Reduplication process in Ewulu

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Abstract

This paper examines reduplication process in Ewulu. The process is formed from verbal derivatives known as simple gerunds. Reduplication is defined as a case of affixational morphology where affixes are phonologically underspecified, receiving their full phonetic expression by copying adjacent phonological units (Broselow and McCarthy 1984:25). Simple gerunds, the equivalents of the English -ing-ending verbs that function as a noun, are formed in Ewulu by affixing a harmonizing low-toned /o/ or /ɔ/ to a reduplicant that is copied from a one-syllable verb stem functioning as base. In Ewulu, simple gerunds can either be complete reduplication or partial reduplication, subject to the morphophonological relations existing between the base and its adjoining reduplicant. Using Marantz (1982), McCarthy and Prince (1990) prosodic morphology approach together with the autosegmental paradigm, we will examine the formation of simple gerunds, the direction of association of reduplicants vis-à-vis the base and subsequently account for how a subset of phonological units interacts with morphological elements to derive complete and partial reduplicated simple gerunds in Ewulu.

1.0 Introduction

Ewulu is a member of the Igbo language of the West Benue-Congo branch of the Niger-Congo family (Williamson and Blench 2000). It is spoken in the North of Delta State, Nigeria. Ewulu has a relatively few numbers of native speakers and constitutes one of the most endangered languages in Nigeria, owing to its lack of written standard orthography and invariably the driving force of language shift.

Linguists, including Sapir (1921:76) cited in Katamba (1993:180), recognize the characteristics of reduplication. Sapir sees reduplication as the

repetition of all part of the radical element. He gives examples in English reduplicatives, such as pooh-pooh, goody-goody, roly-poly, wishy-washy, brain-drain. Sapir's description of typical reduplication include such characteristics as distribution, plurality, repetition, customary activity, increase in size, added intensity, continuance and so on. But a narrower definition of reduplication is given by Katamba going by the peculiar derivational or inflectional nature of reduplication in natural language. According to him, he sees reduplication as a process whereby an affix is realized by phonological material borrowed (copied) from the base.

Like the standard form, Ewulu reduplication process evolves round simple gerund which finds its root in verbal derivative. Verbal derivative is any morpheme or word which is formed or derived from a verb. For instance, the high-tone verb stem, *gu* 'dig' can be repeated thus: o.gu-gu to form simple gerund. This process is complete by attaching low-toned augment /o/ or /ɔ/ as a prefix to the left of the repeated morpheme referred to as reduplicant or affix template. A fuller discussion of this entire phenomenon will be carried out in the appropriate sections. We shall now give some basic facts about Ewulu sound system, since phonology, as we shall see later in the discussion, plays a crucial role in the realisation of both full reduplication and partial reduplication via simple gerunds.

2.0 Some basic facts about Ewulu sound system

Ewulu operates 27 consonant phonemes and 9 vowel phonemes (Utulu 1992). Ewulu consonant phonemes, which have been divided into three unary features, namely labial, coronal and dorsal are presented in Table 1 as follows:

Table 1: Ewulu consonant phoneme system

Labial	Coronal		Dorsal
p	t		k
b	d		g
ɓ			
ɓ			
m	n	ɲ	ŋ
*ŋm			
f	s	ʃ	
	z	tʃ	h
	l		
	r	j	
*w			
*kw			
*gw			

* These phonemes have also been treated as dorsal segments in the literature since in their production there is an overlap of labial and velar place of articulation.

Table 2: Ewulu vowel phoneme system

i u		High	[+high]
ɪ ʊ			
e o		Mid	[-high]
ɛ ɔ			
a		Low	

Phonotactically, the phoneme /ɛ/ (*-ẹ-*) occurs in morpheme/syllable initial or medial position only. It rarely, if ever, occurs in morpheme/syllable final position in simple verbs.

The nine vowel phonemes occur in two subsystems based on the harmony feature [±ATR]. Vowels produced with an advanced tongue root are classified [+ATR]. They are orthographically represented as i, e, u, o; whereas the ones produced with a retracted tongue root, tagged [-ATR], following Stewart (1967), include: ị, ẹ, ụ, ọ, a. The two subsystems are presented in (1). Note that for typographical reasons, we shall not mark tone for all morphemes and their affixes, unless otherwise relevant to the formation of simple gerunds.

(1)

[+ATR]		[-ATR]	
oku	'word'	ẹlụ	'bite'
imi	'nose'	akịtị	'cheek'
onu	'neck'	anụ	'meat'
egu	'fear'	ẹkụ	'kernel'
oke	'boundary'	ọkụ	'fire'
ogu	'thorn'	ọgụ	'medicine'

We shall now go to present the minimally specified matrix for the Ewulu functional vowels. This is presented in Table 3.

