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The Role of Adjacency in Defining the Base of Reduplication*

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1. Introduction and Theoretical Background

A common emerging theme in research on reduplication is how a reduplicant is placed with respect to a base. A standard assumption is that the adjacency relationship between a reduplicant and its base is one that is mandated by UG. For instance, Urbanczyk (1996) has conceptualized adjacency as a hard constraint of grammar. It has recently been claimed, however, that adjacency is best viewed as a violable constraint, given that long-distance reduplication is possible in some languages (Brown 2017). Under either view, regardless of whatever guides the definition of the base, it is assumed that there is a correspondence relation between a fixed base and a reduplicant which is how identity is enforced. The problem to be raised is exemplified by the data in (1) from Nukna, where the combination of the verb stem *tárawá* 'shoot.3SG.OBJ' plus reduplication yields several different surface possibilities (data from Taylor 2015:ex85):

(1) tá~tárawá OR tára~ra~wá OR tárawá~wá
NMLS~shoot.3SG.OBJ
'shooting it'

This squib aims to highlight the complexities of this pattern in Nukna. In these cases, it appears as though there is no fixed "base", in the sense that a morphological constituent might serve as a uniform base of reduplication. Instead, a CV- reduplicant optionally surfaces attached to any syllable within the morphological constituent, and the content of the reduplicant is always identical to the segmental content of the adjacent syllable. In this way, the base is simply the string which is immediately adjacent to the reduplicant, as in Marantz (1982), and formalized in McCarthy & Prince (1993, 1995) and Urbanczyk (1996). If the base is defined as the string adjacent to the reduplicant, this raises questions around how this is formally implemented in cases of optionality such as in (1) where each substring (in terms of syllables) of a stem constitutes a base. This squib lays out the analytical problems with this pattern.

2. Data

The present work focuses on patterns of reduplication in Nukna, a Papuan language (Finisterre family) spoken in Morobe Province, Papua New Guinea.[1] The data and the generalisations come exclusively from Taylor's (2015) careful descriptive work on the language. The Nukna data is presented as found in Taylor (2015), with morpheme glosses and orthography unaltered. For reference, <á> = [ʌ], <y> = [j], and <ng> = [ŋ]. Numbers after examples indicate the page number from Taylor (2015) where the example is found.

There are several different reduplicative morphemes in Nukna. Reduplication in part marks number on nouns by means of the copying of a modifier such as an adjective (Taylor 2015:42); adjectives can be derived from nouns by reduplication (2015:58); and other adjectives can be intensified by reduplication (2015:57). These are each presented below, respectively.

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* This squib is written in appreciation of Doug Pulleyblank. It is in gratitude for being an exemplary model of an academic, a supervisor, and a human being. Much of this, and related work, has been inspired by Doug's very careful analysis of reduplication in Yoruba (Pulleyblank 2008). While that work is focused primarily on the variation found in the cline from identical copying to full lexical specification in the reduplicant, the present work is focused on the variation in placement of the reduplicant.

[1] Thanks to Arron McLaughlin, who originally brought the Nukna data and patterns to my attention. All errors in the presentation and analysis are my own.

(2) sup tá~táwi
stone PL~big
'many large stones' (42)

(3) pet~petná
INTENS~sharp
'very sharp' (57)

(4) sup~sup-ná
NMLS~stone-ADJ
'spherical' (58)

Noun stems can also be derived from reduplication of nominal roots. Taylor notes that the relationship between some of the derived forms and their roots is no longer a transparent one, and that other reduplicated forms appear to be monomorphemic.

(5) kám~káyam
NMLS~enemy
'enmity' (46)

(6) háng~háláng
NMLS~help
'strength' (46)

Some kinship terms and other relational terms can be reduplicated to form plurals, though there are other strategies for forming plurals in the language:

(7) nan~nan-yáni
PL~father-3PL.POSS
'their fathers' (43)

(8) nuk~nuk-ná
PL~friend-3SG.POSS
'her friends' (43)

Finally, it is also possible for total reduplication to arise when a noun root and 3rd person singular possessive suffix forms a base (Tayler 2015:46-47); however, this pattern will not be discussed in the current work.

The present discussion will focus on the shape of reduplicants, and on their placement in a word – two parameters which intersect. In terms of shape, there are two reduplicative shpaes in Nukna which are argued to derive from a set of preferences, and where one reduplicant shape displays unusual behaviours. This involves what will be interpreted here as a default CV- reduplicant, with a CVC- variant which surfaces when the stem is consonant-final (and where C_F will indicate a stem-final consonant, or a correspondent of one found in the reduplicant). As a starting point, the CVC_F- pattern will be outlined first, and is illustrated with the forms below:

(9) san~sa-n
INTENS~leave-NMLS
'separation' (49)

(10) men~me-n
INTENS~say-NMLS
'argument' (49)

(11) pin~pi-n
INTENS~dig-NMLS
'taking turns digging' (49)

As Taylor (2015) points out, the fact that many of these forms are monosyllabic masks the fact that copying this consonant involves skipping base material in longer forms. (12) illustrates this, with *kat-* as the reduplicant (instead of **kam-*, which would be derived from contiguous copying), and the same is true for larger stems (13).

