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Overwriting Does Not Optimize in Nonconcatenative Word Formation

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Overwriting Does Not Optimize in Nonconcatenative Morphology

Andrew Ira Nevins

Overwriting is modeled in Optimality Theory as a competition for a position within the derivational base (Alderete et al. 1999, Ussishkin 1997). Faithfulness constraints that are evaluated on the basis of segment counting predict a typology of languages in which (a) optimization dictates that the relative *size* of the affixal material determines whether it will win out and ''overwrite'' the base, and (b) optimization ensures that if both the affix and base material can surface without incurring phonotactic violations, this should be optimal. Both predictions are wrong. Hebrew denominal verb formation and Hindi echo reduplication demonstrate cases of nonconcatenative derivation in which overwriting is better understood as rule-induced change.

Keywords: Melodic Overwriting, Hindi echo reduplication, shm- reduplication, Fixed-Segment Reduplication, Hebrew denominal verb formation

1 Introduction

In nonderivational theories of phonology, fixed-segment reduplication and templatic vowel-consonant intercalation are two nonconcatenative word-formation processes that must be analyzed as the result of two input morphemes mapping onto one output morpheme. Fixed-segment reduplication[1] (FSR) in English, Hindi, and Turkish (among others) is a process in which a phrase[2] is uttered and followed by a copy with a different initial consonant (*šm-*, *v-*, and *m-*, respectively), yielding a meaning of associative plurality[3] or derision. Alderete et al. (1999) have characterized the phonology of FSR as the result of constraints that do not allow both the base and the fixed segment to fully surface in the reduplicant. The templatic process of Hebrew denominal verb formation (DVF) is one in which the consonants of the input morpheme are intercalated with the characteristic vocalism of a verbal binyan. Ussishkin (1997), pursuing a word-based Semitic morphology, has

[1] Here and henceforth, this term refers to cases of fixed segmentism with *total* reduplication. The problems to be discussed remain largely similar for FSR with partial reduplication, as in Turkish *cip-ciliz* (Kelepir 2000).

[2] FSR is not limited to single words; as Lidz (2001) shows for Kannada, and Nevins and Vaux (2003a) have found for English, it can freely apply to verb phrases that include the object (e.g., *try it*) and conjoined noun phrases (e.g., *cats and dogs*).

[3] In Turkish and Hindi, echo reduplication of *X* yields a meaning of '*X* and the like'; for a semantic characterization of representative plurality in other morphological contexts, see Den Besten 1996 on Afrikaans and Nakanishi and Tomioka 2004 on Japanese.

analyzed the phonology of DVF as the result of constraint interaction that prevents the output from containing both the vowels of the related noun and the vowels of the binyan.

Constraint-based input-output mappings that explicitly reject the notion of morphophonological *processes* must characterize the mismatch between the base (to FSR or DVF) and the output (the reduplicant, with fixed segment(s), or the denominal verb, with binyan vowels), which includes nonconcatenative affixal material, through the mechanism of (Melodic) Overwriting. In the Optimality Theory (OT) implementation of Overwriting, the base and affixal material ''compete'' for realization in the same position, with constraint evaluation, in the form of violation counting, arbitrating in favor of outputs that are fully faithful to the affixal material.

I will profile the logic of Overwriting and demonstrate that the analyses face two problems. The first is based on their implementation in terms of violation counting. Section 2 shows that variation in the relative size of the base and affixal material leads to incorrect predictions for *šm*-reduplication, given existing and reordered constraint rankings. Section 3 demonstrates the second problem, which is based on the formulation of constraints that impose competition of affixal and base segments and cannot enforce ''all-or-nothing'' realization of the affix, and thus turn out to be empirically inadequate. As they stand, Alderete et al.'s analyses cannot account for Hindi FSR and Ussishkin's analysis cannot account for Hebrew DVF when the monosyllabic noun's vowel is nonhigh. Section 4 contains an alternative account for Hindi FSR, and section 5 concludes that operation-based formulations of these processes face neither of these problems.

