Wrong-side reduplication in Koasati

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1. Introduction

Koasati (Muskogean, Kimball 1991) exhibits a reduplication process that suffixes material copied from the left edge of the root.

(1)

a.	lapat-	**lo-**	b.	cofok-	**co-**
	be.barren-	RED-		be.angled-	RED-
	'be barren (pl)'			'be angled (pl)'	

- This is in violation of Marantz's generalization (1982): reduplicant material tends to be adjacent to the corresponding base material.
- Nelson (2003): observed cases of "wrong side reduplication" (WSR) are actually epiphenomenal, not true counterexamples.

Proposal: We will argue that Koasati is true WSR and is not epiphenomenal.

- This supports Riggle (2004), who argued that Creek (also Muskogean) has a similar reduplication process that is also truly wrong-sided.
- Supports models that can generate both wrong- and adjacent-side reduplication (ASR).
- Our analysis uses the system from Nelson (2003) with the addition of Linearity.
- A typological prediction: WSR should only copy from the left edge and affix on the right because of L-Anch.

2. Wrong-side reduplication

The generalization given in Marantz (1982) states the prohibition against WSR as a trend, the 'unmarked case'. By contrast, Nelson (2003) argues that it is a strict ban, and that all apparent cases of WSR are epiphenomenal.

- Prior examples of allegedly-wrong-sided reduplication are explained as being either **non-reduplicative copying** or **full-copy plus deletion**.
- In the **non-reduplicative copying** cases, the root is augmented to meet some prosodic template, with no RED morpheme involved.
- In **full-copy plus deletion**, an independently-attested deletion process reduces a (right-sided) reduplicant.

2.1 Non-reduplicative copying

Non-reduplicative copying expands a root in order to satisfy a morphological template. Crucially, if the root already satisfies that template, no copying occurs.

(2) **Four-syllable template in Yoruba ideophones (via Nelson 2003)**

a.	pepere	pepere-pe	'of being very cute and robust'
	gogoro	gogoro-go	'loftiness'
b.	haragbadu	*harabgadu-ha	'very stout and bulky'
	porogodo	*porogodo-po	'being completely used up'

- Intensive ideophones in Yoruba are minimally four syllables long.
- If the root ideophone is three syllables, the initial syllable is copied.
- No copying occurs if the root already meets the template.
- This requires a variable number of RED morphemes depending on root shape — this is not morphological reduplication.
- Formally, the copied forms violate IO-Integrity; BR-faithfulness is not active.

2.2 *Full copy plus deletion*

Nelson gives Madurese plural reduplication as an example of full copy plus deletion, in which an independently-attested deletion operation renders total reduplication opaque.

(3) **Madurese plural (Stevens 1968, via Nelson 2003)**

/neat/	yat-neyat	'intensions'
/moa/	wa-mowa	'faces'

(4) **First syllable deletion in Madurese compounds:**
/**tu**zhuʔ/ 'finger' + /ənpul/ 'pinky' → [zhuʔ-ənpul]

- Total reduplication is treated as compounding a noun with itself.
- We then expect first-syllable deletion to apply in total reduplication, yielding apparent WSR.

2.3 *Nelson's analysis*

Nelson proposes a formal mechanism to rule out WSR with three crucial components:

1. The RED morpheme is unordered in the input.
   - Inputs for reduplication consist of /RED, ROOT/ with no order specified.
   - i.e. reduplicants are not inherently either prefixes or suffixes.
2. Correspondence is enforced by LEFT-ANCHOR: The left edge of the reduplicant must be in correspondence with the left edge of the base.
   - No hypothetical constraint RIGHT-ANCHOR exists: Extra faithfulness to the left edge of the word is well-attested.[1]
3. Ordering is controlled by LOCALITY: The copied portion of the base and the corresponding reduplicant must be adjacent.

[1] Nelson also proposes an EDGE-ANCHOR constraint that anchors both edges, but not necessarily of the word; this is not relevant to our analysis.

The combination of these three components makes all WSR candidates harmonically bounded.

→ Unlike Marantz (1982), Nelson (2003) predicts that WSR is impossible.

3. KOASATI PLURACTIONAL REDUPLICATION

Koasati verbs are morphologically marked for pluractionality.[2] Pluractionality is marked by a reduplicative suffix to the root:

(5) Pluractional reduplication

Verb	Pluractional	Gloss
lapa:tkin	lapat**lo:**kin	be barren
cofo:knan	cofok**co:**nan	be angled
alo:tkan	alot**lo:**kan	be full
pa:kkon	pak**po:**kon	have a blister
copo:ksin	copok**co:**sin	be a hill
polo:hkin	poloh**po:**kin	be circular
taha:spin	tahas**to:**pin	be light in weight
tala:sban	talas**to:**ban	to be thin
limi:hkon	limih**lo:**kin	to be smooth

The verb forms given in (5) are not monomorphemic:

(6) lapa -t (-lo:) -ki -n
ROOT -FORMATIVE -RED -TENSE -AGR
'to be barren'

- The formative indicates the semantic class of the verb and is lexically-specified; changes in formative yield changes in lexical meaning.
- The outermost suffixes are tense and agreement (in citation form, infinitive with null agreement).
- We will assume that the formative comes with the root, while the inflectional material applies at some later cycle. Reduplication applies to the root before inflectional material is added.

