1. Introduction

An area of functional generative phonology in which considerable interest has recently been shown is that of contrast preservation, or avoidance of derived homonymy. Wilkinson [1974], Kisseberth [1973a] and various other recent articles demonstrate that the application and sequencing of phonological rules can be constrained by the need to preserve systematic phonemic contrasts which would otherwise be obliterated. In this paper it is shown that several tonological rules of Yoruba work together to maintain tonemic contrasts in altered form on the surface. Since the tonemic contrasts in question serve to distinguish relatively large numbers of roots in the Yoruba lexicon, their tonetic preservation can plausibly be ascribed to a functional "minimization of homonymy" principle (MHP), deemed to have cross-linguistic validity and thus a status in phonological theory as a constraint on rule application and ordering. Of particular importance in the preservation of the contrasts are rules deriving downstepped tones after underlying low tones and contour tones after either high or low tones. The downstep rule often interacts with vowel and tone deletion rules in a phonologically unexpected manner to render underlying tonal distinctions recoverable from the surface, though in altered form. The fact that this unexpected rule interaction obtains can be accounted for only in terms of the MHP; a demonstration of this, with reference to certain interesting peculiarities of the Yoruba tonal system, is the subject of sections 2 - 5. In particular, an ordering paradox involving the application of downstep and tone elision in both phonologically expected and unexpected orders provides strong evidence for the MHP. It is shown in section 6 that the rule for contour tones also interacts with the downstep and tone elision rules in a fashion which avoids the loss of tonemic contrast when this could occur. Again, tone elision and the contour tone rule apply in both phonologically expected and unexpected orders, and this paradox can only be explained by recourse
to the MHP. Finally, in section 7 several other homonymy-avoiding phonological processes in Yoruba are discussed.

2. **Low Tone Assimilation in Yoruba**

Yoruba has phonemic high, mid and low level tones (henceforth H, M and L respectively). As reported in Bamgboye [1966a, b] and elsewhere, these three tones show allotonic variants when a low tone syllable immediately precedes. The variant of H (henceforth H') is a low-rising tone, the variant of M (henceforth M') is a slightly lowered level tone in the mid range, and the variant of L (L') is a low level tone. L' differs from L in that the latter often begins on a low pitch and falls slightly. Minimal pairs of VCV nouns differing by H and H', M and M' or L and L' on their second syllables are common in Yoruba, some examples being jẹ́ 'job' / jẹ́ 'poverty', awo 'cult' / àwọ́ 'plate' and ọ̀wọ́ 'broom' / ọ̀wọ́ 'respect'.¹ In each case, of course, the distinction between un­primed and primed tones is conditioned by preceding M. vs. preceding L.

(Yoruba nouns of VCV form never show H initial syllables.)

The derivation of primed tones after L is viewed by Courtenay [1969] and others as a case of downstepping, since the primed tones remain even if the underlying conditioning L is deleted and occasion a slight lowering of subsequent tones. Ward [1952] discusses downdrift in Yoruba and gives an example of interaction between downdrift and the derivation of primed tones where more modern terminology would speak of "downstep": a surface HM' sequence followed by a sequence appearing as HHM in isolation would appear as HM'H''H''M'. Here H'' is not H', but rather a slightly lowered variant of H, just as M' is a slightly lower variation of M. The downstep here is conditioned by an L deleted from the surface sequence HM', which underlyingly would be HLM. Since H'' and M' tones which appear as a result of natural downdrift (using Ward's terminology) after an instance of

¹In this paper ' indicates high tone, ' low tone, ' low-rising tone, ' lowered mid tone, and ' low level tone. Mid tone is unmarked. Later ~ will be used to indicate ML falling tone and ~ to indicate HL falling tone. Also, I use ṣ to represent ṣ, ṣ to represent ё, ṳ following a vowel to represent nasalization, and Ṣ to represent the voiceless palatal fricative.
downstepping (derivation of a primed tone after a subsequently deleted L) are never contrastive, however, general terracing in Yoruba is not relevant to this paper. Only the derivation of primed tones immediately following an underlying L need be considered.

The preceding discussion brings out the nonautomatic character of primed tones. Yoruba has rules for deleting tones and vowels when the latter are juxtaposed. In the case of verb (CV) plus VCV noun combinations, the rule for tone elision is easy to state: if the verb is H, the M or L on the initial noun syllable is deleted, and if the verb is M or L, it is deleted in favor of the tone (M or L) on the initial syllable of the noun. These tone elisions occur independently of which vowel, that of the verb or of the initial noun syllable, is deleted (in general, the rules for vowel elision per se are difficult to formulate, and for some combinations of verb plus noun there may be no general rule at all). I will assume a rule of tone elision here (call it TE) which is independent of vowel elision. Assuming also for the time being that Yoruba has a rule deriving primed tones after an immediately preceding L (call it the "primed tone rule", or PT), the nonautomatic nature of primed tones results because TE is often ordered after PT. Consider cases where the above nouns follow the H verb /rif/ 'to see, find' as objects, thus bringing about a deletion of the initial noun tones:

(1) a. ó rifògò 'he found a job' from /órif isògò/

b. ó rifògò 'he experienced poverty' from /órif ịsògò/

(2) a. ó ràwó 'he saw a cult' from /ó rif ìwó/

b. ó ràwò 'he found a plate' from /ó rif àwò/

(3) a. ó ròwò 'he found a broom' from /ó rif ìwò/

b. ó ròwò 'he found respect' from /ó rif ìwò/

The (b) examples in each pair show that TE must follow PT. The underlying contrast between /ìsògò/ and /ìsògò/ etc., which is carried by the initial syllable tone, is shifted as a result of this order to the final noun syllables on the surface. Thus the order PT-TE, which is opaque, since primed tones appear phonetically after H rather than L, serves to maintain underlying contrasts among morphemes. In combinations of M or L verb plus such nouns as /ìsògò/ and /ìsògò/ the initial noun tones remain
after vowel elision and hence the underlying contrast is still carried by
these tones on the surface, the primed H being purely allotonic.

3. The Homonymy-Avoiding Nature of the Order PT-TE

Bamgboze [1966b] explicitly notes the homonymy-avoiding nature of
this nonautomatic character of primed tones. In cases where the initial
syllable tone of a VCV noun is elided after an H verb, homonymy avoidance
is certainly a result of the opaque order PT-TE, due to the comparatively
large number of nouns which are minimal tonal pairs in their first syllables
in the Yoruba lexicon. Likewise, homonymy avoidance can result from
this order when initial noun tones are deleted after such morphemes as
\$/\$e/ (question-former) and /t/ 'where' or after H verbs in nominalizations
such as \$/\$aw/ 'naming ceremony' from /l+daw/ (lit. 'cutting of umbilicus'). Another case of homonymy avoidance is shown by /i\$ i\$ k\$n/ 'work
(is) hard' from /i\$ i\$ k\$n/ and /i\$ k\$n/ 'a piece of work' from /i\$ k\$n/ (lit. 'one work'), where the deletion of the initial tone of /i\$ k\$n/ 'one', probably by a rule other than TE, follows the application of PT
and thus renders M transparent.

