Overwriting as Optimization: A Reply to Nevins (2005)

Abstract Recent optimality-theoretic analyses of fixed segmentism reduplication and root-and-pattern morphology invoke a technique of overwriting: Phonotactic constraints prevent the cooccurrence of an affix with the unmodified reduplicant or base word, and the resulting conflict is resolved by replacing part of the lexical material with the affix (Ussishkin, 1999; Alderete et al., 1999). Nevins (2005) claims that this type of approach both overgenerates and undergenerates since it predicts unattested overwriting patterns, and cannot account for specific phenomena in Hebrew and Hindi. In this paper, we show that a substantial part of the overgeneration argument is empirically flawed, and argue that all remaining problems find a straightforward solution in the independently motivated parametrization of optimality-theoretic constraints and a general metacondition on possible constraint rankings.

Keywords Melodic Overwriting, Hindi echo reduplication, shm-reduplication, Fixed Segmentism Reduplication

1 Correspondence-Theoretic Analyses of Overwriting

Nevins (2005) addresses two areas where correspondence-theoretic analyses invoke overwriting: Morphological fixed segmentism reduplication (FSR) and vowel-consonant interleaving in Semitic root-and-pattern morphology. In morphological FSR, reduplication is accompanied by the addition of an affix which partially overwrites the reduplicant (the FSR affix).[1] A notorious example of morphological FSR is English *schm-*

[1] We are concerned here only with morphological FSR. Alderete et al. (1999) distinguish this from phonological FSR, where overwriting is the result of a phonological process restricted to the reduplicant.

reduplication which expresses roughly derision or irony. In *schm*-reduplication, the base is copied, and *schm* is realized as the onset of the first syllable of the reduplicant, replacing the original onset of the base if necessary:

(1) *English Schm-reduplication*

a. table	table-schmable
b. plan	plan-schman
c. string	string-schming
d. apple	apple-schmapple

In the correspondence-theoretic analysis proposed in Alderete et al. (1999), *schm* is taken to be an affix which is attached to the base concomitantly with reduplication. Combining *schm* and consonant-initial bases (1a-b-c) would lead to clusters such as **ʃmt* which are excluded in English by high-ranked phonotactic constraints. Assuming that epenthesis is not possible, either *schm* or the onset of the reduplicant must be deleted, and hence compete for realization. This competition is resolved by the two faithfulness constraints MAX-IO and MAX-BR, where the former demands realization of all input material in the output, and the latter requires that all segments of the base also appear in the reduplicant. Thus the input consists of the root, the affix *schm* and the abstract reduplication-triggering affix RED. The correct English pattern is derived by ranking MAX-IO over MAX-BR as illustrated in table (2) (Alderete et al., 1999:356):

(2) *Analysis:* MAX-IO $\gg$ MAX-BR

$t_1a_2b_3l_4e_5$-$ʃ_6m_7$-RED	MAX-IO	MAX-BR
☞ a. $t_1a_2b_3l_4e_5$-$ʃ_6m_7a_2b_3l_4e_5$		*
b. $ʃ_6m_7a_2b_3l_4e_5$-$ʃ_6m_7a_2b_3l_4e_5$	*!	
c. $ʃ_6m_7a_2b_3l_4e_5$-$t_1a_2b_3l_4e_5$	*!	**
d. $t_1a_2b_3l_4e_5$-$t_1a_2b_3l_4e_5$	*!*	

Adam Ussishkin has developed in several papers a correspondence-theoretic approach to vowel-consonant interleaving in Semitic root-and-pattern morphology which is closely parallel to Alderete et al.'s analysis of FSR (Ussishkin, 1999, 2003, 2005).[2] Morphemic vowel melodies are not associated autosegmentally to roots, but are represented as full segments which are affixed to full-fledged stems containing vowels. Affix vowels overwrite stem vowels due to templatic wellformedness constraints and high-ranked faithfulness constraints for affixes. For example, in a significant subpattern of Hebrew denominal verb formation, base vowels are overwritten by the vowel melody *i* – *e*, and extended to the size of a bisyllabic minimal word by doubling the second root consonant (Ussishkin, 1999):

(3) *Hebrew Denominal Verb Formation* (Ussishkin, 1999)

a. dam	'blood'	dimem	'to bleed'
b. xam	'hot'	ximem	'to heat'
c. xad	'sharp'	xided	'to sharpen'
d. cad	'side'	cided	'to side with'

Intuitively, Ussishkin captures this pattern by the assumption that affixal vowels have to be realized inside the base, but since the size of the resulting structure is restricted to bisyllabicity, not all vowels can be parsed. Preference for the realization of affixal vowels is implemented by two separate faithfulness constraints for stem and affix vowels, MAX-V(OWEL)-AF and MAX-V(OWEL)-STEM, ranked in that order. MINWD stands for a set of constraints which jointly require that the prosodic word is a bisyllabic foot with a final consonant. INTEGRITY penalizes the doubling of segments:

(4) *Denominal Verb Formation from Biconsonantal Base* (Ussishkin, 1999)

$d_1a_2m_3 + i_4 - e_5$	MINWD	MAX-V-AF	MAX-V-STEM	INTEGRITY
a. $d_1a_2m_3e_5m_3$		*!		*
b. $d_1i_4m_3a_2m_3$		*!		*
c. $d_1a_2m_3i_4m_3e_5$	*!			*
☞ d. $d_1i_4m_3e_5m_3$			*	*

Nevins (2005) claims that the correspondence-theoretic analysis of overwriting faces

[2]Nevins (2005) cites Ussishkin (1999) consistently as Ussishkin (1997) for reasons unknown to us.

three serious problems: *First*, it cannot capture specific patterns in Hebrew denominal formation and FSR in Hindi. *Second,* it predicts the existence of unattested FSR systems where the FSR affix is backcopied to the base. *Third*, it predicts unattested FSR systems where the realization of the FSR affix depends on its relative size with respect to the portion of the reduplicant it strives to overwrite. In this paper, we argue that the first and third problem find a straightforward solution in the independently motivated parametrization of optimality-theoretic constraints, and show that the second problem is empirically flawed since FSR backcopying is empirically attested.

The paper is structured as follows: Sections 2 and 3 provide correspondence-theoretic analyses of Hebrew and Hindi respectively which obviate Nevins' objections. Section 4 treats the apparent typological problems with backcopying, and section 5 proposes a solution to size-dependent FSR. In section 6, we present our conclusions.

