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Tone in Runyankore verb stem reduplication

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Abstract

In this paper I describe the surprisingly extensive range of choices Runyankore speakers have in "devaluative-frequentative" verb stem reduplication ("to sort of do X, to do X here and there, to do X a lot"). Analyzed as stem-compounding, both single (stem1-stem2) and multiple (stem1-stem2-stem3...) reduplication are possible of a stem such as *furumuka* "dash out" (*furumuka-furumuka*(*-furumuka*...)), with the possibility of left-aligned truncation (*furu-furumuka, furumu-furumuka*), right-aligned truncation (*furumuka-muka, furumuka-rumuka*) and both (*furu-furumuka-muka*). In addition, prefinal stems can alternatively end in "replacive [a]" (*fura-furumuka, furuma-furumuka*). Complementing these variants is a "mixed" system where both stems are truncated (*furumu-rumuka*), to which additional reduplicated stems can also be added (*furu-furumu-rumuka-muka*). While each reduplicated stem is free to choose its shape independently of the others (e.g. *furu-furuma-furumuka, furuma-furu-furumuka* etc.), the same three possible H(igh) stem-tone patterns are observed in different inflections, predictable from the input tones: /H/ on the first stem, /H/ on the last stem, /H/ on the second mora of any stem (au choix). I show that these facts require each stem to be independently derived from the same (complete) morphological and phonological input with tone assigned prior to truncation, thereby directly supporting both reduplication as compounding (Downing 2003) and morphological doubling theory (MDT) (Inkelas & Zoll 2005).

Keywords: Reduplication, tone, Bantu, Runyankore, truncation

1. Introduction

A major area where Laura Downing has made a lasting contribution is in her empirical and theoretical work on reduplication. Both in Bantu and beyond, her influence has been extensive. This will be particularly evident in the present study which I offer in her honor. In what follows I build on Laura's insights on tone in Bantu verb stem reduplication by focusing on Runyankore, a Bantu language spoken in Uganda. As pointed out by Downing (2003), three tonal strategies have been noted in the literature. Assuming that reduplication involves stem compounding, as in (1),

(1) Reduplication: stem1-stem2

contrastive tone may be restricted to one of the stems, assigned to stem1-stem2 as a whole, or realized on both stem1 and stem2. The last is rather rare, best known through Chichewa (Myers

& Carleton 1996, Hyman & Mtenje 1999, Downing 2003, Downing & Mtenje 2018), but occurring also in Cinamwanga (Mtenje 2006), Chisubiya (Mathangwane 2018), and optionally on longer stems in Cilungu (Bickmore 2007). The three cross-linguistic strategies are schematized in (2), where a single H(igh) tone is restricted to the first or last syllable of a stem (here, trisyllabic CaCaCa):

(2)		*Pattern 1*	*Pattern 2*	*Pattern 3*
a.	toneless:	CaCaCa-CaCaCa	CaCaCa-CaCaCa	CaCaCa-CaCaCa
b.	initial H:	(i) CáCaCa-CaCaCa or (ii) CaCaCa-CáCaCa	CáCaCa-CaCaCa	CáCaCa-CáCaCa
c.	final H:	(i) CaCaCá-CaCaCa or (ii) CaCaCa-CaCaCá	CaCaCa-CaCaCá	CaCaCá-CaCaCá

While toneless stems are expected to stay toneless under reduplication, as in (2a), stems with H can vary, depending on the language and the source of the H tone. In (2b,c) we see that the initial or final H can be realized once on stem1 or stem2 (Pattern 1), once on the stem1-stem2 constituent (Pattern 2), or twice, realized once on each stem (Pattern 3). In the Pattern 1 schemas the two schemas marked (i) and (ii) necessarily correspond with each other. Otherwise, as seen in (3), a (i)-(ii) arrangement would be indistinguishable from Pattern 2, while a (ii)-(i) arrangement would result in a mixed system, where initial H is assigned to stem2 and final H is assigned to stem1, an apparently unattested system in Bantu.

(3)				
a.	initial H:	(i) CáCaCa-CaCaCa	(ii) CaCaCa-CáCaCa
b.	final H:	(ii) CaCaCa-CaCaCá	(i) CaCaCá-CaCaCa

While other tone patterns can be assigned by the inflectional morphology, initial H is most often a lexical property of the root, which contrasted with toneless roots in Proto-Bantu and is still contrastive in most daughter languages (cf. Luganda /bál-/ “bear (fruit)” vs. /bal-/ “count”).

In what follows I will present the tonal facts of verb stem reduplication in Runyankore [ISO: nyn], a Bantu language with over 3.4 million speakers in Uganda (Eberhard et al 2019:292), designated JE13 in the updated Guthrie referential classification of the Bantu languages (Maho 2009:59). While these facts will confirm many of the expectations we have from past individual studies as well as overviews such as Downing (1999, 2003) and Hyman (2009), we will see that they are considerably more complex and allow much more variation than reported in any other Bantu language. In the following I will begin with a brief introduction to the Runyankore tone system in §2, followed in §3-8 by descriptions of all of the attested reduplication patterns and their effect on tone. In §9 I discuss three unresolved tonal issues and conclude in §10 with a discussion of the methodological issues that arise in conducting such an extensive study based on elicitation with a single speaker.[1]

[1] As will be repeatedly pointed out, there appears to be considerable variation among Runyankore speakers (and some confusion with mutually intelligible Rukiga). The data reported in this paper are based on 40+ hours of elicitation of thousands of reduplications of 217 Runyankore verb stems with Dr. Daphine Namara, a native speaker of the pastoralist Bahima group from Kamushoko Parish in Mbarara District of Uganda. I would like to thank Daphine (henceforth, DN) for her generous dedication to this project, as well as the students in my Fall 2019 undergraduate field methods course where we first began our investigation of Runyankore, including the discovery of variations in reduplicated infinitives (Huff 2020). I would also like to thank Karee Garvin and Hannah Sande for their invitation, and Chris Beier, Hossep Dolatian, Laura Downing, Nicholas Rolle, and Katie Russell for questions and comments following a presentation of this paper at the Zoom Phonology Meeting on

2. Overview of the Runyankore tone system

In order to appreciate the tonal variations found in Runyankore verb stem reduplication, it will be necessary to introduce the basic tone system of the language. Consistent with the schemas in (2) and (3), Runyankore has a privative /H/ vs. Ø tone system, which is subject to certain constraints. Since the focus of this paper is on verb stem reduplication, we will concern ourselves only with the distribution of H tones within the verb stem, which consists of the verb root and suffixes. As seen in (4), /H/ and Ø contrast on the first mora of the root in the following monosyllabic, bisyllabic, trisyllabic and quadrisyllabic verb stems. Long vowels are written double.

(4)	a.	/gu-/	"fall"	o-ku-gw-a	"to fall"
		/gur-/	"buy"	o-ku-gur-a	"to buy"
		/reeb-/	"see"	o-ku-reeb-a	"to see"
		/rahur-/	"insult"	o-ku-rahur-a	"to insult"
		/furumuk-/	"dash out"	o-ku-furumuk-a	"to dash out"
	b.	/ɲó-/	"drink"	o-kú-nyw-a	"to drink"
		/zín-/	"dance"	o-ku-zín-a	"to dance"
		/kóror-/	"cough"	o-ku-kóror-a	"to cough"
		/zínguruk-/	"unwind (intr.)"	o-ku-zínguruk-a	"to unwind (intr.)"

The underlying Ø stems in (4a) are realized without change in the infinitive forms in the right column. The contrastive root /H/ is also realized stem-initially in the infinitives in (4b), except for monosyllabic stems, where a general rule of Final High Retraction (FHR) shifts a prepausal /H/ onto the penult. Thus, the /H/ /ɲó-/ "drink" is realized on the infinitive prefix of *o-kú-nyw-a* "to drink" (cf. *o-ku-nyw-á gye* "to drink well").[2] FHR will be observed in other examples as well.

While verb tones depend on inflectional features (tense-aspect-mood-negation) and clause type (main-relative-consecutive), verb stems can only have one of four tone patterns, depending on whether the root is /H/ or Ø, and whether there is a suffixal /H/ tone or not. Schematized in (5), the four tone patterns mirror exactly those established for (near-)mutually intelligible Ruhaya (Hyman & Byarushengo 1984:60; Hyman 2016:26).[3]

(5)		*root tone*	*suffix tone*	*output tone*	
	a.	Ø	Ø	no H tone	
	b.	/H/	Ø	H on first mora (V1)	
	c.	Ø	/H/	H on second mora (V2)	
	d.	/H/	/H/	H on final mora (FV)	(the root H is deleted)

Nov. 5, 2020. I also am indebted to Cédric Patin and two reviewers for extensive comments and suggestions on the original submission.

[2] Although I generally follow Runyankore orthography for consonants, in this case *ny* for the palatal nasal [ɲ], I will use the latter IPA symbol when citing forms in explicit phonemic and phonetic representations, hence /ɲó/ and [ɲwa] vs. *o-kú-nywa* "to drink".

[3] Previous work on Runyankore tone include Poletto (1998) and Kaji (2004). Poletto devotes a full chapter to reduplication in which he mostly limits his coverage to the infinitive and the yesterday past (P2) tense which conditions segmental changes. Although he marks tone, he doesn't fully explore tonal assignment in reduplication and thus only reports the presence of H in stem1. Interestingly, he provides only CVC-a stem1 outputs in each reduplication (which is also DN's "first choice" mode of reduplication) vs. the variation that I report below.

As seen, a verb stem can have at most one H in the output, which can occur on the first mora (V1), the second mora (V2), or the final mora (FV). The patterns in (5a,b) were already seen in the infinitives in (4) and occur also in the main clause affirmative remote past (P3), as in (6), where the verb bases are /furumuk-/ "dash out" and /zínguruk-/ "unwind (intr.)":

(6) a. /ba-ka-furumuk-a/ → ba-ka-furumuk-a "they (class 2 human) dashed out"
CL2.SBJ-P3-dash-FV

b. /bi-ka-zínguruk-a/ → bi-ka-zínguruk-a "they (class 8 inanimate) unwound"
CL8.SBJ-P3-scrape-FV

Patterns (5c,d) are illustrated with the same verb stems in the main clause affirmative progressive forms in (7).

