Minimal Reduplication as a Paradigm Uniformity Effect

Maria Gouskova
Rutgers University

1. Introduction

Economy effects of structure avoidance are commonplace in phonology. For example, reduplicative morphemes often appear to be limited in size to at most a syllable. In Ilokano, the reduplicant is always a single heavy syllable, never two (see (1)). In another type of pattern, *minimal reduplication,* adding syllables is avoided altogether: in Rebi West Tarangan, a single consonant is copied if possible ((2)a) and a whole syllable only when necessary—for example, to avoid a geminate (see (2)b).[1]

(1) Ilokano $\sigma_{\mu\mu}$ reduplication (Hayes and Abad 1989)

a. If there is a non-glottal consonant after the first vowel, copy it

kaldíŋ	'goat'	kal-kaldíŋ	reduplicated
pú:sa	'cat'	pus-pú:sa	
jyá:nitor	'janitor'	jyan-jyá:nitor	**jyá:ni-*

b. Glottal stops cannot be codas; reduplicant vowel lengthens instead

kaʔót	's.t. grabbed'	ka:-kaʔót	
ró:ʔot	'leaves, litter'	ro:-ró:ʔot	**roʔ-ró:ʔot*

(2) Rebi West Tarangan: avoid adding a syllable (Nivens 1992, 1993)

a.	ta.pú.ran	'middle'	tar̲.pú.ran	**ta.p̲u̲.pú.ran*
b.	ná.nay	'hot'	n̲a̲.ná.nay	**n̲ná.nay*

Although in both cases the reduplicant is at most a syllable, the size restrictions are different in kind. The heavy monosyllable "template" is found in other, non-

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1. Similar patterns are found in Mbe (Walker 2000), Semai, Temiar (McCarthy 1982, Gafos 1998), Pima (Riggle 2003), Halq'eméylem', Lushootseed (Urbanczyk 1996, 1999), and Nootka (McCarthy and Prince 1994a).

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reduplicative domains—for example, it is a common minimal word (McCarthy and Prince 1986), as in English. The monoconsonantal restriction, on the other hand, is confined to affixes, whether reduplicative or not: no language has ever been reported to limit its roots or words in this way. This asymmetry needs to be explained.

I argue that the two types of restrictions on the size of the reduplicant spring from different sources. The heavy monosyllable "template" arises from restrictions on the kind of foot that the word contains. The heavy monosyllable is unmarked in Ilokano because it optimally satisfies metrical constraints; its small size is merely a side effect of their interaction (see sections 3 and 4). Minimal reduplication, on the other hand, arises from a pressure for affixes to be negligible in size, which itself is a consequence of the theory of paradigm uniformity: smaller affixes make for a better paradigm (see sections 5 and 6). The constraints whose interaction produces these economy effects are independently motivated—they are not called upon specifically to limit size in reduplication.

This approach can be compared with an economy analysis. Under economy, both types of size restrictions arise from a constraint that penalizes structure, be it *STRUC(σ) "No syllables" (Zoll 1993) or a gradient alignment constraint that assigns marks in proportion to the length of the word (Mester and Padgett 1994). This analysis sees the size restrictions as the emergence of the unmarked (TETU, McCarthy and Prince 1994a): syllables are marked everywhere; they are tolerated in bases because input-output faithfulness dominates economy, but syllables are preferably avoided in reduplicants (see section 7). The challenge lies in explaining exactly what is unmarked about syllables that is emerging in reduplication. The purported effects of economy constraints outside of reduplicative domains can be attributed to independently motivated constraints (for a detailed study of one such effect, syncope, see Gouskova 2003). The economy theory must also appeal to vague general principles that confine economy constraints to an emergent, secondary role (see Grimshaw 2003 for discussion).

The larger question is whether markedness constraints in Optimality Theory (Prince and Smolensky 1993) are limited in what they ban. I argue that constraints are lenient: they may penalize things that are relatively marked on some scale but never things that are unmarked. Under this view, certain constraints are impossible to express—for example, economy constraints described above. The theory is laid out briefly in the next section.

