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1 Overview

A single language may have multiple patterns of reduplication. That is, more than one morpheme may result in what appears on the surface as repetition of phonological material. A question then arises: when more than one reduplicative morpheme is present in a single structure, what is the output? For example, Lushootseed (Bates et al., 1994) contains *distributive* (descriptively, a CVC prefix: root 'ʔibəš', DIST 'ʔibʔibəš') and *out-of-control* (descriptively, a VC suffix/infix: OOC 'ʔibibəš') reduplication patterns (1), among others.

(1)	a.	Root:	g^{w}ax̌^{w}	'walk'
	b.	Distributive (DIST):	g^{w}ax̌^{w}-g^{w}ax̌^{w}	'walk to and fro'
	c.	Out-of-control (OOC):	g^{w}ax̌^{w}-ax̌^{w}	'He went for a walk.'

But what form is used for the *distributive* of the *out-of-control* of the *root* '$\sqrt{}$g^{w}ax̌^{w}' (the form used to talk about, say, 'a lot of strolling about')? *A priori*, several logical possibilities arise.

(2)	OOC	a.	g^{w}ax̌^{w}-g^{w}ax̌^{w}-ax̌^{w}
	g^{w} ax̌^{w}	**b.**	**g^{w}ax̌^{w}-ax̌^{w}-g^{w}ax̌^{w}**
	DIST	c.	g^{w}ax̌^{w}-ax̌^{w} ⇒ g^{w}ax̌^{w}ax̌^{w}-g^{w}ax̌^{w}ax̌^{w}

First, DIST might appear to be prefixed to the root, while OOC appears as a suffix (2a). Second, OOC might appear to surface as an infix within the final form, while the DIST appears initially (2b). Third, if reduplication is derived by delimiting and copying strings of symbols, one might have a serial derivation wherein first 'ax̌^{w}' is copied for OOC *within* the DIST string, and then the whole string is repeated to give (2c). These examples do not exhaust the logical possibilities, and yet Lushootseed does not show variation in this form;

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the only surface form is (2b). If this sort of pattern is universal, rather than language-specific—that is, if the Lushootseed solution is quite general—then we must ask: Why does the combination of reduplication-triggering processes from two reduplication patterns (or iteration of the same pattern) yield such a small set of possibilities on the surface?

We suggest here that the Lushootseed solution is quite general cross-linguistically. We examine two approaches to reduplication—one in which reduplication arises through the addition of precedence relations to deep (non-surface) phonological forms, and another that delimits strings to be copied within input forms—and examine how they fare empirically with respect to multiple reduplication.

2 An Answer from Correspondence Theory

Before moving on, we should note that Urbanczyk (2001) offers a well-known Optimality Theoretic analysis of the Lushootseed case mentioned above. Under this approach Lushootseed has multiple RED morphemes, each specified as *root* or *affix* and subject to different gradient ALIGN constraints that make them effectively prefixes or suffixes. A language-specific constraint ranking then determines their placement, shape, and content in the output.

Though a full review of this proposal is not possible here, one important feature should be noted: Urbanczyk's approach offers little in the way of cross-linguistic predictions regarding the placement of reduplicants in multiple reduplication contexts. Under this approach the correct [DIST [OOC √root]] form could have been (2a) had certain constraints been ranked differently (namely, MAX-BR-AFFIX and/or NOCODA). On the other hand, the theory defended here and outlined in the next section makes strong cross-linguistic predictions.