2 Hebrew Denominal Verb Formation

The problem Nevins detects for the correspondence-theoretic analysis of denominal verb formation in Hebrew shows up in Ussishkin's treatment of roots with a medial high vowel. In Ussishkin's analysis, this case opens up an alternative to complete overwriting which allows base *and* affix vowels to be maintained: The base vowel can be employed as the featurally equivalent glide *j* in the onset position of the second syllable:

(5) *Denominal Verb Formation from Glide-medial Base* (Ussishkin, 1999)

$t_1i_2k_3$ + i_4 - e_5	MINWD	MAX-V-AF	MAX-V-STEM	INTEGRITY
a. $t_1i_2i_4e_5k_3$	*!			
b. $t_1i_4k_3e_5k_3$			*!	*
☞ c. $t_1i_4j_2e_5k_3$				

According to Nevins, a fatal flaw of this move is that it predicts the wrong result for *dam*. The *i* of the affix melody could also be used as a glide, resulting in *dajem* (in the following, ☛ indicates candidates which are empirically correct, but do not become optimal under the given ranking):

(6) *Problematic Candidate with Biconsonantal Base* (Nevins, 2005)

$d_1a_2m_3 + i_4 - e_5$	MINWD	MAX-V-AF	MAX-V-STEM	INTEGRITY
a. $d_1a_2m_3e_5m_3$		*!		*
b. $d_1i_4m_3a_2m_3$		*!		*
c. $d_1a_2m_3i_4m_3e_5$	*!			*
☛ d. $d_1i_4m_3e_5m_3$			*!	*
☞ e. $d_1a_2j_4e_5m_3$				

Nevins attributes this problem to a fundamental flaw of Correspondence Theory, namely the implementation of overwriting through constraint evaluation and segment counting. However, we think that (6e) is excluded by constraints and techniques which are fairly standard in OT and actually implicit in Ussishkin's analysis. Note first that, although *i* and *j* have the same distinctive features, they are not completely identical: *i* is dominated by a mora while *j* is not, hence replacing the former by the latter violates faithfulness since it implies deletion of a mora penalized by the constraint MAX-μ:[3]

(7) MAX-μ: Input moras should have correspondent moras in the output.

Moreover, we assume that faithfulness constraints are parametrized in a way which is standard in the optimality-theoretic literature, namely with respect to the domains affix and stem, which goes back to the original formulation of Correspondence Theory in McCarthy and Prince (1995:17). In Ussishkin's analysis, the parametrization of faithfulness constraints to stems and affixes is applied to the constraint MAX-V giving two MAX constraints which are ranked differently. We apply the same strategy to all faithfulness constraints, especially MAX-μ, resulting in the subconstraints MAX-$\mu_{\text{Af(fix)}}$ and MAX-$\mu_{\text{S(tem)}}$, again with different ranking potential, and in the same way to INT(EGRITY). Under the assumption that the vowel melody *i – e* contains true, i.e.

[3]Ussishkin (1999) uses a similar constraint IDENT-μ in the analysis of an exceptional pattern of Hebrew denominal verb formation to avoid that a stem vowel can be realized as a glide. The only additional ingredient we are adding here is the parametrization of this constraint type to stems and affixes which Ussishkin already assumes for all other faithfulness constraints.

moraic, vowels, this straightforwardly gives the correct results. In (8), the stem vowel can be recycled as a glide since MAX-μ_S is ranked below all other constraints, but in (9) MAX-μ_{Af}, which is ranked above INTEGRITY$_S$, blocks turning *i* into a glide by deleting its mora:

(8) *Analysis of Glide-medial Base under Constraint Parametrization*

$t_1i_2k_3$ + i_4 - e_5	MAX-V$_{Af}$	INT$_{Af}$	MAX-μ_{Af}	MAX-V$_S$	INT$_S$	MAX-μ_S
a. $t_1i_4e_5k_3$				*!		*
b. $t_1i_4k_3e_5k_3$					*!	
☞ c. $t_1i_4j_2e_5k_3$						*

(9) *Analysis of Biconsonantal Base under Constraint Parametrization*

$d_1a_2m_3$ + i_4 - e_5	MAX-V$_{Af}$	INT$_{Af}$	MAX-μ_{Af}	MAX-V$_S$	INT$_S$	MAX-μ_S
a. $d_1a_2m_3e_5m_3$	*!		*		*	
b. $d_1i_4m_3a_2m_3$	*!		*		*	
☞ c. $d_1i_4m_3e_5m_3$				*	*	*
d. $d_1a_2j_4e_5m_3$			*!			

There are two important points to note: First, this (and Ussishkin's original) analysis systematically violates a metacondition McCarthy and Prince (1995) have proposed for morphologically parametrized faithfulness constraints, the *Root-Affix Faithfulness Metaconstraint*:

(10) *Root-Affix Faithfulness Metaconstraint, RAFM* (McCarthy and Prince, 1995):
RootFaith $\gg$ AffixFaith

The RAFM is mainly based on the observation that in many harmony processes affixes systematically take over harmonic features from roots, e.g. in root-controlled vowel harmony in Turkish or Finnish. However, there is growing evidence that the RAFM is untenable as a universal principle because it is systematically violated in a number of languages. See Ussishkin (2006) for a recent discussion of counterexamples to the RAFM and a possible psycholinguistic explanation of the strong but not absolute crosslinguistic tendency to obey it.

There is a second interesting point about the analysis of Hebrew sketched above: The MAX constraints relativized to specific morphological domains seem to be ranked "in blocks". All constraints relativized to affix material are ranked above the corresponding constraints relativized to stems. This is crucial for the constraints MAX-V and MAX-μ, which suggests that the RAFM might be replaced by the metacondition on the ranking of faithfulness constraints formulated in (11):

(11) MAX-DEP *Adjacency:*

Let α and β be different morphological domains (e.g stem, affix, base-reduplicant), and $\{C_1, \ldots, C_n\}$ the set of MAX and DEP constraints, then either $\{C_1\alpha \ldots C_n\alpha\} \gg \{C_1\beta \ldots C_n\beta\}$ or $\{C_1\beta \ldots C_n\beta\} \gg \{C_1\alpha \ldots C_n\alpha\}$.

(11) licenses the rankings in (8) and (9), summarized schematically in (12a), but also the ranking in (12b), where the constraints relativized to stems and affixes are systematically flipped. What is systematically excluded are rankings as in (12c-d), where stem and affix MAX constraints alternate in their ranking:[4]

(12)
a. MAX-V_{Af} $\gg \ldots \gg$ MAX-μ_{Af} $\gg \ldots \gg$ MAX-V_S $\gg \ldots \gg$ MAX-μ_S
b. MAX-V_S $\gg \ldots \gg$ MAX-μ_S $\gg \ldots \gg$ MAX-V_{Af} $\gg \ldots \gg$ MAX-μ_{Af}
c. MAX-V_{Af} $\gg \ldots \gg$ MAX-μ_S $\gg \ldots \gg$ MAX-V_S $\gg \ldots \gg$ MAX-μ_{Af}
d. MAX-V_S $\gg \ldots \gg$ MAX-μ_{Af} $\gg \ldots \gg$ MAX-V_{Af} $\gg \ldots \gg$ MAX-μ_S

The generalization expressed by MAX-DEP Adjacency does not extend to IDENT constraints since morphological backcopying may require IDENT$_{IO}$ constraints for different features to be ranked differently with corresponding IDENT$_{BR}$ constraints in the same language (see the discussion of Seereer-Siin in section 4 for an example). However, (11) also covers DEP constraints. For example, for the constraints MAX$_S$, DEP$_S$, MAX$_{Af}$, and DEP$_{Af}$ only the rankings subsumed by (13a) and (13b) are licit according to (12),