2. Lenient Constraints

In Gouskova (2003), I argue that CON is severely limited in the kinds of constraints it admits. All markedness constraints must be based in scales, which encode the relative markedness of at least two non-null structures. Thus, markedness is inherently comparative[2] in this theory: a structure isn't marked except in relation to some other structure; nothing is marked just because it *has* structure. Constraints correspond to scales in a systematic way, and there are restrictions on the scales themselves.[3] Scales are non-trivial statements of markedness: they may not imply that the only thing less marked than some structure is a null structure, ∅.

Many harmoic scales that have been discussed in the literature already fit these criteria: the place markedness scale *phar≻cor≻ dor*, *lab* (Lombardi 2002 and others), the vowel nasality scale *oral vowel≻nasal vowel* (McCarthy and Prince 1995), and the peak/margin sonority scales of Prince and Smolensky 1993; for more examples and discussion of other scales, see Gouskova 2003.

Every scale corresponds to at least one constraint, and every constraint has some corresponding scale. In the mapping from scales to constraints, the least marked level is ignored and does not map to a constraint. If a scale contains only two levels (as in *oral vowel≻nasal vowel*), it will give rise to only one constraint—against the more marked member (in this case, *NASAL VOWEL). Longer scales give rise to more constraints (one for each level), but the least marked member of every scale escapes constrainthood—hence constraints are *lenient*.

The implications of this organization of CON run wide. For one thing, it becomes impossible to express gradient alignment in the theory, since no scale can be constructed to mirror the markedness distinctions made by such constraints (cf. Eisner 1999, Potts and Pullum 2002, McCarthy 2003). Another central consequence of this theory is that it cannot express economy constraints of the *STRUC family, since such constraints cannot be based on legitimate scales.[4] *STRUC(σ), for example, assigns a violation mark for every syllable in the output. The only thing better than a syllable is a null output (∅), so *STRUC(σ) must be based on a trivial scale ∅≻σ, which is banned. Similar problems arise with other economy constraints. For example, there can be no constraint against all oral vowels—the only way to construct one is by zero-extending the two-level scale, *∅≻oral vowel ≻nasal vowel*; such a move renders the constraint illegitimate, however.

Since there are no economy constraints in this theory, all economy effects (such as syllable parsimony in reduplication) must follow from the interaction of

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2. In a sense quite distinct from McCarthy's (2002) Comparative Markedness.
3. Scales are, of course, asymmetric, irreflexive, and transitive (thus, no scale can state that *x* is more marked than *x*, either directly or by transitivity).
4. A potential problem is presented by counting scales, e.g., σ ≻σσ. They are presumably ruled out by a general principle; branching can be referenced by constraints, but counting is not an option. This is the subject of ongoing work.

other factors. An example of such economy effect-producing interaction is discussed next.

3. The heavy monosyllable as an optimal foot

One of the frequently cited rationales for *STRUC(σ) and other economy constraints is that some languages limit their morphemes in size to a single syllable (Urbanczyk 1999, Walker 2003, Urbanczyk to appear). This monosyllabic "template" is found in a variety of Prosodic Morphology contexts: hypocoristics, truncation, reduplication, and minimal words (see McCarthy and Prince 1986). The economy analysis goes something like this: economy forces the word/morpheme to be small, but because it has to be a prosodic word/foot, it must be minimally bimoraic. Hence the bimoraic monosyllable: short enough to minimally violate *STRUC(σ) but long enough to be a well-formed foot.

However, phonological theory already provides an independently motivated account for why the heavy monosyllable (H) might emerge as the best foot: the interaction of familiar constraints on foot structure. These are listed in (3).

(3) GRPHARM: *HL. (Prince and Smolensky's (1993) RHHARM)
FTBIN: "feet are moraically or syllabically binary." (McCarthy and Prince 1986)
WEIGHT-TO-STRESS PRINCIPLE (WSP): "unstressed syllables are light." (Prince 1990)
STRESS-TO-WEIGHT PRINCIPLE (SWP): "stressed syllables are heavy." (named by Prince 1990)

The unranked tableau in (4) shows how these constraints evaluate different prominence-initial feet. The only foot that satisfies all of the constraints is (H): it is even (GRPHARM), binary (FTBIN), contains no unstressed heavy syllables (WSP), and has a heavy head (SWP).