Table 3: Minimally specified matrix for functional vowels in Ewulu

	i	ɪ	e	ɛ	a	u	ʊ	o	ɔ
HIGH	+	+	-	-	-	+	+	-	-
LOW	-	-	-	-	+	-	-	-	-
ATR	+	-	+	-	-	+	-	+	-
BACK	-	-	-	-	-	+	+	+	+
ROUND	-	-	-	-	-	+	+	+	+

3.0 The gerund

Linguists, including Brown et al. (1984:102), describe a gerund in English as a verbal that ends in *-ing-* and functions only as a noun. Brown et al. provide examples such as the one in (2) to illustrate the gerund based on its syntactic function:

(2) i. Gerund as a subject: **Jogging** has become very popular.

ii. Gerund as a predicate nominative: My favourite pastime is **camping**.

iii. Gerund as a direct object: They enjoyed our **singing**.

iv. Gerund as an object of a preposition: You can help us by **cooperating**.

v. Gerund as an indirect object: Julia gave **fishing** a try.

vi. Gerund as an appositive: My favourite exercise, **swimming**, keeps me in great shape.

3.1 The gerund and reduplication in Ewulu

Gerunds in Ewulu have the same morphemic structure like those in the standard variety. This of course should be expected since Ewulu is a member of the proto Igboid. Two types of gerunds have been identified in Igbo, according to their morphemic configuration by Emenanjo (1978: 141). They are: Simple Gerund (which only concerns us in this work), and Complex Gerund. The former is formed from monosyllabic verbs composed into a simple onset plus a vowel element, while the latter, which we lack space to examine here, is derived from complex verbs. Because of their semblance with the verb and their function as a noun, Green and Igwe (1963:28) referred to simple gerunds as 'verbal noun of action'.

One fascinating aspect of simple gerunds is their morphological make up. As a rule, they are formed by attaching an augment /o/ or /ɔ/ and a template to the left of the verb stem. This effect thus results in reduplication that gives rise to the two broadly classified reduplication types, namely Complete Reduplication and Partial Reduplication. The formation of simple gerunds from verbal derivatives is illustrated in the following section.

3.2 The morphology of simple gerunds

The formation process of simple gerunds in Ewulu, as in the standard variety, is a straightforward one. The process works subject to the following principle in (3):

(3) A h a harmonising prefix augment o or ọ, to a reduplicant copied from the base to its (base's) left.

Following the condition in (3), it shows that, structurally, the reduplicant typically has a harmonising ATR augment *-o-*, *-ọ-* affixed to its left. The reduplicant is in turn prefixed to the base, which is normally a simple CV verb stem. The configuration thus projects a trisyllabic [V.CV.CV] full morpheme. Quite clearly, the direction of mapping of the melody is left-to-right, given the principle in (3). In Table 4 below, we provide the procedure for the formation of simple gerunds in order to throw more light on the operations of the principle expounded in (3). Note that reduplicants (template affixes) are underlined in order to mark them distinctly from the base.

Table 4: Formation of simple gerunds

Vowel	Basic (verb stem)	Aug-ment	Reduplicant pi stem		Simple Gerund	Output	Gloss
/i/	si 'cook'	o	si	si	o.si-si	osisi	the cooking
	ri 'eat'	o	ri	ri	o.ri-ri	oriri	the eating
	bi 'live'	o	bi	bi	o.bi-bi	obibi	the living
	shi 'leaking'	o	shi	shi	o.shi-shi	oshishi	the leaking
/ị/	pị 'carve'	ọ	pị	pị	ọ.pị-pị	ọpịpị	the carving
	mị 'roast'	ọ	mị	mị	ọ.mị-mị	ọmịmị	the roasting
	chị 'lead'	ọ	chị	chị	ọ.chị-chị	ọchịchị	the leading
	fị 'whistle'	ọ	fị	fc	ọ.fị-fị	ọfịfị	the whistling

Vowel	Basic (verb stem)	Aug-ment	Reduplicant plus stem		Simple Gerund	Output	Gloss
/e/	je 'move'	o	ji	je	o.ji-ji	ojije	the moving
	de 'write'	o	di	de	o.di-de	odide	the writing
	fe 'fly'	o	fi	fe	o.fi-fe	ofifi	the flying
	ke 'create'	o	ki	ke	o.ki-ke	okike	the creating
/a/	ta 'chew'	ọ	ti	tá	ọ.ti-ta	ọtita	the chewing
	la 'lick'	ọ	li	la	ọ.li-là	ọlila	the licking
	cha 'wash'	ọ	chi	cha	ọ.chi-cha	ọchicha	the washing
	ba 'enter'	ọ	bi	ba	ọ.bi-ba	ọbiba	the entering
/u/	gu 'dig'	o	gu	gu	o.gu-gu	ogugu	the digging
	nu 'pound'	o	nu	nu	o.nu-nu	onunu	the pushing
	bu 'kill'	o	bu	bu	o.bu-bu	obubu	the carrying
	fu 'miss'	o	fu	fu	o.fu-fu	ofufu	the missing
/ʊ/	lụ 'work'	ọ	lụ	lụ	ọ.lụ-lụ	ọlụlụ	the working
	sụ pound'	ọ	sụ	sụ	ọ.sụ-sụ	ọsụsụ	the pounding
	kụ 'plant'	ọ	kụ	kụ	ọ.kụ-kụ	ọkụkụ	the planting
	pụ 'go'	ọ	pụ	pụ	ọ.pụ-pụ	ọpụpụ	the going
/o/	go 'buy'	o	gi	go	o.gi-go	ogigo	the buying
	zo 'hide'	o	zi	zo	o.zi-zo	ozizo	the hiding
	ko 'dress'	o	ki	ko	o.ki-ko	okiko	the dressing
	zo 'rain'	o	zi	zo	o.zi-zo	ozizo	the raining
/ɔ/	kọ 'dry'	ọ	ki	kọ	ọ.ki-kọ	ọkikọ	the drying
	dọ 'pull'	ọ	di	dọ	ọ.di-dọ	ọdidọ	the pulling
	yọ 'sieve'	ọ	yi	yọ	ọ.yi-yọ	ọyiyọ	the sieving
	zọ 'tread'	ọ	zi	zọ	ọ.zi-zọ	ọzizọ	the treading

