

THE TONOLOGY OF LOMÓNGO REDUPLICATION

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Reduplication is a pervasive morphological process in Lomóngo,¹ applying to all classes of lexical items. This paper deals mainly with the tonology of reduplication, with some discussion of related problems in segmental morphophonology. The surface segments and tone patterns of reduplicated forms are consistently predictable only in terms of more abstract underlying forms and phono/tonological derivational rules. With few exceptions, it can be shown that regular reduplicative forms are derived by the same rules needed in less exotic portions of the grammar: a logical enough result not entirely obvious from a cursory glance at the data. Furthermore, Hulstaert's observation [1965: II.229] that "(partial) prereduplication is tonally equivalent to total reduplication" will be seen to have the wider application that 'total' and 'partial' reduplication are identical in deep structure, differing by rules that affect morphological length but not tonal contour. Another interesting aspect of much of the tonology of reduplication (implications of which are considered in Lovins [1971b]) is that the rules frequently apply in such a way that the melodic patterns of the unreduplicated and corresponding reduplicative words are the same, rather than duplicate sequences of tones being added to the (surface) form as syllables are in the course of reduplication. This is a possible but not necessary consequence of the action of independently justified tonological rules on underlying forms to which tones have of course been 'added' along with reduplicating syllables.

The underlying identity of 'total' and 'partial' reduplication will

¹My information on this group of Bantu tone dialects comes from G. Hulstaert's Grammaire du lomóngo [1962, 1965]. All references are to volume and page numbers in this work. I am also indebted to Hulstaert for some very helpful supplementary data and for his comments on an earlier draft of this paper. Examples are from several 'base' dialects unless otherwise noted; some dialect comparisons have been crucial to the analysis.

first be demonstrated, through examination of prereduplicated verb radicals. (Such prereduplicated verb forms have an 'intensive' or 'iterative' sense.) A radical R may be followed by one or more 'extensions' E; the verb is completed by a suffix or 'desinence' D. The prereduplication will be referred to as R', and -(R')-R-(E)- as a 'base'. Since only the first syllable of a radical has lexical tone (i.e. it is subject to a limited number of types of tonological alterations), the sequence -R'-R- behaves in turn like -R-E-: the original radical takes on the character of an extension, as far as the tone rules go. In particular, the new 'extension' R is subject to an obligatory regressive assimilation rule for verbs which will be referred to as the monotony rule: all extensionary syllables take on the tone of the first syllable of the (following) desinence.

Hulstaert also distinguishes between radicals beginning with a consonant and those beginning with a vowel, and another goal of our analysis will be to give as similar a treatment for the two as possible. Taking up C-radicals first, the possible tonal results of 'partial' prereduplication may be summarized as follows, where the underlying tone of R' is a copy of that on R:

(1)	<u>R'</u>	<u>R</u>	<u>D</u>
	L<L	L<L	L
	LH<L	H<L	H
	HL<H	L<H	L
	H<H	H<H	H

Examples are given in (2), with an arbitrary vowel standing for D and low tone (˘) not marked.

(2a)	/sik/	'stop'	-sa-sik-V
(2b)			-sǎ-sík-Ů
(2c)	/lóm̃b/	'be shy'	-lâ-lomb-V
(2d)			-lǎ-lóm̃b-Ů
(2e)	/tǎb/ ²	'jump'	-tâ-ta-V

²G. Hulstaert has kindly brought to my attention the fact that the

(2f)

-tá-tá- \acute{V}

The surface tone of R' appears to be that of R before reduplication, combined with that of R after reduplication and subsequent application of the monotony rule. We could account for the glides by an additional rule of partial regressive assimilation, so that (2b) would have a tonal derivation like this:

(3)	<u>R'</u>	<u>R</u>	<u>D</u>
		L	H
	L		reduplication
		H	monotony rule
	LH		partial regressive assimilation

But this is an ad hoc solution, as is suggested by a look at 'total' reduplication of V-radicals (which are never partially reduplicated).

Examples are

(4a)	/amb/	'receive'	-amb-amb-V
(4b)			-amb- \acute{a} mb- \acute{V}
(4c)	/áts/	'split'	-áts-ats-V
(4d)			-áts- \acute{a} ts- \acute{V}

The tone of R is again determined by the monotony rule, but there is no partial regressive assimilation onto R' (the level underlying tone of R' remains so). The inconsistencies are resolved by following Hulstaert's hint [1965:II.229] that for C-radicals the rules work as if the prereduplication included two syllables, the first carrying the lexical tone and the second 'purely supplementary'. That is, we add a dummy vowel /-a-/ to R', immediately after R' is inserted by copying R. After application of the monotony rule, which affects the new extension E' but not R', the original vowel of R' is deleted. Schematically,

form -tá- 'jump' cited on II.228 is shown elsewhere in the grammar to be underlying /táb/, with the usual application of intervocalic /b/-deletion (see below). The underlying form CVC is attested in words with /b/ appearing on the surface, as well as here by the tonological behavior of the radical in prereduplication.