[4] We have not found any analysis in the OT-literature where a ranking violating MAX-DEP Adjacency as in these examples would be crucial.

excluding other conceivable rankings such as (13c) and (13d):[5]

(13) a. $\{\textsc{Max}_S, \textsc{Dep}_S\} \gg \{\textsc{Max}_{Af}, \textsc{Dep}_{Af}\}$
b. $\{\textsc{Max}_{Af}, \textsc{Dep}_{Af}\} \gg \{\textsc{Max}_S, \textsc{Dep}_S\}$
c. $\textsc{Max}_{Af} \gg \textsc{Max}_S \gg \textsc{Dep}_{Af} \gg \textsc{Dep}_S$
d. $\textsc{Max}_{Af} \gg \textsc{Dep}_S \gg \textsc{Dep}_{Af} \gg \textsc{Max}_S$

MAX-DEP Adjacency predicts a number of interesting and, as far as we see, correct typological restrictions on possible phonological systems. Outside of the area of overwriting, a ranking such as $\{\textsc{Max}_S, \textsc{Dep}_S\} \gg \{\textsc{Max}_{Af}, \textsc{Dep}_{Af}\}$ predicts that in the context of higher-ranked markedness constraints illicit phonotactic configurations are repaired by deleting affixal segments or by inserting segments "into" affixes, but not by inserting or deleting in the domain of stems. A case in point is Albanian where in affixed forms a word-final stressed heavy syllable is augmented by schwa to create a bisyllabic foot (e.g. *qershí*, 'cherry (nom.)' *qershí-n-ə*, 'cherry (acc.)' vs. *této-n* with penultimate stress and lack of schwa insertion, Trommer, 2008). Under the assumption that epenthetic material has morphological affiliation and that there are high-ranked constraints which block intervening material with a different morphological affiliation, this is insertion "into an affix". Such epenthesis is not possible if the stressed final heavy syllable is part of a monomorphemic root (e.g. *pelín*, 'absinth (nom.)' is not augmented to **pelínə*). Hence $\textsc{Dep}_S$ dominates $\textsc{Dep}_{Af}$ in Albanian. Albanian shows the same asymmetry for deletion: For example in the optative suffix *fsh*, *f* is deleted after consonants (e.g. *puno-fsh*, 'you shall work', vs. *hap-sh*, 'you shall open'). Hence $\textsc{Max}_S$ dominates $\textsc{Max}_{Af}$.[6] Taken together, Albanian obeys MAX-DEP Adjacency since $\{\textsc{Max}_S,\textsc{Dep}_S\}$ dominates

[5]Contra McCarthy and Prince (1993) we take it for granted that epenthetic segments are morphologically affiliated to stems or affixes depending on the consequences of their affiliation for constraint evaluation. The claim of McCarthy and Prince that epenthetic segments are without any morphological affiliation makes a unified parametrization of faithfulness constraints impossible since constraints such as $\textsc{Dep}_{IO Affix}$ and $\textsc{Dep}_{IO Stem}$ would never be violated.

[6]Obviously, these data raise the question why underlying *hapfsh* cannot be repaired by schwa epenthesis (i.e. *[hapəfsh] or *[hapfəsh]). We assume that the impossibility of *[hapəfsh] is due to the fact that schwa syllables in Albanian do not license codas with multiple obstruents, and *[hapfəsh] is excluded because Albanian does not allow epenthesis inside a morpheme, probably due to a constraint such as M-O-CONTIGUITY ("No M-internal insertion", Landman, 2002).

$\{$MAX$_{Af}$, DEP$_{Af}\}$. What is excluded by MAX-DEP Adjacency are the "mixed rankings" in (14):

(14) a. $\{$MAX$_S$, DEP$_{Af}\} \gg \{$MAX$_{Af}$, DEP$_S\}$

b. $\{$MAX$_{Af}$, DEP$_S\} \gg \{$DEP$_{Af}$, MAX$_S\}$

(14a) corresponds to a language where deletion in consonant clusters works as in Albanian, but epenthesis is restricted to bare roots. (14b) would be instantiated by a language with the Albanian vowel epenthesis pattern which shows deletion of root in favor of affix consonants. Both language types are impossible by MAX-DEP Adjacency. More generally, MAX-DEP Adjacency excludes a subset of the options which are excluded by the RAFM. Under the assumption that epenthetic material undergoes obligatory morphological affiliation, the RAFM excludes (14a) and (14b), but also all other rankings where any affix faithfulness constraint is ranked over a corresponding root/stem faithfulness constraint. Since the RAFM is obviously too restrictive, MAX-DEP Adjacency seems to be on the right track.

MAX-DEP Adjacency also extends to output-output correspondence. For example, it explains a substantial part of the asymmetry between class 1 and class 2 affixes in English under the analysis of Benua (1997). Benua argues that class 1 and class 2 affixes subcategorize for different output-output correspondence relations connecting derived words to the corresponding base words. Thus a word with a class 1 affix (e.g. *condemn-ation*) instantiates class 1 correspondence whereas a word derived by a class 2 affix (e.g. *condemn-ing*) is subject to class 2 correspondence. Now syllable-final cluster simplification (/kʌndɛmn/ → [kʌndɛm]) overapplies in class 2 derivations ([kʌndɛmɪŋ]/*[kʌndɛmnɪŋ]), but not in class 1 derivations (*[kʌndɛmejʃn]/[kʌndɛmnejʃn]) indicating that DEP$_{OO2}$ is ranked higher than MAX$_{IO}$, while DEP$_{OO1}$ is ranked lower than MAX$_{IO}$.[7] More generally, words derived by class 2 affixes are more faithful to their paradigmatic bases than words derived by class 1 affixes, which

[7] The ranking DEP$_{OO2} \gg$ DEP$_{OO1}$ also plays a crucial role in Benua's account of the fact that class 1 affixes, but not class 2 affixes can attach to bound roots (Benua, 1997:200ff).

translates into a general higher ranking of class 2 faithfulness constraints above the corresponding class 1 constraints. As Benua herself notes (Benua, 1997:2006), this clustering of faithfulness suggests a principled basis in some kind of metaranking. MAX-DEP Adjacency provides exactly the correct prediction for all cases of output-output-faithfulness which involve MAX and DEP constraints. Thus words derived by class 1 affixes undergo consonant degemination while words derived by class 2 affixes do not (Borowsky, 1986). For example the prefix-final nasal is deleted in *in-numerable* (class 1), but not in *un-natural* (class 2). This shows that MAX_{OO2} is ranked above MAX_{OO1}. Similarly trisyllabic shortening applies in class 1 derivations (e.g. *divine/divinity*), but not in class 2 derivations (e.g. *leader/leaderless*, Durand, 1990) which implies that MAX-μ_{OO2} dominates MAX-μ_{OO1}. What is impossible under MAX-DEP Adjacency are again languages which show mixed patterns. Thus a variety of English where only class 2 derived words avoid degemination, but underapplication of trisyllabic shortening is restricted to class 1 derived words is predicted to be impossible since the subrankings $\text{MAX}_{\text{OO2}} \gg \text{MAX}_{\text{OO1}}$ and MAX-$\mu_{\text{OO1}} \gg$ MAX-μ_{OO2} cannot be combined in a way which is consistent with MAX-DEP Adjacency.[8]

For morphological overwriting phenomena, MAX-DEP Adjacency predicts that overwriting is consistent. Thus in Hebrew denominal verb formation, affix vowels overwrite stem vowels, and affix moras resist gliding whereas stem moras do not. What is typologically excluded by MAX-DEP Adjacency are languages where resistance to gliding is restricted to affixes, but stem vowels overwrite affix vowels, or the opposite distribution, where affix vowels overwrite stem vowels, but resistance to gliding is restricted to stems. Finally, the consequences of MAX-DEP Adjacency for DEP constraints will also play a crucial role for our analysis of segment-counting FSR in section 5.