(7) a. /ni-ba-furumuk-a + H/ → ni-ba-furúmuk-a "they are dashing out"
PROG-CL2.SBJ-dash-FV

b. /ni-bi-zínguruk-a + H/ → ni-bi-zingurúk-a "they are unwinding"
PROG-CL8.SBJ-unwind-FV

As seen, the suffixal H is realized on the second mora of the stem in (7a). In (7b) the suffixal H is assigned to the FV, but undergoes prepausal FHR and is therefore realized on the penult (cf. *ni-bi-zinguruk-á gye* "they are unwinding well"). As a convention I will underline the FV when the suffixal H has been assigned to it and will transcribe such verbs forms with the post-FHR H tone on the penult.

Since they provide the four stem-tone patterns, the above two main clause inflections (P3, PROG) will be kept constant throughout the paper. Morpheme-by-morpheme glossing should therefore not be necessary, as only the root (and its reduplication) will vary. However, before moving on to consider reduplication, a few further details need to be pointed out. First, when an utterance-penultimate syllable has a long vowel and carries a /H/ tone, a falling tone results. This pertains to either a root /H/, as in (8a) or a suffixal /H/ as in (8b), but not a penultimate H which results from FHR, as in (8c).

(8) a.	/ba-ka-téek-a/	→	ba-ka-téèk-a		"they cooked"
b.	/ni-ba-zaan-a +H/	→	ni-ba-zaán-a	[ni-ba-záàn-a]	"they are playing"
c.	/ni-ba-téek-a +H/	→	ni-ba-teek-á	[ni-ba-téék-a]	"they are cooking"
d.	/ni-ba-zaan-is-a +H/	→	ni-ba-zaán-is-a	[ni-ba-záán-is-a]	"they are playing with"
e.	/ba-ka-téek-es-a/	→	ba-ka-téék-es-a		"they cooked with"

As before, I have underlined the FV in (8c), since the H tone is first assigned to it and then retracted to the penult (cf. *ni-ba-teeká gye* "they are cooking well"). In this case the expected rising tone (**ni-ba-teék-a*) is simplified to a H tone on the long vowel, since rising tones are not allowed in the language. In (8b) I also underlined the second mora of the long vowel in *-zaan-* "play", since the V2 /H/ has been initially assigned to it. The examples in (8d) and (8e) show that pre-penultimate rising and falling tones are also both simplified to all H. To sidestep these complications, I will avoid verb stems with underlying long vowels. Long vowels will therefore only arise in the case of monosyllabic verb stem reduplication, where I will

indicate penultimate falling tone with an acute accent on the first vowel (*e.g. nywáa*) vs. an all H long vowel with two acute accents (e.g. *nywáá*).

With the above general properties of Runyankore verb tone established, we can now consider reduplication. As we will see, there is considerable variation in how verb stems are reduplicated in terms of their segmental shape which needs to be taken into consideration as we consider the tone. I start in §3 with full stem reduplication, which will set the scene for the tonal properties we will follow in subsequent sections. Except where noted otherwise, the meanings of a single stem reduplication vary between a devaluative ("to sort of do X"), a distributive ("to do X here and there") or an augmentative-frequentative ("to do X a lot"). Cases of double and triple stem reduplication have only the last meaning, with each reduplication further intensifying the effect.

3. Full stem reduplication

As an introduction to Runyankore verb stem reduplication, I begin with cases where the stem is fully reduplicated. I will first exemplify how the four tone patterns in (5) are realized in single reduplication, and then extend this to multiple stem reduplication.

3.1 Toneless verb stems

As mentioned, the remote past (P3) lacks a suffixal H. This therefore means that there will be only the possibility of a root /H/ vs. no /H/. Without surprise, the reduplication of a toneless stem will be two toneless stems, as in (9).

(9)	a.	ba-ka-gw-a	"they fell"	→	ba-ka-gwaa-gwa
	b.	ba-ka-gur-a	"they bought"	→	ba-ka-gura-gura
	c.	ba-ka-rahur-a	"they insulted"	→	ba-ka-rahura-rahura
	d.	ba-ka-furumuk-a	"they dashed out"	→	ba-ka-furumuka-furumuka

The above examples show total reduplication of stems that are monosyllabic (9a), bisyllabic (9b), trisyllabic (9c), and quadrisyllabic (9d). All forms are phonologically toneless, with each toneless vowel realized on a default low pitch. In the above and subsequent examples hyphens are used to separate prefixes, here *ba-* "they (noun class 2)" and *-ka-* (P3), and the inflectional FV *-a* (in unreduplicated inputs only), as well as the individual stems in reduplicated forms. Rather than identifying one of stem forms as the base and the other as the reduplicant, I will refer to the two forms as stem1 and stem2, each of which potentially consists of the verb root, possible derivational suffixes (causative, applicative etc.), and the FV *-a*. In (9a) the monosyllabic stem /gu-a/ "fall" first undergoes gliding and compensatory lengthening to become *gwaa-gwaa*, which then undergoes word-final vowel shortening.[4]

[4] Final vowel shortening occurs both at the end of a word (affecting *gwa*), but also at the end of a bisyllabic or longer stem. Thus, /ba-ka-kóm-u-a/ "they were tied" (P3) reduplicates as *ba-ka-kómwa-komwa*. However, it should be noted that the first stem can also undergo optional lengthening of their FV, e.g. *ba-ka-guraa-gura, ba-ka-rahuraa-rahura, ba-ka-furumukaa-furumuka*. This is less common and will not be transcribed. It should be noted that both Poletto's (1998) speaker and one reviewer find reduplicated monosyllabic stems less acceptable, possibly disallowed in mutually intelligible Rukiga. Huff (2020) originally found that only monosyllabic verbs with a consonant + glide onset could reduplicate (e.g. /rí-a/ "eat" in (11a) and /sí-a/ "burn" in (11c)), while DN ultimately accepted reduplication of all monosyllabic verbs (e.g. /fú-a/ "die" → *ni-ba-fáá-fa* "they are sort of dying, dying a lot" in (11b)). Of course, certain verbs (and aspectual distinctions) are more semantically compatible with devaluative/frequentative reduplication than others.

3.2 Verb stems with V1 /H/

Since the above P3 verbs are toneless, they do not bear on how tone is realized in reduplication. However, now consider the following total reduplication of stems with a V1 /H/:

(10)	a.	ba-ká-nywa	"they drank"	→	ba-ka-nywáa-nywa ba-ka-nywáá-nywa
	b.	ba-ka-zín-a	"they danced"	→	ba-ka-zína-zina
	c.	ba-ka-kóror-a	"they coughed"	→	ba-ka-kórora-korora
	d.	bi-ka-zínguruk-a	"they unwound"	→	bi-ka-zínguruka-zinguruka

As seen, except for monosyllabic stems, the input /H/ tone can only be realized on stem1. Other forms with the /H/ on stem2 or on both stems are totally ungrammatical: **ba-ka-zina-zína*, **ba-ka-zína-zína* etc.[5] What is unexpected in (10a) is that the root /H/ can alternatively be maintained on stem2, something which is impossible with longer stems. As indicated by the underlining, the final stem2 /H/ then undergoes FHR and is realized as a level H tone on the first stem. The same two possibilities exist for other /H/ tone monosyllabic stems, as seen in (11).[6]

(11)	a.	ba-ká-rya	"they ate"	→	ba-ka-ryáa-rya	ba-ka-ryáá-rya
	b.	ba-ká-f-a	"they died"	→	ba-ka-fáa-fa	ba-ka-fáá-fa
	c.	bi-ká-sy-a	"they burned"	→	bi-ka-syáa-sya	bi-ka-syáá-sya

These facts are not tense-specific. The same two patterns are possible in the infinitive in (12a) and the remote future in (12b):[7]

(12)	a.	o-kú-nyw-a	"to drink"	→	o-ku-nywáa-nywa	o-ku-nywáá-nywa
	b.	bá-ryáá-nywa	"they will drink"	→	ba-ryáá-nywáa-nywa	ba-ryáá-nywáá-nywa

I will identify this as Issue #1, the first of three issues that will be postponed until §9: Why do monosyllabic stems allow two tonal patterns vs. longer stems?

3.3 Verb stems with FV /H/

As will be recalled from §2, verbs with a lexical /H/ realize an inflectional suffixal /H/ on their FV, while toneless verbs realize the suffixal /H/ on their V2. In this section we consider the FV cases exemplified in the progressive. As seen in the input forms in (13), the /H/ assigned to the FV is retracted onto the penult by FHR:

[5] Monosyllabic verbs also optionally allow the object prefix to reduplicate: *ni-ba-gí-nyw-a* "they are drinking it" (*wáragi* "cornbeer") → *ni-ba-gi-nywaa-gí-nywa*. DN rejects reduplicating the object prefix with longer stems: *ni-ba-gi-kóm-a* "they are tying it", **ni-ba-gi-koma-gi-kóma*. I return to this in §9.2.

[6] In (11c) I have replaced (human) class 2 *ba-* with (inanimate) class 8 *bi-* so that we don't have to refer to people burning. The root for "burn" is /hí-/, whose /h/ undergoes a general rule $h \rightarrow s$ / __ *y*.

[7] The input to (12b) is /ba-ríá-ɲó-a/, which first becomes *ba-ryáá-nyw-á* and then *bá-ryaa-nyw-á* by a process of H Tone Bumping. The H of *-nyw-á* then shifts to the penult by FHR. See Hyman (2020) for extensive documentation of both rules.

(13)	a.	ni-bá-nywa	"they are drinking"	→	ni-ba-nywáá-nywa ni-ba-nywáa-nywa
	b.	ni-ba-zín-a	"they are dancing"	→	ni-ba-zina-zína
	c.	ni-ba-korór-a	"they are coughing"	→	ni-ba-korora-koróra
	d.	ni-bi-zingurúk-a	"they are unwinding"	→	ni-bi-zinguruka-zingurúka

Except for the monosyllabic stem in (13a), which again allows both a stem1 and stem2 H realization, the FV suffixal tone is realized on stem2. Assigning it to stem1 or to both stems is ungrammatical (**ni-ba-zína-zina*, **ni-ba-zína-zína* etc.). In these examples we are not able to tell if the suffixal /H/ is being assigned to stem2 or to the whole of the stem1-stem2 complex. If the former, then it would be Pattern 1, since the /H/ would be assigned to a single stem. If the latter, this would be a case of Pattern 2, since the final H is assigned to the reduplicated stem1-stem2 as a whole. Since it is hard to distinguish between the two interpretations, it may ultimately depend on the specific framework that is adopted. What I will assume from this point forward is that the compounding process of reduplication also copies the tone, but that only one H tone can surface in the combined reduplicated stem (R-stem). I will thus speak of the V1 /H/ being "realized" on stem1 and the FV /H/ being "realized" on stem2, rather than being "assigned". In the following section we will see both possibilities in the case of the V2 /H/.

