ending of the singular persons (first elements) of the third column where NWY (our SY) has -o. Finally, SEY changes the final vowel of singular nouns according as the verbs express the grammatical notions of the first three columns, that is, -o# for "definite," -a# for "indefinite," and -e# for habitual (see Adetugbo's examples in f.n. 34 of this chapter.) In this respect, SEY differs from both CY and SY which never use these endings on nouns (including our referential nouns.

To summarize, all dialects mark all singular preverbs of the first two columns by -o and -a; SEY and CY mark "habitual," the third column, with -e; and SEY overtly uses all endings on nouns subjects.

From these data Adetugbọ arrives at the following conclusions (p. 11)

> ...A synchronic analysis which disregards the regular vocalic identity of the singular personal pronouns in these different tenses may be considered faulty. A tentative analysis of these tense patterns will be:
>
> (a) 1st person sing. /m/ for all dialects.
> (b) 2nd person sing. /w/ CY and SEY, or
> (c) fusion of tense formative and pronoun o in some CY and NW dialects.
> (d) 3rd person sing. signalled by high tone in all dialects.
> (e) to the vocalic segment preceding the main verb is attributed the signalling of tense-aspect distinction.

Adetugbọ is correct that an unwary synchronic analysis will be faulty, especially in the face of such an overwhelming evidence as he presents here. It seems to us, however, that his conclusions are premature, for

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reasons which follow. It seems that Adetugbọ may have chosen to exclude certain materials, for no other reason than that he considers them irrelevant to his argument. Consider the following table.[40]

TABLE XI

Definite	Imperfective		Indefinite	Negative	
	Progressive	Habitual			Habitual
mō tà	mō mí tà	mā máā tà	màá tà	mī ó tà	mī(k)ò tà	mī è é tà
ō tà	ō mí tà	wɔ̄ ā máā tà	wàá tà	ō ó tà	ō(k)ò tà	ē è é tà
ó tà	ó mí tà	ā máā tà	á tà	yó tà	kò tà	kè é tà
ā tà	ā mí tà	à máā tà	ā á tà	ā ó tà	ā(k)ò tà	ā è é tà
ɛ̄ tà	ɛ̄ mí tà	è máā tà	ɛ̄ á tà	ɛ̄ ó tà	ɛ̄(k)ò tà	ɛ̄ è é tà
wɔ̃ tà	wɔ̃̄ mí tà	wɔ̄ āmáā tà	wɔ̃̄ á tà	wɔ̃̄ ó tà	wɔ̃(k)ò tà	wɔ̃̄ è é tà

Table XI by no means exhausts the inventory of pronominal paradigms in Yoruba. But we are reasonably sure that as far as SY is concerned any other addition will only repeat the basic pattern which can be observed in this table. For example, we have not added the pattern normally referred to as perfective;

|mō tī tà| 'I have sold'

or its negative form

|mī kò ì tí ì tà| 'I have not yet sold'.

But this is precisely because both do not give us any information that we cannot get out of the right-hand column for the "indefinite," plus all the columns for negative forms in Table XI. Comparing Tables X and XI,

---

40. We will keep Adetugbọ's nomenclature for the time being, that is, his tenses: Definite, indefinite, habitual, etc.
|mī è é tà| ← /mī kò í tà/. See below for further discussions.

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we will notice that Adetugbọ has omitted what we have labelled (in XI) imperfective habitual, the right column under indefinite, similarly the forms for "negative habitual." Imperfective progressive is our representation of Adetugbọ's habitual. It is true that this form is used not infrequently as habitual, but it is most fundamentally progressive. We would like to suggest (perhaps timidly) that the use of this form for habitual, and for the so-called indefinite, is of recent origin, and is probably a borrowing from English usage. Examples:

(1) /mō mí lɔ̄ sí èkó/ 'I am going to Lagos'

(2) /mō mí lɔ̄ sí èkó ní ɔ̀šɔ̀ɔ̀šɛ̀/ 'I go to Lagos every week'

(3) /mō mí lɔ̄ sí èkó ní ɔ̀lā/ 'I am going to Lagos tomorrow'.

The imperfective habitual form in Table X unlike the progressive form is always habitual grammatically, and both of the forms under the heading "indefinite" are commonly used for that purpose alone, namely, for hypothetical or contemplated ("future") actions.

The left-hand column of the negative is, so to speak, a transform of both the "definite" and the "progressive"; and the negative habitual corresponds to the affirmative habitual. The negative of the "indefinite" has no new information for us. Hence we omit it. Now, where in all this does the notion of "tense," in the normal sense of that term come in? Adetugbọ does not indicate whether or not he is using the notion figuratively. We have argued above that the form referred to here as definite, does not imply a past action. Adetugbọ's terminology, "tense-aspect," is itself an index of an uneasiness about the content of the term.

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Let us now consider Adetugbọ's conclusions. On the basis of Table XI and the data from SEY and CY (Adetugbọ, 1969), it appears at first correct, as he suggests, to attribute the signalling of aspect distinction to the syllabic segment preceding the main verb (conclusion (e)), and to assume, further, a fusion of the aspect formative with the pronoun o in CY and NWY (SY) dialects (Conclusion (c)). A look at Table X seems to lend some support not only to these two but also to Adetugbọ's other conclusions. In addition, the singular pronouns of the last three columns (endings i, o, ø; i, e) appear to suggest that the o of the first two columns may not be considered as part of the pronoun (Conclusion (a) and (b)), but as the aspect marker. It seems, then, that in the last three columns we have the actual forms representing the pronouns, where the 3rd singular is neutralized before all aspect markers.

The question then arises as to (1) why the aspect marker (/o/) is maintained in column two before /mi/ and, (2) why the 3rd singular is not neutralized there. There are two possible answers: one is that /mí/ is really not an aspect marker; or, two, that /mí/, like /tī/ (as in /mō tī tà/ 'I have sold'), is in fact an aspect marker, but that all other elements (máa, á, ó, (k)ò, (k)è é) immediately preceding the verb in the last five columns are not; they are mere preverbs with the meanings of "habitual," "hypothetical," and "negation." In the case of hypothesis two, the 3rd singular drops o only before non-aspectual preverbs.[41]

41. As in the case of all other tentative hypotheses in this study, we do not propose any P-rule for 3rd Sg. Pronoun dropping. However, a subject to confirmation by additional data from Yoruba such a rule would take the following form:

$$\underset{\text{3rd Sg.}}{[+\text{Pro}]} \rightarrow \underset{\text{3rd Sg.}}{\phi} \; / \; \text{——} \underset{\text{Pre-VB}}{[\quad X \quad]}_{\text{Pre-VB.}}$$

Condition: X is not an aspect marker and is non-null.
For the purpose of emphasis, "aspect" refers to the grammatical notion of perfective-nonperfective, and must, therefore, exclude "habitual." Habitual acts may or may not be perfective. e.g. 'I have always done it that way'; 'I used to do it that way'.

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The 2nd alternative appears valid to us. It is, therefore, necessary to revise everything said in the last paragraph as well as Adetugbọ's conclusions. In their place we posit (with reference to Table XI)

(1) that /mō, ō, ó, ā, ɛ̄, wɔ̄/ of the first two columns are pronouns.

(2) that the forms of column one (that is, Adetugbọ's definite) are unmarked for aspect.

(3) That before non-aspectual preverbs (ā máā, á, yóò, kò, etc.), the pronouns assume an assimilable form. We hope that further material will throw more light on the nature of this form.

Whatever the form postulated in (3) turns out to be, its effect is clear from the last five columns. (See further on the form of assimilation to be discussed in a moment.) In the meantime, on the basis of the foregoing, the following are two reasons for considering Adetugbọ's conclusions inadequate:

(1) The formatives /m/ and /w/ which Adetugbọ proposes as pronouns would be unique in the language, and are at any rate do not appear to be supported by any property, rule or feature of Yoruba on any level of analysis.

(2) All the forms represented by /mi/ in Table XI (whatever the tone feature) actually occur in the language--Adetugbọ's /N/ (table X) being a superficial representation of only one of these. When followed by a formative with non-syllabic initial, the /i/-elision rule (P-7) applies, and P-8 syllabifies the remaining nasal consonant. It is only after the application of P-8 (and P-10 (assimilation of nasal consonants)), then, that any preverb that may drop its nonsyllabic initial does so. The following forms are derived through such a sequence of rules:

|mō ṅ́ tà|	(←/mō mí tà/)	'I am selling'.
|ŋ̄ ó tà|	(←/mĪ yóò tà/)	'I shall sell'.
|ŋ̄ ò tà|	(←/mĪ kò tà/)	'I don't sell'.
|ŋ̄ è é tà|	(←/mĪ kò í tà/)	'I don't (habitually) sell'.

There is, of course, a third reason of greater theoretical import for considering Adetugbọ's conclusions inadequate. In particular, all three

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dialects of Yoruba in Adetugbọ's study differ not just merely in the inventory of phonological segments with which we are provided in tables of contrastive oral and nasal vowels (Adetugbọ (1969a), p. 4), but most funadmentally in the rules by which we arrived at the inventory from underlying representations. For example, CY (that is, Ijẹ̀ṣà) elides initial /w/ of lexical items x under conditions which are not yet sufficiently investigated. This much is clear: the /w/-elision is not limited to the 3rd plural of the pronominal system as in the study under discussion. Thus while the following is true:

SY: /w$\bar{ɔ}$ tà/ 'they sell'

CY (Ijẹ̀ṣà): /$\bar{ɔ}$ tà/ 'they sell'.

the following is also true:

SY: /ó wí kpé w$\bar{ɔ}$ tá/ 'He says that they sold'

CY: /í $\bar{ɪ}$ $\bar{ɔ}$ tà/ 'He says that they sold'.

In the second set of examples here, the /w/ elision combines with phonological changes to make the CY example almost unrecognizably distinct from that of SY. Also, for another type of difference in P-rules, the last column of Table XI has the underlying representation:

/m$\bar{ɪ}$ kò í tà/ 'I don't (habitually) sell.'

Now, there are certain (residual) rules in SY[42] which assimilate o to i in certain contexts, then, finally, change each of the segments into |e|, thus yielding such forms (after P-8 and P-10) as:

|$\bar{ŋ}$è é tà| 'I don't (habitually) sell'.

|èèbòó| (←/òjĭ̀bòó/, P-18 having elided the /j/) 'whiteman'.

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42. The condition of application of these rules are too poorly understood at present. Our presentation is, therefore, mainly discoursive.

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We suggest that phonological changes that distinguish the pronominal systems of Ondo (SEY) and Ijẹ̀ṣà (CY) from that of SY Adetugbọ (1969a, especially pp. 8-10) are primarily of this order.

As Paul Kiparsky has sought to demonstrate in "Linguistic Universals and Linguistic Change,"[43] change(s) in a phonological rule may lead not only to a "restructuring in a tiny corner of the vocabulary," but also to some significant modification in the syntax. We surmise, then, that further research may yet lead to an explicit statement of changes that can account for the observed distinctions in the pronominal systems of Yoruba dialects. For the present, we hope that our account above points in the right direction.

5.5 Categorial Rules: The Verb

It is clear by now that in this study we have not insisted on a strict compartmentalization of the categories that have headed the sections and chapters. Thus, we have brought in verbs where appropriate, and have not delayed till now to let the reader in on what, otherwise, would pass for the mystery of Yoruba verbs. The following are further examples of verbal formatives:

/kpí/	'to divide'
/rí/	'to see'
/wò/	'to look'
/dárā/	'to be good'
/kéré/	'to be small'

43. In Universals of Linguistic Theory, ed. by Emmon Bach and Robert T. Harms. (N.Y., 1968), pp. 171-204.

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/gā/ 'to be tall'

/gbɛ̄/ 'to be dry'

/gbɛ́/ 'to dig'

/rà/ 'to buy'

/tɛ̀/ 'to bend'

/mū̄/ 'to drink'

/mū́/ 'to be sharp'

The Sequence Structure Condition 5 has characterized the structure of the Yoruba verb in a most incomplete fashion as follows:

SqSC 5. Verb Structure:

$$\begin{matrix}[& [-syl] \\ VB & \end{matrix}$$

SqSC states merely that a Yoruba verb never has a syllabic initial. We can restate this to mean that it never has a vowel initial. Such a statement is not accidental to our presentation.

Also in this study we have not subclassified Yoruba verbs into those that have the feature [± Adj], and those that do not; for it is easy to show that in Yoruba, every item that can be legitimately classified as a verb is not an exception to any of the rules of grammar defining the category. For example, all verbs in Yoruba undergo the same type of nominalization, and adjectivalization; and all verbs except the "predicator" /nĪ/ (as in |ìwà nĪ ɛ̄wà| 'character is beauty' (manner maketh man)) command an SM when preceded by a noun subject. However, as in all languages, not all verbs take an object, though they all take some kind of complement or other, namely, temporal, manner, etc. As we have shown above, some verb forms may be optionally used as adjectives without undergoing the normal

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process of derivation. Such forms, however, constitute a closed set, in Yoruba and the option characterizing them is only a form of enrichment. Examples:

/kpūkpā/	'red' as in /ā̌šɔ̄ kpūkpā/	'red piece of cloth'
/tũ̄tũ̄/	'new' as in /ā̌šɔ̄ tũ̄tũ̄/	'new clothes'
/fũ̄fũ̄/	'white' as in /ā̌šɔ̄ fũ̄fũ̄/	'white piece of cloth'

In short, the Yoruba verb is not an optimum syllable (with the canonic form CV) as some would have us believe. Some Yoruba verbs are dissyllabic, others are monosyllabic. The fact that the former are often translated into other languages as a 'predicate' should not deter us from making a legitimate identification in the language. Example:

ìwèé náà á tuntun 'the book is new' (Eng.)

'le livre est tout neuf' (Fr.)

el libro es nuevo (Sp.)

5.51 The Verb Phrase.

The Verb Phrase (VP) consists, in Yoruba, of the verb followed by its complement(s). Examples:

(1)	/rí rōbōtō/	'look round and small'
(2)	/rǐ̀ lɔ̄/	'walk away'
(3)	/rī̀ ɔ̀nɔ̀/	'travel a road'
(4)	/tà tɔ́/	'finish selling'
(5)	/tā ɛ̄rɔ̄/	'sell meat'
(6)	/fɛ́ ɛ́ rà/	'want to sell'
(7)	/fɛ́ ōwó/	'want money'

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(8) /fɛ́ Ɪgbá/ 'want calabash'

(9) /pɔ̃́ tó/ 'ripe enough'

(10) /gɔ̀ kpúkpɔ̀/ 'to be very stupid'

When the complement is a noun (object) as in (3), (5), (7) and (8), the verb obligatorily undergoes P-30.

P-30. Pre-accusative Verb Adjustment:

$$[+L] \rightarrow \begin{bmatrix} -H \\ -L \end{bmatrix} \; / \; \left[\begin{bmatrix} +syl \\ \_\_\_\_ \end{bmatrix} \right]_{VB} + \left[\quad \right]_{\text{Noun Obj.}}$$

Rule 30 converts the tone feature of the vowel final of a verb to mid, if it happens to be low, when that verb is followed immediately by a Noun object. This rule has syntactic consequences which have always been taken for granted. These will be discussed below.

5.52 Verb-Noun Combination.

In the speech of native speakers of Yoruba, when a verb is followed immediately by a noun with vowel initial, either the vowel final of the verb, or the vowel initial of the noun may be dropped. Examples:

/tā ɛ̄rɔ̄/ → |tɛ̄rɔ̄|, /fɛ́ ōwó/ →|fówó|, but /fɛ́ ɔ̄wɔ́/ → |fɛ́wɔ́|

The problem is, how do the speakers of Yoruba decide which of the vowels is to be dropped?

This phenomenon is referred to as "contraction in Yoruba," and has always been thought to include the "Verb+Pronoun Object." We have seen, however, the only type of verb-pronoun contraction in Yoruba, presented above as a special case of P-12 (5.43). Insofar as we subscribe to the terminology, verb-nominal contraction shall refer strictly to that between

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a verb and its noun object, and we shall attempt to show where earlier accounts may have erred.[44]

One cannot but remark the fact that Ida Ward was one of the first to realize the complexity of the problem of contraction in Yoruba, yet she remained optimistic about a final solution. She says:

> ...There is little doubt that the collection and classification of large numbers of examples would produce a rule.[45]

The work of Awobuluyi, and, lately, that of Courtenay as well as those of Bamgboṣe have been part of the struggle to achieve Ward's goal, i.e., "to explain exactly what is going on in Yoruba."

Perhaps Bamgboṣe's works have made the most far-reaching conclusions about contraction in Yoruba. We attempt here to show where his proposals appear to be weak. Most importantly, we propose an entirely different descriptive approach. There is nothing to suggest that our own approach offers the solution to the problem of contraction in the language. It seems to us, however, that our account explains more than that of any of the earlier descriptions. The main feature of our account is that syntactic considerations figure prominently, at any rate, more than in any of the previous treatments of contraction in Yoruba.

---

44. References will be made mainly to Awobuluyi (1964), The Phonology and Morphology of Yoruba, to Bamgbose (1965), "Assimilation and Contraction in Yoruba"; (1967) "Vowel Harmony in Yoruba"; (1967) A Short Yoruba Grammar, and to Courtenay (1968) A Generative Phonology of Yoruba. Much of this discussion will, however, take Bamgbose's works into account.

45. An Introduction to the Yoruba Language (Cambridge, England, 1952), p. 125.

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5.521 An Earlier View.