Note that double lines show the demarcation of eight of the nine functional vowels operative in Ewulu. For clarity, template affixes (reduplicants) are underlined.

Given the description of simple gerunds illustrated in Table 4, a careful observation shows that their formation is processed in two ways as indicated in (4):

(4) i. by *completely* repeating segmental content of the base, and
ii. by *partly* repeating segmental content of the base.

As can be seen from the table, the repetition (*or copying*) of the base is not arbitrary but systematic. The fascinating aspect of simple gerunds is the regularity by which the distribution of phonological elements within the reduplicant and the base occur. For example, where the vowel element of the base is any of i, ị, u, ụ, all of which are specified with the feature [+high], reduplication becomes total. But, where the vowel element of the base is any of e, a, o, ọ, all of which are specified with the feature [-high], reduplication becomes partial.

Following the SPE framework (Chomsky and Halle 1968), phonologically, (see Tables 2 and 3), the two groups of vowels minimally contrast by the feature [±high]. It seems perfectly plausible therefore to assume that reduplication process in Ewulu is governed by one operating principle: the principle of Height Harmony. Functionally, the act of raising the tongue body to a high position crucially triggers full reduplication; a lowering of the tongue body however radically blocks the full reduplication process.

By way of reinforcing our claim for height harmony phenomenon, observe the forms in (4b) and notice that they are morphologically ill-formed. This is because non-high verb stems here are somewhat 'forced' to behave like high verb stems. As a rule, only high verb stems repeat wholly their phonological identity with reduplicants. The well-formedness of the forms in (4a) and (4c) is understood to be the function of the base staying faithful to the height harmony constraint, which specifies that only the base specified with [+high] can have their entire phonological elements repeated in the reduplicant, as illustrated below:

Non-high verb stems			High verb stems	
(4a) je > o.ji-***je***	'the going'	(4b) *o.je-***je**	(4c) si > o.si-***si***	'the cooking'
ta > o.ti_-***ta***	'the chewing'	*o.ta-***ta**	pɪ > o.pi_-***pɪ***	'the carving'
go > o.gi-***go***	'the buying'	*o.go-***go**	gu > o.gu-***gu***	'the digging'
kọ > o.ki_-***kọ***	'the drying'	*o.kọ-***kọ**	lʊ > o.lu -***lu***	'the working'
le > o.li-***le***	'the selling'	*o.le-***le**	fɪ > o.fi-***fɪ***	'the twisting'
zo > o.zi-***zo***	'the hiding'	*o.zo-***zo**	sʊ > o.su-***su***	'the pounding'
Partial reduplication		*ill-formed	Complete reduplication	

Note that the base is in bold-face italics.

4.0 Analysis

To account for the two reduplication types in Ewulu, we may approach our analysis by using McCarthy and Prince's (1990) theory of Prosodic Morphology. The theory explicitly represents reduplication through the mapping of morphological representations directly on to the syllable, using the Prosodic Morphology Hypothesis.

4.1 A prosodic morphology derivation of Ewulu reduplication

In our analysis of Ewulu reduplication, we would ignore the CV template earlier used by McCarthy (1982b). Rather we will adopt the approach, which strictly recognises the syllable in accounting for prosodic phenomena. This is because linguists such as Marantz (1982) and later McCarthy and Prince (1990), working in the area of prosodic morphology, argue that reduplicative process unequivocally supplies a template composed of the syllable, the foot and the phonological word.

In view of this, we adopt the *mapping principles* proposed by Marantz (1982) to support our analysis of simple gerunds in Ewulu. The Principles are stated in (5) as follows:

(5) **Mapping principles in reduplication**

(i) Introduce an underspecified affix, that is, prefix, suffix or infix;

(ii) create an unassociated copy of the phonemic melody of the root or stem or base;

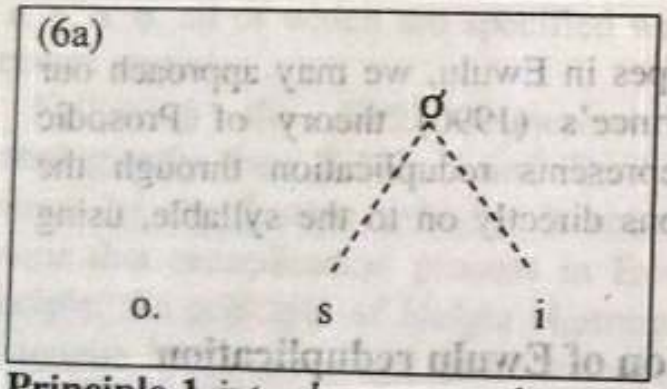
(iii) associate the copied phonemic melody on to the prosodic unit (the syllable)one-to-one, going from left to right or right to left; and

(iv) finally erase all superfluous phonemic material that remains unassociated at the end.

