Morphological Correspondence in Kinande Reduplication
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MORPHOLOGICAL CORRESPONDENCE IN KINANDE REDUPLICATION*

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0. Introduction

Most work on reduplication since McCarthy & Prince (1986) has focussed on the way prosody constrains reduplicative patterns. However, recent work by Downing (to appear, 1997), McCarthy & Prince (1994) and Urbanczyk (1995) has argued that the prosodic and segmental shape of reduplicants (REDs) is often best accounted for by proposing that reduplicants are subject to morphological constraints as well as prosodic ones. In this paper I argue, in section 1, that verbal reduplication in KiNande is best analyzed by defining the RED as a morphological constituent, the Canonical Verb Stem. Once REDs in KiNande are defined morphologically as Canonical Verb Stems, I will show that otherwise puzzling restrictions and variations in the realization of RED receive a straightforward explanation. One restriction is that only derived longer stems can be reduplicated using the regular Canonical Stem pattern; underived longer stems have restrictions on reduplication. In section 2, I will argue that this pattern may be accounted for by proposing that morphological correspondence constraints optimize the Canonical Stem RED only if the morphological parse of RED matches the morphological parse of the same segments in the Base. Another restriction is that Kinande verb stems with two possible causative forms (this is a lexical property of stems) may also have two reduplicated forms of the RED of the longer causative. But verbs with only the longer causative have only one reduplicated form of the longer causative. In section 3, I argue that this may be accounted for by output-output constraints requiring the Canonical Stem defined by RED to match an output listed allomorph of the Base causative verb stem.

1. The Canonical Verb Stem

1.1. Arguments for the Canonical Stem

In KiNande, as in many Bantu languages (see Downing, to appear), the verbal reduplicant is two syllables long and ends in a fixed vowel /a/ (the reduplicated form means to do the action of the verb here and there, or quickly):

(1) KiNande Verbal Reduplication (Mutaka & Hyman 1990; eri- is the infinitive prefix; the reduplicant is underlined)

	Stem	Reduplicated Form	Gloss
(a)	*Consonant-initial:*		
	eri-huma	eri-huma=huma	‘to beat’
	eri-hum-ir-a	eri-huma=humira	‘to beat for’
	eri-hum-an-a	eri-huma=humana	‘to beat each other’
	eri-hum-ir-an-a	eri-huma=humirana	‘to beat for each other’
(b)	erí-tuma	erí-tuma=tuma	‘to send’
	erí-tum-ir-a	erí-tuma=tumira	‘to send to’
	erí-tum-an-a	erí-tuma=tumana	‘to send each other’
	erí-tum-ir-an-a	erí-tuma=tumirana	‘to send to each other’

The prefixal position of RED and its fixed disyllabic length are familiar prosodic conditions on reduplication, and can be accounted for by the constraints in (2):

(2)
(a) **Contiguity:** RED (R) corresponds to a contiguous substring of Base (B).
(b) **Anchoring:** The initial element in R is identical to the initial element in B.
(c) **Align RED** (**Align**; adapted McCarthy & Prince 1993a,b):
Align (RED, R; Stem, L)
The reduplicant subcategorizes for a following Stem.
(d) **RED=Foot** (adapted McCarthy & Prince 1993b):
The left and right edges of RED must coincide, respectively, with the left and right edges of a bisyllabic (morphological) foot.[1]
OUTRANKS
(e) **MAX B-R:** Every element of the RED has a correspondent in the Base.

The RED includes only the first two syllables of the stem due to the constraints in (2a,b,d,e) (McCarthy & Prince 1993b, pp 62-63, figs. (110), (111)). The prefixal position of the reduplicant is made optimal by the alignment constraint in (2c).

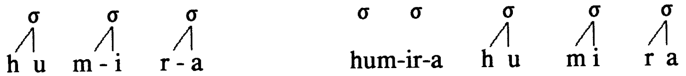
It is more problematic, however, to account for why the second Base vowel does not always have a correspondent in the RED, but is replaced by the fixed vowel /a/. In their original analysis of KiNande reduplication, Mutaka & Hyman propose that the Morpheme Integrity Constraint (MIC) in (3) blocks the second Base vowel from appearing in the RED:

(3) **Morpheme Integrity Constraint** (Mutaka & Hyman 1990; fig (22))
Mapping of a melody to a reduplicative template takes place *by morpheme*. If the whole of a morpheme cannot be successfully mapped into the bisyllabic reduplicative template, then none of the morpheme may be mapped.