(4) (H) among trochees

	WSP	SWP	GRPHARM(*HL)	FTBIN
<u>H</u>L			*	
<u>H</u>				
<u>L</u>L		*		
<u>L</u>H	*	*		
<u>L</u>		*		*

Among iambic feet, light-heavy (LH) performs at least as well as (H), but in the realm of trochees (H) is most harmonic. This is not to say that (H) doesn't have problems—such feet must contain either long vowels or codas, both of which are marked. At the level of foot structure, however, it is very well-formed.

This well-formedness of (H) is key to why it surfaces in so many prosodic morphology domains: under at least some rankings, it is the best foot and the best prosodic word. I demonstrate this next by analyzing Ilokano reduplication.

4. The monosyllabic reduplicant in Ilokano

The analysis of Ilokano (recall (1)) must answer two questions: (i) why copy just one foot, and (ii) why copy this particular foot. I argue that reduplication in Ilokano follows a TETU pattern (McCarthy and Prince 1994a)—RED copies all and only the material that is needed to form an optimal prosodic word.

McCarthy and Prince's (1994a) theory already provides an answer to (i): a single foot can be an optimal prosodic word. In their analysis of Diyari, which also limits its RED to a single foot (though disyllabic), they argue that RED is lexically specified as a morphological (and therefore prosodic) word. As such it is subject to all the constraints that hold of any word, reduplicative or not. RED must additionally obey constraints that are routinely violated in non-reduplicative phonology; thus, it cannot contain any unfooted syllables or multiple feet.

The second question is why reduplication copies a particular type of foot—(H)—rather than, say, (HL), (LL), or (L). Here, the constraints discussed in section 3 come into play. A (HL) foot is an uneven trochee and therefore violates GRPHARM (see (5)). (L) violates FTBIN and SWP, and (LL) violates SWP. Only (H) satisfies all of these constraints, so it wins.

(5) Ilokano reduplication

/RED-jyanitor/	GRPHARM	SWP	MAX-BR	IDLENGTH(BR)
a.☞(jyán)-(jyá:)nitor			****	*
b. (jyá.ni)-(jyá:)nitor		*!	***	*
c. (jyá:)-(jyá:)nitor			*****!	
d. (jyá:ni)-(jyá:)nitor	*!		***	

There is independent evidence for this analysis of Ilokano. According to Hayes and Abad (1989), all stressed syllables are heavy (CV: or CVC), and long vowels are found only in stressed open syllables *and in reduplicants*. Thus, the same constraint that requires stressed syllables to be heavy in non-reduplicative phonology, SWP, is responsible for the size of the reduplicant—no templatic constraints are needed in the analysis. The constraints whose interaction produces the monosyllabic limit are independently motivated constraints on foot structure (GRPHARM, SWP), they are in no sense economy constraints; thus, (H) beats (LL) and (HL) not because it has fewer syllables but because its weight is better distributed throughout the foot.

While this type of analysis works well for the heavy monosyllable minimal word in Ilokano and other Prosodic Morphology domains, there is no parallel account of smaller size restrictions (e.g., the light monosyllable) and atemplatic, minimal reduplication—hence special templatic constraints and economy are often invoked for these (see section 7). The next section presents a theory that derives such restrictions from independent principles.

5. Output-Output faithfulness and reduplicative affixation

The theory of Output-Output (OO) faithfulness expresses the intuition that morphologically related forms are required to be similar in certain ways (Burzio 1994, Kenstowicz 1996, Benua 1997). One of the forms in a paradigm is selected as the base, with which other related forms stand in OO correspondence. Various OO faithfulness have been discussed: MAX$_{OO}$ penalizes deletion of material that is present in the base in derived forms, IDENT$_{OO}$ penalizes non-matching feature values, and so on. DEP$_{OO}$ requires that every segment in the derived form have a correspondent in the base. This last constraint is violated by epenthesis, by underlying segments that surface only in derived forms (e.g., “bombardment” vs. “bom<b>”), and by affix segments.

An affixed form, e.g., *obviousness* (see (6)), violates DEP$_{OO}$—none of the segments in *-ness* are present in the base *obvious*. Nonrealization of the affix would violate IO-Faith in this case (since *-ness* is present in the input), which must dominate DEP$_{OO}$ in English. If DEP$_{OO}$ were undominated, the language would have no affixes—which results in a most uniform paradigm.