3.4 Verb stems with V2 /H/

Recall that verb forms with a toneless root assign the suffixal /H/ to the second mora (V2). Diverging from the FV /H/, which can be realized only on stem2, the examples in (14) show that the V2 /H/ can be realized on either stem1 or stem2:

(14)	a.	ni-bá-gwa	"they are falling"	→	ni-ba-gwáa-gwa ni-ba-gwáá-gwa
	b.	ni-ba-gúr-a	"they are buying"	→	ni-ba-gurá-gura ni-ba-gura-gúra
	c.	ni-ba-rahúr-a	"they are insulting"	→	ni-ba-rahúra-rahura ni-ba-rahura-rahúra
	d.	ni-ba-furúmuk-a	"they are dashing"	→	ni-ba-furúmuka-furumuka ni-ba-furumuka-furúmuka

Since monosyllabic stems have a /CV-a/ structure, the second mora /H/ will be assigned to the FV /-a/. If the /H/ is assigned to the stem1, the phrase-penultimate long vowel will be realized with a HL falling tone. If assigned to stem2, the /H/ will undergo FHR and the long penultimate vowel will be realized all H. Since the V2 /H/ is realized on a single stem, although either one, this is a clear case of Pattern 1.[8]

In the next section we will see that the V2 /H/ has even greater freedom when more than two stems occur in reduplication. The difference between the FV /H/ and the V2 /H/ is rather striking. The question is why the same /H/ suffix (here, of the progressive) can be realized on

[8] While the V1 and FV realizations reflect left- and right-edge alignment, I will not resolve how the V2 position is targeted. Atttested in many Bantu languages, Pulleyblank (1986:172) proposes for Chitonga that the first mora is "extratonal", thus making the V2 the first visible mora at the left-edge. Whether this can apply to non-initial compounded stems is questionable, given that their first mora is not at the left periphery of the R-stem.

the V2 of either stem, while its FV realization can only be realized on the second stem. I will designate this as Issue #2 and come back to it in §9.2.

3.5 Multiple reduplication

The above represents the simplest type of reduplication in Runyankore: A stem is fully reduplicated with only one /H/ present in the stem1-stem2 constituent: Setting monosyllabic stems aside, the lexical V1 /H/ is realized on stem1, the suffixal FV /H/ is realized on stem2, and the suffixal V2 /H/ can be realized on either stem1 or stem2. Unlike other Bantu languages, Runyankore can reduplicate the verb stem more than once.[9] Multiple reduplication is illustrated in the P3 with toneless stems in (15) and V1 /H/ stems in (16).

(15)	a.	ba-ka-gwaa-gwaa-gwa	"they fell a lot"
		ba-ka-gwaa-gwaa-gwaa-gwa	
	b.	ba-ka-gura-gura-gura	"the bought a lot"
		ba-ka-gura-gura-gura-gura	
	c.	ba-ka-rahura-rahura-rahura	"they insulted a lot"
		ba-ka-rahura-rahura-rahura-rahura	
	d.	ba-ka-furumuka-furumuka-furumuka	"they dashed out a lot"
		ba-ka-furumuka-furumuka-furumuka-furumuka	
(16)	a.	ba-ka-nywáa-nywaa-nywa	"they drank a lot"
		ba-ka-nywaa-nywáa-nywa	
		ba-ka-nywaa-nywáá-nywa	
		ba-ka-nywáa-nywaa-nywaa-nywa	
		ba-ka-nywaa-nywáá-nywaa-nywa	
		ba-ka-nywaa-nywaa-nywáa-nywa	
		ba-ka-nywaa-nywaa-nywáá-nywa	
	b.	ba-ka-zína-zina-zina	"they danced a lot"
		ba-ka-zína-zina-zina-zina	
	c.	ba-ka-kórora-korora-korora	"they coughed a lot"
		ba-ka-kórora-korora-korora-korora	
	d.	bi-ka-zínguruka-zinguruka-zinguruka	"they unwound a lot"
		bi-ka-zínguruka-zinguruka-zinguruka-zinguruka	

[9] At the time of preparing this paper I was not aware of any other Bantu language that has multiple verb stem reduplication of this sort (despite the fact that verb stem reduplication is virtually universal in Bantu). I checked with colleagues who told me that they have not found it in Luganda (Francis Katamba), Ndebele (Galen Sibanda), Rutooro (Lee Bickmore), Kinande (Philip Mutaka and Pat Schneider-Zioga), Kikerewe (David Odden), or Ciyao (Ngunga 2000:108), a rare case of where the impossibility of double reduplication is explicitly mentioned. Subsequently Winfred Mkochi informed me that multiple reduplication occurs in Malawian Chitonga, but with a different intensifying semantics (Mkochi 2020). One reviewer indicated that Runyankore speakers s/he consulted did not accept multiple reduplication, which indicates possible variation among speakers or groups (both DN and her husband, who accept multiple reduplication, are Bahima). On the other hand, one's immediate response may not reflect what actually can be produced. While Al Mtenje originally informed me that it was not possible in Chichewa, he later wrote: "After going through several examples of triple reduplication, I indeed accept that we have cases of that in Chichewa." (March 19, 2020). It is likely that further digging will reveal more such cases (cf. §10).

Although I indicate only double and triple reduplication, there is no principled upper bound as to how many times the stem can be reduplicated. While single reduplication was said to have either a devaluative ("to sort of do X"), distributive ("to do X here and there"), or augmentative-frequentative ("to do X a lot") meaning, multiple reduplication only has the last meaning, which is increasingly intensified with each additional reduplicated stem. The examples in (15) are of course toneless, while those in (16) again show the V1 /H/ only on the first stem (which we can continue to refer to as stem1). Monosyllabic stems are again exceptional, allowing the V1 /H/ to be realized on any of the three or four stems (see §9.1). Each monosyllabic stem retains length from its bimoraic input /ɲó-a/ except the last, which undergoes word-final vowel shortening.

The examples in (17) in the present progressive show that the suffixal FV /H/ is assigned to the last stem.

(17) a. ni-ba-nywáá-nywaa-nywa "they are drinking a lot"
ni-ba-nywaa-nywáa-nywa
ni-ba-nywaa-nywáá-nywa
ni-ba-nywáá-nywaa-nywaa-nywa
ni-ba-nywaa-nywáá-nywaa-nywa
ni-ba-nywaa-nywaa-nywáá-nywa
ni-ba-nywaa-nywaa-nywáá-nywa
b. ni-ba-zina-zina-zína "they are dancing a lot"
ni-ba-zína-zina-zina-zína
c. ni-ba-korora-korora-kóróra "they are coughing a lot"
ni-ba-kórora-korora-kóróra
d. ni-bi-zinguruka-zinguruka-zingurúka "they are unwinding a lot"
ni-bi-zinguruka-zinguruka-zinguruka-zingurúka

Again, the monosyllabic stems in (17a) are exceptional in accepting the /H/ on any stem, while longer stems can only take the /H/ on their last stem (**ni-ba-zína-zina-zina*, **ni-ba-zina-zína*, **ni-ba-zina-zina-zína*). Finally, note in (18) that in multiple reduplication the suffixal V2 /H/ can appear on any stem, whether monosyllabic or longer:

(18) a. ni-ba-gwáá-gwaa-gwa "they are falling a lot"
ni-ba-gwaa-gwáa-gwa
ni-ba-gwaa-gwáá-gwa
ni-ba-gwáá-gwaa-gwaa-gwa
ni-ba-gwaa-gwáá-gwaa-gwa
ni-ba-gwaa-gwaa-gwáa-gwa
ni-ba-gwaa-gwaa-gwáá-gwa
b. ni-ba-gurá-gura-gura "they are buying a lot"
ni-ba-gura-gurá-gura
ni-ba-gura-gura-gúra
ni-ba-gurá-gura-gura-gura
ni-ba-gura-gurá-gura-gura
ni-ba-gura-gura-gurá-gura
ni-ba-gura-gura-gura-gúra

c. ni-ba-rahúra-rahura-rahura “they are insulting a lot”
ni-ba-rahura-rahúra-rahura
ni-ba-rahura-rahura-rahúra
ni-ba-rahúra-rahura-rahura-rahura
ni-ba-rahura-rahúra-rahura-rahura
ni-ba-rahura-rahura-rahúra-rahura
ni-ba-rahura-rahura-rahura-rahúra

d. ni-ba-furúmuka-furumuka-furumuka “they are dashing a lot”
ni-ba-furumuka-furúmuka-furumuka
ni-ba-furumuka-furumuka-furúmuka
ni-ba-furúmuka-furumuka-furumuka-furumuka
ni-ba-furumuka-furúmuka-furumuka-furumuka
ni-ba-furumuka-furumuka-furúmuka-furumuka
ni-ba-furumuka-furumuka-furumuka-furúmuka

As seen, multiple reduplication shows the same tonal facts as single reduplication, I will come back to the unexpected tonal options on monosyllabic stems as Issue #1 in §9.1.

4. Left-aligned truncation

While the preceding section dealt only with total reduplication of the verb stem, there are other possibilities, where one or another stem is truncated by one or more syllables with its last vowel optionally replaced by [a]. In this section we consider left-aligned truncation, i.e. truncation where the initials of the stems correspond.[10] I will first treat truncation of stem1 in single reduplication, followed by truncation in multiple reduplication.

4.1 Truncation in single reduplication

The possible left-aligned truncations are first illustrated with the P3 form of the stem /furumuk-a/ “dash out” whose full reduplication *ba-ka-furumuka-furumuka* “they dashed out here and there” was seen in (9d).

(19) ba-ka-furumuka “they dashed out” →

	truncated	*truncated + [a]*
a.	ba-ka-furumu-furumuka	ba-ka-furum<u>a</u>-furumuka
b.	ba-ka-furu-furumuka	ba-ka-fur<u>a</u>-furumuka
c.	*ba-ka-fu-furumuka	*ba-ka-fa-furumuka

As seen in (19a,b) a stem of three or more syllables can optionally be truncated with its last vowel either remaining identical to the corresponding input vowel (here, [u]) or being realized by a “replacive [a]”. (19c) shows that a truncated stem1 must consist of at least two syllables. Other toneless P3 examples are seen in (20).