Both theories presented in the following two sections assume that the morphological form of a word and the dictionary entry of the reduplicating morphemes—that is, their idiosyncratic form—interact to produce the surface forms. These approaches do not espouse the hypotheses of "Generalized Template Theory" (McCarthy and Prince, 1995) or "Emergence of the Unmarked" (Spaelti, 1997) approaches to reduplication, which propose that general markedness constraints govern all aspects of reduplication. Though the issue cannot be addressed in depth here, these approaches do not seem viable as general theories of reduplication, as they do not account for the full range of observed reduplication patterns (e.g., Thao -CCV- reduplication: *arfaz* ⇒ *arfarfaz*, which creates an additional NOCODA violation (Chang, 1998)).[1]

[1]The problem of generality in markedness-reduction theories is essentially dupli-

3 A Relation-Based Approach

Raimy (2000:12) observes that "there are non-trivial and non-derivable ordering relationships between segments in phonology[...]." These relationships are non-trivial in at least two ways: (a) there are no palindromic languages where, e.g., [kæt]=[tæk], and (b) phonological rules, processes, and constraints must have access to ordering information; an SPE-type rule (Chomsky and Halle, 1968) like `A→B/C__D` can only apply if the information is available that `C` immediately precedes `A` and `A` immediately precedes `D`.

Raimy (2000) proposes that these crucial precedence relations be explicitly represented in phonology: A→B is read 'A immediately precedes B.' Since in most theories these relations have always been implicitly present, this enrichment of the symbolic vocabulary is not an enrichment of the theory. Rather, it allows us to make observations and ask questions that would not have been obvious otherwise. For example, it now becomes clear that the precedence relation for phonological representations has been assumed to be linear. And yet, though this assumption may be justified for the output of phonology at the interface with articulatory-perceptual systems (cf. Chomsky's (1995) *Bare Output Conditions*), Raimy's novel move is to ask whether this assumption is justified for levels of grammar further removed from the surface. That is, though at the surface only linear representations like (3a) are legible to extra-linguistic systems, might it be the case that, within phonology, representations like (3b) are allowed?

(3) a. $\# \rightarrow g^w \rightarrow a \rightarrow \check{x}^w \rightarrow \%$
b. $\# \rightarrow g^w \rightarrow a \rightarrow \check{x}^w \rightarrow \%$
c. $\# \rightarrow g^w \rightarrow a \rightarrow \check{x}^w \rightarrow g^w \rightarrow a \rightarrow \check{x}^w \rightarrow \%$

While precedence in (3a) is asymmetric (if A precedes B then B does not precede A), the set of relations in (3b) is non-asymmetric. Some segments are immediately followed or immediately preceded by more than one segment: [g^w] follows both # (the beginning juncture) and [x̌^{w}], while [x̌^{w}] precedes both % (the end juncture) and [g^w]. There is nothing logically problematic in such a representation; relations can have whatever properties they have. We must simply ask which types of relations are empirically defensible. Raimy (2000) proposes that non-asymmetric representations are empirically motivated: they underlie reduplication, as well as infixation and other types of morpho-phonological phenomena. Under this approach (3b) is the underlying

cated for the gradient alignment approach to infixation, as Yu (2003) argues.

form for total reduplication of /$g^w a\check{x}^w$/ as in (1).

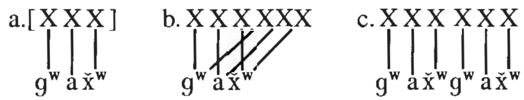
However, by hypothesis, (3b) must be linearized to form (3c) if it is to be legible to sensory-motor systems. *Linearization* is simply the reconcatenation of a non-linear representation (i.e., one containing "loops") as a linear representation. That is, though the input to linearization can be non-linear, the output is not. Furthermore, we propose that linearization is guided by three natural principles: *completeness, economy,* and *shortest.* COMPLETENESS ensures that the segments and relations in the input are maximally spelled out in the output. Informally, ECONOMY simply says "do no more than is necessary." This condition legislates against gratuitous output that is not necessary for satisfaction of the other conditions. Finally, in the case of multiple "loops," SHORTEST dictates that, in cases of nesting, inside loops are spelled out before outside loops. We will see below how these conditions are computed.