(6) Regular affixation

OO-Faith

obvious$_{base}$ → obvious-ness

IO-Faith ↑ ↑ ↑ ***IO-Faith***

/obvious$_{stem}$/ /obvious$_{stem}$-ness$_{affix}$/

(from Benua 1997:40)

DEP$_{OO}$ applies to reduplicative affixes, as well, though in the case of reduplication, not copying a segment violates BR-Faith, not IO-Faith. The hypothetical example in (7) illustrates this. The smaller the reduplicant, the better the performance on DEP-SEG$_{OO}$, and the larger the reduplicant, the better the performance on MAX-SEG$_{BR}$.

(7) Reduplicative affixation violates DEP-OO

/RED-badupi/; [badupi]$_{base}$	MAX-SEG$_{BR}$	DEP-SEG$_{OO}$
a. badupi-badupi		******
b. ∅-badupi	******	
c. bad-badupi	***	***

Therefore, DEP$_{OO}$ constraints act as an all-purpose size minimizer for affixes: the larger the affix, reduplicative or not, the worse the form does on this constraint. As I show in the following section, this constraint is a central force in Rebi West Tarangan.

6. Rebi West Tarangan

6.1. Background and data

The reduplicant in Rebi West Tarangan (Nivens 1992, 1993, Spaelti 1997) has three shapes: C, CV, and CVC. The shape of the reduplicant is determined by the phonological properties of the base. The relevant details of the phonology are as follows: (i) there is a categorical ban on geminates and tautosyllabic clusters; (ii) main stress falls on the penultimate syllable of the root, and (iii) the reduplicant prefixes to the stressed syllable, so sometimes it is an infix (this is a prefix-to-prosodic-constituent pattern; see Broselow and McCarthy 1983 et seq.).

The pattern of reduplication is exemplified in (8). By default, a single consonant is copied and prefixed to the stressed syllable (see (a)). If the stressed syllable is initial or preceded by a closed syllable, copying just one consonant would yield a cluster; instead, an entire CVC sequence is copied (see (b)). Examples (c) and (d) show CV: reduplicants: in (c), there is no consonant immediately following the stressed vowel, and copying more than one vowel or copying a non-contiguous sequence is ruled out. In (d), the first and the second consonants of the main stress foot are identical, so a single CV sequence is copied to avoid creating a geminate.

(8) Rebi West Tarangan minimal reduplication (Nivens 1992, 1993)

a. Copy a single C and prefix it to stressed syllable
   ta.pú.ran   tar.pú.ran 'middle'   *ta.pur.pú.ran
   bi.núk   bik.núk 'ankle'   *bi.nu.núk

b. If the stressed syllable is initial or preceded by a coda, copy CVC
   lɔ́.pay   lɔp.lɔ́.pay 'cold'   *plɔ́.pay
   gar.kɔ́w-na   gar.kɔw.kɔ́w-na 'orphaned-3s'   *garw.kɔ́w-na

c. If the stressed syllable is initial but not followed by C, copy CV
   rú.a   ru.rú.a 'two'   *rrúa, *rua-rua
   dɔ́.am   dɔ.dɔ́.am 'pound'   *mdɔ́am, *dɔ́m-dɔ́am

d. If C1=C2, copy CV
   ná.nay   na.ná.nay 'hot'   *nan.ná.nay
   da-má.ma   ma.má.ma 'chew'   *mam.má.ma

There are several things to notice here. First, in the default case (e.g., *tarpúran*), the derived form is remarkably similar to the base form: it has stress on the same syllable, and it only differs from the base form by one non-initial consonant. Second, it appears that consonants are added to the base with relative ease, but vowels are added reluctantly: when a single consonant cannot be copied in *l<u>ɔp</u>.lɔ́.pay*, the solution is to copy a whole CVC syllable, not just CV.

6.2. Analysis

The analysis captures the intuition that reduplicative affixation is limited in its ability to add vowels/syllables to the base. The central force in limiting the size of the reduplicant is DEP-V_{OO}: "Every vowel in the derived form must have an OO-correspondent in the OO-base." This constraint is ranked above MAX_{BR}, favoring paradigmatically derived forms with consonantal affixes.

