

MARSHALLESE SINGLE SEGMENT REDUPLICATION
An Argument for the Skeleton

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In Marshallese,¹ a Micronesian language spoken in the Marshall Islands, the distributive for a number of nouns is formed by reduplicating the initial consonant of the base.² When a prefix attaches to the distributive, the surface forms of the two dialects surface the same. (In Bender's texts two dialects are given: Ratak and Ralik, spoken in the western and the eastern chains respectively.) The form of the output is XC_1C_2Y . X is the prefix, C_1 and C_2 are the reduplicated and base-initial consonants respectively, and Y is the remainder of the base. For example, [ye-k-kidiwdiw] is analysed as [ye-] 'he'(prefix), [-k-] (reduplicated consonant), [-kidiwdiw] 'dog'(reduplication base).

But when no prefix attaches to the reduplicated form, surface realizations of the two dialects differ. The output in Ralik is $[yV]C_1C_2Y$, where [yV] is a dummy segment plus a vowel, C_1 is the reduplicated consonant, C_2 is the initial consonant of the base, and Y is the remainder of the base. For example, /kidiw/ 'dog' -> /kkidiwdiw/ -> [yikkidiwdiw] 'dog' (distrib). The output of the second dialect, Ratak, is C_1VC_2Y ; C_1 is the reduplicated consonant, V is a vowel, C_2 is the initial consonant of the base and Y is the remainder of the base. For example, /kidiw/ 'dog' -> /kkidiwdiw/ -> [kikidiwdiw] 'dog' (distrib).

If we assume that Ralik and Ratak have identical underlying representations, then in order to account for the various surface forms, the constituent reduplicated must be a C slot (Marantz, 1982). In the above examples, the common denominator of the distributive in all forms is the reduplicated initial consonant of the base; thus the view argued here is that the output of reduplication is C_1C_2Y . C_1 is the reduplicated consonant, C_2 is the initial consonant of the base and Y is the remainder of the base. This assumption accounts for both dialects' (identical) prefixed forms, and also for the dissimilar unprefixed forms. The former surface straight-forwardly as [prefix + reduplicated C + base]. The unprefixed surface forms in the two dialects also result straight-forwardly. The syllable structure of Marshallese (for both dialects) is CV(V)C. As complex onsets are disallowed, the initial CC sequence resulting from reduplication is an ill-formed surface structure, i.e. *[#CCV...]. Epenthesis of initial [yV-] in Ralik ($[yV]C_1C_2Y$) and of an inter-consonantal vowel in Ratak (C_1VC_2Y) results in well-formed syllables in each dialect. Thus syllable well-formedness conditions motivate epenthesis in each dialect; but the method of resolution differs.

An alternative analysis of the Marshallese distributive assumes the prosodic theory of McCarthy and Prince (1986; 1987; 1988). As the skeleton is rejected in this model, Marshallese data cannot be formalized as reduplication of a C slot. Rather, in this theory only prosodic constituents can be reduplication affixes; therefore, the only viable analysis of Marshallese is where a core syllable is assumed to be the reduplication affix.³

The prosodic analysis accounts for the variable Marshallese forms if we assume that the process of copy is not automatic, rather languages -- or dialects of a single language -- choose between spread and copy to associate melody to the empty reduplicative affix.⁴ In Ratak, following prefixation of a core syllable to the base, melody associates via copy. A CV sequence results and the Ratak unprefixated forms are derived. An additional vowel deletion rule explains the prefixed forms (as demonstrated below, formalization of the vowel deletion rule is quite problematic). But in Ralik a core syllable prefixes to the noun and melody associates via spread. This analysis results in reduplication of a single consonant, accounting nicely for both the prefixed and unprefixated surface forms of this dialect ([yV] epenthesis must apply in the unprefixated forms).

The latter analysis, core syllable plus spread, results in a core syllable with no mora as the core syllable dominates a single consonant. This "mora-less" core syllable, required to handle the variable surface forms in Marshallese, challenges the notion of core syllable proposed by the prosodic theory: as shown below, the prosodic theory assumes the core syllable requires a mora lest 'segment skipping' effects occurring in the association of melody to core syllable be unexplained (see for example, Sanskrit and Tagalog, McCarthy and Prince 1986:16). Thus a problem of theory-internal coherence is raised for the prosodic theory when the core syllable is assumed as the affix in Marshallese.

In section 1, the Marshallese distributive is formalized as reduplication of a single C slot; additional rules accounting for all surface forms are provided. An account of Marshallese under the prosodic analysis (McCarthy and Prince, 1986; 1987; 1988) is then demonstrated and the problems resulting from the prosodic view of Marshallese are discussed. In order to maintain the crucial assumptions in the prosodic theory, it is concluded that the skeleton is necessary to explain the Marshallese facts.