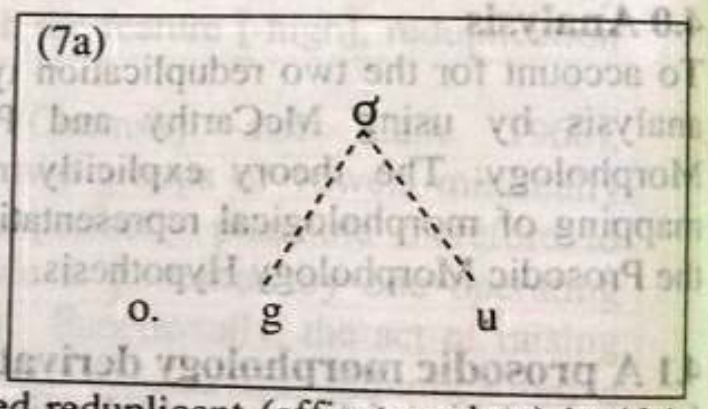
We shall now apply these principles by taking the simple verb forms illustrated in Table 4, si 'cook', je 'go', gu 'dig' and kọ 'dry', to examine reduplicated verb stems in Ewulu simple gerunds in (6), (7), (8) and (9) as follows:

High verb stem

(6a)

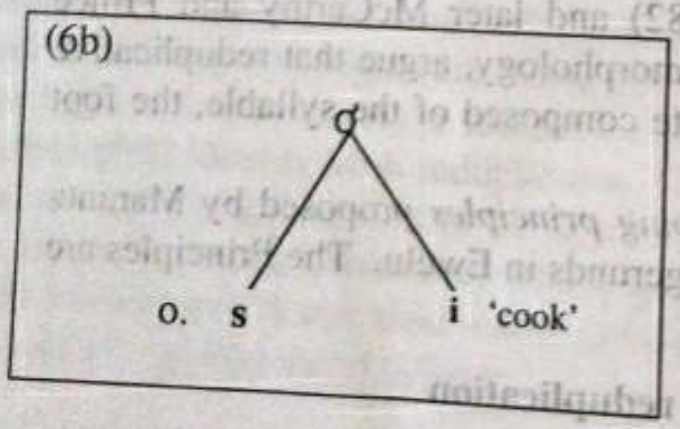


(7a)

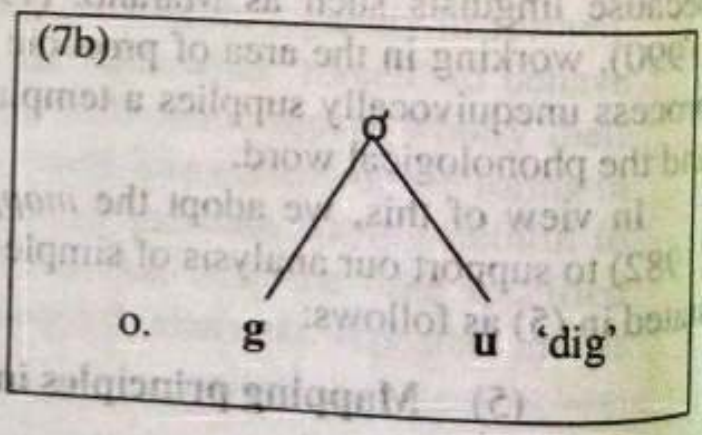


Principle 1 *introduces* an underspecified reduplicant (affix template) in (6a) and (7a).

(6b)

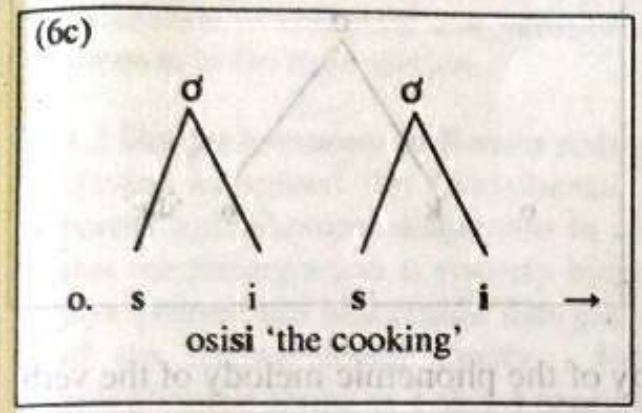


(7b)



