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Author(s): Laura J. Downing

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Jita Glide Epenthesis and the Maximality Principle*

Laura J. Downing
University of Michigan

1. Introduction

In Jita, an Eastern Bantu language spoken in Tanzania, derived glides arise in two vowel hiatus contexts. In a sequence of two monomoraic vowels, if the first vowel is [+high] it will become a glide - or off-glide - and the following vowel is compensatorily lengthened. This is shown in (1a):

- (1a) Glide Formation in Jita¹
oku - iga --> ok^wi:ga 'to imitate'
eBi - ára --> eB^yá:ra 'fingers'

In a sequence of three monomoraic vowels, again, if the first vowel is high it will glide and the second vowel will lengthen. In addition, the glide [y] is epenthesized before the third vowel, as shown in (1b):

- (1b) Glide Epenthesis in Jita
oku-í-ocera --> ok^wi:yócerá 'to roast for oneself'

Odden & Odden (1985) account for very similar facts in KiHehe, another Tanzanian Bantu language, using a skeletal approach by proposing two ordered rules. A rule of Glide Formation first applies to derive glides from high vowels in words like (1a), then a rule of Glide Epenthesis applies to the output of Glide Formation in words like (1b). If the opposite ordering applied, then an incorrect form for (1b) would surface as shown in (1c):

- (1c) Glide Epenthesis incorrectly precedes Glide Formation
(applying left to right)
- | | |
|------------------|----------------------------|
| UR | oku-í-ocera |
| Glide Epenthesis | okuyíocera --> okuyiyocera |
| Glide Formation | cannot apply |
| SR | *okuyiyocera |

Adopting Itô's (1986, 1989) prosodic theory of syllable structure, I shall first show in this paper that the rules of Glide Formation and Glide Epenthesis are motivated by the syllable structure of Jita. As syllabification rules, they are not ordered in the phonology, but instead apply whenever their context is met. After presenting Odden and Odden's (1985) analysis of the KiHehe facts, I shall show that the apparent ordering of these two rules falls out straightforwardly from the directionality and maximality principles of prosodic theory which Itô (1989) has shown typically predict epenthesis sites.

2. Syllable Structure of Jita

2.1. Basic Syllable Template

Like many Bantu languages (e.g., Shona (Myers 1987), Kirundi (Broselow & Niyondagara 1989), Kinyambo (Bickmore 1989) and LuGanda (Katamba 1985)), Jita has the basic syllable template (C)V(V). That is, a syllable must contain at least one vowel, and a maximal syllable may consist of a single

segment in the onset followed by a long vowel. No closed syllables or complex onsets may occur, so no consonant clusters are found in Jita.² Although onsetless (vowel-initial) short syllables seem to constitute the minimal syllable in Jita, this minimal syllable occurs most regularly in only one context, namely, phrase-initial position. Some typical Jita words illustrating these preliminary generalizations about syllable structure are given in (2), below (the syllables are set off by periods in these examples):

(2)	(a)	o.ku.su.ka	'to weave; pour'
	(b)	o.mu.sa:.ni	'friend (cl.1)'
	(c)	e.mi.li.mu	'jobs; tasks (cl.4)'
	(d)	e.Bi.re.fu	'chins; beards (cl.8)'
	(e)	u.ta:.té:.ka	'you didn't cook'
	(f)	i.ta:.lú:.Ba	'it (cl.9) didn't follow'

To account for Jita syllable structure, I will adopt the prosodic licensing approach defended by Itô (1986, 1989) and Goldsmith (1989). Under this approach, syllable structure is not assigned by ordered rules (as in, for example, Steriade (1982), Levin (1985)). Rather, syllabification results from matching sequences of segments to a syllable template. According to Itô (1986), the syllable template and the other syllabification principles of a language are to be understood as Well-Formedness Conditions (WFC's) defining which segment sequences form the permissible syllables of a language. Since these syllabification rules are WFC's they are what Halle & Vergnaud call "persistent rules" and reapply whenever their context is met, rather than being ordered among the phonological rules (Itô 1986).