1. Marshallese Single Segment Reduplication

1.1 Data

Figure 1 demonstrates the distributive reduplication described by Bender:

(1) <u>reduplication base</u> ⁵		<u>output of reduplication</u>	
diylah	'nails'	ddiylahlah	'have many nails'
gertak	'snore'	ggertaktak	'habitually snore'
jegaw	'odor of fish'	jjegawgaw	'permeated with fish odor'
jekab	'checkered'	jjekabkab	'checkered all over'
kewnah	'sneak away'	kkewnahnah	'habitually sneak away'
piyaw	'be chilly'	ppiyawyew	'sensitive to chills'
kewpay	'coat'	kkewpaypay	'habitually wear a coat'
kewtak	'rise'	kkewtaktak	'continually rising'
ran	'dirty'	rranran	'very dirty'

Forms in the left column are the reduplication base; forms in the right column are the output of reduplication. Figure (2) provides unprefix surface forms of the output of (1) in both dialects:

(2) Unprefixed surface forms (Bender, 1968; 1969b)⁶

<u>reduplicated form</u>	<u>surface forms</u>	
	<u>Ralik</u>	<u>Ratak</u>
ddiylahlah	-> yiddiylahlah	didiylahlah
ggertaktak	-> yeggertaktak	gegertaktak
jjegawgaw	-> yejjegawgaw	jejjegawgaw
jjekabkab	-> yejjekabkab	jejekabkab
kkewnahnah	-> yekkewnahnah	kekewnahnah
ppiyawyew	-> yippiyawyew	pipiyawyew
kkewpaypay	-> yekkewpaypay	kekewpaypay
kkewtaktak	-> yekkewtaktak	kekewtaktak
rranran	-> yerranran	reranran

Assuming that the two dialects of Marshallese have the same underlying forms, (2) demonstrates that the output of reduplication is the input into the unprefix surface forms. When the output of reduplication is itself prefixed, the forms in the right columns of (2) do not result; rather the prefix attaches directly to the output of reduplication as given in the righthand column of (1). For example, /ye-/ 'he' prefixed to /ddiylahlah/ results in [yeddiylahlah] 'he has many nails' in both dialects. While Bender does not give the phonetic realizations of the prefixed forms, he claims that these prefixed, reduplicated forms take the shape [prefix + reduplicated consonant + base] (Bender, 1976; also personal communication). Although surface realizations of the prefixed forms are not available, surface forms of double consonant stems, stems with an initial double consonant, are.

The surface realization of prefixed and unprefix reduplication forms parallels the realization of prefixed and unprefix double consonant stems; surface forms of prefixed and unprefix double consonant stems are given in Bender's text.

(3) Double consonant stems (Bender, 1968, 1969a; 1969b):⁷

a. prefixed forms

<u>double consonant stem</u>	<u>surface realizations</u> ⁸
lliw 'angry'	-> yilliw 'I am angry'
mman 'good'	-> yemman 'It is good'
qqir&y 'play'	-> yiqqiri&y 'I play'
tt&r 'run'	-> yett&r 'he runs'
bbej 'swell'	-> yebbej 'he swells'

b. unprefix forms

	<u>Ralik</u>	<u>Ratak</u>
lliw	-> yilliw	liliw 'angry'
mman	-> yemman	maman 'good'
qqir&y	-> yiqqir&y	qiqir&y 'play'
tt&r	-> y&tt&r	t&t&r 'run'
bbej	-> yebbej	bebej 'swell'

As with reduplicated forms, (figures (1) and (2)), when a prefix attaches to the double consonant stem, the stem undergoes no modification (3a). But when unprefixes, (3b), [yV-] epenthesis precedes the stem in Ralik, and in Ratak vowel epenthesis splits the initial consonants of the stem. Thus the behavior of reduplication forms is not unique; rather, whenever an initial double consonant results from a word formation process, epenthesis operates on the illicit onset sequence so that surface forms conform to the CV(V)C syllable structure of the language.

1.2 Reduplication formalized: A single segment as affix

The forms presented above result if we assume that a C slot is the reduplication prefix in Marshallese; the skeletal framework of reduplication set forth by Marantz (1982) allows such a prefix. Additionally, we might assume that the segmental realization of this skeletal prefix is supplied through spread (Steriade, 1982) or copy (Marantz, 1982):

(4) C slot as reduplication affix⁹

a. with copy

C + Cm Cm C Cm C -> C	Cm Cm C Cm C -> /kkidiwdiw/
ki di w di w	kidiwidiwi ki di w di w

"dog" dist.

