Tonally branching *s* in Yorùbá is [LH][*]

Victor Manfredi
Boston University

Avec une même structure grammaticale ne peuvent se combiner qu'un nombre limité des systèmes phonologiques.

– Troubetskoy

1.   Introduction

The place of Yorùbá prosody (or tonality) within Kwa and Niger-Congo has been a crux of the generative Africanist literature for three decades (Stewart 1965; Williamson 1968; Meussen 1970; Voorhoeve 1971; Welmers 1973, Hombert 1974). The problem boils down to whether typological relationships of this kind are insightfully stateable in terms of rules, *à la* Pulleyblank (1983), or of representations, as I will argue here.

§2 presents a list of problems, some framed in impressionistic or categorial terms (Ward 1952: 29-41; Abraham 1958: x-xxxi; Bámgbóṣé 1966A,B, 1970; Awobùlúyì 1970, 1987; Oyèláràn 1970; Welmers 1973; Sterk 1975; Akinlabí 1985A,B), others having been refined, revised or revealed instrumentally (LaVelle 1974; Hombert 1976; Akinlabí and Láníran 1988; Láníran 1988, 1992; Connell and Ladd 1990; Akinlabí and Liberman 1995). §3 presents the representational analysis which is sloganized in the title of this note.

If metrical licensing indeed captures prosodic generalizations of Yorùbá and related, prosodically different, languages at the systematic phonetic level, it supports two more general propositions as advanced by Kaye and Lowenstamm (1982) and Giegerich (1985) among others. (i) Prosodic constituents, like other phonological and syntactic domains, are licenced by the government relation. (ii) Construction of government domains in phonology, as in syntax, entails the existence of empty categories.

2.   Rule-based puzzles

Early generative fixes on Yorùbá in tone typology held a standard SPE dichotomy between representations and rules, with limited attention to concepts of markedness or possible tone system. In that worldview, the matter posed itself as follows. Several Benue-Kwa languages (Àkan, Èdó, Ìgbo, Èfìk-Ìbìbìò…) have at most two lexical tones (H and L), plus at least two tone rules (downstep and downdrift).[1] Yorùbá, by contrast, happens to have three lexical tones (H, M, L) but just one of the rules (downstep, the "assimilated L tone" of Bámgbóṣé 1966). This picture is more or less explicit in Armstrong (1968), Courtenay (1968), Maddieson (ed. 1970) and many other contemporaneous writings.

For such a viewpoint, Yorùbá posed several intriguing questions, which have remained mysterious:[2]

(1) a Did Yorùbá gain a third lexical tone *vis-à-vis* its Benue-Kwa relatives Àkan, Èdó, Ìgbo and Èfìk-Ìbìbìò via a process of "tone-splitting" (Stahlke 1974, Maddieson 1974)? If so, is the 'new' tone Yorùbá's present-day M or L?

   b.   Did Yorùbá lose the strong, perseverative downdrift pattern of Àkan/Èdó/Ìgbo/Èfìk-Ìbìbìò as a consequence of acquiring its third lexical tone (Ward 1952: 37*f.*)? How did it nonetheless keep downstep (the "assimilated L tone"), if downstep presupposes downdrift *à la* Stewart (1965)?[3]

   c.   How can Yorùbá be distinguished from Íkóm-Yàlà (in the macro-Ìdomà group of eastern Kwa) , a language with three tones, downstep and also canonical downdrift (Armstrong 1968)?

[1] Gbè (including Èvè), though 'tonetically' more complex than Àkan or Ìgbo, like them has just two lexical tones (Stahlke 1971).

[2] Perhaps because they involve 'local' typological comparisons within the Benue-Kwa family of Niger-Congo, these matters at the outset were posed diachronically, but soon were translated into synchronic terms, which is how I will treat them here.

[3] Alongside Yorùbá, another Benue-Kwa example of downstep without downdrift is the Bantu language Kipare (Odden 1983).

As to (1a), based on language-internal M~L alternations exemplified in (2-3), Stahlke (1974) suggests that Yorùbá M is more L-like than H-like, and hence that proto-Kwa *L 'split' into Yorùbá L and M:

(2)a. Mo ra   bàtà.
     1S   buy(M) shoe
     'I bought (some) shoes'

(3)a. Mo lọ.
     1S(M) go
     'I went'

  b. Kí   ni   ó rà?
     what COMP 3S buy(L)
     'What did s/he buy'

  b. Mò ń   lọ.
     1S(L) PROG go
     'I'm going' (cf. Bámgbóṣé 1965: 18)

Stahlke cites two other distributional restrictions to make the same point. There is allophony of object clitics between M (after a verb root that bears H) and H (otherwise), cf. (4); and a systematic absence of segmental noun prefixes bearing H, cf. (5).[4] These latter two arguments sound a bit tendentious, however. True enough, the elsewhere case in (4) groups M and L-bearing verb roots together, but only in a negative way which doesn't require them to share any property. And Yorùbá has nothing against an H-bearing prefix *per se*: the syntactic nominal prefixes (infinitive, gerund), like other default functional heads of the language, bear H tone, cf. (6) from Awóyalé (1983), thus the gap in (5a) holds only for open-class (lexical) items.

(4)a. Ó rí mi.
     3S see 1S(M)
     'S/he saw me'

(5)a. *[N V-CV...]
     |
     H

(6)a. Iṣú   dára   [INF á-jẹ].
     yam.AGR good   H-eat
     'Yam is good to eat'

  b. Ó pa   mí.
     3S affect 1S(H)
     'S/he hit/killed me'

  b. igbá
     prefix(M)-...
     'calabash'

  b. Jímọ̀ ọ́ gọ̀ [INF ọ́-sọ ọ̀rọ̀].
     AGR stupid   H-say talk
     'Jímọ talks unreasonably'

  c. Ó wò   mí.
     3S regard 1S(H)
     'S/he looked at me'

  c. ìgbá
     prefix(L)-...
     'locust bean, eggplant'

  c. Jímọ̀ ọ́ pẹ́ ní [GER lí-lọ-ilé].
     AGR late in   H-go-home
     'Jímọ is late in going home'

External evidence also fails to support the derivation of Yorùbá M from *L. A search for Ìgbo cognates of Yorùbá MM nouns retrieves six HH and one H!H, but none with an L on either prefix or root, cf. (7). For M verb roots, the result is scarcely different: three H (notably all from the 'strong H' class) and one L, cf. (8).[5]

	Yorùbá nouns		Ìgbo nouns			Yorùbá verb roots		Ìgbo verb roots	
(7)	akin	'manly one'	ókhẹ	'male, large'	(8)a.	jẹ	'eat'	rí	'eat'
	erin	'elephant'	ényi	'elephant'		mu	'drink'	ńụ́	'drink'
	ẹni	'person'	ọnye	'person'		γi	'be tough'	shí	'be tough'
	ẹnu	'mouth'	ọ̀nụ	'mouth'					
	ẹran	'animal'	ánụ	'animal'	b.	bẹ	'cut'	bè	'cut'
	ibi	'place'	ébe	'place'					
	omi	'water'	mírín	'water'					

As Akinlabí (1985A,B) notes, all Stahlke's examples are reinterpretable as evidence that M is not a tone in underlying representation, but rather a default pronunciation of the absence of a tonal element drawn from the set {H, L}.[6] Specifically, on the default-M view, the effects in (2)-(4) are more convincingly rule-derived as L-deletion, L-epenthesis and H-deletion respectively. However, Stahlke's idea was that a single property underlies all four of the above phenomena, so if we reject his L/M architoneme we need to come up with

---

[4]This gap also holds outside Yorùbá, e.g. for neighboring Gbè (Stahlke 1971, Capo 1991, Gbeto 1993).