By default, a single consonant is copied. Copying more would incur violations of high-ranking DEP-V_{OO}, which assigns violations for every vowel in a derived form that has no correspondent in the OO-base. The constraint that favors more complete copying, MAX-SEG-BR, must be ranked below DEP-V_{OO} (see (9)—shared marks are cancelled):

(9) Default pattern: copy a single consonant and prefix it to the main foot

/RED-tapuran/	DEP-V_{OO} cf. ta.pú.ran	MAX-SEG_{BR}
a. ☞ta<u>r</u>.(pú.ran)		**
b. ta.<u>pur</u>.(pú.ran)	*!	

DEP-V_{OO} is itself dominated, so sometimes vowels do have to be copied (see (10)). *COMPLEX "no tautosyllabic clusters" rules out a single-consonant reduplicant, as (b) shows. I assume that MORPH-REAL (Kurisu 2001 and others) is undominated here, so avoiding a cluster by not realizing RED is not an option. Candidate (c) is of interest because it differs from the winner only in copying a single consonant instead of two. The winner and (c) are tied on DEP-V_{OO}, both copying a single vowel. The decision is passed down to MAX-SEG_{BR}, which favors the candidate with more exhaustive copying. Thus, RED will copy as many consonants as possible while adding as few vowels as possible:

(10) If stress is initial, copy a CVC syllable and prefix it to the main foot

/RED-lɔpay/	*COMPLEX	DEP-V_{OO} cf.[lɔ́.pay]	MAX-SEG_{BR}	DEP-C_{OO}
a.☞<u>lɔp</u>.(lɔ́.pay)		*	**	**
b. (<u>p</u>lɔ́.pay)	*!		****	*
c. <u>lɔ</u>.(lɔ́.pay)		*	***!	*

This opportunistic copying of consonants will fail if there is a danger of violating high ranking constraints like *GEMINATE, so *<u>na</u>-nánay* will beat *<u>nan</u>-nánay*. Similarly, $CONTIG_{BR}$ rules out skipping in the copying of hiatus bases, so only one consonant is copied in *d<u>ɔ</u>-dɔ́.am* (**dɔ́m-dɔ́.am*). The summary ranking is given in (11).

(11) {*COMPLEX, CONTIG$_{BR}$, *GEM, MORPH-REAL}>>DEP-V$_{OO}$>>MAX-SEG-BR>>DEP-C$_{OO}$

Outside of reduplicative paradigms, Rebi West Tarangan shows effects of paradigm uniformity as well (Nivens 1992). Stress is fixed on the root, which Nivens analyzes cyclically and which can be recast in OO-terms (Burzio 1994, Benua 1997). Even more relevant to reduplication is the monosyllabic limit on the size of suffixes—which follows if MORPH-REAL and syllable structure constraints dominate DEP-V$_{OO}$. No monosyllabic limit holds of roots; they can be as many as four syllables long. Thus, paradigm uniformity controls various aspects of the language's phonology—including reduplication.

7. Alternatives: templates and syllable economy

There are two existing approaches to minimal reduplication in Optimality Theory: templates and syllable economy. As I show in this section, the paradigm uniformity approach overlaps with both of these alternatives: like the templatic approach, it predicts templatic backcopying, and like the economy approach, it relies on limiting the amount of structure in affixes. I suggest that the problems of the paradigm uniformity approach are outweighed by its advantages.

7.1. The templatic approach

The templatic approach relies on a constraint that specifically prohibits affixes from being larger than a syllable:

(12) AFFIX≤σ: "The phonological exponent of an affix is no larger than a syllable." (McCarthy and Prince 1994b)

A reduplicant that is morphologically designated as an affix will be subject to this constraint, which under the right ranking would limit reduplicant size accordingly. This approach adequately accounts for cases of templatic CV reduplication such as Nootka, but, as pointed out by Walker (2000), AFFIX≤ σ fails to make the right distinction for minimal reduplication. The reason is that AFFIX≤σ is equally well satisfied by a candidate that copies a single consonant as by one that copies a whole syllable, and Base-Reduplicant faith prefers the larger reduplicant (wrongly in this case). Copying less than a syllable should never be optimal in this system, since no constraint favors minimal copying:

(13) AFFIX≤ σ fails to make the right distinction

/RED-tapuran/	AFFIX≤σ	MAX_{BR}
a. tarpuran	✓	*!*
b. 💣 tapurpúran	✓	

7.2. Templatic backcopying and DEP_{OO}

Apart from not working for cases like Rebi West Tarangan, templatic constraints encounter an additional problem: their presence in CON predicts that under the ranking in (14), the base should be truncated to match the size of the reduplicant, but only in reduplicated words.[5] This happens because the reduplicant and the base stand in correspondence. Whenever both the templatic constraint and base-reduplicant faithfulness dominate input-output faithfulness, the reduplicative base will have shorten to match RED in size:

(14) Templatic backcopying with AFFIX ≤ σ

		AFFIX≤σ	MAX-BR	MAX-IO
/RED-badupi/	a. ☞ ba-ba			****
	b. ba-badupi		*!***	
	c. badupi-badupi	*!		
/badupi/	d. ☞ badupi			
	e. ba			****!

Unfortunately, removing templatic constraints from CON does not remove templatic backcopying from the theory. The backcopying effect can be produced by DEP_{OO}, as well—it makes the same distinction, penalizing only the material in RED:

(15) Templatic backcopying with DEP_{OO}

		DEP_{OO}	MAX-BR	MAX-IO
/RED-badupi/ cf. $[\text{badupi}]_{base}$	a. ☞ ba-ba	**		****
	b. ba-badupi	**	*!***	
	c. badupi-badupi	***!***		
/badupi/	d. ☞ badupi			
	e. ba			****!

Templatic backcopying is predicted by any theory that includes constraints violated by affixes but not bases/stems. If all constraints applied generally to all

5. McCarthy and Prince (1999) call templatic backcopying the Kager-Hamilton conundrum.

morphemes, whether affixal or not, then templatic backcopying would never be optimal (see the next section).

Two points should be made here. On the one hand, some examples of templatic backcopying have been put forth in the literature (see Downing 2000), so the theory needs some mechanism to account for them—Output-Output faithfulness is one such mechanism. On the other hand, even if the purported examples of templatic backcopying can be reanalyzed in other terms, templatic backcopying is still a problematic prediction for any theory that includes Output-Output faith between bases and derived forms (Kenstowicz 1996, Benua 1997). I will return to this issue in the next section after introducing the syllable economy approach.

7.3. The syllable economy approach

The distinction that AFFIX≤σ could not make, *tarpuran*≻**tapurpuran*, can be made by economy constraints, which assign more violation marks to longer forms than to shorter ones. These include *STRUC(σ)[6] as well as gradient syllable alignment constraints (see (17)). Both constraints favor shorter forms, though syllable alignment differs from *STRUC(σ) in that it is fully satisfied by monosyllabic word, whereas *STRUC(σ) is fully satisfied only by a null candidate.

(16) *STRUC(σ): “No syllables.” (Zoll 1993)

(17) ALL-σ-LEFT/RIGHT: “Every syllable is leftmost/rightmost in its prosodic word.” (Mester and Padgett 1994; applied to minimal reduplication by Spaelti 1997, Walker 1998)

Since *tar.pu.ran* has fewer syllables than *ta.pur.pu.ran*, it does better on economy, which under this approach must dominate MAX_{BR} in Rebi West Tarangan. Intuitively, the economy analysis works much like the paradigm uniformity analysis I propose in this paper: the reduplication process is limited in its ability to add syllables/structure to the base. The difference lies in the treatment of the base itself (see (18)).

6. A variation on *STRUC(σ) has been called general “markedness”—Gafos 1998 and Nelson 2003 are among some proposals that invoke it. General “markedness” would include constraints against every single structure, feature, etc. regardless of markedness. See Gouskova (2003, ch. 2&4) for discussion.

(18) Global Syllable Economy (straw man)

		MAX$_{BR}$	MORPH-REAL	*STRUC(σ)	MAX$_{IO}$
/RED-badupi/	a. ☞ ba-ba			**	****
	b. badupi-badupi			***!***	
	c. ∅-ba	**!	*!	*	
/badupi/	d. ☞ ba			*	****
	e. ∅		*!		******
	f. badupi			***	

Economy constraints evaluate all syllables, whether they are in the reduplicant or in a base. Because of this, economy theory does not predict templatic backcopying (provided that it explicitly rejects Ouput-Output faithfulness, as well). But, it does predict that under some rankings, *all morphemes should be limited in size to a syllable or a smaller unit*. If *STRUC(σ) dominates MAX$_{IO}$, the result is a language in which the size restriction holds globally.