It should be noted that linearization is not simply a patch necessitated by the treatment of reduplication as the result of looping precedence relations. In fact, some linearization procedure is implicit in most treatments of affixation (especially infixation). Therefore, this approach can truly claim to contain no reduplication-specific mechanisms (*pace* Downing (2001)). Nevertheless, it has proved a fruitful framework in which to explain over- and underapplication (Raimy, 2000) as well as non-reduplicative copying and avoidance phenomena (Fitzpatrick and Nevins, 2002). We call this approach *Relational Phonology* (RP).

4 Distributed Reduplication

Frampton (2002) develops the theory of *Distributed Reduplication* (DR), which draws on the insights of Raimy (2000), as well as other work including Steriade (1988), McCarthy (1986), and Odden and Odden (1985). Rather than making use of independently necessary precedence relations, DR posits the existence of *duplication junctures* (here [and]), not unlike musical repeat symbols. These junctures are inserted by morphology into the timing tier of a phonological representation, as in (4a). Phonology interprets these symbols as instructions to copy the delimited string of timing slots, along with their associations to melodic material (4b) (this is called *transcription* in DR). The resulting violations of the line-crossing constraint are resolved through phoneme fission, giving, in this case, full reduplication (4c).[2] Most importantly, phonological processes can apply between any of these steps.

[2]To save space, DR derivations will be abbreviated below. For example, the derivations of (1b,c) would be represented as in (ia,b).

(4) 

5 Nested and Overlapping Precedence

We now turn to several cases of multiple reduplication that involve more than one reduplicative morpheme in a single form. The first case, we argue, helps distinguish empirically between RP and DR. These examples also help to illustrate the workings of linearization.

5.1 Polygamous Source

In RP a Lushootseed word including both DIST and OOC morphemes would have the underlying form in (5). The looping precedence relations have already been added to this representation through the spell-out of morphological features (Halle and Marantz, 1993).[3] Assume for the moment a non-cyclic derivation.

(5) #→b→a→l→i→%

In order to show that linearization produces the correct output form, we can compare this form with impossible linearizations in a tableau.[4]

(6)

	Input: (5)	COMPLETE	SHORTEST	ECONOMY
☞ a.	bal-al-bali			a-lb-a-l
b.	bal-bal-ali		*!	b-a-la-l
c.	bal-ali	(l-b)!		a-l
d.	bal-al-al-bali			a-l-!a-lb-a-l

(i) a. $[g^w a\check{x}^w] \Rightarrow g^w a\check{x}^w\text{-}g^w a\check{x}^w$
b. $g^w [a\check{x}^w] \Rightarrow g^w a\check{x}^w\text{-}a\check{x}^w$

[3]We do not provide explicit rules for the insertion of precedence relations. Assume these are given idiosyncratically for each morpheme. For the moment we assume a theory of possible phonological landmarks/anchor points (Yu, 2003) will provide an appropriate inventory of possible insertion points.

[4]These linearization constraints cannot be reranked to produce a factorial typology, a key feature of OT constraints. Thus their presentation in tableau form is purely for the sake of exposition. Here hyphens stand for immediate precedence relations.

COMPLETENESS rules out (6c), which fails to include the l→b relation in the output. ECONOMY rules out (6d) since this form results from unnecessarily crossing the l→a relation more than once. SHORTEST rules out (6b) since this form would result if the l→b relation were crossed before the shorter l→a relation. Length is calculated at [l] with forward relations to [b] and [a] by comparison of material intervening between [b] and [l] and between [a] and [l]. While [a] must be crossed to get from [b] to [l], only the link between [a] and [l] must be crossed to get from [a] to [l]. Thus the l→a link is shorter.[5] Descriptively, SHORTEST is operative when there are two backwards-pointing precedence relations, choosing the one whose endpoint is closer in terms of transitively preceding the source (e.g. an "inner loop").