[5]Transcriptions are orthographic: no tonemark denotes M in Yorùbá, but in Ìgbo it denotes "same as preceding marked tone". Supporting evidence for the paired cognates in (7) and (8) is given in Manfredi (*to appear*); in particular, the consonantal sound correspondences belong to quasi-regular sets. The Ìgbo distinction between strong and weak H, first observed by Swift *et al.* (1962), systematically cross-classifies the non-L verb roots in southern districts such as Ọ̀weré and Ḿbàisén. It is wholly absent in northern communities like Ọ̀nịcha and has a vestigial role in the copula system in Ṅnééwi, cf. Nwáchukwu (1976), Éménanjọ (1981), Manfredi (1984, 1991, 1993), Clark (1989) and the Appendix of Déchaine (1993: 497-520).

[6]Kaye (1981) analyzes M as absence of tone in the 'four-tone' systems of Kru (at the western extremity of Kwa).

an alternative or else ascribe the clustering all four alternations in one language to coincidence. Accepting Kaye and Akinlabí's default-M analysis as a necessary step toward an alternative, representational account, it clearly does not answer the typological question in a holistic way. Admitting that additional hypotheses are required, in order to escape the stipulative character of rule-based theory, we can explore the consequences of the following: (i) a metrical representation of tone domains, and (ii) a fonosyntactic grammatical architecture which constrains metrical constituency.

Going back to the typological issues, consider now (1b): how to allow downstep in a language without requiring downdrift, and still maintain Stewart's (1965) claim of an implicational relationship between the two phenomena. This problem was already stated by Schachter (1961): in a language with downstep but not downdrift, the downdrift rule would have to be derivationally global, applying just to strings containing an abstract L, i.e. just in contexts where L-deletion will subsequently apply. Thus for Schachter (1965), the theoretically defensible option is to reject Stewart's inherent relationship between downdrift and downstep. But this may be unduly pessimistic, if current theory offers more possibilities, and in any case the empirical question implied by Schachter's qualms still needs an answer: how far does Yorùbá have downstep and yet lack downdrift? On this point, much relevant instrumental evidence has been collected in the past decade.

Courtenay effectively dismissed the problem when she called Yorùbá an "orthodox… 'terraced-level' language" (1971: 254), but lab phoneticians haven't gone along. Connell and Ladd (1990) replicate Akinlabí and Lániran's (1988) finding that the lowering of H values across a sentence is not systematic lowering of H after L, of the sort familiar from Ìgbo etc. but (at least partly) the cumulative effect of events of local H *raising before* L. This suggests a new way to frame the Ìgbo/Yorùbá contrast, which is at the heart of the typological problem at hand. At least one assumption of the older literature survives instrumental scrutiny: in both languages, the declination countour of a sentence is computed with respect to tonal context[7], but then the differences begin. In Ìgbo (and Èdó), the relevant tonal context is the number of HL feet; but in Yorùbá, only HL sequences increase the differential (Lániran 1992: 240, 270). Instrumental studies find that a sentence-initial L in Yorùbá is neither raised nor does it contribute to declination (Lániran 1992: 219); this would follow if L does not participate directly in the creation of higher-level prosodic constituents. In Ìgbo (and Èdó) by contrast, an initial L is phonetically cliticized to the following H, and hence is sharply raised, to about the pitch of initial M before H in Yorùbá (Íhìọnú 1988); this would follow if L is a foot-final element, Ìgbo (and Èdó) so that a domain-initial L must attach in a special way. A third difference between the two types is that in Ìgbo (and Èdó), L as well as H declines across the downdrift domain (≈ the sentence), but this is not true in Yorùbá, where L maintains a more nearly level value even if the H value dramatically declines. An abstract way to integrate all these observations into one parameter is to say that Ìgbo/Èdó has a *non*local downdrift domain, but Yorùbá doesn't. To make this parameter explicit and concrete, a first approximation is Lániran's idea that tonal feet are LH in Yorùbá—versus the HL feet standardly assumed for Ìgbo-type systems in the Huang-Clements-Inkelas tradition of 'register tone' representations.

Similar considerations bear on question (1a). Yorùbá M neither triggers nor undergoes downdrift, and yet the parametric presence of M in Yorùbá correlates with the restriction of downdrift to H, and to local contexts, as just mentioned. A further point is that Yorùbá M does not get downdrifted systematically, although it does get downstepped, i.e. its pitch is affected by covert L but not (necessarily) by overt L.[8] If we want to relate these observations to the preceding ones, it is logically impossible to do so in terms of rules, since there is no element in common: one rule will talk about what happens with H and L, the other (non)rule about what doesn't happen with M. Evidently, a necessary step in linking the two effects together is to posit some representation in which H, M and L all participate in a predictable manner.

---

[7]Contra the claim of Pierrehumbert and Beckman (1988)—repeated by McCarthy (1988)—that declination ignores tones.

[8]The context-dependency of the downdrift of Yorùbá M was observed already by Welmers (1973: 107, cited by Elugbe 1995: 69). He notices that the negative aux *kò* in (ii) has no effect on the (derived) M of *ra* 'buy', but the L-bearing prefix of *àga* chair does lower the M of the root syllable, so that sentences (i) and (ii) end on the same phonetic value for M. (As a control, it would also be nice to know that sentence (iii) has the same final pitch, but that goes beyond the point at hand.)

i.	Ó ra àga.	ii.	*pro* Kò ra àga.	iii.	Mo ra àga.
	3S buy chair		3S NEG buy chair		1S buy chair
	'S/he bought [a] chair'		'S/he didn't buy [a] chair'		'I bought [a] chair'

Welmers made this remarkable observation without the benefit of any acoustic technology besides unusually big ears.

This brings us to (1c) and Íkóm-Yàlà: a language with M but with nonlocal downdrift and therefore with downdrift of L and M (as well as H) across the sentence (Armstrong 1968, 1972). Íkóm-Yàlà is precisely what Stewart and Courtenay suspected Yorùbá to be. The undeniable difference between Íkóm-Yàlà and Yorùbá shows that while M *may* be an inert tone with respect to prosodic structure, such is not *necessarily* the case. In effect, UG has more than one way to integrate M into a prosdic structure which includes just H and L as the other categorial values. This inference constrains a representational answer to question (1b): the Yorùbá 'solution' to the three-tone 'problem' is not the only possible one. Put differently: there must be at least two alternative ways to license the three tones {H, L, M} into the prosodic constituents of a natural language; assuming two ways, we obtain either Íkóm-Yàlà or Yorùbá depending on the choice.[9]

Before getting to representations, however, we ought to open the descriptive door to Yorùbá tonal effects as wide as possible.[10] Parallel to the M~L alternation in subject clitics illustrated above in (3), Bámgbósé (1972: 31) notices dialectal or intra-lexical M~L variation in the prefixes of the nouns in (9).