(20) a. ba-ka-rahur-a “they insulted” → ba-ka-rahu-rahura
ba-ka-raha-rahura

[10] As discussed in §6, right-aligned truncation is also attested, e.g. *ba-ka-furumuka-muka.*

b. ba-ka-munyunguz-a "they rinsed" → ba-ka-munyungu-munyunguza
ba-ka-munyunga-munyunguza
ba-ka-munyu-munyunguza
ba-ka-munya-munyunguza

The corresponding P3 forms with a /H/ verb root are shown in (21).

(21) a. ba-ka-kóror-a "they coughed" → ba-ka-kóro-korora[11]
ba-ka-kóra-korora
c. bi-ka-zínguruk-a "they unwound" → bi-ka-zíngu-zinguruka
bi-ka-zínga-zinguruka
bi-ka-zínguru-zinguruka
bi-ka-zíngura-zinguruka

As seen, the V1 /H/ is realized on stem1, even when it is truncated. Again, the lexical /H/ cannot be realized on stem2 or on both stems: **bi-ka-zingu-zínguruka*, **bi-ka-zíngu-zínguruka*.

Turning to forms with a suffixal /H/, as in the total reduplications seen earlier in (13) and (17), a FV /H/ must be realized on stem2:

(22) a. ni-ba-korór-a "they are coughing" → ni-ba-koro-kórór<u>a</u>
ni-ba-kora-kórór<u>a</u>
b. ni-bi-zingurúk-a "they are unwinding" → ni-bi-zingu-zingurúk<u>a</u>
ni-bi-zinga-zingurúk<u>a</u>
ni-bi-zinguru-zingurúk<u>a</u>
ni-bi-zingura-zingurúk<u>a</u>

Once again, forms such as **ni-bi-zingú-zinguruka* and **ni-bi-zingurú-zinguruka* are ungrammatical.

This leaves the V2 suffixal /H/ which in earlier examples was able to be realized on either or any stem in full stem reduplication. The same is true of single truncated reduplication:

(23) a. ni-ba-rahúr-a "they are insulting" → ni-ba-rahú-rahura
ni-ba-rahu-rahúra
ni-ba-rahá-rahura
ni-ba-raha-rahura

[11] Of these variants, DN much favours replacive [a] forms and shows a dispreference when a trisyllabic verb stem is reduplicated by copying the first CVCV, e.g. *ba-ka-kóro-korora*. Depending on the lexical verb, DN's judgments vary from immediate acceptance, e.g. *ba-ka-rahu-rahura* in (20a), to a dislike, e.g. *ba-ka-kóro-korora* in (21a) to original rejection followed by subsequent acceptance, e.g. *ba-ka-guruka* "they jumped" → *ba-ka-guru-guruka*. I have not been able to determine anything that correlates among the lexemes where an otherwise general reduplication pattern is dispreferred. The corresponding CVCV stem1 reduplication is more regularly acceptable when stem2 is quadrisyllabic: *bi-ka-zíngu-zinguruka*, and a CVCa stem1 is always acceptable independent of the number of syllables in the input stem, e.g. *ba-ka-kóra-korora.*

b. ni-ba-furúmuk-a "they are dashing out" → ni-ba-furú-furumuka
ni-ba-furu-furúmuka
ni-ba-furá-furumuka
ni-ba-fura-furúmuka
ni-ba-furúmu-furumuka
ni-ba-furumu-furúmuka
ni-ba-furúma-furumuka
ni-ba-furuma-furúmuka

4.2 Truncation in multiple reduplication

As just seen, the same tone patterns are observed in single reduplication whether stem1 is truncated or not, with or without final replacive [a]. Since this is also the case in multiple reduplication and in order not to be too repetitive, I will restrict the demonstration to the quadrisyllabic verb stems /furumuk-a/ "dash out" and /zínguruk-a/ "unwind". As before, I start with the toneless P3 reduplicated truncation forms of *ba-ka-furumuk-a* "they dashed out" in (24).

(24)				
	2σ+2σ	ba-ka-furu-furu-furumuka	3σ+2σ	ba-ka-furumu-furu-furumuka
		ba-ka-fura-fura-furumuka		ba-ka-furuma-fura-furumuka
		ba-ka-furu-fura-furumuka		ba-ka-furumu-fura-furumuka
		ba-ka-fura-furu-furumuka		ba-ka-furuma-furu-furumuka
	2σ+3σ	ba-ka-furu-furumu-furumuka	3σ+3σ	ba-ka-furumu-furumu-furumuka
		ba-ka-fura-furuma-furumuka		ba-ka-furuma-furuma-furumuka
		ba-ka-furu-furuma-furumuka		ba-ka-furumu-furuma-furumuka
		ba-ka-fura-furumu-furumuka		ba-ka-furuma-furumu-furumuka

In (24) I have arranged the forms by the number of syllables in the two truncated stems. In the forms in the first column, stem1 is bisyllabic, while stem1 is trisyllabic in the second column. As seen, the non-final stem1 and stem2 can truncate independently of each other, either to two syllables or three, with or without replacive [a], thereby producing 16 possibilities.[12] The same is seen in the corresponding reduplicated forms of *bi-ka-zínguruk-a* "they unwound" in (25), where the V1 /H/ must be realized on stem1:

(25)				
	2σ+2σ	bi-ka-zíngu-zingu-zinguruka	3σ+2σ	bi-ka-zínguru-zingu-zinguruka
		bi-ka-zínga-zinga-zinguruka		bi-ka-zíngura-zinga-zinguruka
		bi-ka-zíngu-zinga-zinguruka		bi-ka-zínguru-zingura-zinguruka
		bi-ka-zínga-zingu-zinguruka		bi-ka-zíngura-zinguru-zinguruka

[12] Although I won't enumerate them here, given space considerations, if each stem is truncated, triple reduplication of /furumuk-a/ produces 64 possibilities, since the third reduplicated stem can independently take the shapes *furu-*, *fura-*, *furumu-* and *furuma-* multiplied by 16. Since there is no principled upward limitation on how many times one can reduplicate, a fourth reduplicant could mathematically provide 256 different realizations, i.e. 4^n possibilities, where n = the number of reduplicated stems. In fact, there are even more possibilities, since even the choice of whether to truncate is stem-independent, hence: *ba-ka-furu-furumuka-furumuka, ba-ka-furumuka-furu-furumuka, ba-ka-furumu-furumuka-furumuka, ba-ka-furumuka-furumu-furumuka* + the replacive [a] variants, hence 5^n possibilities.

2σ+3σ	bi-ka-zíngu-zinguru-zinguruka	3σ+3σ	bi-ka-zínguru-zinguru-zinguruka
	bi-ka-zínga-zingura-zinguruka		bi-ka-zíngura-zingura-zinguruka
	bi-ka-zíngu-zingura-zinguruka		bi-ka-zínguru-zingura-zinguruka
	bi-ka-zínga-zinguru-furumuka		bi-ka-zíngura-zinguru-zinguruka

As seen next in (26), FV /H/ also produces (16) different outputs of *ni-bi-zingurúk-a* "they are unwinding":

(26)				
	2σ+2σ	ni-bi-zingu-zingu-zingurúka	3σ+2σ	ni-bi-zinguru-zingu-zingurúka
		ni-bi-zinga-zinga-zingurúka		ni-bi-zingura-zinga-zingurúka
		ni-bi-zingu-zinga-zingurúka		ni-bi-zinguru-zinga-zingurúka
		ni-bi-zinga-zingu-zingurúka		ni-bi-zingura-zingu-zingurúka
	2σ+3σ	ni-bi-zingu-zinguru-zingurúka	3σ+3σ	ni-bi-zinguru-zinguru-zingurúka
		ni-bi-zinga-zingura-zingurúka		ni-bi-zingura-zingura-zingurúka
		ni-bi-zingu-zingura-zingurúka		ni-bi-zinguru-zingura-zingurúka
		ni-bi-zinga-zinguru-zingurúka		ni-bi-zingura-zinguru-zingurúka

Finally, since the V2 /H/ can be realized on any stem, there are potentially 48 different reduplications of *ni-ba-furúmuk-a* "they are dashing out", as in (27).

(27)				
		V2 /H/ on stem1		
	2σ+2σ	ni-ba-furú-furu-furumuka	3σ+2σ	ni-ba-furúmu-furu-furumuka
		ni-ba-furá-fura-furumuka		ni-ba-furúma-fura-furumuka
		ni-ba-furú-fura-furumuka		ni-ba-furúmu-fura-furumuka
		ni-ba-furá-furu-furumuka		ni-ba-furúma-furu-furumuka
	2σ+3σ	ni-ba-furú-furumu-furumuka	3σ+3σ	ni-ba-furúmu-furumu-furumuka
		ni-ba-furá-furuma-furumuka		ni-ba-furúma-furuma-furumuka
		ni-ba-furú-furuma-furumuka		ni-ba-furúmu-furuma-furumuka
		ni-ba-furá-furumu-furumuka		ni-ba-furúma-furuma-furumuka
		V2 /H/ on stem2		
	2σ+2σ	ni-ba-furu-furú-furumuka	3σ+2σ	ni-ba-furumu-furú-furumuka
		ni-ba-fura-furá-furumuka		ni-ba-furuma-furá-furumuka
		ni-ba-furu-furá-furumuka		ni-ba-furumu-furá-furumuka
		ni-ba-fura-furú-furumuka		ni-ba-furuma-furú-furumuka
	2σ+3σ	ni-ba-furu-furúmu-furumuka	3σ+3σ	ni-ba-furumu-furúmu-furumuka
		ni-ba-fura-furúma-furumuka		ni-ba-furuma-furúma-furumuka
		ni-ba-furu-furúma-furumuka		ni-ba-furumu-furúma-furumuka
		ni-ba-fura-furúmu-furumuka		ni-ba-furuma-furúmu-furumuka
		V2 /H/ on stem3		
	2σ+3σ	ni-ba-furu-furu-furúmuka	3σ+2σ	ni-ba-furumu-furuu-furúmuka
		ni-ba-fura-fura-furúmuka		ni-ba-furuma-fura-furúmuka
		ni-ba-furu-fura-furúmuka		ni-ba-furumu-fura-furúmuka
		ni-ba-fura-furu-furúmuka a		ni-ba-furuma-furu-furúmuka

2σ+3σ	ni-ba-furu-furumu-furúmuka	3σ+3σ	ni-ba-furumu-furumu-furúmuka
	ni-ba-fura-furuma-furúmuka		ni-ba-furuma-furuma-furúmuka
	ni-ba-furu-furuma-furúmuka		ni-ba-furumu-furuma-furúmuka
	ni-ba-fura-furumu-furúmuka		ni-ba-furuma-furumu-furúmuka

What the above double reduplicated forms show is that even when a four-syllable stem is truncated to two, there is no tendency to lose the independent status of each stem. For example, had the first form been reanalyzed as *ni-ba-furufuru-furumuka* or *ni-ba-furu-furufurumuka* the V2 rule could not possibly produce the well-formed alternates *ni-ba-furu-furú-furumuka* and *ni-ba-furu-furu-furúmuka*.