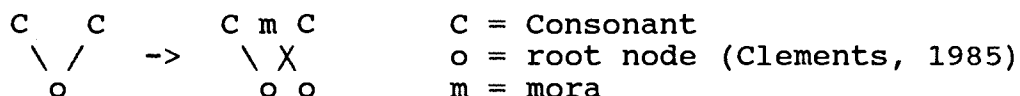
b. with spread

C + Cm Cm C Cm C ->	C + Cm Cm C Cm C -> /kkidiwdiw/
	\
ki di w di w	ki di w di w

In (4a), a C slot affixes to the reduplication base and the base copies; subsequent association from left to right between the copy and the affix results in the correct output of reduplication, a double consonant, as given in (1). (4b) shows that the C affix is associated with melody via spread of the base initial segment; again the output of reduplication shown in (1) results.

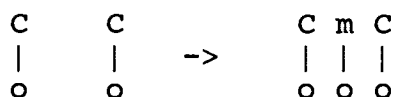
Under either analysis in (4), prefixed forms in both dialects are derived by simply attaching the prefix to the output of reduplication. However, while either analysis complies with surface prefixed forms in both dialects, the phenomenon of "geminate integrity" (Guerssel, 1978; Kenstowicz and Pyle, 1973; Hayes, 1986; Steriade, 1982), argues for (4a) as against (4b). Specifically, vowel epenthesis between the reduplicated and initial consonant of the base in Ratak is evidence against the analysis in (4b). Various researchers (Kaye, pc cited in Halle and Vergnaud, 1980, cited in Schein and Steriade, 1986; also Kenstowicz, Bader, and Benkeddache, 1982, cited in Schein and Steriade, 1986; Steriade, 1982; Hayes 1986; Schein and Steriade, 1986), argue that epenthesis cannot split true geminates as crossed association lines result:

(5)



However as no crossed association lines result, epenthesis may split fake geminates:

(6) Epenthesis splits fake geminates



If epenthesis only splits "fake" geminates, as argued by the proponents of "geminate integrity", then only the analysis of copy given in (4a) is compatible with the Ratak unprefixes surface forms, and crucially spread in (4b) is not. As shown, the output of reduplication in (4a) is a fake geminate whereas the output of reduplication in (4b) is a true geminate. Thus if (4b) were the correct analysis, the identical consonants resulting from reduplication could not undergo epenthesis (and note that the epenthetic vowel in these forms takes the features of the initial vowel of the base; thus if (4b) were the correct representation, then following mora insertion, the representation in (6) would result when this mora associated to phonetic content in the base). However, as the two identical consonants resulting from reduplication do undergo epenthesis in Ratak, only (4a) is consistent with the surface forms of this dialect.

In Ralik, on the other hand, the double consonant produced by reduplication is not split; rather [yV-] is prefixed to the output of reduplication. The epenthetic status of [y] is corroborated by Bender (1969b; 1973). For example, words analyzed with two historical final syllables can be realized with or without a final epenthetic [-Vy]. Final [-iy] optionally occurs as the last syllable of a whole class of unsuffixed verbs (Bender, 1969; 1973). Whereas Ratak resolves the ill-formed structures resulting from reduplication via epenthesis between the double consonants, Ralik epenthesizes a dummy consonant plus a vowel before the double consonants resulting from reduplication; well-formed syllable structure is thus induced.

Either (4a) or (4b) is consistent with Ralik surface forms; only (4a) is consistent with Ratak unprefixes forms. As both Ralik and Ratak are consistent with the analysis in (4a), the assumption made here is that (4a) is the correct analysis of Marshallese reduplication.¹⁰

The analysis of Marshallese reduplication as affixation of an empty C slot accounts for the prefixed and unprefixes forms of both Ratak and Ralik. The prefixed forms, identical in both dialects, result from affixation of the prefix to the output of reduplication; no additional processes are needed. The unprefixes forms are motivated by syllable well-formedness in the language.

As the output of reduplication creates ill-formed surface structures, epenthesis results in well-formed syllables. The form of epenthesis differs in the two dialects as Ratak breaks up the cluster while Ralik supplies an initial syllable to which the reduplicated consonant associates.

2. The prosodic account

The prosodic theory of McCarthy and Prince (1986; 1987; 1988; hereafter M&P) offers an alternative analysis of the Marshallese distributive. In this theory only prosodic constituents qualify as reduplication affixes. This section demonstrates that if a prosodic affix is assumed for Marshallese then the position on "segment skipping" followed in the prosodic theory must be abandoned. However, abandoning this position, a necessary move in the exposition of Marshallese, results in irreconcilable theory-internal problems for the prosodic theory itself. Ironically then, if the crucial aspects of the prosodic theory are to be maintained, then this model cannot account for Marshallese. Therefore formalization of Marshallese reduplication must utilize a C slot as argued in section 1 of this paper.