[8] What is in principle possible is a version of English where class 1 affixes show generally high-ranking MAX and DEP constraints while the corresponding faithfulness constraints for class 2 are ranked low. But this is to be expected anyway under the assumption that these classes are arbitrary lexical classes.

3 Phonologically Unmotivated Overwriting in Hindi

In the analysis of English FSR given in Alderete et al. (1999), the competition for realization between the FSR affix and the original base material arises because phonotactic wellformedness constraints ban the simultaneous realization of both. This rules out a candidate like **schmtable-schmtable*, which does not violate any faithfulness constraint: no root material is deleted or inserted, the affix is realized, and base and reduplicant are maximally faithful to each other. But, as Nevins shows, there is an FSR formation pattern in Hindi where overwriting happens even though non-overwriting would result in a phonotactically licit sound sequence of the language. In this pattern, *v* systematically overwrites the first consonant of the root, as can be seen in (15):[9]

(15) *FSR in Hindi* (Nevins, 2005:280)

a. roti	roti-voti	'bread and the like'
b. mez	mez-vez	'tables and the like'
c. tras	tras-vras	'grief and the like'
d. aam	aam-vaam	'mangoes and the like'

If *v* is simply an affix we would incorrectly expect **roti-vroti* for (15a). However, the markedness constraint in (16) banning a consonant cluster like *vr* cannot be ranked high in Hindi since this very same onset can be found in the reduplicated form *tras-vras*.

(16) $*[_\sigma$CC: Onsets are simple. (Kager, 1999)

The dilemma of ranking $*[_\sigma$CC high enough to rule out *roti-vroti* and low enough to allow *tras-vras* is sketched in (17) and (18). If $*[_\sigma$CC is ranked above the BR Faithfulness constraints (17), we get the correct output for the input *roti* (15a), but incorrect overwriting for *tras* (15c). The opposite ranking (18) makes the right prediction for *tras*, but leads incorrectly to non-overwriting for the onset of *roti*. In the tableaux, we abbreviate the corresponding pairs of MAX and DEP constraints as FAITH$_S$, FAITH$_{AF}$,

[9] We abstract away from the fact that in cases where the root onset is already *v*, the allomorph *ʃ* appears in the reduplicant instead of *v*.

and FAITH$_{BR}$, while the single MAX and DEP violations are indicated by "m" and "d" respectively in the single cells:

(17) *FSR in Hindi with* *[$_\sigma$CC *Dominating* FAITH$_{BR}$

	FAITH$_{AF}$	FAITH$_{S}$	*[$_\sigma$CC	FAITH$_{BR}$
$r_1o_2t_3i_4$-v_5-RED				
☞ a. $r_1o_2t_3i_4$-$v_5o_2t_3i_4$				md
b. $v_5o_2t_3i_4$-$v_5o_2t_3i_4$		md!		
c. $r_1o_2t_3i_4$-$r_1o_2t_3i_4$	m!			
d. $r_1o_2t_3i_4$-$v_5r_1o_2t_3i_4$			*!	d
e. $v_5r_1o_2t_3i_4$-$v_5r_1o_2t_3i_4$		d!	**	
$t_1r_2a_3s_4$-v_5-RED				
☛ a. $t_1r_2a_3s_4$-$v_5r_2a_3s_4$			*!*	md
b. $v_5a_3s_4$-$v_5a_3s_4$		mmd!		
☞ c. $t_1r_2a_3s_4$-$v_5a_3s_4$			*	mmd
d. $t_1r_2a_3s_4$-$t_1r_2a_3s_4$	m!		**	

(18) *FSR in Hindi with* FAITH$_{BR}$ *Dominating* *[$_\sigma$CC

	FAITH$_{AF}$	FAITH$_{S}$	FAITH$_{BR}$	*[$_\sigma$CC
$r_1o_2t_3i_4$-v_5-RED				
☛ a. $r_1o_2t_3i_4$-$v_5o_2t_3i_4$			md!	
b. $v_5o_2t_3i_4$-$v_5o_2t_3i_4$		md!		
c. $r_1o_2t_3i_4$-$r_1o_2t_3i_4$	m!			
☞ d. $r_1o_2t_3i_4$-$v_5r_1o_2t_3i_4$			d	*
e. $v_5r_1o_2t_3i_4$-$v_5r_1o_2t_3i_4$		d!		**
$t_1r_2a_3s_4$-v_5-RED				
☞ a. $t_1r_2a_3s_4$-$v_5r_2a_3s_4$			md	**
b. $v_5a_3s_4$-$v_5a_3s_4$		mmd!		
c. $t_1r_2a_3s_4$-$v_5a_3s_4$			mmd!	*
d. $t_1r_2a_3s_4$-$t_1r_2a_3s_4$	m!			**

We will show that the insufficiency of a simple OT-analysis does not reveal any general problem with correspondence-theoretic OT, but can be straightforwardly resolved by a finer-grained analysis invoking constraint parametrization.

The crucial observation is that Hindi does not prohibit complex onsets in general, but only complex onsets in reduplicants which are not present in the corresponding base.

Whether the reduplicant violates a markedness constraint is not decided in isolation but in comparison with the violations of the base. This is highly reminiscent of a state of affairs captured in McCarthy (2003) by "Comparative Markedness". We will first sketch McCarthy's theory and then show that a natural generalization of his approach accounts for the Hindi data.