- (5) $/CV_{\alpha T}C_0^2/ \rightarrow CV_{\alpha T}C_0^2-a-CV_{\alpha T}C_0^2-V_{\beta T}$
- $CV_{\alpha T}-a_{\beta T}-CV_{\beta T}C_0^2-V_{\beta T}$ monotony rule; generalized version of /b/-deletion
- $Ca_{\alpha T, \beta T}-CV_{\beta T}C_0^2-V_{\beta T}$ vowel-elision and tone composition

The rules cited in (5), typical of Lom̄nḡo tonology, are easily described: Intervocalic /b/-deletion is a fairly general process at the beginning of a word, as is the elision of the first of two adjacent vowels. Both are seen, in that order, in the form

- (6) $/botám\acute{b}\acute{a} b\acute{o}kw\acute{e}k\acute{i}/ \rightarrow botám\acute{b}\acute{o}kw\acute{e}k\acute{i}$ 'the tree fell'

Tone composition is the usual result of such vocalic elision: the tones of what were two syllables are combined on the one remaining. The outcome may be a tritone, as LHL in (7), or even, sometimes, a LHLH glide:

- (7) $/b\check{o}m\check{o} botám\acute{b}\acute{a}/ \rightarrow b\check{o}m\check{o}tám\acute{b}\acute{a}$

An occasional alternative to tone composition, when elision has taken place, is a form of total progressive assimilation characteristic of certain vocalic prefixes (/e-/ , /o-/ , /a-/): the prefix vowel assumes the tone of a preceding vowel, which otherwise vanishes completely.

Returning to (5), we see that this sort of derivation reduces a 'total' reduplication of a C-radical to a 'partial' one for each of the forms in (2), without resorting to any additional rules to obtain the /a/ in, or the glide on, R'. For example, corresponding to (2b) again (cf. (3)) we have

- (8) $/sik/ \rightarrow$
- | | |
|--|-----------------------------|
| $sik-a-sik-\acute{V}$ | |
| $sik-\acute{a}-s\acute{f}k-\acute{V}$ | monotony rule |
| $si-\acute{a}-s\acute{f}k-\acute{V}^3$ | consonant deletion |
| $s\check{a}-s\acute{f}k-\acute{V}$ | V-elision, tone composition |

³This stage of the derivation may be attested in the speech of the

The dialectal forms in (9) support this analysis: they too have /-a-/ inserted between R' and R, and subject to the monotony rule. But the final consonant cluster of the reduplicated radical remains in R', so there is no vocalic sequence to instigate elision and tone composition. That is, the crucial difference between total and partial reduplication for C-radicals is merely the failure of consonant deletion to apply in the former case. All other differences are a necessary consequence of omitting this one rule.

(9a)	/lamb/	'creep'	-lamb-a-lamb-V
(9b)			-lamb-á-lámb-V̂
(9c)	/bím̄b/	'throw'	-bím̄b-a-bím̄b-V
(9d)			-bím̄b-á-bím̄b-V̂

In the case of V-radicals, no consonants are deleted either. Thus the initial vowel of R' is not involved in any elision and tone composition. We have the option of positing an inserted /-a-/ after R', as for C-radicals: Such a vowel would take on the tone of the vowel in R by the monotony rule and then be elided before this vowel, leaving no trace. But it will be suggested on the basis of later evidence that consistency is best served by not inserting /-a-/ in V-reduplicatives and then deleting it, even though this differentiates the initial stages of the derivations of consonantal and vocalic reduplications. The latter require simply one application of the monotony rule, to the vowel of R. (Cf. the more complicated treatment in Lovins [1971a; 1971b].)

The verb bases derived in this fashion may be used to form substantives as well as verbs, with the substantive endings asserting their tonality through the monotony rule. Examples are

Nkengo [Hulstaert 1970:25]: the only two prereduplicated verb forms observed were -kʃakɛf- ([kyâkɛf]) 'look all around' and -sʃaseng- ([syâseng]) 'beg' (with low-toned desinence). Hulstaert comments that "We would need other examples with other radical vowels to ascertain whether this [l] is part of the formation or whether it is a representation of the radical vowel /ɛ/ of these two verbs."