However, there are a few instances where the order PT-TE applies but
avoidance of derived homonymy would seem not to be a problem, due to the
structure of inputs. An example is nominalizations with the "infix" /k/,
cited in Bamgboze [1966b]. From nouns like /l\$e/ 'book' and /\$gbo/ 'in-
fusion' nominals of the form /l\$e\$i\$w/ 'any book' and /\$gbo\$i\$w/ 'any
infusion' can be formed, apparently by reduplication of the base noun
around the element /k/. The initial base-noun tone is deleted in these
forms, but not until PT has applied to derive a primed tone on the final
syllable of the base-noun. Derived homonymy seemingly could never arise
in such constructions, since the base noun remains intact to the left of
/k/. (Even if the initial tone of this leftmost occurrence of the base
noun were deleted after an H verb, for instance, the order PT-TE would
still preserve underlying contrasts.) If homonymy avoidance is not a
factor here, one might expect the phonologically unmarked (transparent)
order TE-PT to apply to these reduplicated nominal. Since TE-PT doesn't
apply, the homonymy avoidance seen in the verb+object combinations etc.
may be only an accidental result of, not a cause for, the phonologically
unexpected order PT-TE. The next four sections of this paper will be devoted to a demonstration that the order PT-TE is to be explained via a minimization of homonymy principle (MHP) and that the few apparent counterexamples one can find, such as that just cited, are not really counterexamples at all.

4. Evidence from Surface Consonant-Initial Nouns

Rowlands [1954] argues that surface consonant-initial nouns in Yoruba, such as pápá 'field', jagunjagun 'soldier' and Látúndé (proper name), reduplicated adjectives such as kékeré 'small' and dúdú 'dark', and miscellaneous words such as the numerals méjí 'two' etc., are to be analyzed with an underlying initial M on a zero vowel segment. Such an analysis is least abstract in the case of proper names like Látúndé, composed of M-initial noun + verb + verb (/Olá+tún+dé/ 'honor again comes') or similar components. Rowlands is led to this analysis because surface consonant-initial nouns require that an immediately preceding noun end on a mid tone vowel in certain constructions. Thus we find Ilé Látúndé 'Latunde's house' from /Ilé Látúndé/ and Òrù méjí 'load of two (of them)' from /Ørù Œméjí/; the latter construction, which is genitival, contrasts with Òrù méjí 'two loads'. Rowlands' interpretation of these data is that the mid tone vowel mora identical to the final vowel of the first noun is a surface reflection of the underlying "floating" initial M of the second noun. Ward (p.55) believes that the added phonetic mid tone supplies a prefix for the so-called consonant-initial nouns, bringing them into surface conformity in these constructions with most other Yoruba nouns, which are of the form VCV. Thus, the above examples really ought to be written Ilé elátúndé and Òrù uméjí according to this analysis.

Courtenay [1969] also argues that surface consonant-initial nouns have an initial mid tone underlyingly, but she goes on to supply an abstract vowel prefix, /u/, to support this tone. This device permits her

2méjí and other numerals are analyzed by Bamgbọ̀le [1966b] and Abraham [1958] as ultimately bimorphemic: they are represented as /gámá+e/] etc. by Abraham. The initial L of the second morpheme accounts for the L' on the second surface syllable of méjí.
to fill a gap in the system of underlying noun prefixes, since all but /u/ occur phonetically in standard Yoruba, and also permits a generalization about the canonical form of nouns: all are vowel-initial. Fresco [1970] criticizes this analysis, partly on the grounds that Courtenay's choice of mid tone for the /u/ prefix is ad hoc. However, Rowlands' data would indicate that if an underlying prefix for surface consonant-initial nouns can be set up at all, it should have mid tone. Here I will follow Rowlands, and assume an underlying initial floating M for these nouns. 3

This done, an argument that an MHP figures in the sequencing of Yoruba rules emerges. The supporting vowel inserted for the floating M prefix in ɛruu méji above and ɔkọọ dúdú 'husband of dark ones' actually has a contrastive function, for when méji and dúdú appear as modifying adjectives, the supporting vowel does not appear and the M prefix is deleted: cf. ɛru méji and ɔkọ dúdú 'dark husband'. The rule inserting the supporting vowel (identical to the final vowel of the preceding noun) is syntactically conditioned, applying only to genitival constructions. When this rule does not apply, the same rule that deletes the initial tone of /ɔkọŋ/ 'one' to derive kọŋ after nouns can probably be used to delete the floating prefix M of /əmẹ́jì/ etc. (this rule may also be syntactically conditioned). Calling this special deletion rule TE', for constructions like /ɔ̀rò əmẹ́jì/ 'two words' the order of rules must be TE'- PT (the vowel-support rule fails to apply) to derive the correct output, ɔ̀rò əmẹ́jì. This is a transparent order, since the final L'

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3Rowlands [1954] argues that initial floating M is supported by the fact that M and L verb roots show M before a consonant-initial noun complement. If such nouns have floating M prefix, this tonal change can be considered a replacement of the verb tone by that of the prefix. In general, L and M verbs lose their tones in favor of the initial tone of a VCV noun complement. However, L verb roots show M before VCV complements if contraction doesn't occur, so it appears that a rule raising verb L to M must be recognized anyway: this could also apply before consonant-initial complements. Rowlands attempts to account for this raising of verb L to M by supposing that the VCV nouns are treated in cases of non-contraction "as if they have zero consonant initial" (p. 385), and thus have an added floating M prefix, but such an analysis seems highly improbable. It is not even clear how to state it normally.
of ωρό, which stands directly before the initial syllable of mějí on the surface, conditions a primed H on this syllable.

What is crucial here is that the transparent order TE'-PT could not possibly lead to surface homonymy, since no surface consonant-initial nouns give evidence of having a floating L prefix or no prefix underlyingly. In other words, there are no words /dúdú/, /méjí/ etc. which contrast with /dúdú/, /méjí/ etc. in prefixes and thus threaten to merge phonetically with the latter in constructions where the order TE'-PT applies. On the other hand, /kon/, with a real vowel prefix, contrasts with /kon/ 'to be sour' ('to be hard' by extension), and thus requires the order PT-TE' when its initial vowel is deleted in certain adjectival constructions. Other words like /kon/ are yẹn 'that' (demonstrative adjective) from /lyẹn/ 'that one' and wọ 'which' (interrogative adjective) from /èwo/ 'which one'. A minor ordering paradox thus arises between PT and TE', which can be explained in terms of the MHP, if it is indeed TE' which accounts both for the deletion of the floating M prefix from /méjí/ etc. and the deletion of the vocalic prefix and tone from /kon/ etc.