(9) eèrà/èèrà 'ant'   ọṣù 'month'/òṣù 'moon   Yorùbá/Yòrùbá '[glossonym]'
     oògùn/òògùn 'medicine'   òṣùmàrè/òṣùmàrè 'rainbow'

The difference with respect to Stahlke's case is that the syntactic context in (3) is before a H-bearing aux, but the lexical context in (9) is before an L-bearing root-initial syllable.

Akinlabí (1985) and 'S. Oyèlàràn (p.c.) draw attention to the suppression of H before L in the domain of a prefix that also bears L. The context is either lexical (10a) or derivational/inflectional (10b).

(10)a. ìpayà 'fear'   ←ì-pá-àyà 'NOM-cringe-chest'
        ìkẹ.rin 'fourth'   ←ì-kó-ẹrin 'NOM-take-four' (where [.] = downstep)
        ìbeji 'twins'   ←ì-bí-èjì 'NOM-give.birth-two'
        òfalè 'lover (m.)'   ←ò-(fì-)fẹ-àlè 'agent-NOM-love-girlfriend', cf. a-fá-lè MHL

     b. òrọkorò 'any/bad talk' ←òrò-kí-òrò 'word-Cᵒ-word'
        kò gbọdò 'needn't'   ←kò 'NEG' gbẹ́-òdò 'lite.V-immediate.presence', cf. ó gbọ́.dò '3s must'

Abraham (1958: 438) describes a loss of H affecting just the item *ní* 'have' in agentive synthetic compounds whose noun contains only L tone, cf. (11); and he records another suppression of the H of *ní* in (12b).[11]

(11) alàgbà 'respected person' ←o-ní-àgbà 'ER-have-seniority'
      alààyè 'living creature'   ←o-ní-àyè 'ER-have-space'
      olòṣì 'poor person'   ←o-ní-òṣì 'ER-have-destitution'

(12)a. Ta   ni   ó ní [$_{KP}$ Ø [$_{DP}$ Ø [$_{NP}$ ajá]]]?   b. Ta   ni   ó ni [$_{KP}$ Ø [$_{DP}$ [$_{D}$ ajá$_i$] [$_{NP}$ t$_i$]]]?
        who COMP 3S V   dog   who COMP 3S V   dog
        'Who has/owns a dog?'   'Who has/owns the dog in question?'

        [talólájá] = M H H H   [talólajá] = M H M H

(6) above showed some null functional heads—possibly Dᵒ—spelling out as H (cf. also Manfredi 1992A). H-spellout also affects Tᵒ, Cᵒ and Kᵒ, cf. (13) and Déchaine (1992, 1993). In relative and resumptive contexts as in (13b), default H is supplemented by segmental material (*ti, o*) recovering chain (agreement) features.

(13)a. Àgbẹ̀ ẹ lọ.   b. àgbẹ̀ tí   ó   lọ   c. Mo jẹ ẹ́.
        farmer T go   farmer C.AGR T.AGR go   1S eat K
        'A/the farmer went'   'the farmer who went'   'I ate it'

---

[9]Ghotuọ (in the North-Central group of macro-Èdó) seems to be in the same prosodic basket as Íkóm-Yàlà "[W]hile the downstepping of the mid in Yorùbá is apparently not obligatory in all environments, that of Ghotuọ is" (Elugbe 1995: 72). I am assuming that the parametric space of UG is given by unavoidable formal indeterminacies: *des fois, il faut simplement choisir.*

[10]For this purpose, the list compiled by Sterk (1975) is helpful.

[11](10) shows *contra* Manfredi (1995) that *ní* 'have' is not the only item in Yorùbá whose H is vulnerable to prosodic suppression.

The irrealis modals *kò* 'doesn't/won't', *yóò* 'will', *máà* 'Don't!' bear a final L which might be motivated compositionally as the left prosodic boundary of a head-movement domain, cf. Déchaine (*this volume*).

The spreading of H onto L and conversely (Ward 1952) fails to cross either M (Láníran 1992: 199*fn.*, Akinlabí and Liberman 1995) or covert L (Bámgbóṣé 1966).

Given the learnability problem, one may be excused for hoping that all the above tonal phenomena converge as evidence of a simple representational parameter. Here goes.

3. Metrical analysis

Long before Bamba's (1992) metrical framework of tone analysis, several scholars of Kwa languages had proposed that 'latent' or zero tones underly downstep (Stewart 1965; Bámgbóṣé 1966, 1970). In Benue-Congo, Williamson (1968, now also 1988) reported the phrasal determination of pitch accent in Ìzǫn. Soon thereafter, analyses appeared of Kwa languages where tone structure seems to condition segmental deletion (Dakubu 1975; Kaye 1981; Chumbow 1982), though this causality was impossible in terms of the reigning, autosegmental theory. Considerations of typology suggested that tones are licensed in metrical positions (Kimenyi 1978, 1987; Clements and Ford 1979; Huang 1980; Odden 1984; Ladd 1991)[12] and that metrical structure motivates abstract or zero tones (Koopman 1982; Manfredi 1992B, 1993).

I assume with Bamba that 'two-tones plus downstep' systems like Ìgbo reflect the constituent in (14):[13]

(14)

```
      s       (w)
      |        |
      H        L
```
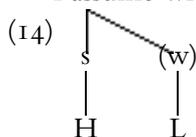
Metrical structure, binary by design, can accommodate a third tone (M) only if *s* or *w* branches and *s* or *w* is the attachment site. If the two if's coincide on one node, then the direction of attachment matters, and if they don't, a reattachment is unavoidable. Of the six possible outcomes, only two are well-formed.

(15)	(16a)	*(16b)	*(17a)	*(17b)	*(18)
s (w)	s (w)	s (w)	s (w)	s (w)	s (w)
L H M	H M L	H L M	M H L	H M L	M H L
branch	branch	branch	branch	branch	branch
attach	attach	attach	attach	attach	attach
reattach left	right	left	right		reattach
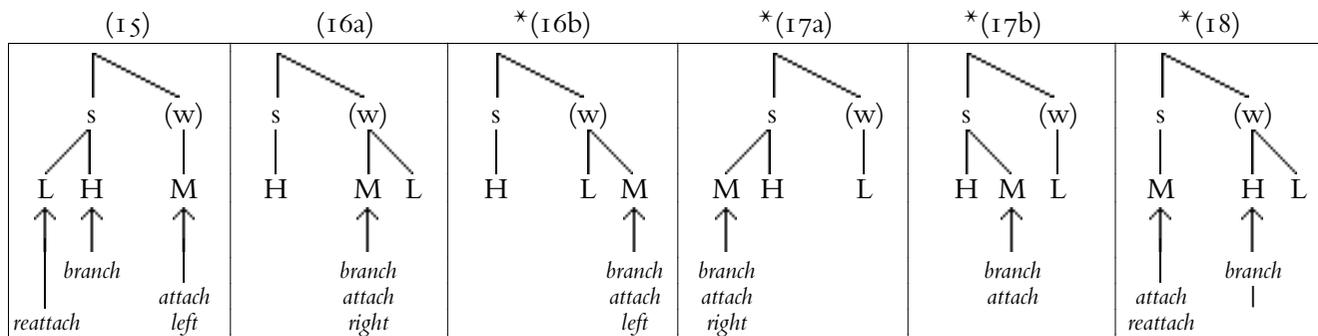
In (15), M attaches to *w*; *s* branches, not *w*, so L must reattach to *s*; right reattachment would violate locality (19a) as the governor H would be nonadjacent to *w*, so L goes left, becoming strong (ungoverned). In (16b), M on the right side of branching *w* is ungoverned, again by (19a), but left attachment (16a) is fine, assuming that M as an un(der)specified element does not invoke (19a), i.e. M can 'transmit' government from H, analogous to a governed preposition in a verb phrase.[14] (17) shows the two subcases where *attach* and *branch* coincide on *s*; both are out by (19b). (18) ignores all three of the licensing conditions in (19).