Following Itô (1989), I further assume that syllabification conventions license sequences of moras and root nodes, in the case of onsets and codas, not skeletal timing units (X or CV slots). As Hayes (1989), Hock (1986), Hyman (1985) and McCarthy & Prince (1986) have all convincingly argued, moras give a more insightful account of prosodic timing than CV or X slots do in relation to a number of phonological phenomena, including compensatory lengthening and syllable structure. Although there are some differences in the details of these moraic theories, all agree that, on the surface at least, onsets do not contribute a mora to the syllable. Only elements in the rhyme - universally the nuclear vowel(s) and, on a language-particular basis, consonants in the coda - contribute a mora to the syllable and thus affect syllable weight.

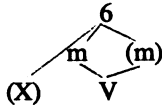
Short vowels, in moraic theory, are universally associated with a single mora, while long vowels are associated with two moras. Glides are distinguished from high vowels in that they are not linked to a mora (Hayes 1989; Hyman 1985). Since Jita has both phonemic glides and phonemic vowel length, I assume mora association must be present underlyingly, so that the contrast between /i/, i:, y/, for example, is represented as shown in (3):

- (3) Representation of Short vs. Long Vowels vs. Glides
(Hayes 1989, p. 256; "m" = mora)

(a)	/i/ =	$\begin{array}{c} \text{m} \\ \\ \text{i} \end{array}$	(b)	/i:/ =	$\begin{array}{c} \text{m} \quad \text{m} \\ \diagdown \quad / \\ \text{i} \end{array}$	(c)	/y/ =	i
-----	-------	--	-----	--------	---	-----	-------	---

Using the moraic approach, then, the basic syllable template for Jita is formulated as in (4):³

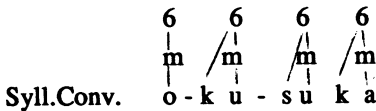
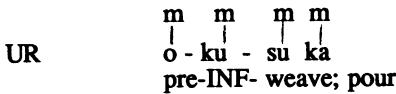
(4) Basic Syllable Template ("6" = syllable)



In other words, Jita syllables are maximally bimoraic. Only a single non-moraic segment (glide or consonant) is licensed in onset position, and the second mora must be the second half of a geminate vowel. Neither consonant sequences nor vowel sequences (diphthongs) are licensed within a syllable.

The application of the moraic syllabification principles discussed so far is illustrated by the derivation of (2a) oku-suka 'to weave; pour' given in (5):

(5) Syllabification of (2a) oku-suka 'to weave; pour'



The other words in (2) would have analogous derivations.

These rules also account for the slightly more complex data given in (6):

- | | | | |
|-----|-----|------------|-----------------------|
| (6) | (a) | o.ku.i:.ga | 'to pass a test' |
| | (b) | a.ma.u:.kâ | 'caterpillars' (Cl.6) |
| | (c) | e.mi.a:.no | 'yells' (n., Cl. 4) |

In these words, notice that onsetless syllables occur word-medially only when a long vowel immediately follows a short vowel. Since onsets are optional (though note that this will be revised shortly) and long vowels are licensed by the Basic Syllable Template (4), these words would be syllabified just like (2a).

2.2. (Off-) glide Formation and Compensatory Lengthening

As was shown by the data in (2) and (6), onsetless monomoraic syllables only occur regularly in phrase-initial position in Jita. Elsewhere, onsetless monomoraic syllables are disfavored, as they seem to be in other Bantu languages (e.g., Kirundi (Broselow & Niyondagara 1989); LuGanda (Katamba 1985); Kinyambo (Bickmore (1989); and Shona (Myers 1987)). When monomoraic vowel sequences arise in Jita, they are regularly eliminated. As shown by the data in (7), if the first vowel in a sequence of two (non-identical)

monomoraic vowels is [+high], it will become an (off-)glide and the second vowel is lengthened (compare these data with those in (2), above):⁴