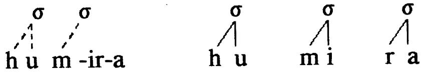
As shown in the derivation in (4), the second stem vowel may not copy in longer stems, because this would always split up a suffixal morpheme (in (4), this morpheme is the benefactive suffix /-ir-/) in violation of the MIC (hyphens indicate morpheme breaks). The unmapped portion of the copied stem deletes by Stray Erasure (Itô 1986) and the fixed /a/ is inserted by default:

(4) Derivation of -huma=humira (adapted Mutaka & Hyman 1990; fig. (44))

a. input representation b. affixing (trochee) and copying



c. left to right mapping (respects MIC) d. /a/ inserted by default



huma=humira

The problem with this analysis is that /a/ is arguably not the phonological default vowel in KiNande.[2] As Archangeli (1984, 1988) argues, the phonological default vowel in a language is typically the one that surfaces in epenthesis contexts. If /a/ were the default vowel in KiNande, we would expect it to be the epenthetic vowel which would occur to eliminate closed syllables in borrowed words, for example (KiNande has strictly CV syllable structure). But as shown in (5), generally front vowels, never /a/, eliminate closed syllables in French borrowings:

(5) French borrowings into KiNande (Larry Hyman, Ngessimo Mutaka, p.c.)

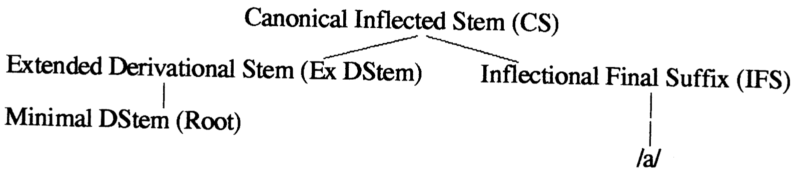
(a)	a-masini	'machine'	
(b)	kamutsere	'magistrate'	(French 'commissaire')
(c)	omu-sofere	'chauffeur'	
(d)	e-sosote	'sock'	(French 'chaussette')
(e)	e-supu	'soup'	

The epenthetic vowel in Bantu languages is typically a front vowel, in fact. For example, Kiyomi & Davis (1992) argue that /i/ is the epenthetic vowel in SiSwati, and Odden (1996) argues /i/ is epenthetic vowel in Kikerewe.

If /a/ is not the phonological default vowel, then some other explanation for its occurrence in the final position in RED must be found. To account for a similar Kikuyu reduplication pattern, Peng (1991) proposes that the /a/ is phonologically prespecified to fill the second vowel slot in the template. But this implies that the fact that /a/ and not some other vowel occurs in the second syllable is unpredictable and arbitrary. However, I propose (see, too, Downing 1997, to appear) that /a/ is inserted because it is the morphological default vowel. Indeed, what is striking about the form of RED is that it resembles a canonical two-syllable Bantu verb stem (Doke 1943, 1954), ending with the default Final Vowel morpheme /a/.

The requirement that the RED resemble a Canonical Verb Stem (CS) is formalized by the constraint in (6):

(6) **RED=CS:** RED is a Canonical Stem (CS) as defined below (this representation of verb stem structure follows Myers 1987):



The representation in (6) is proposed as a morphological well-formedness constraint on the shape of RED. This constraint is satisfied iff (a) the RED is morphologically parsed and contains two constituents, the DStem (which minimally dominates the Minimal DStem (Root) but may also dominate optional derivational suffixes and the Inflectional Final Suffix; and (b) the RED ends in /a/, the morphological default inflectional final suffix.

The Canonical Stem analysis, then, straightforwardly solves both problems the fixed /a/ pattern raises. The second vowel of the base does not occur in RED, because the second RED vowel must be identifiable as an Inflectional Final Suffix (IFS).[3] The vowel /a/ occurs in the reduplicant because it is the default IFS.