Pairs of lexical representations like /méjí/ (noun) and /méjí/ (adjective) would avoid the need to delete the initial floating M of nouns in adjectival constructions. However, there is evidence that the Yoruba numerals, at least, are to be considered as basically nouns. Thus kọn 'one' is derived from /kọn/, which is a noun, appearing in its full form in mo rí kọn 'I saw one' (something previously named). Likewise méjí 'two', méjí 'three' etc. can be used as pronominal complements in sentences: mo rí méjí 'I saw three' and so on [Abraham 1958:xxxii]. Likewise, Yoruba demonstrative and interrogative adjectives are derived from nouns (see text below). It seems reasonable to also consider qualitative adjectives, which are mainly derived from verbs of state by reduplication, as underlying nouns. Note that reduplicated nonstative verbs are often used as verbal nouns (cf. jíjó 'dancing' from /jó/ 'to dance' and ffá 'pulling' from /fá/ 'to pull'), so that the adjectives tító 'straight' from /tító/ 'to be straight' etc. can be considered as stative verbal nouns ('being straight' etc.)

Courtenay [1969] takes another view of ẹrùn méjí etc., supposing that an underlying "associative morpheme" /θ/, which takes on the quality of the final vowel of the possessed noun, is present here. Thus she would presumably analyze ẹlẹ kékèrè 'small house' as /lélẹ kékèrè/ and ẹlẹ kékèrè 'house of a small one' as /lélẹ ọ kékèrè/. If the adjective kékèrè derives from the noun /kékèrè/ or even /ukékèrè/, however, the rule TE' must still figure in the derivation of the surface form and the
5. **Vowel/Tone Elision in Nominals**

The rules governing elision of tones in CV verb plus VCV noun complement constructions generally hold for nominalizations composed of nominalizing prefix + verb + noun as well. Thus from /\l/ (nominalizing prefix) plus /sln/ 'cover over' plus /\d\k\u/ 'corpse' the nominal ısınkũ 'burial' is formed by application of PT to the noun and deletion of the mid tone of the verb in favor of the initial L of the noun. Another example is ır̥ɔr̥ 'reflection, cogitation' from /\l/ plus /\r\o/ 'think' plus /ɔr̥/ 'head', where the L of the verb is deleted in favor of the initial M of the noun. Since ısınkũ and ır̥ɔr̥ presumably have L' and M' respectively on their second syllables, due to the surface presence of the L prefix, they require that PT apply after the verb tone is deleted and the tone of the noun prefix brought into position immediately following the L prefix. Assuming the order PT-TE for these nominals, this can be accomplished by setting up a cyclical application for PT, so that, in effect, the order PT-TE-PT is available.

An example forcing the order PT-TE for nominals is given by ıtıllũ 'subversive activities' from /\l/ + /tı/ 'dig up' + /llu/ 'town', where PT must derive H' on the second syllable of /llu/ before the first syllable L is replaced by the H of the verb. There are also cases like ıdawũ 'naming ceremony' mentioned above, where the underlying verb H is idiosyncratically changed to M after replacing the initial noun L. The primed tones on the second syllables of ıdawũ and ıtıllũ can also be derived by assuming that PT is cyclic. Derivations of ıtıllũ and ıdawũ are shown under (4):

\[
\begin{align*}
(4) \quad \text{a. } & /\l+(tı \ lũ)/ \\
& \llũ \quad \text{PT} \\
& \lũ \quad \text{TE (vowel elision assumed)} \\
& \tı \quad \text{PT} \\
& \ltıllũ
\end{align*}
\]

argument for the expectedness of the transparent order TE'-PT in the case of /ðrɔ Ñméj/ etc. still holds.

Abraham [1958] gives ıtıllũ for this form. In general, he does
The freedom with which nominals are formed from verbs and noun complements [Ward 1952:179] by the addition of various prefixes makes it understandable that the order PT-TE should apply to the verb+noun combinations, since minimal tonal pairs of nouns can figure in them. An example is \(1\)jõgbó '(act of) burning bush' from /\(1\)/ + /jõ/ + /jgbó/ and \(1\)jõgbó 'act of) burning vegetable' from /\(1\)/ + /jõ/ + /jgbó/; we may also form agentive nouns ajõgbó 'bush-burner' and ajõgbó 'vegetable-burner' from the same verb and noun plus the agentive prefix /a-. It seems that virtually any semantically acceptable verb plus object combination can be nominalized with /\(1\)-/ to refer to the act of state involved, and many such combinations also allow agentive nominalization with /a-/ and other sorts of nominalizations as well.

It is reasonable to assume that these freely formed nominalizations meaning 'act of doing X' etc. are transformationally derived or, in a lexicalist theory, represented somehow as open syntactic classes in the lexicon. There are other types of nominals, also formed with /\(1\)-/ in some cases, which are relatable to verb plus object combinations but have rather idiosyncratic meanings given the meanings of their components. The degrees of idiosyncrasy involved are various. Of nominals already given, \(1\)sinku 'burial' has a meaning clearly related to its components and is no doubt transformationally derived, \(1\)rorf is slightly more

not recognize a tone deletion when preceding H vowel and following L vowels are juxtaposed, but rather a vowel assimilation with retention of both tones. This appears to be dialectism.

My thanks to Anthony Obilade of Northwestern University for confirming these examples. In his speech, at least, H' on the second syllable does not seem to be as clear as on the third syllables.
opaque semantically and perhaps should be related to a lexical unit [ro+orf], though a transformational derivation is also a possibility, while ṣtǔlǔ is even more opaque semantically and probably must be listed in the lexicon as a unit [l+tǔ+lǔ]. There is evidence that a compound lexical verbal underlies ṣtǔlǔ, however, since ṣn tǔlǔ 'he is an agitator', where tǔlǔ is the main verb, is a well-formed sentence.