Bamgbọṣe (1965) defines the verbo-nominal contraction in Yoruba by the formula:

$$V_1 + V_2 \rightarrow \begin{Bmatrix} V_1 \\ V_2 \end{Bmatrix}$$

where V_1 is the verb final vowel, and V_2 the noun initial vowel. He follows with following note:

> ...It occurs in a combination in which the second of the words in contact is either a pronoun or a noun (which may or may not have qualifiers). Although in both cases, only one of the vowels in contact is retained, there is a difference in how the tones are contracted. On this criterion, therefore, we may distinguish two types of contraction: (a) Pronoun Contraction, (b) Noun contraction.

5.5211 Pronoun Contraction

Bamgbọṣe proposes the following rules for pronoun contraction.

(1) $\acute{v}_1 + v_2 \rightarrow v_1$

(2) $v_1 + \acute{v}_2 \rightarrow \acute{v}_1$

v_1 is the verb final vowel, and v_2 is the pronoun. Since Bamgbọṣe bases his case exclusively on the third person singular object pronoun, v_2 is normally obligatorily assimilated to v_1 (#5.43). But that is not the important thing in this case. It is that pronoun contraction is practically unknown in the register of Yoruba usually referred to as Standard. In the first place, if it exists at all, it would be limited to the third singular. However, even in the third singular, this kind of contraction

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may occur in non-standard dialects, and then only in a highly restricted context. In Standard Yoruba, the nearest thing to such a contraction occurs in the third singular object after a high verb preceded by the Negative imperative marker <u>máà</u> (#5.43).

1. |gé ē| 'cut it'
2. |máà gē| (</máà gē ē/) 'don't cut it'.

Bamgboṣe has retained his belief in Pronoun Contraction (of his 1965 article) in his booklet <u>A Short Yoruba Grammar</u> (1967, p. 31). This time, however, this belief is stated with some reservation when he says

> ...Note that a high tone cannot occur before the contraction having a high tone. For example, we can only say <u>ó ṣe é</u> ('he did it') not <u>ó ṣé</u>.

But beside this reservation, there are non-trivial counterexamples to the supposed Pronoun contraction. For example, no phonological rule or rules operate to make the following utterances phonetically alike in 'Standard Yoruba' (SY), that is to make (2) like (1), and (4) like (3).

(1) (a) <u>ré</u> 'to slice' (2)(a) <u>re é</u> 'soak it' (3)(a) <u>re</u> 'soak'
(4)(a) <u>ré ẹ</u> 'slice it'

(1)(b) <u>ró</u> 'to wrap around' (2)(b) <u>ro ó</u> 'hoe it' (3)(b) <u>ro</u> 'to hoe'
(4)(b) <u>ró o</u> 'wrap it around yourself'

(1)(c) <u>pín</u> 'to divide' (2)(c) <u>pin ín</u> 'end it' (3)(c) <u>pin</u> 'to end'
(4)(c) <u>pín in</u> 'divide it'

The two pronoun contraction formulas above claim that series 2 of the examples given here is pronounced like series 1, and series 4 like 3. But the kind of neutralization which would lead to such contractions does not occur in spoken Yoruba as far as we know.

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5.5212 Behaviour of Tones in Noun Contraction.

The following statement is not unlike what one may encounter in all past studies of contraction in Yoruba:

> ...In a noun contraction, the two vowels in contact may be identical or different. As far as the tones are concerned, the rules for contraction are quite simple: a high tone plus a mid tone is contracted in a high tone, a high tone plus a low tone is contracted to a high tone, but elided low tone still remains phonologically significant in the contraction (thus elided low tone is indicated by a dot), a mid tone plus a low tone is contracted to a low tone.[49]

Bamgboşe formulates these observations as follows (in our own convention):

1. $[+H] + [^{-H}_{-L}] \rightarrow [+H]$

2. $[+H] + [+L] \rightarrow [+H]$

3. $[^{-H}_{-L}] + [+L] \rightarrow [+L]$

The formulas summarize P-4, P-5, and P-6. But notice that it is simply not the case, as earlier students of Yoruba seem to have assumed, that these rules apply exclusively to verb-noun contraction. Derivations above have shown clearly that they apply more generally within the language.

Moreover, combinations of the lexical forms of verbs and nouns should normally yield far greater syntactic possibilities, in terms of tone sequences, than these rules characterize. The question has hardly been clearly put just why only these three rules completely characterize verb-noun contractions as they do other types of contractions. In other words, why are all the sequential possibilities of verb-noun contraction (with respect to tone registers) not realized? The answer lies in two constraints already stated in widely separated parts of this study, both applying

49. Bamgboşe (1965). Underscoring mine. The underscored passage is irrelevant to noun contraction. It is an orthographic convention adopted by Bamgboşe.

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to each of the categories involved in the contraction. One is lexical (SqSC 4), the other phonological (P-30). For ease of reference we present them together here:

SqSC-4

$$\left[\left[\left\{\begin{matrix}[-syl] \\ [+syl \\ -H]\end{matrix}\right\}\right]\right]_{FORM}$$

P-30. Pre-accusative verb adjustment

$$[+L] \rightarrow [^{-H}_{-L}] \;/\; \left[\begin{matrix}+syl \\ \_\_\_\_\end{matrix}\right]_{VB} + \left[\;\right._{Noun\ Obj.}$$

P-30 states simply that a verb final vowel with the feature low tone, is realized phonetically with a mid tone when the verb is followed by a noun (not a pronoun) object.

Any account of both the contact between identical vowels, and the contact of mid-tone vowels which omits a fourth formula

4. $[^{-H}_{-L}] + [^{-H}_{-L}] \rightarrow [^{-H}_{-L}]$.

offers no insight into the discussion of contraction in Yoruba. The fact is, in not considering this formula, one is actually keeping silent not only about verb-noun combination of the pure type

5. $[^{-H}_{-L}] + [^{-H}_{-L}]$ (re ata 'pick pepper')

but also about the types with the underlying forms:

6. [+L[+ $[^{-H}_{-L}]$ (fò aso 'wash clothes')

7. [+L] + [+L] (tà èwà 'sell refried beans').

The last two do not occur in the phonetic representation of Yoruba because of the effect of P-30. The importance of this discussion is that this

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phonological rule must apply before any of the rules of tone replacement in verb-noun contraction, and probably before the rules of F-feature contraction; otherwise, one would end up with non-Yoruba utterances. We feel that it is a serious oversight to have neglected this fact in earlier studies, since we do not see any reason to take any phonological, or syntactic process for granted. Thus the following forms, in terms of tones alone, are the phonetic representations of the above given examples.

8. $\begin{bmatrix}-H\\-L\end{bmatrix}$ + $\begin{bmatrix}-H\\-L\end{bmatrix}$ (re ata 'pick pepper')

9. $\begin{bmatrix}-H\\-L\end{bmatrix}$ + $\begin{bmatrix}-H\\-L\end{bmatrix}$ (fọ aṣọ 'wash clothes')

10. $\begin{bmatrix}-H\\-L\end{bmatrix}$ + [+L] (ta ẹ̀wà 'sell cooked beans')

5 and 6, on the one hand, 3 and 7 on the other, now have the same feature representations in 8 and 9, 3 and 10, respectively.

Interestingly enough, the structural ambiguities of the resulting phonetic representations are more apparent than real. The question is: How do we explain the fact that the phonetic realizations are not perceived as ambiguous by a native speaker of Yoruba? There are several explanations possible, of which the following seem to be applicable in this case. We will put the matter thus: Let X and Y be two verbs in the lexicon of Yoruba; one is low tone, the other mid. The following situations arise. Either there is no X such that X is identical with Y except for tone (for example, ǰẹ 'eat', not ǰẹ̀); or where there is an X and a Y, such that X is identical with Y, except for tone, it is necessarily the case that X never governs a noun with the same selectional (semantic) features as Y does. For example, let X = ro, and Y = rò, then rò ẹ̀fọ́

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('cook vegetable stew') exists phonologically speaking, but not ro ẹ̀fó, conversely, rò oko does not exist, but ro oko ('hoe a plot') does. In other words, there is a strong selectional restriction between verb and noun in Yoruba. It is clear, then, that there can be little or no perceptual ambiguity for a native speaker of Yoruba who hears and uses X to represent both X and Y. For him, there is only one way to understand ro ẹ̀fó, and there is no alternative interpretation for ro oko.

It must be emphasized that we are not claiming there are no exceptions to these observations. It is, however, the case that such exceptions are few, and should be explicable, in the light of what we have here.

5.5213 Principles of Verb + Noun Contraction

From the above discussion, one comes off with the not unreasonable impression that any vowel can be dropped in a contraction situation, and, that on the surface of it, there is seemingly no order as to how vowels are dropped when they are dropped, and no identifiable contextual constraint on the dropping. Bamgboṣe acknowledges "the difficulty of formulating phonological rules to account for which of the two vowels in contact is to be elided, when these vowels are different" (1965, p. 162. Underlining mine, O.). He proposes an approach which he believes provides a way out of this long recognized difficulty. He states his major principles of elision thus:

> ...In discussing contractions, it is necessary to distinguish between collocations of verb and noun which are always contracted and those that are not. In the former, the question of predicting which vowel is to be

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elided does not arise because the verb-nominal collocation only occurs in its already contracted form. Examples of such collocations are:

róntí	'remember'
pẹ̀lú	'be with'
já.de	'go out'
gbilẹ̀	'take root'

In the latter where the verb-nominal collocation can occur uncontracted as well as contracted, the problem of which vowel is elided in the contraction arises.

This proposal divides all Yoruba verb-noun combinations into three groups: (1) those in which the vowels in contact are identical, (2) those that are always contracted, and (3) those whose vowels in contact are not identical, and are not always contracted. He sees the third group as the only one to be accounted for. This grouping, however, appears artificial. First of all, as in the case with Bamgboṣe's treatment of tones (see above), one would question the validity of the exclusion of group (1). The assumption underlying this exclusion seems to be that in cases where the vowels in contact are identical, it does not matter which of the two is elided.[50] Examples:

/rā ā̌ṣɔ̄/	|rā̌ṣɔ̄|	'buy clothes'
/bō ōrí/	|bōrí|	'cover the head'

This assumption, however, treats group (1) as exceptions to any principles of contraction that may be proposed, an approach which dodges rather than solves the problem. Instead of merely stating that (1) is a group of exceptions, we believe that it would be useful to establish clearly why a set of explanatory principles may not apply to members of the group as strings in the language, if in fact those principles do not apply.

50. But compare Courtenay's implicit contention that where both vowels are identical either inherently or by assimilation, it is always the final vowel of the verb that is retained.

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Secondly, the criterion which defines group (2) appears suspect. It might be useful to distinguish between "non-analyzable" and "always contracted." The first implies the second, but the relation is asymmetric. For example, we do not know of any evidence in the language that may suggest the meanings of the constituents of

|pɛ̀lùú| '(be) with'

|jókòó| 'sit down'

if both items were analyzed. Both always occur in the forms given here, yet a plausible constituent analysis can be provided on the basis of the rules of the language. For example, on the basis of the glide rule, |y̆jókòó| may be analyzed as consisting of /y̆jó/ + /v̀kòó/, where v is an unidentifiable vowel. The point is that all forms in group (2) are analyzable, and only very few compound verbs (of the type just given) occur always contracted in the language. Take for example, rǫ́ntí of Bamgboṣe's examples; the following usages are common:

mo rǫ́nti i rẹ	/mō rɔ̄́tí ɪ̄ rɛ̀/	'I remember it'
rǫ́n mi l'étí i rẹ	/rɔ̄́ mɪ̄ létí ɪ̄ rɛ̀/	'Remind me of it'

Furthermore, it can be shown in this manner that some members of (2) belong, in their analytic form, to (1), and others to (3).[51] Examples:

/rētí/ 'to hope', 'to expect'

but /rē ētí/ 'to pick the ear (usually with the intention of clearing the auditory tube)'

/rɔ̄́tí/ 'to remember'

but /rɔ̄́ ētí/ Lit. 'to sew ear'

51. All these observations apply equally to Courtenay, who may have followed Bamgboṣe in some essentials, and has even gone so far as to use vowel identity as a stage in her derivation of utterances resulting from the vowel elision under consideration.

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Turning to group (3), we notice that, among the examples given for illustration in Bamgboṣe (1965), a good number do not have any other form, so that the criterion of 'always contracted' should apply to them as well. Among these examples are the following:

wolè	'mind your steps'
lulè	'fall down'
t.éwé	'set leaves, especially for preparing èko|(èkɔ̄|)'
pasè	'to beat a rhythm with the feet'
rasè	'supplicate' as in rawó rasè

In fact, there is nothing to stop one from considering these exceptions as items belonging to group (2), that is, to the group of the items that are supposedly always contracted. But let us now consider the other principles that Bamgboṣe has set up to account for (3).

5.5214 Other Earlier Principles of Contraction.

The following are the principles that the work under discussion proposes as totally accounting for contraction in the verb-nominal collocations of group (3). It is suggested that the nine principles together show "that the overall tendency in a noun contraction is for the vowel of the verb (i.e., the vowel of the first word of the contraction) to drop out." (Examples for each principle given below are a few of those used for illustration in the original text, and are given in orthographic representation).

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(a) The vowel i whether of the verb or of the nominal is almost always elided elided.

gbé inó → gbénó 'lift the lamp'

wo ilè → wolę 'look at the ground'

(b) Except before the vowel i, the vowel u of the verb is almost always

ju igi → jugi 'throw a stick'

bu omi → bomi 'take water'

(c) The initial low tone syllable of a nominal (other than i) is usually retained.

kó èkó → ké.kó 'learn a lesson'

se àjé → sàjé 'engage in witchcraft'

(d) The initial vowel of a nominal whose first two syllables consist of two identical vowels is usually retained.

so òótó → sòótó 'speak the truth'

gbé aago → gbáago 'lit the clock'.

(e) In the case of the other vowels, it is more useful to determine the elision of the vowel from the verb rather than from the nominal [sic] because nominals beginning with different vowels show much less variation in the elision of their vowels than verbs ending in different vowels.

gba ewé → gbewé 'take the leaf'

gba eja → gbeja 'take the fish'

gba ewé → gbewé 'take the leaves'

te ewé → tewé 'spread the leaves'.

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The following additional principles apply to vowels of the verb not covered by principles (a) to (d) above.

(i) The nasal vowel of the verb is usually elided and nasality is transferred to the initial vowel of the nominal with the following exceptions:

(1) The nasalized vowel of the verb is usually retained before the initial vowel o of the nominal. Before other vowels its retention is optional.

pín epo → pénpo 'share the oil'

ron awo → ranwo 'sew the leather'

(2) Nasality is dropped when the nasalized vowel u is elided in the sequence fun, mu (occurring with a nominal other than o. Before o, the retention of nasality is optional in the sequence fun, and obligatory in the other sequence.

mú owó → mówó 'take money'

fún ewúré → féwúré 'give (it) to the goat'

(ii) The vowel a of a verb having a high tone is usually retained, except in the case of bá and wá where this vowel is elided.

já ewé → jáwé 'pluck the leaves'

wá eja → wéja 'look for fish'

(iii) The vowel a of a verb which has a mid tone when followed by a complement is usually retained unless this verb is one of a pair of verbs which differ by one having a low tone and the other a mid tone when they are not followed

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by a complement. (Two exceptions are the verbs: gbà 'get' and pa 'kill', where a is elided even though these verbs do not have such a contrast).[52]

la ẹnu → lanu 'open the mouth'

gba owó → gbowó 'get money'

When a pair of verbs contrast as specified above, the vowel a of the verb having a low tone is elided, and that of the verb having a mid tone is retained.

(tà) ta epo → tepo 'sell oil'

(ta) ta epo → tapo 'spill oil'

(iv) In the cases which are covered by (i) to (iii) above, the vowel of the verb is usually elided.

gbọ́ ariwo → gbariwo 'hear a noise'

kó ewé → kéwé 'gather the leaves'

jẹ ewé → jewé 'eat leaves'.

There are so many exceptions to principles (a) and (b) that their usefulness as principles of nominal contraction is questionable. Consider the following examples which are by no means isolated:

(A), counterexamples to (a)

ríra (←rí ara) 'to be disgusting' (said of things)

wíjọ́ (←wí ejó) 'to complain' (as in court)

jiyọ̀ (←jẹ iyò) 'to lick salt'

minu (←mi enu) 'condemn with a nod'

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52. There are several other exceptions to (iii) besides those given in the text. For example: fà 'to pull', wà 'dig up', dà 'pour away', etc. Bamgbọṣe's principles of contraction include most of Awobuluyi's (1964).

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(B), counterexamples to (b)

bubẹ̀	(←bu ọbẹ̀)	'dish out soup'
rúmi	(←rú omi)	'stir up water' (in the particular sense of 'make dirty')
dúrọn	(←dú ẹrọn)	'slaughter an animal' (by cutting its throat)
tukọ̀	(←tu ọkọ̀)	'row' (as of a boat).

Principle (c) invokes tone as the deciding factor. It states that the low tone preserves the vowel initial of the noun. This is a good observational statement, but it has too many nontrivial exceptions to be a valid principle. Bamgboṣe himself readily finds exceptions to this principle (f.n. 100, p. 165). Among these are:

la ọ̀nọ̀ → lànọ̀	'make a path'
pa èǹyọ̀n → pâǹyọ̀n	'kill a person'
fẹ́ è.kejì → fé.ke.jì	'marry the second one'

These exceptions are by no means isolated.

Consider, along with this principle, principle (ii), which also makes tones a determining factor in contraction. The following are counterexamples to (ii):

kẹ́mi (ká ẹ́mi)	'pick shea nut'
jeso (ja eso)	'pluck fruit'

Principle (d), however, states exactly the opposite of (c) and (ii). According to it, vowel qualities (and not tones) determine the nature of contraction. We must remember throughout all this that it is to be understood (quite correctly, we think) that tones behave independently of other vowel features in Yoruba.

