

The Phonemic Status of Mid Tone in Ebolowa Bulu*

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1. Introduction

It has been supposed by various writers, especially Alexandre (1962, 1966), that NW Bantu languages like Bulu (A. 70 group) have no phonemic mid tone. Rather, the mid tone (henceforth M) which appears phonetically in Bulu is derived by raising underlying low tones (L), lowering underlying high tones (H), or, most importantly, contracting underlying sequences of L and H spread over two syllables into a tautosyllabic contour tone which is then converted to M. For example, the Bulu noun âwóm 'ten' would have the underlying representation /âwómô/, from which the surface form is derived by deletion of the final vowel, retraction of the final L to the first root syllable to form tautosyllabic HL, and conversion of this to M. Arguments for such an analysis are given in Alexandre (1962). In this paper evidence will be presented that in Ebolowa Bulu, and apparently in the Bulu described by Bates (1926), the derivation of surface M from underlying sequences of L and H by tone retraction (henceforth the "sequence analysis" of M) is not correct. Instead, a toneme /M/ must be set up along with /L/ and /H/. My arguments for tonemic M in Ebolowa Bulu (henceforth EB) are primarily formal, being based on the distribution of M in morphemes and on the complexity of the morphotonemic rules that must be used in a sequence analysis. At the conclusion of the paper, however, one small piece of "psychological" evidence for /M/ involving drum language will be given.¹

2. Initial arguments against deriving M from tone sequences.

Alexandre's (1962) analysis of M from /HL/ runs into an immediate difficulty in EB. Consider the phrases âsóné dî 'this tooth' and ébéns jî 'this shield', from âsón 'tooth' and ébé 'shield'. The final "buffer" schwa which prevents the juxtaposition of consonants across # in these examples takes H, the root syllable M seen in the citation forms remaining. Such demonstrative phrases can be derived from underlying /LH/ noun root sequences more easily than from /HL/ sequences. All that is required is a rule (ad hoc, as it turns out) to raise the root L to M before the final H, which remains on the buffer schwa. Phonetic M on the citation forms âsón etc. then arises via retraction of this H in the absence of buffer schwa to form tautosyllabic LH, if a sequence analysis can be maintained.²

The buffer ə seen in âsóné dî is replaced by a copy of the root vowel /o/ in the construction zá âsónó 'what sort of tooth?'; similarly we have zá mvíní 'what sort of antelope?' from mvín. If buffer schwa or final full vowels were taken as underlying, a support

would be provided for the final H needed in a sequence analysis of M. However, final full vowels cannot be used in the underlying representations, since this would provide no means of predicting the loss of the final vowel from e.g. /èbàpá/ 'hard outer skin of sugar-cane' (èbàp) in clause-final position and the retention of the final vowel of e.g. /èbàtá/ 'puddle' (èbàtá), which also has two identical root vowels, in the same environment. Therefore final schwa would have to be posited. However, schwa is not otherwise phonemic. Medial and final phonetic ə in words like ébélé 'friend' are derivable from /ɛ/, shown by the surface complementary distribution of ə and ɛ in morphemes as well as by morphophonemic evidence.³ Taking underlying final /ɛ/ in àsòŋ etc. will not do, of course, since then these roots could not be distinguished from surface vowel-final ébélé (/ébélé/) etc. I conclude that àsòŋ etc. have no underlying final vowel and that buffer schwa and final full vowels are inserted by rule. This effects a savings of features in the lexicon and correctly captures the predictable nature of these final vowels.

We must therefore take the underlying form of àsòŋ to be /àsòŋ̃/, with the final H a "floating" tone. For purposes of underlying symmetry in the analysis of surface monosyllabic noun roots, Alexandre (1962) takes the underlying forms of fám 'man' and môt 'person' to be /fám̃/ and /môt̃/. This move is consistent with the fact that buffer schwa on such roots takes H after root H and L after root L (fámé nyù 'this man' and môté nyù 'this person'), though it is not necessary, since the H and L on buffer schwa are clearly predictable. For the sake of argument, I will assume that a sequence analysis of M in EB will require underlying floating final tones for all surface monosyllabic noun roots. There is nothing inherently wrong with all these floating tones; floating tones have been posited in Hyman and Schuh (1974), and final floating stresses have been proposed in Wilkinson (to appear). EB nonetheless yields internal evidence that they ought not to be set up.