This restriction might appear to hold in Yuhup, where morphemes and syllables are said to correspond one to one (Lopes and Parker 1999, Walker 2003). However, this generalization comes with several qualifications. All roots consist of a minimally heavy syllable, [CVC] or [CV:]. Stressed syllables must contain a long vowel in Yuhup, so vowel length reflects foot structure. Lopes and Parker also note that a number of morphemes have the shape LH, e.g., *wahá:d^{n}* 'to be born, to appear.' These facts suggest that the source of the size restriction is metrical, possibly involving an iambic foot. Some directions for analysis are outlined in §3.

I suggest that all cases which involve the monosyllabic size maximum *on words* should be analyzed in terms independent of economy. Economy constraints are generally unnecessary: all of their purported effects (e.g., syncope, haplology, and others) can and should be analyzed in terms of independently motivated constraints. Economy constraints produce some effects that are undesirable in any case. On the other hand, Output-Output constraints are independently needed to account for cyclic and derived environment effects, which do not necessarily have anything to do with economy (see Benua 1997 and others).

8. Conclusion

To summarize, I have argued that the monosyllabic size restriction found in reduplication is not heterogeneous: some cases are metrical in character, while others arise from Output-Output faithfulness—the pressure for words in a morphological paradigm to differ from each other minimally. The non-uniform treatment of such size restrictions makes sense, since there is a substantive difference between them: the heavy monosyllable surfaces in a variety of prosodic morphology contexts and in metrical phonology, whereas the "as small as possible" restriction is truly confined to affixes. The non-uniform approach is also in keeping with a rather restricted theory of CON: markedness constraints may only ban structures that are marked in comparison to other structures; they never ban structure absolutely. In other words, there are no economy constraints.

References

Benua, Laura. 1997. Transderivational Identity: Phonological Relations between Words. University of Massachusetts, Amherst: Ph. D. Dissertation. ROA-259.

Broselow, Ellen, and John J. McCarthy. 1983. A theory of internal reduplication. *The Linguistic Review* 3:25-98.

Burzio, Luigi. 1994. *Principles of English Stress*. Cambridge: Cambridge University Press.

Downing, Laura. 2000. Morphological and prosodic constraints on Kinande verbal reduplication. *Phonology* 17:1-38.

Eisner, Jason. 1999. Doing OT in a straightjacket. Ms. Los Angeles, CA. UCLA.

Gafos, Adamantios. 1998. A-templatic reduplication. *Linguistic Inquiry* 29:515-527.

Gouskova, Maria. 2003. Deriving Economy: Syncope in Optimality Theory. University of Massachusetts, Amherst: Ph. D. Dissertation. ROA-610.

Grimshaw, Jane. 2003. Economy of Structure in OT. In *Papers in Optimality Theory II. University of Massachusetts Occasional Papers 26*, eds. Angela Carpenter, Andries Coetzee and Paul de Lacy. Amherst, Mass.: Graduate Linguistic Student Association. ROA-434.

Hayes, Bruce, and May Abad. 1989. Reduplication and syllabification in Ilokano. *Lingua* 77:331-374.

Kenstowicz, Michael. 1996. Base-identity and uniform exponence: alternatives to cyclicity. In *Current Trends in Phonology: Models and methods*, eds. Jacques Durand and Bernard Laks, 363-393. Paris-X and Salford: University of Salford Publications.

Kurisu, Kazutaka. 2001. The Phonology of Morpheme Realization. University of Santa Cruz: Ph. D. Dissertation.

Lombardi, Linda. 2002. Coronal epenthesis and markedness. *Phonology* 19:219-251.

Lopes, Aurise Brandao, and Steve Parker. 1999. Aspects of Yuhup Phonology. *International Journal of American Linguistics* 65:324-342.

McCarthy, John J. 1982. Prosodic templates, morphemic templates, and morphemic tiers. In *The Structure of Phonological Representations*, eds. Harry van der Hulst and Norval Smith, 191-223. Dordrecht: Foris.

McCarthy, John J., and Alan Prince. 1986. Prosodic Morphology 1986. New Brunswick, NJ: Rutgers University Center for Cognitive Science. Version of 1996.