2 Incorrect Winners Based on Relative Sizes

The constraint-based implementation of Overwriting can be schematized as follows:

(1) *A*: The segmental material of the affix.
    B: The segmental material of the base.
    P: The position into which both *A* and *B* are competing to surface.
    C: A set of markedness constraints that prohibit both *A* and *B* from fully surfacing.
    F: A faithfulness ranking that, given interaction with *C*, results in *A* surfacing rather than *B*.

The logic of Overwriting is supposed to guarantee that *A* always surfaces, at the expense of *B*. Alderete et al.'s characterization of English *šm*-reduplication (pp. 355ff.) for *table-šmable* is that ''[t]he [fixed segment] is an affix that is realized simultaneously with the reduplicative copy, overwriting part of it'' (p. 328). The constraint interaction is depicted in tableau (2).

(2) Alderete et al.'s (1999) tableau 12: $\text{MAX}_{\text{IO}} \gg \text{MAX}_{\text{BR}}$ in *table-šmable*

/table-RED-šm/	MAX_{IO}	MAX_{BR}
a. ☞ table-<u>šm</u>able		t
b. table-<u>table</u>	šm!	
c. šmable-<u>table</u>	t!	šm
d. šmable-<u>šmable</u>	t!	

The competition for reduplicant-initial position is thus between /šm-/ and [t] of the base.[4] The instantiation of the general schema in (1) for FSR is shown in (3).

(3) A = the fixed segment /šm/
    B = base onset /t/
    P = the onset of the first σ of the reduplicant
    C = high-ranked PHON-CON and DEP
    F = MAX$_{IO}$ ≫ MAX$_{BR}$

Though Alderete et al. do not provide PHON-CON, it is safe to assume that it is a family of constraints on phonotactically ill-formed onsets such as [šmt] and that DEP legislates against epenthesis that would enable accommodation of both *A* and *B* (e.g., *šmitable*).

Though the analysis in terms of two interacting constraints appears relatively simple, it immediately incurs a typological misprediction. The reader need only flip the columns in tableau (2) and inspect candidate (d) to verify that the reranking MAX$_{BR}$ ≫ MAX$_{IO}$ will yield *šmable-šmable* as the optimal output in ''English-Prime,'' in which the fixed segment ''backcopies'' into the base.[5] Such a case is reminiscent of the ''Kager-Hamilton problem'' discussed by McCarthy and Prince (1999) for Diyari prosodic size requirements, in which ranking FAITH$_{BR}$ over FAITH$_{IO}$ pathologically shrinks the base. To my knowledge, there is no language of the English-Prime sort. This errant FSR pattern is the result of the violability of optimality-theoretic constraints, in this case MAX$_{IO}$. The full realization of the base in the first copy and the full realization of the fixed segment in the second copy are *inviolable* properties of *šm*-reduplication.

Proponents of factorial typology, who maintain that all possible OT rankings yield possible languages, even if they are not attested, may possibly object that English-Prime *is* a possible language, but that extralinguistic constraints on recoverability of the input in the lexicon lead to nonexistence of languages that obliterate the identity of the input. However, recoverability will not be compromised in English-Prime for the input *string*. Because candidates are evaluated with respect to MAX$_{BR}$ by means of segment counting, when the base has more onset consonants than the reduplicant, *šm*-reduplication of *string* in such a language would actually produce *string-string*, as shown in tableau (4).

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[4] The status of *šm*- as a prefix is guaranteed by Alderete et al.'s ALIGN-L(Prefix, PrWd) (p. 356); although I assume that the same proposal will extend to Urdu-Hindi in section 3, I must point out that it is insufficient for the English data, as many speakers overwrite the onset of the stressed syllable, regardless of initiality, as in *obscéne-obšméne* (Nevins and Vaux 2003a).

[5] The dialect of Pig Latin that produces *woven-way* for the input *oven* (Nevins and Vaux 2003b) should not be considered as an example of fixed-segment backcopying, as the glide is epenthetic for vowel-initial words and does not constitute a separate morpheme.