As M&P is not yet published the assumptions of this theory will be overviewed. Then a prosodic analysis of Marshallese is given and the problems resulting from this theory are discussed.

2.1 Assumptions of the Prosodic Theory

In the prosodic theory of M&P (1986; 1988) reduplication affixes are always one of eight possible prosodic constituents: σ , a syllable (realized with as many segments as the language permits); σ_C , a core syllable requiring a mora, allowing one onset consonant and disallowing a coda; σ_m , a mono-moraic syllable allowing any number of onset consonants and optionally allowing a coda; σ_{mm} , a bimoraic syllable allowing onset and coda; $\sigma \sigma$, a quantity insensitive foot; $\sigma_m \sigma_{mm}$, a quantity sensitive foot; mm , a bimoraic foot; and the prosodic word, a constituent which remains largely unformalized in reduplication (but see Spring, 1989, where reduplication in Axininca Campa is analyzed using the prosodic word as the base of reduplication).

Following Marantz (1982), M&P assume the base of affixation copies, and this melody is associated to the affix. The prosodic affix associates to as much of the copy as results in a well-formed prosodic constituent of the language. M&P differ from previous analyses of reduplication (eg. Marantz, 1982; Levin, 1983; Broselow and McCarthy, 1984) in the following ways: 1) MP make explicit the claim that the base of affixation can be a phonological constituent (further developing notions set forth in Broselow and McCarthy, 1984); 2) M&P set forth the Template Satisfaction Condition (MP, 1986:6; 1988:1), a principle requiring association of an affix to a melody whereby obligatory positions of the affix are satisfied; 3) segment skipping is disallowed except in order to fulfill 2) above, i.e. to fill the mora in a σ_C , segments can be skipped; 4) segments of the copy are not restricted to associate to the reduplicative affix;

copied segments may associate across the affix/base morpheme juncture; 5) the skeleton is not a level of representation.

2.2 Marshallese formalized under the prosodic theory

In the prosodic model a skeletal analysis of Marshallese is prohibited as the skeleton is disallowed in this theory. Rather, the reduplication affix must be a prosodic constituent. The surface forms in figure (2) demonstrate that the largest sequence which ever surfaces in Marshallese reduplication is a CV sequence (Ratak unprefixing forms). Elsewhere, only a single consonant ever reduplicates. Thus the σ_C plus copy would account for the CV sequence which reduplicates in Ratak unprefixing forms (to account for prefixed forms we must assume that vowel deletion applies to the output of reduplication). In Ralik, the σ_C plus spread would account for all of the Ralik forms, as under this formalism only a single consonant reduplicates. The reduplication of σ_C plus copy versus σ_C plus spread is demonstrated in (7).

(7) The σ_C as affix

a. with copy

$$\begin{array}{ccc} \sigma_C + \sigma & \sigma & \sigma & \rightarrow & \sigma_C & \sigma_C \sigma & \sigma & \rightarrow & [\text{kikidiwdiw}] \\ \wedge \backslash & / \backslash \backslash & / \backslash \backslash & & / \backslash & / \backslash \backslash & / \backslash \backslash & & \\ \text{ki} & \text{di} & \text{w} & \text{di} & \text{w} & \text{kidiwidiwi} & \text{ki} & \text{di} & \text{w} & \text{di} & \text{w} \end{array}$$

b. with spread

$$\begin{array}{ccc} \sigma_C + \sigma & \sigma & \sigma & \rightarrow & \sigma_C \sigma & \sigma & \sigma & \rightarrow & [\text{kkidiwdiw}] \\ \wedge \backslash & / \backslash \backslash & / \backslash \backslash & & \vee \backslash & / \backslash \backslash & / \backslash \backslash & & \\ \text{ki} & \text{diw} & \text{diw} & & \text{ki} & \text{di} & \text{wdi} & \text{w} & \end{array}$$

While M&P nowhere elaborates the formalization assumed in (7b), σ_C plus spread, we might assume the notion of spread, as opposed to copy, is a possible parameter in the prosodic model as such formalism is used elsewhere in the literature (for example Steriade 1982 accounts for Greek reduplication utilizing spread). Assuming copy versus spread allows us to posit a prosodic affix for Marshallese; section 2.3 demonstrates the need for both (7a) and (7b) in the Marshallese analysis. (7a) accounts for Ratak (unprefixing forms; the prefixed forms remain a problem in this model) but cannot account for Ralik forms, and (7b) accounts for Ralik forms but is problematic for Ratak.