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Principle (e) adds to the confusion, and we find it a little hard to understand. In particular, we do not know what "beginning in different vowels," and "ending in different vowels" mean.

As far as contraction involving nasals are concerned, it is stated that verb final nasal vowels are different from all other vowels, and accordingly behave differently in contraction. We have strong reservations about this assertion. There are valid objections to (i). Specifically, it can be shown that no transfer of nasality is involved in cases of contraction. What happens at best is a neutralization of certain F-features so that after P-31 has applied, we are left with an indeterminate nasal syllabic with a tone.[53]

P-31. Nasal Neutralization

$$\begin{bmatrix} \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix} \rightarrow \phi \Big/ \left[\begin{array}{c} +\text{syl} \\ +\text{nas} \\ \hline +T_i \end{array}\right]_{VE} + \begin{bmatrix} [+\text{syl}] \\ \text{Noun Obj.} \end{bmatrix}$$

Moreover, P-31 is optional in certain cases. That is, there is in these cases an option between using this process and dropping altogether either the nasal vowel of the verb, or the initial vowel of the noun. Examples:

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53. This type of segment has been very well described by Trubetzkoy in his Principes: (p. 194).
"Les particularitiés spécifiques de la <<nasale indéterminée>> (ou de l'archiphonème nasal) sont sa résonance nasale et ses propriétés de sonante (c'est-a-dire le degré minimum d'obstacle). Par là cet archiphonème se rapproche des voyelles nasalisées. Et de fait, il existe souvent entre la <<nasale indéterminée>> et les voyelles nasalisées un rapport étroit. ..." (See further Ch. 7 below).
We represent this nasal element with [n̥], but it should not be identified with the alveolar /n/ of Yoruba, which we recognize. The process by which the indeterminate nasal arises in the cases we are considering is called synaleph.

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(1) rẹrin (←rín èrín) 'laugh'

(2)i. p'ńaṣọ
(a)ii. pínṣọ } (←pín aṣọ) 'divide cloth'

(b) mo mọ 'un tí mo f'n álejò méjọ je

'I know thing that I gave strangers eight eat

(Adeboye Babalọla, Àwọn Oríkì Oríle; "Olúfẹ̀" (line 194).

(3) pónṣọ (←pón aṣọ) 'to yellow clothes'

In other words, contrary to Bamgboṣe's principle (i), nasality is under no circumstances transferred in contraction.

The examples of the elided nasal vowel accompanied by a transfer of nasality are strange for the following reasons. The vowel e does not have a nasal counterpart in the language, and no phonological rule in Yoruba accommodates it. In other words, nasalized e does not occur phonetically, or phonologically in Yoruba, and pénpo (under (i)) is neither generated nor derivable through Yoruba phonological rules. But that is far from suggesting that it is a fabrication. We are only saying that alternatives p'ńepo and even pínpo are more plausible, and actually occur. Nor is this to say that in the contraction arising from verbo-nominal collocation, the nasal vowel is not entirely elided in some cases. It is, however, that all other cases (such as examples (1) and (2(a)ii) above) can be subsumed within general rules of vowel elision which we will propose in a moment.

For further illustration, consider one of Bamgboṣe's examples of transferred nasality (cf. Rowlands, 1954, p. 384):

rọ́n awọ → ranwọ 'sew leather'

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This example is not at all helpful in understanding the phonology of the language. Bamgbọse himself agrees that rọ́n and rán do not contrast in the language, and that even in the speech of some speakers of Yoruba only one of them occurs. But his examples, like this one, suggest that in the speech of the same speaker or speakers, one of these non-contrasting forms may be converted into the other. This does not appear to be very plausible.

Finally, the principle of transfer of nasality transgresses the sequence structure restrictions of Yoruba. In particular it violates the morpheme structure condition that states that no morpheme in the language begins with a nasal vowel. There is, of course, the problem of verification to decide which is arbitrary, the MSC, or the transfer of nasality. But quite apart from empirical verification, there are other restrictions in the language which operate almost without exceptions as this particular MSC. Take the vowel harmony for example. It does not apply across major syntactic categories. That is, an affix or a pronominal preverb may harmonize to a noun, or a verb, but never a noun to a verb, or vice versa, not even in the type of contraction we have been discussing here.

Examples:

kọbè	(←kọ ebè)	'make heaps (as in cultivation)'
róṣọ	(←ró aṣọ)	'wrap around oneself a type of cloth'

but not

kobè;

róṣọ.

In other words, |rɔ̃́wɔ̄| ←|rɔ̃́ āwɔ̄| by the elision of the vowel initial of the noun, and not |rãwɔ̄| ←|rɔ̃́ āwɔ̄| by the double process of elision

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and transfer of nasality. It is in part a parallel constraint on nasality that makes it obligatory that it is neutralized in /n/ (P-9) when the latter is followed immediately by an oral vowel of a lexical item. For these reasons the principle of nasal transfer, like those already discussed, is inadequate.

In conclusion, we have been trying to show that even though Bamgbọse's account of verbo-nominal contractions in Yoruba is superior to similar attempts before, or since his works in question, it is far from satisfactory. It neither describes all that is observable in the language, nor does it explain adequately what it describes.

5.53 A New Proposal.

As a first approximation, using the examples provided by Bamgbọse (1965) for heuristic purposes, we subdivide verbo-nominal collocations in Yoruba into two groups:

Group I

rọ́ntí (←rọ́n etí)	'remember'
tẹ́wé (←tẹ́ ewé)	'set leaves'
pàṇyọ̀n (pa ènyọ̀n)	'commit murder'
wọ́wé (←wọ́ ewé)	'fetch leaves' (this involves a specific manner of fetching)
sonwó (←son owó)	'pay up'
dáwó (←dá owó)	'pay a contribution'
pasè (←pa asè)	'beat a rhythm with the feet'
tapo (←ta epo)	'spill oil'
fọṣọ (←fọ aṣọ)	'wash clothes'

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Group II

kẹ́kọ́ (←kọ́ ẹ̀kọ́)	'learn'
rẹ̀rọ (←ra ẹ̀rọ)	'buy a mill'
sòótọ́ (←so òóto)	'tell the truth'
gbáago (←gbé ago)	'steal a bell'
gbéwé (←gbá ewé)	'sweep leaves'
gbewé (←gba ewé)	'get leaves'
gbẹja (←gba ẹja)	'get fish'
bọ́kọ (←bá ọkọ)	'overtake husband'
wẹ́ja (←wá ẹja)	'search for fish'
te.o (←ta epo)	'sell oil'
gbáriwo (←gbọ́ ariwo)	'hear a noise'
jewé (←je ewé)	'eat leaves'

The number of items in each group is of no importance.

The only significant similarity in both groups is that they are derived through the same general process, that is, form a VERB-NOUN concatenation. From then on they diverge: items in group I keep their verb final vowel, whereas items in group II lose it and retain the noun initial vowel instead. Most importantly, items in group I belong to a different grammatical category from items in group II. We will recall that Bamgbọṣe classifies all collocations into those that are always contracted, and those that are not. We can say that his two classes correspond very roughly to our two groups here. However, Bamgbọṣe's classification shows no more than that students of Yoruba have always felt curious about the syntactic behaviour which sets items in our group I apart from items in group II. But there has been a dearth of hypotheses on how to handle

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them. We have shown above that the criterion of analyzability and of collocational pre-supposition (that is, that they always occur together) which are often used are vacuous. Recall the examples:

rọ́ntí	'remember', as in
mo rọ́n òré è mi l'étí	'I reminded my friend'.
wọlẹ̀	'mind your steps!', as
mo lọ o wo ilẹ̀ titun tí mo rà	'I went to look for my newly bought grounds';

These examples show that these items are quite transparent, and that the components do not always occur together. But notice that once separated, the meaning changes. At any rate, the meaning of each of the items in group I is not, literally, the sum of the meanings of its parts. This is the crucial characteristic of items in group I which is not observable in the items of group II. For example:

tepo	'sell palm-oil'
mo ta àgbá epo kọn	'I sold a barrel of palm-oil'

Syntactically, then, items in group I may be described as VERBS, but items in group II must remain 'VERB + NOUN'.[54] These can be represented either

54. Our attention has been freshly drawn to Rowlands' cursorily mentioned, nevertheless, identical stand on these matters (1954, p. 384):
> ...An examination of the cases of elision soon makes it clear that at the phonological level of analysis it is impossible to formulate any rule as to which vowel survives. ...We can explain the difference in treatment between bímọ and b'ọmọ by saying that in the first our attention is focused on the verbal, in the second on the nominal (which) is here used in a less familiar). Further examples of difference of treatment of the same vowels in contact in identical tonal situations are dá and iná > dáná, but dá and ifá > dífá. ...

This makes it all the more surprising that studies on Yoruba after 1954 have been done as if Rowlands had never made this observation. Yet references are made to his work in all later descriptions of Yoruba. It is now clear, for example, that Courtenay may have borrowed her criterion of familiarity (for deciding which verbs elide their vowel final, which don't) from Rowlands. Bamgboṣe neglects this latter criterion, quite rightly, but, unfortunately, neglects as

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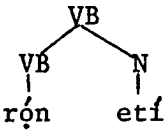
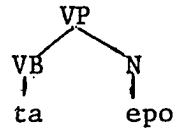
with the Phrase Markers, or with proper bracketing as follows:

Group I (a)



(b) $\left[_{VB}\ [\text{rọ́n}]_{VB}\ +\ [\text{etí}]_{N\ N}\ \right]_{VB}$

Group II (a)



(b) $\left[_{VP}\ [\text{ta}]_{VB\ VB}\ +\ [\text{epo}]_{N\ N}\ \right]_{VP}$

Vowel elision processes in these two categories are carried out as specified in P-32.

P-32. Verb-Noun Contraction a :

$$\begin{bmatrix} +\text{syl} \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix} \rightarrow \phi \ / \left\{ \begin{array}{ll} \left[_{VB}\ X\right]_{VB} + \left[_{\text{Noun Obj.}}\ \left|\overline{+T_i}\right|\ \right]_{VB} & \text{(a)} \\ \left[_{VP}\ \left|\overline{+T_i}\right|\ \right]_{VB} + \left[_{N}\ X\ \right]_{VP} & \text{(b)} \end{array} \right\}$$

Condition: $X \neq 0$. (X is not empty.)

---

well the richer suggestion of other non-phonological criteria in the passage quoted here.

It is also clear, however, that even Rowlands himself does not really believe in the validity of the syntactic criteria that he suggests, and on which we base our major stand here. He states quite firmly (p. 385) that "The relative familiarity of the two constituents in any combination apparently decides which vowel shall survive." The examples he supplies to support this argument immediately shows its weakness:

gba	iná > gbiná	'catch fire'
pa	iná > paná	'put out fire',

thereby implying that gbà is less familiar than pa. But gbaná, 'to contain a blaze', exists! (Not synonymous with paná).

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In other words, P-32 (a) and (b) are phonological rules in Yoruba, such that P-32 (a) applies to derive items of group I, just in case there is a phonological representation of the type I (b); and P-32 (b) applies to derive items of group II, just in case the bracketing is of type II (b). No claim is made that the representations here are deep structure representations. They obviously have undergone some transformations, details of which should not detain us here.

In summary, verbo-nominal collocations that function syntactically as VERBS keep the verb vowel final, and the noun vowel initial is obligatorily elided. In the case of verbo-nominal collocations that remain VERB + NOUN (NP), vowel elision is optional, and when it takes place, it is the vowel quality (non-tonal features) of verb final vowel features that are neutralized.

5.531 Apparent Exceptions

It will be noticed that we have omitted, from the lists of items above, collocations in which high vowels or their nasalized counterparts are either verb final vowels, or noun initial vowels, or both. This omission is not accidental. The approach just proposed would account for more of these cases than any other approach already proposed in earlier studies. But it does not explain cases of doublets which are most commonly formed by collocations of the type that have been excluded so far. Consider the following doublets:

I		II	
je iyón	→ jeyón	jiyón	'eat pounded yam'
gba ilè	→ gbalè	gbile	'take root'

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pa irọ́ → paró	puró (*piró)	'tell a lie'
gbọ́ ìró → gbóro	gbúró (*gbíró)	'hear from', 'receive news of'
dá *iró → dáró	dúró (*díró)[55]	'wait', 'stand straight'
ja iyọ̀n → jayọ̀n	jiyọ̀n	'argue'

Materials from the Ijẹ̀ṣà and the Ekìtì (CY) dialects of Yoruba (Adetugbọ, op. cit.; Adetugbọ, 1969b; and Bamgboṣe, 1967)[56] will form the basis of the following explanation of these apparent exceptions. In CY (and also in SEY, i.e. Ondo) a fairly large number of formatives which have i-initial in SY have u-initial. Examples:

A.	CY	SY	
	ukú	ikú	'death'
	ùyà	ìyà	'suffering'
	uṣẹ́	iṣẹ́	'task'
	ugbá	igbá	'calabash'
	ùlù	ìlù	'drum'
	ulé	ilé	'house'

On the basis of these correspondences and from the SY doublets given above, one may posit the following additional correspondences:

*uró	iró	'lie'
*ùró	ìró	'rumour (about something or someone)'

It should not, however, be assumed that #u- of CY simply becomes #i- of SY. It seems that under certain conditions still poorly understood

55. Ibid., op. cit.

56. "Toward a Yoruba dialectology," contribution to a Week-end Seminar on Yoruba Language and Literature, Institute of African Studies, University of Ife, Nigeria, Dec., 1969.

Bamgboṣe, "Vowel Harmony in Yoruba," Paper presented at the Seventh West African Languages Congress, Lagos, 1967.

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CY #u- corresponds to SY #o- (thus CY ujà :: SY ojà, 'market place') and CY #i- corresponds to SY #ẹ- (CY ìjè :: SY èjè, 'blood'), etc. Given these facts, Bamgboṣe (1967) seeks to explain the following contractions.

B	ragbá	(← SY. ra igbá :: CY ra ugbá)	'buy calabash'
	rugba	(← SY. ru igbá :: CY ru ugbá)	'carry calabash'
	jílá	(← SY. jí ilá :: CY jí ilá)	'steal okra'
	jẹlá	(← SY. jẹ ilá :: CY jẹ ilá)	'eat okra'

He suggests that contractions result from an elision process as is indicated by the placement of the apostrophe in C.

C	ru'gbá	'carry calabash'
	r'ugbá	'buy calabash'
	jí'lá	'steal okra
	j'ilá	'eat okra'

The apostrophe indicates which of the juxtaposed vowels has been deleted. Forms in C are supposed to be CY correspondents of SY forms in B. Judging from the uncontracted B forms in parentheses, Bamgboṣe appears to be claiming, then, that CY #u- and #i- correspond to SY a, the second segment in ragbá, and ẹ, the second segment in jẹlá.

It seems to us, however, that the explanation for the contractions in B and C resides elsewhere, namely, in the phonological property of the uncontracted forms, a property which both Bamgboṣe and Adetugbọ (1969b) acknowledge. It is this property which accounts for the doublets that occur in SY.

Consider the following phonological representations of a few formatives as provided by Bamgboṣe and Adetugbọ:

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D	CY	SY	
	ukú /ūkú/	ikú /īkú/	
	ùyà /Ùjà/	ìyà /ìjà/	
	uṣé /Ūšé/	iṣé /īšé/	
	ilẹ̀ /Īlɛ̀/	ilẹ̀ /īlɛ̀/	'soil' (Adetugbọ, 1969b, 6)
	ilá /Īlá/	ilá /īlá/	
	ugbá /Ūgbá/	igbá /īgbá/	

First, it will be noticed that all the occurrences of u- and i- before low vowels are realized lax in CY. The crucial fact is that the vowel harmony which, as has been described in chapter III (SqSC3) is limited to non-high vowels in SY is generalized in CY, and the harmony feature is no longer relative height or aperture as such, but the opposition tense-nontense. Thus in CY all vowels necessarily agree in tenseness with the vowels that follow in the formative. Consider the following further examples (Bamgboṣe, 1967).

CY	SY	
/ɛ̄rÌrà/	/ɛ̄rìrà/	'ant'
/ɔ̀kŰtā/	/ɔ̀kútā/	'stone'
/ɛ̄rŮkpɛ̀/	/ɛ̄rùkpɛ̀/	'dirt (as of the soil)'[57]

Two observations are in order here. First, only nontense CY #u- or #i- may correspond to SY #o- and #e- (i.e, /ɔ/ and /ɛ/ respectively),

57. This explains, for example, the CY correspondents of the formatives as examples in 3.22:

SY	CY	
/èrí/	/èrí/	'testimony'
/ɛ̄bí/	/ɛ̄bí/	're tives'
/ɛ̄rù/	/ɛ̄rù/	'load'

Since the high vowel are tense, all the preceding vowel simply harmonize.

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whatever the other conditions may turn out to be. Secondly, the elisions in B above take the opposition tense-nontense into account. The following is what happens:

ru ugbá	/rū Ūgbá/	→	|rūgbá|
ra ugbá	/rā Ūgbá/	→	|rāgbá|
jí ilá	/jí Īlá/	→	|jílá|
jẹ ilá	/jɛ̄ Īlá/	→	|jɛ̄lá|

P-33 accounts for this phenomenon.