A DR derivation would proceed as in (7a) or (7b). In (7a) the inner OOC string is expanded first, with the new X-slots appearing to the right of the right DIST juncture. The DIST string is then expanded to yield the incorrect form: *bal-bal-al-i. (The reverse order of copying would yield the same result.) If instead the new OOC X-slots appear inside the DIST juncture (that is, as close to the original OOC juncture as possible), the derivation in (7b) arises. Though there does not seem to be a principled way to distinguish these approaches (copying inside or outside truncation junctures), we will not dwell on the matter, since both yield incorrect results in this case.[6]

(7) a. [b [al]] i ⇒ [bal] al i ⇒ *bal-bal-al-i
b. [b [al]] i ⇒ [balal] i ⇒ *balal-balal-i

A cyclic DR derivation could yield the correct form only if DIST applies first (8a), rather than last (8b):

(8) a. [bal] i ⇒ b [al] bali ⇒ bal-al-bali
b. b [al] i ⇒ [bal] al i ⇒ *bal-bal-al-i

It is clear, then, that we must establish the morphological structure of DIST-OOC forms in order to evaluate these theories, neither of which eschews in principle the possibility of cyclic derivation.[7] In doing so, we must keep in mind that the shape of forms including DIST and OOC reduplication patterns

[5]It may be the case that calculation of SHORTEST can always be done on previously linearized material, thus obviating the need for look-ahead.

[6]This issue would not arise were the inner string not at the edge of the outer string.

[7]Cyclicity seems to be active in, e.g., the interaction of distributive and reflexive reduplication in Klamath (Barker, 1964:113), and [DIM [DIST √]] forms in Lushootseed (Fitzpatrick and Nevins, 2002). In such cases, the cyclic/non-cyclic distinction is established based on facts independent of the reduplication patterns themselves.

is invariant. Under an RP approach, due to the invariant nature of linearization, the same surface form will arise in a non-cyclic derivation, regardless of the morpheme hierarchy. Under a cyclic derivation, only the [OOC [DIST √root]] form is predicted to surface with the observed shape (this derivation would proceed essentially as in (8a)). DR, on the other hand, must rely on an invariant [OOC [DIST √root]] order and a cyclic derivation, as any other situation will lead to a false prediction.

(9)

	DR:		**RP:**	
	Cyclic	Non-cyclic	Cyclic	Non-cyclic
[DIST [OOC √]]	*	*	*	✓
[OOC [DIST √]]	✓	*	✓	✓

Unfortunately, it is difficult to determine the morphological structure of every form containing DIST and OOC. First, the OOC shape actually arises from several morphemes, including 'out of control' and 'particularization' (Bates et al., 1994:xvii). DIST, on the other hand, essentially contributes 'plurality.' Finally, only a small number of these multiply reduplicated forms are recorded in our data source. Yet despite these difficulties, the existence of forms that appear to be the distributive of an out-of-control (i.e., many Xs involved in an 'out of control' event), such as *saq*^{w}*'aq*^{w}*'saq*^{w}*'* 'many flying around, wheeling in the sky' (from *saq*^{w}*'* 'fly'), suggests that at least some of these forms are derived from [DIST [OOC √root]] structures. If this is so, then only RP and a non-cyclic derivation will suffice.

5.2 Completeness in Nested and Overlapping Reduplication

Tagalog has an 'initial C(C)V' reduplication pattern as well as an 'initial foot' pattern (Kie Zuraw, p.c.).

(10) Pattern A: trabaho ⇒ tra-trabaho
Pattern B: diliryu ⇒ dili-diliryu

When A and B appear together in the same form, the following pattern arises.

(11) a. dalas 'rapidity' da-dalas-dalas 'haste'
b. dili 'meditation' di-dili-dili 'comtemplation'

The RP representation underlying (11b) is shown in (12).