Before proceeding with the analysis, note that the σ_C is the only possible prosodic affix which can account for Marshallese, because it is the only constituent which disallows a coda. In Ratak, crucially only a CV sequence and not a CVC sequence must reduplicate. Positing the σ , σ_m , or the σ_{mm} , each of which allows a coda, would result in reduplication of a CVC sequence when accompanied by copy (and as noted, when a prosodic constituent is assumed as the affix, only assuming copy versus spread can account for the difference between Ratak -- copy -- and Ralik -- spread). Thus any syllable type in the prosodic theory except σ_C

would result in ungrammatical CVC sequences in Ratak.¹¹

2.3 The Analysis

The analysis in (7a) assumes that a prosodic constituent, δ_C , is the reduplicative affix and copy supplies the melody; the analysis as given results in the correct unprefixal Ratak surface forms, which surface as a CV sequence. If we assume (7a) is the analysis of both dialects, then in order to account for forms where a vowel does not mediate between the reduplicated consonant and the consonant of the base, i.e. the Ralik unprefixal forms (eg. [yikkidiwi]) and both dialects' prefixal forms (eg. [yekkidiwi]), a vowel deletion rule would be required (additionally Ralik unprefixal forms would require initial [yV-] epenthesis). Vowel deletion might be formulated as in (8).¹²

(8) Vowel Deletion¹³

$$m \rightarrow 0 \quad / \quad C_m + C$$

Vowel deletion in (8) deletes the vowel of the δ_C reduplication affix. A derivation of an unprefixated Ralik form is given in (9a) and in (9b) a prefixed Ratak form is given:

(9) Derivations

a.

δ_c
 $\begin{array}{ccccc} \delta & \delta & \delta & \delta & \delta \\ | & | & | & | & | \\ m & m & m & m & m \end{array}$
 $\begin{array}{ccccc} \delta & & \delta & \delta & \delta \\ | & & | & | & | \\ m & & m & m & m \end{array}$

kidiw -> kidiwdiw -> kikidiwdiw -> yikikidiwdiw -> yi k idiwdiw

b.

[illegible]

The first argument against vowel deletion in (8) is that the application of this rule on any reduplicated form results in an OCP violation (McCarthy, 1986). In essence, the OCP claims that adjacent identical segments (or autosegments) are disallowed. The OCP explains the non-application of phonological rules to forms which would otherwise be expected to undergo the rule: a rule fails to apply to a target when the structure created by the rule would violate the OCP, i.e. two adjacent identical segments (or autosegments) would result.

Vowel deletion in (8) violates the OCP if it applies between the identical consonants created by reduplication:

(10) Vowel deletion results in an OCP violation¹⁴

CmCmCmCmCCmC CmC CmCmCCmC
 ||||| ||||| |||||
 yikikidiwdiw -> yik_kidiwdiw

The OCP then argues against the use of the analysis in (7a) to account for Ralik unprefixes forms and all prefixed forms. The second argument against this analysis is that vowel deletion in (8), required to derive the unprefixes Ralik forms and all prefixed forms, should also delete the initial base vowel of the Ratak unprefixes forms. Note that Ratak unprefixes forms meet the structural description of (8) as a [Cm + Cm] sequence is derived in the course of reduplication.

(11) Overapplication of Vowel deletion

kidiw -> kidiwdiw -> $\begin{matrix} \delta_c \\ \text{m} \end{matrix}$ + $\begin{matrix} \delta \\ \text{m} \end{matrix} \begin{matrix} \delta \\ \text{m} \end{matrix} \begin{matrix} \delta \\ \text{m} \end{matrix}$ -> $\begin{matrix} \delta \\ \text{m} \end{matrix} \begin{matrix} \delta \\ \text{m} \end{matrix} \begin{matrix} \delta \\ \text{m} \end{matrix}$ *kikidiwdiw

Following reduplication, the base initial vowel is a potential target for vowel deletion in Ratak unprefixes forms. The output of vowel deletion on the initial vowel of the base results in a well-formed CVC syllable; nonetheless this form (eg. *[kikidiwdiw]) is incorrect.