P-33. Verb-Noun Contraction (b):

$$\begin{bmatrix} +\text{syl} \\ \alpha\text{tense} \end{bmatrix} \rightarrow \phi \;/\; \left\{ \begin{array}{ll} \left.\text{——}\right]_{VB} + \left[\begin{bmatrix} +\text{syl} \\ \alpha\text{tense} \end{bmatrix}\right._{N.Obj.} & \text{(a)} \\ \left.\begin{bmatrix} +\text{syl} \\ -\alpha\text{tense} \end{bmatrix}\right]_{VB} + \left[\text{——}\right._{N.Obj.} & \text{(b)} \end{array} \right\}$$

P-33 states that where, in a verb-noun collocation, the two vowels in contact agree in tenseness, it is the verb that loses its final vowel. P-33(b), on the other hand, deletes the initial vowel of noun object where the vowels in contact do not agree in tenseness.

P-33, then, accounts for the strings in B. As for the contraction doublets which appear to be exceptions to P-32, group I appear to be derived through P-32, while group II are derived through P-33. Now, P-33 cannot apply in SY, if for no other reason that that tenseness is not functional in that register of the language. The occurrence of doublets in SY may, therefore, be explained either as a result of dialectal borrowings, or as a reflection of an earlier stage of Yoruba language.

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If we take the second hypothesis, we have to decide the direction of change, that is, whether the SY forms or the CY forms represent the earlier stage. If Kiparsky (1968b) is right that phonological changes tend toward a simplification or a generalization of existing rules, then, the generalization of the vowel harmony condition as in CY must be considered a later stage in the evolution of Yoruba. If this is so, then, the first hypothesis follows, namely, that members of group II of the apparent exceptions are borrowed into SY from CY.

In summary, we have proposed that contraction in Yoruba does not need a proliferation of static rules as earlier studies have assumed. Contraction is syntactically motivated as set out in P-32, which, like any other syntactic rule, is at the disposal of the individual speakers of the language, and especially speakers of SY. Apparent exceptions to this rule are borrowings (into SY) of forms from CY dialects which implement P-33 as a supplementary derivation.

Again, it should be emphasized that our postulates in this case, as in all other cases in this study, do not claim to explain all the possible data of SY, let alone of the Yoruba language as a whole. Taken together they may, however, provide a better motivated account than earlier ones. It may be that further research will either show the postulates to be inadequate, or establish their validity.

5.54 A Verbal Complementation.

The VERB + NOUN combination which we have been discussing is one type of VP. In this section, we would like to provide a brief phonological account of a different type of VP.

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In Yoruba a closed set of verbs demands verbal complements in a manner that structurally recalls the Noun + Noun determination described above (#5.33). The process consists mainly of introducing a marker between a verb of volition or of motion and its complement which is itself a verb. The resulting construction may be termed a final (purpose, or volitional) phrase. Consider the following utterances:

A. (1) |ó lɔ̄ ɔ̄ fɔ̄ ā̌šɔ̄| 'he went to wash clothes'

(2) |ó fɛ́ ɛ́ fɔ̄ ā̌šɔ̄| 'he wants to wash clothes'

(3) |ó bèrɛ̀ sí í fɔ̄ ā̌šɔ̄| 'he begins to wash clothes'

(4) |ó wá á fɔ̄ ā̌šɔ̄| 'he comes to wash clothes'

(5) |ó šɛ̄ é fɔ̀|[59] 'It can be washed'

B. (1)(a) |ó bèrèsí ā̌šɔ̄ ó fɔ̀| 'he begins to wash clothes'

(b) |ó mɔ̄ ā̌šɔ̄ ó fɔ̀| 'he knows how to wash clothes'

(c) |ó fɛ́ ā̌šɔ̄ ó fɔ̀| 'he wants to wash clothes'

(2) |ó lɛ́è fɔ̄ ā̌šɔ̄| 'he can wash clothes'

C. (1) |ó rì lɔ̄| 'he went walking'

(cf. (F.) Il est allé en marchant)

(2) |ó sáré lɔ̄| 'he went running'

(cf. (Fr.) Il est allé en courant)

(3) |ó jára lɔ̄| 'he went in a hurry'

(cf. (Fr.) Il s'en alla en hâte.)

---

59. The underlying form of the second verb in each of the sentences of A is /fɔ̀/, that is, before P-37 (Pre-accusative verb adjustment) where the verb is followed by noun.

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The VP of sentence types A and B (1) may be represented formally as follows:

A: $[\underset{VP}{\text{VB + FM}} + \underset{VP}{\text{VB + N}}]$.

B(1): $[\underset{VP}{\text{VB + N + FM}} + \underset{VP}{\text{VB}}]$.

FM is the Final Marker.

In the above examples, A(2) and B1(c) have identical semantic interpretations, as do A(3) and B1(a). This suggests that both construction types may be considered as stylistic variants, where type B1 may be described transformationally as a permutation of type A. B1(b) does not have a type A corresponding construction, nor do A(1) and A(4) have corresponding type B1. This suggests that when identical verbs are involved in both construction types, the resulting sentences are semantic equivalents. It is interesting that category N may be a pronoun in both types. Examples:

A' : |ó fɛ́ ɛ́ fɔ̀ ɔ́|

B' : |ó fɛ́ ɛ̄ ɛ́ fɔ̀|

'he wants to wash it'.

In these examples, the object pronouns stand distinct from the FM, since they behave as described by rules P-27 to P-29: |fɔ̀ ɔ́|in A', and |fɛ́ɛ̄| in B'; and the position of the pronoun object is precisely the same in relation to the verbs as in types A and B1. The FM precedes immediately the second verb in A' and B', exactly as in A and B1 constructions above.

It will be noticed that the FM is high-tone except in A(1). It turns out that after the verb /lɔ/, the FM may be either high tone or mid tone, as in

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|ó lɔ̄ ɔ̄ fɔ̄ ā̌šɔ̄|

|ó lɔ̄ ɔ́ fɔ̄ ā̌š⁻| (cf. ọ̀yọ̀ |ó lɔ̀ ɔ́ fɔ̄ ā̌šɔ̄|

The second appear to be a dialectal, or local variant.

From the foregoing, it can be concluded that Yoruba has a syntactic marker, which we have labelled FM, and for which only a few verbs have features. A transformational rule inserts FM into the appropriate strings, and P-34 specifies its spelling much in the same manner as the subject marker (SM) was specified above.

P-34 FM Spelling:

$$FM \rightarrow \begin{bmatrix} +syl \\ {}^{F}1 \\ \vdots \\ {}^{F}n \\ +H \end{bmatrix} \quad / \quad \begin{bmatrix} +syl \\ {}^{F}1 \\ \vdots \\ {}^{F}n \\ T_i \end{bmatrix}_{VB} + \_\_\_\_ + \Big[\Big]_{VB}$$

Thus /ó + fɛ́ + FM + fɔ̄ + ā̌šɔ̄/ → |ó fɛ́ ɛ́ fɔ̄ ā̌šɔ̄|

/ó + sē + FM + fɔ̀/ → |ó šē é fɔ̀|

Both Ward (1952) and Siertsema (1958) include /lɛ́è/ ('to be able') as in B2 among verbs of volition. However, the syntactic behavior of this item is more similar to that of /jóò/ (hypothetical particle) as in /èmī jóò wàá/, 'I shall come') than to that of the verbs of volition. For, apart from the fact that they both induce glide formation (cf. /èmī lɛ́è wàá/ 'I can come'), both items show similar free variants:

|lɛ́è| , |lè|, |lē| : |jóò| , |jíò| , |jó| .

In short, the final |è| of |lɛ́è| is not an FM from which it is tonally different anyway. Besides, /lɛ́è/ is not the only non-volitional verb that takes a verbal complement without the FM. Other examples are given

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in C above. The similarity between the C phrases and those of A and B1 must be understood to be merely formal.[60]

5.6 Some Low-level Phonological Rules.

Among the low-level P-rules for SY would be that which would derive |e| from the sequence of /o/ and /i/ (#5.44). Such a rule would account for the following utterances both of which we have encountered earlier.

|èèbòó| ← /òĭbóó/ /òjĭbò/ 'whiteman'

|kè é tà| ← /kò í tà/ 'he is not accustomed to sell'.

However, as we have remarked above, further research is needed to determine the extent and the precise conditions for the application of this rule.

---

60. Earlier mentions of volitional verb-verb construction include those by Ward (1952, #239), Siertsema (1958, p.55ff), and Rowlands (1954, 386). With regard to the FM, Ward thinks that "it is probable that this lengthening of the vowel takes the place of a prefix of the second verb and the construction is an abbreviation of Verb + Verbal Noun." Thus, it seems that Ward would derive, for example, A(1) |ó lɔ̄ ɔ̄ fɔ̄ ā̌ʃɔ| from /ó lɔ̄ ì fɔ̄ ā̌ʃɔ/. Siertsema (1958) agrees with Ward that the final construction is derived from a sequence of a verb plus a nominal derivative of some other verb, but she argues that that derivative is not Ward's verbal noun. Siertsema prefers what she herself has labelled "nominal noun." For example, /fífɔ̀/. Thus, for Siertsema, A(1) is derived from /ò lɔ̄ fífɔ̀ ā̌ʃɔ̄/.

If Ward and Siertsema are right, we will have to assume that Yoruba first derives a noun from a verb, then a verb from that noun, and that both the original verb and the last are identical! Nothing, however, in the structure of Yoruba supports such a supposition. Besides, as we have shown above (#5.35), Siertsema's "nominal noun" is no more than a derived adjective used as noun, presumably after the modified noun is transformationally deleted.

In short, not only is the FM not an earlier verbal prefix, all attempts to derive it from either Ward's verbal noun, or from Siertsema's nominal noun are also implausible.

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Meanwhile, there is another aspect of spoken SY that is worth noting, and to which we devote this section. Consider the following utterances:

1. (a) |ó lɔ̄ èkòó| ← /o l si ekoo/ 'he went to Lagos'
   (b) |ó lɔ̄ ékòó|
2. |ó wálé| ← /ó wá īlé/ ← /ó wá sí īlé/ 'he comes home'
3. |ó dɔ́ǰà| ← /ó dé ɔ̄ǰà/ ← /ó dé sí ɔ̄ǰà/ 'he arrives at the market'
4. |ó fī ì ílɛ̀| ← /ó fī í sí īlɛ̀/ 'he left it on the ground (or, he left it behind)'.

It will be noticed that the particle sí 'to (of motion' is commonly missing from the lefthand strings of all the derivational statements. In addition, the vowel initials of the last words of 1(a) and (b) differ in tone features. Furthermore, the leftmost strings of 2. and 3. undergo verb-noun contraction rules.

The process that yields these forms presupposes a P-rule which deletes either s, or sí. 1(a) and 1(b) are local variations of a string directly produced by such a rule. It appears that the local varieties of SY in which 1(a) occurs suspends P-7(a) which deletes either the /i/ or the /e/ final of certain prenominal items (#5.212). Instead, these varieties of SY apply P-35 which deletes sí.

P-35 /sí/-deletion (optional):

$$\begin{bmatrix}-\text{son}\\+\text{cor}\\+\text{ant}\\+\text{cont}\end{bmatrix}\begin{bmatrix}+\text{syl}\\+\text{high}\\+\text{front}\\-\text{nas}\end{bmatrix} \rightarrow \phi \;/\; \underline{\qquad}\Big]_{\text{GR.FORM}} + \Big[_{\text{NOUN}}$$

To the best of our knowledge, P-35 applies in the Oyo and, especially, in Ogbomọṣọ variety of SY. Thus one hears almost invariably:

(a) |ó lɔ̄ ōkō| ← /ó lɔ̄ sí ōkō/ 'he went to the farm'

(b) |ó lɔ̄ èkòó| ← /ó lɔ̄ sí èkòó/ 'he went to Lagos'.

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It is not clear at this time if P-35 applies strictly after the verb /lɔ/ ('to go'), or generally to all occurrences of the function word sí. Certainly, the leftmost strings of 2 and 3 above are not decisive one way or the other, since their verbs have hightone final vowel to begin with, and may, like the high tone of sí survive contraction. The intermediate strings of (2) and (3) suggest that the rule applies generally. But (4) offers a caveat. First of all, it occurs in the same variety of SY as 1(a),2, and 3. Secondly, 2, and 3 also have variants as in the following phrases:

(c)	|ó wá ílé ē wā|	'he came to our house'
(d)	|ó dé ílé ē wā|	'he arrived at house'
(e)	ó bọ́ óde |ó bɔ́ ódē|	'he emerged (Lit: he fell (to) outside)', as in igi kan rọ̀gbọ̀dọ̀, ó ti 'nú odò bọ́ óde. (Babalọla, op. cit. (239, 260).

These two examples along with 1(b) and 4, give adequate grounds to believe that P-36 is an alternative to P-35.

P-36 s'-deletion:

$$\begin{bmatrix} -\text{son} \\ +\text{cor} \\ +\text{ant} \\ +\text{cont} \end{bmatrix} \rightarrow \phi \;/\; \underline{\qquad}\begin{bmatrix} \\ \\ \end{bmatrix}_N \; [+\text{syl}]$$

Condition: /s/ ← /sí/

In order to generate sentences 1(b) and 4, and the last two sample utterances above, P-36 would have to apply after P-7a, and the tone elision rules as in Derivation 12.

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Derivation 12:

	after P-35	After P-7	After tone	After P-36
/ ó dé sí ilé/	---	/ó dé só ilé/	/ó dé sílé/	|ó dé ílé|
/ ó lɔ̄ sí ɪ̄lé/	|ó l ilé|	---	---	---
/ ò fi í sí ɪ̄lé/	---	/ó fɪ̄ í só ɪ̄lé/	/ó fɪ̄ í sílé/	|ó fɪ̄ í ílé|

The last row of derivation 12 (which is the same as example 4) does not have a variant of type 1(a). This suggests that P-35 may apply only when <u>sí</u> occurs with verbs of motion.

In general, the application of both P-35 and P-36 further points to the relevance of ordering in phonological rules.

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CHAPTER VI

PHONETIC REALIZATION OF PHONOLOGICAL TONE REGISTERS[1]

Proposals for the phonetic representation of phonological features, as far as we know, have not taken tone into consideration. It appears that this omission is due to the phonological status so far assigned to tone. In this discussion we have explicitly assigned to tone a phonological status and a domain which will make it possible to account for its phonetic representation within the provisions of the Transformational generative (T.G.) model of phonological description as in The Sound Pattern of English (Chomsky and Halle, 1968). Basically, we have taken the stand (not strange to T. G. as shall be shown below) that a tone register is a distinctive feature in the Jakobsonian sense (subject to the qualification to be given presently). Moreover, this distinctive feature, like any other, has a single segment as domain.

Since Trubetskoy prematurely abandoned his 1929 point of view ("Zur allgemeinen Theorie der Phonologischen Vokalsysteme," TCLP, v. i, 39-67) that "tone registers and tone modulations (contours) occur as a component of the vowel-phoneme in many languages" (p. 41, 44, translation is mine), phonological theory has been unable to provide an adequate account of tone. This state of affairs has prompted Gleason (Language 37, 2 (1961) 294 ff.) to declare rather appropriately that

> It is obvious that linguists in general have been less successful in coping with tone systems than with consonants or vowels.

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1. What holds for tone registers holds for tone contours, all other things being equal.

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> ...The...need is for better theory. We should expect that general phonologic theory should be as adequate for tone as for consonants and vowels, but it has not been. This can be only for one of two reasons: either the two are quite different and will require totally different theory (and hence techniques), or our existing theories are insufficiently general. If, as I suspect, the problem is largely of the second sort, then development of a theory better able to handle tone will result automatically in better theory for all phonologic subsystems.

All non-generative models of phonological description (with the possible exception of the Firthian model) have characteristically referred to tone (along with quantity and stress) as a prosodic feature, and have considered it a segment with the syllable (or the word) as domain. This has resulted in contradictions such as one observes in Pike (Tone Languages, (1948),pp. 5), Martinet ("La double articulation du langage," La linguistique synchronique (1968)), and William S-Y Wang ("Phonological Features of Tone," IJAL 33, 1, 2, (1967)), to take a representative few.

Pike seems to feel intuitively that a tone register is not quite the same as a phoneme, but could not escape granting it a "segmental status with a difference." Hence he calls it a toneme which an analyst may isolate only through commutation as he does a phoneme. But in giving his examples one sees that Pike's toneme is not a phoneme at all. He suggests that tones replace one another in the languages in which they occur just as voice and voicelessness (e.g. Eng.: wife /waif/: wives/waiv (ə)z/; or as in the difference between /š/ (mesh) and /ž/ (rouge) both of which are phonemes of English). Obviously, Pike himself recognizes voicing as subphonemic unit, and it is all the more surprising that he has not treated tone as such.

Martinet's methodological procedure of double articulation (like Pike's commutation) assigns tone to the class of marginal linguistic

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elements, while his principle of functionalism puts it (and other so-called prosodic elements) in the same class with his class of core elements such as labiality, voicing, nasality, etc. But again, like Pike, Martinet decides against considering tone a subphonemic phonological unit.

Wang's approach is deceptive, for it is essentially a formalization of the phonemic approach, and it carries the latter to its logical conclusion. If tone is a segment, then it must have features as has been provided for within the Jakobsonian theory of distinctive features. Wang accordingly proposes seven features for tone (namely, registers and contours). But he does not succeed in making a convincing case for the superordinate unit of "tone" and its features. He concludes by suggesting that the syllable be assigned a phonological status. Imagine, however, the syllable as a phonological unit with segments as features, where these segments themselves, Wang's tone and vowels, for example, also have features, and so on. This, certainly, is a less than satisfactory approach to a phonological account of tone.