[2] Pluractional verbs denote multiple events; this can either indicate iterativity or a plural direct object.

- Length is associated with penultimate syllable stress (Kimball, 1991). The reduplicant in these examples is coincidentally penultimate. Stress (and lengthening) is calculated at a later cycle, after reduplication has applied.

This morphological breakdown gives us forms like:

(7) Pluractional reduplication (stems)

Verb stem	Pluractional stem	Gloss
lapat-	lapat**lo**-	be barren
cofok-	cofok**co**	be angled
alot-	alot**lo**-	be full
pak-	pak**po**-	have a blister
...		

- Given this morphological breakdown, the generalization is: Suffix /-Co/, where /C/ is a copy of the first consonant in the root.
- This is true WSR, contra Nelson (2003): Neither non-reduplicative copying nor full copy plus deletion will predict these forms.

3.1 Not non-reduplicative copying

While most Koasati verb roots are disyllabic, some monosyllabic ones undergo the same reduplication process.

(8) a. cofok- **co**-
ROOT RED
'be angled (pl)'

b. pak- **po**-
ROOT RED
'have many blisters'

- Non-reduplicative copying augments a root with copied segments to meet some overall prosodic template.
- There is no single prosodic template which all Koasati pluractional forms meet.
- Koasati reduplication generates multiple stem shapes, consistent with a RED morpheme rather than non-reduplicative copying.

3.2 Not full copy plus deletion

Neither are pluractional stems formed by full copy plus deletion:

- The reduplicant consists of the first consonant in the root plus a fixed segment /o/.
- There is no independently attested process that reduces verbs to only their first consonant plus a fixed segment; such a process would be highly unlikely.

3.3 Creek reduplication

Riggle (2004) provides similar data from the related language Creek:

(9) Creek reduplicated stems

Verb stem	Pluractional stem	Gloss
lisk-	lis**li**k-	'old'
polok-	polo**po**k-	'round'
holwak-	holwa**ho**k-	'ugly, naughty'

This is also analyzed as true WSR.

- The Koasati data provides additional evidence that true WSR exists.
- In addition, the Creek process is infixing, which leaves open the possibility of other analyses.
- The Koasati data, by contrast, is fully suffixing and so provides a clearer case of WSR.

4. Analysis

Overview: We use the same constraint set from Nelson (2003) with the addition of Linearity (McCarthy & Prince, 1995) which prevents re-ordering of elements. Copying is demanded by Max-BR and L-Anch. Base shrinkage in vowel-initial roots is mediated by Max-RtB.

Constraint set:

- L-ANCH: The left edge of the reduplicant corresponds to the left edge of the base (Nelson, 2003). (Assign one * if the left edge of the base is not in correspondence with the left edge of reduplicant.)
- LOCALITY: The copied portion of the base and corresponding reduplicant must be adjacent (Nelson, 2003). (Assign one * for each non-copied segment between base and reduplicant.)
- LINEARITY: Don't reorder elements (McCarthy & Prince, 1995). (Assign one * if x precedes y in the input and the correspondent of x does not precede the correspondent of y in the output.)
- MAX: Every segment in the input has a correspondent in the output.
- DEP-μ: Every mora in the output has a correspondent in the input.
- PARSE: Input material must be parsed into prosodic structure.
- ONSET: Syllables must begin with a consonant.
- DEP-BR: Every segment in the reduplicant has a correspondent in the base.
- MAX-BR: Every segment in the base has a correspondent in the reduplicant.
- MAX-RTB: Every segment in the root has a correspondent in the base (Downing, 1998).

Form of the reduplicant: $-[\mu]_{RED}$<o>

- The reduplicant is lexically specified to have one mora and (contra Nelson) to be a suffix, attaching to the right edge of bases in the input.
- This prosodic template is followed by a floating segment <o>.[3] (Floating status indicated with angle brackets.)

[3]There is a closed-set of roots which are lexically specified to take an allomorph of the reduplicant without the floating <o>.

4.1 No reordering

L-ANCH forces the reduplicant to copy from the left edge. Because LINEARITY outranks LOCALITY, the reduplicant cannot be reordered to be closer to the copied material in the base.