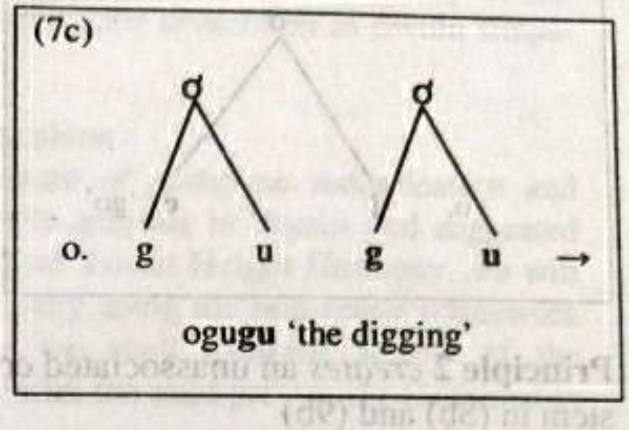
Principle 2 *creates* an unassociated copy of the phonemic melody of the verb stem in (6b) and (7b)

(6c)



osisi 'the cooking'

(7c)



ogugu 'the digging'

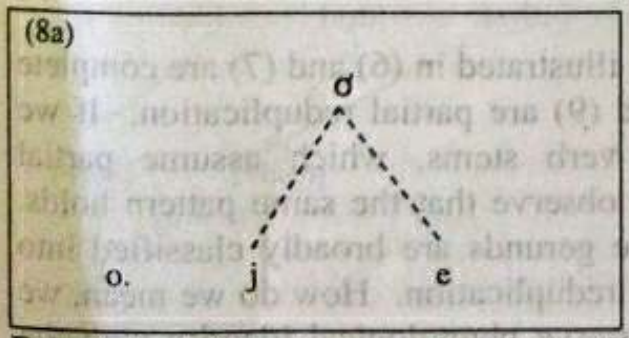
Principle 3 associates the copied phonemic melody on to the syllable one-to-one to generate the output in (6c) and (7c)

(6d) **Principle 4 is *void*.** No superfluous phonemic material occurs unassociated as we can notice in (6c) and (7c).

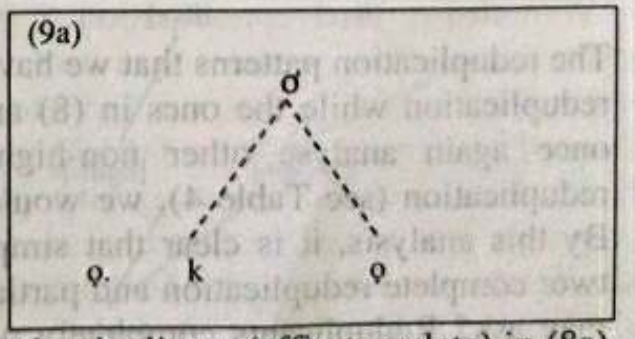
If we advance McCarthy's model and Marantz's approach to verb stems with low-high vowels, /ɪ/ and /ʊ/, which are also specified with [+high] value, we should find that the same observation holds (see particularly Table 4 for detailed illustrations). We shall now go to examine non-high verb stems, je 'go' and kọ 'dry' in (8) and (9), whose vowel segments are specified with [-high] feature.

Non-high verb stems

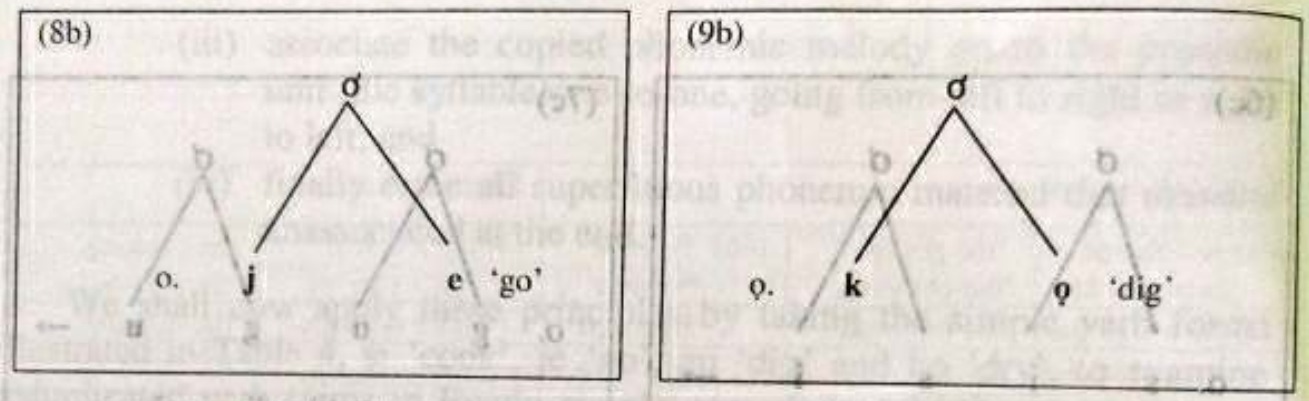
(8a)