First, it turns out that only /CVC̃/, /CVC̃̃/ and /CVC̃̃̃/ noun roots can be justified in EB. Setting up /CVC/ roots would force an ad hoc rule to convert tautosyllabic HL to some other tone after retraction, since EB shows no roots with phonetic falling tones. Also, no root shows morphotonemic behavior derivable from intermediate tautosyllabic HL. Thus there is no evidence at all as to what phonetic tone HL should be converted to: the choice is arbitrary. To avoid these undesirable results, an MSC to the effect that floating final L doesn't occur after root H must be set up. This MSC is ad hoc, however, since /LL/, /HH/, /LH/ and /HL/ all occur regularly in roots when the final tone is supported: cf. /òkàlà/ 'mat', /èbóngá/ 'pillow', /èbàtá/ 'puddle' and /áfólà/ 'space, clearing'.⁴ An even more unlikely constraint on underlying tonal patterns must be stated if final floating H after root H and L after root L, whose justification in EB is weak, are rejected in a sequence analysis of M.

More evidence against deriving M from /LH/ comes from the distribution of phonetic M in polysyllabic noun roots. In /CVCV/ or /CVCVC/ roots all combinations of L and H may occur on the two

syllables. The distribution of phonetic M is not unlimited, but it is fairly wide. Thus we find /LM/, /MM/, /HM/ and /MH/; /ML/ apparently doesn't occur.⁵ Consider first such nouns as sòngò 'game played with a board and nut markers'. (The final M here is brought out by the tonal contours of sòngò nyù 'this songo game' and ányásá dì 'this rag'.)⁶ In a sequence analysis of M, the final M of sòngò can be derived by positing an underlying form /sòngò̃/ and stipulating that the floating H moves only to the final syllable when retracted. But now what of words like àsèlèk 'cricket' and àbàngák 'type of small tree'? àsèlèk and ngòmgbàn 'lemon' can be analyzed in the same way as sòngò, with underlying final floating H which is retracted only to the final L syllable, but àbàngák and òbàngám 'bias' present a problem. If their underlying representations are /àbàngák̃/ and /òbàngám̃/, they must be specially marked to insure that the final floating H is retracted onto both L root syllables. Tonemic /M/ may as well replace the lexical feature needed, however. The only alternative seems to be set up underlying forms /àbàngák̃̃/ etc. and stipulate that two final floating high tones are retracted to both L syllables of the root. Similarly, èjànètán 'fence with traps' would require /èjànètáñ̃̃/. This move is not very desirable either, however, as it may raise theoretical problems regarding the definition of syllables and also leads to violation of an EB MSC.

The analysis of sòngò as /sòngò̃/ presents a problem itself, for floating final tones were originally proposed only for surface consonant-final roots, where they supply the historical final vowels of such roots in a sense. Putting a floating H after the final vowels of sòngò and èngòmbe 'native harp' in their underlying representations results in deviant forms, since EB has a general MSC prohibiting final vowel (hence tone) sequences in polysyllabic roots (this MSC is also violated by iterated final floating tones). Indeed, surface vowel-final roots never show a second final vowel when a consonant-initial word follows, so a floating final tone in their underlying representations never has phonetic justification. I conclude that vowel-final nouns not containing M, like èsúmá 'monkey', èlòlè 'tame duck', mèvínlè 'ebony tree', etc., would be analyzed as not having final floating tones underlyingly in a sequence analysis.