(4) Hypothetical English-Prime: $\text{MAX}_{\text{BR}} \gg \text{MAX}_{\text{IO}}$

/string-RED-šm/	MAX_{BR}	MAX_{IO}
a. string-šming	str!	
b. ☞ string-string		šm
c. šming-string	šm!	str
d. šming-šming		str!

Since the onset consonants of B outnumber those of A, MAX_{BR} will favor the candidate that totally fails to realize the fixed segments.[6] Since Alderete et al.'s analysis is designed around cases where $|B| \leq |A|$, and implemented as a competition that the string with more segments should always win, this result is unavoidable.

Recall the profile of Overwriting: A and B compete for position P, and A is favored. Subsequently, apparent ''Overwriting'' of A where B should otherwise surface ensues. Of course, the preferential surfacing of A will be trivially victorious when B is null. Since the mechanism of Overwriting relies on base-reduplicant correspondence, it will be helpful to introduce another element, P', into the Overwriting schema.

(5) P: A position into which both A and B are competing to surface. (Given F and C, A should win in P when P is the onset of the reduplicant and $|A| > |B|$.)

P': Another position, in correspondence with P, into which both A and B are competing to surface. (Given F and C, A should win in P' when P' is the onset of the base and $|A| > |B|$.)

In the case where B is Ø, F ensures that A will win in P—there is simply no competition. The unexpected (and unwanted) result is that A *can* win in P' as well. A concrete example occurs when the base lacks an initial onset. Tableau (6) illustrates that Alderete et al.'s rankings will select not only the optimal *eel-šmeel*, but *šmeel-šmeel* as well (mispredicted winners are indicated by ☜).

(6) Erroneous prediction when $B = $ Ø in *eel-šmeel*

/eel-RED-šm/	MAX_{IO}	MAX_{BR}
a. ☞ eel-šmeel		
b. eel-eel	šm!	
c. šmeel-eel		šm!
d. ☜ šmeel-šmeel		

In this scenario, multiple winners emerge; since there is no onset in P', there is no competition with base material, and A can surface there in addition to P. Of course, there are imaginable

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[6] I have omitted further possibilities, such as *šring-string*, in which base and affix consonants are mixed, by granting English-Prime a high-ranking $\text{CONTIGUITY}_{\text{BR}}$ for present purposes.

''fixes'' to the mispredictions above, but the general methodology of having to add constraints post hoc for V-initial words, a quite ordinary example, points to the fact that Overwriting makes it easy to overlook many possibilities that correspondence theory generates (see Walther 2001 for extended discussion). The fact remains that although there are many relative sizes of *A* and *B*, this variation *never* plays a role in the outcome. Though any particular Overwriting analysis can be made to require the correct winner, it remains unexplained why the output is so limited compared to what is made available. It *could* be the case that languages determined the output of FSR as in (7), but it's not.

(7) $|A| > |B|$; input *eel* → *šmeel-šmeel*
    $|A| = |B|$; input *plate* → *plate-šmate*
    $|A| < |B|$; input *string* → *string-string*

In summary, the generalization that in FSR, the fixed segment replaces the first consonant of the second copy cannot be captured by a single statement of an Overwriting grammar; instead, it must be the conspiratorial result of many violable constraints within a (perhaps fixed) ranking.

Before proceeding, I note that the notion of *P* as a ''position of competition'' does not exist in many alternatives to Overwriting. For instance, in an analysis whereby fixed segmentism is the result of a morphophonological modification of an input string, there is not competition; there is change. There are many process-based formulations of FSR that avoid the operations above; it is not important to choose among them here, though in section 4 I will indicate one feasible approach.

3 The Wrong Winner: Licit Combinations of *A* and *B*

In the previous section, we considered cases in which *B* was either null or larger than *A*, resulting in unwanted predictions. In this section, we will examine cases in which *C*, the constraints prohibiting both *A* and *B* from surfacing in *P*, go wholly unviolated, thus skirting the logic of Overwriting as all-or-nothing competition. First, consider the role of *C* in English *šm*-reduplication: PHON-CON disallows onsets such as [šmt], as /šm/ cannot form a licit onset cluster with any other segment.[7] However, to find a contrasting case, we need only turn to Urdu-Hindi (8), in which the prefixing fixed segment /v-/ can occur in onset clusters, *even in reduplicants*.[8]

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[7] However, in cases reported by Nevins and Vaux (2003a), as well as the movie *Mall Rats*, some speakers have been found to produce *breakfast-šmreakfast*. The discussion of Hindi entirely parallels these dialects.