1.2. A potential problem with the Canonical Stem analysis

The Canonical Stem analysis of KiNande reduplication predicts that the RED in KiNande should always end with the IFS /a/. But, as shown in (7a), if a disyllabic stem ends with some other IFS - like subjunctive /-e/ - then that IFS vowel also occurs in the RED. However, /a/ does occur in RED of longer stems, as shown in (7b):

(7) Subjunctive verbs (Mutaka & Hyman 1990, pp 93-94; figs. (47-48))

(a) *Two-syllable stems*

Stem	Reduplicated form	Gloss
tú-húm-è	tú-húme=humè	‘let’s beat’
tu-túm-ê	tu-tume=túmê	‘let’s send’
tú-sw-er-è	tú-swere=swerè	‘let’s grind for’

BUT

(b) *Longer stems*

tú-húm-ir-è	tú-húma=humirè *tú-húme=humire	‘let’s beat for’
tu-tum-ír-ê	tu-tuma-tumírê *tu-tume=tumírê	‘let’s send to’

Mutaka & Hyman’s (1990) MIC analysis predicts that the Final /-e/ in (7a) should be copied: the subjunctive suffix may be fit into RED without splitting it. What I will argue in this section is that the Canonical Stem analysis is equally able to handle these facts.

The crucial observation motivating my analysis is that the final vowel is only copied in two-syllable stems. That is, it is optimal to copy the Final Vowel of the Base iff Base is same size (two syllables) as the RED, since in this case a perfect match between the RED and the Base may be achieved. RED=CS (6) is only satisfied (and SDEP violated) if copying the entire Base violates the maximality condition on RED, so a perfect match between RED and the Base is not possible. As shown by the tableau in (8), simply ranking MAX (2e) above RED=CS (6) derives exactly this result:

(8) Tableau exemplifying subjunctive analysis[4]

		RED=Ft >>	MAX >>	RED=CS >>	SDEP
(a)	√ tu-**hume**=hume	√	√	*	√
(b)	* tu-**huma**=hume	√	*!	√	*
(c)	√tu-**huma**=humire	√	*	√	*
(d)	*tu-**hume**=humire	√	*	*!	*
(e)	*tu-**humi**=humire	√	*	*!	√
(f)	*tu-**humire**=humire	*!	√	*	√

To sum up, in this section I have shown that Canonical Stem best explains why fixed /a/ regularly occurs in the second syllable of the RED. I have also shown that ranking MAX above the RED=CS constraint straightforwardly explains why only two-syllable Base stems regularly violate the Canonical Stem constraint.

There is no need to appeal to the MIC to explain this pattern. In the next two sections, I will look at data that is problematic for the MIC analysis, and show that the Canonical Stem analysis extends to these cases, too.

2. Morphological Correspondence between RED and Base

The first problem I will discuss is why only derived longer stems can be reduplicated by the regular Canonical Stem pattern. As shown in (9), underived longer stems show variation in reduplication, with only a few following the Canonical Stem pattern (9a), others showing total reduplication (9b), while many do not reduplicate at all (9c) (Mutaka & Hyman (1990), fig (75)):[5]

(9) Reduplication of underived polysyllabic verb stems

(a)	eri-gambul-a	eri-gamb-a=gambul-a	'to talk'
	eri-goner-a	eri-gona=gonera	'to neglect'
	erí-lender-a	erí-lenda=lendera	'to walk'
(b)	erí-bindul-a	erí-bindula=bindula *erí-bind-a=bindula	'to change'
	eri-guluk-a	eri-guluka=guluka	'to fly'
	erí-birikir-a	erí-birikira=birikira	'to call'
(c)	erí-bugul-a	NONE	'to find'
	erí-balik-a	NONE	'to jump'

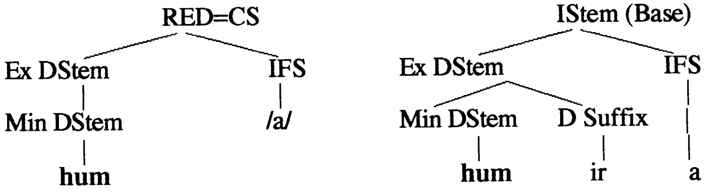
This restriction is by no means confined to KiNande. The disyllabic Canonical Stem form of RED is also not possible for underived polysyllabic stems in other Bantu languages, like SiSwati (Downing 1997) and KiKerewe (Odden 1996).