Consider now nouns like àsimbá 'trick' and èvulá 'eyelid', which show medial M and final H. Their underlying representations will contain only one floating H, which will be retracted onto the medial L to yield the phonetic medial M. E.g. /àsimbá̃/ must then be marked as requiring retraction of floating H to the first root syllable, in contradistinction to /sòngò̃/, or the tone retraction rule must be made more complicated by explicitly mentioning the final H vowel in order to carry out the correct retraction. The latter move is clearly preferable. Rule (1) will insure that floating H is always moved over a final H vowel onto a preceding L; if there is no final H vowel, the floating H is moved to a final L vowel. (This rule does not show the additional complexity needed to move several floating H's onto L root syllables in succession.)

$$(1) \quad X \quad \begin{bmatrix} V \\ +\text{lowered} \end{bmatrix} \quad C_0^2 \quad \left(\begin{bmatrix} V \\ +\text{raised} \end{bmatrix} \right) \quad \begin{bmatrix} -\text{segment} \\ +\text{raised} \end{bmatrix} \# \Rightarrow 1 \quad \begin{bmatrix} 2 \\ +\text{rising} \end{bmatrix} \quad 3 \quad 4 \quad \emptyset \quad 6$$

1 2 3 4 5 6

Rule (1) will work correctly in the case of representations like /əmándák/ 'crop of fowl', phonetically əmándák, which cannot permit retraction of the floating H to the first root syllable; since no C is specified between terms 4 and 5 of (1), the rule doesn't apply to such forms. If nouns of the form $\check{V}\check{C}\check{V}\check{C}\check{V}\check{C}$ exist, the underlying representation would be / $\check{V}\check{C}\check{V}\check{C}\check{V}\check{C}$ /, with both floating H's correctly moved to the two root syllables. However, in genitival constructions like /èbàtá é méndím/ 'puddle of water', phonetically èbàtá méndím through regressive retraction of the dependent prefix H, (1) will incorrectly move the dependent prefix H across the final H vowel of /èbàtá/ to its first root syllable L after the dependent prefix vowel is deleted (section 3).⁸ To avoid *èbàtá méndím as an output, we must set up a separate rule for retracting dependent prefix tones or make (1) yet more complex. Since part of the justification for a sequence analysis of M resides in the independent need for a tone retraction rule, according to Alexandre (1962), the first alternative must be discarded. The second move cannot be accomplished by simply specifying a new term Y, with the condition that Y doesn't contain #, between terms 4 and 5 of (1), since this would also preclude the derivation of òkàlá fám 'mat of the man' from /òkàlá ó fám/. Rather, Y must be linked to the presence of term 4, such that if 4 is present Y cannot contain #. The result is a quite unnatural rule which casts doubt on the sequence analysis of M that led to its formulation.

3. Morphotonemic evidence against M from tone sequences.

The chief morphotonemic evidence for deriving M from /LH/ is the tonal pattern shown by nouns with surface monosyllabic roots in demonstrative, possessive and locative phrases. The tones on buffer schwa in ákó'ó dàm 'my stone' (àkók 'stone'), ákó'ó dàm 'my trail' (àkók 'trail') and ábò'ò dàm 'my bush-rat' (àbòk 'bush-rat') give concrete evidence for final floating tones. Another piece of supposed morphotonemic evidence is that Bulu independently needs a rule of progressive tone retraction to derive, e.g. òkàlá fám from /òkàlá ó fám/ via intermediate òkàlá ò fám. As argued at the end of the last section, however, a single rule for deriving M and the tonal patterns of genitive constructions is complex and unnatural. Furthermore, the rule must be made even more complex to account for the fact that tone retraction to produce M must result in addition of H to an L syllable, whereas retraction from deleted dependent prefixes results in replacement of L by H. The output from e.g. /àbùm é fám/ 'stomach of the man' must not be *àbùmè fám.⁹ Incorporation of this information into a "single" tone retraction rule renders the "independent support" for a sequence analysis of M virtually nil in EB.

In an analysis assuming /M/, the tones appearing on buffer schwa must be derived by rule: after ə is inserted, H is added if

the noun root syllable is H or M, and L is added if the root syllable is L. The rule needed for this can easily group H and M together as [-lowered], inserting H after [-lowered] and L after [+lowered]. Though this rule is simple formally, it does represent a complication of the grammar of EB. However, this cost is offset in feature-counting terms by a great savings of tonal features in lexical representations, since no floating tones are needed. Also, of course, assuming /M/ avoids violations of the MSC against successive final vowels and tones in polysyllabic roots. Furthermore, we will now see that the similar behavior of H and M in causing the addition of H on buffer schwa is paralleled elsewhere in EB.

