2. Yoruba

Yoruba has three phonemically distinctive tones-H(igh), M(id), and L(ow). H occurs in word-initial position only in marked consonant-initial words, which reveal an implicit initial vowel when preceded by another word in genitive construction. Most words start with a vowel, which is L or M but not H. Except for this minor tonotactic restriction, tones occur freely in lexical representations, without apparent restrictions on word melodies. So there are three possible tonal patterns for monosyllables, nine possible tonal patterns for disyllables, and so on, as in (7).  

(7) Lexical tone contrast:

<table>
<thead>
<tr>
<th>ra H</th>
<th>ra M</th>
<th>ra L</th>
</tr>
</thead>
<tbody>
<tr>
<td>'to disappear'</td>
<td>'to rub'</td>
<td>'to buy'</td>
</tr>
<tr>
<td>ोको MH</td>
<td>ोको MM</td>
<td>ोको ML</td>
</tr>
<tr>
<td>'hoe'</td>
<td>'husband'</td>
<td>'vehicle'</td>
</tr>
<tr>
<td>ilu LH</td>
<td>ilu LM</td>
<td>ilu LL</td>
</tr>
<tr>
<td>'town'</td>
<td>'opener'</td>
<td>'drum'</td>
</tr>
<tr>
<td>pakoko HH</td>
<td>kese HM</td>
<td>pakoko HL</td>
</tr>
<tr>
<td>'plank'</td>
<td>mythological place name</td>
<td>'chewing stick'</td>
</tr>
</tbody>
</table>

2.1 Non-specification of the Mid tone

The Yoruba mid tone has been analyzed as underlying tonelessness since Akinlabi (1985) and Pulleyblank (1986a). In both Akinlabi's and Pulleyblank’s works, several arguments are given for this hypothesis. We will briefly sketch two examples, relating to tonal stability and tone spreading.

2.1.1 Tone Stability

When an object noun follows a verb in Yoruba, the two words are combined phonologically by deleting either the final vowel of the verb or the initial vowel of the object. Any High or Low tones of the deleted vowel are retained in the result. However, Mid tones are not “stable” in this sense, but instead behave in various combinations with other tones as if they were simply not there. Thus a Mid tone verb followed by an object whose initial vowel is Low will yield a combined form whose first vowel is simply Low, not some sort of Mid-Low contour, or a Mid with a following downstep, or anything else of the sort.

The crucial cases are exemplified below. The tone patterns in each of the (a) and (b) examples in (8) - (18) are the same; in the (a) examples the vowel of the verb is deleted whereas in the (b) examples the vowel of the noun is deleted.

H verb + L initial noun
A few remarks are necessary for the motivation behind the selection of the above forms. First, as noted above since V-initial nouns cannot start with H in Yoruba, no examples of the form X+HX can arise. Second, when a L-tone verb precedes its object, the tone always deletes even if the vowel is preserved, so the case L+XX offers no evidence in this matter.

Extracting the tonal input and output alone from the above examples, we have the following:

Summary of Tonal Input and Output:
8(a-b)  \( H + L \ H \rightarrow H \ L \ H \)

9(a-b)  \( H + L \ L \rightarrow H \ L \)

10(a-b)  \( H + L \ M \rightarrow H \ L \ M^{ii} \)

11(a-b)  \( H + M \ H \rightarrow H \ H \)

12(a-b)  \( M + L \ H \rightarrow L \ H \)

Thus in all the cases that can arise, and whose output is not obscured by the deletion of the verbal L, we can say that H and L always remain when their lexically-associated vowel deletes, while M never does. We assume therefore that Yoruba has privative H and L tones, and that the Mid tone is simply lack of tone.

### 2.1.2 “Tonal Spreading” treats Mid as nonexistent

In Yoruba, a sequence of L H is realized as L LH and a sequence of H L is realized as H HL, that is adjacent H and L tones always spread (rightwards) onto each other, creating LH and HL contours.

\[
\begin{align*}
(13)a. \quad & \text{ala (LH)} \rightarrow \text{ala (L LH)} \quad \text{'}dream' \\
& \text{rara (HL)} \rightarrow \text{rara (H HL)} \quad \text{'}elegy' \\
\end{align*}
\]

On the contrary, an M L sequence does not become *M ML and an M H sequence does not become *M MH. That is, M never spreads to any other tone; and so there are no MX contours, as indeed there could not be if Mid does not exist.

\[
\begin{align*}
(14)b. \quad & \text{ole (ML)} \rightarrow \text{ole (ML)} \quad \text{'}thief' \\
& \text{ile (MH)} \rightarrow \text{ile (MH)} \quad \text{'}house' \\
\end{align*}
\]