(19) a.   Locality: A governor is strictly adjacent to its governee (Kaye *et al.* 1990, Charette 1991).
   b.   Projection: *[$_s$ …M…] (Kaye 1981, Akinlabí 1985).
   c.   Government: [$_s$ …H…] (Bamba 1991).

I claim that the two well-formed options are attested: (15) by Yorùbá, and (16a) by Íkóm-Yàlà.

---

[12]Alone of these, Clements and Ford did not explore metrical tone representations, which however they did recognize—at least rhetorically (1979:198)—as a means by which cross-Niger-Congo generalizations could be expressed.

[13]See also Bamba (*this volume*). I preserve Bamba's notation whereby the non-head of a metrical constituent—the *w* branch—is parenthesized;and for all constituents, tonal or metrical, the head projects to a higher domain by a vertical association line.

[14]This replaces my (1979) stipulation of two flavors of M: [−H, −L] as in Yorùbá and [+H, +L] as in Íkóm-Yàlà.

3.1   Yorùbá

Inspection of (15) shows that it is the only three-tone metrical constituent consistent with Láníran's abovementioned LH foot for Yorùbá. A second useful feature is its consistency with the strength hierarchy H>L>M posited by Bámgbóṣé (1965) and others to describe the tonal consequences of vowel contraction.[15]

Tone spreading is hypothesized to be an effect of government (Manfredi 1993). Yorùbá H and L spread onto each other. If H is the metrical head, the spread of L onto H forces the learner to let *s* branch, as in (15). Spread of H onto L is less expected; the syntactic analog is perhaps exceptional case marking. cf. (20). The blocking of spread by intervening M translates easily into the blocking of government, cf. (21).

(20)

(21)
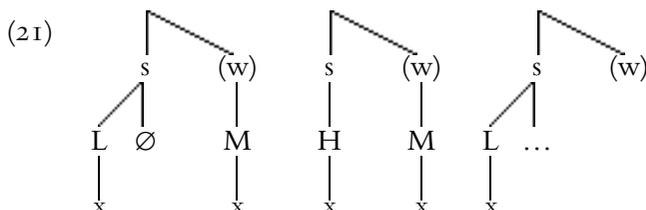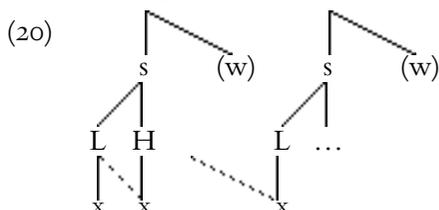
In this foot structure, domain-initial M is anomalous. If it adjoins to the subsequent constituent, and that constituent has a zero head, i.e. does not contain H, this might pose a problem of locality which is resolved by forming the adjunction one level down, to L. This is a plausible story for the ML…∼LL… cases in (9).

Yorùbá downstep as in *alá.gbo* 'owner/seller of herb infusions (*àgbo*)' also has a straightforward source in the representation in (15). I assume prosodic structure is preserved across elision, which affects the second tone-bearing unit (rime) in (22a). The downstep trigger is the null head of the second foot in (22b).

(22)a.

b.
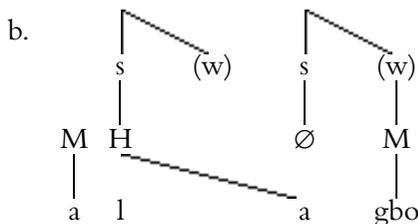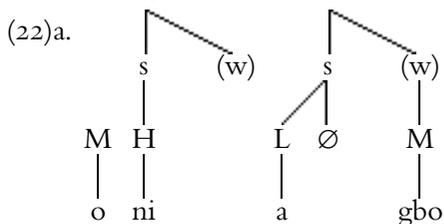
More challenging is why covert L should block H spread. Bámgbóṣé (1972: 26) cites a minimal pair *olórò* 'wealthy person, owner of wealth (*orò*)' with spread, *oĺ.rò* 'person in question, owner of discussion (*òrò*)' with no spread. By the above assumptions, the respective underlying forms are (23a-b). The problem is why elision and reassociation don't merge the two cases, obliterating the reported phonetic difference.

(23)a.

b.
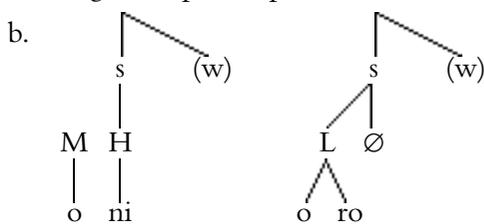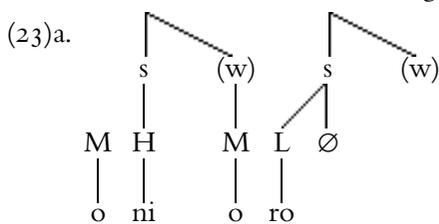
The solution again denies resyllabification and appeals to structure preservation: the first syllable of 'wealth' (23a) is in the same foot as the H of *ní* 'have', but the same is not true for 'matter' (23b). If *φ* is the foot boundary, it suffices to say that H does not govern L in (24b) because it's not fully external to *φ*.[16]
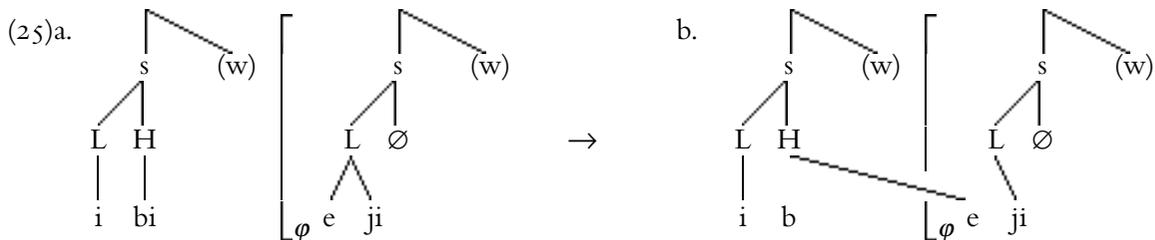
(24)a.

b.