(12) #→d→i→l→i→%

The RP linearization algorithm produces (13a) as the correct output. This case illustrates how COMPLETENESS, locally computed, provides a preference for linearization to spell out backward pointing links first. Thus at the first [i] the link to [d] is followed, rather than the link to [l]. One might think of linearization as 'playing it safe' by always following backward loops when possible. This approach to completeness rules out (13b).[8]

(13)

	Input: (13)	COMPLETE	SHORT	ECONOMY
☞ a.	di-dili-dili			d-id-i-l-i
b.	dili-di-dili	*!		d-id-i-l-i
c.	di-dili	(i-d)!		d-i
d.	di-dili-di-dili			d-id-i-!d-i-l-i

COMPLETENESS also plays a role in the correct linearization of overlapping reduplication patterns. For example, in Lushootseed diminutive-OOC reduplication (14), the link between [a] and [d] (the result of the DIM morpheme, descriptively a CV prefix) is spelled out before a→y due to the local computation of COMPLETENESS.

(14) #→d→a→y→ʔ→% ⇒ [da-day-ay-ʔ]

DR derivations are possible for both of these examples. Either a cyclic derivation (not shown), or a derivation as in (15a) would be an adequate solution to the Tagalog example (11). However, no non-cyclic derivation exists for overlapping reduplicants, as in Lushootseed diminutive-OOC forms, unless diacritics are added to allow juncture pairing information to be retained (15b). If this information were lost, we might expect a derivation such as (15c). Thus, barring diacritics, DR would have to rely on cyclic reduplication.

(15) a. [[di] li] ⇒ di [dili] ⇒ di-dili-dili (Tagalog)
b. [$_1$ d [$_2$ a]$_1$ y]$_2$ ʔ ⇒ [daay] ʔ ⇒ da-day-ayʔ (Lush. DIM-OOC)
c. [d [a] y] ʔ ⇒ [daay] ʔ ⇒ *daaydaayʔ

Fitzpatrick and Nevins (2002) argue, based on the fact that leftward stress assignment, and [i]-insertion to accommodate stress, applies in DIM and OOC reduplication (DIM: 'bədáʔ' ⇒ 'bíbədaʔ'; OOC: 'ʔəx̌íd' ⇒ 'ʔəx̌íx̌əd') while remaining where previously assigned in DIST ('bədáʔ' ⇒ 'bədbədáʔ') that DIM and OOC are "level 1" affixes and DIST is "level 2." Linearization ap-

[8] A global, more topographical, approach to SHORTEST under which 'inside' loops are followed first would also rule out (13b).

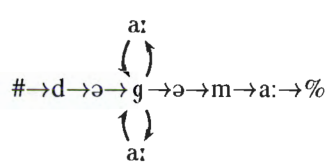
plies only after a block of level 1 affixes and after every level 2 affix. Mester (1988) arrives at a similar conclusion, reached through different representational assumptions about reduplication.[9] Thus the assumption of cyclicity may be problematic in Lushootseed DIM-OOC reduplication.

6 Iterated Reduplication

> "Cyclicity is a stipulation in derivational algorithms. It is a *nice* stipulation, but still a stipulation, whose need we might question." (M. Brody, in MIT colloquium talk "String Theory," 25 April 2003)

Having examined the computation of linearization in the case of multiple *distinct* reduplication-triggering morphemes (e.g., DIST and OOC) above, we turn to an illustration of the same principles in cases of *iterated* application of the *same* morpheme. The frequentative in Tigre can be multiply attenuated (Rose, 2001): dəgm-aː 'tell, relate', dəgaːgəm-aː 'tell stories occasionally', dəgaːgaːgəm-aː 'tell stories very occasionally'. It is clear that the assumption of cyclic iteration of the FREQ pattern will derive this result. However, there is no external evidence for such an assumption. We therefore note that our linearization algorithm is compatible with a cyclic view of morpheme spell-out, and pursue the possibility that each frequentative iteration is spelled-out in 'parallel.' In the case of dəgaːgaːgəm-aː, linearization takes as input two new precedence-adding relations:

(16)



⇒ dəgaːgaːgəm-aː

The principles of COMPLETENESS and ECONOMY guarantee that exactly the number of occurrences of [g] (i.e., exactly the number of distinct precedence relations to /g/) will appear in the output. This result can be thought of as equivalent to Rose's (2001) Correspondence Theoretic INTEGRITY and