(12) kát~kámut
NMLS~die
'death, dying' (50)

(13) hát~hárámut
NMLS~be.surprised
'being surprised' (50)

The fact that the stem-final C_F is copied in the reduplicant is evident in forms which take different nominalizing suffixes, where the *-n* suffix indicates a reciprocal action. As Taylor (2015) notes, in some cases, a root could potentially take any of the available nominalizing suffixes, yielding a pattern where the final consonant of the reduplicant changes. Taylor illustrates this with the root *pitá* 'be afraid':

(14) pitá-k
be.afraid-NMLS
'fear' (49)

(15) pik~pitá-k
INTENS~be.afraid-NMLS
'state of being afraid' (50)

(16) pin~pitá-n
INTENS~be.afraid-NMLS
'being frightened by each other' (50)

This clearly indicates that the suffix forms part of the stem, and the right edge of the overall base of reduplication. The base ends at the nominalizing suffix, though, as evidenced by the fact that further suffixes do not participate in the reduplication, as in (17), and where the expectation would be that suffixes such as *-sáni* would otherwise trigger a different reduplicative shape (by virtue of being vowel-final; see below).

(17) narág-ng hák~háti-k-sáni
perceive-SV INTENS~apportion-NMLS-2PL.POSS
'your (PL) belief' (48)

Thus, in this instance, the base is clearly demarcated on both the left and the right edges, by a word boundary, and by the nominalising suffix, respectively. This insight will be imported into the analysis below.

The final pattern to be accounted for here is what can be considered a "default" CV- reduplicant in the context where the stem does not end in a consonant:

(18) tá~tá
NMLS~do
'doing' (50)

This nested set of patterns can be accounted for straightforwardly in that the special case of CVC_F- occurs when a base is consonant-final, while the default case emerges in contexts where there is no consonant finally in the stem (i.e. one which would be available for reduplication). What is noteworthy about this pattern is that when the reduplicant is CV-, it is any syllable in the word which can serve as the base of reduplication, and where (by hypothesis) the reduplicant surfaces prefixed to it. The following are adapted from Taylor (2015:51), where only the presentation has been changed.

(19) ho~hose OR hose~se
NMLS~cut
'cutting'

(20) ká~kápá OR kápá~pá
NMLS~see.3NSG.OBJ
'seeing them'

(21) pá~párámi OR párá~rá~mi OR párámi~mi
NMLS~spin
'spinning'

(22) tá~tárawá OR tára~ra~wá OR tárawá~wá
NMLS~shoot.3SG.OBJ
'shooting it'

We have to acknowledge here that it is not possible to tell whether the reduplicant remains prefixed to the "base" word-internally, or whether it is suffixed (i.e. right-aligned) at some point, as the data is limited. Since the CVC- pattern is strictly prefixing, it is a fair assumption that a reduplicant found anywhere in the word is also prefixed to the base. Thus, the ~ symbol is used solely to mark the boundary at the site of reduplication, as it makes no commitment to which is sub-string is the base and which is the reduplicant.

The following generalisations can be made regarding reduplication in Nukna: (1) If the stem ends in a C_F, the reduplicant precedes the entire stem (as a base), and the reduplicant is right anchored to the C_F, (2) If the stem ends in a V, the reduplicant precedes a "base", but the base can be any syllable in the word, and there is no right anchoring. These generalisations will form the basis of an analysis, but one where an outstanding question still remains: Why a CV- reduplicant is allowed to emerge on any syllable, while the CVC_F- reduplicant is fixed at the left edge.

3. A Sketch of an Analysis

In order to achieve a CVC_F- reduplicant, it will be assumed that there is a pressure for the final consonant of the word to be identical to the final consonant in the stem (C_F). Since there is no intervening material standing between the initial CV and the stem-final copied C_F in the reduplicant, it will be assumed that a constraint on Anchoring is highly ranked. This will be defined in (23) as ANCHOR-C-R-BR:

(23) ANCHOR-C-R-BR (hereafter ANCHOR-R): Assign a violation if the consonant at the right edge of the stem does not stand in correspondence with the segment at the right edge of the reduplicant

This is *not* the same as ANCHOR-R-C-BR: i.e., a statement which assigns a violation if the right edge of the reduplicant is not anchored to a right-most consonant in the stem. This would incorrectly yield cases where CV- reduplicants surface. In these cases, it would be imaginable for epenthesis of a stem-final consonant to help satisfy the constraint, though no such operation is apparent in Nukna. Finally, it should be noted that satisfying ANCHOR-R in some instances means violating CONTIGUITY-BR (McCarthy & Prince 1993, 1995), which penalizes skipping:

(24) CVC_F-Reduplication

/RED-kamut/ 'death'	ANCHOR-R	CONTIGUITY-BR
ka-kamut	*!	
kam-kamut	*!	
☞ kat-kamut		*

ANCHOR-R effectively prevents a C_1VC_2- reduplicant from emerging from a $C_1VC_2VC_F$ base, such as *kamut* 'death'; i.e. it forces the skipping of any consonants intervening between C_1 and C_F.