An important piece of morphotonemic evidence for /M/ comes from reduplicated nouns.¹⁰ H and M noun roots show symmetric behavior with respect to the tones on reduplicated syllables; both seem to be at variance with L roots, which show a different pattern. For roots of CVC or CVCV form, reduplication involves copying the first C and the first V before the root. For instance, from the nouns òkòṅ 'disease' and kúm 'wealth' the nouns ḥkókòṅ 'sick person' and ḥkukúm 'rich person; chief' are formed. (/ɛ,ɔ/ are reduplicated as e, o and /a/ as ɛ.) The M root here takes H on the reduplicated syllable, and the H root takes M. This pattern is general, as shown by the class VI reduplicates òsusún 'little fly' and òkákáé 'little leaf' from /òsún/ 'fly' and /òkáké/ 'leaf' on one hand and òsòsòṅ 'little black ant' and òmvémvák 'small mongoose' from /èsòṅ/ 'black ant' and /mvák/ 'mongoose' on the other. Since no phonetic conditioning of the M on the reduplicated syllable of H roots is possible (cf. òkákáé wù 'this little leaf', where the prefix L which might have lowered a preceding H to M is itself raised to H), a morphological rule introducing M is necessary. Assuming underlying /M/, before which H is introduced on the reduplicated syllable, these facts can be described by:

$$(2) + C \begin{bmatrix} V \\ \text{-lowered} \\ \text{+raised} \end{bmatrix} C + \Rightarrow 1 \ 2 \begin{bmatrix} 3 \\ \text{-araised} \end{bmatrix} 4 \ 5$$

1 2 3 4 5

To account for the reduplication of L roots, as in m̀b̀ùb̀ùm̀ 'pregnant woman' from /à̀b̀ùm̀/ 'stomach' and òk̀òk̀ám̀ 'little akam tree' from /à̀k̀ám̀/, I assume a separate transformational rule to reduplicate the root L and put H on the root. Now (2) can be formulated only if underlying /M/ is assumed. If M derives from /LH/, separate rules must be set up to reduplicate M before H roots and H before /LH/ roots. A single rule for reduplicating L and phonetic M roots can be set up in a sequence analysis if final floating tones are copied across an intervening root L (not root H), but this represents a spurious generalization, since e.g. èl̀òl̀è 'tame duck' reduplicates as òl̀òl̀òl̀è 'little duck', not *òl̀òl̀òl̀è or *òl̀òl̀òl̀é. Such a rule would have to specifically mention the absence of a vowel support for final floating tones

in order not to incorrectly apply to èlòlè and other CVCV roots. This is an ad hoc complication in the rule; furthermore, a special rule is still needed to put H on L roots after reduplication in this analysis. It is better to assume (2) and a separate rule for the divergent reduplication of L monosyllabic roots. A simple rule can also be formulated for reduplicating disyllabic roots if second syllable tones, floating or otherwise, are ignored: H always appears on the reduplicated syllable (cf. òbèbàtá 'little puddle' from /èbàtá/, òbèbèngé 'little bell' from /àbèngé/, òkékátá 'little crab' from /kátá/ and òvévèlè 'little pool' from /èvélé/.)

Reduplication demonstrates a tonological relationship between H and M in providing support for tonemic /M/. There is a second morphotonemic process in EB which does the same thing. The words zá 'what' and ébé 'fellow-' require that a following noun with monosyllable root show a copy of the root vowel after the final consonant. Examples are ébé môtô 'fellow human being', ébé mvíní 'fellow mvín antelope' (as used, e.g., in a folktale) and ébé fáma 'fellow man', as well as zá mvòmò 'what sort of python', zá mvá'á 'what sort of mongoose' and zá kùlù 'what sort of tortoise'.¹¹ The first two examples show the same basic tonal pattern that would appear if buffer schwa had been added to the L noun /môtô/ and the M noun /mvín/. However, the third example has a tonal pattern other than that seen when buffer schwa is added to the H noun /fáma/, for the schwa takes H rather than M. If we have /fám'/, as required by the sequence analysis, a special rule changing final H to M when the root vowel of an H noun is copied is needed.