---
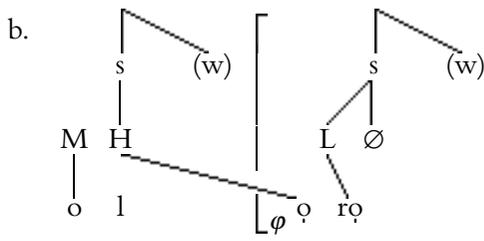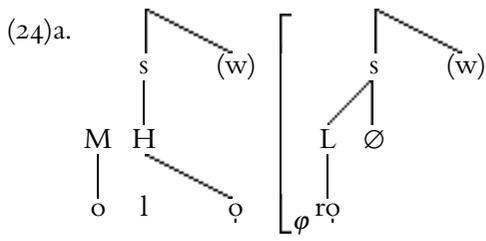
[15]Chumbow (1982) applies the same strength hierarchy to Ògòrì (probably a macro-Nupe language, 'Y. Awóyalé, p.c.). The difference of (15) vs. (16a) predicts that non-H tones will resolve differently under vowel contraction in Yorùbá vs. Íkóm-Yàlà.
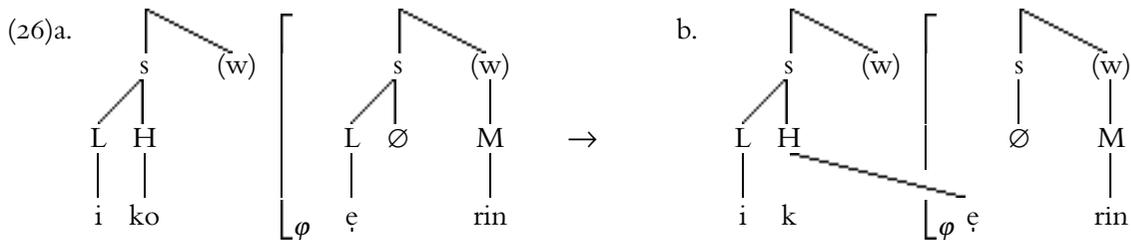
[16]A comparable definition of 'external' with respect to governing category is given by Chomsky (1986: 9).

Needless to say, the category **φ** in (24) is not a prosodic diacritic, just a visual cue for the constituency relations which are carried over from underlying structures in (23); the same relations could be read off a fuller notation which included syllabic (onset-rime) structure, assuming that this links to prosody. One must acknowledge, however, that **φ** does threaten the prosodic linking parameter: the hypothesis that prosodic structure linke to *either* tones *or* rimes but implicitly not to both at the same time (Manfredi 1993: 177).

φ also says something—though not everythiing—about the suppression of H exemplified in (10). This differs minimally from the glide-blocking context in (24), in that the domain is L-initial. Here the suggestion is that, if H reassociates to the third TBU due to the elision of the second, not only is its structural position within the second foot incomplete for the reason cited in (24b), but it is equally no longer completely within the first foot, and hence the initial L is unlicensed, cf. (25b).
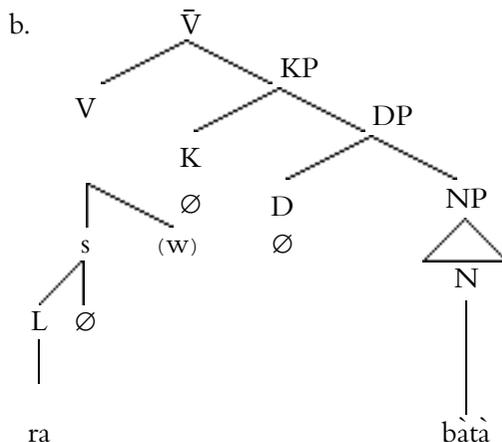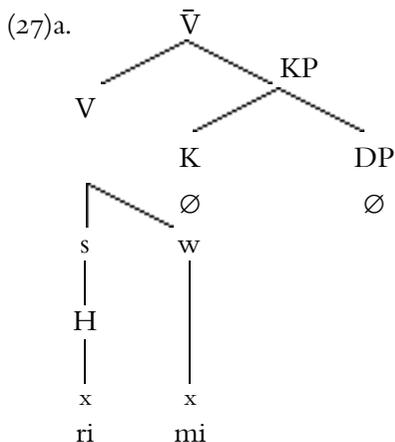
(25)a.
```
    s    (w)        s     (w)              s    (w)        s     (w)
   /\    |         /|      |              /\    |         /|      |
  L  H  |        L   ∅     |            L   H  |        L   ∅     |
  |  |              |     /\                |   \          |     /\
  i  bi          φ  e  ji       →        i    b        φ  e  ji
```
b.

One can imagine two ways to 'fix' (25b): suppress the H, or delete the initial L whose licensing is put at risk by H's reassociation to the third TBU. Why the former occurs and not the latter, is suggested by the forms like *ìke̩.rin* 'fourth' in which H suppression cooccurs with downstep, cf. (26).

(26)a.
```
    s    (w)        s    (w)    M           s    (w)        s    (w)    M
   /\    |         /|     |     |          /\    |         |     |     |
  L  H  |        L   ∅    |    |         L   H  |         ∅     |    |
  |  |              |         |            |    \          |         |
  i  ko          φ  e̩       rin    →     i    k        φ  e̩       rin
```
b.

The null head in (26b), whose presence is witnessed by the phonetic downstep in this example, is required by projection (19b): M can't project a foot. We can speculate that reassociation brings the null head into conflict with a filled head of the first foot, so structure preservation requires suppression of the H.

The list of suppressed Hs, as recounted in §2, includes cases restricted to the morpheme *ní*, cf. data (11) and (12) above. A form like *alàgbà* in (11) shows a different outcome from that of *o̩ló̩.rò̩* in (23b), which is surprising because they have the same tonal input. The possibility of *o̩ló̩.rò̩* itself does not undermine the suggestion of Manfredi (1995) that the sequence MHL is unable to support two feet, since we have argued that the two feet of *o̩ló̩.rò̩* are also supported by additional structure: the category **φ**. If the *o̩ló̩.rò̩*-type is productive but the cases like *alàgbà* in (11) constitute a finite list, one can deny that elision takes place in the latter, perhaps because *ní* 'have' is no longer synchronically analyzable, so there is no basis to postulate **φ**. It is also relevant that the H tone of *ní* 'have' is uniquely unstable in Yorùbá morphosyntax, as argued in the same paper from the other instance of H suppression, cf. (12).