5. Interim summary

Based on the previous examples and discussion the following in (28a-f) has been established:

(28) a. reduplication of the entire verb stem is always possible
b. non-final stems can be truncated by one or more syllables
c. truncated stems can optionally end in replacive [a]
d. in cases of double and triple reduplication, whether to truncate (and by how much), and whether to use replacive [a], is determined independently on a stem-by-stem basis
e. in the case of bisyllabic and longer stems, the above choices have no effect on tone: V1 /H/ is always on stem1, FV /H/ is always on the last stem, and V2 /H/ can be on any stem
f. in the case of monosyllabic stems, V1 /H/, FV /H/ and V2 /H/ can be realized on any stem. (I return to this in §9.1.)
g. except in the case of monosyllabic stems, a stem must satisfy a bisyllabic minimum:

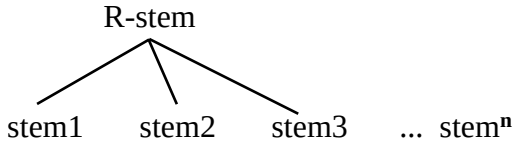
(29)	a.	ba-ka-gura	"they bought"	→	*ba-ka-gu-gura
					*ba-ka-ga-gura
	b.	ba-ka-zína	"they danced"	→	*ba-ka-zí-zina
					*ba-ka-zá-zina
	c.	ba-ka-guruka	"they jumped"	→	*ba-ka-gu-guruka
					*ba-ka-ga-guruka
	d.	ba-ka-kórora	"they coughed"	→	*ba-ka-kó-korora
					*ba-ka-ká-korora

While DN rejects outright forms like those in (29), she is not able to identify who, but wonders if someone else might accept forms like *??ba-ka-guu-gura* and *??bi-ka-zíí-zina,* where the monosyllabic stem1 has undergone vowel lengthening. If these do exist as options it would mean that such speakers place a bimoraic rather than bisyllabic minimum on truncated stems.[13]

[13] The fact that (non-final) monosyllabic stems maintain a long vowel (*o-ku-gwa* "to fall" → *o-ku-gwaa-gw*a) shows that there already is a bimoraic minimum on non-truncated verb stems. Two verbs were found that do accept CV- reduplication, e.g. with a V2 /H/: *ni-ba-ra-rahúra* "they sort of insult", *ni-ba-ha-hakánisa* "they sort of dispute". While a single CV- cannot take the V2 /H/ tone, the latter was also recorded with double CV-CV- reduplication: *ni-ba-ha-ha-hakánisa* "they dispute a lot". A second tonal realization *ni-ba-ha-há-hakanisa* was

So far the above facts are amply accounted for as compounding (Downing 2003) or Morphological Doubling Theory (Inkelas & Zoll 2005). All that is is needed is that the daughter (truncated or full) stems all report to a higher reduplication stem (R-stem) node, as in (30).

(30)



I propose that each stem inherits the same morphological and phonological input, including tone, and is free to choose among the options in (28) independently of the other stems, subject to the following three constraints on the R-stem:

1. All of the input material of the unreduplicated B-stem must be realized somewhere in the R-Stem.[14]

2. There can be at most one H per R-stem.

3. The left edge of the R-stem must be aligned with the left edge of the full stem (**rumuka-furumuka*).

In determining how to approach these facts, one advantage of MDT over Base-Reduplicant Correspondence (McCarthy & Prince 1995) is that it does not force us to distinguish between base and reduplicant. So far full reduplication in (31a) has been the only case where there is some question as to which is which. The left-aligned truncations suggest RED-Base, although full stems can be separated by one or more truncated stems, as in (31b-e).

(31) a. ba-ka-furumuka-furumuka "they dashed out a lot"
b. ba-ka-furumuka-furu-furumuka
c. ba-ka-furumuka-furu-furu-furumuka
d. ba-ka-furumuka-furumu-furumuka
e. ba-ka-furumuka-furumu-furumu-furumuka

While each stem in (31) is left-aligned, right-aligned truncation is also possible. In the next section we will see two more constraints on the R-stem:

4. The right edge of the R-stem must be aligned with the right edge of the last stem (furumuka → furumuka-muka, *furumuka-furu).

5. No stem can occur if not left- or right-aligned (furumuka ↛ *furumu-rumu-rumuka).

In fact, the broader generalization is that every stem in an R-stem must be be left- or right-aligned, if not both.

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also accepted, suggesting (?) that *hahá-* forms one stem. Interestingly, these two verb stems both begin with *Ca*. In other cases, DN rejected outright forms with replacive [-a]: **ni-ba-ga(a)-gurúka* etc.

[14] Compare the notion of "existential faithfulness" (∃-Faith) discussed by Struijke (2002) and references cited therein.

6. Right-aligned truncation

For reasons that we will now see, right-aligned truncation has an important tonal consequence that we did not run into with left-aligned truncation. In the following two subsections I will again first show how it operates in single reduplication and then turn to cases of multiple right-aligned truncation.[15]

6.1 Truncation in single reduplication

We once again begin with toneless forms to illustrate the truncation patterns:

(32) a. ba-ka-rahur-a "they insulted" → ba-ka-rahura-hura
b. ba-ka-furumuk-a "they dashed out" → ba-ka-furumuka-muka
→ ba-ka-furumuka-rumuka

Whereas the stems in left-aligned truncations are identical at their left edge, right-aligned truncation requires that both stems end identically (**ba-ka-furumuka-furu*). Again, truncation can be by one or more syllables, as long as the truncated stem has at least two syllables (**ba-ka-furumuka-ka*). Since the infinitive, progressive, and P3 verb forms I have been citing in this study all end with [a], each stem will automatically end with [a], and replacive [a] cannot be distinguished in these forms.[16]

As seen in (33) and (34), the V1 and FV /H/ patterns remain under right-aligned truncation:

(33) a. ba-ka-kóror-a "they coughed" → ba-ka-kórora-rora
b. bi-ka-zínguruk-a "they unwound" → bi-ka-zínguruka-ruka
→ bi-ka-zínguruka-guruka

(34) a. ni-ba-korór-a "they are coughing" → ni-ba-korora-róra
b. ni-bi-zingurúk-a "they unwound" → bi-ka-zinguruka-rúka
→ bi-ka-zinguruka-gurúka

Turning now to V2 /H/ this is where two complications arise, one predicted by stem compounding/MDT, the other one rather surprising:

(35) ni-ba-rahúr-a "they are insulting" a. → ni-ba-rahúra-hura
b. → ni-ba-rahura-húra
ni-ba-furúmuk-a "they are dashing out" c. → ni-ba-furúmuka-muka
d. *ni-ba-furumuka-múka

[15] While right-aligned ("suffixal") reduplication is rarer than left-aligned ("prefixal") reduplication in Bantu, it has been occasionally reported, e.g. in Bukusu (Downing 2004) and Malawian Citonga (Mkochi 2017).

[16] Other inflectional forms such as the hortative end in *-e*. In this case, the first full stem can occur with replacive [a]: *tu-furúmuk-e* "let"s dash out!" → *tu-furúmuke-furumuke ~ tu-furúmuka-furumuke*. The same is observed with right-aligned truncation: *tu-furúmuke-muke* and *tu-furúmuke-rumuke* as well as *tu-furúmuka-muke* and *tu-furúmuka-rumuke*. In such cases although right-alignment is superficially violated, replacive [a] is always available on any non-initial stem as long as the other constraints are satisifed.

e. → ni-ba-furúmuka-rumuka
f. → ni-ba-furumuka-rúmuka
g. → ni-ba-furumuka-rumúka

We first observe in (35d) that the V2 /H/ is categorically rejected on the final vowel of the bisyllabic truncated stem2. This is because it does not contain the second mora of the full stem (the *ru* of *furumuka*) which would normally have received the H. The other important observation concerns the trisyllabic truncations. In (35e) the V2 /H/ is realized without surprise on the full stem1. In (35f) the V2 /H/ is assigned to the pre-truncation input (*furúmuka* → *rúmuka*), thereby supporting a full-copy + truncation analysis as in the compounding and MDT approaches. However, rather surprisingly, in (35g) the V2 /H/ is determined after truncation (*rumuka* → *rumúka*), which is not predicted. In this case the V2 is checked in the output. Thus, the V2 /H/ is either realized "in situ", based on the input, or by shifting it to the V2 of the truncated form.

It is important to underscore that the V2 mora must "first" survive right-aligned truncation in order to obtain the surface V2 realization. More evidence is seen in five-syllable stems:

(36)	ni-ba-hakánisan-a	"they are disputing each other"	→
a.	ni-ba-hakánisana-sana	*ni-ba-hakanisana-sána	
b.	ni-ba-hakánisana-nisana	*ni-ba-hakanisana-nísana	
c.		*ni-ba-hakanisana-nisána	
d.	ni-ba-hakánisana-kanisana	ni-ba-hakanisana-kánisana	(= input V2 H on stem2)
e.		ni-ba-hakanisana-kanísana	(= output V2 H on stem2)

The forms on the right in (36a-c) are all ungrammatical since the underlined input V2 mora [ka] is truncated. (36d) shows the result of realizing the V2 /H/ on that mora itself, while (36e) allows the H to be realized on [ni], the surface-V2 of stem2. This brings us to Issue #3: How do we account for the output V2 /H/ in (35g) and (36e)? I will come back to this in §9.3.

6.2 Double right-aligned truncation with V2 /H/

It also is possible to double reduplicate a truncated right-aligned stem. Since the same tonal facts are observed in placing V1 (stem1) and FV (last stem) /H/ I will limit discussion to the V2 /H/. First, the V2 /H/ can always be realized on the full stem1.