In Comparative Markedness Theory, markedness constraints are parametrized with respect to the "fully faithful candidate" (FFC), the candidate for a given constraint evaluation which is maximally faithful to the input structure. Consequently, every standard markedness constraint M is replaced by two constraints $_{O}M$ and $_{N}M$, where $_{O}M$ assigns violation marks to "old" marked structures, i.e. those being present in the FFC, and $_{N}M$ penalizes "new" marked structures, i.e. those not being present in the FFC. Thus $_{N}M$ compares candidates in the output assigning violation marks only if it does not assign a violation mark to the corresponding phonological material in the designated candidate. A typical example of a Comparative Markedness effect is voicing assimilation in Mekkan Arabic (McCarthy, 2003; Abu-Mansour, 1996; Bakalla, 1973), where voicing of underlying obstruents is generally retained in the output (19a), but voiced coda obstruents assimilate in voicing to a following voiceless obstruent (19b). However, a voiceless coda obstruent does not assimilate to a following voiced obstruent (19c):

(19) *Mekkan Arabic Voicing Assimilation* (Abu-Mansour, 1996; Bakalla, 1973)

a. /ʔibnu/	ʔibnu	'his son'
b. /ʔagsam/	ʔaksam	'he swore an oath'
c. /ʔakbar/	ʔakbar	'older'

Crucially, the markedness constraint NOVOICEDOBSTRUENT (NOVCDOB) is obeyed in blocking a *new* voiced obstruent through assimilation (**agbar*), but can be violated by an *old* voiced obstruent, i.e. one which is already present in the input. The tableaux in (20) show how parametrization of NOVCDOB allows this to be derived:

(20) *Mekkan Arabic Voicing Assimilation* (McCarthy, 2003)

	$_{N}$NOVCDOB	AGREE(voice)	IDENT(voice)	$_{O}$NOVCDOB
$ʔ_1a_2g_3s_4a_5m_6$				
☞ a. $ʔ_1a_2k_3s_4a_5m_6$			*	
b. $ʔ_1a_2g_3s_4a_5m_6$		*!		*
$ʔ_1a_2k_3b_4a_5r_6$				
☞ a. $ʔ_1a_2k_3b_4a_5r_6$		*		*
b. $ʔ_1a_2g_3b_4a_5r_6$	*!		*	*
$ʔ_1i_2b_3n_4u_5$				
☞ a. $ʔ_1i_2b_3n_4u_5$				*
b. $ʔ_1i_2p_3n_4u_5$			*!	

As McCarthy notes, Comparative Markedness naturally extends from input-output correspondence to other types of correspondence. Thus in a derived-environment effect such as Korean palatalization, palatalization of *t* only applies if it is triggered by a following *i* across a morpheme boundary.

(21) *Korean Palatalization* (Ahn, 1998)

a.	/pat^h-i/	→	pac^{h}i	'field-COP'
	/mat-i/	→	maci	'eldest-NOM'
	/put^h-i/	→	puc^{h}i	'to stick to-CAUS'
	/tot-i/	→	toci	'rise-NOM'
b.	/mati/	→	mati	'knot'
	/kac^{h}i/	→	kac^{h}i	'value'

This pattern can be captured by splitting the markedness constraint PAL, which penalizes instances of coronal consonants followed by *i*, relativizing it to Comparative Markedness in output-output (OO) correspondence (McCarthy, 2003:21-23). Thus OO-$_{O}$PAL targets *ti*-sequences which are already present in the (output of the) morphological base of the evaluated form, while OO-$_{N}$PAL targets violations which are new in the sense that they appear in the output of the derived (in this case affixed) form, but not in the (unaffixed) morphological base. Assuming that only the latter constraint is ranked above the relevant faithfulness constraints, it follows that the forms in (21a) undergo palatalization, but not the ones in (21b).

We expect that the same extension as for output-output correspondence also applies to base-reduplicant correspondence, and in fact this is what happens in the Hindi FSR case. Hence *$[_\sigma$CC is replaced by the constraints in (22):

(22) a. BR_N*$[_\sigma$CC: Avoid complex onsets in the reduplicant which do not have a counterpart in the base.

b. BR_O*$[_\sigma$CC: Avoid complex onsets in the reduplicant which have a counterpart in the base.

By ranking BR_N*$[_\sigma$CC over $\text{F}\textsc{aith}_{BR}$ over BR_O*$[_\sigma$CC, the correct candidate *roti-voti* becomes optimal since *roti-vroti* creates a "new" complex onset not corresponding to a complex onset in the base and therefore violates BR_N*$[_\sigma$CC. This complex onset can be prohibited without causing any problem for *tras-vras*. The latter only violates the lower ranked BR_O*$[_\sigma$CC, and not the high-ranked BR_N*$[_\sigma$CC since the complex onset *vr* in the reduplicant corresponds to the complex onset *tr* in the base. The tableaux in (23) illustrate the derivation of the correct FSR-pattern in Hindi. As can be seen, the low-ranked BR_O*$[_\sigma$CC does not decide optimality in any competition.

(23) *Hindi FSR with Comparative Markedness Constraints*

	$\text{F}\textsc{aith}_{AF}$	$\text{F}\textsc{aith}_{S}$	BR_N *$[_\sigma$CC	$\text{F}\textsc{aith}_{BR}$	BR_O *$[_\sigma$CC
$r_1o_2t_3i_4$-v_5-RED					
☞ a. $r_1o_2t_3i_4$-$v_5o_2t_3i_4$				md	
b. $v_5o_2t_3i_4$-$v_1o_2t_3i_4$		md!			
c. $r_1o_2t_3i_4$-$r_1o_2t_3i_4$	m!				
d. $r_1o_2t_3i_4$-$v_5r_1o_2t_3i_4$			*!	d	
e. $v_5r_1o_2t_3i_4$-$v_5r_1o_2t_3i_4$		d!			*
$t_1r_2a_3s_4$-v_5-RED					
☞ a. $t_1r_2a_3s_4$-$v_5r_2a_3s_4$				md	*
b. $v_5a_3s_4$-$v_5a_3s_4$		mmd!			
c. $t_1r_2a_3s_4$-$v_5a_3s_4$				mmd!	
d. $t_1r_2a_3s_4$-$t_1r_2a_3s_4$	m!				*

While a detailed discussion of the consequences Comparative Markedness has for reduplication is beyond the scope of this paper, it is important to note that it does not affect the most essential prediction of the correspondence-theoretic approach to reduplication: Phonological structure of reduplicants is equally or less marked than the corresponding structure in bases[10] - which corresponds roughly to 'The Emergence of the Unmarked' (TETU, McCarthy and Prince, 1994) in reduplication. To see this, consider markedness of onset complexity in simple reduplication (i.e. reduplication without fixed segmentism).[11] The classical case of TETU in onset complexity is Sanskrit where complex base onsets correspond to simplex onsets in reduplicants (e.g. *sa-swar*, 'to sound (perf.)', Whitney, 1889; Steriade, 1988; Kager, 1999). (24) shows all relevant constraints under a Comparative Markedness analysis. Obviously, (24d), which corresponds to the Sanskrit pattern, becomes optimal if the three leftmost constraints are undominated. (24c) represents a language where complex onsets in reduplicants are simplified and this simplification backcopies to the base (although the language in case might not generally repair complex onsets through deletion). Since backcopying of TETU effects is attested (cf. section 4 and footnote 13), this is also a plausible option. (24a) shows the obvious possibility that complex onsets are retained throughout a language. The crucial candidate is (24b), which poses a potential problem for the prediction that reduplicants cannot be more marked than the corresponding bases: In $s_1w_2a_3$-$s_1a_3r_4$ the reduplicant is more marked for onset complexity than its base. Outputs like this are categorically excluded under the pre-Comparative Markedness version of Correspondence Theory. As is already implicit in (24), they are also impossible if Comparative Markedness is extended to the BR-relation: (24b) is harmonically bounded by (24c) because its constraint violations are a proper superset of those for the latter candidate. Since candidates which are harmonically bounded by at least one

[10]An important caveat is that a markedness increase in the reduplicant *is* possible if it is compensated by markedness reduction for another markedness dimension (McCarthy and Prince, 1994:334).