In an analysis that posits /M/ and no floating tones, however, the H appearing on the copied final vowel of an M root and the M on the copied final vowel of an H root are treated as a unitary phenomenon related to the tone reduplication carried out by rule (2). In fact, the vowel-copying process itself can be viewed as a kind of reduplication, so that a single rule for progressive and regressive reduplication in the appropriate morphological environments can be set up for monosyllabic noun roots, and rule (2) can be modified to carry out progressive and regressive tone reduplication for noun roots with H and M tone levels. The fact that tones on epenthetic schwa do not follow the tone copying pattern provided by modified (2) can be ascribed to the fact that epenthetic schwa is phonetically conditioned rather than an instance of reduplication.

There is also morphotonemic support for /M/ which does not rely on rule simplification due to explicit recognition of /H/ and /M/ as a toneme class defined by [-lowered]. Bulu allows several sorts of nouns to be derived from verb roots by prefixation of various noun class prefixes and change of the verb tone in some cases. Examples based on the disyllabic verb roots /bètè/ 'to lift', /tébè/ 'to stand' and /bìlì/ 'to be caught' (from /bì/ 'to catch') are àbèté 'lifting; jack', mbètè 'one who lifts', àtébé 'standing; stand', ntébè 'one who stands', àbìlì 'a place where one is caught', and mbìlì 'one who is caught'. Thus gerunds are formed by changing the final tone of the verb root (always L) to H. This is also borne out by longer derived verb forms, such as bòmòlò 'to hammer' (/bòm/ 'to strike'), which forms the gerund àbòmòlò 'hammering' as well as the agentive noun mbòmòlò 'one who hammers'.

Considering monosyllabic verb stems, we find that derived nouns often show a change from verb L to M. This is seen in âfûm 'whiteness' from /fûm/ 'to be white', êdûŋ 'rustling' from /dûŋ/ 'to rustle' and âdîp 'being obstructed' from /dîp/ 'to obstruct'. Of these, the second, with the class V singular prefix /ê-/ , is not formed by a regular pattern, but the other two represent the usual class IV gerund. Such forms appear at first to support the derivation of M from /LH/: the rule changing final L of disyllabic verb roots to H in the formation of gerunds can be extended to add a final floating H after monosyllabic L verb roots, and the normal tone retraction process will derive the M of the nominals. However, there are two problems with this.

First, although all disyllabic verb roots show raising of their final L to H in the formation of gerunds, not all monosyllabic L roots change this L to M in gerunds. Examples are âkâp 'sharing' from /kâp/ 'to share' and âvâk 'rejoicing' from /vâk/ 'to rejoice'. The retention of L here does not appear to be predictable on phonological grounds, so such roots must be marked not to undergo the rule adding final H. However, there are so many monosyllabic L verb roots which fail to undergo the rule that they cannot very well be treated as phonological exceptions. This, plus the fact that there are no exceptions among the disyllabic verb roots, makes it likely that two different rules are involved, that for disyllabic roots being essentially phonological and that for monosyllabic roots morphological. Such an analysis is supported by the fact that many M gerunds coming from L verbs are idiosyncratic regarding prefixation, like êdûŋ above and òkôn 'disease' (class VI), related to /kôn/ 'to be sick'.

Further evidence that morphological rules are involved in the derivation of mid tone monosyllabic deverbal nouns comes from the fact that nouns formed with class I or class II prefixes often show M when monosyllabic L verb roots are the source. Thus from /jûk/ 'to be bothered' and /fûk/ 'to mash' the class II nouns ñjûk 'bother' and mfûk 'mashed food' are formed (compare ñkûs 'purchase' from /kûs/ 'to buy'). Class I and II nouns formed from disyllabic verb roots never show raising of the final L, however, as shown by mbêtê etc. above (class I) and by ñkôbô 'talk' (class II) from /kôbô/ 'to talk'. Hence we must have a special rule to derive the mid tones on the nominals from monosyllabic verbs. (The rule deriving class IV gerunds is obviously irrelevant, since classes I and II are involved.) Because many class I or II nominals from L monosyllabic verbs retain the verb L, such as ñkûs 'purchase' from /kûs/ 'to buy', this rule must furthermore be morphological. Rather than add floating H to the L verb roots undergoing it, which requires a more complex rule unsupported by other data, the rule may better change L to M by simply respecifying [+lowered] as [-lowered] in the context of morphemes marked to undergo it. The same is true of the morphological rule needed in the derivation of class IV gerunds and isolated nominals like òkôn. All of this, in turn, supports tonemic /M/, since segments or suprasegments derived directly by morphological rules are by definition phonemic. An intermediate stage /LH/ has been eliminated here, forcing M into the status of a toneme.