ANCHOR-R must dominate what will be assumed to be a templatic constraint which defines a CV- as the default reduplicant shape; i.e. RED=CV. This is not to deny the possibility of the template being defined by other independent pressures, a la Generalized Template Theory (McCarthy & Prince 1999, Urbanczyk 2006); however, for lack of a better understanding of what those pressures might be in Nukna, a templatic constraint will be employed here, largely for expository convenience. (25) illustrates how this ranking derives CVC- reduplicants:

(25) CVC_F- reduplication

/red-kamut/ 'death'	ANCHOR-R	RED=CV
ka-kamut	*!	
kam-kamut	*!	*
☞ kat-kamut		*

In order to achieve a CV- reduplicant, or even in cases of CVC_F-, MAX-BR will also be violated. This constraint is added to the ranking in order to illustrate how the templatic constraint truncates the reduplicant at the expense of Max-BR, which demands total segmental copying from the base. If ANCHOR-R is vacuously satisfied, as in cases where the stem ends in a vowel, then this allows for a CV- reduplicant to emerge, as in (26). The templatic constraint, dominating MAX-BR, ensures the reduplicant is truncated to CV-, and nothing larger:

(26) CV- reduplication

/RED-hose/	ANCHOR-R	RED=CV	MAX-BR
☞ ho-hose			**
hos-hose		*!	*

There is perhaps not a satisfying complete analysis of these patterns; however, two salient points can will be expanded on in the next section: there is a generalised issue with formally defining the base of reduplication as a source of copying, and there is nothing obvious which either compels a CVC_F- reduplicant to remain fixed at the left edge, or allows a CV- reduplicant to "float".

4. Discussion

The two outstanding issues raised above can be expanded on here. First, however the reduplicative patterns of Nukna are to be analyzed, they raise important questions about the nature of the relationship between the base and the reduplicant. The fact that the reduplicant in vowel-final stems can "float" in its placement within the stem, attaching to a new base to be identical to, is to my understanding, novel. It

does resemble a well-known pattern, "internal" or "infixing" reduplication (Broselow & McCarthy 1983). In these cases, a reduplicant is infixed inside of a base for prosodic reasons, but the melodic content is supplied to the reduplicant by the string which is adjacent to the reduplicant. Cases like this lend support to an approach which views the base simply as the string adjacent to the reduplicant. In autosegmental approaches like that of Marantz (1982) or Broselow & McCarthy (1983), the spreading of melodic content was achieved largely through an adjacency relation. It appears in the Nukna case that adjacency is also an important factor, illustrated by the optional placement of the reduplicant, which copies from whatever is right-adjacent to it. At present it is not clear how this notion of adjacency is to be encoded, aside from either a hard constraint (Urbanczyk 1996) or a violable constraint (Lunden 2004, Brown 2017). This also leaves the directionality of copying to be explained, though if reduplicants are sub-categorized as prefixes or suffixes, this potentially leaves directionality to emerge for free, as the base will be the thing which either follows (for prefixes) or precedes (for suffixes); i.e. it is unlikely there will be "copying" from both directions.

The more specific issue is what in the formalism allows for the 'floating' placement of the CV-reduplicant. The optionality in the placement of a reduplicant is not limited to Nukna. For instance, it also occurs in some environments in Tagalog, where the reduplicant can be attached to a root, or to a prefix (Rackowski 1999). The Nukna pattern is significant in that it is not morphology which governs the optionality. Instead, the CV- reduplicative pattern is apparently available for any given syllable in a stem. For whatever reason, the severing of the right-hand consonantal anchor C_F allows for the reduplicant to move from syllable to syllable, i.e. base to base. This makes obvious the fact that the base of reduplication, insofar as the base provides the material for copying, is not necessarily the stem itself, but the string which is adjacent to a reduplicant. In this way the morphological stem is the ultimate delimiter of what can constitute a base, but perhaps not necessarily the base of reduplication itself. It is not odd that a CVC_F- reduplicant requires strict prefixation; what is odd, though, is the fact that it is not allowed the freedom of placement which the CV- reduplicant is. There is no real state of affairs such that a CVC_F- would consistently violate phonotactic constraints if it were to be infixed, nor that the final anchoring condition would suddenly be violated by this.

Thus, while the question of what constitutes a base for copying is for phonological theory to grapple with, the question more specific to this particular data set is why the severing of the right consonantal anchor for a reduplicant allows for the optionality in placement.

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