Another issue where prosodic licensing gives some insight is the complementarity/asymmetry of lexical prefixes, which bear M or L, cf. (5), vs. syntactic prefixes, which bear H, cf. (6) and (13). If it is correct that the open-class lexicon does not have access to the closed-class or 'functional' categories (C, T, K, D), then the metrical framework offers a simple way to compel the latter to spell out as H, namely require them to be prosodically strong. A converse requirement—that lexical prefixes are weak—is inconsistent with (15), since L is licensed only in s; however, the desired effect is obtained by restricting the spellout of null heads to phrasal syntax, i.e. by limiting H-spellout to functional categories. The remaining tone effects in §2 are H deletion on an object clitic after H as in (4a), and L-deletion before a direct object as in (2a). The former is plausibly related to the H-spellout as just described, i.e. H-spellout is blocked in the immediate domain of H; intuively, two H's are unable to coexist in one foot, but syntax insists that one foot is all there can be, cf. (27a). L-deletion looks like the converse problem: too much structure and not enough tone, cf. (27b); one could argue that H-spellout is not possible there because null K/D is properly governed by a lexical head.
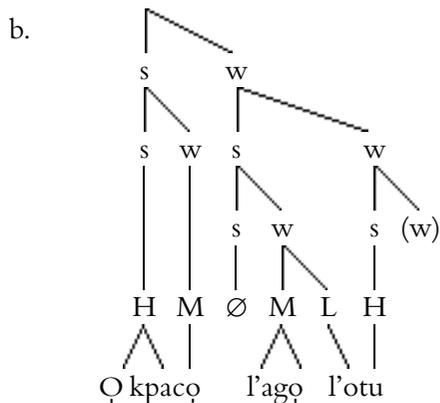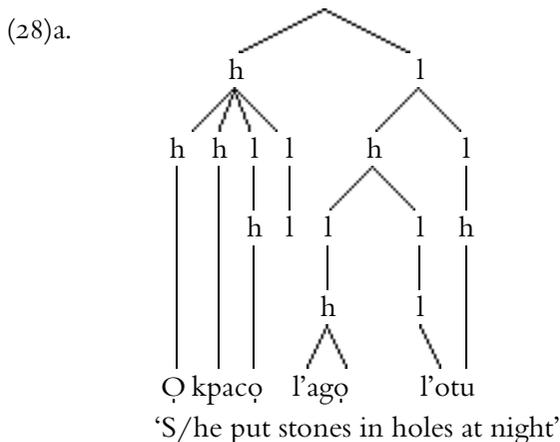
(27)a.

```
              V̄
          ╱      ╲
        V          KP
              ╱        ╲
            K            DP
          ╱  ╲           ∅
         s    w          ∅
         │    │
         H    │
         │    │
         x    x
         ri   mi
```

b.

```
              V̄
          ╱      ╲
        V          KP
              ╱        ╲
            K            DP
          ╱  ╲        ╱      ╲
         s   (w)    D          NP
       ╱  ╲         ∅          △
      L    ∅                   N
      │                        │
      ra                      bàtà
```

Summarizing, the discussion has moved from relatively phonetic issues (spreading and downstep) to syntax (closed-class affixation, clitics, Case). If specific analyses of individual problems along the way are revised or rejected, my point here has been different: that a list of such problems can be brought face-to-face through the lens of prosody, specifically through the claim that Yorùbá belongs to a specific metrical type, as represented in (15).

3.2 Íkóm-Yàlà versus Yorùbá

Íkóm-Yàlà, I claim, is an example of the other way in which a third lexical tone can be integrated into binary metrical structure. The prediction is that Íkóm-Yàlà and Yorùbá do not differ randomly in phonetic tone effects, but that the properties of Íkóm-Yàlà converge on a different foot structure, the one in (16a).

Armstrong observed that Íkóm-Yàlà L does not spread onto H, although Íkóm-Yàlà M has the property of blocking H-spread onto L (1972: 425). Unlike Yorùbá, Íkóm-Yàlà has nonlocal downdrift. Summarizing these parametrically, one can say that M is strong and L is weak in Íkóm-Yàlà, while Yorùbá reverses the two values. All these properties follow by inspection of (16a).

Manfredi (1979) proposed to represent Íkóm-Yàlà in terms of hierarchical tone features, as in (28a); this translates into the metrical-tone framework as in (28b)

(28)a.

```
              ╱      ╲
            h          l
        ╱╱│╲        ╱    ╲
      h  h l l     h       l
            │  │  ╱ ╲      │
            h  l l    l    h
                │     │
                h     l
       ╱ │ │  ╱ ╲   ╱ ╲ ╱ ╲
      Ọ kpacọ  l'agọ    l'otu
```
'S/he put stones in holes at night'

b.

```
        ╱      ╲
      s          w
      │        ╱   ╲
      s   w   s      w
      │   │  ╱ ╲    ╱ ╲
      │   │ s   w  s  (w)
      │   │ │   │  │   │
      H   M ∅   M  L   H
     ╱ ╲  │  ╱ ╲  ╲ ╱ ╲
    Ọ kpacọ  l'agọ l'otu
```

Note, finally, that the constraint set in (19) remains constant across all the languages surveyed.

4. Conclusion: from prosody to fonosyntax

§3.1 proposed explicit answers to the longstanding West-Africanist questions in (1), and provided a coherent account of the list of observations in §2. Whether or not these answers and this account are correct, they are not value-neutral: that is, they contradict a theory of syntax-phonology 'interface' in which anything and everything is possible. Rather, they require us to believe that tones are integrated into prosodic structure, and phrase structure, with surprisingly few options. In other words, they insist that Yorùbá phonology is learnable, but only if UG has a constrained architecture and phonology is part of UG.

References

Akinlabí, A. M. (1985A) *Tonal underspecification and Yorùbá tone*. Dissertation, University of Ìbàdàn.

_____ (1985B/1992) [A] two-tone analysis of Yorùbá. Presented at 6th Conference of the Linguistic Association of Nigeria, Zaria/*Research in Yorùbá Language and Literature* 2: 59-76.

Akinlabí A. M. and Y. Lániran (1988) Tone and intonation of declarative sentences in Yorùbá. Presented at the 19th Annual Conference on African Linguistics, Boston University.

Akinlabí, A. M. and M. Y. Liberman (1995) On the phonetic interpretation of the Yorùbá tone system. Presented at the 26th Annual Conference on African Linguistics, University of California, Los Angeles.

Ámáyó, A. (1983) Tone rules and derivational history in Èdó phonology. In I. R. Dihoff (ed.) *Current Approaches to African Linguistics*. Foris, Dordrecht. Pp. 185-97.

Armstrong, R. G. (1968) Yàlà (Ikom): a 'terraced level' language with three tones. *Journal of West African Languages* 5: 49-58.

_____ (1972) A note on downstem in Yàlà (Ikom). *Studies in African Linguistics* 3: 423-25.

_____ (1983) The Idomoid languages of the Benue and Cross-River Valleys. *Journal of West African Languages* 13: 91-149.

Awóbùlúyì, Ọ. (1970) High-tone-junction-contracting verbs in Yorùbá. *Journal of West African Languages* 7: 29-38.

_____ (1978) *Essentials of Yorùbá Grammar*. Oxford University Press, Ìbàdàn.

Bamba, M. (1990) On downstep in the tonal system of Ojene Jula. In J. P. Hutchison and V. Manfredi (eds.), *Current Approaches to African Linguistics* 7. Foris, Dordrecht. Pp. 1-14.

_____ (1991) *De l'interaction entre tons et accent*. Dissertation, Université du Québec à Montréal.

_____ (1995) La prosodie du haoussa. This volume.

Bámgbóṣé, A. (1965) *Yorùbá Orthography*. Ìbàdàn University Press.

_____ (1966A) *A Grammar of Yorùbá*. Cambridge University Press.

_____ (1966B) The assimilated low tone in Yorùbá. *Lingua* 16: 1-13.

_____ (1970) Zero in tonal analysis. *Actes du Xᵉ Congress International des Linguistes*. Pp. 15-20.

Bittner, M. and K. Hale (1994) The structural determination of Case. To appear in *Linguistic Inquiry*.

Capo, H. B. C. (1991) A *Comparative Phonology of Gbè*. Mouton/DeGruyter, Berlin.