4. Conclusion

It has been shown in the preceding sections that the optimal formulation of several EB morphotonemic rules seems to require underlying /M/ along with /L/ and /H/ and that the distribution of M in EB morphemes is such that a sequence analysis of this tone is rather contrived. None of this evidence forces us unconditionally to give up the more abstract sequence analysis of M; rather it only gives a strong indication that the sequence analysis is wrong and that EB has phonemicized a mid tone. One might expect EB to further restructure the distribution of M in morphemes and further level morphotonemic processes pointing to /LH/ rather than /M/ if this tone is now tonemic, however. For example, a spread of M into the first syllables of disyllabic noun roots with second syllable L (see fn. 6) would destroy the possibility of a sequence analysis for M. Similarly, a spread of M into verbal morphotonemic patterns might have such an effect. As far as I can tell, EB verbs in isolation mainly contrast in only L and H, but there are a few verb roots which seem to show M in isolation or clause-finally, examples being dí 'eat' and yén 'see' (cf. bà 'cut into pieces', dí 'eat' and fák 'dig'). I have found no cases where this apparent M occurs in context, however. One might expect /M/ to spread into verb roots more pervasively. Only observation of the future development of EB could provide this kind of evidence for tonemic /M/.

Tonemic /M/ might also be supported by evidence from borrowing. For instance, if /CVCé/ noun roots from some neighboring language characteristically lost the final /e/ in EB but did not uniformly develop M on the resulting monosyllabic root (e.g. retained L on the root in a high proportion of cases), this would presumably constitute evidence that a rule converting /LH/ to M is not a synchronic part of EB. At present, unfortunately, I have no data of this sort.

There is one piece of evidence exterior to the structure of EB itself which does suggest a phonemic mid tone, however. This comes from drum language as practiced at Ebolowa. Alexandre (1969) and von Hagen (1914) both state that only H and L are sounded in Bulu drum language, and the former says this indicates that Bulu has only these tones as tonemes. My informant, who has more than average familiarity with and interest in drum language (his uncle being a drummer), tells me that a skilled drummer will in fact sound M as well as L and H. An example showing all three lexical tone levels is zá'á wó wùlù étó jì 'come quickly' (lit. 'come, you walk this seat/place') from /zù+ák wó wùlù étó jì/, where the M on the root of /étó/ 'seat' is drummed along with the underlying and derived H's and L's in the rest of the sentence. On the other hand, tonetic M derived from /H/ by downstepping is not drummed, according to Mr. Etua, though in a short example like à ngáá !wú 'he may die' from /a ngáá wú/ (compare à ngá wú 'he died' from /a ngá wú/) the derived M on wú would not be impossible to render, even if this sentence were embedded in a longer drummed expression. Since EB drum language seems to reproduce lexical (contrastive) M regularly, but not the noncontrastive downstepped H, Alexandre's own argument may indicate that the former has a "psychologically real", i.e. tonemic, status in the language.¹²