[8] Data elicited in my own studies and confirmed by Rajesh Bhatt, Pritha Chandra, and Utpal Lahiri. Interestingly, Alderete et al. cite Hindi fixed segmentism in their article: ''[A] single language can have more than one overwriting string with no phonological conditioning of the choice. For instance, Hindi (Singh 1969) overwrites with *w-*, *s-*, and rarely *m-*'' (p. 355). In fact, the choice between *v* and *š* is *entirely* phonological; the fixed segment is always *v*, unless the base begins with *v*, in which case the fixed segment is *š*. The report of an *m-* allomorph does not describe the dialect of any speaker I have met, though the forms I've elicited have all come from Mumbai- and Delhi-born consultants.

(8) paanii-<u>vaani</u> 'water and the like'
     mez-<u>vez</u> 'tables and the like'
     aam-<u>vaam</u> 'mangoes and the like'
     tras-<u>vras</u> 'grief and the like'
     vakil-<u>šakil</u> 'lawyers and the like'
     roti-<u>voti</u> 'bread and the like'
     yaar-<u>vaar</u> 'friends and the like'

The form *tras-vras* illustrates that [vr] is a licit onset cluster in the reduplicant. Thus, no redupli-cant-specific *COMPLEX constraint-interaction can be employed to ban such sequences from the onset of the second copy. The phonology of Urdu-Hindi is such that the constraint interaction *C* allows strings that comprise both *A* and *B* to surface together in *P*; this *should* be the ideal state of affairs for Overwriting, as shown in tableau (9).

(9) Erroneous prediction when PHON-CON allows *roti-vroti*

/roti-RED-v/	MAX$_{IO}$	MAX$_{BR}$	DEP(Base)
a. ☞ roti-<u>vroti</u>			
b. roti-<u>roti</u>	v!		
c. roti-<u>voti</u>		r!	
d. voti-<u>voti</u>	r!		v
e. vroti-<u>vroti</u>			v!

However, as (8) illustrates, the actual form is *roti-voti*. The reason that Overwriting makes the wrong prediction here is that the actual state of affairs is one in which *A and B are not in competition*. On the contrary, the examples seem to indicate that *A* and *B* are in a relationship of mutual exclusivity determined by the morphological process of FSR, which replaces the first member of the first onset of the second copy with the fixed segment. The statement of the facts is extremely simple, but there is no modification to Alderete et. al's analysis that can get the facts right, because Overwriting analyses are always predicated on the assumption that *C* will ban surfacing of both *A* and *B*, and no phonotactic constraint *C* can be chosen that disallows **vroti* while allowing *tras*. In the next section, I will present a simple account of the Hindi phenomena that is formulated in terms of specific points of affixation.

     The problem for Hindi FSR, which pivots upon a surprisingly licit combination of *A* and *B* that the Overwriting constraint cannot prevent, arises in Ussishkin's (1997, 2000) account of DVF in Modern Hebrew in a similar manner, where *C* is the templatic restriction of the *piʕel* binyan. Ussishkin proposes that denominal verb formation in this binyan (10) is word-based (all examples to be discussed have monosyllabic nouns).