Furthermore, when H or L is spread onto M, M is (usually) completely erased. Thus in monomorphemic words with initial M, a following H or L can optiontionally spread backwards onto the first syllable. In this case the initial M is completely supplanted, and the result is homophonous with an underlying HH or LL sequence.

\[
\begin{align*}
(15a) \quad & \text{MLL} \rightarrow \text{LLL} / \text{MLL} \\
& \text{èèrà} \rightarrow \text{èèrà} / \text{èèrà} \quad \text{'}ants' \\
& \text{èèpè} \rightarrow \text{èèpè} / \text{èèpè} \quad \text{'}sand' \\
(15b) \quad & \text{MHH} \rightarrow \text{HHH} / \text{MHH} \\
& \text{èègùn} \rightarrow \text{èègùn} / \text{èègùn} \quad \text{'}maquarade' \\
\end{align*}
\]
2.2 The paradox of Yoruba tone (non-)spreading and (non-)relinking

However the Yoruba cases of tone non-spreading and non-relinking present a paradox. In configurations (16a) and (16b) below (illustrated in 17a), where each syllable has its own tone, the first syllable's tone insists on crowding onto the second syllable. In configurations (16c) and (16d), where the second syllable is unspecified for tone, the first syllable's tone stays home, leaving its neighbor tonally empty (i.e. Mid). (See examples in (17b))

\[
\begin{align*}
(16) & \quad \text{a. } \sigma \sigma & \text{b. } \sigma \sigma & \text{c. } \sigma \sigma & \text{d. } \sigma \sigma \\
& \quad H \ L & \quad L \ H & \quad H & \quad L \\
(17)a. & \quad \text{ala (LH)} & \rightarrow & \text{ala (L LH)} & \text{'}dream\text{' } \\
& \quad \text{rara (HL)} & \rightarrow & \text{rara (H HL)} & \text{'}elegy\text{' } \\
(17)b. & \quad \text{kese (HØ)} & \rightarrow & \text{kese (HØ)} & \text{’mythological place name’ } \\
& \quad \text{ilu (LØ)} & \rightarrow & \text{ilu (LØ)} & \text{’opener’ } \\
\end{align*}
\]

Furthermore, in vowel deletion a Low tone “relinks” if the final syllable has a high tone (18a), but again not if the final syllable is tonally empty (18b). Examples are in (19a) and (19b) respectively.

\[
\begin{align*}
(18) & \quad \text{a. } \sigma \sigma \sigma & \rightarrow & \sigma \sigma \\
& \quad H \ L \ H & \quad H \ LH \\
(19)a & \quad \text{Input } & \rightarrow & \text{Output } \\
& \quad \text{m u i w e} & \rightarrow & \text{f e i wo} \\
& \quad | | | & \rightarrow & | | | \\
& \quad H \ L \ H & \quad H \ L \ H \\
(19)b & \quad \text{Input} & \rightarrow & \text{Output} \\
& \quad \text{m u w e} & \rightarrow & \text{fe w o} \\
& \quad | | | & \rightarrow & | | | \\
& \quad H \ L \ H & \quad H \ L \ H \\
\end{align*}
\]

Yoruba thus presents a case ironically antithetical to Williams/Goldsmith's original Well-Formedness Condition: the rule seems to be that a tone “spreads” or “relinks” if and only if the target syllable already has its own tone!

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1 The examples in this paper are given in the standard Yoruba orthography. In this orthography, e = [ɛ], o = [ɔ], s = [s], p = [kp], j = [ʃ]. A nasal vowel is written as an oral vowel followed by “n”, otherwise an “n” before a consonant represents a syllabic nasal. An acute accent on a vowel [´] indicates a (H)igh tone, a grave accent [´] marks a (L)ow tone, (M)id tones are unmarked. Where necessary we indicate the tones with the letters HML in addition to marks on the vowels. In Yoruba, a High tone is realised as a Low-High contour after a Low tone, and a Low tone is realised as a High-Low contour after a High tone. We abstract away from this predictable tone “spreading” in this
paper. Whenever we indicate a contour, such a contour is formed by surface re-combination of two tones through tonal re-association.

ii We will not discuss vowel deletion, which is complex question requiring a monograph-sized treatment of its own.

iii Any examples whose output is specified as (HL M) are pronounced exactly as this notation implies in some dialects, but in standard Yoruba, they are pronounced as a raised H followed by an M. In earlier studies (see Bamgbose 1966b, Akinlabi 1985, Pulleyblank 1986), this was thought to be an H followed by a tone between M and L, a sort of "downstepped Mid." The essential point is that the L tone is in some sense preserved.