Footnotes

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¹Some of my data is drawn from Bates (1926), with corroboration from Mr. Etua. In general, the Bulu described by Bates correlates closely with Mr. Etua's speech; both forms of Bulu seem to diverge considerably from the language described by Alexandre (1962, 1966) in tonetics and tonology. For instance, Alexandre (1962) scarcely recognizes mid tone on nouns, whereas I have found large numbers of minimal noun pairs and even triples which are distinguished by M vs. L and/or H. When Alexandre does show M on a surface monosyllabic noun root, he derives it from an underlying sequence /HL/, which never appears phonetically on a single syllable, but he does not definitely decide whether the final L is to be supported by a vowel. Alexandre (1962) also posits underlying /CVC̣/, /CVC̣̣/ and /CVC̣̣̣/ roots, possibly with final vowels, which result in H, L and rising tone surface roots respectively. As stated below in the text, this is done largely to establish symmetry in the underlying forms of nouns (all are "disyllabic") and to bring Bulu into conformity with usual Bantu root structure. Disposing of tonemic /M/ and rising tone in favor of /HL/ and /LH/ spread over two syllables also makes Bulu tonal structure look more like the usual two tone Bantu system.

The tonal features used in this article are taken from Fromkin (1972). To save space, I do not indicate a morpheme boundary between noun prefixes and roots. Singular prefixes are either single vowels or nasals, and thus easily recognizable.

²Deriving M from /LH/ is correct etymologically, for Bulu monosyllabic noun roots in M are generally cognate to Ewondo roots with a rising tone (e.g. Bulu àsòŋ 'tooth' and Ewondo àsòŋ). The absence of phonetic rising tone on any EB monosyllabic roots makes it possible to automatically convert tautosyllabic LH to M. Historically, the EB M monosyllabic roots were no doubt disyllabic with L on the first syllable and H on the second, the latter containing full vowels which were later weakened and lost. The ancestors of EB monosyllabic roots with other tones would also be disyllabic, undergoing the same truncation (see Alexandre's generalized analysis of surface monosyllabic roots, which reflects these changes, as outlined in footnote 1).

I also point out here that prefix L on nouns is raised to H in demonstrative, possessive and locative phrases: hence àsòŋé dî 'this tooth' from /àsòŋ̣ di/ in a sequence analysis. The tone on the demonstrative adjective /di/ is derived by a general rule.

³The allophones of /ɛ/ actually present a more complicated picture. ɛ appears before non-velar nasal consonants; ɛ̣ appears before velar consonants and word-finally; a rather fronted mid central vowel occurs elsewhere. These details do not affect the arguments in the text.

⁴Such an MSC is not needed for the Bulu described by Alexandre, where there is evidence for underlying /CVC/ as well as the three other possible disyllabic combinations of L and H (see footnote 1).

⁵Bates (1926) shows a few nouns, such as zombò 'old male mandrill', which seem to have second syllable M and final syllable L. However, I have not been able to reproduce this data. After much probing and discussion, Mr. Etua and I tentatively conclude that ML roots do not exist in EB. There are nouns like ébándá 'bridge' and ékángá 'native hospitalization' which sometimes seem to show second syllable M when pronounced in isolation, but this M always disappears in context. If EB is moving away from underlying /LH/ toward /M/, it is perhaps not surprising that ML roots should be the last to appear, since these are derivationally least compatible with the original /LH/ (section 4).

⁶In general, the pitch contour of a demonstrative etc. phrase having a noun head with a supported high tone seems to be uniformly higher than the contours of phrases whose heads have only supported M or L tones. Thus the contour of ákó'ó dī 'this stone' below in the text, from /ákók di/, is higher than that of ákó'ó dī 'this trail', from /ákók di/, even though tones that must be considered H occur phonetically in both. Likewise the contours of áféndé'é dī 'this linden tree' and émándá'á jī 'this crop' (/émándák/) are higher than those of ásèlè'é dī 'this cricket' (/àsèlèk/) and ábàngá'á dī 'this abangak tree' (/ábàngák/); ányásá dī differs similarly from (é)sòngó nyù. This "high contour" vs. "mid contour" and "low contour" makes it easy to distinguish the difference between supported /H/, /M/ and /L/ in context. Some kind of rule which raises the pitch of entire phrases must be posited when supported /H/ is present.

In ákó'ó dī above /k/ shows regular conversion to ? inter-focally: a copy of root /ɔ/ appears finally after this ? rather than buffer schwa.