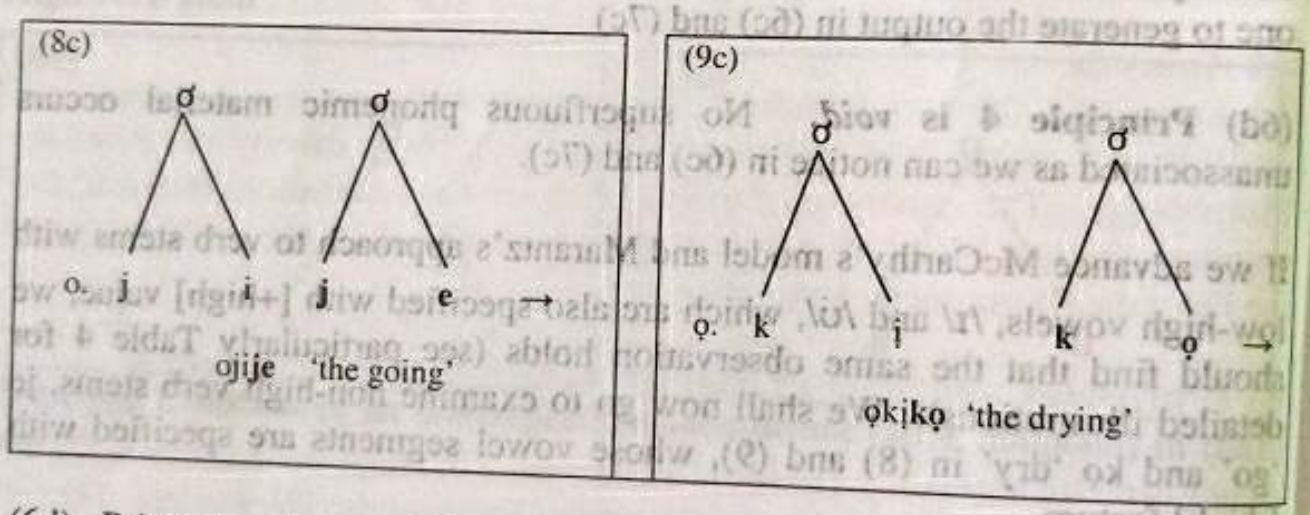
(9a)



Principle 1 *introduces* and underspecified reduplicant (affix template) in (8a) and (9a).



Principle 2 *creates* an unassociated copy of the phonemic melody of the verb stem in (8b) and (9b)



(6d) Principle 4 is void. No superfluous phonemic material occurs unassociated as we can notice in (8c) and (9c).

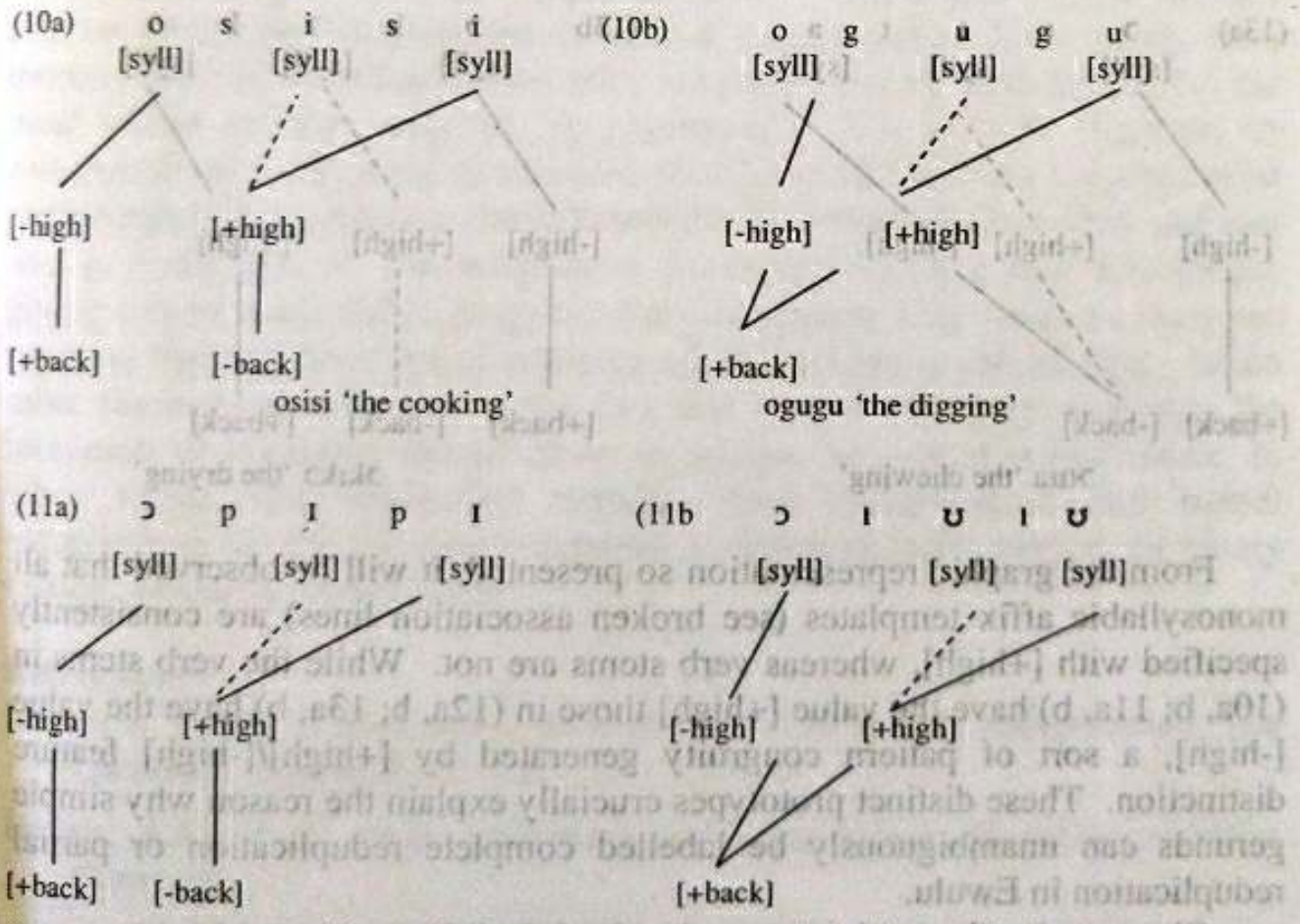
The reduplication patterns that we have illustrated in (6) and (7) are complete reduplication while the ones in (8) and (9) are partial reduplication. If we once again analyse other non-high verb stems, which assume partial reduplication (see Table 4), we would observe that the same pattern holds. By this analysis, it is clear that simple gerunds are broadly classified into two: complete reduplication and partial reduplication. How do we mean, we may ask? Reduplicants completely preserve phonological identity with the base, if the base contains a high vowel (cf. examples in 6 and 7), whereas reduplicants partly preserve phonological identity with the base, if the base contains a non-high vowel (cf. examples in 8 and 9).