(7)	(a)	o.ku.i.ga -->	o.k ^w i:.ga	'to imitate'
	(b)	o.mu.á.na -->	o.m ^w á:.na	'child' (cl.1)
	(c)	e.mi.o.yo -->	e.m ^y o:.yo	'hearts' (cl.4)
	(d)	e.Bi.á.ra -->	e.BYa:.ra	'fingers' (cl.8)
	(e)	u.a.té:.ka -->	wa:.té:.ka	'you cooked'
	(f)	i.a.lu:.Ba -->	ya:.lu:.Ba	'it (Cl.9) followed'

Note that (off-)glide formation and vowel lengthening do not occur if the second vowel is long (compare (6a) oku-i:ga 'to pass a test' with (7a) ok^w-i:ga 'to imitate'). Instead, only adjacent monomoraic vowels trigger off-glide formation.

If the two adjacent [+high] vowels are identical, they combine to form a single long vowel, as shown in (8):

(8)	(a)	o.ku.ú.ma -->	o.kú:.ma	'to become dry'
	(b)	e.li.í.no -->	e.lí:.no	'tooth'
BUT	(c)	o.ku.u.ta:.sya -->	o.ku.u.ta:.sya	'to hurt (tr.)'

Again, this process is blocked if the second vowel is long (compare (8a) okú:ma 'to become dry' with (8c) oku-u:ta:sya 'to hurt (someone)').

To account for the fact that onsetless monomoraic syllables are eliminated in Jita by combining two adjacent monomoraic vowels in separate syllables to form a single bimoraic syllable, I propose that the mora of the second vowel is delinked from its syllable and incorporated into the syllable of the first vowel by the Restructuring rule given in (9), which is very similar to a Resyllabification rule proposed by Myers (1987) to account for analogous Shona data:

(9) Onsetless Syllable Restructuring



Restructuring (9) in Jita may be motivated by what Itô (1989) has called the Onset Principle, cited in (10), below:

(10) Onset Principle (Itô 1989: 223, fig. (3))

Avoid $\delta[V$

which states that onsetless syllables are to be avoided whenever possible. Restructuring (9) may then be considered a strategy for repairing ill-formed onsetless syllables in Jita. To account for the fact that onsetless syllables may only occur in phrase-initial position in Jita, I also follow Itô (1989) in proposing

that these peripheral moras may be extraprosodic and so be invisible to the Onset Principle (10).

The Onset Principle as it stands does not explain why onsetless bimoraic syllables, as in (6), resist Restructuring (9), however. One possible explanation would be to propose that in Jita the bimoraic limit on syllable weight blocks restructuring of onsetless bimoraic syllables, since the result would necessarily exceed the bimoraic limit. Another possibility is to propose that Jita syllables are subject to the Branching Constraint, formulated in (11):

(11) Branching Constraint

Syllables must branch, either by containing an onset (a) or by containing two moras (b)

(a)



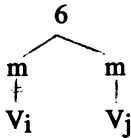
(b)



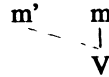
Since onsetless bimoraic syllables do not violate the Branching Constraint (11), they are well-formed and so not subject to Restructuring (9). Onsetless monomoraic syllables do violate the constraint, however, and must undergo Restructuring (9) to derive well-formed syllables.

After two adjacent monomoraic vowels are combined into a single bimoraic syllable by Restructuring (9), other rules must apply to derive a geminate vowel in the syllable, as diphthongs are not licensed in Jita.⁵ If the two restructured vowels are identical, their feature hierarchies are fused to conform to the OCP (Odden 1986), and a geminate vowel is derived. If the restructured vowels are non-identical, the following repair rules must apply to derive a geminate vowel. First, the vowel on the left delinks from its mora by the rule in (12). Then the features of the vowel on the right spread leftward to the resulting free mora to derive a geminate vowel by the Compensatory Lengthening rule given in (13):

(12) Vowel Demorification



(13) Compensatory Lengthening
(m' = unassociated mora)



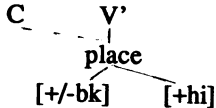
Although Stray Erasure eventually deletes the vowel features delinked by Demorification (12), I assume they do not delete immediately but instead are able to reassociate with other positions within the syllable. As shown by the data in (14), if there is no onset consonant preceding the demorified high vowel derived by Demorification (12), it surfaces as a glide followed by a long vowel:

- (14) Simple Glide in Onset Position
- | | | | |
|-----|------------------|--------------|------------------|
| (a) | u-amá-gura --> | wa:magúra | 'you bought' |
| (b) | u-amá-ge:nda --> | wa:magé:nda | 'you went' |
| (c) | i-amá-gwa --> | ya:mágwa | 'it (Cl.9) fell' |
| (d) | i-amá-Birima --> | ya:maBfírima | 'it (Cl.9) ran' |

Since the Basic Syllable Template (4) allows glides to be syllabified in onset position (if the onset position is not already filled by a consonant), the data in (14) have a straightforward derivation. After Demorification (12) and Compensatory Lengthening (13) apply, the demorified high vowel is licensed in onset position as a glide.

When the demorified [+high] vowel is preceded by an onset consonant, it may not be syllabified in onset position. Instead, its place features reassociate with the onset consonant as an off-glide, by the rule given in (15):

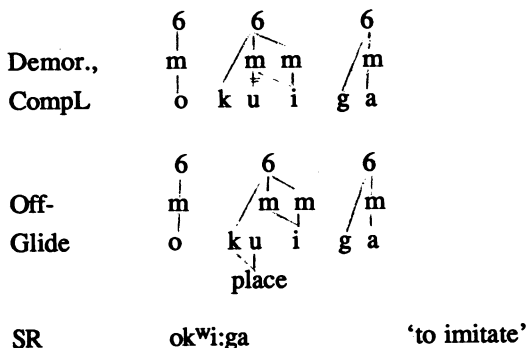
- (15) (Off-)glide Formation (V' = unsyllabified vowel)



The remaining unassociated root node and vowel features are deleted by Stray Erasure. The application of Glide Formation (15) is illustrated in the derivation of (7a) ok^{wi}:ga 'to imitate' given in (16):

- (16) Derivation of (7a) ok^{wi}:ga 'to imitate'

	m	m	m	m
UR	o	ku	i	ga
	PP-	Cl.15	-	imitate
	6	6	6	6
	m	m	m	m
Syll.Conv.	o	ku	i	ga
	6	6	6	6
	m	m	m	m
Restruc.	o	ku	i	ga



To summarize this section, we have seen that (Off-)Glide Formation is motivated by the Branching Constraint on well-formed syllables in Jita. Onsetless monomoraic syllables are ill-formed, and so undergo a rule of Restructuring which incorporates them into the preceding syllable. Other rules then apply to derive Compensatory Lengthening and Off-glide Formation. It is important to note at this point that the output of (Off-)Glide Formation and Compensatory Lengthening is a maximal syllable of Jita, namely, an onset followed by a bimoraic vowel.

3. Glide Epenthesis

Underlying sequences of three adjacent monomoraic vowels are also found in a few contexts in Jita, notably when the reflexive object marker /-i-/ is affixed to a vowel-initial verb stem. Since syllables are maximally bimoraic in Jita, only two - the first two - of the sequence of three adjacent vowels may undergo Restructuring and Compensatory Lengthening. The third monomoraic onsetless vowel cannot also be restructured into that syllable without violating the bimoraic limit on syllable weight. Instead, a glide is inserted before this third vowel, as shown by the data in (17):

- (17) Glide Insertion (Form of infinitives is:
 Infinitive prefix - Reflexive Object Prefix - Verb Stem)
- | | | | |
|-----|------------------|---------------------------|-------------------------|
| (a) | oku-f-ocera --> | ok ^{wi} :yó:cera | ‘to roast for oneself’ |
| (b) | oku-f-úmya --> | ok ^{wi} :yúmya | ‘to dry oneself’ |
| (c) | oku-f-enda --> | ok ^{wi} :yé:nda | ‘to like oneself’ |
| (d) | oku-f-élelwa --> | ok ^{wi} :yélelwa | ‘to understand oneself’ |

Glide insertion is also clearly triggered by the Branching Constraint. Just like Restructuring, glide insertion repairs ill-formed onsetless monomoraic syllables. It may thus be more properly considered a rule of onset epenthesis, and formulated as shown in (18):

(18) Glide Epenthesis



The unspecified onset will later be assigned the features of the palatal glide [y] by default. (Recall that phrase-initial onsetless syllables will not undergo Glide Epenthesis because they are extraprosodic.)