The generative phonology is based on Roman Jakobson's theory of distinctive feature analysis, as mentioned in chapter I above (Preliminaries, 1955; Jakobson and Halle, Fundamentals of Language, 1956). Jakobson in his proposal goes to great pains to define his terms. He writes:

> ...The distinctive features are divided into two classes: 1) prosodic, and 2) inherent. A prosodic feature is displayed only by those phonemes which form the crest of the syllable and it may be defined only with reference to the relief of the syllable or of the syllable chain, whereas the inherent feature is displayed by phonemes irrespective of their role in the relief of the syllable, and the definition of such a feature does not refer to the relief of the syllable or the syllable crest. (Fundamentals, #441.)

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In other words, Jakobson asserts, first, that a feature is displayed by single segments (phonemes); that a feature is prosodic if it is displayed only by phonemes that form syllable crests (where the syllable is defined by rules of particular languages (Fundamentals, p. 20)), otherwise, the feature is inherent; and that both prosodic and inherent features may or may not be distinctive, depending on the language (Tone registers and nasality, for example, are distinctive in Yoruba, while they are not in English).

In the light of the foregoing, then, when Jakobson states that a distinctive feature is a relational property he does not exclude the inherent features as also being relational. Failure to appreciate this point of view has led a few analysts to insist that the tone, say, is relational, but not labiality, voicing, or other inherent features. This misunderstanding drew a firm protest from Jakobson himself in 1961, first, that

> Every combination of distinctive features into simultaneous bundles results in a specific contextual variation. In view of incessant misunderstandings, it is necessary to reemphasize that any distinctive feature exists only "as a term of relation." The definition of such a phonemic invariant cannot be made in absolute terms--it cannot refer to a metric resemblance but must be based only on relational equivalence.

Then further, with regard to the status of prosodic feature that

> The transition from phoneme level to the feature level of speech analysis requires that the two sets be rigorously distinguished, and that such promiscuous medleys as "prosodic phonemes" (instead of prosodic features) or phonemes allegedly "undecomposable" into features be studiously avoided.

In short, in Jakobson's theory, a tone register is a subphonemic unit, a feature of the same rank as for example, [±back].

Jakobson's distinctive features have articulatory characterizations and acoustic correlates. Moreover, they are just the features "relevant

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for phonetic description" (Postal, 1968, p. 109). Precisely these points raise the problem of the "transfer of phonological features to the phonetic data," or as I prefer to put it, the problem of the phonetic realization of phonological features. This is what Šaumjan (1961) identifies as the problem of identity as has been briefly discussed in chapter I. He writes:

> If distinctive features are acoustic properties, one may ask how different acoustic properties can be the same as distinctive features? If distinctive features are actually acoustic properties, then identity and non-identity of distinctive features must follow from the physical nature of the acoustic properties, and not contradict their physical nature.

Šaumjan takes the dramatic example of the phonetic realization of the features Compact and Diffuse in Greenlandic. In that language, /i/ is [+diffuse], and /æ/ is [+compact]. However when followed by uvulars, the following things happen.

$$i \rightarrow a$$

$$æ \rightarrow a$$

That is, [+Diffuse] is now identical with [+compact] (i → a), and [+compact] is not identical with [+compact] since [a] and [ɑ] must be assigned to distinct phonological segments. To bring it nearer home, consider the fact that all vowels in English may be reduced to Schwa when unstressed as in some dialects. Or still nearer home, the low tonal register of certain 'common Yoruba' verbs is realized as mid when the verbs take an object, yet both low and mid registers are distinctive in the language. It appears that tonal processes such as glide formation (in Yoruba) and Downdrift can be seen in this light too.

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In order to resolve this problem Šaumjan proposes his "Two level theory of phonology." The theory recognizes two principal levels of abstraction: the observational level, and the level of construct. Phonological features belong to the level of construct and are a purely relational elements (cf. Jakobson above). Sound or acoustic substratum (a relational physical fact) and acoustic property (a physical fact) are both assigned to the observational level. The observational level is related to the level of construct by a correspondence rule, namely that

> If x is an acoustic property and is in relation of opposition to at least one acoustic property y, then x is in relation of embodiment to the distinctive feature D.

Thus if the distinctive feature [+Diffuse] as in /i/ is realized as in the sound [i], then [i] is in relation of embodiment (E) to /i/. This fact can be represented as

E (i, i)

The Greenlandic example can now be restated as follows, where the segments stand for appropriate physical correlates [+Diffuse], [+Compact]:

E (i, i)

E (æ, æ)

In pre-uvular positions:

E (a, i)

E (ɑ, æ)

Sound phonological segment

(phonetic segment)

or preferably:

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$$E\ (\{^{i}_{a}\},\ i)$$

$$E\ (\{^{æ}_{\alpha}\};\ æ)$$

acoustic substratum. phonological segment

If L stands for low register, and M for mid, then the Yoruba tone example given above likewise admits of the following statement

$$E\ (L,\ L)$$

In a verb preceding Noun Object:

$$E\ (M,\ L).$$ M abbreviates [-H, -L]

or again

$$E\ (\{^{L}_{M}\}\ L)$$

phonological feature

phonetic realizations (acoustic substratum)

The transformational generative proposal (also briefly discussed in chapter I) is not unlike Šaumjan's in many respects. In accordance with Jakobson's approach, it recognizes tone registers as features of the same order as labiality, nasality, etc. (Chomsky and Miller, 1963, p. 308; Chomsky and Halle, 1968, p. 376; Postal (1968), p. 87 et passim). But the T. G. model also argues that the claim of invariance that Jakobson's theory makes about human language is contrary to fact. Though couched differently from Šaumjan, the T.G.'s objection to Jakobson is on the same ground, namely, his use of the term "distinctive feature" to mean both "phonetic distinctive feature" and "phonological distinctive feature."

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Such usage implies a condition of invariance that will thus relate phonological and phonetic representations. Chomsky and Halle write (p. 169):

> Unfortunately, the discussion and development of the theory of distinctive features has been confused by the use of the term "distinctive feature" in both senses. This is appropriate only insofar as the invariance condition is met--that is, insofar as the phonological rules simply add redundant features to lexical matrices, giving additional specification of archi-segments. (As we have seen), however, this is not the case in general. In fact, we do not believe that there is <u>any</u> significant intermediate level of linguistic representation between phonetic and phonological at which representations are strictly in terms of submatrices of the full phonetic representation. In any event, the phonological and phonetic functions of distinctive features must be clearly distinguished.

The reference to the role of phonological rules in this quotation is to the proposal that P-rules may also introduce, or delete features in mapping the phonological representation of an utterance unto its appropriate phonetic representation. Consider, for example, the French equivalent of "to the Ballroom dance."

/a + l(ə) + bal/

This is phonetically realized as

[o bal] <u>au bal</u> (cf. à la danse)

As one may have observed, the TG proposal, like Šaumjan's, also recognizes two levels. Šaumjan relates his two levels with a set of correspondence rules. In the TG proposal, phonological rules map representations of strings on the phonological level unto appropriate representations on the phonetic level. In this proposal, phonological features have a classificatory function (Chomsky and Halle (1968), p. 297) and

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> they are binary, as are all other classificatory features in the lexicon, for the natural way of indicating whether or not an item belongs to a particular category is by means of binary features.

As for phonetic features:

> ...The phonetic features can be characterized as physical scales describing independently controllable aspects of the speech event, such as vocalicness, nasality, voicing, glottalization. There are, therefore, as many phonetic features as there are aspects under partially independent control.[2]

This means that each tone register, as a feature, must be definable in articulatory terms, since there is a distinct articulatory configuration that determines and sets it apart not only from other features such as voicing, and nasality, but also from the other registers. For example, it appears that a gradation of muscular inervation (tension) (Ladefoged (1967), pp. 5, 50ff, 87; Ladefoged (1970)) distinguishes among registers, so that

<u>lọ</u>	/lɔ̄/	'to go'
<u>lọ</u>	/lɔ́/	'to transplant'
<u>lọ</u>	/lɔ̀/	'to grind'

---

2. McCawley (1968c, #1.2) proposes two sets of phonological rules to account for physical representations of phonological features. His proposal assumes that the phonological component of any grammar splits into

> a system of phonological rules, which involve only the Jakobsonian features, and a system of feature interpretation rules, which convert the Jakobsonian feature specifications into ranges of physical variables.

McCawley does not elaborate on how this proposal would work. Besides, it is not clear what advantage it has over proposals which posit two levels of representation, but a single system of rules. In particular it would have been helpful to know the nature of McCawley's feature interpretation rules.

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are phonological representations of distinct utterances of Yoruba only by virtue of these characteristic innervations.

We propose then that the phonetic representation of Yoruba phonological tone registers is, as is the case with all other phonological features, rule-governed. Thus [+L] may be realized M as stated above; and [+H] may, for example, be realized [+L +H] through the glide-formation rule.

e.g. wá 'come'

but yíò wàá 'He will come'

In other words, we would say that the phonological features L and H may be realized along the scales

$$L_1, L_2, L_3, \ldots L_n$$

$$H_1, H_2, H_3, \ldots H_k$$

where n, and k have fixed values, since the features "relate to independently controllable aspects of the speech event or independent elements of perceptual representation."

The matrix below (Table VIII of chapter III) is a partial feature specification of Yoruba syllabic segments; partial because we show only tone registers.

The case of the feature of M is very interesting, but not as strange as it might seem at first (see chapter III). Consider the Yoruba vowel system as a whole, without the additional dimension of tone registers:

i u

e o

ɛ a ɔ

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Feature Specification of Yoruba

Vowels: Tone

	i	e	ɛ	a	ɔ	o	u	ɪ	ɛ̃	ã	ɔ̃	ũ	í	é	ɛ́	á	ɔ́	ó	ú	ɪ́	ɛ̃́	ã́	ɔ̃́	ṹ	ì	è	ɛ̀	à	ɔ̀	ò	ù	ɪ̀	ɛ̃̀	ã̀	ɔ̃̀	ũ̀
H	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+

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Four features (two oppositions), front-back, high-low, suffice to describe the system. Notice, however, that there is always a third feature which is redundant as a result of the choice of each of the two oppositions. The segment which bears the feature left out may, when necessary, simply be referred to as nonfront and nonback, or nonhigh and nonlow, as the case might be. The case of the feature M is similar. Notice that in each of the three cases, no explicit metric exists for choosing the extreme parameters as distinctive features at the expense of the medial parameter. It appears, however, that our description is made notationally simpler by doing so.

The observations in the preceding paragraph have two implications. First, just as P-rules may recognize the redundant parameter nonback-nonfront, as in the phonological rule for Yoruba (see P-3)

$$/\tilde{a}/ \rightarrow /\tilde{ɔ}/$$

or in terms of features:

$$1.\quad [-\text{back}] \rightarrow [+\text{back}] \,/\, \begin{bmatrix} +\text{syl} \\ \hline -\text{front} \\ +\text{low} \\ +\text{nasal} \end{bmatrix}$$

so may P-rules apply to M, for example, as in

$$2.\quad [+\text{L}] \rightarrow [-\text{L}] \,/\, \begin{bmatrix} +\text{syl} \\ \hline -\text{H} \end{bmatrix}_{\text{VB}} \; \# \; [_{\text{N.Obj.}}$$

<u>rà</u>	|rà|	'(to) buy'
<u>ra isu</u>	|rā ĭšū|	'buy yam'

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The second implication is that matrices such as one finds in the works of Wang (1967), and Woo (1967), or even such as the following proposed by Ian Maddieson[3]

	M	H	L	EH	EL	X_1	X_2	X_3
H	-	+	-	+	-	+	+	-
L	-	-	+	-	+	+	+	-
E	-	-	-	+	+	+	-	+

cannot lay claim to any motivation in an integrated phonological theory. The features H, L, E in Maddieson's proposal appear to be highly motivated in themselves. But one cannot say as much for the units of which they are supposed to be features. Imagine inventing complex phonological elements (decomposable into features in the Jakobsonian sense) such as front, back, midsagittal, etc., for Yoruba vowel system, where these elements would now have the features [±front], and [±back]. Both the elements and the features together would yield a matrix similar to those in the works just mentioned. Notice that it really does not matter whether or not one represents the complex elements with a more abstract notation such as the numbers 1, 2, 3, ..., n, or with the iconic symbols ,[, I,],..., for front, midsagittal, and back, respectively, as many analysts have done for tone. It simply is not clear in what way matrices derived from these

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3. Discussion meeting on the problems of tone in generative phonology, University of Ibadan, Department of Linguistics and Nigerian Languages, May 25-26, 1970.

   The feature E is [±extreme]. By this feature, Maddieson proposes that we should be able to account for languages with as many as five registers, and there is no information that any language has more. A language with five registers, for example, may be assigned the first five columns in Maddieson's matrix. X_1, X_2, and X_3 are unrealized but logical possibilities.

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are equivalent to the one we have proposed for Yoruba. Nor is it easy to understand, if at all they proved to be equivalent, why one would adopt a system which not only splits phonological theory into two in effect, namely, into tone phonology, and "segmental" phonology, but which shows no empirical motivation.

In conclusion, it seems to us that both Šaumjan's, and Chomsky and Halle's proposals offer highly motivated frameworks for describing tones. Of these two, Chomsky and Halle's appears to be the more explicit, and is, therefore, preferable for our purpose which was to propose an approach to phonetic representation of phonological registers.

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CHAPTER VII

NASALITY IN PHONOLOGICAL THEORY

This chapter presents an outline discussion of another fundamental issue in phonology. In the present chapter, we give a brief review of some of the stands made on the problem of Nasality in the theory, and suggest guidelines for a more plausible account of the phenomenon.

7.1 The Setting: Nasal Consonants are Continuants

With due apologies to psychologists, linguists, and, of course, to psycholinguists, the treatment of nasality, and especially, of nasal segments in phonological theory has been an interesting case of oral fixation.[1] As we have specified in Chapter III above, the speech mechanism consists superficially of three cavities: the buccal (oral) cavity, the nasal cavity, and the pharyngeal cavity. In general, the last two have been most often considered mere annexes of the first. As a result, sounds produced in the nasal cavity, for example, are treated as abnormal, marked, or even subsidiary with respect to those produced in the oral cavity. Perhaps there is justification for this feeling, but we like to take the point of view that the entire speech mechanism is equally at the disposal of the human speech faculty. Speakers of each language may, and do choose to make use of only certain aspects of it, just as speakers of particular languages select only certain phonetic features for distinctive functions, and not others. If speech parameters are considered globally rather than from a strictly "oral" point of view, it seems to us that it

1. We have no psycho-analytic basis for this claim, of course, except the linguistic reasons that follow!!

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would be inevitable that the feature [±Syllabic] be assigned to the major feature category, as we suggest, rather than to the feature [±vocalic] as defined by Chomsky and Halle. Moreover, it becomes inescapable to define syllabicity as we have, and thus also put the segments /m/, /n/, /l/ and /r/ in the same natural group, $\begin{bmatrix}+son\\+cons\end{bmatrix}$ as we have done in this study.

In so doing, we are not setting any precedent. We merely wish to underscore the fact that when the so-called oral sounds are produced, those that have unimpeded air passage in the oral cavity may be produced with the nasal cavity totally sealed off. The noncontinuants have the air passage blocked in all three cavities during production, or, at any rate, prior to explosion. It is not clear, then, why sounds whose unimpeded air passage is through the nasal cavity should be treated as noncontinuants.

Trubetskoy has early emphasized a point of view similar to ours in characterizing the nasal consonants. He writes:

> ...Les nasales sont toujours des sonantes, c'est-à-dire, des consonnes ayant un degré minimum d'obstacle, même si dans leur articulation l'espace buccal est tout à fait fermé: l'écoulement de l'air par le nez, rendu possible par l'abaissement du voile du palais "dévalorise" pour ainsi dire l'occlusion buccale.[2]

However, Chomsky and Halle appear to be unimpressed by this apt observation by Trubetskoy.[3] Or else, having committed themselves to a

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2. Principes. p. 194.

3. The Sound Pattern: Chapter 7. Chomsky and Halle originally propose [±sonorant], [±vocalic], and [±consonantal] as the major class features. On the basis of their definition of [±vocalic] they group nasal consonants with obstruents as nonvocalic:

> Vocalic sounds are produced with an oral (sic) cavity in which the most radical constriction does not exceed that found in the high vowels [i] and [u] and with vocal cords that are positioned so as to allow spontaneous voicing; in producing nonvocalic sounds one or both of these conditions are not satisfied.
>
> Vocalic sounds, therefore, are voiced vowels and liquids, whereas

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definition based only on oral parameters, they could find no compelling reason not to exclude nasal consonants from the class of noncontinuants. Happily, a "recent work" to which they allude has made them aware that, in so doing, they leave a problem unresolved. But they still see it only as "the problem of subclassifying /n/ and /l/" (Chomsky and Halle, 1968, 317 ff.). From their own point of view, if total blockage of airflow, and voicing alternation are taken as the relevant parameter, then the nasal consonant is unequivocally a continuant; but if mid-sagittal blockage, behaviour in other languages (than in English, we suppose), and other facts in different languages are taken into consideration, they believe that the nasal consonant should be a noncontinuant. So, they argue, there should be two types of nasal consonants and liquids. Notice, however, that, of the three criteria in favor of noncontinuant nasals, only one is sufficiently explicit as to be of any use, the first. There are certainly facts of "other languages," too, which support the supposition that /n/, for example, is definitely a continuant. The use of the feature [±syllabic] in different languages is one such fact.

Given the major grouping in 3.22, and our definition of features, while groups (a) (-sonorant, -syllabic, +consonantal), and (b) (+sonorant, -syllabic, +consonant) are nonsyllabic on the universal level, members of (b), but NOT members of (a), may become syllabic in individual languages.

---

glides, nasal consonants, and obstruents, as well as voiceless vowels and liquids, are nonvocalic.