We may now propose a formalisation for vowel height harmony in the realisation of complete and partial reduplication distinction in Ewulu simple gerunds in the next section.

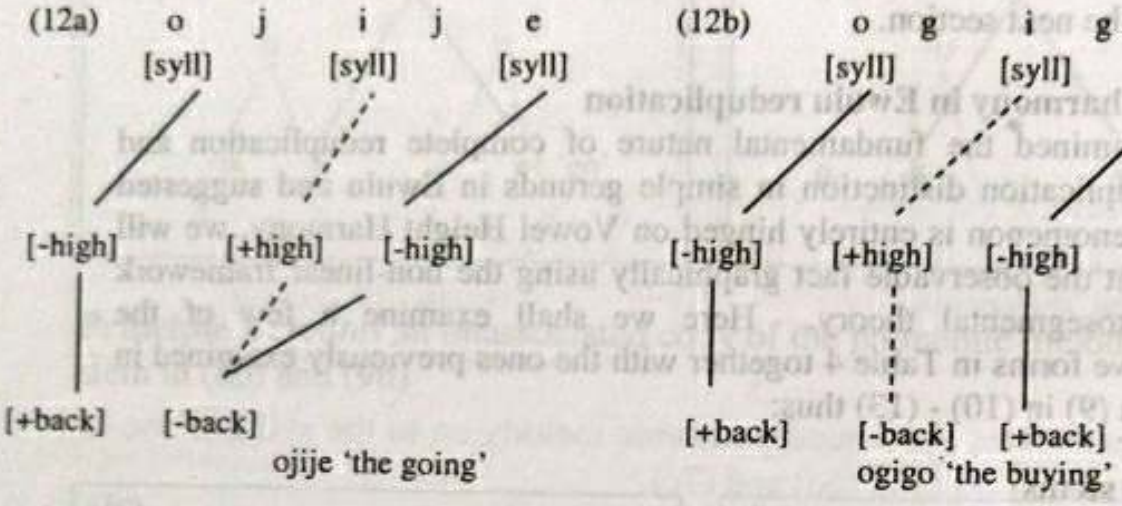
4.2 Height harmony in Ewulu reduplication