Many of the mildly idiosyncratic nominals, and even some highly idiosyncratic ones, show the order PT-TE: some, like ɹdawọ, show subsequent lowering of a second syllable H as well. But what is interesting about Yoruba "idiosyncratic" (ie. derived from lexical compound verbals) nominals is that not all of them show this order. Abraham [1959] separately lists about ten nominals (p. xx) which consist of L verb plus MH noun but do not show the usual tonal pattern of such nominals. Some of these are

\[
\begin{align*}
\text{(5) } & \text{lti̞jù 'modesty, shame'} /t̞l + ojú/ 'shut' + 'eye' \\
& \text{lrẹ́tì 'hope'} /rẹ̝ + eti/ 'lose' (?) + 'ear' \\
& \text{lrò́rì 'pillow'} /rò̝ + orì/ 'support' + 'head' \\
& \text{lài̞wẹ́ 'fragment'} /la + awẹ́/ 'split' + 'segment' \\
& \text{ọmọ́nlé 'builder'} /mọ̝n + llé/ 'build' + 'house'
\end{align*}
\]

For example, the rather idiosyncratic lti̞jù can be analyzed as /l̞/ + /t̞l/ 'to (be) shut' + /ojú/ 'eye' (cf. (5)), as in the case of ṣtǔlǔ above, there is a lexical compound verb tijú 'to feel shame' which can appear independently in sentences (cf. ṣ tijú lṣẹ́ erẹ́ 'he is ashamed of his work' or (lit.) 'he shuts eye work his'). Note that in the sentence just given the compound verb [t̞l+ojú] undergoes the normal rule of tone elision, whereby the M of the noun prefix replaces the L of the verb. In the nominal, however, a different sort of tone elision occurs, for the verb L remains and the prefix M of the noun is deleted. After the verb L is thus brought into the syllable immediately preceding the final H of the noun, this H is converted to H' by PT.

If tone elision in verb+noun constructions is brought about by first raising a verb L to M before a noun (call this "low tone raising", or LTR), the order TE-PT can apply to ltíjù etc. Specifically, the TE rule will delete a verb M before any noun prefix tone, whether this M is underlying
or derived by LTR, but will delete a noun prefix tone after a verb extreme
tone, ie. H or L. Using the tone features suggested in Wang [1967] for
Yoruba, the tone class consisting of H and L can be referred to as
[-central], and such a TE rule can be formulated quite simply. Nominals
like 'Iti jũ', which are not transformationally derived, are then marked as
exceptions to LTR: LTR fails to apply to them, TE subsequently deletes
the noun prefix tone after the unaltered verb L, just as it deletes the
noun prefix tone after the verb H in 'Itũlũ', and PT then applies to derive
H' on the final noun syllable. The same subrule of TE applies both to
'Iti jũ' and 'Itũlũ' (neither undergoes LTR), but this subrule applies in
different orders with PT in the two cases. In transformational nominali-
izations like 'Iróri', as well as in the case of ['tI+ojũ] when used as a
verb in sentences, LTR applies to the low tone verb, making it impossible
for PT to apply after TE.

A negative exception feature [-LTR] will have to be associated with
entire nominals rather than just the compound verbs on which they are
based, since we have 'Iti jũ' as a verb (LTR applies) and 'Iti jũ' (no LTR).
I will assume that lexical units ['I+['tI+ojũ']] etc. exist which are marked
[-LTR] and are related to ['tI+ojũ'] etc. by lexical redundancy rules.
Thus the nominals which don't undergo LTR are not morphologically derived
by prefixation, whereas nominals which do undergo LTR, like 'Iróri' and
all transformationally derived nominals, are derived by prefixation.
There are a few nominals, such as 'Omọnlẹ 'builder' and 'Irẹti' (see (5)),
which show idiosyncratic lowering of the tone on the verb, the resulting
L then replacing the initial M of the noun and permitting PT to apply to
the final H. Such a nominal, although semantically transparent, must be
listed in the lexicon as a unit ['I+[mọn+Ilé]] in order to be marked for this
idiosyncratic verb tone lowering. There is independent evidence that
such a unit is needed, however, since /'O/ appears here as the agentive
prefix, rather than the usual /a/. When /mọn/ plus /Ilé/ appear in a
nominal with the latter prefix, we get the expected amọnlẹ 'builder',
with no lowering of the verb tone.

In general, the question may be raised as to whether nominals like
 Omọnlẹ and the non-LTR forms discussed in the text, which are claimed to
derive from lexical compound verbals [V+N], are really analyzable into noun plus verb parts. If verb units /tl\jʊ/ , /mən\lɛ/ etc. are set up, with no attempt at further analysis, and the nominals tl\jʊ etc. formed from them by addition of prefixes, TE and vowel elision do not even have to apply to derive the nominals and no ordering paradox involving TE and PT arises. However, there is good evidence that tl\jʊ must be analyzed into /tl\+ojʊ/ and so forth. In the case of tl\jʊ, proof of analyzability comes from the separability of /ojʊ/ from /tl/ with retention of the idiomatic meaning: ojʊ tl mlf 'I am ashamed' (lit. 'eye has closed (to) me') is found as well as o tl mlf lόjʊ 'I am ashamed' (lit. 'it (ie. shame) has closed my eye'). Likewise we find ojʊ tl mlf lάlì ʂéé 'I'm ashamed to do it'. (Abraham's transcription is used in these examples.) In the case of other non-LTR nominals and also of mən\lɛ separability of verbs and nouns with retention of the nominals' meanings similarly demonstrates that true compounds are at hand. Indeed, Courtenay [1969] represents verbals with far less semantic and syntactic evidence for compounding, such as jókò 'to sit down' (see below), as lexical compounds (with highly abstract components).

It remains to be explained why the transparent order TE-PT applies to the non-LTR nominals, but not to any of those derived by prefixation. The answer seems to lie in the MHP. The number of non-LTR nominals is not negligible—others not listed separately by Abraham are scattered through his dictionary, such as ləjʊ 'civilization' [l+[lə+ojʊ]], literally 'to open the eye'. However, these "nonderived" nominals are much less numerous than the derived nominals of various sorts. The components of non-LTR nominals are necessarily L verbs and MH, MM or ML nouns, for otherwise the effect of the nonapplication of LTR is vacuous. Thus a non-LTR nominal /V+[C\v+VC\v]/ can only contrast underlyingly with a derived nominal /V+C\v+VC\v/ (for which the effect of LTR is nullified by tone elision). However, since non-LTR nominals are restricted in number, few if any of them contrast underlyingly with derived nominals in the relevant way, due to the absence of appropriate nouns to appear in the latter. For example, Abraham lists no noun /o\jʊ/ contrasting with /ojʊ/, so that nominals /l+tl+o\jʊ/ or /l+lə+o\jʊ/ which contrast with /l+[t\l+o\jʊ]/
or /l+[lɔ+oju]/ cannot be formed; in other cases a VCV noun might exist but be semantically incompatible with the CV verb in the non-LTR nominal. Therefore the opaque order PT-TE is not needed to prevent phonetic merger with derived nominals, and the phonologically expected, transparent order TE-PT is able to apply. The non-LTR nominals differ here from the derived /V+C\U+VC\U/ nominals, where the opaque order PT-TE must apply to prevent phonetic merger with derived /V+C\U+VC\U/ nominals.