(37)	ni-ba-furúmuka-muka-muka	ni-ba-furúmuka-rumuka-muka
	ni-ba-furúmuka-muka-rumuka	ni-ba-furúmuka-rumuka-rumuka

Again, the V2 /H/ cannot be assigned to a bisyllabic truncated stem that lacks the input V2:

(38) *ni-ba-furumuka-muká-muka
*ni-ba-furumuka-muká-rumuka
*ni-ba-furumuka-muka-múka
*ni-ba-furumuka-rumuka-múka

However, as seen in (39), V2 /H/ can be assigned to any trisyllabic truncated stem, this time with five possibilities:

(39)	V2 /H/ assigned before truncation	V2 /H/ assigned after truncation
	ni-ba-furúmuka-rumuka-rumuka	ni-ba-furúmuka-rumuka-rumuka
	ni-ba-furumuka-rúmuka-rumuka	ni-ba-furumuka-rumúka-rumuka
	ni-ba-furumuka-rumuka-rúmuka	ni-ba-furumuka-rumuka-rumúka

As seen, the V2 mora can be calculated based on either the full input or the output truncated stem.

7. Left- and Right-aligned truncation

Without any further surprises, left- and right-aligned truncation can be combined to produce a large number of possibilities. In (40) is show the V2 /H/ being realized on stem1:

(40)		
	ni-ba-furú-furumuka-muka	ni-ba-furú-furumuka-rumuka
	ni-ba-furá-furumuka-muka	ni-ba-furá-furumuka-rumuka
	ni-ba-furúmu-furumuka-muka	ni-ba-furúmu-furumuka-rumuka
	ni-ba-furúma-furumuka-muka	ni-ba-furúma-furumuka-rumuka

To these we can add the option of assigning the V2 /H/ alternatives to stem2 or stem3 (*ni-ba-furumu-furúmuka-rumuka, ni-ba-furumu-furumuka-rúmuka, ni-ba-furumu-furumuka-rumúka* etc.) and double left- and/or right-aligned reduplication (*furu-furu-furumuka-muka-muka* etc.), among other possibilities.

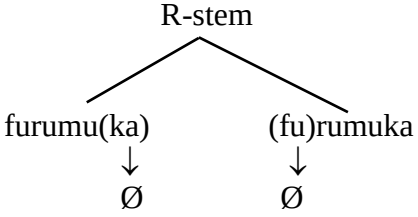
8. Internal "complementary" truncation

The last reduplicative strategy combines right-truncation on stem1 + left-truncation on stem2, producing an overlap and a discontinuity. A four-syllable stem such as /furumuk-a/ "dash out" can reduplicate as two trisyllabic stems, where the first can optionally receive "replacive [a]":

(41)	V2 /H/ on stem 1	V2 /H/ on stem2 input	V2 /H/ on stem2 output
	ni-ba-furúmu-rumuka	ni-ba-furumu-rúmuka	ni-ba-furumu-rumúka
	ni-ba-furúma-rumuka	ni-ba-furuma-rúmuka	ni-ba-furuma-rumúka

Internal complementary truncation nicely supports full stem-compounding/MDT, since it is not possible to identify a base and reduplicant:[17]

(42)



[17] The only other such case I am aware of comes from a few examples of Bukusu cited by Downing (2004:80), who identifies such reduplication as "infixation": *xúu-funilana* "to break for each other" → *xúu-funila-nilana.*

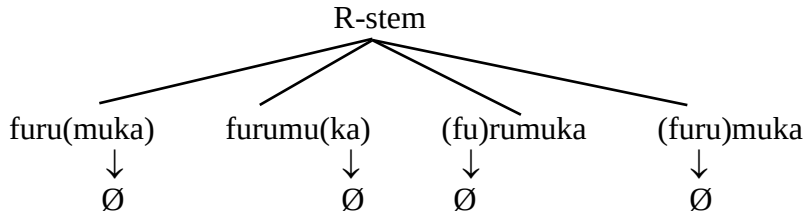
While such contiguous opposite edge truncation results in two incomplete stems rather than one full and one truncated, it is only by considering them both together that R-stem realizes all of the input material in this complementary fashion: [fu] appears on stem1, [rumu] on both stems, and [ka] on stem2. It is also possible to combine left- or right-aligned reduplication with complementary truncation. In (43) I only show the V2 /H/ on stem1, but the same tonal variation occurs as above, e.g.

(43)

a.	full stem left-aligned	:	ni-ba-furúmuka-[furumu-rumuka]
b.	truncated left-aligned (3s)	:	ni-ba-furúmu-[furumu-rumuka]
c.	truncated left-aligned (2s)	:	ni-ba-furú-[furumu-rumuka]
d.	full stem right-aligned	:	ni-ba-[furúmu-rumuka]-furumuka
e.	truncated right-aligned (3s)	:	ni-ba-[furúmu-rumuka]-rumuka
f.	truncated right-aligned (2s)	:	ni-ba-[furúmu-rumuka]-muka
g.	both (2s + 2s)	:	ni-ba-furú-[furumu-rumuka]-muka
h.	left-aligned-doubled (2s)	:	ni-ba-furú-furu-[furumu-rumuka]
i.	right-aligned-doubled (2s)	:	ni-ba-[furúmu-rumuka]-muka-muka
j.	both doubled (2s)	:	ni-ba-furú-furu-[furumu-rumuka]-muka-muka

(44) schematizes *ni-ba-furú-furumu-rumuka-muka*:

(44)



Additional possibilities include other permutations of 2s and 3s truncations, ±replacive [a] on each truncated stem, and V2 /H/ on stems other than stem1. I have not been able to calculate the total of reduplicative possibilities this produces, but it's a high number!

9. Discussion

As we have seen in the above, the "genius" of the Runyankore verb-stem reduplication system is that reduplicated stems have a freedom of choice, as long as certain parameters are met. We have seen almost all of these:

(45) Concerning the shape of stems in reduplication
- a. iteration: reduplication is unlimited: once, twice, more...
- b. compounding: each constituent of the R-stem is a stem
- c. alignment: the first stem must be left-aligned and the last stem must be right-aligned (**rumuka-furumuka*, **furumuka-furumu*); internal stems must be left- or right-aligned (**furu-muru-muruka*)
- d. truncation: must leave a two-syllable minimum behind
- e. whether to truncate (and by how much), and whether to use replacive [a], is all determined independently on a stem-by-stem basis
- f. in the case of bisyllabic and longer stems, the above choices have no effect on tone (except for right-aligned truncations lacking the V2, as we have seen)

g. everything in the underlying input must be realized somewhere in the R-stem. Thus, /furumuka/ → **furumu-rumu, *furu-furumu*; also tone, an input V1, V2 or FV /H/ must be realized somewhere in the R-stem.

(46) Concerning tone assignment in reduplication
a. V1 /H/ is assigned to stem1
b. FV /H/ is assigned to the last stem
c. V2 /H/ can be assigned to any stem (except for right-aligned truncations lacking the input V2, as we have seen)
d. monosyllabic stems allow an input /H/ to be realized on any stem

This brings us back to the three issues that were identified and postponed:

(47) a. Why do monosyllabic stems allow more tonal patterns than longer stems?
b. Why can the same suffix /H/ (e.g. of the Progressive) be realized as V2 on any stem, while the FV /H/ of corresponding tense-aspects can only be realized on the last stem?
c. How do we account for input vs. output V2 /H/ in right-aligned truncation?

9.1. Tone on Monosyllabic Verb Stem Reduplication

As was seen in §3.2 and §3.5 reduplicated monosyllabic verbs exceptionally allow a V1, FV or V2 /H/ to be realized on any stem. In order to understand these unexpected results, the reduplicative possibilities of such verb stems were scrutinized on a number of occasions. It should be noted that there are only 16 /CV-/ verb roots in the language of which four toneless roots and four /H/ roots were chosen for systematic study. When toneless monosyllabic verbs are reduplicated in constructions without a /H/ suffix, there is of course no H in the output, as in the P3 in (9a) and (15a). Table 1 shows that the V2 /H/ can appear on any stem, marked by √:

	stem 1	*stem 2*	*stem 1*	*stem 2*	*stem 3*	*stem 1*	*stem 2*	*stem 3*	*stem 4*
/gu-/ [gwa] "fall"	√	√	√	√	√	√	√	√	√
/se-/ [sa] "grind"	√	√	√	√	√	√	√	√	√
/ju-/ [jwa] "bleed"	√	√	√	√	√	√	√	√	√
/to-/ [twa] "contribute"	√	√	√	√	√	√	√	√	√

Table 1. Tone on Reduplicated Toneless Monosyllabic Stems with V2 /H/

As we have previously seen, monosyllabic stems consist of a monomoraic /CV-/ root plus a final vowel, e.g. /gu-a/, which will undergo gliding + compensatory lengthening (*gwaa*), maintaining the bimoraic minimum on verb stems. The final stem will then undergo word-final shortening (*gwa*). If the V2 /H/ is assigned to the penultimate stem, a HL falling tone will result (*ni-ba-gwáa-gwa*); if assigned to the final stem, the V2 /H/ will shift to the penult by FHR (*ni-ba-gwáá-gwa*).

Table 2 shows that the indicated four verbs allow V1 or FV /H/ to be realized on either the first or last stem in reduplication:

	stem 1	*stem 2*	*stem 1*	*stem 2*	*stem 3*	*stem 1*	*stem 2*	*stem 3*	*stem 4*
/ɲó-/ [ɲwá] "drink"	√	√	√	(√)	√	√	(√)	(√)	√
/rí-/ [ryá] "eat"	√	√	√	(√)	√	√	(√)	(√)	√
/fá-/ [fá] "die"	√	√	√	√	√	√	√	√	√
/hí-/ [syá] "burn"	√	√	√	√	√	√	√	√	√

Table 2. Tone on Monosyllabic Stems with V1 or FV /H/

However, variable judgments were received on internal stems, marked by (√). Sometimes these were accepted, sometimes questioned or rejected. Interestingly, the two intransitive verbs /fá-/ "die" and /hí-/ "burn" consistently allowed the /H/ on internal stems.[18]

While there are differences, the unmistakeable conclusion is that there is overlap and near-identity between the realization of V1, V2 and FV /H/ in monosyllabic stem reduplication. While free realization of the V2 /H/ has been the pattern on longer stems as well, acceptance of multiple variations of V1 and FV /H/ is quite surprising from a general Bantu perspective. In other languages such as Chichewa, a reduplicated monosyllabic stem often fuses as a single stem within the R-stem. In contrast, compared to longer stems, the internal structure of R-stems with two or more monosyllabic stems is more accessible to V1 and FV tonal realizations in Runyankore.