It is our belief that vocalicness is not only inadequate, but also that subgroups such as syllabic, nasal, consonants and liquids are language specific, and should not be posited at the level considered to be universal. This is why, as suggested in Chapter III above, we find their implicit definition of their newly adopted feature "syllabic" inadequate.

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By the same token, group (d) is syllabic on the universal level; when and if any of its members loses its feature [+syllabic], it does not for that reason become consonantal, it becomes a glide. But it is members of group (b) that interest us for the present.

Instead of Chomsky and Halle's table X (Chomsky and Halle, 1968, p. 354, #67):

Table X

	sonorant	syllabic	consonantal
Vowels	+	+	-
syllabic liquids	+	+	+
syllabic nasals	+	+	+
nonsyllabic liquids	+	-	+
nonsyllabic nasals	+	-	+
glides: w, y, h, ?	+	-	-
obstruents	-	-	+

we propose the following: Table X

	sonorant	syllabic	consonantal
vowels	+	+	-
liquids	+	-	+
nasals	+	-	+
glides	+	-	-
obstruents	-	-	+

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It is doubtful if such a dichotomy as syllabic liquids/nasals vs. nonsyllabic liquids/nasals is universal, especially in view of the fact that Chomsky and Halle themselves now consider the three features sonorant, syllabic, and consonantal as "major class features."[4] Thus, we propose, as is implied by our Table X , that the "special circumstances" (Chomsky and Halle, 1968, 354) under which nasals may become syllabic are language specific. It is doubtful whether a generalized specifications of such circumstances can be provided, given the present state of development in

4. Such a dichotomy is, for instance, irrelevant to French, and has led the authors to make false generalizations about the language. Since only vowels are syllabic in French, two features adequately identify them, and the feature sonorant is distinctive only for consonants. Accordingly, we propose that Chomsky and Halle's (68):

(a) $\begin{bmatrix}+\text{son}\\+\text{syll}\\-\text{cons}\end{bmatrix} \rightarrow \phi \;/\; \text{——} \; \#$ $\left\{\begin{bmatrix}+\text{son}\\+\text{syll}\\-\text{cons}\end{bmatrix}, \begin{bmatrix}+\text{con}\\-\text{syll}\\-\text{cons}\end{bmatrix}\right\}$

(b) $\begin{bmatrix}-\text{son}\\-\text{syll}\\+\text{cons}\end{bmatrix} \rightarrow \phi \;/\; \text{——} \; \#$ $\left\{\begin{bmatrix}-\text{son}\\-\text{syll}\\+\text{cons}\end{bmatrix}, \begin{bmatrix}+\text{son}\\-\text{syll}\\+\text{cons}\end{bmatrix}\right\}$

be replaced with the following:

(a) $\begin{bmatrix}+\text{syll}\\-\text{cons}\end{bmatrix} \rightarrow \phi \;/\; \text{——} \; \#$ $\left\{\begin{bmatrix}+\text{syll}\\-\text{cons}\end{bmatrix}, \begin{bmatrix}-\text{syll}\\-\text{cons}\end{bmatrix}\right\}$

(b) $\begin{bmatrix}-\text{son}\\-\text{syll}\\+\text{cons}\end{bmatrix} \rightarrow \phi \;/\; \text{——} \; \#$ $\left\{\begin{bmatrix}-\text{syll}\\+\text{cons}\end{bmatrix}, \begin{bmatrix}-\text{syll}\\+\text{cons}\end{bmatrix}\right\}$

It is also very interesting that anywhere /l/ is in danger of being syllabic in French, it is automatically devoiced thus

peuple |pøp̥l̥|.

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phonological theory. Chomsky and Halle's suggestion of "between obstruents," is far from useful. In English, for example, one may say that /l/ is syllabic in the normal Standard American pronunciation of the word little |lIt̩l|, yet it is not between obstruents. Although very little attention has been paid to this problem of syllabic consonants in phonological descriptions, most cases of its mention seem to support our claim that the feature [+syllabic] is assigned by rule(s) to nonvowels.

7.2 Some Past Discussions of Syllabic Nasal Nonvowels.

Again that astute observer of languages, Trubetskoy, has considered syllabic, nonvowel sounds in some of their many forms. In languages where there is only one nasalized vowel, so argues Trubetskoy, the vowel's only phonologically relevant feature is its nasality, and its timbre and point of articulation are, more often than not, determined by its surrounding consonants.

> ...et son aperture ne peut être en somme qu'inexistante. En d'autre termes cette voyelle nasal "indèterminèe" n'est rien d'autre qu'une nasale faisant syllabe dont l'articulation se modèle sur celle de la consonne suivante.[5]

In languages without consonant clusters, he continues, nasal "consonants" immediately preceding nonsyllabic segments can only contrast with vowels, and should be distinguished from the segments /m/, /n/, /ŋ/, etc., which contrast only with consonants. In other words, Trubetskoy considers the syllabic nasals (as in certain African languages, for example), as occurrences of his "nasale indéterminée," and calls it "la nasale faisant syllable" (syllabic nasal):

5. Principes. p. 132.

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> ..."Et de fait il existe souvent entre la "nasale indéterminée" et les voyelles nasalisées un rapport etroit. Souvent les voyelles nasalisées ne sont pas des phonèmes indépendants, mais seulement des variantes combinatoires du groupe "voyelle + nasale indéterminée"...Là où les nasales faisant syllabe se règlent dans leur réalisation d'après les particularités de localisation de la consonne suivante comme. c'est le cas dans de nombreuses langues africaines et dans quelques (comme américaines), on peut parler aussi bien d'une nasale indéterminée faisant syllabe que d'une voyelle nasalisee indéterminée.[6]

Having said these things, Trubetskoy is worried that his postulate might result in descriptions of languages in which there are more nasal vowels than there are their non-nasal counterparts ("mais cela contredirerait à tout ce que nous savons de la corrélation de nasalité." Principes,p.132).

Trubetskoy, however, overlooks certain facts which should allay his fears. First, only a few languages nasalize all their vowels. Secondly, it is highly unlikely that a language whose vowel phonemes all have non-combinatory nasal counterparts has "syllabic nasals"; and, thirdly, the occurrence of syllabic nasals, as of syllabic liquids, is generally rule-governed, that is, is a product of at least one phonological rule.

Other scholars beside Trubetskoy have remarked this fact, although none has stated it systematically the way we have for Yoruba in Chapter V of this study. Thus Pike observes that "occasionally...contraction--especially in extra-rapid conversation between intimate friends--leaves a Mixteco n or r carrying a significant toneme" (1948, p. 31). For example háni?inì 'hit inside-I' that is, "I think", may become hándì.

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6. Ibid. p. 194.

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Schachter and Fromkin's statement in their phonological descriptions of the Akan languages also confirms our point of view, namely, that syllabicity in nasal consonants and in liquids is a phonetic, and NOT a phonological phenomenon. Schachter and Fromkin (1968, p. 64) write:

> ...It is likely...that at an earlier stage these tone-bearing nasals were nasalized vowels, and at a still earlier stage, syllables consisting of nasal consonants and oral vowels.[7]

The crucial point is that the positing of the feature [±syllabic] as major class feature, in place of [±vocalic], makes an account of this phenomenon of syllabic nasals and liquids entirely natural. In Yoruba, for example, any syllabic segment is tonal. The P-rule that assigns tone to the nasal consonant therefore, subjects the utterance of which the nasal segment is part to SgSC 18. Furthermore, a syllabic nasal occurs only before a nonsyllabic segment, and presupposes the deletion of a vowel between itself and that nonsyllabic. The fact that Courtenay, for example, considers syllabicity merely incidental to Yoruba (and to language as a whole) thus vitiates her account of the syllabic nasal in Yoruba as will be seen presently.

7.3 Nasal Consonants in Yoruba.

7.31 Extreme claims have been made about the number of nasal consonants in Yoruba. Siertsema (Lingua 7, (1958), 356-360), for example, has had to spend a considerable amount of energy debunking the theory that all

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7. Greenberg in a comment on an earlier version of this study has even observed that "free variation or alternation of N + V ∿ N is very common without a nasalized vowel being involved.

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sonorants may have nasal counterparts that are themselves phonemes. In particular, she takes Ward (1952, #57) to task on this matter. Ward had suggested that

> It is possible, even probable, that they (|w| and |j| :O) are weakened forms of the nasal consonants nw and ny, the former a combination of n with the lip-rounding belonging to w, and the latter a pure palatal consonant.

Ward believes that only /r/ is regularly nasalized when followed by a nasal vowel. Siertsema has, however, successfully argued that all the three sonorants, /r, w, j/, may be nasalized only when followed by a nasal vowel, and that |ŋ| is only a phonetic variant of /m/ or /n/. Examples (compare the left hand column with the right hand column of nonnasalized forms):

n̄g ò lọ	|ŋ ò lɔ̄|	mi kò lọ	|mĩ kò lɔ̄|	'I did not go'
rọ́n	|rɔ̃́|	'to sew'	rọ́ |rɔ́|	'to crackle'
wọ́n	|wɔ̃́|	'(be) expensive'	wọ́ |wɔ́|	'to be crooked'
yọ́n	|jɔ̃́|	'to yawn'	yọ́ |jɔ́|	'to melt'

Siertsema, then, is one of those who claim that Yoruba has two and only two nasal consonants.

7.32 Some other scholars (Awobuluyi (1964), Ladefoged (1964), and Elizabeth Dunstan (1966, probably drawing from the first two scholars) claim that Yoruba has only one nasal consonant, and it is /m/; |n| is merely a conditioned variant of /l/.

Lately, Courtenay (1968) has claimed that Yoruba has no nasal consonants at all. It is a pity that Courtenay insists on generalizing to members of a given language group, hypotheses established on the basis of

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a single member of that group. In this case, she first accepts the theory that Yoruba is a one-nasal-consonant language, then attempts to show that even that one (/m/) is but a phonetic variant of /b/. Proof: Schachter and Fromkin (1968) have shown that all occurrences of nasal consonants are predictable in the Akan languages; and, the Akan languages, like Yoruba, are Kwa languages! As supplementary evidence, Courtenay cannot find two words with /b/ followed by a nasal vowel even in Abraham's Dictionary of Modern Yoruba. Hence she posits that obìnrin |ɔ̄bĭ̀rĭ̄| 'woman' (the only example she could find) is not only the sole exception, but a borrowing in to the language.

Courtenay sets aside this "sole occurrence" of obìnrin and proposes that all phonetic occurrences of |m| and |n| in Yoruba are derived from /b/ and /l/ each followed by nasal vowels. Thus |m| and |n| should occur in SY necessarily only in the neighborhood of nasal vowels. We shall come to this last point presently.

One is tempted to believe that the text on which Courtenay bases her description must have been very limited. For in the first place, obìnrin cannot be a borrowed item, because it is the antonym of okùnrin |ɔ̄kŭ̀rĭ̄| 'man', and this pair is paralleled by others, for example: abo |ābɔ̄| 'female': ako |ākɔ̄| 'male', both said of infants and animals. There is also the pair, òbò |òbò| 'female sex organ' : okó |ɔ̄kó| 'male sex organ'. Courtenay's claim would have to assume, too, that all three pairs with /b/ ∿ /k/ alternation were not only borrowed into Yoruba from some yet unidentified language, but that the semantic distinctions among them were alwo borrowed.

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In the second place, |b| followed by a nasal vowel as in obìnrin, is by no means an isolated occurrence in the language. Consider the following few examples:

èbùn	|èbũ̀|	'gift' :	emu	|ɛ̄mū|	'palm wine'
ìbọn	|ìbɔ̃̄|	'gun' :	ìmọ̀	|ìmɔ̃̀|	'knowledge'
àbọ̀n	|àbɔ̃̀|	'unripe' :	amọ̀	|āmɔ̃̀|	'clay'

These examples suggest that Courtenay's supplementary evidence of complementary distribution (even if CD were a useful concept), would still lead one to reject her hypothesis. It is true that the occurrence of |b| before nasal vowels is restricted. But this should not be surprising in a language with three non-nasal bilabial stops, of which two are voiced. Unfortunately, Courtenay either does not consider this fact at all, or else considers it irrelevant.

But what are the consequences of considering |m| and |n| as surface structure phenomena the way Courtenay does? First, one now has to derive them from some underlying segments followed immediately by nasal vowels. Thus one would derive

imú |īmṹ| 'nose' from /ìbṹ/

móló |móló| 'a type of musical instrument' from /bõló/ (probably a loan word from Hausa, but cf. móòrè |móòrè| 'life force')

ìmọ̀ |ìmɔ̃̀| 'knowledge' from /ìbɔ̃̀/, 'a type of abnormal development of the buttocks')

inó |īnɔ̃́| 'fire' from /īlɔ̃́ /.

enu |ɛ̄nū| 'mouth' from /ɛ̄lū/.

àno |ànɔ̃̀| 'in-law' from /àlɔ̃́/

òní |òní| 'today' from /òlī̀/

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It does not seem to bother Courtenay that, as she herself is well aware, we have no evidence of nasalized o in the language's past, even if the minimal pairs given earlier did not exist. Besides, there is nothing in the language to point to this kind of development (|m|←|b|). Thus to derive meje |méjèē| 'seven (as in 'seven things'), the initial |m| would have to be derived first from an underlying sequence of |b| plus a nasal vowel. While this may well be so, it is puzzling why |m| remains nasalized in the absence of a conditioning nasal, unless, of course, we want to say that |m| became phonemic! But this would constitute a most undesirable round-about way of saying that mù |mù̃| 'to soak' (as of water soaking something) and bùn |bù̃| 'to present' are two distinct words!!

The argument against the 'n ← l' hypothesis does not apply to Courtenay alone, it applies as well to Awobuluyi, and to Ladefoged. The basis of this hypothesis is the distributionalist criterion of complementary distribution. It claims that because no minimal pair of the type 'l + V_1' : 'n + V_1' occurs in the language, |n|and |l| must be variants of the same phoneme. Moreover, there is a very important "phonological" process by which |n| becomes |l| before non-nasal vowels (see P-9, above, for example). For these reasons, it has been claimed that |n| and |l| are not only variants of the same phoneme, but also that |l| is that phoneme. The argument appears unassailable.

Consider, however, the fact (1) that the absence of a minimal pair declares the phonemicity of either |n|, or of |l| undecidable; and (2) that the phonological unit |ĩ| and |i| exist in SY, but it is uncommon that either of them occurs after |l|, while both may occur after |n|, assuming that our elision rules P-4 to P-11 are correct for Yoruba.

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Even if our rules are incorrect, it is a fact of the language that syllabic nasals are derived according to the P-rules in this study; and all those scholars also admit this much. It is not clear then, why, as in the case of |m|, |n| remains nasalized even after the elision of the conditioning vowel, that is, assuming that all i's that follow |n| are necessarily nasal.

Most important of all, the alternation of |n| and |l| is syntactically motivated. The surprising thing is that all these scholars, including Pike (1948) whose authoritative sanction Ladefoged invokes to back his claim, admit syntactic or morphological criteria in phonological explanation. It is clear, however, that the notion of overlapping is either foreign to their thinking, or that they simply reject such a concept. For, if they accept the principle of overlapping they would see the futility in declaring that there is only one nasal consonant in Yoruba, and it is not |n|: "thus invalidating Ferguson's assumption eleven."[8]

We do not intend to repeat Postal (1968), and Chomsky's (1967) argument to show the inadequacies of any linguistic analysis based on the notion of complementary distribution, or which denies the concept of overlapping. We will merely give illustrations that are pertinent to the case of |n| and |l| in Yoruba. Consider the hackneyed example of writer |raIDar| and rider |raI:Dar| in Standard American, where the surface structure would certainly lead a phonemicist to declare length phonemic, and the D's as "allophones" of the same phoneme. In reality, however,

8. "Assumptions about Nasals..." (in Universals of Language, edited by Joseph H. Greenberg, 1963) pp. 42-47. Assumptions XI: "In a given language the number of NVs is never greater than the number of non-nasal vowel phonemes."

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the differential length of the vowels is conditioned by the different phonemes to which D's belong. A P-rule first lengthens all stressed vowels preceding voiced segments in the language, and a subsequent rule changes all dentals to a flap in the intervocalic position before an unstressed vowel. In Yoruba, too, all |l| ∿ |n| alternations are rule-governed, as we have explicitly stated in Chapter V. Notice that the alternations take place at the morpheme boundary. This indicates that the reverse alternation |l| ∿ |n| does not occur due simply to the restriction on the occurrence of nasal vowels in the initial position. But it does not serve any additional purpose to multiply examples from other languages.[9]

9. It is the type of alternation at issue here that Kiparsky (Mimeo, 1968) has termed "Contextual neutralization, in which an underlying distinction is lost only in a specific environment and retained elsewhere" (p. 8). In Yoruba, the context happens to be syntactic. Compare the well known ablaut rule in classical Greek, and the umlaut in German, both being morphologically conditioned context neutralization.

See also Greenberg's Anthropological Linguistics (1968), pp. 89-100, for a well reasoned argument against complementary distribution, and Trubetskoy's principles of "phonemic analysis" (Principes, p. 50f.) Principles III and IV are as follows:

> IIIe règle: Si deux sons d'une langue, parents entre eux au point de vue acoustique ou articulatoire, ne se présentent jamais dans le même entourage phonique, ils sont à considérer comme des variantes combinatoires du même phonème.
>
> IVe règle: Deux sons, bien que satisfaisant aux conditions de la règle III, ne peuvent malgré cela être considérés comme des variantes d'un même phonème si dans le language en question ils peuvent se trouver 'lun à côter de l'autre, autrement dit, être les termes d'un groupe phonique, et cela dans les conditions ou l'un des deux sons apparait isolement.