(10) dam 'blood'; dimem 'he bled'
      tik 'file'; tijek 'he filed'

Ussishkin proposes that the mapping to the inflected and tensed verbal output proceeds from two

inputs: a base—the semantically related noun; and an affix—the binyan vocalism /i e/.[9] Rather than pursuing the traditional root-and-pattern analysis of Hebrew word formation, Ussishkin argues that the word-based analysis (and its concomitant Overwriting implementation) captures phonological regularities of glide insertion in DVF, stating that ''[a]n [output-output-based analysis] is the only possible analysis of Denominal Verb Formation'' (2000:102).[10] This can be illustrated as in tableau (11) for DVF from a noun base with a low vowel: the constraints determine that when [dam] and /i e/ combine, the vowel of the base noun is lost to the affixal vowels.[11]

(11) Ussishkin's (1997) (45): Denominal verb formation of biconsonantal roots

/dam/ + /i e/		MINWD	MAX-V-A	MAX-V-S	INTEGRITY
a.	damem		*!		*
b.	dimam		*!		*
c.	damime	*!			*
d. ☞	dimem			*	*

While MAX-V-S requires faithfulness to base vowels (S is for *Stem*), MAX-V-A requires faithfulness to affixal vowels. The role of *C* is played by MINWD, a cover term for the templatic constraints of minimal bisyllabicity and a closed second syllable. The instantiation of (1) for Ussishkin's analysis of denominal verbs is given in (12).

(12) A = the binyan vocalism segment /i e/
B = the base vowel /a/
P = the available vowel positions
C = MINWD
F = MAX-V-A $\gg$ MAX-V-S

Because of the templatic restrictions on this binyan, only two syllabic nuclei can surface, and since *F* favors *A*, the binyan vocalism wins.

Having observed the constraint interaction that enforces competition between *A* and *B*, we turn to denominal verbs formed from nouns with the vowel [i]. Ussishkin suggests that since [i] and [j] are featurally equivalent, differing only in syllabic position, the base vowel *B* can surface

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[9] The relative precedence of these vowels is taken for granted.

[10] The morphosyntactic consequences (and their shortcomings) of a word-based approach to DVF are discussed at length by Arad (2003).

[11] A word of explanation is due here regarding the INTEGRITY constraint. It assesses a violation for each instance of multiple correspondence in the output. Thus, since /m/ in the input has two correspondents in the output, one violation ensues. A ranking of left-anchoring constraints (that ban word-internal output correspondents of left-edge base material) above right-anchoring constraints yields a preference for *dimem* over *didem*. Before concluding this aside, I should mention that all DVF outputs discussed by Ussishkin are 3rd person masculine singular. It is unclear how inflected forms such as 1st person masculine singular *dimamti* with the putative /i a ti/ affix, are derived—possibly via a further derivational step from *dimem*? If so, the account becomes even more ''derivational'' than traditional analyses, as it involves an extra step of Overwriting: after *dam* → *dimem*, *dimem* → *dimamti*. If *dimamti* is assumed to be derived, not from *dimem*, but directly from *dam*, then further machinery is required to rule out **dimamati*, in which all four vowels surface, as no trisyllabicity constraint for inflected forms has been proposed.

as a consonant, thereby avoiding position *P*, while respecting *F* and allowing all of *A* to surface, as shown in tableau (13).

(13) Ussishkin's (1997) (52): Denominal verb formation of glide-medial roots

	/tik/ + /i e/	MɪɴWᴅ	Mᴀx-V-A	Mᴀx-V-S	Iɴᴛᴇɢʀɪᴛʏ
a.	tiiek	!*			
b.	tikek			!*	*
c. ☞	tijek				

Because the base vowel is preserved in the output (in the form of a glide), there is no violation of Mᴀx-V-S. MɪɴWᴅ is respected as well, as the glide does not constitute a syllabic nucleus. Thus, Ussishkin's Overwriting implementation allows all three vowels from the input morphemes to successfully surface when an input high vowel has a glide correspondent.[12]

However, an unexpectedly licit combination arises because of the formulation of *C* that allows all three vowels to surface in the case of non-high-vowel bases, contrary to fact. Given Ussishkin's characterization of [i] and [j] as segmentally equivalent, and the apparent ability of an input /i/ to surface as [j] in *tijek*, the possibility of an /i/ surfacing as [j] in the denominal verb for /dam/ + /i e/ should obtain as well. The binyan /i/ becomes a medial glide, and such a state of affairs allows optimal negotiation for both *A* and *B* to surface. The constraint interaction is illustrated in tableau (14), which includes the constraints exactly as evaluated in tableau (13).