(10a)	/sik/	'stop'	/bo-sik-a-sik-á/ →	
			bosásíká	'hesitation'
			also note: bosasiko	'hesitation'
(10b)	/nóng/	'be unsteady'	bonânongo	'oscillation'
(10c)	/béng/		ebábéngá	'unstable person'

Deverbal substantives (formed on unreduplicated verb bases) [Hulstaert 1965:II.92-94] may involve 'total' reduplication including an original E, not just a monosyllabic radical. Representative examples are

(11a)	/lé/	'eat'	ε-lé lé	
(11b)	/sang/	'say'	e-sangásanga	
(11c)	/fím /	'refuse'	e-fímáfíma	
(11d)	/sangol/	'inherit'	e-sangó ásangola	
(11e)	/sángol/	'lift'	e-sángó ásángola	
(11f)	/falangany/	'spill'	e-falángányáfalanganya	
(11g)	/as/	'look for'	-asása	
(11h)	/ungutsw/	'get confused'	-ungútswúngutswa	
(11i)	/ft/	'expel'	ʔtfta (note (regular) elision of /ə-/)	
(11j)	/úngusan/	'get lost'	úngúsánúngusana	(ditto)

It is clear that these tone patterns are not accounted for by the above analysis, but no major refinements are needed. Suppose we take the underlying form

(12) -R'(E')ááR(E)á

for all consonant-base words in (11) except those with CV radicals. The first of the two inserted medial vowels makes the extensions of R' H, by the monotony rule, then elides before the second, yielding /-á-/ by tone composition. The suffixed final /-á/ likewise determines the tone of the extensions of R by the monotony rule (so they are always L). All rules apply in the same order as before, but the monotony rule applies to two sequences within the word rather than one. This involves keeping R distinct as a radical--it is not subordinated to the tonological role of an extension, and maintains its lexical tone. The same boundary or whatever that does this gives /-áá-/ its desinential

character (ability to trigger the monotony rule). The second-desinence-effect may be more explicitly attributed to the presence of /-á-/ , as is demonstrated by the V-base examples in (11). Hulstaert explicitly proposes underlying forms like /-as-á-as-a/ → -asâsa, for (11g), with elision of the first of the two medial vowels. If we also add /-à-/ following B' for high-toned V-bases, the derived high tones on E' in e.g. (11j) follow immediately. A representation of the underlying form for V-based words in (11) is

(13) R'(E')á R(E)â

At this point there must be different underlying forms for C-bases and V-bases, as regards /a/-insertion. If B' is followed by /-á-/ in V-base deverbal substantives, an extra /-à-/ is not only unnecessary but incorrect. As mentioned previously, the difference between stem-types that was optional for simple verb-base reduplications should be definitely imposed on the basis of what happens to deverbal substantives, rather than making a distinction between the two types of reduplication on such grounds.

It is implicit in this analysis that /-à-/ and /-â-/ in (12) should not be regarded as the same sort of entity: the one is an extra vowel dictated by the consonantal radical, the other a suffix to the whole word.

None of the above, unfortunately, applies to (11a): radicals of the form CV are simply reduplicated, with no infixal or suffixal /a/'s added. Two ways of describing this exceptional behavior come to mind. First, it may just be labelled as exceptional, possibly limited to deverbal substantives of the form CV. A second treatment is to class CV bases with V-bases and specify that /-à-/ is inserted only in certain consonant-dominated environments, bringing out the epenthetic nature of /-à-/ for reduplicative verb stems and deverbal substantives alike; but no satisfactory statement of the relevant environments has been reached.

The /...-á-...-â/ pattern for reduplicated forms is a very common one, though there are still a few derivational quirks to be mentioned.

'Partial' reduplication for deverbal substantives, like those discussed just above, may occur with CVC radicals to yield forms like

(14a) /kəl/ 'do' e-kě-kəl-a

(14b) /tél/ 'predict' e-té-tél-a

Dialectally the vowel of R' may be /a/; but if the original vowel is retained, as it is in (14), we are apparently faced with elision of the second vowel in a sequence (after consonant deletion). (We cannot omit /-ǎ-/ to begin with, since it is needed to obtain glides on R', as in (14a).) This is not a unique occurrence in the general phonology of Lómóngó, and can probably be safely viewed as a minor rule. In some dialects [Hulstaert 1965:I.155, 162] /a/ is intercalated between two words, the first of which loses a vocalic ending and the second the prefix /bǐ-/ (which becomes /?/); the tone of the /a/ is the combination of those of the two vowels that have been elided. The significant point is that here /-ǐ-/ elides after /a/, yielding up its tone to it.