Informally, the restriction seems to be that the bisyllabic Canonical Stem is only a possible realization of RED if it matches an actual verb stem of the language which is derivationally related to the stem of the Base. To account for this restriction, I propose that the Canonical Stem pattern of reduplication is only possible in these languages if RED satisfies the morphological correspondence constraint in (10):

(10) **MDEP**: The DStem of RED corresponds to the DStem of the Base.

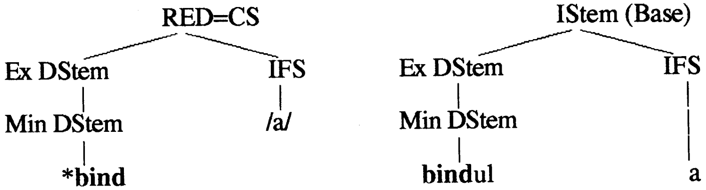
MDEP is satisfied iff the segments parsed into the DStem of RED are identical to (all the) segments parsed into the DStem of the Base. The representations below show that Canonical Stem reduplication for longer derived stems satisfies MDEP (11), while Canonical Stem reduplication for longer underived stems violates MDEP (12):

(11) Structure reduplicated stems (e.g., (1a)) with CS RED: MDEP satisfied



BUT

(12) Structure reduplicated stems (e.g., (9b)) with no CS RED: MDEP violated



MDEP must be highly ranked, along with RED=Ft, in order to disfavor a bisyllabic Canonical Stem (CS) RED when MDEP is violated. This is shown by comparing the tableau in (13) evaluating a stem like that in (11) for which a CS RED is optimal, with the tableau in (14) evaluating a stem like that in (12) for which a CS RED is non-optimal:

(13) CS RED (a) is optimal output

/-hum-ir-a/	MDEP	RED=Ft	>>MAX >>	RED=CS	>>SDEP
(a) √**hum+a**=hum+ir-a	√	√	*	√	*
(b) ***hum+i**=hum+ir-a	√	√	*	*!	√
(c) ***hum+ira**=hum+ir-a	√	*!	√	√	√

(14) CS RED (a) is non-optimal output; rather, total reduplication (c) is

/-bindul-a/	MDEP >>	RED=Ft >>	MAX >>	RED=CS >>	SDEP
(a) ***bind+a**=bindul-a	*!	√	*	√	*
(b) ***bind+u**=bindul-a	*!	√	*	*	√
(c) √**bindul+a**=bindul-a	√	*	√	√	√

The ranking of MDEP must be variable in KiNande, though, to account for the variation in reduplication for underived longer stems shown in (9).[6] If both must be satisfied by the optimal candidate, then reduplication is blocked, as for verbs like in (9c). If MDEP >> RED=Ft, as shown in (14), total reduplication is optimal. If RED=Ft >> MDEP, partial reduplication is optimal, as for verbs like in (9a).

To sum up this section, I have shown that proposing that RED has the morphological structure of a verb stem allows us to account for why underived polysyllabic stems do not always take the CS RED: it only occurs if it is an actual verb stem and morphologically related to the Base stem. MDEP (10) optimizes REDs in which the morphological parse of corresponding segments in RED and the Base is identical, making partial reduplication of underived polysyllabic stems non-optimal.

The MIC (3) also predicts that underived polysyllabic stems should not follow the bisyllabic reduplication pattern, since that would violate the MIC. But the MIC has trouble explaining the form of REDs when reduplication is not blocked. It wrongly predicts that (14b), rather than (14a), should be the optimal form of the RED if the MIC is exceptionally violated in longer underived stems, since only the MIC blocks copying the second stem vowel.[7] Mutaka & Hynan's (1990) analysis also cannot explain why total reduplication is a possible variant to bisyllabic reduplication. In the prosodic theory of reduplication they adopt, it is impossible to capture what these variants have in common, since total reduplication has a morphological template, while partial reduplication has a prosodic template. However, as shown in (14), the Canonical Stem analysis predicts that if MDEP is ignored, the Canonical Stem candidate (14a) is more optimal than faithful copy of the first two syllables. The analysis also correctly predicts that, if RED=FT is ignored, total reduplication (14c) should be a possible variant for longer underived stems, since, like (14a), it satisfies both RED=CS and MDEP.