[11]Morphological FSR reflects TETU in a rather indirect way since the presence of the FSR affix might actually make the reduplicant more complex (cf. e.g. English *table-schmable*). Crucially, this increase in complexity is not due to phonological factors, but to the morphological presence of the affix.

other candidate can never become optimal under any ranking (Prince and Smolensky, 1993:129), (24c) is universally excluded as required.

(24) *Reduplication and Comparative Markedness violations*

RED-$s_1w_2a_3r_4$	BR$_N$ *[$_\sigma$CC	BR$_O$ *[$_\sigma$CC	FAITH$_S$	FAITH$_{BR}$	IO$_N$ *[$_\sigma$CC	IO$_O$ *[$_\sigma$CC
a. $s_1w_2a_3$-$s_1w_2a_3r_4$		*		m		*
b. $s_1w_2a_3$-$s_1a_3r_4$	*		m	md		
c. s_1a_3-$s_1a_3r_4$			m	m		
d. s_1a_3-$s_1w_2a_3r_4$				mm		*

4 Morphological Backcopying

Because correspondence-theoretic OT allows candidates exhibiting any conceivable modification to the input, one of the possible outcomes in (25) is (25b), where the FSR affix "backcopies" from the reduplicant to the base. As Nevins correctly points out, this candidate becomes optimal if the ranking of MAX$_{IO}$ and MAX$_{BR}$ is reversed:

(25) *Analysis:* MAX$_{BR}$ ≫ MAX$_{IO}$

$t_1a_2b_3l_4e_5$-$ʃ_6m_7$-RED	MAX$_{BR}$	MAX$_{IO}$
a. $t_1a_2b_3l_4e_5$-$ʃ_6m_7a_2b_3l_4e_5$	*!	
☞ b. $ʃ_6m_7a_2b_3l_4e_5$-$ʃ_6m_7a_2b_3l_4e_5$		*
c. $ʃ_6m_7a_2b_3l_4e_5$-$t_1a_2b_3l_4e_5$	*!*	*
d. $t_1a_2b_3l_4e_5$-$t_1a_2b_3l_4e_5$		**!

Since it is one of the foundational tenets of Optimality Theory that – apart from systematic restrictions on possible rankings – constraints can be freely reranked, this combination of FSR and backcopying should be attested in some language. Hence we expect to find a language English' with the backcopying FSR construction in (25). Nevins (2005) classifies this pattern as typologically not attested and takes this alleged gap as evidence for a morphological approach to reduplication as in Raimy (2000), which he claims to be incapable of deriving fixed segmentism backcopying. We have shown elsewhere that the morphological approach to FSR in fact allows to derive backcopying patterns (Zimmermann and Trommer, 2007). Here, we argue that backcopying of morphological material is indeed attested in the languages of the world and Nevins' argument is empirically problematic.

First, FSR involving backcopying is found in Siroi, a non-Austronesian language of Papua New Guinea (Wells, 1979; Inkelas and Zoll, 2005). In Siroi, adjectives are reduplicated to express plural formation. In addition to reduplication, the fixed segmentism *g* replaces the onset of the second syllable in disyllabic words (26a,b) and is infixed in monosyllabic words (26c). Crucially, *g* does not only appear in the reduplicant but also in the base:

(26) *Reduplication in Siroi* (Wells, 1979)

a.	maye	ma**g**e-ma**g**e	'good'
b.	sungo	su**g**o-su**g**o	'big'
c.	kuen	ku**g**en-ku**g**en	'tall'

A slightly different case of morphological backcopying can be observed in Seereer-Siin, an Atlantic language analyzed in detail by Mc Laughlin (2000). In Seereer, the first consonant of a noun stem undergoes mutation after specific noun class prefixes. Two patterns of mutation are found, voicing mutation changing a voiced into a voiceless stop (27a-b) and continuancy mutation changing a continuant into a stop (27c-d). In (27), these mutation processes are triggered by the singular class prefix *o-* while the plural forms show the underlying root-initial consonant:

(27) *Consonant Mutation in Seerer-Siin* (Mc Laughlin, 2000)

	SG	PL		
a.	o-**c**ir	**ɟ**ir	'sick person'	*Voicing mutation*
b.	o-**k**awul	**g**awul	'griot'	
c.	o-**p**aɗ	**f**aɗ	'slave'	*Continuancy mutation*
d.	o-**t**ew	**r**ew	'woman'	

Consonant mutation interacts with a second process, derivation of agent nouns through reduplication, where the reduplicative prefix is truncated to a CV: template (28). The patterns of interest here are the ones in (28d-g): In contrast to voicing mutation (28a-c), continuancy mutation affects the initial consonant of the reduplicant and applies optionally also to the root:

(28) *Reduplication and Mutation in Seereer-Siin* (Mc Laughlin, 2000)

Voicing Mutation: No Featural Transfer

a. bind	'write'	o-pii-bind	'writer'
b. dap	'launder'	o-taa-dap	'launderer'
c. gim	'sing'	o-kii-gim	'singer'

Continuancy Mutation: Optional Featural Transfer

d. xoox	'cultivate'	o-qoo-xoox	o-qoo-**q**oox	'farmer'
e. fec	'dance'	o-pee-fec	o-pee-**p**ec	'dancer'
f. war	'kill'	o-baa-war	o-baa-**b**ar	'killer'
g. riw	'weave'	o-tii-riw	o-tii-**t**iw	'weaver'

Following Mc Laughlin (2000), we assume that mutation in Seereer is featural affixation of the features [–cont] and [–voice]. Under this analysis, backcopying in Seereer, although not FSR in the strict sense, is completely parallel to the situation in Siroi: A (featural) affix can only be realized by overwriting a feature specification of the reduplicant ([–cont] replaces [+cont] of the initial consonant) and this change is copied back to the base. Note that a derivational account of these patterns is problematic: One could assume that for the backcopying options in (28), mutation applies first to the base followed by reduplication. But morphologically, mutation in these cases applies to nouns, not to verbs, hence the morphological structure of *o-baa-bar* is as in (29), which implies exactly the opposite ordering of phonological operations: *o* triggers mutation in the noun derived previously by reduplication:

(29) $[\text{o}_{\text{Class}}\ [\text{R}\textsc{ed}_{\text{N}}\ [\text{bar}]_{\text{V}}]_{\text{N}}]_{\text{Class}}$

Moreover, the fact that there is no featural transfer for the voicing mutation, which can be straightforwardly derived in Correspondence Theory by the different ranking of base-reduplicant faithfulness constraints for voicing and continuancy as in (30) appears to be a mystery under a derivational account.