Because of these problems (7a) cannot account for Ralik unprefixes forms and is also problematic for both dialects' prefixed forms. A second analysis, (7b), is where the δ_c affix receives melody through spread. The output of (7b) is a single segment. This analysis accounts for all the forms where a single consonant results, i.e. Ralik unprefixes forms and both dialects' prefixed forms ([yV-] epenthesis is required to account for the surface unprefixes forms in Ralik). The problem of (7b) is that it cannot account for the Ratak unprefixes forms. The output of (7b) is a true geminate; as argued in section 1, under the tenets of geminate integrity, true geminates cannot be split by epenthesis. Thus (7b) cannot be the correct analysis of Ratak unprefixes forms as these surface forms require that a vowel intervenes between the reduplicated and base initial consonant. To account for the Ratak unprefixes forms, epenthesis must split the identical consonants resulting from reduplication in (7b) thus violating geminate integrity. I conclude then that the Ratak unprefixes forms cannot be analyzed under (7b).¹⁵

While neither analysis in (7) accounts for all Marshallese forms, as (7a) accounts for some forms and (7b) accounts for others, we might assume that both of the analyses taken together account for the variation in the two dialects. Recall that (7a), a δ_c plus copy, results in a CV sequence, the correct output for Ratak unprefixes forms. Likewise, (7b), where spread results in reduplication of a single consonant, accounts for the Ralik prefixed and unprefixes forms. Thus we might assume that the two

dialects have the same affix but differ as to how melody is supplied to this affix.¹⁶

The first, non-problematic, consequence of this third analysis is that copy is not automatic in reduplication; rather languages choose between copy and spread as the means by which empty affixes are filled. The second consequence is that contrary to M&P's proposal, the σ_C syllable does not require a mora (see 2.1 of this paper). Rather in (7b) the σ_C with spread results in a syllable with a single consonant and crucially, no mora.

Allowing the "mora-less" σ_C , (7b), is crucial if a prosodic analysis of the Marshallese data is to be achieved, i.e. to account for the difference between Ratak and Ralik surface forms. However, assuming (7b), a formalism which results in a mora-less σ_C , in turn creates a problem for the central tenets of the prosodic theory.

2.4 The Problem

In previous accounts of reduplication (eg. Marantz, 1982), "segment skipping", a phenomenon whereby segments of the copy may be skipped in order to fill the C and V slots of the reduplication affix, is allowed. In setting forth the prosodic characterization of reduplication, M&P (1986) claim that segment skipping is generally disallowed. For example in Manam, to account for reduplication of forms like /moita/ -> [moitaita] 'knife', M&P claim that a foot suffixes to the base of reduplication and association is right to left:

(12) Analysis of Manam (MP, 1986:39-40)

$\sigma \quad \sigma$

moita -> moita + -> moita + $\begin{array}{c} \sigma \quad \sigma \\ m \quad m \\ | \quad | \end{array}$ -> [moitaita]

moita

Note that as the [o] of the copy (moita) cannot be skipped, the initial [m] of the COPY cannot be syllabified into the onset position of the affix -- even though onsets are allowed in this language (a form like [salagalaga] 'long' reduplicates with an onset consonant as no segments are skipped in associating the [l] with the onset position of the affix). Thus ungrammatical forms like *[moitamita] do not occur.

(13)

$\sigma \quad \sigma$

moita -> moita + -> moita + $\begin{array}{c} \sigma \quad \sigma \\ m \quad m \\ | \quad | \end{array}$ -> *[moitamita]

moita

To account for (languages like) Manam, M&P posit a foot ($\sigma \sigma$) affix, which because of the prohibition on segment skipping, is realized without an onset. Therefore the prosodic theory explains the realizations of prosodic affixes which surface as given in

However, in the prosodic theory segment skipping is allowed in exactly one case. To explain the behavior of σ_C in some languages, a constituent which MP claim must associate to a single mora, segment skipping may occur. The principle which exceptionally sanctions segment skipping in the case of σ_C is the Template Satisfaction Condition (TSC). The TSC claims that "all elements in a template are obligatorily satisfied" (MP, 1986:6). Because the mora is required in a σ_C affix, and thus is an "element" in this template, segment skipping is allowed in order to fulfill the TSC.¹⁷

(14) Tagalog δ_C syllable reduplication (MP, 1986:16)

As demonstrated by (14) segment skipping, elsewhere prohibited, is allowed in order to fill the obligatory mora of the δ_C as dictated by the TSC.

Note however that the position taken by the prosodic theory to sanction segment skipping, that δ_C requires a mora, is incompatible with the analysis of Ralik in (7b) where crucially the δ_C has no mora. Rather the output of (7b) is a single consonant. Thus if we assume that (7b) accounts for Ralik, a necessary assumption if we wish to maintain a prosodic analysis of Marshallese, it cannot be the case that the δ_C requires a mora.¹⁸ However, if a mora is not an obligatory constituent of the δ_C , then the prosodic analysis of languages like Tagalog, where segment skipping is allowed (to satisfy the obligatory mora of the δ_C) must be revised.