Ranking: LINEARITY, L-ANCH ≫ LOCALITY

(10) /lapat-$[\mu]_{RED}$<o>/ → l_1apatl_1o

	/lapat-$[\mu]_{RED}$<o>/	LINEARITY	L-ANCH	LOCALITY
→ 1.	lapatlo			****
2.	lolapat	* W		L
3.	lapatpo		* W	** L

4.2 Consonant initial case

Rankings: PARSE, MAX ≫ DEP-BR, MAX-BR

(11) /lapat-$[\mu]_{RED}$<o>/ → l_1apatl_1o[4]

	/lapat-$[\mu]_{RED}$<o>/	L-ANCH	MAX	DEP-μ	PARSE	DEP-BR	MAX-BR
→ 1.	l_1apatl_1o					*	****
2.	$l_1a_2patl_1a_2$<o> *<o> unlinked*				* W	L	*** L
3.	$l_1a_2patl_1a_2$ *<o> deleted*		* W			L	*** L
4.	$l_1a_2p_3a_4t_5l_1a_2p_3a_4t_5o$ *full copy, <o> linked*			** W		L	L
5.	lapat-$[\mu]_{RED}$<o> *faithful*	* W			* W	L	**** W
6.	lap_1atp_1o *not L anchored*	* W				*	****

- Ranking PARSE and MAX over MAX-BR causes the <o> to link to the reduplicant instead of remaining unparsed or getting deleted.
- DEP-μ ≫ MAX-BR prevents extra material from getting copied into the reduplicant. L-ANCH ensures the reduplicant is in correspondence with the leftmost segment.

[4]For simplicity, we are not showing candidates which differ in root-base correspondence. These candidates are not relevant to the ranking arguments here.

4.3 Vowel initial case

In vowel-initial roots, the reduplicant skips the vowel and copies the first consonant.

- This is a case of 'base shrinkage': The base for reduplication purposes is not the entire root.
- Following (Downing, 1998), we model this with Optimized Base constraints: The base for reduplication purposes is constructed on the surface, constrained by RtB-faithfulness.
- Shrinkage allows joint satisfaction of L-ANCH, ONSET, and PARSE.
- MAX-RTB: Every segment in the root has a correspondent in the base (Downing, 1998).

Ranking: L-ANCH≫ MAX-RTB

(12) /alot-[μ]$_{RED}$<o>/ → a(l$_1$ot)l$_1$o

	/alot-[μ]$_{RED}$<o>/	PARSE	L-ANCH	ONSET	MAX-RTB
→ 1.	a.(l$_1$ot).l$_1$o			*	*
2.	(a.l$_1$ot).l$_1$o *no base shrinkage*		* W	*	L
3.	(a.$_1$lot).a$_1$-<o> *<o> unlinked*	* W		** W	L
4.	alo(t$_1$).t$_1$o *too much shrinkage*			*	*** W

- Ranking L-ANCH over MAX-RTB in a system which includes ONSET will cause the optimal candidate to have base shrinkage.
- In order for L-ANCH to be satisfied and for the reduplicant to have an onset, the optimal base excludes the initial vowel of the root.

4.4 Ranking summary

LINEARITY, L-ANCH ≫ LOCALITY	Tableau (10)
PARSE, MAX ≫ DEP-BR, MAX-BR	Tableau (11)
DEP-μ ≫ MAX-BR	Tableau (11)
L-ANCH ≫ MAX-RTB	Tableau (12)

5. CONCLUSION

We have shown that wrong-sided Koasati pluractional reduplication is not epiphenomenal and have provided an analysis which uses Nelson's system with the addition of LINEARITY.

- The combination of Nelson's system which does not allow WSR with commonly assumed faithfulness constraints allows for the existence of true WSR.
- Since Koasati presents a case of actual WSR, our grammatical models should allow for it.

Typological prediction: Because there is no constraint RIGHT-ANCHOR in Nelson's system, we predict WSR to always be suffixing. With a prefixed reduplicant, WSR is harmonically bounded; only adjacent-side reduplication (ASR) is possible.

(13) WSR is harmonically bounded when RED is a prefix

	RED-bopomo	L-ANCH	LINEARITY	LOCALITY
→ 1.	bo-bopomo			
2.	mo-bopomo	* W		**** W

We thus predict a three-way typology of word-edge reduplication:

(14) Typology of L-ANCH, LOCALITY, & LINEARITY

Type	Input	Output	Crucial Rankings
Suffixing ASR	bopomo-RED	bopomo-mo	LOCALITY, LINEARITY ≫ L-ANCH
Suffixing WSR	bopomo-RED	bopomo-bo	L-ANCH, LINEARITY ≫ LOCALITY
Prefixing ASR	RED-bopomo	bo-bopomo	Any

In sum: Koasati pluractional reduplication is true wrong-side reduplication. Our analysis makes a concrete typological prediction: Prefixing reduplication is always adjacent-side, never wrong-side. To our knowledge, this prediction is bourne out.

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