[9] "...the theory makes predictions about the point(s) in the derivation where linearization occurs. Linearization will take place whenever Tier Conflation/Bracket Erasure is invoked... If Tier Conflation/Bracket Erasure is stratal and not cyclic, there is thus a certain delay between morphological formation and morphological destructuring... Until Tier Conflation applies to [reduplicated forms]... that is, until they exit their stratum of formation, they remain nonlinearized." (Mester, 1988:178–179)

REALIZEMORPHEME as they evaluate outputs of RED and guarantee no more copies of /g/ than necessary. A possible difference is that our principles are inviolable and language-universal. An identical computation holds in Thao (Austronesian) *Ca-* retriplication (Blust, 2001), where *qca* 'repeat' becomes *mig-qa-qa-qca* 'keep changing one's position'.

We turn our attention to Manam (Austronesian) reduplication, which differs slightly from Tigre. As Buckley (1997) convincingly argues, there is a class of 'inherently reduplicated roots' that contain the instruction to reduplicate in their lexical entry. One such root is *ragogo* 'be warm'. Based on Buckley's proposals, we take the underlying form of this root as:

(17) #→r→a→g→o→%

Manam has a process of rightward disyllabic reduplication to create adjectival forms (Lichtenberk, 1983:609): *salaga-**laga*** 'long', *malipi-**lipi*** 'working'. One might expect that if reduplication is computed on the surface form of the root, the output for *ragogo* would be **ragogo-**gogo***, with two copies of the final foot. However, the attested output is *ragogo-**go***. Buckley (1997) argues that this is not haplology, as there is no evidence outside of reduplication for a ban on sequences of identical syllables. Though this may appear to be a case of reduplicative allomorphy, RP provides a natural non-allomorphic solution.

In cases without lexical loops (e.g., *salaga* ⇒ *salaga-laga*), it is clear that the adjectival morpheme results in the addition of a relation between the final segment and the onset of the penultimate syllable. To compute the placement of the link, the morphology counts back two vowels, following precedence relations. In lexically reduplicated forms like (17), from % the computation goes to /o/ and increments the vowel counter by one, then to /g/, then to what precedes it, namely /o/ (recall that back-pointing loops are always taken first), at which point the vowel counter reaches two. The consonant preceding the second counted vowel (/g/ in this case) will be set as the head of the new link, and the final segment of the input, /o/, is set as tail, resulting in the addition of a new precedence relation, as in (18).

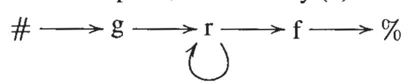
(18) #→r→a→g→o→%

It should be clear that this is formally identical to the Tigre case, and linearization will result in three copies of the syllable [go], rather than four. No cyclic application can derive this result. To conclude this subsection, we have shown that the same principles that govern linearization in multiple reduplication triggered by distinct morphemes apply to precedence structures created by iteration of the same reduplication pattern.

6.1 A Note on Excessive Power and Underdetermination

In the interest of charting the generative space afforded by the introduction of non-linear precedence relations, we note that for a given reduplication output, there may be multiple representations that will yield identical surface form. *Phonological Ambiguity* holds when, for instance, the Tigrinya frequentative of the root √grf 'whip' is [gərarəf]. Just as *I saw the man with the telescope* has two structural analyses, so does [gərarəf] (epenthetic schwas omitted from following diagrams):

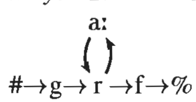
(19) *Analysis 1:* (a) Penultimate C Reduplication to Achieve Quadriconsonantal Template, Followed by (b) *-a* infixation between C2 and C3:

a. 

b. # → g → r → r → f → %

c. # → g → r → a → r → f → %

(20) *Analysis 2:* C*a*- reduplication of Penultimate Consonant:



(Linearized as: #→g→r→a→r→f→%)

At first blush, the fact that the same string can be given two different analyses might indicate that the theory of linearization and reduplication has too much 'expressive power'. However, the existence of two distinct idiolects of frequentative reduplication when the root is quadriliteral deserves an explanation. One of us has argued elsewhere, on the basis of dialects of Pig Latin (Nevins and Vaux, 2003a) and variants of *shm-* reduplication (Nevins and Vaux, 2003b) that idiolectal variation in complex forms is the emergent result of different analyses chosen on simple forms, due to underdetermination (phonological ambiguity). Sharon Rose has found two groups of speakers, all of the same age group, and all from near Asmara. When asked to form the frequentative for √glbt' 'turn over', one group produces [gəla:bət'] and one group produces [gələba:bət']. Both groups, however, produce [gəra:rəf] for triliteral roots. By hypothesis, one group has consistently adopted *Analysis 1*, infixing *-a* into a filled quadriconsonantal template, and one group has consistently adopted *Analysis 2*, computing C*a*- reduplication on the penultimate root consonant:

(21) *Analysis 1:* Quadriconsonantal Template, followed by *-a* infixation between C2 and C3, yielding [gəlabət']:
→ g → l → b → t → %
→ g → l → a → b → t → %

(22) *Analysis 2:* *Ca-* reduplication of penultimate C, yielding [gələbabət']:
a:
#→g→l→b→t→% (Linearized as: #→g→l→b→a→b→t→%)

In other words, both Analysis 1 and 2 are compatible with the data for simple forms; dialect variation on 'more complicated' forms is the result of variable rule postulation for simpler forms. This result is only possible in 'redundantly expressive' systems.

7 Contributions

We argue above that RP and DR differ significantly in their empirical coverage. The locus of this difference can be found in an important formal distinction: DR proposes a *substring* theory of reduplication, while RP provides a *relational* approach. That is, DR depends on the circumscription of a particular substring with a pair of process-specific junctures. RP, on the other hand, holds that the same fundamental immediate precedence relation that is necessary for, e.g., the encoding of idiosyncratic segment order, underlies reduplication. No special status is given to substrings that appear to be repeated in the output. Rather, the novel proposal is that individual segments can be in multiple precedence relations. Non-linear representations are then linearized using an algorithm independently required for a full treatment of affixation.

External observers of syntactic theory often ask, "Why have trees at all, if you need to linearize them into strings anyway? Why not just start with strings and compute all your relations on them?" The answer is that we can define relations on trees that we cannot define on linear strings. The proposal of non-linear representations that need to be linearized later is not driven by a perverse desire to complicate the system. Rather, trees are needed to characterize phenomena dependent on non-linear relations. The same goes for the "loops" of RP: the existence of non-linear phonological representations is motivated by the fact that they capture generalizations that we hope to have shown cannot be captured by referring to linear strings alone.

Syntacticians will have noticed a parallel between multiple precedence in RP and multiple dominance in syntax (created through movement/remerger).

In both cases a single element is in multiple positions "simultaneously." Yet in the case of RP, this element is pronounced in both positions, while syntactic elements are generally pronounced in one position only. What could explain this difference? We propose that the answer can be found in a fundamental difference between syntax and phonology: syntax is recursive in a way that phonology is not. While syntactic merger creates objects that can themselves undergo further merger, creating nested structure, phonological concatenation can only string items together. Thus while deletion or skipping of a syntactic constituent will not destroy or cut apart a syntactic structure, the same cannot be said for phonological segments. If a segment is cut out, the precedence structure itself falls apart. Thus, though non-repetition is preferred, this is simply impossible in the linearization of phonological forms.

To conclude, we have attempted a measure of descriptive adequacy, and showed that multiple reduplication allows the subtly divergent predictions of seemingly very similar models to be empirically compared. In terms of explanatory adequacy, our derivational linearization algorithm severely limits the learner's hypothesis space.

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