(30) a. $\text{I}\textsc{dent}_{\text{IO}}$ [voice] $\gg$ $\text{I}\textsc{dent}_{\text{BR}}$ [voice]

b. $\text{I}\textsc{dent}_{\text{BR}}$ [continuant] $\gg$ $\text{I}\textsc{dent}_{\text{IO}}$ [continuant]

The Seereer-Siin data have also important consequences for the MAX-DEP Adjacency condition we have proposed in section 2 (11). In (30), IDENT constraints for different morphological domains (the base-reduplicant correspondence relation, and the input-output correspondence relation) cannot be ranked in different contiguous blocks with respect to each other. This is evidence that the MAX-DEP Adjacency Condition cannot be extended to IDENT constraints.

We conclude that morphological backcopying in FSR and more generally is empirically attested.[12] This is especially interesting because there is recent evidence that there exist also other types of backcopying which have previously been claimed to be impossible. Thus Caballero (2006) and Gouskova (2007) show that Guarijio and Tonkawa exhibit backcopying of prosodic templates which has been declared impossible by McCarthy and Prince (1999) (the "Kager-Hamilton problem") lending support to the correspondence-theoretic approach to FSR which naturally predicts this type of phenomena.[13]

[12] Another possible example of morphological backcopying outside of FSR is found in Chumash (McCarthy and Prince, 1995). However, Inkelas and Zoll (2005) and Frampton (2004) argue against this analysis for Chumash.

[13] An anonymous reviewer points out that Correspondence Theory would also predict apparently unattested backcopying of cluster simplification (e.g. *ta-trabaho* exists, but not *ta-tabaho*). What the theoretical discussion of the last years shows is that backcopying in general is existent, but typologically rare. We believe that backcopying of cluster simplification is in principle possible and might well turn out to exist.

5 Segment-counting Fixed Segmentism Reduplication

Since Alderete et al. (1999) derive overwriting in English FSR through a faithfulness constraint which effectively compares whether the root onset or the FSR affix are longer – $\text{M}\textsc{ax}_{\text{IO}}$ prefers realization of more input segments – one can easily imagine scenarios in which varying the size of the root onset should yield different FSR patterns. In the tableaux (31) and (32), we show, following Nevins (2005), that the analysis of Alderete et al. (1999) predicts precisely those inconsistent patterns depending on the size of the base onset. (31) illustrates the English ranking for a root without onset. Backcopying of the FSR affix (31b) comes "for free" (without the necessity to overwrite and to violate $\text{M}\textsc{ax}_{\text{IO}}$) and fares equally well as the correct candidate (31a):

(31) *Wrong Prediction for Vowel-initial Base* (Nevins, 1995)

$a_1pp_2l_3e_4$-$ʃ_5m_6$-RED	MAX-IO	MAX-BR
☞ a. $a_1pp_2l_3e_4$-$ʃ_5m_6a_1pp_2l_3e_4$		
☞ b. $ʃ_5m_6a_1pp_2l_3e_4$-$ʃ_5m_6a_1pp_2l_3e_4$		
c. $ʃ_5m_6a_1pp_2l_3e_4$-$a_1pp_2l_3e_4$		*!*
d. $a_1pp_2l_3e_4$-$a_1pp_2l_3e_4$	*!*	

In (32), *schm*-reduplication for the English' ranking is shown for lexemes with different onset lengths. Straightforward backcopying only occurs with bases of onset length 1. With onset-less bases and bases starting with two consonants we get optionality. With a base whose onset contains three consonants, the FSR affix is suppressed. As Nevins argues, there are no attested cases of FSR where the realization of the FSR affix depends on the number of segments in the base, hence the factorial typology of the correspondence-theoretic analysis seems to make a wrong prediction. This problem cannot be solved by adding more constraints. Assuming a ranking where $\text{M}\textsc{ax}_{\text{BR}}$ and $\text{M}\textsc{ax}_{\text{IO}}$, ranked in that order, are undominated, at least the outputs for *table* and *string* will be just as in (32), no matter what constraints are ranked lower. Hence inconsistent FSR triggered by segment counting would still be part of the factorial typology.

(32) *Inconsistent FSR in English'*

	MAX$_{BR}$	MAX$_{IO}$
1: $a_1pp_2l_3e_4$-$ʃ_5m_6$-RED		
☞ a. $a_1pp_2l_3e_4$-$ʃ_5m_6a_1pp_2l_3e_4$		
☞ b. $ʃ_5m_6a_1pp_2l_3e_4$-$ʃ_5m_6a_1pp_2l_3e_4$		
c. $a_1pp_2l_3e_4$-$a_1pp_2l_3e_4$		*!*
2: $t_1a_2b_3l_4e_5$-$ʃ_6m_7$-RED		
a. $t_1a_2b_3l_4e_5$-$ʃ_6m_7a_2b_3l_4e_5$	*!	
☞ b. $ʃ_6m_7a_2b_3l_4e_5$-$ʃ_6m_7a_2b_3l_4e_5$		*
c. $t_1a_2b_3l_4e_5$-$t_1a_2b_3l_4e_5$		**!
3: $p_1l_2a_3n_4$-$ʃ_5m_6$-RED		
a. $p_1l_2a_3n_4$-$ʃ_5m_6a_3n_4$	*!*	
☞ b. $ʃ_5m_6a_3n_4$-$ʃ_5m_6a_3n_4$		**
☞ c. $p_1l_2a_3n_4$-$p_1l_2a_3n_4$		**
4: $s_1t_2r_3i_4ng_5$-$ʃ_6m_7$-RED		
a. $s_1t_2r_3i_4ng_5$-$ʃ_6m_7i_4ng_5$	*!**	
b. $ʃ_6m_7i_4ng_5$-$ʃ_6m_7i_4ng_5$		***!
☞ c. $s_1t_2r_3i_4ng_5$-$s_1t_2r_3i_4ng_5$		**

We accept Nevins' conclusion that the analysis of Alderete et al. (1999) is seriously flawed by this misprediction, but we don't think that it points to any fundamental problem of OT or Correspondence Theory. Instead we argue that patterns as in (32) are excluded by standard means of parametrizing faithfulness constraints and the MAX-DEP Adjacency Condition we have introduced in section 2. Restricting ourselves to MAX and DEP constraints the following faithfulness constraints are relevant for FSR:

(33) a. MAX$_S$: Every segment of the stem in the input has a correspondent in the base in the output.

b. DEP$_S$: Every segment of the base in the output has a correspondent in the stem in the input.

c. MAX$_{AF}$: Every segment of an affix in the input has a correspondent in an affix in the output.

d. DEP$_{AF}$: Every segment of an affix in the output has a correspondent in an affix in the input

e. MAX$_{BR}$: Every segment in the base has a correspondent in the reduplicant.

f. DEP$_{BR}$: Every segment in the reduplicant has a correspondent in the base.