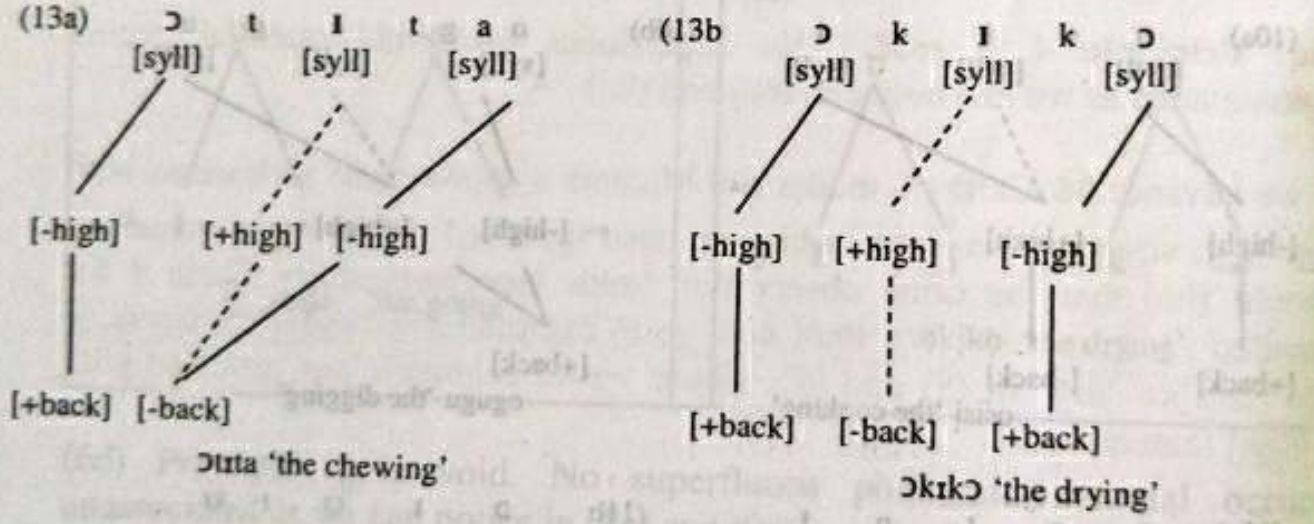
Having examined the fundamental nature of complete reduplication and partial reduplication distinction in simple gerunds in Ewulu and suggested that the phenomenon is entirely hinged on Vowel Height Harmony, we will now present the observable fact graphically using the non-linear framework of the autosegmental theory. Here we shall examine a few of the reduplicative forms in Table 4 together with the ones previously examined in (6) through (9) in (10) - (13) thus:

High-verb stems



Non-high-verb stems





From the graphic representation so presented, it will be observed that all monosyllabic affix templates (see broken association lines) are consistently specified with [+high], whereas verb stems are not. While the verb stems in (10a, b; 11a, b) have the value [+high] those in (12a, b; 13a, b) have the value [-high], a sort of pattern congruity generated by [+high]/[-high] feature distinction. These distinct prototypes crucially explain the reason why simple gerunds can unambiguously be labelled complete reduplication or partial reduplication in Ewulu.

Observe also that verb stems value for [±back] varies considerably: some verb stems are [+back], some are [-back]. But much more relevant to the

issue under discussion is that, on the one hand, templates fail to copy entirely the elements of the base if the base vocalic element is [-high]. On the other hand, templates copy completely all elements of the base if the base vocalic element is [+high]. This regular pattern thus provides us with a principled explanation for the fact that simple gerunds fully reduplicate only if verb stems are specified with the [+high] feature, otherwise, simple gerunds are realised as partial reduplication. This assumption seems to throw more light on the hypothesised forms in (2b) where our attempt to induce total copy of the base on reduplicants with [-high] yielded anomalous forms.

5.0 Conclusion

From this study, we show that Ewulu reduplication process finds its origin in verbal derivatives known as Simple Gerunds. Structurally, simple gerunds can be complete reduplication or partial reduplication. Both forms have monosyllabic (CV) reduplicative affix template (reduplicant) attached to the base whose syllable structure is commonly a CV syllable structure, in consonance with the phonotactic constraint that syllables in the language must remain open. Reduplicants characteristically have harmonising ATR augment *-o-, -ọ-* prefixed to it. The template is in turn prefixed to a verb stem (base), giving rise to a trisyllabic [v.cv-cv] free morpheme. This structure therefore suggests that the direction of mapping of the melody is left-to-right. Much more fascinating, however, is the fact that Height Harmony motivates the formation of complete reduplication in relation to partial reduplication. In other words, the distinction between total reduplication and partial reduplication in Ewulu simple gerunds is fundamentally hinged on cavity feature, primarily, vowel height.

References

Broselow, E. and J. McCarthy. 1984. A theory of internal reduplication. *The Linguistic Review*, 3, 25 - 88.

Brown, A.C. et al. 1984. *Grammar and composition*. Houghton: Mifflin Company.

Chomsky, N. and M. Halle. 1968. *The sound pattern of English*. New York: Harper and Row.

Emenanjo, E.N. 1978. *Elements of modern Igbo grammar*. Ibadan: Oxford University Press.

Goldsmith, J. 1990. *Autosegmental and metrical phonology*. Cambridge: Basil Blackwell.

Green, M. M. and G. E. Igwe. 1963. *A descriptive grammar of Igbo*. Berlin: Akademie-Verlage.

Katamba, F. 1993. *Modern linguistics morphology*. London: Macmillan Press Limited.

Marantz, A. 1982. Re reduplication. *LI*, 13, 483 - 545.

McCarthy, J. 1982b. *Formal problems in semitic phonology and morphology*. New York: Garland.

McCarthy, J. and A. S. Prince. 1990. Foot and word in prosodic morphology. *NLLT*, 8, 209-283.

Sapir, E. 1921. *Language*. New York: Harcourt Brace.

Stewart, J. M. 1967. Tongue root position in Akan vowel harmony. *Phonetica 16*, 185-204.

Utulu, D. C. 1992. *Introduction to phonology and morphology of Ewulu*. B.A Project, Department of Linguistics and African Languages, University of Ibadan, Ibadan.

Williamson, K. and R. Blench. 2000. Niger Congo. In Bernd Heine and Derek Nurse (eds.) *African Language: An Introduction*. Cambridge: Cambridge University Press.