3. Morphological correspondence in Causative Stems

Defining RED as a Canonical Stem also helps solve puzzles for Mutaka & Hyman's (1990) analysis of causative stem reduplication. As they show, there are three basic problems raised by causative reduplication. First, as shown in (15), the causative suffix /-y-/ may occur in REDs of some causative stems in violation of contiguity (and the non-causative Canonical Stem is often a variant form of RED):

(15) KiNande causative suffix reduplication (Mutaka & Hyman 1990, fig. (57))

	Stem	Reduplicated Form	Gloss
(a)	eri-gul-y-a	eri-gulya=gulya *eri-gula=gulya	'to sell'
	eri-gul-ir-y-a	eri-gula=gulirya eri-gulya=gulirya	'to sell to'
	eri-gul-ir-an-y-a	eri-gula=guliranya eri-gulya=guliranya	'to sell to each other'
(b)	erí-bul-y-a	erí-bulya=bulya *erí-bula=bulya	'to ask'
	erí-bul-ir-y-a	erí-bula=bulirya erí-bulya=bulirya	'to ask for'
	erí-bul-ir-an-y-a	erí-bula=buliranya erí-bulya=buliranya	'to ask for each other'

However, as shown in (16), the causative suffix /-y-/ only occurs in the RED if that variant of the causative is possible for the Base stem. Otherwise, the RED may only have the form of the non-causative Canonical Stem :

(16) Restrictions on causative reduplication (Mutaka & Hyman, figs (62)-(65))

Causative /-y-/ may not reduplicate if shorter causative not possible for Base stem

(a)	eri-huma	'to beat'	eri-hum-is-y-a	'to cause to beat'
			*eri-hum-y-a	
	erí-tuma	'to send'	erí-tum-is-y-a	'to cause to send'
			*erí-tum-y-a	
(b)	eri-huma=humisya		*eri-humya=humisya	
	erí-tuma=tumisya		*erí-tumya=tumisya	

BUT *Causative /-y-/ may reduplicate if shorter causative is possible for Base stem*

(c)	eri-genda	'to go'	eri-gend-y-a	'to cause to go'
		OR	eri-gend-es-y-a	
	eri-heka	'to carry'	eri-hek-y-a	'to cause to carry'
		OR	eri-hek-es-y-a	
(d)	eri-genda=gendesya	AND	eri-gendya=gendesya	
	eri-heka=hekesya	AND	eri-hekya=hekesya	

A final problem is why the causative /-y-/ can reduplicate, in violation of contiguity, while the passive /-w-/ cannot, even though both morphemes are glides and both are restricted to occur after the final consonant in the inflectional stem. As shown in (17), the RED of passive stems is always a non-passive Canonical Stem:

(17) KiNande passive suffix reduplication (Mutaka & Hyman, fig. (56))

	Stem	Reduplicated form	Gloss
(a)	eri-hum-w-a	eri-humwa=humwa	'to be beaten'
		*eri-huma=humwa	
	eri-hum-ir-w-a	eri-huma=humirwa	'to be beaten for'
		*eri-humwa=humirwa	
	eri-hum-ir-an-w-a	eri-huma=humiranwa	'to be beaten for each other'
		*eri-humwa=humiranwa	
(b)	erí-tum-w-a	erí-tumwa=tumwa	'to be sent'
		*erí-tuma=tumwa	
	erí-tum-ir-w-a	erí-tuma=tumirwa	'to be sent to'
		*erí-tumwa=tumirwa	
	erí-tum-ir-an-w-a	erí-tuma=tumiranwa	'to be sent to each other'
		*erí-tumwa=tumiranwa	

As Mutaka & Hyman note, these characteristics of causative reduplication are all problematic for their analysis. The MIC blocks copying a monosegmental morpheme which is outside the two-syllable window of left-to-right mapping, so intervening morphemes cannot be skipped to attain the causative. Even if we allow the mapping principle to be violated for the causative, we can not explain why this is not also possible for passives. Finally, it is not clear how to allow mapping to be violated for the causative iff the resulting RED matches a possible realization of the causative stem for the Base.