Rule III is the principle of complementary distribution. But in IV, Trubetskoy recognizes the inadequacy of CD. The limiting condition in IV occurs in the case of |n| and |l| in Yoruba, that is, |n| may occur immediately before |l|. Under such circumstances, by IV, |n| and |l| cannot be considered variants of the same phoneme.

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Let us consider one of the consequences of assuming that |n| is a variant of |l|. First, we would be positing non-occurring sounds as in the examples above. Besides, it is not the case that the substitution of one of these two sounds for the other makes no difference to the native speaker of Yoruba. Above all, the distributionalist stand on the question of |n| ∿ |l| alternation, together with the use of vocalicness as a major class feature, results in a very dubious process of syllabic nasal derivation. For example, to derive (a) mo wà ńlé |mō wà ńlé| ('I am at home') from (b) /mō wà lĺ ĭlé/ the following rules would be necessary:

(1) consonant nasalization (in order to make sure that both l's of (b) are not nasalized): /mō wà nĺ ĭlé/.[10]

(2) vowel elision: /mō wà nĺ ɸlé/.

(3) nasal vocalization (since Courtenay's nasals are normally -vocalic). /mō wà n̩ĺ ɸlé/.

(4) "deconsonantization," to prevent adding tone to |l|'s and |r|'s which are $\left[\begin{smallmatrix}+\text{vocalic}\\+\text{cons}\end{smallmatrix}\right]$. (We do not know what the output of such a rule would look like).

(5) tone adding rule: /mō wà ń̩ĺ ɸlé/.

The ad hoc nature of these rules is glaring. Since |l| is $\left[\begin{smallmatrix}+\text{vocalic}\\+\text{cons}\end{smallmatrix}\right]$ in Courtenay's system, her P-rule which is equivalent to (3) here is made necessary by (1): |n| is $\left[\begin{smallmatrix}-\text{vocalic}\\+\text{cons}\end{smallmatrix}\right]$. In addition, (2) would enjoin that, whereas the vowel initial of nouns is normally preserved in the case of elision involving the phrase structure /ni + Noun/, the noun

10. Notice that there is no way of accounting for |mō| without positing a nasalized |õ| or some such segment which will have to lose its nasality again, while |m| keeps its own.

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loses its vowel initial if the vowel is |i|. Such a move is necessary if we are not to lose the nasal consonant we just invented by rule (1). But notice that precisely what Courtenay seeks to avoid (that is, the process |n| → |l| / ——|i|) happens in the Egba dialect, where Courtenay's i-exception would be intolerable. In this dialect, |ni| loses its vowel final in all cases (as in our P-rules above), but in addition, |n| loses its nasality before all non-nasal vowels, including |i|-initial of the following noun. Thus we have the following correspondence between Ẹ̀gbàá and SY:

	E.	SY.	
	l'ídó	n'ídó	'at Ido'
	l'ílé	n'ílé	'at home'
but	l'ókó	l'ókó	'on the farm'.

In Courtenay's description, syllabicity is merely incidental in the sense that only $\left[\begin{smallmatrix}+\text{vocalic}\\-\text{cons}\end{smallmatrix}\right]$ segments are necessarily tonal, and only tonal segments are syllabic. In other words, we are given two unnecessary levels of presupposition:

Syllabic ⇒ tonal,

tonal ⇒ $\left[\begin{smallmatrix}+\text{vocalic}\\-\text{cons}\end{smallmatrix}\right]$

where it should suffice that

tonal ⇒ syllabic.

Both tone and syllabicity are rule-assigned according to Courtenay. In other words, they are both surface structure phenomena. This is not only unnecessary, but strange as well.

Finally, consider the surface structure fact that syllabic nasal consonants are homorganic with the following consonants. In the case of

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Courtenay who posits no nasal consonants for Yoruba, we have (1) a morpheme structure condition which makes nasal consonants illicit in the language; we then have (2) a P-rule that derives nasal consonants from any non-syllabic segments followed by a nasal vowel; (3) these nasal consonants must now be neutralized to an archiphoneme /N/, before (4) being finally assimilated.

For Awobuluyi and others, who posit /m/ as the only nasal consonant in Yoruba, it would be necessary to have the following rules in order to assure homorganic assimilation.

(1) |m| → |n| / _____ Dental

(2) |1| → |n| / _____ Nasal Vowel

(3) |m| → |ŋ| / _____ Velar consonants

(4) |m| → |m| / _____

But we would not know how to derive the variants of |n| (←|1|) before consonants, since the conditioning vowel is no longer present. Thus we would have to learn to live with <u>l'Ife</u> |lífɛ̀| instead of |nífɛ̀| 'at Ifẹ', and |íkpákpá| instead of |ńkpákpá| 'in the field'. This is an unacceptable state of affairs.

By our own approach, all the ad hoc measures, and infelicities of non-occurring forms do not arise: /m,n,l,r/ belong to the same natural class, all being sonorant and consonantal; an MSC states that all syllabic segments are necessarily non-consonantal and tonal; and we have P-rules whose application goes beyond just this class of segments. We submit that this happy state of affairs is due to a point of view that substitutes syllabicity for vocalicness as a major class feature, discards compelementary distribution as a necessary condition for contrast, and is aware that overlapping is a fact of human speech.

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In view of the foregoing, then, one would like to state that both /n/ and /m/ are phonological segments of Yoruba, and not just mere surface structure phenomena. In place of Courtenay's P-31 (consonant nasalization) we can now have a low-level rule which nasalizes all nonsyllabic sonorants when followed by nasal vowels. Such a rule is the following rule.

P-37 Sonorant Nasalization:

$$\begin{bmatrix}+\text{son}\\-\text{syl}\end{bmatrix} \rightarrow [+\text{nas}] \; / \; \_\_\_ \; \begin{bmatrix}+\text{syl}\\+\text{nas}\end{bmatrix} \; .$$

P-34 applies vacuously to /l/, /m/, and /n/. Since in the case of /l/, the structural description is never satisfied in SY (that is, /l/ is never followed by a nasal vowel), and /m/, and /n/ are already nasal. But all the glides /j, h, w/ and /r/ are nasalized according to P-37. Thus

		Underlying Form	After P-37
rìn	'to walk'	/rĩ̀/	|r̃ĩ̀|
rún	'to crumple'	/rṹ/	|r̃ṹ|
yìn	'to praise'	/jĩ̀/	|j̃ĩ̀|
yún	'to dispense'	/jṹ/	|j̃ṹ|
hin	'yes'	/hī/	|h̃ī|
hun	'to weave'	/hū	|h̃ū|
wìn	'to lend'	/wĩ́/	|w̃ĩ́|
wúńdíá	'adolescent girl'	/wṹńdíá/	|w̃ṹńdíá|

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CONCLUSIONS

0. In the introduction to this study, we set ourselves a limited goal. In meeting this assignment several problems in the phonology of Common Yoruba have been considered, several questions raised, and some answers proposed, or outlined. The following is a recapitulation of some of the salient points made.

1. Tone registers are observed to be used in Yoruba in the same way as any other of the phonological features of the language. Two registers, "raised" and "lowered," are represented phonologically as "H" and "L" respectively, and the third phonetic level normally referred to as mid-tone is phonologically the absence in a syllabic segment of both "H" and "L". As phonological features of Yoruba, these tone registers, like any other features, have single segments as domain. A survey of the literature on the phenomenon of tone in languages (Chapter VI) turns up no reason that one might not consider assigning the same domain to tones in other tone languages. In addition, what holds for tones apparently holds for stress and quantity, all three of which are normally referred to as "prosodic features" in the literature. It is to be noted, however, that the term "prosodic" has not always meant the same thing to all analysts of languages in which these elements are functional.

Problems do arise, however, with the treatment of tone registers as phonological (or classificatory) features, since, at that level, they must have binary values. One of the problems is this: How does one state in a lexical representation that tone is non-criterial for non-syllabic segments? In other words, how does one distinguish a syllabic

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segment which has the features [-H, -L], and so has mid-tone, from a nonsyllabic segment which must be marked in the same way but which has no tone either definitionally, or articulatorily. As far as Yoruba is concerned, the same problem arises in the cases of the features "front" and "lateral." The fact is, from time to time this situation arises in the description of particular languages in which given features may be actually non-criterial for certain natural classes of segments. This has long been observed to be the case for tone registers, stress, and quantity. It is apparently to avoid facing this problem of representation that Jakobson, Fant, and Halle (1955) term these features "prosodic," because the features are relevant only to vowels. If this is so, then what is prosodic should, perhaps, be defined for each particular language, so that the term "prosodic" would now mean "distinctive only with respect to one major class of the phonological segments of this language." In this usage, we would be back at a somewhat Firthian concept of prosody, according to which, technically, any feature may be prosodic salva distinctione depending on the language being described. As far as we can see, the solution to this problem probably goes to the heart of the phonological theory based either partially or wholly on the concept of binarism.

In other respects in the present study, considering tone registers to be phonological makes it highly plausible to explain tone glide formation in Yoruba as simple rule-governed phonological processes. This way it is possible to avoid the unnecessary complication which earlier treatments of tone glides have introduced into the phonological description of the language.

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2. In the present work, we replace the feature "vocalic" with "syllabic." But, as in the case of tone registers, this also raises questions about the place of the feature "syllabic" in phonological theory. In chapter III, we propose an articulatory definition which would make the feature "syllabic" universal, since a functional definition must be ipso facto language specific. The proposed definition, relative, of course, to our notion of a tripartite division of the vocal tract (Chapters III and VII), not only allows us to put nasal consonants and liquids into the same natural class, but also to surmise on the nature of those segments which, while not inherently syllabic, may and, in fact, do assume syllabic roles on the phonetic level. This is, for example, the case with nasal consonants in Yoruba (Chapter VII). In the same chapter, we propose a justification for the point of view that /m/ and /n/ are phonological in Yoruba.

3. Section 4.3 of chapter IV presents the sequence structure conditions of Yoruba. It raises another question of general phonological interest: that is, to what extent is it useful to set an upper limit to the number of segments the formatives of a language may contain? Is there any evidence to suggest that when the formative of a language is sufficiently long--where the notion of sufficiently long can be made precise--the language breaks it up in a kind of proper bracketing as with the phrase? What we observe is that no phonological rule, or set of rules suggests that Yoruba does this, contrary to Courtenay's (1968) suggestion in formulating a sequence structure condition which limits the formative length to five or six segments. It will be interesting to investigate this matter more systematically in other languages. While it is valid that

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phonological rules may operate with formative boundaries as points of reference, it does not seem that rules operate with reference to the number of segments in the formative.

4. In chapter IV and later in chapter V (section 5.3), it is argued with supporting evidence that it is still rather premature to assert that all noun initial vowels are of prefix origin. Derivation by prefixation is, to be sure, still a very productive process in the language. But this in no way supports the suggestion, attractive as that may appear, that we must postulate an underlying prefix for all nouns, then devise a rule (as Courtenay (1968) does) to delete or transform this prefix in a vast number of cases, and without any apparent justification.

The notion of affixation as one can gather in recent works in the phonology of Yoruba, appears to be all-encompassing. In chapter V (sections 5.33, 5.34, and 5.54, in addition to 5.3) we establish that what these works have passed off as either prefix, suffix, or mere phonetic reflexes are at least isolable grammatical formatives such as the determinant marker (DM, #5.33), the subject marker (SM, #5.34), and the final marker (FM, #5.54). We have shown that these are not affixes in any sense definable within the phonological description of Yoruba.

5. In the rest of chapter V, we extend the notion of adjective derivation to include modifiers derived from nouns. The existence of this derivational process has been obscured by an orthographic practice which joins a modifier so derived to the formative it modifies. Thus Rowlands (1954) has been deceived into calling formatives followed by their noun-based modifiers "closed compounds."

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In addition to this, we make several minor proposals for the treatment of the pronominal system. This includes the proposal that forms hitherto referred to as independent pronouns be considered a subclass of nouns along with certain demonstratives and names of numbers. This proposal is based both on phonological and syntactic reasons.

Finally, in chapter V (#5.5 to 5.54), we consider the verb phrase. The most important aspect of this part of the present study is the appraisal of existing treatments of contraction in Yoruba, and our own proposal for handling this phenomenon. We propose that elision of one of the juxtaposed vowels in a verb-noun collocation depends on whether the sequence is syntactically a noun phrase (NP), or a verb (VB). Apparent exceptions in SY are shown to be borrowings from CY dialects where contraction apparently operates additionally on whether or not the juxtaposed vowels agree in tense-nontense feature content. This proposal not only explains more of the data, but also shows a considerable advantage over a multiplicity of rules in each of the earlier studies, where each rule has exceptions which call for another set of rules, and so on.

In general, given the scope of the present study, it will be highly presumptuous to claim that justice has been done to all these problems, and much more so to claim that sufficiently explanatory accounts have been provided in all cases. As stated on occasions, some proposals have been made both because we believe that they explain more of the data than other previous accounts, and also to show that other existing solutions are not all that self-evident, and may even have been based on rather flimsy arguments. With these findings, we hope at least that the inquiry into the nature of Yoruba shall have been advanced a little.

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Appendix

LIST OF MSC's

General SgSC's:

SgSc 1: [+high] ↓ ↓ [-low]

SgSC 2: [+front] ↓ ↓ [-back]

SgSC 3: [+sonorant] ↓ ↓ [+cont]

Major Classes:

SgSC 4: [+cons] ↓ ↓

$$\begin{bmatrix} -\text{front} \\ -\text{syl} \\ -\text{low} \end{bmatrix}$$

SgSC 5: [+syl] ↓ ↓

$$\begin{bmatrix} -\text{cons} \\ -\text{cor} \\ -\text{ant} \\ -\text{lat} \\ +\text{vcd} \\ +\text{son} \end{bmatrix}$$

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SgSC 6:

[+son, +cons] → [-low, -back, -high, +ant, +vcd]

SgSC 7:

[-syl, -cons, α low, β ant] → [+son, -cor, -lat, -nas, -front, -α vcd, -α high, β back]

Nonsyllabic Segments (consonants):

SgSC 8:

[-son] → [+cons, -syl, -nas, -lat]

SgSC 9:

[-son, +cont] → [-back, -vcd]

SgSC 10:

[-son, +back] → [[-son, +back], -cons, -high]

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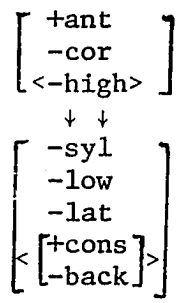
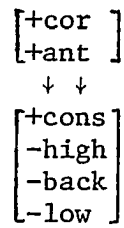
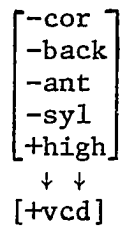
SgSC 11:



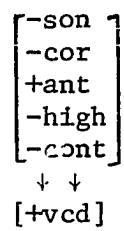
SgSC 12:



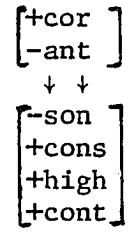
SgSC 13:



SgSC 14:



SgSC 15:



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SgSC 16:

$$[+lat] \rightarrow \begin{bmatrix} +son \\ +cons \\ +cor \\ -nas \end{bmatrix}$$

Syllabic Segments:

SgSC 17:

$$\begin{bmatrix} +syl \\ -high \\ -low \end{bmatrix} \rightarrow [-nas]$$

SgSC 18:

$$\left[\left\{ \begin{matrix} [+H] \\ [+L] \\ [-H] \\ [-L] \end{matrix} \right\} \right] \rightarrow [+syl]$$

SgSC 19:

$$[+H] \rightarrow [-L]$$

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Morpheme Sequence Conditions (SqSC's)

SqSC 1: General structure of Yoruba formative:

P(C): $\left[\left[([-syl])\ [+syl]([-syl][+syl])_{\circ}\right]_{FORM}\right]_{FORM}$

SqSC 2: Formative Structure

N(C): $\sim\left[\left[\left[\left[\begin{matrix}+syl\\ [+nas]\end{matrix}\right]\left\{\left[\begin{matrix}+high\\ +back\end{matrix}\right]\right\}\right]\right]_{FORM}\right]$

SqSC 3: Vowel Co-occurrence

P(C): $\left[\left[([-syl])\left\{\begin{matrix}\left[\begin{matrix}[+high]\\ \left[\begin{matrix}+low\\ -front\\ -back\end{matrix}\right]\end{matrix}\right\}([-syl][+syl])_{\circ}\\ \left[\begin{matrix}-high\\ -low\end{matrix}\right]([-syl]\left[\begin{matrix}+syl\\ -low\end{matrix}\right])_{\circ}\\ \left[\begin{matrix}+low\\ +front\\ +back\end{matrix}\right]([-syl]\left[\begin{matrix}+syl\\ +low\end{matrix}\right])_{\circ}\end{matrix}\right\}\right]_{FORM}\right]_{FORM}$

SqSC 4: Formatives

P(C): $\left[\left[\left\{\left[\begin{matrix}[-syl]\\ \left[\begin{matrix}+syl\\ -H\end{matrix}\right]\end{matrix}\right\}\right]\right]_{FORM}\right]$

SqSC 5: Verb Structure

P(C): $\left[\left[\begin{matrix}[-syl]\\ VB\end{matrix}\right]\right]$

SqSC 6: Post Nasal Vowel

N(C): $\sim\left[\left[X\left[\begin{matrix}+cor\\ +nas\end{matrix}\right]\left[\begin{matrix}+syl\\ -nas\end{matrix}\right]\right]_{FORM}\right]$

Condition: X may be empty.

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PHONOLOGICAL RULES

What follows is a tentative nonrandomly ordered inventory of the P-rules of Yoruba. The ordering has been suggested by the sequential application of rules necessitated by the derivations given throughout chapter V. There are, however, unresolved problems with regard to the ordering of phonological rules. As far as Yoruba is concerned, it is possible that later and more rigorous studies will propose a different ordering from the present one.