Charette, M. (1989) The minimality condition in phonology. *Journal of Linguistics* 25: 159-87.

_____ (1991) *Conditions on Phonological Government*. Cambridge University Press.

Chomsky, N. (1986) *Barriers*. M. I. T. Press, Cambridge, Mass.

Chumbow, B. S. (1982) Contraction and tone polarization in Ògòrì. *Journal of West African Languages* 12: 89-103.

Clark, M. M. (1989) *The Tonal System of Ìgbo*. Foris, Dordrecht.

Clements, G. N. (1981/1983) The hierarchical representation of tone. In G. N. Clements (ed.) *Harvard Studies in Phonology* 2: 50-108. Reprinted in I. R. Dihoff (ed.) *Current Approaches to African Linguistics*. Foris, Dordrecht (Pp. 145-76) and in Language .

Clements, G. N. and K. C. Ford (1979) Kikuyu tone shift and its synchronic consequences. *Linguistic Inquiry* 10: 179-210.

Connell, B. and D. R. Ladd (1990) Aspects of pitch realisation in Yorùbá. *Phonology* 7: 1-29.

Courtenay, K. (1968) *A generative phonology of Yorùbá*. Dissertation, U. C. L. A.

_____ (1971) Yorùbá: a 'terraced level' language with three tonemes. *Studies in Afrcan Linguistics* 2: 239-56.

Dakubu, M. E. Kropp (1975) Towards a definition of the rhythm of Gã. Mimeo, University of Ghana, Legon. [Cited in Dakubu 1981; not personally consulted.]

_____ (1981) *One Voice; the Linguistic Culture of an Accra Lineage*. African Studies Center, Leiden.

Délánọ, I. O. (1969) *Dictionary of Yorùbá Monosyllabic Verbs*. Institute of African Studies, Univesity of Ifẹ̀, Ilé Ifẹ̀.

Déchaine, R.-M. (1992) Inflection in Ìgbo and Yorùbá. *MITWPL* 17: 95-119.

_____ (1993) *Predicates across categories: towards a category-neutral syntax*. Dissertation, UMass, Amherst.

_____ (1994) The complementizer position in Yorùbá. Presented at 23rd Colloquium on African Languages and Linguistics, Afrikaanse Taalkunde, RULeiden, 30 August – 1 September.

_____ (1995) Negation in Ìgbo and Yorùbá. This volume.

Déchaine, R.-M. and V. Manfredi (1995) Cohabitations of syntax and phonology. Presented at HILP2, Universiteit van Amsterdam, 26 January.

Dolphyne, F. A. (1994) A phonetic and phonological study of downdrift and downstep in Àkan. Presented at the 25th Annual Conference on African Linguistics, Rutgers University, 27 March.

Elugbe, B. (1995) The 'assimilated low tone' in Ghotuọ. In K. Owólabí (ed.) *Language in Nigeria; Essays in Honour of Ayọ̀ Báńgbóṣé*. Group Publishers, Ìbàdàn. Pp. 68-74.

Éménanjọ, E. 'N. (1981/1984) *Auxiliaries in Ìgbo syntax*. University of Ìbàdàn dissertation/IULC, Bloomington, Ind.

Fresco, E. M. (1969) The tones of the Yorùbá and Ìgálà disyllabic noun prefix. *Journal of West African Languages* 6: 31-34.

Gbeto, F. (1993) Du statut du ton M et de la représentation des tons en Gbè. Presented at the 23rd Colloquium on African Languages and Linguistics, Leiden, 30 August-1 September.

Giegerich, H. J. (1985) *Metrical Phonology and Phonological Structure*. Cambridge University Press.

Goldsmith, J. (1986) The rise of rhythmic structure in Bantu. In W. Dressler (ed.) *Phonologica* 1984.

_____ (1988) Prosodic trends in the Bantu languages. In H. van der Hulst and N. Smith (eds.) *Autosegmental Studies in Pitch Accent*. Foris, Dordrecht, Pp. 81-93.

Guerssel,M. and J. Lowenstamm (1990) Stem formation and government in Arabic. *GLOW Newsletter* 24: 80-81.

Hombert, J.-M. (1974) Universals of downdrift; their phonetic basis and significance for a theory of tone. *Studies in African Linguistics*, Supplement 5: 169-83.

_____ (1976) Perception of tones in bisyllabic nouns in Yorùbá. *Studies in African Linguistics*, Supplement 6: 109-21.

Huang, C. T. J. (1980) The metrical structure of terraced-level tones. *NELS* 10: 257-70.

Íhìọ̀nú, Ụ. P. (1988) Towards a pedagogy of Ìgbo and Yorùbá tones. Presented at the 19th Annual Conference on African Linguistics, Boston University.

Kaye, J. D. (1981) Tone sensitive rules in Dida. *Studies in African Linguistics*, Supplement 8: 82-85.

_____ (1987) Government in phonology; the case of Moroccan Arabic. *The Linguistic Review* 6: 131-59.

_____ (1990) Coda licensing. *Phonology* 7: 301-30.

_____ (1994) Vowel harmony; the left hand of God. *GLOW Newsletter* 32: 32-33.

Kaye, J. D. and J. Lowenstamm (1982) "Up until the early seventies…". *GLOW Newsletter* 8: 22-23.

Kaye, J. D., J. Lowenstamm and J.-R. Vergnaud. (1985) The internal structure of phonological elements: a theory of charm and government. *Phonology* 2: 305-28.

_____ (1990) Constituent structure and government in phonology. *Phonological Yearbook* 7: 193-231.

Kimenyi, A. (1978) Grammatical tone neutralization in Kinyarwanda. *Studies in African Linguistics* 9: 303-16.

_____ (1987) Leftward High tone displacement in Kinyarwanda. Presented at the 18th Annual Conference on African Linguistics, Bloomington, Ind.

_____ (1988) Compound-noun High tone assignment in Kinyarwanda. Presented at the 19th Annual Conference on African Linguistics, Boston University.

_____ (1989A) High Tone rightward displacement and repetition in Kinyarwanda. In F. Jouannet (ed.) *Modèles en tonologie (Kirundi et Kinyarwanda)*. Éditions du CNRS, Paris.

_____ (1989B) L'haplogie tonale ou la loi de Meeussen. In F. Jouannet (ed.) *Modèles en tonologie (Kirundi et Kinyarwanda)*. Éditions du CNRS, Paris.

_____ (1994) U-turn phenomena in Kinyarwanda tone rhythm rules. Presented at 25th Annual Conference on African Linguistics, Rutgers University, 27 March.

_____ (to appear) *A Tonal Grammar of Kinyarwanda; an Autosegmental and Metrical* Analysis. De Gruyter, Berlin.

Koopman, H. (1982) Le ton abstrait du Kagwe. In J. Kaye, H. Koopman and D. Sportiche (eds.) *Projet sur les langues Kru. Premier Rapport*. Université du Québec à Montréal. Pp. 46-59.

Ladd, D. R. (1990) Metrical representation of pitch register. In J. Kingston and M. E. Beckman (eds.) *Papers in Laboratory Phonology 1; Between the Grammar and Physics of Speech*. Cambridge University Press. Pp. 35-57.