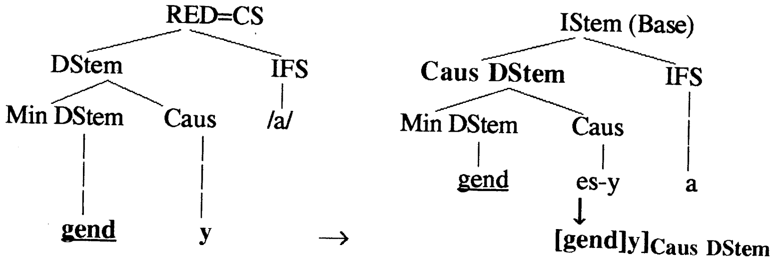
But in a theory where the RED is defined as a verb stem, these morphological correspondence conditions can be more readily formalized. The crucial observation motivating my analysis is that, as Mutaka & Hyman note, the shorter /-y-/ form of the causative is non-productive (lexicalized), while the longer form of the causative (/-isya/) and the passive are both productive. To account for this contrast, I propose, following work like that of Anshen & Aronoff (1988) and

Aronoff (1976), that the unproductive shorter form of the causative must be a listed allomorph of causative DStems, while the productive longer form of the causative and the passive are not listed. The unifying generalization for the data in (15)-(17) can now be formalized by the output-output correspondence constraint in (18):[8]

(18) **DEP O-O:** The RED DStem ouput must correspond to an output listed allomorph of the DStem of the Base.

This constraint is always satisfied by a non-derived RED DStem candidate (modulo MAX satisfaction; see (20), below), because, I assume, the Minimal DStem is a listed allomorph of every Extended DStem derived from it. As shown in (19), this constraint is also satisfied when RED matches the shorter causative DStem iff the Base Causative DStem has the shorter causative as a listed allomorph.

(19) Causative Reduplication Correspondence Effects: DEP O-O satisfied



As we can see in (19), the shorter causative DStem RED is optimal because it satisfies DEP O-O: the segments in the RED output correspond to the segments in the output of a listed allomorph of the Causative DStem of the Base. However, DEP O-O is violated if RED is a passive DStem, since bisyllabic passives are not listed allomorphs of the Base DStem. And, of course, a longer causative DStem will never be an optimal form of RED since it would violate the two-syllable maximum. The tableau in (20) exemplifies the analysis:

(20) Exemplificatory tableau for causative reduplication

	MDEP	RED=FT	DEP O-O >>	MAX >>	RED=CS >>	SDEP
(a) √**gulya**=gulya	√	√	√	√	√	√
(b) ***gula**=gulya	√	√	√	*!	√	*
(c) ***gula**=gulirya	√	√	√	*!*	√	*
(d) √**gulya**=gulirya	√	√	√	*	√	**
(e) √**huma**=humisya	√	√	√	*	√	*
(f) ***humya**=humisya	√	√	*!	*	√	*
(g) ***genda**=gendesya	√	√	√	*!*	√	*
(h) √**gendya**=gendesya	√	√	√	*	√	*
(i) ***gendesya**=gendesya	√	*!	*	√	√	√

In (20), notice that the non-derived RED DStem candidates (20b, c, e, g) always satisfy DEP O-O, since I am assuming that the MinDStem is a listed allomorph of all DStems derived from it. In the first pair of candidates, however, candidate (20a) is optimal (and the non-derived DStem candidate (20b) is not), because, as discussed in section 1.2, above, it is always optimal to satisfy MAX by copying the entire Base when the Base is disyllabic. The analysis chooses the shorter causative DStem candidate (20d) as optimal in the next set as well. But the MinDStem candidate (20c) is clearly a near-optimal variant, since it only incurs one more MAX violation than (20d). Further, (20c) satisfies Uniform Exponence (Downing 1997, Kenstowicz, to appear), since it would be the form of RED which would be optimal for all other stems derivationally related to this one, thus minimizing differences in the realization of REDs for that DStem. In the next candidate set (20e,f), in constrast, only the non-causative RED (20e) is optimal since (20f) is not a listed allomorph of that Base DStem. The final candidate set also has two variants, since the Base DStem has a shorter causative (20h) as a listed allomorph. However, the longer causative (20i) is not a possible form of RED because it violates RED=Ft.