An interesting case of homonymy-avoidance due to the application vs. nonapplication of LTR comes from the LTR nominal /r\U oril \U 'reflection' (/l-/ + /r\U oril \U 'head') above and the non-LTR nominal /r\U oril \U 'pillow' from (/l-/ + /r\U oril \U 'support' + /r\U oril \U 'head'). Since the vowel of /r\U oril \U is deleted, surface homonymy would result were it not for the variable application of LTR. Another such pair, cited by Abraham, is /gb\U ow\U \U 'acting as guarantor' (non-LTR) and /gb\U ow\U \U 'shaking hands' (LTR): here the component morphemes are /gb\U \U 'receive' plus /ow\U \U 'hand', and the surface tonal difference comes about because [gb\U +ow\U \U] 'act as guarantor' is a verbal unit marked [-LTR] whereas the collocation /gb\U +/ow\U \U 'receive (shake) hand' arises through ordinary syntactic processes.

It is worth mentioning that the non-transformational nominal /t\U ul\U \U 'subversive activities' above behaves just as though it were transformationally derived, undergoing PT-TE, even though it derives from a lexical unit [t\U +l\U] which does not contrast with any other verb plus noun collocation (there happens to be no noun /l\U in the dictionaries I have seen, so the collocation /t\U +/l\U, whether a lexical unit or not, could not arise). In general, however, some /C\U +/VC\U \U verb-noun lexical units will contrast with /C\U +/VC\U \U collocations of some kind, so PT-TE is necessary for them. This order then, extends to all nominals of the form /V+C\U+VC\U/. Note that such nominals cannot be exceptions to any rule, like LTR, which would provide a means of distinguishing those undergoing PT-TE from those not undergoing it; there are no tone change rules like LTR which affect them.

6. **The Derivation of Falling Low Tones after High Tones**

Ward [1952] and Stevick [1963] show phonetic falling tones on lexical L verbs in constructions like ó k\U \U 'it remains' from /ó k\U/ and nígb\U \U
'when' from /nī gbà tī/. Lexical HL nouns like pāpā 'field' (/pāpā/) also show phonetic falling L. According to Ward (p. 34), this falling tone derived from L is tonetically not greater than the interval lower mid to low, but Stevick (p. 3) refers to a high falling tone. There do seem to be phonetic differences in various occurrences of this falling tone, of which at least some can be ascribed to phonological factors [Bamgboye 1966:fn. 19]. I will assume a basic slight phonetic fall, whose variants will be described below: this basic falling tone will be denoted by the diacritic ~ and the symbol F.

There is a symmetry in the derivation of H' and F, since the former appears after underlying L and the latter after underlying H. A single rule for the derivation of H' and F can be stated using Wang's [1967] feature system:

\[
\begin{align*}
V_{-\text{central}} & \quad \rightarrow \quad [-\alpha \text{ high}] [\alpha \text{ high}] / V_{-\text{central}} \\
\alpha \text{ high} & \quad \rightarrow \quad [-\alpha \text{ high}] \\
\end{align*}
\]

Such a rule is stated for Yoruba gliding tones in Fromkin [1972]. Numerical values for the feature "high" are introduced by a rule discussed below.

As pointed out in section 2 there is a "downstepped" level high tone in Yoruba (H'') which differs from H', according to Ward (p. 39) at least. It is likely that the level tones H'', M' and L' should all be derived after underlying L by a rule separate from (4). Courtenay [1971] states that Yoruba has a rule deriving slightly lowered H and M after an underlying L and another rule deriving gliding tones from H and L: the two interact in the case of H', which according to Courtenay is low-rising and ends on a pitch slightly lower than H in isolation. Ward agrees with this phonetic interpretation of H'; her data definitely require both a "downstep" rule and a rule for gliding tones. Henceforth I will assume that the PT rule of previous sections is simply a downstep rule, which may apply to a string of tones following an underlying L (cf. Ward's example whereby phonetic HM', from /HLM/, followed by HHM yields HM'H''H''M'), and that (6) is also in the grammar, following PT.
Now consider verb+Noun collocations like /dɪ/ 'to stop up' + /ɪpɔ/ 'place' and /fʊ/ 'to want' + /ɡràn/ 'matter'. When contraction takes place, these yield respectively dɪpɔ 'to replace' and fʊràn 'to like'. The second syllables of both contractions show a falling tone derived from the underlying final L. This requires an order whereby TE precedes (6), so that the verb H can be brought into the syllable immediately preceding the final noun L to derive F from the latter. TE-(6) also obtains for non-LTR nominals, but it is impossible to have the order TE-(6) for derived nominals, since in e.g. /jʊ+ɡbɔ/ first bringing the H of /jʊ/ into the syllable immediately preceding the final H of /ɡbɔ/ would incorrectly prevent the application of (6) to the latter by destroying the environment for its application. Thus we must either accept an ordering paradox involving (6) and TE as well as PT and TE or give up deriving F after H by the same rule that derives H' after L.

Two rules for deriving contour tones are stated in Courtenay [1969], but they are placed together in her system of rules and are no doubt considered a single rule. Courtenay looks independently at examples which require tone elision before the derivation of F and examples which require the derivation of H' before tone elision, but does not consider the implications of this. Both TE and (6) are ordered after all phonological and tonological rules in her system, underlying low tones being kept around through derivations by deleting all features of their supporting vowels but [+segment]. TE then deletes only "vowelless" low tones, after (6) has appropriately applied. Applying (6) and TE (as well as PT) late in the context of floating L's may work in avoiding cyclical application of these rules, but it doesn't solve the problem of how they interact with each other. Stahlke [1972] suggests that PT, and presumably other rules dependent on underlying low tones whose vowels are deleted, be made global to avoid cyclical application. (6), of course, could be ordered after TE and made "locally" global with respect to it in those cases where the input to TE must also be the input to (6). This, however, is only a notational variant of the reordering approach and has no explanatory value.
Once again, the MHP can be invoked to account for the ordering paradox involving TE and (6) (I assume that (6) is to be left intact and not split into two rules differently ordered vis-a-vis TE). Consider an example like gbésè 'to hurry' from /gba/ 'to lift' plus /èsè/ 'foot'. If Yoruba had a noun like /èsè/ which could cooccur with /gba/, the structure /gba èsè/ would become homonymous with /gba èsè/ 'to hurry' by virtue of the transparent order TE-(6), since both nouns would be treated as though they had H prefixes. The opaque order (6)-TE would maintain the underlying distinction. In fact, however, Yoruba has no nouns with initial H vowels, so such derived homonymy is impossible. Now suppose that a noun /èsè/, also compatible with /gba/ exists. (Such a LL noun is phonologically permissible.) The structure /gba èsè/ would become homonymous with /gba èsè/ were it not for a phenomenon cited in Bamgboye [1966:fn. 19], reportedly based on spectrographic data. Note that dfpo and fèràn above show different falling tones on their final syllables, that of the former being indicated as H-L and that of the latter as M-L. Bamgboye reports that in general an HL noun-verb contraction derived from /H ML/ shows a "sharper falling pitch" than an HL noun-verb contraction from /H LL/. Assuming this is true for some dialects anyway (Ward does not show it), we thus have no derived homonymy of /gba èsè/ and /gba èsè/ with the order TE-(6).