(14) Erroneous prediction when glide formation yields *dajem*

	/dam/ + /i e/	MɪɴWᴅ	Mᴀx-V-A	Mᴀx-V-S	Iɴᴛᴇɢʀɪᴛʏ
a.	daiem	*!			
b.	dimem			!*	*
c.	damime	*!			*
d.	damem		!*		*
e. ☜	dajem				

While such a state of affairs should be ideal from the correspondence theory standpoint, the predicted form isn't the actual form; as we know from tableau (11), it should be *dimem*. Overwrit-

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[12] Though the issues are in principle distinct, the Overwriting analysis is the consequence of assuming a word-based morphology. An operation-based account *could* derive DVs from words, if it were based on three separate processes, as shown in (i).

(i) *Derivational steps in word-based DVF*
   1. *If the input noun has three (or more) consonants*, delete all of the vowels.
       If the input noun has two consonants,
       If the vowel is high, convert it to a glide.
       Otherwise, delete the vowel.
   2. Associate the resulting consonants and the binyan vowels to the template.

In a root-based account, on the other hand, step 1 is unnecessary. If the glide is assumed to be part of the root, then there is no need for the word-based procedure of converting the noun into a triconsonantal sequence that happens to be identical to the putative root prior to DVF.

ing again makes the wrong prediction because of *the assumption that A and B are in competition*. In a morphophonological theory that acknowledges a consonantal root, the fact that only root consonants can surface as glides in a bisyllabic template and that binyan vowels always surface as binyan vowels is straightforwardly captured. While a ''fix'' to Ussishkin's analysis might constrain only nonaffixal vowels to surface as glides, such a move would essentially recapitulate the very root/affix distinction Ussishkin is attempting to deny.

Again, the problem arises because of the encoding of a competition relation between stem and affix vowels for nuclear positions. There is no way to rule out **dajem* while allowing *tijek* within an Overwriting schema that attempts to optimize both MAX-V-A and MAX-V-S. The glide-surfacing problem for a combination of inputs with a high vowel becomes compounded with the counting problem of section 2 when we consider a case in which $|B| > 1$. When B has more than one element that can occupy P, with no constraint favoring one element of B over another, more than one ''optimal'' output may be selected, contrary to fact. Tableau (15) illustrates that the Hebrew noun *bima* 'stage' (Ussishkin's (1997) example (33)), which has the actual denominal verb form *bijem* 'to stage', can surface as *bajem* as well in an Overwriting scenario.[13]

(15) Erroneous prediction when $|B| > 1$ in *bijam*

$/bi_1ma_2/ + /i_3 e_4/$	MINWD	MAX-V-A	MAX-V-S	INTEGRITY
a. $bi_1j_3a_2m$		e_4!		
b. ☞ $ba_2j_3e_4m$			i_1	
c. ☞ $bi_1j_3e_4m$			a_2	
d. ☞ $bi_3j_1e_4m$			a_2	
e. $be_4j_1a_2m$		i_3!		

The mispredicted optionality arises for a now-familiar reason, the nature of constraint evaluation as counting. For MAX-V-S, all violations are treated equally; the fact is that $1 = 1$ is all that matters when no constraint favors one element of B against another. On the other hand, the acknowledgment of $\sqrt{BJM}$ as the consonantal root straightforwardly averts this problem.

4 Specific Points of Affixation Determine Hindi Fixed-Segment Reduplication

In fact, if FSR is viewed as a form of affixation that accompanies reduplication, it can be quite simply analyzed as follows. For concreteness, I will provide an implementation in the *Multiprecedence and Linearization* family of models (Raimy 2000, Fitzpatrick and Nevins, to appear), although a large class of other analyses of reduplication (none of which include the notion of competition for a position) would suffice as well.