4. Conclusion

In sum, I have argued that the fixed final /a/ in Bantu verbal reduplicants is best explained by proposing the RED must meet a morphological constraint in addition to a prosodic one: it must sound like a Canonical Verb Stem. While /a/ is phonologically unpredictable and marked in this context, morphologically it is the regular inflectional final suffix for verb stems, so it is morphologically predictable that /a/ should fill the Final Vowel slot in the RED. Proposing that RED is a verb stem with internal morphological constituency also explains why some verbs cannot take the Canonical Stem RED pattern. Since RED sounds like a regular verb stem, the expectation is that it should be an actual verb stem which is morphologically related to the Base for reduplication. When this expectation fails, the Canonical Stem RED pattern is non-optimal. Finally, I have argued that proposing that RED is a verb stem also explains the morphological conditions on causative reduplication in KiNande. Since RED is a DStem, it may be constrained to match a listed allomorph of a Causative Base DStem. These morphological constraints on the occurrence of the suffix in RED are plausible if RED must sound like a Canonical Verb Stem. But they would simply be ad hoc stipulations in a theory where REDs are defined to have only prosodic, but not morphological, constituency.

NOTES

* All KiNande data discussed in this paper are from Mutaka & Hyman (1990) and Mutaka (1994). I would like to thank Ngessimo Mutaka and Larry Hyman for helpful comments on the data and analysis, as well as George Bergman, Sharon Inkelas, Orhan Orgun, Doug Pulleyblank and Donca Steriade. Any errors of fact or interpretation are, of course, my own responsibility.

[1] See Crowhurst (1992) for a discussion of distinctions between stress feet and "morphological feet" like the one defining RED in this analysis.

[2] But see Schlindwein (1987) for an alternative view.

[3] **RED=CS >> SDEP** optimizes having fixed /a/ in the second syllable of the reduplicant over copying the second syllable of the base. (**SDEP**: Every segment of RED must have a correspondent in the Base.)

[4] As pointed out to me by Sharon Inkelas and Orhan Orgun, it is important to note that I am interpreting MAX categorically in the tableaux, so that both (8c) and (8e) violate MAX equally, even though the segments of RED (8e) more closely match the segments of the Base. However, McCarthy & Prince (1995) also seem to assume that MAX violations are incurred only when the number of segments is different in the RED compared to the Base. The quality of the corresponding segments is evaluated by other constraints, like SDEP. Because all segments of RED (8e) match their correspondents in the Base while those of (8c) do not, SDEP is violated in (8c) but not (8e). But SDEP is too lowly ranked to optimize a better match if two candidates have the same number of segments but neither satisfies MAX.

[5] According to Mutaka & Hyman, out of some 200 polysyllabic underived verb stems, only 29 follow the regular Canonical Stem reduplication pattern shown in (1) and (9a), while 108 have the total reduplication pattern shown in (9b), and 77 do not reduplicate, like those in (9c).

[6] It is beyond the scope of this paper to address the theoretical problems raised by variable rankings in OT, but the interested reader will find an insightful discussion of this issue in Nagy (1996) and Nagy & Reynolds (1996).

[7] Mutaka & Hyman mention in fn 31 that one would expect /a/ since stems typically end in /a/, but this does not follow from anything in their analysis.

[8] See work like Benua (1996), Buckley (1995), Downing (1997), Kenstowicz (to appear), McCarthy & Prince (1995) and Steriade (1995, 1997) for other arguments in favor of output-output correspondence. But see, too, Hale et al. (1997) for a critique of some of these output-output correspondence analyses.

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