McCarthy, John J., and Alan Prince. 1994a. The emergence of the unmarked: Optimality in prosodic morphology. In *Proceedings of the North East Linguistic Society 24*, ed. Mercè Gonzàlez, 333-379. Amherst, Mass.: GLSA Publications.

McCarthy, John J., and Alan Prince. 1994b. Two lectures on Prosodic Morphology (Utrecht, 1994). Part I: Template form in Prosodic Morphology. Part II: Faithfulness and reduplicative identity. Ms. Amherst, Mass. and New Brunswick, NJ. ROA-59.

McCarthy, John J., and Alan Prince. 1995. Faithfulness and Reduplicative Identity. In *University of Massachusetts Occasional Papers in Linguistics 18*, eds. Jill

Beckman, Laura Walsh Dickey and Suzanne Urbanczyk, 249-384. Amherst, Mass.: GLSA Publications.
McCarthy, John J., and Alan Prince. 1999. Faithfulness and identity in Prosodic Morphology. In *The Prosody-Morphology Interface*, eds. Rene Kager, Harry van der Hulst and Wim Zonneveld, 218-309. Cambridge: Cambridge University Press.
McCarthy, John J. 2002. Comparative Markedness. Ms. University of Massachusetts, Amherst. ROA-489.
McCarthy, John J. 2003. OT constraints are categorical. *Phonology* 20:75-138.
Mester, Armin, and Jaye Padgett. 1994. Directional syllabification in Generalized Alignment. In *Phonology at Santa Cruz 3*, eds. Jason Merchant, Jaye Padgett and Rachel Walker, 79-85. Santa Cruz, CA: University of California at Santa Cruz.
Nelson, Nicole. 2003. Asymmetric Anchoring. Rutgers University: Ph. D. Dissertation.
Nivens, Richard. 1992. A lexical phonology of West Tarangan. In *Phonological Studies in Four Languages of Maluku*, eds. Donald A. Burquest and Wyn D. Laidig, 127-227. Dallas: Summer Institute of Linguistics.
Nivens, Richard. 1993. Reduplication in Four Dialects of West Tarangan. *Oceanic Linguistics* 32:358-388.
Potts, Christopher, and Geoffrey Pullum. 2002. Model theory and the content of OT constraints. *Phonology* 19:361-393.
Prince, Alan. 1990. Quantitative consequences of rhythmic organization. In *Parasession on the Syllable in Phonetics and Phonology*, eds. M. Ziolkowski, M. Noske and K. Deaton, 355-398. Chicago: Chicago Linguistic Society.
Prince, Alan, and Paul Smolensky. 1993. Optimality Theory: Constraint interaction in generative grammar. New Brunswick, NJ: Rutgers University Center for Cognitive Science. ROA-537 (version of 2002).
Riggle, Jason. 2003. Infixing reduplication in Pima and its theoretical consequences. Paper presented at *LSA 77*, Atlanta, GA.
Spaelti, Philip. 1997. Dimensions of Variation in Multi-Pattern Reduplication. Department of Linguistics, University of California, Santa Cruz: Ph. D. Dissertation.
Urbanczyk, Suzanne. 1996. Patterns of Reduplication in Lushootseed. University of Massachusetts: Ph. D. Dissertation.
Urbanczyk, Suzanne. 1999. A-templatic reduplication in Halq'eméylem'. In *The Proceedings of the West Coast Conference on Formal Linguistics 17*, eds. Kimary N. Shahin, Susan J. Blake and Eun-Sook Kim, 655-669. Stanford, CA: CSLI.
Urbanczyk, Suzanne. to appear. Reduplicative Form and the Root-Affix Asymmetry. *Natural Language and Linguistic Theory*.
Walker, Rachel. 1998. Minimizing RED: Nasal Copy in Mbe. Ms. University of California, Santa Cruz. ROA-264.
Walker, Rachel. 2000. Nasal reduplication in Mbe affixation. *Phonology* 17:65-115.
Walker, Rachel. 2003. Yuhup prosodic morphology and a case of augmentation. In *The Proceedings of NELS 23*. Amherst, MA: GLSA.
Zoll, Cheryl. 1993. Directionless syllabification and ghosts in Yawelmani. Ms. Berkeley, CA. ROA-28.