Second-vowel elision also occurs in reduplicative gerundive forms of the verb, which have /N̂-/ prefix and desinence /-ǎ/. The possible surface forms [Hulstaert 1965:II.457] of such gerundives are exemplified by

(15a) /sak/ 'fish' n-sǎ-sak-a

(15b) /sák/ 'prevent' n-sǎ-sák-a

(15c) /ít/ 'smoke-dry' nj-ǐ-ít-a

(15d) /ít/ 'hunt' nj-ǐ-ít-a

Hulstaert proposes /ñ-ít-ǎ-ít-ǎ/ for (15d), with elision of /t-ǎ-/. The underlying form

(16) /ñR'ǎRǎ/

is valid for all cases. Note that in e.g. (15c) there is no apparent motivation for the glide's ending up on the vowel of R', not on that of R; normally the tone of an elided vowel would go onto the vowel following it. But it is of course impossible to distinguish [njǐíta] from [njítta] phonetically, and indeed Hulstaert cites both [nju(t)íta] and

This will be considered further below. A description of the tonology may be based on the following examples:

(23a)	bo-nto	'person'	e-nto-nto	'giant'
(23b)	nyama	'animal'	bo-nya-nyama	'the animal kingdom'
(23c)	lo-kolé	'tom-tom'	i-kǎ-kolé	'little tom-tom'
(23d)	e-sé	'village'	bo-sê-se	'all the villages'
(23e)	mbóka	'road'	e-mbâ-mboka	'large road'
(23f)	li-tóli	'ear'	i-tâ-toi	'little ear'
(23g)	bo-támhá	'tree'	i-tá-támhá	'shrub'
(24a)	w-ili	'root'	y-ii-iii	'rootlet'
(24b)	y-ukú	'wasp'	y-uk-úkú	'small wasp'
(24c)	b-ási	'water'	w-ás-asi	'juicy'
(24d)	y-ómba (/ómba/)	'thing'	y-ómb-omba	'little thing'
(24e)	w-ányá	'intelligence'	y-ány-ányá	'small intelligence'
(24f)	y-ífo (/ífo/)	'match'	y-íf-ífo	'little match'

(In (23a, b, g) and (24a, e, f) both the plain and reduplicative forms have a level tone contour that remains so by copying. The second vowel of R' is elided before the first one of R for V-stems, with tone composition applying vacuously; the second syllable of R' is deleted for C-stems, with analogous results. LH stems ((23c), (24b)) undergo a similar process, but this time tone composition gives us LH-LH reduplicative forms--the only exception to the generalization that the melody of the word is retained in reduplication. For reduplicatives based on HL stems ((23e, f), (24c, d)) or H monosyllabics ((23d)) have the tonal contour HL-L(L) or H-LL, melodically equivalent to HL. The lowered tone of the first syllable of R is unaccounted for by any rules proposed so far. (In the previous discussions cited, it was proposed--with a regrettably incorrect attribution to Hulstaert--that the lowered tone might in the case of V-stems be the result of total progressive assimilation, as described above for certain cases of vocalic elision,

rather than the usual tone composition: the first L on R would be imposed by the second (L) vowel in R'. This proposal contradicts a fairly substantial generalization about Lom̄nḡo tonology (a L tone does not normally override a following H one) and fails to account for the same sort of tone-lowering in C-stems.) The remaining alternative at present is some sort of constraint on surface HLHL tone melodies. Such a tone pattern is rare for words, non-existent on single syllables. Also, it would in this case violate the principle of melodic constancy. Violation of this principle for LH reduplications is concomitant with the ubiquitousness of LHLH tone contours. I am not suggesting any particular cause-and-effect relation, but a joint consideration of these facts makes a constraint proposal the more plausible; even though it may mean abandoning the assignment of tone patterns according to purely tonological rules and instituting a role for phrasal pitch assignment as well. (See also Lovins [1971b].)