Suppose the learner's first encounter with Hindi FSR is the output *paani-vaani* in a semantic context where she can deduce that it is an operation on the input *paani*. She may posit the rule

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[13] Note that only LINEARITY-respecting candidates in which index 1 precedes 2 and index 3 precedes 4 are illustrated, for the sake of brevity.

in (16), which views the process with a level of specificity to represent that the first segment's consonantality is part of the structural description. Note that first() and last() are binary predicates true only of the segments immediately-preceded by or immediately-preceding nothing, respectively.

(16) *Structural description*
      ∃x, consonant(x), first(x)
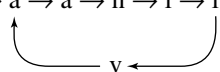   ∃y, x immediately-precedes y
      ∃z, last(z)

      Structural change
      Add the relation: z immediately-precedes /v/
      Add the relation: /v/ immediately-precedes y

The operation of (16) will create a set of immediate-precedence relations that can be graphically represented as in (17), where # and % represent the null-predecessor and the null-successor. Note that (17) only shows immediate-precedence relations; of course, additional information such as metrical, prosodic, and subsegmental structure is present at this level of representation as well.

(17) # → p → a → a → n → i → i → %
                    v ←

Linearization of (17) into a set of precedence relations where no segments are in symmetric or reflexive transitive-precedence relations will yield (18).

(18) # → p → a → a → n → i → i → v → a → a → n → i → i → %

Thus, the rule in (16) will generate the attested output *paani-vaani*, and in fact, *tras-vras* and *roti-voti* as well, as the reader can verify. However, the rule postulated by the learner in (16) is specific to consonant-initial segments. Upon encountering *aam-vaam* in a context in which it is clear that it reflects a computation on *aam*, the learner, having postulated (16) already, will leave (16) intact and posit a second rule, (19).

(19) *Structural description*
      ∃x, first(x)
      ∃y, last(y)

      Structural change
      Add the relation: y immediately-precedes /v/
      Add the relation: /v/ immediately-precedes x

Linearization of the subsequent set of immediate-precedence relations will yield *aam-vaam*. In short, there are two rules, (16) and (19), which are in fact disjunctively ordered by the Elsewhere Condition, since the set of inputs to which (19) applies is a proper subset of the set of inputs to which (16) applies. Thus, in the case of consonant-initial inputs, (16) will always apply instead of (19), whereas in the case of vowel-initial inputs, only (19) can apply.

The analysis offered here does not depend on the ordering of inputs. Suppose that instead, the learner hears *aam-vaam* first, then *paani-vaani*. By the principle of positing more restrictive rules first, (20) and (21) will be the pair of rules.[14]

(20) *Structural description*
$\exists$x, vowel(x), first(x)
$\exists$y, last(y)

Structural change
Add the relation: y immediately-precedes /v/
Add the relation: /v/ immediately-precedes x

(21) *Structural description*
$\exists$x, first(x)
$\exists$y, x immediately-precedes y
$\exists$z, last(z)

Structural change
Add the relation: z immediately-precedes /v/
Add the relation: /v/ immediately-precedes y

Again, the rules stand in an elsewhere relation; hence, vowel-initial inputs will always trigger rule (20), while consonant-initial inputs will always trigger rule (21). The attested output forms in section 2 will all be correctly derived.

The learner needs no special constraint-demotion algorithm, no typological oddities predicted by the addition of parochial constraints that must be universal and violable, and no generation and evaluation of 2^n inputs. The learner only needs predicates identifying consonants and vowels and operations on immediate-precedence relations. Again, see Raimy 2000 and Fitzpatrick and Nevins, to appear, for detailed explication of the formalism, with applications to allomorphy, overapplication, and multiple reduplication.

To conclude, I will reemphasize that the particular formulation given here in terms of immediate-precedence, rules, and the Elsewhere Condition is but one of many alternatives. What these share is that they view FSR as a process of affixation of segmental material to a particular landmark in the word, accompanied by the repetition of segmental material within the word. The grammar need not refer to spurious optimization of ''well-formedness'' between the fixed segment and the nonreduplicated portion of the base.

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[14] Philip Spaelti (pers. comm., October 2003) has raised the concern that there are two rules here, for what is apparently one process. However, any formulation of a rule or set of constraints for Hindi FSR must say something of the form ''If consonant-initial, do this; otherwise, if vowel-initial, do that,'' which, the form of English conditional clauses notwithstanding, represent two distinct processes.