Bamgboye [1966:3] states that a LL noun in isolation shows two level tones whereas a ML noun shows a level mid tone followed by a "falling pitch starting at a low point" (e.g. low-falling). (Courtenay [1971] also mentions a difference between "downstepped" and nondownstepped L.) If the low-falling tone starts at the same pitch as the level low tone and falls to an even lower pitch, the downstep rule PT can derive a tone specified as, say, [5 high] from [-central, -high] following another low toneme and another tonetic rule can specify the nondownstepped low tone.

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8 Ayo Bamgboye [personal communication] says that the relevant spectograms were made by John Kelly at the University of Ibadan. Footnote 19 in Bamgboye [1966b] mistakenly states that the spectograms are due to Stevick.
as [5 high][6 high].

(Here I follow Fromkin [1972] in treating decreasing pitch as increasing integral values of "high".) It is also possible to suppose that PT simply leaves downstepped L specified as [-high] and that the tonetic rule for nondownstepped (falling) L introduces the sequence [-high][6 high], with [-high] interpreted as [5 high] by convention. The same convention would interpret the first L ([-high]) tone of an LL noun as [5 high]. With such an analysis, the tonetic difference between dípò and fèrán can be accounted for using (6) as it stands. For /dí pò/, PT does not apply, the rule for nondownstepped L (NDL) introduces the specification [-high][6 high] for the final L, TE applies, and finally (6) specifies the [-high] portion of the final L as [+high] [-high]. Here NDL applies opaquely before TE, just as PT must sometimes apply before this rule. By a presumably justifiable convention, the triple sequence [+high][-high][6 high] which results in this derivation from the underlying final L is reduced to [+high][6 high] (later [1 high] [6 high]) by "absorption" of the [-high] middle tone (i.e. [1 high] [5 high][6 high] becomes [1 high][6 high]). For /fè qàran/, NDL does not apply, PT leaves the final L specified [-high], TE next applies, and finally (6) specifies the final L as [+high][-high], later [1 high] [5 high]. In this manner the tonetic difference between the final falling glides in dípò and fèrán is established as [1 high][6 high] and [1 high][5 high] respectively.

Sample derivations for dípò and fèrán are shown under (7a) and a derivation of the derived nominal ṹògbò 'burning vegetable', which requires the order PT-(6)-TE, under (7b):

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9 Downstep or downdrift rules like PT which assign numerical values to tone features like "high" have been stated by various writers, for example Fromkin [1972:56]. PT can assign numerical values to "high" late, assuming underlying L's are somehow available to it, but must still apply before TE in cases like /fè qàran/ since TE obliterates the L on which PT depends. PT is probably best left distinct from the phonetic rule which assigns numerical values to falling tones, though it might be possible to reapply PT after TE and (6) to handle this aspect of assigning numerical coefficients.
The derivations under (7a) show that the orders PT-TE-(6) and NDL-TE-(6) account for the different final glides in fópò and férân and
thus for their surface contrast. Cases where this contrast avoids derived homonymy are easy to find: actual examples are /gbe ęśę/ 'to hurry' and /gbe ęśę/ 'to lift provisions' given as a hypothetical case above, or /rf ękł/ 'see a boat' and /rf ękł/ 'see a spear'. The surface glide contrast is due to the opaque ordering of PT and NDL before TE, which sets up an initial tonal contrast which (6) can later take advantage of in producing the different glides. Because of this initial tonal contrast, the order between TE and (6) can be transparent in (7a), there being no functional purpose which an opaque order (6)-TE would serve. In (7b), however, the order between TE and (6) is in fact opaque. It might seem that the prior application of PT would introduce an adequate indication of the later deleted L noun prefix in the downstepped H on the noun root, so that the order TE-(6) could subsequently apply as in (7a). The fact that this does not happen can possibly be attributed to a sort of paradigm condition on allomorphy of roots: since /łgbó/ 'vegetable' appears as łgbó, with transparent H', in many surface constructions, the noun will show final H' even if the prefix is deleted. In other words, the allomorphs of /łgbó/ are łgbó and gbó rather than the more divergent łgbó and ągbó, which presumably aids in proper perception of the underlying form from the surface variants. In the case of underlying LL nouns like /łrąń/, on the other hand, the surface allomorphs are ąrąń or rąń if no segment or a low-toned vowel precede respectively, and rąń if a high-toned vowel precedes (the grave accent is written on both syllables of ąrąń to show the tonetic identity of "downstepped" L with nonfinal L). Since rąń does occur in at least some phonetic contexts, it is apparently felt that derivation of rąń after H does not represent too much divergence in allomorphy. Note that /łgbó/ would invariably appear as ągbó, never as gbó, after deletion of the prefix if TE were always ordered before (6).

10Note that, without prior application of PT, the opaque order (6)-TE would do nothing to avoid derived homonymy in these examples, assuming that (6) introduces only the specification that a tone is falling, not actual numerical values for the fall. With respect to the formulation of PT, it may be necessary to introduce numerical values for "central" as well as "high", assuming Wang's features, since M is specified only as [+central]. If so, the changes needed in the rule are not great.
It is significant that the rising tone H' is derived on the second syllable of /lgbɔ/ even in isolation, whereas the second syllable of /qrən/ remains L in isolation, a falling tone appearing only in context. We may suppose that a morpheme whose underlying representation leads automatically (i.e. in isolation) to a different phonetic representation will tend to show this phonetic representation in all surface contexts whereas a morpheme whose surface realization in isolation is the same as its underlying representation can have a different phonetic representation in some contexts. Such a principle of allomorphy would leave the second syllable H' of /lgbɔ/ inviolate since it differs from the underlying second syllable H but would permit replacement of the second syllable L of /qrən/ in the appropriate contexts, since this L may be considered identical to the underlying L. This principle would tend to render underlying representations more recoverable from the surface, since if an underlying form is realized on the surface without change in some contexts (including isolation), additional phonetic forms derived from it will not obscure its identity, but if it is never realized as such on the surface, due to automatic alteration, additional allomorphy might make it all the harder to reconstruct. Thus, the existence of /qrən/ and rən as allomorphs of /qrən/ permit recoverability of the latter even though rən also exists, whereas if both /lgbɔ/ and !gbọ were derived from /lgbọ/ the latter would presumably be even more obscure. This view of the principle ties in with the minimization of allomorphy discussed in the preceding paragraph, of course. Also, the fact that H' is lexicalized in a few Yoruba nominals (see section 7) is no doubt relevant here (note that falling tones are never lexicalized). Finally, partial motivation for this principle in Yoruba may be that its effect is to maximize the applicability of (6), since (6)-TE applied to (7a) would counterfeed (6) and TE-(6) applied to (7b) would bleed (6).