⁷We may assume that the leftmost floating H would always be moved to the first root L syllable in these examples, with the rightmost floating H remaining behind on buffer schwa if it is inserted. Note that a properly generalized version of (1) is needed to retract the floating H of /émándák/ to the final H syllable.

⁸The application of (1) cannot be blocked here by ordering a regressive tone movement rule before (1), since forms like àwùtá bēfám 'bad luck (in hunting) of the man' from /àwùtá é bēfám/ show both progressive and regressive tone movement, thus requiring simultaneous application of the rules.

⁹I note here that in all the morphotonic arguments in this section one might get around the evidence for tonemic /M/ by ordering the tone retraction rule before the morphotonic rules involved. Such a use of ordering is plainly intolerable in the absence of independent motivation for the required order, however. Furthermore, such a move is bound to fail anyway, since the tone retraction rule itself gives some evidence for tonemic /M/. In particular, when the H of a dependent prefix is retracted onto the final L vowel or buffer schwa of a preceding noun, this H is

lowered to M when the first tone of the following noun is L. Thus we have àbùmé mòt 'stomach of the person' from /àbùm é mòt/, but àbùmé kòs 'stomach of the fish' and àbùmé fám 'stomach of the man'. Since nouns with a final H vowel do not show such lowering in genitival constructions (cf. ànyàsá mòt 'rag of the person'), it cannot be phonetically conditioned, and must be made part of the tone retraction rule. Both the environment and the structural change of the latter can be formulated more simply if /M/ is assumed. Hence we must have two separate retraction rules in a sequence analysis of M if /LH/ is to be converted to M before retraction of H from dependent prefixes occurs.

¹⁰Reduplication is productive in Fang, and rather productive in EB, but apparently not so productive in more northerly dialects of Bulu. My informants accept the examples below in the text, though they find some of them a bit unusual. The MH tonal pattern on òsúsún 'little fly' from /òsún/ etc. is noted by Good (1936), but not by Alexandre (1966).

¹¹The final H of mvini here seems to fall slightly, though this fall is not so noticeable in the case of e.g. zá mvá?á 'what sort of mongoose?' from /zá mvak/. I assume that a special variable rule applies to derive the slight fall on final H in these constructions after the H is inserted by modified (2). The same fall is derived on the final supported tones of kátá 'crab' and sòngó.

EB proper names like Àkónó (àkón 'pillar') and Àsónó (àsón 'tooth') also show reduplicated final vowels. Alexandre (1962) takes proper names to be evidence for his sequence analysis, but in fact they present a problem for a sequence analysis in EB, since a few M monosyllabic noun roots are related to names with an HL sequence (cf. Àwómó, related to àwóm 'ten'). Such data makes it impossible to tell what tone sequence M should come from in EB. (Note that àwóm shows normal M root behavior in àwómé fón '10 ears of corn'.) I assume that the EB proper names are separate lexical entries related to corresponding common nouns by redundancy rules of some sort. This analysis is supported by the fact that the names are not analyzable into prefix plus root: the plural of Òyòn (related to /ò+yòn/ 'dry season') is not *Àyòn (cf. /à+yòn/ 'dry seasons') but rather Bòyòn from /bè+òyòn/, gotten by adding the class I plural prefix /bè-/ to Òyòn, as in Bòyòn bàbáé 'two people named Oyon'. Likewise 'this Oyon' is Òyònè nyú, with class I singular adjective nyú, rather than *Òyònè wú, which one would expect if initial ò here were the class VI singular prefix.

¹²It seems clear that EB drumming could not reproduce downstep and downdrift over long stretches of speech, since this would require too many tonal distinctions on the drum. The reproduction of tonetic variants like downstepped H (noncontrastive since e.g. /ngáá/ 'future' is distinguished from /ngá/ 'past' by vowel length) over short stretches cannot be ruled out a priori, however. Jack Berry (personal communication) informs me that phonetic phenomena like gliding tones are represented in Akan drum language.

It is also noteworthy that Bulu /M/ undergoes downstepping just as /H/ does. This is shown by the difference between

à ngáá wó'ó !nón 'he may hear the bird' from /a ngáá wók ònón/
 and à ngá wó'ó nón 'he heard the bird' from /a ngá wók ònón/.

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