In sum, Glide Epenthesis, like Glide Formation, may be considered a syllabification principle of Jita, as it also repairs ill-formed syllables which violate the Branching Constraint. It is important to note that the output of Glide Epenthesis - in contrast with Glide Formation - is only a minimal syllable of Jita, namely, an onset followed by a monomoraic vowel.

Thus far, I have assumed that Glide Formation applies before Glide Epenthesis, since otherwise the incorrect form in (1c) would be derived. Further, I have assumed that both rules apply from left to right, since it is the first two - not the second two - of the three adjacent vowels which undergo Restructuring. Before showing how the prosodic principles of maximality and directionality proposed by Itô (1989) account for the order and direction of application of these two rules, I shall compare the analysis so far with a skeletal account of very similar KiHehe facts proposed by Odden & Odden (1985).

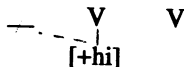
As shown by the data in (19), KiHehe - like Jita - has a rule of Glide Formation which derives a glide from a high vowel when it immediately precedes another vowel:

(19) Glide Formation in KiHehe (Odden & Odden 1985, fig. (2))

kú-teléka	'to cook'	kw-íta	'to spill'
kw-éngéla	'to carry on back'	kw-áaka	'to be lit'
mu-sito	'heavy (1,3)'	mw-áangufu	'fast (1,3)'
kú-mu-tóva	'to him him'	a-mw-éenda	'he will like him'
mi-síto	'heavy (4)'	my-áangufu	'fast (4)'
fi-síto	'heavy (8)'	fy-áangufu	'fast (8)'
kú-lu-gúla	'to buy it (11)'	kú-lw-ííta	'to pour it (11)'

Odden & Odden account for this by the skeletal rule of Glide Formation cited in (20a), which derives a glide from a high vowel when it immediately precedes another vowel:

(20a) Glide Formation (Odden & Odden 1985, fig. (3))



KiHehe also resembles Jita in having a rule of Glide Epenthesis which inserts a glide before the third in a sequence of three adjacent vowels after Glide Formation (20a) applies to the first two vowels. Odden & Odden's skeletal rule of Glide Epenthesis is formulated in (20b), and an example from KiHehe showing the application of both rules is given in (20c):

(20b) Glide Epenthesis in KiHehe (Odden & Odden 1985, fig. (4))

$$\emptyset \rightarrow C / \underset{\underset{6}{|}}{V} _ \underset{\underset{6}{|}}{V}$$

(20c) KiHehe example illustrating both Glide Formation and
Glide Epenthesis:
kú-i-eénda --> kwíyeénda 'to love each other'

Since the two rules apply in nearly the same context (i.e., to adjacent vowels), Odden & Odden must stipulate that Glide Formation applies before Glide Epenthesis in order to prevent the derivation of incorrect forms like that given in (1c).

If we compare Odden & Odden's skeletal analysis of KiHehe with the present prosodic analysis of Jita, it is clear that the skeletal approach misses the generalization that both Glide Formation and Glide Epenthesis are motivated by syllabification principles. It is just a coincidence in the skeletal approach that the rules apply to sequences of adjacent vowels. This omission is especially unfortunate in the case of Glide Epenthesis since, as Itô (1986, 1989) has argued, epenthesis rules almost universally increase syllable well-formedness. Further, in the skeletal account it is not clear why two rules should apply in near identical environments. In the prosodic account presented here, however, I have shown that Jita syllables are maximally bimoraic, so that only two monomoraic vowels may be incorporated into a single syllable by Restructuring. In a sequence of three vowels, one will be left "stranded," and Onset Epenthesis allows this stranded vowel to be incorporated into a well-formed minimal syllable.