5 Conclusion

The twin problems of built-in sensitivity of Overwriting to the relative sizes of *A* and *B* and the impossibility of formulating constraints so as to guarantee complete exclusion of *B* when *A* surfaces suggest that the phonological material of affixes does not ''compete'' in a simple *A*-versus-*B* manner. The actual output form in the cases above is always one where *B* wins. But given the architectural assumptions of Melodic Overwriting as optimization of *F* (i.e., satisfaction of two different MAX constraints), this result cannot be guaranteed without a host of auxiliary assumptions. A model of FSR as the simple replacement of the first consonant by the fixed segment and a model of DVF that associates consonantal roots and binyan vowels to a template are to be preferred to implementations in which these affixes are in a constraint-governed monostratal competitive relationship vying to surface in the output, determined by segment counting. Apparently, there are some things in phonology better left understood as rules.

References

Alderete, John, Jill Beckman, Laura Benua, Amalia Gnanadesikan, John McCarthy, and Suzanne Urbanczyk. 1999. Reduplication with fixed segmentism. *Linguistic Inquiry* 30:327–364.

Arad, Maya. 2003. Locality constraints on the interpretation of roots: The case of Hebrew denominal verbs. *Natural Language & Linguistic Theory* 21:737–778.

Besten, Hans den. 1996. Associative DPs. In *Linguistics in the Netherlands 1996*, ed. by Crit Cremers and Marcel den Dikken, 13–24. Amsterdam: John Benjamins.

Fitzpatrick, Justin, and Andrew Nevins. To appear. Phonological occurrences: Relations and copying. In *Papers presented at the 2nd North American Phonology Conference*. Available at http://theoling.auf .net (paper no.: LingBuzz/000051).

Kelepir, Meltem. 2000. To be or not to be faithful. In *Studies on Turkish and Turkic languages: Proceedings of the Ninth International Conference on Turkish Linguistics*, ed. by Aslı Göksel and Celia Kerslake. Wiesbaden: Harrassowitz Verlag.

Lidz, Jeffrey. 2001. Echo formation in Kannada and the theory of word formation. *The Linguistic Review* 18:375–394.

McCarthy, John, and Alan Prince. 1999. Faithfulness and identity in Prosodic Morphology. In *The prosody-morphology interface*, ed. by René Kager, Harry van der Hulst, and Wim Zonneveld, 218–309. Cambridge: Cambridge University Press.

Nakanishi, Kimiko, and Satoshi Tomioka. 2004. Japanese plurals are exceptional. *Journal of East Asian Linguistics* 13:113–140.

Nevins, Andrew, and Bert Vaux. 2003a. Metalinguistic, shmetalinguistic: The phonology and morphology of *shm-* reduplication. In *CLS 39*. Results of an online survey: http://www.ai.mit.edu/projects/dm/ shm.

Nevins, Andrew, and Bert Vaux. 2003b. Underdetermination in language games: Survey and analysis of Pig Latin dialects. Paper presented at the annual meeting of the Linguistic Society of America, Atlanta.

Raimy, Eric. 2000. *The phonology and morphology of reduplication*. Berlin: Mouton de Gruyter.

Singh, Amar Bahadur. 1969. On echo words in Hindi. *Indian Linguistics* 30:185–195.

Ussishkin, Adam. 1997. The inadequacy of the consonantal root: Modern Hebrew, denominal verbs, and output-output correspondence. *Phonology* 16:401–442.

Ussishkin, Adam. 2000. The emergence of fixed prosody. Doctoral dissertation, University of California, Santa Cruz.

Walther, Markus. 2001. Correspondence theory: More candidates than atoms in the universe. Marburger Arbeiten zur Linguistik 6. Available at http://pc0880.germanistik-kunst.uni-marburg.de/mal/MAL-TEXTS-archive/6-0301/.

Department of Linguistics
317 Boylston Hall
Harvard University
Cambridge, MA 02138
nevins@fas.harvard.edu