Other analyses of dípọ́ and fẹ́rən can be devised, but all of them involve peculiarities regarding (6) which seem to be explicable only on functional grounds. I will consider only one alternative briefly here.
Possibly the above ordering paradox involving TE and (6) could be avoided if (6) is uniformly ordered before TE and the latter reformulated as a rule of rightward tone spreading (cf. Hyman and Schuh [1974]) which applies in a differential fashion around intervening L and M. Specifically, the noun prefix L in /fọ ọran/ might "partially block" spreading of the preceding H onto the L noun root syllable, whereas the noun prefix M in /dị ipọ/ would not block the spread of H. This "partial blocking" due to intervening L would bear a resemblance to the blocking of H spreading by intervening voiced obstruents discussed by Hyman and Schuh, since low tone and voiced obstruents at least are deemed to have a phonological relationship in terms of features. The mechanics of the partial blocking could involve slight lowering of the verb H in /fọ ọran/, with the lowered H then being allowed to "pass" to the noun root syllable. However, this scenario runs into an immediate difficulty, for it requires that H spreading around M and L occur only if the M or L is later deleted: Yoruba does not show surface sequences of the form HMF or HLF derived from /HML/ or /HLL/ respectively. Thus H shift would have to recapitulate the structural description of TE to apply correctly, a situation which is totally without motivation except on functional grounds. Furthermore, the lowering of H envisioned here seems to run counter to the facts in certain idiolects [Bamgboye 1966b:fn. 1]), where the H of a verb is actually higher in pitch if an intervening L noun object prefix is deleted than if an M prefix is deleted. The analysis summarized under (7) does not take this peculiarity into account, but is more consonant with it than a tone shift analysis seems to be.

7. Some Other Yoruba Rules

So far we have seen that ordering paradoxes involving PT and TE, as well as TE and (6), can be accounted for by the MHP, which dictates a phonologically marked order only when derived homonymy in constructions of similar constituency would result from application of the unmarked (transparent) order; the transparent interaction between PT and TE discussed in section 3 can be similarly accounted for. Some mention of subsidiary homonymy-avoidance strategies is also in order. These are
generally not as systematic as those discussed in sections 4-6 but the
purpose of homonymy-avoidance is still rather well served. Given the
high functional load of tone in monosyllabic verbs and vowel-initial di-
syllabic nouns, any rule affecting tones poses a potential threat of de-
rived homonymy. Tone elision is only one such rule, others being rules
which change one toneme to another. There are two such rules, both syn-
tactically conditioned, which bear further mention.

The rule (LTR) which raises L verbs to M before noun complements
could theoretically lead to surface homonymy between underlying low and
mid tone verbs. It is obligatory, so such homonymy cannot be obviated
by failure to apply the rule in some cases. Also, there seem to be no
transferred tonetic contrasts on phones of surrounding morphemes to car-
ry an underlying contrast between L and M verbs. Thus /mo gbà qran/ 'I
received meat' becomes mo gbà qran and then mo gbəran in contraction.
According to Stahlke [1972] there is no derivation of M' on the initial
noun syllable prior to raising of the verb L. If an opaque interaction
between PT and LTR occurred here, the resulting *mo gbəran would be
phonetically distinct from a hypothetical mo gbəran from /mo gbà qran/.
One might expect an opaque homonymy-avoiding interaction here, unless
some other factor is at work to reduce the chances of derived homonymy
in this case.

In fact, it turns out that there is another factor. Oyelaran [1972]
argues that there are comparatively few minimal verbal pairs CV and CV
having the same selectional restrictions and thus taking identical noun
complements: thus /rò/ 'to cook' and /ro/ 'to hoe' (his examples) will
not generally take the same objects or other complements. Now Stahlke
[1972] maintains that tones in Yoruba monosyllabic verbs are so distri-
buted that minimal tonal pairs involving L and M are more rare than one
would expect, whereas minimal pairs involving either H and M or H and L
are more common. Stahlke attributes this to an original lack of contrast
between M and L in Yoruba (LTR is then a reflection of this historical
situation). In synchronic terms, the functional load between M and L in
verbs is not yet sufficiently great for the MHP to require an opaque
interaction between PT and LTR applied to /CV VCV/ constructions in order to distinguish them phonetically from /CV VCV/ constructions. If M–L contrasts in monosyllabic verbs having identical selectional restrictions should become greater, one might expect such an opaque interaction to develop, resulting in an ordering paradox like that observed between PT and TE.

The rule raising the final tones of nouns appearing immediately before non-future-tense verbs as subjects could also theoretically lead to derived homonymy in some cases. The rule either adds a high tone copy of the final vowel of a noun or changes the tone of the final vowel to H. Derived homonymy is possible only in the second type of change: minimal tonal pairs of nouns which could be merged are MM and MH, LL and LM, LL and LH, and LM and LH. Given the high functional load of H vs. M or H vs. L (also of M vs. L?) on final noun syllables, it is unlikely that differing selectional restrictions on nouns will do much to reduce perceived surface homonymy of noun–verb constructions here, any more than they reduce perceived homonymy sufficiently when noun prefix tones are deleted after H verbs. Furthermore, the subject tone-raising rule is obligatory, so that phonetic merger cannot be avoided by selected nonapplication of the rule. It thus seems that we have an exception to the MHP.