To understand why this might be so, I hypothesize that individual monosyllabic stems can optionally lose their stem status, and hence their ability to realize an input /H/.[19] Assuming that at least one monosyllabic verb must maintain its stem status and the others treated as non-stems, this could result in an input /H/ being assigned to any one of the input stems, as in (48), where the one stem is shown in brackets, and the non-stems are unbracketeds:

(48) a. initial stem: [nywáa] - nywaa - nywa (double right-aligned reduplication)
b. medial stem: nywaa - [nywáa] - nywa (left- and right-aligned reduplication)
c. final stem: nywaa - nywaa - [nywá] (double left-aligned reduplication)

Such distinctions seem not far afield as we have seen that both left- and right-aligned truncated reduplication is possible. As indicated by the acute accent, the above structural differences could derive all three assignments in a trisyllabic R-stem consisting of three monosyllabic verbs forms. To this we need only add that all three /H/ tone assignments are realized identically on a monosyllabic stem, producing the following three-way merger:

(49) a. V1 /H/ : nyó-a → nywáá ... ba-ká-nywa "they drank"
b. FV /H/ : nyo-á → nywáá ... ni-bá-nywa "they are drinking"
c. V2 /H/ : gu-á → gwáá ... ni-bá-gwa "they are falling"

[18] The two transitive verbs /rí-/ "eat" and /ɲó/ "drink" were examined both when occurring finally and when followed by a complement, where DN found /H/ on an internal stem to be more acceptable. Sometimes the judgments were slightly different for /ɲó-/ "drink" vs. /rí-/ "eat", sometimes preferring internal stem /H/ on one or the other. This underscores that there is some lexeme-specific preference for one vs. another tone pattern, as elsewhere (cf. note 11). See §10 for more discussion.

[19] The "non-stems" in (48b,c) would still maintain their underlying bimoricity, since they would not be subject to stem-final vowel shortening.

It could therefore be that the combination of the restructuring in (48) and the tonal equivalences in (49) conspire to provide the multiple possibilities in Table 2. Recall that on longer stems, V1 /H/ and FV /H/ are consistently realized on the first vs. last stem, respectively.

9.2. FV /H/ vs. V2 /H/

The second issue concerns the different potentials of V2 /H/ and FV /H/. V2 /H/ can be realized on any stem, while the FV /H/ that occurs in the same tense-aspects can only be realized on the last stem. This has a historical explanation. In pre-Runyankore (and more transparently in other languages such as Luganda) there were two different H tone suffixes. The first suffixal /H/ always linked to the V2, even after a V1 /H/ root, as in the present habitual negative forms in (50).

(50) a. /ti-ba-furumuk-a + H/ → ti-ba-furúmuk-a "they don't dash out"
H

b. /ti-bi-zínguruk-a + H/ → ti-bi-zínguruk-a "they don't unwind"
H H
↓
Ø

Based on comparative evidence, stems such as in (50) went through the following stages:

(51)		Ø root	/H/ root	
	a.	/furumuka + H/	/zínguruka + H/	input
	b.	furúmúká	zíngúrúká	linking of suffix H from V2 to FV
	c.	furúmùkà	zíngùrùkà	Meeussen's Rule
	d.	furúmuka	zínguruka	privative H analysis
		V2 /H/	no suffix /H/	

Starting with the input in (51a), in (51b) the /H/ suffix tone linked to all of the vowels from the second mora to the FV, as Meeussen (1961) reconstructs for Proto-Bantu. This is followed by the application of Meeussen's Rule, by which all but the first of the successive H tones become L, indicated by the grave accent. Although this L is crucially distinct from Ø in synchronic Luganda (Hyman & Katamba 2010:72-73), the privative H/Ø output in Runyankore in (51d) results in Ø roots exhibiting a V2 /H/ suffix, and /H/ roots lacking a /H/ suffix.[20]

Contrasting with this first suffix /H/ reflected in the present habitual negative construction in (50), the progressive V2/FV /H/ suffix that we have repeatedly seen was originally an enclitic.[21] While the /H/ tone could still be anticipated onto the V2 if the verb root was toneless, it stayed outside the verb stem as an enclitic if the verb root was /H/.[22] Although I will suggest another

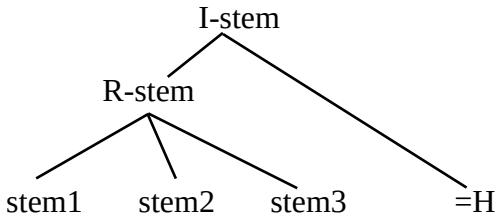
[20] The same "polar" system of H suffix after Ø root vs. Ø suffix after root /H/ is found elsewhere in the Rutara subgroup of Bantu, e.g. Ruhaya (Hyman & Byarushengo 1984:62, Hyman 2016:26-27). Goldsmith (1987) contrasts this with the second H suffix, which he refers to as the "complex" V2 vs. FV pattern. See also Odden & Bickmore (2014).

[21] Potentially parallel to this distinction, Mtenje (2006) shows that in Cinamwanga a V2 or penultimate suffixal /H/ is copied in reduplication, but a FV suffixal /H/ is not, indicating that it has a different (enclitic?) status in that language as well.

[22] Like Meussen's Rule, this also can be seen a synchronic OCP effect, although with a different resolution.

interpretation in (53), this is is still a possible analysis today: the suffixal /H/ could be an enclitic that falls outside the R-stem.[23] If the R-stem is toneless, it can be realized on any V2; if there is a H in the R-stem it links to the FV of the R-stem and the R-stem (root) H is deleted.[24] This suggests the following structure, where I-stem = the inflectional stem (Downing 2000:5).

(52)



However, this does not address why the V2 /H/ can go on any stem, while the V1 /H/ contributed by the lexical root can only go on stem1.

To account for this I slightly adapt a suggestion from Nicholas Rolle (personal communication) that rather than seeing the stems as coordinate under R-stem, as in (52), they may be nested.[25] The tonal facts fall out from the bracketing distinctions in (53a) vs. (53b,c), where Hs in parentheses cannot be realized:

(53) a. V1 /H/: (((stem1) stem2) stem3)
H (H) (H)

b. FV /H/: (stem1 (stem2 (stem3)))
(H) (H) H

c. V2 /H/: (stem1 (stem2 (stem3)))
H H H

As seen in (53a), in the absence of a suffixal /H/ the R-stem has a left-branching structure. Since only stem1 has a left bracket from which to calculate V1, a V1 /H/ will only be able to be realized on stem1. If, on the other hand, there is a suffixal /H/, the R-stem structure is right-branching as in (53b,c). Since only stem3 has a right bracket after it in (53b), the FV /H/ will have to be realized on stem3. On the other hand, since the V2 /H/ can be calculated from any of the three left-brackets in (53c), it can be realized on any of the three stems. In other words, even if we assume that tone is copied (as I have), any one of the V2 /H/'s can survive, while only the first V1 and last FV /H/ can.

[23] In Hyman (1993) I explore this idea for Ruhaya and compare analyses of the V2/FV tone pattern which poses problems for certain derivational frameworks.

[24] In fact, as in Ruhaya, any prefixal H is also deleted whenever there is a suffix H, whether realized on the V2 or the FV. For example, while the realization of /ti-bí-zínguruk-a/ as *ti-bí-zinguruka* "they do not unwind" shows that the subject prefix /bí-/ "they (class 8)" has an input /H/, this prefixal H is not realized in *ti-ba-furúmuka* "they do not dash out" in (50a). Prefixal H tones can be realized along with a root H only if there is no suffixal H. As opposed to suffixal /H/, V1 /H/ does not trigger deletion of prefixal Hs: /ba-ría-zínguruk-a/ → *ba-ryáá-zínguruka* "they will unwind" (remote future). It is tempting to relate this difference to the two R-stem structures that are introduced in (53) below: the right-branching structure in (53b) results in only the suffixal /H/ being realized, while the left-branching structure in (53a) has no such effect.

[25] I prefer to see this as an issue concerning how the stems are structured rather than just grouping the tones into nested domains. It would be reassuring if some other phonological property confirmed the left- vs. right-branchings. While stem-final vowel shortening would be expected to apply only to stem3 in (53b,c), it unfortunately applies to all non-final bisyllabic and longer stems in both structures.

There is in fact further evidence that V1 /H/ should be analyzed this way. This concerns the object prefix, which can optionally be reduplicated only on monosyllabic stems. First, as seen in (54a-c), object markers are underlyingly toneless. However, if the stem is all Ø, as in (54d), object markers are realized with a H tone

(54)	a.	V2 /H/	:	ni-ba-gi-munyúnguz-a	"they are rinsing it" (class 9 -gi-)
	b.	FV /H/	:	ni-ba-gi-zingurúk-a	"they are unwinding it"
	c.	V1 /H/	:	ba-ka-gi-zíngurur-a	"they unwound it"
	d.	Ø	:	ba-ka-gí-munyunguz-a	"they rinsed it"

This tonal alternation can be treated either by a morphologically conditioned rule or by setting up two sets of allomorphs, with the /H/ set being chosen to assure that there will be a H in the "macro-stem" (object marker+stem).[26] With this in mind, consider now the following suffixal /H/ reduplications with the object prefix:

(55)	a.	FV /ɲó-á/:	ni-ba-gí-nyw-a	"they are drinking it" →	ni-ba-gi-nywaa-gí-nywa
					ni-ba-gi-nywáá-gi-nywa
	b.	V2 /se-á/:	ni-ba-gí-s-a	"they are grinding it" →	ni-ba-gi-sáá-gi-sa
					ni-ba-gi-saa-gí-sa

As before, both the FV /H/ can irregularly be assigned to either stem in (55a), while V2 /H/ can go on either stem in (55b). Now consider the corresponding reduplications without a suffixal /H/:

(56)	a.	Ø	/se-a/:	ba-ka-gí-s-a	"they ground it" →	ba-ka-gí-saa-gi-sa
						*ba-ka-gi-saa-gí-sa
	b.	V1	/ɲó-a/:	ba-ka-gí-nyw-a	"they drank it" →	ba-ka-gí-nywaa-gi-nywa
						*ba-ka-gi-nywáá-gi-nywa

In (56a) we see that only the first object marker can appear with an H tone, showing that this is conditioned at the I-stem level. The crucial example, however, is (56b), where the V1 /H/ is realized on the first object prefix, not on the verb root! If we assume that the bracketed structure is as in (57a), we can see in (57b) that the /H/ contributed by the root /ɲó/ "drink" is linked to the object prefix in stem1, with the second root /H/ being stray-erased in stem2.[27]

(57) a. ((gi-nywa) gi-nywa)
H H

b. ((gí-nywa) gi-nywa)
H H
↓
Ø

I therefore conclude that left-most V1, right-most FV, and variable V2 /H/ placements can be accounted for by reference to prosodically nested stems.