One solution to this problem would be to assume that as the mora is not required in δ_C , segment skipping must freely occur. This view correctly achieves the core syllable affix in languages like Tagalog (see (14)). But under this assumption it is difficult to explain the absence of an onset in the reduplication affix in (languages like) Manam, as exemplified in (12) and (13) of this paper. Alternatively, in order to account for Manam it could be the case that segment skipping is strictly disallowed. But in this case languages like Tagalog remain unexplained. Apparently then when we claim that the mora-less δ_C is a possible affix -- to account for the variation in Marshallese -- no single set of assumptions on "segment skipping" allows us to generate the surface forms of languages like Tagalog and Manam.

The solution to this paradox is to recognise that the prosodic analysis of Marshallese, where both (7a) and (7b) are required to handle the variation in reduplication, is wrong.

Rather if we allow a C slot in the formal representation of phonological structures, the account of Marshallese given in section 1 of this paper follows. The position on segment skipping taken by the prosodic theory, which results in correct outputs for both Manam and Tagalog, can then be maintained as the δ_C continues to require a mora.

3. Conclusion

Affixation of a single C slot explains quite simply all the surface forms of Marshallese reduplication. Moreover, as the syllable template in Marshallese is a CV(V)C template, the difference between the output of reduplication and the surface realization of unprefixated forms is explained. As clusters are disallowed, in the absence of prefixation, epenthesis must apply to the output of reduplication to generate well-formed surface structures. In Ratak an epenthetic mora between the identical consonants resulting from reduplication results in syllable well-formedness. In Ralik epenthetic [yV-] appended to this consonant cluster satisfies syllabification requirements. When prefixed, the consonant cluster resulting from reduplication surfaces as is. Prefixation, a morphological process which presumably occurs before epenthesis in both Ralik and Ratak, results in well-formed syllable templates, making epenthesis in either dialect at this point superfluous.

The alternative prosodic analysis of Marshallese can account for the dialectal variation (but vowel deletion in Ratak unprefixated forms remains a problem), but does so only at the cost of theory-internal coherence in the prosodic model. As demonstrated, when a prosodic account of Marshallese is given, only a δ_C can be the affix. To account for variation between Ratak and Ralik, both spread and copy must be assumed to supply melody to the affix. But when spread applies, the mora-less δ_C which results creates problems for the account of segment skipping proposed by the prosodic theory. As a mora is no longer a required element of the constituent δ_C , segment skipping cannot be motivated by the obligatory mora of the δ_C ; explaining the restrictive segment skipping which actually occurs in language becomes impossible. Because of this problem the prosodic analysis of Marshallese was rejected.

In rejecting the prosodic analysis of Marshallese, we see that the skeletal account must be used to explain the various prefixed and unprefixated forms surfacing in Marshallese reduplication. Therefore, in order to maintain the prosodic theory the skeleton must be included as a level of reference in phonological representations and processes.

Footnotes

1. I thank Megan Crowhurst, Richard Demers, Ken Drozd, Richard Oehrle, and especially Diana Archangeli, Robin Schafer and Wendy Wiswall. Mistakes, etc. are my responsibility.

2. Bender (1969b) claims that the distributive is formed by the combination of two reduplication processes, initial consonant and final syllable reduplication. But other forms cited by Bender show that reduplication of the final syllable and that of the initial consonant are independent morphological processes. The following data demonstrate this point:

- a. Menyin yenahaj kabilegey 'This thing will surprise him.'
(transitive)
- b. Menyin yenahaj kabilegleg 'This thing will cause great
surprise.' (intransitive)
- c. Menyin yenahaj kab**ilegleg** 'This thing will cause great
surprise.' (distributive)

In b. the final syllable reduplicates, indicating the intransitive, while initial consonant reduplication in c. denotes the distributive. I conclude that these two reduplication processes are independent, and refer to the initial consonant reduplication as the distributive throughout this paper.

3. Core syllable, δ_C , is a prosodic affix recognised by McCarthy and Prince (1986; 1988). These researchers argue that the core syllable requires a single mora and may have one onset consonant; no coda is allowed in this constituent.

4. Marantz (1982) introduces the notion of copy: in reduplication an affix (with no intrinsic phonetic content) is adjoined to a base. Copy of the base melody plus subsequent association of the copy to the reduplication affix is the means by which phonetic content is supplied to the affix.

The notion of spread is introduced by Steriade (1982). Here, rather than copy supplying a melody to an empty affix, Steriade assumes the base melody itself can spread to the empty affix.

5. I assume that two reduplication processes occur here: initial consonant and final syllable reduplication. See note 2.

6. Relatively few forms are cited here, as Bender (1968; 1969a; 1969b) provides few examples in his text. But he claims that reduplication is a "productive morphophonemic process...which produces 'distributive' forms by doubling the initial consonants and (usually) also reduplicating the final syllable" (Bender, 1968:26)

7. [&] is a front vowel whose phonetic form is between [i] and [e].