As yet unexplained too is the occurrence of forms like [it̄atō] 'little ear' in one dialect, [it̄otō] in another, where neither of the underlying vowels of R' surfaces in the first instance. Whereas in (5) etc. the insertion of /-a-/ necessary for tonological reasons also gave /a/ as the constant vowel in R', after elision of the original vowel, in nominal reduplications we cannot plausibly insert an extra vowel, for several reasons: First, because this would mean eliding two stem vowels, if neither is /a/, and second, because the inserted vowel would in all cases have its tonality determined solely by that of the vowels of R', and in every other case of /a/-insertion presented this vowel has either been affected by the monotony rule or had its own underlying tone which surfaced by tone composition. It appears that in (22) we have to do not with a juxtaposition-and-elision phenomenon (with or without /a/-insertion), but rather with a substitution that also assigns to /a/ the derived tone of the reduced form of R', by some mechanism not further specifiable here. It is easiest to say, as we did above, that this reduced form is R'(=R) minus its final syllable (substitution occurs only with disyllabic stems): that e.g. the first reduplicative form in (22) is derived from the second. But Hulstaert's

observation [1965:II.24] that substitution of /a/ is much more frequent if the original second vowel of R' is /a/ ("In the base dialects this [substitution] always happens if the final [vowel] is /a/, but sometimes also when it is another vowel") implies a more complicated process. Such forms with surface /a/ in R' and original final /a/ (as in (22)) could be derived simply by the familiar means of deleting the first vowel and second consonant in R', leaving the final /a/. This introduces two ways of deriving the same sort of reduplicative forms, each applying depending on the identity of the final vowel of the stem--which does not seem at all the right approach, doubly so since in some dialects the first vowel is always retained whether or not the second one is /a/ [Hulstaert 1965:II.24]. Keeping the derivation uniform--removal of the final syllable of R', then possible later /a/-substitution, the disproportionate influence of underlying stem-final /a/ on /a/-substitution might be attributed to the fact that a second type of derivation having the same result is indeed possible. We then have a consistent analysis plus a 'reinforcing' factor for a certain kind of rule application.

A final question about /a/-substitution is why the vowel of a monosyllabic stem is always preserved [Hulstaert 1965:II.24]. This exception is a difficult one to state because of H monosyllabic stems like /nsé/ that act like disyllabic HL stems in reduplicating (i.e. are disyllabic in deep structure), to the extent that the vowel of R assumes a low tone, and that of R' a glide: [insêse] 'small fish'.⁴ The only aspect of the derivation that distinguishes forms like this from e.g. [ikâkota] 'little old woman', structurally speaking, is that R ends up monosyllabic in the one case, disyllabic in the other. This is not a very appealing environment for which to specify /a/-substitution ("more than one syllable following R' "), and I will leave the question open. On the other hand, this approach is consistent with the hypothesis

⁴Hulstaert notes that some monosyllabic stems (though not /nsé/) are disyllabic in Pygmoid dialects, and suggests that this is fruitful ground for diachronic investigation.

that /a/-substitution is a purely 'surface' matter, occurring after all other rules have applied.

All of the nominal reduplications mentioned so far have been 'regular' in that the tone of R' bears a motivated resemblance to that of R; the derivation begins with a complete copying. There are however reduplicated forms that look rather different:

(25a)	njúťú	'stench'	bo-nju-njúťú	'great stench'
(25b)	bo-nkámá	'one hundred'	e-nka-nkámá	'hundreds'
(25c)	mpósá	'desire'	e-mpa-mpósá	'passion'
(25d)	bo-(n)tóné	(name of plant)	lo-(n)to-(n)tóné	
(25e)	mbéíá	'call'	bo-mba-mbéíá	'many calls'
(25f)	mpímbó	'aroma'	bo-mpi-mpímbó	'aromatic'
(25g)	ndéngé		bo-nde-ndéngé	'varied'
(25h)	njáíé	'river'	bo-nja-njáíé	'riverside'
(25i)	lo-mbóíé	(kind of fruit)	i-mbo-mbóíé	(kind of plant)
(25j)	bo-mpéíé	'lassitude'	i-mpε-mpéíé	'idle'

Compare (23g), etc. Other exceptional forms are

(26a)	bo-mbánga	(name of plant)	lo-mbǎ-angá	
(26b)	lǒma	'temerity'	mp-óm-ǒmá	'intrepidity'
(26c)	i-mpínga	'piece'	i-mpǎ-mpínga	'heap'
(26d)	linsímí	'taciturnity'	bo-nsĩ-nsími	'low voice'

The words in (25) and (26) are 'frozen' in the language--they are not derived by productive rules. The data suggest that an initial nasal is a necessary, but not sufficient, condition for following these patterns.

Examples (25) present no great difficulty if one posits a rule that lowers the vowel of R'. The H final vowels in R, in (26a, b), remain a puzzle; nor do the last two examples look very hopeful for neat derivations. However, the proposed unreduplicated forms are somewhat tentative, and there is also a possibility of tone movement in one form or the other since the original derivation occurred.

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