[26] Since most object markers were historically *H, it more likely that the H is a retention: Object markers became L (Ø) except when followed by an all L (Ø) stem.

[27] An alternative interpretation is that /ɲó/ "drink" is optionally treated as a toneless root, in which case the H on the object prefix *gí-* in (57b) would be from H tone insertion. Monosyllabic verb stems show certain other unexpected tonal properties in the verb paradigm which are the subject of a separate study.

9.3. Input vs. Output V2

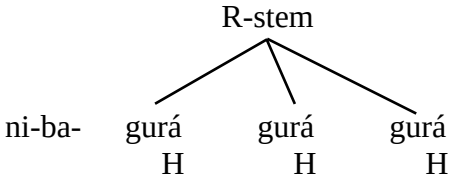
This then brings me to the curious input vs. output realization of V2 /H/ in right-aligned truncation:

(58) ni-ba-furúmuk-a "they are dashing out here and there"
- a. ni-ba-furúmuka-rumuka = H on input/output V2 of stem1
- b. ni-ba-furumuka-rúmuka = H on input V2 of stem2
- c. ni-ba-furumuka-rumúka = H on output V2 of stem 2

The output V2 /H/ in (58c) represents the only case where a tone is assigned to a mora other than the mora that would have received the /H/ in the non-reduplicated stem. With left-aligned truncation there never is a problem, since each stem has to be two syllables and hence includes the V2. Recall my assumption that reduplication consists of total stem compounding with individual stems optionally and independently undergoing truncation and replacive [a]. This includes the V2 /H/ on multiple stems, as in (59b).

(59) a. ni-ba-gurá "they are buying" →

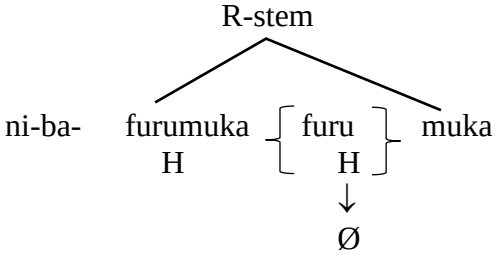
b.



c. ni-ba-gurá-gura-gura
ni-ba-gura-gurá-gura
ni-ba-gura-gura-gúra

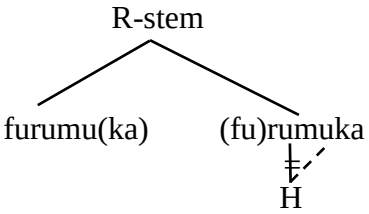
Although the R-stem is limited to at most one H tone in the output, any one of the three V2 /H/s in (59b) can be realized, as in (59c). Where right-aligned truncation applies as in (60), only the output in (60a) is possible. The impossibility of (60b) is predicted if the V2 /H/ is truncated along with its tone-bearing unit, as schematized in (60c).

(60) a. ni-ba-furúmuka "they are dashing out" → ni-ba-furúmuka-muka
b. *ni-ba-furumuka-múka
c.



In (59c) and (60a) the H of [gurá] and [furúmuka] falls on what is both an input and output V2. The V2 assignment is thus transparent and surface-true (ignoring FHR in (59c)). However, when truncation has the effect of a V2 /H/ occurring initially in its (right-aligned) stem, it may be realized there, as in (61a) or optionally shift, as in (61b).

(61) a. ni-ba-furúmuka "they are dashing out" → ni-ba-furumu-rúmuka
b. → ni-ba-furumu-rumúka
c.



Depending on the framework, either a shifting process is needed, as schematized in (61c), or there is an equal "ranking" between a faithfulness constraint maintaining where the V2 H would be in a full stem vs. satisfying that it is in the V2 position in the surface truncated stem. However this is implemented, the clear distinction is whether the V2 /H/ is calculated before vs. after right-aligned truncation.[28]

10. Conclusion

In the previous sections I have shown that Runyankore exhibits an impressive range of possibilities in verb stem reduplication (all of which are also available in noun reduplication). This includes multiple reduplication, left- and right-truncation, replacive [a], and internal "complementary" truncation, which can be combined with each other. Among the possible shapes, full stem reduplication is always available (*furumuka-furumuka*), as is DN's "first choice" reduplication pattern, left-aligned truncation to a bisyllable combined with replacive [a] (e.g. *fura-furumuka*). There is no evidence that choosing one of the truncation patterns or not, or using replacive [a] or not, has any effect on the meaning. However, as I have sporadically pointed out, DN sometimes accepts certain patterns on some lexemes but not others without any apparent predictability. This of course points to one of the limitations in this study which is based on extensive elicitation with one speaker whose judgments would ideally be compared with others. It also could be crucial to catch reduplications in spontaneous speech! I would like therefore to end with a few observations concerning methodology.

Of course, many other descriptions of Bantu reduplication have been similarly based on work with one or perhaps two speakers. In my study I have tried to compensate as best I can by collecting judgments on a large number of verbs (217) taken through the various reduplicative options, more than once, in different orders, on separate occasions, with and without something following the verb. In all, more than 40 hours were spent over several months carefully checking one judgment against another. I not only marked judgments as acceptable (√), questionable (?), or unacceptable (*), but on many occasions also took down DN's exact reaction. Among the most common responses to the less than perfect structures were "that's weird", "that's twisted", "I think acceptable, but I wouldn't say it", "someone else might say it", and "I prefer the other way", referring to truncated CVC-*a*. As a result, the massive amount of data and judgments involving numerous verbs had to be first compared and then interpreted.

From this procedure I concluded what has been presented in the previous paragraphs: Every one of the acceptable patterns was documented on different verb stems of the same and different

[28] I should mention that this is another area of lexeme-specific variation. Thus, while /furumuka/ "dash out" and /hakanisa/ "dispute" accept the surface V2, DN does not like the surface V2 realization of /muŋunguz-a/ "rinse": *ni-ba-munyunguza-nyúnguza, *ni-ba-munyunguza-nyungúza.*

syllable length. The occasional (usually consistent) rejection of a pattern on a specific lexeme was noted, but was not judged to discredit the well-formedness of the structure if it was judged acceptable on most verbs. I of course do not know what the basis of lexeme-specific preferences is, and find it rather puzzling, as it would not be possible for DN to have heard most of the thousands of reduplicated forms that I queried. In this respect, the study resembles work in traditional generative syntax where one has to judge the well-formedness of sentences that have never been heard before. As in syntax, we can't know exactly how other speakers would judge such cases. However, I have always viewed intraspeaker variation as a "gift": The consultant is alerting us to the fact that there is an issue that can now be further investigated.[29] However, by examining this large corpus of reduplicated forms, I feel that we can at the very least establish what the range is of the variation, though not the specific preferences of different speakers.

There is, however, a perhaps more serious question: How does the elicited data compare with what actually happens when speakers speak? While DN accepts many different ways of reduplicating, she most frequently first offered the full stem and CVC-*a* reduplications, as reported elsewhere.[30] However, every once in a while DN volunteered a surprisingly different reduplication for a specific verb, slowly revealing that other options were available. I followed this up by querying the same (and other) reduplications on other verbs, thereby yielding the results that I report in this study. The question concerns the status of these options. We don't know if other speakers will accept as many possibilities as DN, for instance, the less common right- (vs. left-) truncation and the quite unusual multiple reduplication. Concerning the latter, most published studies on Bantu reduplication unfortunately do not indicate whether multiple reduplication is possible. As mentioned in note 9, I consulted over email with several Bantuist colleagues who have worked on reduplication, asking them specifically if multiple reduplication was possible in the languages they know. Most of the answers came back negative. Winfred Mkochi, however, informed me that Malawian Citonga can double reduplicate with a different meaning: If the verb stem is reduplicated once, the meaning is "to do X repeatedly" (Mkochi 2017). If reduplicated twice, the meaning is "to do X excessively". As I pointed out earlier for Runyankore, single reduplication can have several meanings, while multiple reduplication can only mean "to do X a lot". The question is why multiple reduplication has hardly been documented in the Bantu literature.[31] It may still be that most Bantu languages do not permit double reduplication, while a minority of them do, likely with

[29] Also as in syntax, I suspect that it would be hard to work out all of the possibilities by examining texts or recording conversations.

[30] Also working with DN, Huff (2020) documented both full stem and CVC-*a* reduplication in the infinitive, while Poletto (1998) reported only CVC-*a*, working with a different speaker who had other differences from DN, whose speech is virtually identical to that reported in Kaji (2004). Christine Beier (personal communication) brings up another point about elicitation, which is that there are significant differences in language consultants (as there are among introspecting linguists working on their own language). One type of elicitee quickly establishes what s/he thinks the pattern is (as a linguist would) and either accepts or rejects a form depending on whether it falls within that pattern. Another type of elicitee doesn't try to match to an expected structure, but approaches each form individually, looking to determine if there is a context where it might be used. In comparing reduplication across Bantu languages, we have to be sure that native speakers don't judge multiple reduplication by whether it fits or doesn't fit the pattern that they have in mind, or whether they can vs. cannot imagine the context where it would be used—but rather because it is or is not grammatical.

[31] As already mentioned, one reviewer was generally wary of double reduplication and pointed out an alternative form of intensification via an *-aguz-* suffix, consisting of *-agur-* plus the causative suffix *-y-* (*ry* → *z*): *o-ku-shab-a* "to beg", *o-ku-shab-aguz-a* "to beg a lot", *o-ku-túm-a* "to send", *o-ku-túm-aguz-a* "to send often". Since *-aguz-* can be combined with other suffixes including the passive (e.g. *ba-ka-nyw-és-aguz-ibw-a* "they drank a lot", they-P3-drink-CAUS-aguz-PASS-FV), both it and the base suffix *-agur-* merit a serious investigation.

semantic differences. Or it may be that one's first reaction is to reject it, but upon closer inspection recognize that it is possible, even if some speakers prefer not to use it. Since we have rarely bothered to look for it in our elicitations, it could be that multiple reduplication is more widespread, but we have just overlooked it. I hope this study will encourage others to seek out multiple reduplication in other Bantu languages—and report back.

Abbreviations

CAUS (causative), CL (+ number = noun class), DN (name of consultant), FHR (Final H Retraction), FV (inflectional final vowel), H (high tone), Ø (lack of tone), P3 (remote past), PASS (passive), PROG (progressive), SBJ (subject), V1 (first mora of stem), V2 (second mora of stem).

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