However, the tone-raising rule itself has a contrastive function, so that it also serves the MHP. For example, clauses like aṣọ tuntun 'the cloth is new' are distinguished from noun-adjective nominal groups like aṣọ tuntun 'new cloth' only by virtue of the final H on /aṣọ/ 'cloth' in the former. Secondly, it may be that subject nouns occur with following modifiers, which then take the high tone subject marker, more than they occur alone [Ward 1952:46]; since the modifiers are less likely to evince derived homonymy through the tone-raising rule, for various

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11 Some have analyzed the "high tone subject junction" phenomenon as due to an H subject-marker morpheme whose tone appears on the final vowel of the subject noun. Derived homonymy of nouns contrasting in different underlying final tones is still a theoretical possibility in such an analysis.
reasons, this reduces its total incidence. (Any tendency to cooccur with following modifiers is obviously irrelevant to the incidence of derived homonymy in object nouns.) Finally, even nonmodified subject nouns may show different kinds of raised subject-marker tones. I have elicited the following from an informant: ẹjá ń ọ̀wọ́ 'the fish is swimming' from /ẹjá ń ọ̀wọ́/ and ajá ń ọ̀wọ́ 'the dog is swimming' from /ajá ń ọ̀wọ́/, compared with ará ń gbọ́ 'the body is shaken' from /ara ń gbọ́/ and ará ń gbọ́ 'the relative is shaken' from /ara ń gbọ́/. It seems that /ara/ and /ẹ/ in the last example show a raised H, whereas a regular H occurs in the third, as well as in both the first and second. I have not been able to check out the generality of this intriguing difference, but it may represent a restricted sub-process whereby underlying H is raised higher than underlying M in the subject tone-raising process when derived homonymy threatens.12

Yoruba vowel elision could also lead to derived homonymy, and in some cases no doubt does, but here a variety of ancillary strategies for homonymy-avoidance are also possible. First, vowel elision is optional, so that it is simply not applied in some cases where homonymy would result. Bamgboye [1966a] gives the examples fokún 'use the rope' from /fl ọkùn/ and fl ọkùn 'swing the rope' from /fl ọkùn/, the latter being characteristically left uncontracted. Secondly, circumlocutions may be used to avoid homonymy-creating contractions (cf. dé ọ̀wn lọsẹ́ 'tie them in the feet' in preference to dẹsẹ́ ọ̀wn 'tie their feet', based on /ọsẹ́/ 'foot'). Finally, variable contractions may be used to avoid homonymy: /bá aṣo/ 'find clothes' leads only to báṣọ, whereas /bọ́ aṣo/ 'remove clothes' leads to bọ́ṣọ. In general, many writers on Yoruba have recognized that the diverse kinds of vowel elision in verb+noun etc. combinations may be partially explicable in terms that relate to homonymy-avoidance. Even seemingly purely phonological rules for vowel elision may also be a function of the MHP.

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12 My thanks to Anthony Obilade for these data.
Reduplicated nominals like *lwěkíwě 'any book', mentioned in section 2, are not really counterexamples to the MHP. Here, although the opaque order PT-TE which actually applies is not needed for homonymy-avoidance, it is still expected phonologically because of the structure of the form to which it applies. If the transparent order TE-PT applied to these reduplicated nominals, surface forms like *lwěkíwě would result. Such forms render the reduplication rule opaque, however, in the sense that the VCV sequence to the right of k could not be a duplicate in strict phonetic terms of the VCV sequence to the left, nor vice-versa. In order for phonetically similar allomorphs to appear both left and right of k, i.e. for as much surface evidence as possible that a reduplication has occurred to exist, PT, the only rule to apply to the left-hand occurrence of the noun, must apply before TE to the right-hand occurrence. Here, then, we have a trade-off between opacity of PT and opacity of the reduplication rule, and opacity in the latter is avoided. (I propose no general principle to account for this.)

Another problem is posed by a small number of "frozen" forms like l̩kêwá '(the) tenth' and márün 'five' (adjectival), as well as verbs like jókó 'to sit'. These forms are hard to decompose into parts to which PT and TE could apply: e.g. l̩kêwá is decomposed etymologically by Bamgboye [1966b] into /l̩+ko+wá/ 'taking of ten', but in present-day Yoruba this word never appears uncontracted. A form like jókó doesn't even have a clear etymological decomposition (Courtenay [1968] gives /jó+l̩ko/, presumably 'dance' or 'burn' plus 'a rapping', 'a taking' or 'a plunging', none of which fit very well). In cases like this, H' on the final syllables has apparently become lexicalized, due not to the MHP (e.g. l̩kêwá contrasts with no nominal or other word having final H and a similar syntactic distribution) but rather to the frequency with which the original components of these forms occurred together, eventually losing their individual identity. Ancient nominals like l̩kêwá and

13 Courtenay [1969] actually gives no meaning for the noun or the verb components of jókó; one gets the impression that she treats the noun, but not the verb, as "abstract" (i.e. having no specifiable meaning). It is not clear what theoretical status such an element would have.
the other ordinals thus stand in stark contrast to non-LTR nominals like \( \text{n\=aju} \) 'civilization', which rather than phonemicizing \( H' \) etc. by eliminating (opaque) applications of PT and TE have made these primed tones truly allophonic by switching to a transparent order for these rules. In the middle are all the verb+noun combinations etc. which clearly call for rules of tone and vowel elision, due to the existence of uncontracted forms, but render PT opaque (non-allophonic) by ordering it before the elision rules. As far as the MHP is concerned, one might expect more phonemicization of the primed tones in some cases and more "allophonization" in others, all within the context of contracted forms, perhaps leading to a correlation of phonemic and allophonic primed tones with mutually exclusive syntactic or semantic categories [Wilkinson 1974].

8. **Conclusion**

It has been shown in sections 2-6 that Yoruba rules for deriving surface variants of tonemes and a rule deleting tonemes in conjunction with vowel deletion frequently apply in opaque orders, contrary to the theory of rule ordering first outlined in Kiparsky [1971] and developed in Kisseberth [1973b] and elsewhere, whereby transparent orders are "unmarked" and therefore should tend to predominate in languages. However, the Yoruba data does not constitute an unqualified counterexample to a maximization of transparency principle, for such rules as PT and TE or (6) and TE interact opaquely only when a functional purpose, that of maintaining underlying tonal contrasts on the surface or, in somewhat different terms, keeping the "phonological distance" between a base form and its allomorphs to a minimum, is thereby served. As we saw, PT and TE apply in an opaque order in most constructions, since the freedom of morpheme combination in them would often lead to derived tonal homonymy along with segmental homonymy under a transparent order, but in a restricted class of nominals whose components could not easily be confused with other elements, the transparent order TE-PT is able to assert itself. Likewise, (6) and TE are opaquely ordered for constructions where such an order minimizes the distance between base forms and allomorphs (when a rising tone is derived from H by (6)), but revert to a
transparent order where opacity of (6) would not contribute to such minimization (when a falling tone is derived from L). If a "minimization of homonymy" principle is made available in linguistic theory, these variable rule interactions can be accounted for: an opaque interaction obtains only when the MHP is thereby served, and not otherwise. In a similar fashion, the various constraints on rule form and application noted in section 7 can be explained by the MHP. Thus the Yoruba data provides rather good justification for this principle. Of course, much work needs to be done in formulating and elaborating such a functional principle, in particular supplying a statement of the phonological circumstances under which it ought to come into play and an indication of how it can be formally implemented (e.g. through transderivational constraints). These are topics for future research.

REFERENCES