If stem and affix-faithfulness constraints are undominated, we get the English pattern (34).[14]

(34) *Possible Rankings for English*

	FAITH$_S$	FAITH$_{AF}$	...
1: $a_1pp_2l_3e_4$-$ʃ_5m_6$-RED			
☞ a. $a_1pp_2l_3e_4$-$ʃ_5m_6a_1pp_2l_3e_4$			
b. $ʃ_5m_6a_1pp_2l_3e_4$-$ʃ_5m_6a_1pp_2l_3e_4$	dd!		
c. $a_1pp_2l_3e_4$-$a_1pp_2l_3e_4$		mm!	
2: $t_1a_2b_3l_4e_5$-$ʃ_6m_7$-RED			
☞ a. $t_1a_2b_3l_4e_5$-$ʃ_6m_7a_2b_3l_4e_5$			
b. $ʃ_6m_7a_2b_3l_4e_5$-$ʃ_6m_7a_2b_3l_4e_5$	mdd!		
c. $t_1a_2b_3l_4e_5$-$t_1a_2b_3l_4e_5$		mm!	
3: $p_1l_2a_3n_4$-$ʃ_5m_6$-RED			
☞ a. $p_1l_2a_3n_4$-$ʃ_5m_6a_3n_4$			
b. $ʃ_5m_6a_3n_4$-$ʃ_5m_6a_3n_4$	mmdd!		
c. $p_1l_2a_3n_4$-$p_1l_2a_3n_4$		mm!	
4: $s_1t_2r_3i_4ng_5$-$ʃ_6m_7$-RED			
☞ a. $s_1t_2r_3i_4ng_5$-$ʃ_6m_7i_4ng_5$			
b. $ʃ_6m_7i_4ng_5$-$ʃ_6m_7i_4ng_5$	mmmdd!		
c. $s_1t_2r_3i_4ng_5$-$s_1t_2r_3i_4ng_5$		mm!	

Backcopying results if affix and base-reduplicant faithfulness constraints are ranked highest (35):

[14] Although the abstract morpheme RED is often characterized as an affix, we take it to be invisible for input-output faithfulness constraints, and more specifically for faithfulness constraints relativized to affixes. This hypothesis should be uncontroversial for MAX and IDENT constraints: Since RED morphemes do not have any input segments there are no segments which could be deleted or modified in the output. We assume that RED is also "invisible" for input-output DEP constraints. Because RED is only present in the input, and output constraints only evaluate output structure, this means that RED is not directly visible to *any* constraints.

(35) *Backcopying Rankings*

	FAITH$_{AF}$	FAITH$_{BR}$	...
1: $a_1pp_2l_3e_4$-$ʃ_5m_6$-RED			
a. $a_1pp_2l_3e_4$-$ʃ_5m_6a_1pp_2l_3e_4$		dd!	
☞ b. $ʃ_5m_6a_1pp_2l_3e_4$-$ʃ_5m_6a_1pp_2l_3e_4$			
c. $a_1pp_2l_3e_4$-$a_1pp_2l_3e_4$	mm!		
2: $t_1a_2b_3l_4e_5$-$ʃ_6m_7$-RED			
a. $t_1a_2b_3l_4e_5$-$ʃ_6m_7a_2b_3l_4e_5$		mdd!	
☞ b. $ʃ_6m_7a_2b_3l_4e_5$-$ʃ_6m_7a_2b_3l_4e_5$			
c. $t_1a_2b_3l_4e_5$-$t_1a_2b_3l_4e_5$	mm!		
3: $p_1l_2a_3n_4$-$ʃ_5m_6$-RED			
a. $p_1l_2a_3n_4$-$ʃ_5m_6a_3n_4$		mmdd!	
☞ b. $ʃ_5m_6a_3n_4$-$ʃ_5m_6a_3n_4$			
c. $p_1l_2a_3n_4$-$p_1l_2a_3n_4$	mm!		
4: $s_1t_2r_3i_4ng_5$-$ʃ_6m_7$-RED			
a. $s_1t_2r_3i_4ng_5$-$ʃ_6m_7i_4ng_5$		mmmdd!	
☞ b. $ʃ_6m_7i_4ng_5$-$ʃ_6m_7i_4ng_5$			
c. $s_1t_2r_3i_4ng_5$-$s_1t_2r_3i_4ng_5$	mm!		

Finally we get complete suppression of the FSR affix if stem and base-reduplicant faithfulness constraints are undominated. Under this ranking, FSR can not be distinguished from reduplication without fixed segmentism in the input:

(36) *Suppression of the FSR Affix*

	FAITH_{S}	FAITH_{BR}	...
1: $a_1pp_2l_3e_4$-$ʃ_5m_6$-RED			
a. $a_1pp_2l_3e_4$-$ʃ_5m_6a_1pp_2l_3e_4$		dd!	
b. $ʃ_5m_6a_1pp_2l_3e_4$-$ʃ_5m_6a_1pp_2l_3e_4$	dd!		
☞ c. $a_1pp_2l_3e_4$-$a_1pp_2l_3e_4$			
2: $t_1a_2b_3l_4e_5$-$ʃ_6m_7$-RED			
a. $t_1a_2b_3l_4e_5$-$ʃ_6m_7a_2b_3l_4e_5$		mdd!	
b. $ʃ_6m_7a_2b_3l_4e_5$-$ʃ_6m_7a_2b_3l_4e_5$	mdd!		
☞ c. $t_1a_2b_3l_4e_5$-$t_1a_2b_3l_4e_5$			
3: $p_1l_2a_3n_4$-$ʃ_5m_6$-RED			
a. $p_1l_2a_3n_4$-$ʃ_5m_6a_3n_4$		mmdd!	
b. $ʃ_5m_6a_3n_4$-$ʃ_5m_6a_3n_4$	mmdd!		
☞ c. $p_1l_2a_3n_4$-$p_1l_2a_3n_4$			
4: $s_1t_2r_3i_4ng_5$-$ʃ_6m_7$-RED			
a. $s_1t_2r_3i_4ng_5$-$ʃ_6m_7i_4ng_5$		mmmdd!	
b. $ʃ_6m_7i_4ng_5$-$ʃ_6m_7i_4ng_5$	mmmdd!		
☞ c. $s_1t_2r_3i_4ng_5$-$s_1t_2r_3i_4ng_5$			

Since (34) to (36) exhaust all ranking possibilities which conform to MAX-DEP Adjacency, it is easy to see that the constraint system in (33) systematically excludes segment-counting FSR, i.e. FSR where realization and backcopying of the FSR affix varies with the phonological size of the base.[15]

6 Conclusion

Nevins' critique of Alderete et al. (1999) and Ussishkin (1999) has revealed several potential problems in these analyses. However, we have shown that the implementation of overwriting in a correspondence-theoretic account does not face any of the general problems Nevins points out for Correspondence Theory. Taking advantage of the standard parametrization for faithfulness constraints and an independently motivated metacondition on possible constraint rankings, Correspondence Theory seems to be well-suited

[15]The approach of Raimy (2000) which Nevins offers as an alternative to the correspondence-theoretic analysis of FSR actually allows to generate different apparently unattested types of segment-counting FSR (Zimmermann and Trommer, 2007).

to capture intricate specific overwriting phenomena, and to make typological predictions which closely reflect our current understanding of possible overwriting patterns in human language.

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