What remains to be explained is how the direction and order of application of Glide Formation and Glide Epenthesis may be accounted for. The direction of application of these two rules falls out from the directionality principle (Itô 1989), which states that the direction of syllable construction must be specified in each language. In Jita, syllables must be constructed from left to right across the word, since it is the two leftmost of three adjacent vowels which restructure into a single syllable, leaving the third onsetless. If syllabification applied from right to left, we would incorrectly predict that the rightmost two vowels of the three adjacent vowels in the data in (17) would restructure into a single bimoraic syllable, leaving the first of the three vowels unchanged. This can be seen by comparing the correct derivation of (17a) ok^{wi}.yóccera 'to roast for oneself' given in (21) with the incorrect derivation given in (22):

- (21) Correct derivation of (17a) ok^{wi}:yóçera 'to roast for oneself':
Left to right syllabification

UR
 $\begin{array}{cccccc} m & m & m & m & m & m \\ | & | & | & | & | & | \\ o & k & u & - & i & - & o & c & e & r & a \\ \text{INF} & & - & \text{OP} & - & & \text{roast} & \text{for} & & & \end{array}$

Syll.Conv
 $\begin{array}{cccccc} 6 & 6 & 6 & 6 & 6 & 6 \\ | & / & | & | & / & / \\ m & m & m & m & m & m \\ | & | & | & | & | & | \\ o & k & u & i & o & c & e & r & a \end{array}$

Restruc
 $\begin{array}{cccccc} 6 & 6 & 6 & 6 & 6 & 6 \\ | & / & | & | & / & / \\ m & m & m & m & m & m \\ | & | & | & | & | & | \\ o & k & u & i & o & c & e & r & a \end{array}$

Compl,
Off-Glide
 $\begin{array}{cccccc} 6 & 6 & 6 & 6 & 6 \\ | & / & | & | & / & / \\ m & m & m & m & m & m \\ | & | & | & | & | & | \\ o & k & u & i & o & c & e & r & a \\ & & \text{place} & & & & & & \end{array}$

Restruc. Not Applicable

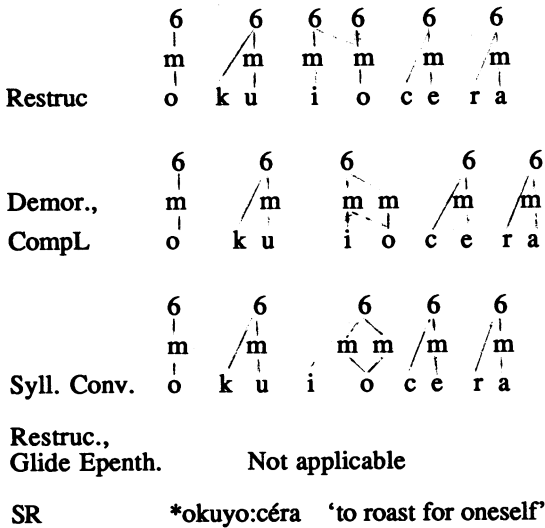
Glide
Epenh.
 $\begin{array}{cccccc} 6 & 6 & 6 & 6 & 6 \\ | & / & | & | & / & / \\ m & m & m & m & m & m \\ | & | & | & | & | & | \\ o & kw & i & y & o & c & e & r & a \end{array}$

SR ok^{wi}:yóçera 'to roast for oneself'

- (22) Incorrect derivation of (17a) ok^{wi}:yóçera 'to roast for oneself':
Right to left syllabification

UR
 $\begin{array}{cccccc} m & m & m & m & m & m \\ | & | & | & | & | & | \\ o & k & u & - & i & - & o & c & e & r & a \\ \text{INF} & & - & \text{OP} & - & & \text{roast} & \text{for} & & & \end{array}$

Syll. Conv
 $\begin{array}{cccccc} 6 & 6 & 6 & 6 & 6 & 6 \\ | & / & | & | & / & / \\ m & m & m & m & m & m \\ | & | & | & | & | & | \\ o & k & u & i & o & c & e & r & a \end{array}$