Lániran, Y. Ọ. (1988) Modeling intonation in a tone language; the Yorùbá example. Presented at the Workshop on Tone, Accent and Locality, UMass Amherst, 14 November.

_____ (1992) *Intonation in tone languages; the phoentic implementation of tones in Yorùbá*. Dissertation, Cornell University, Ithaca, N.Y.

LaVelle, C. R. (1974) An experimental study of Yorùbá tone. *Studies in African Linguistics*, Supplement 5: 185-204.

Liberman, M. and A. Prince (1977) On stress and linguistic rhythm. *Linguistic Inquiry* 8: 249-336.

Lowenstamm, J. (1987) Prosodic government. In Kaye *et al.* (eds.) *Projet de linguistique africaniste: études phonologiques et syntaxiques; rapport de l'année 1986-87*. Université du Québec à Montréal. Pp. 248-51.

Maddieson, I. (1972) Tone system typology and distinctive features. In A. Rigault and R. Charbonneau (eds.) *Proceedings of the 7th International Conference of Phonetic Sciences*. Moutoon, den Haag. Pp. 957-61.

_____ (1974) A possible new cause of tone-splitting—evidence from Cama, Yorùbá and other languages. *Studies in African Linguistics*, Supplement 5: 205-21.

Maddieson, I. ed. (1970) *Tone in Generative Phonology. Research Notes* [Ìbàdàn] 3.2-3.

Manfredi, V. (1979) Morphologization of downstep in Ìgbo dialects. A. B. honors thesis, Dept. of Linguistics, Harvard University, Cambridge, Mass.

_____ (1984) Abstractess and Ìgbo verb tone. Presented at the 5th Conference of the Linguistic Association of Nigeria, Ǹsụ́ká.

_____ (1992A) A typology of Yorùbá nominalizations. *MITWPL* 17, 205-17.

_____ (1992B) The limits of downstep in Ágbọ̀ sentence prosody. In M. Liberman and C. MacLemore (eds.) *IRCS Report* 92-37. Institute for Research in Cognitive Studies, University of Pennsylvania. Pp. 103-15.

_____ (1993) Spreading and downstep: prosodic government in tone languages. In H. van der Hulst and K. Snider (eds.) *The Phonology of Tone*; *the Representation of Tonal Register*. Mouton/de Gruyter, Berlin. Pp. 133-84.

_____ (1995) Syntactic (de)composition of Yorùbá 'be' and 'have'. In L. Nash & G. Tsoulas (ed.s), *Langues et Grammaire-1*. Département des Sciences du Langage, Université de Paris-8, Vincennes à Saint-Denis.

_____ (to appear) For a historical phonology of Ìgbo and Yorùbá. In Q. B. Yaî (ed.), *Festschrift Pierre Fátúmbí Verger*. Paris.

McCarthy, J. J. (1988) Commentary on the paper by Lániran. Workshop on Tone, Accent and Locality, UMass Amherst, 14 November.

Meussen, A. E. (1970) Tone typologies for West African languages. *African Language Studies* 11: 266-71.

Nwáchukwu, P. A. (1976) *Noun phrase sentential complementation in Ìgbo*. Dissertation, University of London.

Odden, D. (1983) Three dialects of Kipare. Presented at the 14th Annual Conference on African Linguistics, University of Wisconsin, Madison, 7-10 April.

_____ (1984A) Problems in the metrical representation of tone. *Studies in African Linguistics*, Supplement 9, pp. 254-57.

_____ (1984B) An accentual approach to tone in Kimatuumbi. In D. Goyvaerts (ed.) *African Linguistics; Studies in Memory of M. W. K. Semikenke*. Benjamins, Amsterdam. Pp. 345-419.

_____ (1988) Predictable tone systems in Bantu. In H. van der Hulst and N. Smith (eds.) *Autosegmental Studies in Pitch Accent*. Foris, Dordrecht, Pp. 225-51.

Oyèláràn, Q. O. (1970) *Yorùbá phonology*. Dissertation, Stanford University.

Pierrehumbert, J. B. and M. E. Beckman (1988) *Japanese Tone Structure*. M. I. T. Press., Cambridge, Mass.

Pulleyblank, D. (1983/1986) *Tone in Lexical Phonology*. Dissertation, M. I. T., Cambridge, Mass./Reidel, Dordrecht.

Schachter, P. (1961) Phonemic similarity in tonal analysis. Language 37: 231-38.

_____ (1965) Some comments on J. M. Stewart's "The typology of the Twì tone system". *Bulletin of the Institute of African Studies* (Legon) 1: 28-42.

_____ (1969) Natural assimilation rules in Àkan. *International Journal of American Linguistics* 35: 342-55.

Schadeberg, T, (1973) Kinga; a restricted tone system. Studies in African Linguistics 4: 23-47.

Stahlke, H. (1971) The noun prefix in Èʋè. *Studies in African Linguistics*, Supplement 2: 141-59.

_____ (1974) The devcelopment of the three-way tonal contrast in Yorùbá. In E. Voeltz (ed.) *Third Annual Conference on African Linguistics*. Indiana University Press, Bloomington. Pp. 139-45.

_____ (1976) The noun prefix in Yorùbá. *Studies in African Linguistics*, Supplement 6: 243-53.

Sterk, J. P. (1975) The ordering of derivational tone rules in Yorùbá. *OSU WPL* 20: 116-24.

Stewart, J. M. (1965) The typology of the Twì tone system. *Bulletin of the Institute of African Studies* (Legon) 1: 1-27.

Swift, L. B., A. Áhághotù & E. Ùgọ́jị́ (1962) *Ìgbo Basic Course*. Foreign Service Institute, Washington D. C.

Twahirwa, A. (1994) Le translatif relatif et les relatives en Kinyarwanda. Presented at the 25th Annual Conference on African Linguistics, Rutgers University, 27 March.

Troubetzkoy, N. S. (1939/1964) *Grundzüge der Phonologie/Principes de phonologie*. Travaux du Cercle Linguistique de Prague 7/Klincksieck, Paris..

Voorhoeve, J. (1971) Tone systems: the theme underlying the variations (trans. by F. Heny).

_____ (1973) Safwa as a restricted tone system. Studies in African Linguistics 4: 1-22.

Ward, I. C. (1952) *An Introduction to the Yorùbá Language*. Heffer, Cambridge.

Welmers, Wm. E. (1959) Tonemics, morphotonemics and tonal morphemes. *General Linguistics* 4: 1-9.

_____ (1973) *African Language Structures*. University of California Press, Berkeley.

Williamson, K. R. M. (1968) Deep and surface structure in tone languages. *Journal of West African Languages* 2: 77-81.

_____ (1970) Downdrift/downstep. In I. Maddieson (ed.) *Tone in Generative Phonology. Research Notes* 3.2-3, Dept. of Linguistics and Nigerian Languages, University of Ìbàdàn. Pp. 22-33.

_____ (1988) Tone and accent in Ìzǒn. In H. van der Hulst and N. Smith (eds.) *Autosegmental Studies in Pitch Accent*. Foris, Dordrecht, Pp. 81-93.

Winston, F. D. D. (1960) The 'mid tone' in Èfìk. *African Language Studies* 1: 185-92.

African Studies Center
Boston University
270 Bay State RD
Boston MA 02215