8. The initial [yi-] in the first and third forms is glossed as "I". All fourth and fifth forms are given in the stem and unaffixed forms in Ben text; the prefixed surfaced forms are hypothetical. See Bender, 1968:2

9. The correct formalization of syllable nuclei is not a central issue here. I assume that mora, "m", rather than a V slot is the correct hierarchical structure. However, when providing the epenthetic sequence in Ralik, [yV-] is used for clarity rather

than the ambiguous representation [ym-]. The predictions of these two opposing assumptions are beyond the scope of this paper.

10. Diana Archangeli, Megan Crowhurst, and Robin Schafer independently note that the difference between Ratak and Ralik might be that Ratak undergoes C affixation plus copy (4a) while Ralik undergoes C affixation plus spread. This assumption accounts for the different types of epenthesis affecting the two dialects. As a true geminate results, the output of (4b) cannot be split by epenthesis. Therefore the type of epenthesis actually occurring, [yV-] epenthesis, resolves the problem of syllabification. While this argument is interesting, the central points in this paper are not dependent upon either analysis of Ralik.

11. The prosodic theory (McP 1986) assumes that when a prosodic unit affixes to the base the largest possible prosodic template results. As CVC templates are allowed in Marshallese, the affixation of σ , σ_m or σ_{mm} would result in ungrammatical CVC forms for Ralik (assuming these constituents as the affix would not be a problem for Ralik, where spread supplies only a single consonant to the affix). Thus for example, for the form /dilah/ affixation of a σ plus copy would result in the form *[dildilahlah] instead of [didilahlah].

Likewise, the extrametrical syllable, (σ) a constituent which MCP assume dominates a sole consonant, cannot be the affix in Marshallese reduplication. In analyzing infixation reduplication, MCP (1986) and Prince (1987) assume that extrametricality marks constituents which are exempt from reduplication (copy) processes. Other researchers also argue that extrametricality exempts constituents from rules; see for example McCarthy, 1979; Hayes, 1980; Harris, 1983; Archangeli, 1984, 1986. In line with previous literature, as extrametrical units are seen to be exempt from rules, it would be incoherent to then assume that these constituents were the specific targets of reduplication in Marshallese.

12. For ease of exposition, assume that vowel deletion occurs after [yV-] epenthesizes to the Ralik unprefix form. Under this view prefixed forms and Ralik unprefix forms are structurally identical, i.e. the structural description of vowel deletion is [Cm + Cm]. In the unprefix forms [Cm + ...] is the prefix and [... + Cm] is the reduplication affix. In the Ralik unprefix forms [Cm + ...] is the epenthetic [yV] sequence and [... + Cm] is the reduplication affix.

13. This rule is formalized linearly to show that the rule would apply in a derived environment, i.e. following the principle of Structure Preservation (Kiparsky, 1982).

14. In sections discussing formal representations in the prosodic theory, I use "C" and "V" in a descriptive, rather than in a formal sense.

15. A final possibility is that the two dialects have different affixes, a partially specified syllable of the form [yVC] plus spread of the initial base consonant in Ralik, and an unspecified δ_C plus copy in Ratak. This solution is as problematic as the others: in Ralik prefixed forms the [yV-] portion of the affix would never surface, and in Ratak, assuming a δ_C as affix requires the problematic vowel deletion rule given in (8) of this paper. This third possibility then is quickly rejected.

16. Under this assumption Ratak prefixed forms are still problematic. If (7a) is the correct formalization of Ratak, the output of (7a) must be modified by vowel deletion in the Ratak prefixed forms. As demonstrated, this vowel deletion rule (given in figure 8) violates the OCP and additionally predicts that Ratak unprefixed forms should undergo it. Despite this problem, I consider the following analysis and demonstrate additional problems.

17. If moras are elements in all templates, and thus under the TSC, are obligatorily satisfied, segment skipping could in principle occur in any of the prosodic constituents recognised by the prosodic theory. However as only the δ_C limits the number of onset consonants to one and disallows codas, it is only the δ_C which actually does skip segments under the rubric of the TSC. All other constituents can syllabify all consonants in a copied string and therefore, segments are never skipped in order to fill the (obligatory) mora(s) of the constituent.

18. And note that the mora stipulation on the δ_C affix is a requirement on the affix itself, not a stipulation on some aspect of copy. Thus it cannot be argued that the difference between δ_C with spread versus δ_C + copy explains the different behaviors of Ralik on the one hand, and languages like Tagalog on the other.

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