Next we must account for the fact that Glide Formation must apply before Glide Epenthesis. This ordering is especially problematic, since syllabification rules may not be ordered in the prosodic approach I have adopted. Further, in general, Goldsmith (1990) has suggested that if a language has two rules which repair the same phonotactic constraint (like the Branching Constraint), the two rules should apply freely subject to the Elsewhere Condition, which states that if two rules apply in the same phonological context, the more specific rule must apply before the more general rule. Otherwise, the more specific rule will never be able to apply. The Elsewhere Condition will not allow us to impose the correct ordering on Glide Formation and Glide Epenthesis, however. Because neither rule applies in a particular morphological context, it is difficult to see in what sense one rule is more specific than the other. Instead, I propose that the correct ordering of these two rules falls out from the maximality principle (Itô 1989), which states that maximal structures - in the case of syllable structure, maximal syllables - are always constructed before minimal structures; otherwise, maximal structures would never surface. Recall that Glide Formation derives maximal (bimoraic) syllables while Glide Epenthesis derives minimal (monomoraic) syllables. The maximality principle therefore correctly requires Glide Formation to apply before Glide Epenthesis. Otherwise, as shown in (1c), Glide Formation would never have a chance to apply.

4. Conclusion

In sum, Jita provides striking confirmation for Itô's (1989) hypothesis that the prosodic principles of maximality and directionality correctly predict epenthesis sites in languages. As I have shown, the Branching Constraint on Jita syllable structure motivates the two syllable repair rules which apply in sequences of three adjacent vowels. Glide Epenthesis inserts a glide before the third vowel, after a rule of Glide Formation restructures the first two vowels of

the sequence into a single bimoraic syllable. This rule ordering need not be specified, as it falls out from the maximality principle: since Glide Formation derives maximal syllables, it must apply before Glide Epenthesis, which only derives minimal syllables. Directionality allows us to specify that syllabification rules in Jita apply from left to right. As a result, it is the third in a sequence of three adjacent vowels which will be left onsetless after Glide Formation applies. Jita Glide Epenthesis, like epenthesis rules cross-linguistically, thus incorporates stranded segments into well-formed syllables. A skeletal insertion approach to Glide Epenthesis like that proposed by Odden & Odden (1985), in contrast, both must stipulate the ordering of the two rules and also misses the generalization that Glide Epenthesis, like Glide Formation, improves syllable well-formedness.

NOTES

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¹ The following transcription conventions have been adopted for this paper: "B" indicates a voiced bilabial fricative; high tones are indicated by an acute accent on a vowel, falling tones with a circumflex accent, while low tones are unmarked; and off-glides on consonants are indicated by a superscripted glide.

² The only exceptions I know of to the generalization that consonant clusters do not occur in Jita are a tiny handful of words which are transparently borrowed from either Swahili or English: e.g., *i:Bustáni* 'garden' (from Arabic via Swahili) and *i:plastíki* 'plastic bucket' (from English). Since Magayane is fluent in both English and Swahili, I am assuming the syllable structure of these words was also borrowed and have not tried to account for them in the analysis of Jita syllable structure which follows.

³ The symbols "C", "V" and "X" are used in this paper as abbreviations for a root node associated with the feature [+consonantal], [-consonantal] or [+/-consonantal], respectively, not as timing slots.

⁴ Examples of other Bantu languages with lengthening in this context are: Haya (Byarushengo 1977), Kinyambo (Bickmore 1989), KiHehe (Odden & Odden 1985), LuGanda (Clements 1986; Katamba 1985; Tucker 1962) and Kinyarwanda (Sagey 1986).

⁵ According to Prince (1984), it is not uncommon for languages to have long vowels but not diphthongs. He proposes to capture that fact by a constraint prohibiting tautosyllabic sequences of the feature [-consonantal]. (Recall that, by the OCP, geminate vowels are represented as one set of features linked to two moras.) This allows the optimal Jita syllable to be defined on the feature tier simply as a single C followed by a single V.

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