Consider the rules for consonant deletion, for example. In a sense, P-13 is more general than any of the rules 16 to 18, in that 13 applies to all formatives that satisfy its conditions. But P-16, for example, not only deletes /r/ everywhere P-13 does, it also deletes it where P-13 would not. So, with respect to /r/, P-16 is more general than P-13. Thus

oori -→ oriri 'West African red-billed dove'

by both P-13 and P-16, but

agbáa -→ agbára 'strength'

by P-16 only. The same relationship exists between rule 13, on the one hand, and 17 and 18, on the other. This kind of interference between phonological rules has been described as subtractive by Chafe (1967).[1] We have here, then, a case of mutually subtractive relation. From our

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1. Wallace L. Chafe ("The Ordering of Phonological Rules." Project On Linguistic Analysis. 2nd series, no. 2 (University of California, Berkeley).

   Cf. Paul Kiparsky (1968b) on bleeding relationship among rules. Kiparsky defines bleeding relationship as a functional relationship such that, given two rules A and B, A removes representations to which B would otherwise apply:

   A. [ ] → [∿ϕ]

   B. [ϕ] → [ ]" p. 198.

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own observation, it appears that when the application of neither of two mutually subtractive rules renders the other vacuous, as in the case of the rules being considered, it does not matter which applies before the other. There are, however, other rules which must apply after P-13, but before 16, 17, and 18. We have accordingly tentatively ordered P-13 to precede the others. The ordering of the last three with respect to one another has no independent motivation. Nor are we sure what consequences the formal similarity among the rules has, except that, for the present, Derivations 6 and 7 suggest that there may be no interference among them.

It may be that the phonological rules of Yoruba must be arranged into blocks such that we would have two levels of ordering: One internal to each block, the other among blocks. We do not have in mind here a classification of rules into groups that can be abbreviated into schemata. We mean, for example--and this is partly why we have organized chapter V as above into general and categorial sections--that there may be a type of generic relationship among certain processes, a relationship describable in terms of a semi-independent set of rules, such that consonant deletion rules apply in block, followed, or preceded by the rules of contraction, and so on. A proper ordering must reflect such a linguistic relationship.

In the following list, low-level rules come last, and are preceded by rules of generalized application. Rules that apply to categories (NP, VP, etc.) come first in the list, preceded, of course, by P-1 to P-3 which must apply to all formatives before any other rule. But there is no priority implied among the sets of rules that apply to particular categories. That is, there is no

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significance in the fact that the set of rules applying to nouns, say, precedes the set applying to verbs. Problems undoubtedly remain as to the internal ordering of a set of rules applying to a particular category. For example, the last word has clearly not been said about P-31 (nasal neutralization) preceding the two contraction rules, nor is it entirely clear whether P-20 need apply strictly after P-6. But in spite of these reservations the ordering of the rules which follows is fairly correct on the basis of the data available to us, and as shown by the derivations in chapter V.

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Phonological Rules

P-1 /a/ - fronting:

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

P-2 Nasal Vowel Raising:

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

P-3 Nasal backing:

$$\begin{bmatrix} +syl \\ +low \\ -front \end{bmatrix} \rightarrow [+back] / \left[\overline{+nas}\right]$$

P-21 Determinant Marker deletion: (optional)

$$DM \rightarrow \phi \; / \underset{N}{\_\_} [+syl]$$

P-22 Determinant marker specification:

$$DM \rightarrow \begin{bmatrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ -H \\ -L \end{bmatrix} \; / \; \left[\begin{bmatrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ T_i \end{bmatrix}\right]_N \_\_\_ [_N$$

P-23: Subject Marker (SM) Specification:

$$SM \rightarrow \begin{bmatrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ +H \end{bmatrix} \; / \; \left[\begin{bmatrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ +T_i \end{bmatrix}\right]_N + \_\_\_ + [_{VB}$$

Condition: $T_i \neq +H$.

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P-24: SM Adjustment:

$$\begin{bmatrix} +syl \\ \left\{\begin{matrix} [+H] \\ \begin{bmatrix} -H \\ -L \end{bmatrix} \end{matrix}\right\} \end{bmatrix} \rightarrow \phi / \underline{\quad}\,]_{NP} + [_{SM}$$

P-25: Adjective derivation (a):

$$[+syl] \rightarrow \phi / [_{Adj.}\ [\underline{\quad}_{N}$$

P-26: Adjective derivation (b):

$$ADJM \rightarrow \begin{bmatrix} -syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix} \begin{bmatrix} +syl \\ +high \\ +front \\ +H \end{bmatrix} / \left[\underline{\quad}_{Adj.} \begin{bmatrix} -syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix}\right]_{VB}$$

P-27: Pronoun Object Spelling:

$$[\ \ ] \rightarrow \begin{bmatrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix} / \begin{bmatrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ \langle +H \rangle \end{bmatrix}_{VB} + \left\{ \begin{matrix} \langle [\underline{\quad}_{2nd\ Pl.\ Pro} \rangle & (a) \\ \begin{bmatrix} +Pro \\ \underline{\quad}_{3rd\ Sg.} \end{bmatrix}_{3rd\ Sg.} & (b) \end{matrix} \right\}$$

P-28: Pronoun tone assignment (a):

$$[+syl] \rightarrow \begin{bmatrix} -H \\ -L \end{bmatrix} / \begin{bmatrix} +syl \\ +H \end{bmatrix}\Big]_{VB} + \Big[_{Pro.\ Obj.} ([-syl])[\underline{\quad}]$$

P-29: Pronoun tone assignment (b):

$$[+syl] \rightarrow [+H] / \begin{bmatrix} +syl \\ -H \end{bmatrix}\Big]_{VB} + \Big[_{Pro.\ Obj.} ([-syl])[\underline{\quad}]$$

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P-30: Pre-accusative Verb Adjustment:

$$[+L] \rightarrow \begin{bmatrix} -H \\ -L \end{bmatrix} / \left[\begin{bmatrix} +syl \\ \underline{\quad} \end{bmatrix} \right]_{VB} + [\ \text{N. Obj.}$$

P-11: Glide Formation:

$$\phi \rightarrow \begin{bmatrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ +L \end{bmatrix} / \begin{bmatrix} +syl \\ +L \end{bmatrix} [-syl] \text{ —— } \begin{bmatrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \\ +T_i \end{bmatrix}$$

Condition: $T_i \neq +L$.

P-13: Consonant deletion:

$$\underset{1}{[-syl]} \rightarrow \phi / ([-syl]) \begin{bmatrix} +syl \\ -high \end{bmatrix} \text{ ——} \left[\begin{bmatrix} +syl \\ [+high] \end{bmatrix} \left\{ \left\langle \begin{bmatrix} \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix} \right\rangle \right\} \right] \underset{2}{[-syl]} \left[\begin{bmatrix} +syl \\ [\ ] \end{bmatrix} \left\{ \left\langle \begin{bmatrix} \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix} \right\rangle \right\} \right]$$

Condition: 1 and 2 are identical.

P-14: Montonal feature assimilation:

$$\underset{2}{[+syl]} \rightarrow \begin{bmatrix} \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix} / \left[X \begin{bmatrix} +syl \\ \alpha_1 F_1 \\ \vdots \\ \alpha_n F_n \end{bmatrix} \text{ —— } [-syl] \right]_N \quad 1$$

Condition: 1 is of a lower vowel height than 2; X may be empty.

P-15: Mid-tone Assimilation:

$$\begin{bmatrix} -H \\ -L \end{bmatrix} \rightarrow [+L] / \left[\begin{bmatrix} +syl \\ \underline{\quad} \end{bmatrix} \begin{bmatrix} +syl \\ +L \end{bmatrix} \right]_N$$

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P-16: /r/ - deletion:

$$/r/ \rightarrow \phi \; / \; \left[\begin{Bmatrix} ((V)C)V\_\_VCV(CV)_0 \\ (V)CV\_\_V \end{Bmatrix} \right]_{FORM} \quad \begin{matrix} (a) \\ (b) \end{matrix}$$

P-17: /w/ - deletion:

$$\begin{bmatrix} -syl \\ -cons \\ +ant \end{bmatrix} \rightarrow \phi \; / \; \left\{ \begin{matrix} \left[\begin{bmatrix} +syl \\ +back \\ -high \end{bmatrix}_N \_\_ \begin{bmatrix} +syl \\ +back \end{bmatrix} \right. \\ \left[([+seg])[+seg] \begin{bmatrix} +syl \\ -front \\ -high \end{bmatrix} \_\_ \begin{bmatrix} +syl \\ -front \\ -high \end{bmatrix} \right]_{FORM} \end{matrix} \right\} \begin{matrix} (a) \\ (b)(i,ii) \end{matrix}$$

Condition: b(ii) may not be a noun.

P-18: /j/ - deletion:

$$\begin{bmatrix} -syl \\ -cons \\ -ant \end{bmatrix} \rightarrow \phi \; / \; \left\{ \begin{matrix} \left[[+seg] \begin{bmatrix} +syl \\ -high \end{bmatrix} \_\_ \begin{bmatrix} +syl \\ +front \end{bmatrix} \right]_{FORM} \quad FORM \\ \left[([+seg])_0 \begin{bmatrix} +syl \\ -high \end{bmatrix} \_\_ \begin{bmatrix} +syl \\ +front \end{bmatrix} ([+seg][+seg]) \right]_N \end{matrix} \right\} \begin{matrix} (a) \\ (b) \end{matrix}$$

Conditions: 1. If the vowel following /j/ is low, then, the preceding vowel, too, must be low.

2. P-18(a) does apply to nouns.

P-19: Back-front vowel assimilation:

$$[-front] \rightarrow [+front] \; / \; \begin{bmatrix} +syl \\ \alpha\ high \\ \beta\ low \\ \_\_ \end{bmatrix} \begin{bmatrix} +syl \\ \alpha\ high \\ \beta\ low \\ +front \end{bmatrix}$$

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P-31: Nasal neutralization:

$$\begin{bmatrix}\alpha_1 F_1\\ \vdots\\ \alpha_n F_n\end{bmatrix} \rightarrow \phi \;/\; \left[\begin{bmatrix}+\text{syl}\\ +\text{nas}\\ \hline +T_i\end{bmatrix}\right]_{VB} + \begin{bmatrix}[+\text{syl}]\\ \text{N. obj.}\end{bmatrix}$$

P-32: Verb-Noun Contraction (i):

$$\begin{bmatrix}+\text{syl}\\ \alpha_1 F_1\\ \vdots\\ \alpha_n F_n\end{bmatrix} \rightarrow \phi \;/\; \left\{\begin{array}{ll}\left[\begin{bmatrix}X\end{bmatrix}_{VB} + \left[\begin{bmatrix}\overline{+T_i}\end{bmatrix}_{\text{N. Obj.}}\right]_{VB}\right. & \text{(a)}\\ \left.\left[\begin{bmatrix}\overline{+T_i}\end{bmatrix}\right]_{VB} + \begin{bmatrix}X\\ N\end{bmatrix}_{VP}\right. & \text{(b)}\end{array}\right.$$

NP

Condition: X is not empty.

P-33: Verb-Noun Contraction (ii):

$$\begin{bmatrix}+\text{syl}\\ \alpha\ \text{tense}\end{bmatrix} \rightarrow \phi \;/\; \left\{\begin{array}{ll}\text{—}]_{VB} + \begin{bmatrix}+\text{syl}\\ \alpha\ \text{tense}\end{bmatrix}_{\text{N. Obj.}} & \text{(a)}\\ \begin{bmatrix}+\text{syl}\\ -\ \alpha\ \text{tense}\end{bmatrix}\begin{bmatrix}\\ VB\end{bmatrix} + \begin{bmatrix}\text{—}\\ \text{N. Obj.}\end{bmatrix} & \text{(b)}\end{array}\right.$$

P-34: FM Spelling:

$$FM \rightarrow \begin{bmatrix}+\text{syl}\\ \alpha_1 F_1\\ \vdots\\ \alpha_n F_n\\ +H\end{bmatrix} / \left[\begin{bmatrix}+\text{syl}\\ \alpha_1 F_1\\ \vdots\\ \alpha_n F_n\\ T_i\end{bmatrix}\right]_{VB} + \text{——} + \begin{bmatrix}\\ VB\end{bmatrix}$$

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P-7: F-feature deletion:

$$\begin{bmatrix}+\text{syl}\\-\text{low}\\+\text{front}\end{bmatrix} \rightarrow \phi \;/\; \left\{\begin{array}{ll}\begin{bmatrix}\text{——}\\+T_i\end{bmatrix}\begin{bmatrix}+ & [[+\text{syl}] \\ & \end{bmatrix} & \text{(a)}\\[2ex] \begin{bmatrix}-\text{syl}\\+\text{nas}\end{bmatrix}\begin{bmatrix}\text{——}\\+\text{high}\\+T_i\end{bmatrix}(]+[)[-\text{syl}][+\text{syl}] & \text{(b)}\end{array}\right\}$$

P-4: Tone transformation (i):

$$[-H[\;\rightarrow\; \phi \;/\; \left\{\begin{array}{ll}[+H] & \text{(a)}\\ \text{——}\quad [+T_i] & \text{(b)}\end{array}\right\}$$

Conditions: (1) Both tones in contact belong to different formatives, that is, they are each features of initial, or final segments of different formatives.

(2) T_i varies over "+H", "+L", and "-H,-L".

P-12: High tone transformation: (Optional)

$$[+H] \rightarrow \begin{bmatrix}-H\\-L\end{bmatrix} \;/\; \begin{bmatrix}+\text{syl}\\+L\end{bmatrix}\;[-\text{syl}]\;\underset{1}{\begin{bmatrix}+\text{syl}\\+L\end{bmatrix}}\;\underset{2}{\begin{bmatrix}+\text{syl}\\\text{——}\end{bmatrix}} + \begin{bmatrix}\begin{bmatrix}+\text{syl}\\\phi L\end{bmatrix}\;[+\text{seg}]\;[+\text{seg}]\end{bmatrix}$$

Conditions: "1" results from glide formation (i.e., from P-11);

ϕ means a low register has been deleted.

P-9: /n/-denasalization:

$$\begin{bmatrix}+\text{cor}\\+\text{nas}\end{bmatrix} \rightarrow [+\text{lat}] \;/\; \text{——} + \begin{bmatrix}\begin{bmatrix}+\text{syl}\\ \left\{\begin{bmatrix}-\text{high}\\-\text{front}\end{bmatrix}\right\}\\ [-\text{nas}]\end{bmatrix}\\ \text{FORM}\end{bmatrix}$$

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P-10: Homorganic assimilation:

$$\begin{bmatrix}-\text{syl}\\+\text{nas}\end{bmatrix} \rightarrow \begin{bmatrix}\alpha\ \text{ant}\\ \beta\ \text{cor}\\ \gamma\ \text{back}\end{bmatrix} \ / \ \text{——} \ \begin{bmatrix}-\text{syl}\\ \alpha\ \text{ant}\\ \beta\ \text{cor}\\ \gamma\ \text{back}\end{bmatrix}$$

P-8: Syllabic nasal:

$$\begin{bmatrix}-\text{syl}\\+\text{nas}\end{bmatrix} \rightarrow [+T_i] / \text{——} \begin{bmatrix}\phi F\\+T_i\end{bmatrix} (] + [)[-\text{syl}][+\text{syl}]$$

P-5: Tone transformation (ii):

$$\begin{bmatrix}+\text{syl}\\ \phi T_i\end{bmatrix} \rightarrow [+T_i] \ / \ \begin{matrix}\phi F\\ +T_i\end{matrix}$$

Condition: 1. same as 1. for P-4.
2. T_j is -H.

P-6: Tone transformation (iii):

$$\begin{bmatrix}\phi F\\+T_i\end{bmatrix} \rightarrow \phi \ / \ \begin{bmatrix}+\text{syl}\\+T_i\end{bmatrix}$$

P-20: Harmonization:

$$[+\text{syl}] \rightarrow \begin{bmatrix}\alpha_1 F_1\\ \vdots\\ \alpha_n F_n\end{bmatrix} \ / \ \begin{bmatrix}\begin{bmatrix}\text{——}\\ -H\\ -L\end{bmatrix}\\ N\end{bmatrix} [+\text{lat}] \begin{bmatrix}\begin{bmatrix}+\text{syl}\\ \alpha_1 F_1\\ \vdots\\ \alpha_n F_n\end{bmatrix}\\ N\end{bmatrix}$$

P-35: /sí/-deletion: (optional)

$$\begin{bmatrix}-\text{son}\\+\text{cor}\\+\text{ant}\\+\text{cont}\end{bmatrix} \begin{bmatrix}+\text{syl}\\+\text{high}\\+\text{front}\\-\text{nas}\\+H\end{bmatrix} \rightarrow \phi \ / \ \text{——}]_{\text{LOC. FORM}} + [_{\text{NOUN}}$$

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P-36: S′-deletion:

$$\begin{bmatrix}-\text{son}\\+\text{cor}\\+\text{ant}\\+\text{cont}\end{bmatrix} \rightarrow \phi \;/\; \text{——} + \begin{bmatrix}[+\text{syl}]\\ \text{N}\end{bmatrix}$$

Condition: /s/ ← /sí/

P-37: Sonorant nasalization:

$$\begin{bmatrix}+\text{son}\\-\text{syl}\end{bmatrix} \rightarrow [+\text{nas}] \;/\; \text{——} \begin{bmatrix}+\text{syl}\\+\text{nas}\end{bmatrix}$$

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