Two applications of Precedence-Based Phonology

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Precedence-Based Phonology (PBP, Raimy 2000) demonstrates the utility of explicitly encoding precedence relations among X-slots in phonological representations in accounting for a range of phonological and morphological phenomena, with a focus on reduplication. One of Raimy's most important results is the demonstration that apparent over- and under-application of phonological processes in reduplicated forms can be handled in a derivational framework, contrary to claims in the Optimality Theoretic literature (McCarthy & Prince 1995). If Raimy's use of precedence relations were just an *ad hoc* proposal to counter the claim that phonology must be non-derivational, it would be of limited interest. In this paper, we analyze two phenomena that show that Raimy's approach is not parochial, but rather can serve as the basis of an interesting range of analyses.

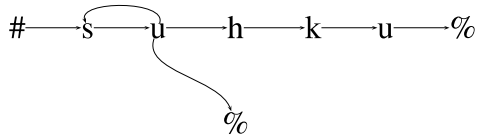
Guarijio: Our analysis of Guarijio "abbreviated" reduplication combines Raimy's treatment of reduplication with an approach to subtraction morphology that also uses PBP (Gagnon 2008, w/ modifications from Samuels 2011).

(1) abbreviated reduplication in Guarijio (Caballero 2006: 278)

a. nogá 'to move'	no-nó 'to start moving'
b. suhku 'to scratch body'	su-sú 'to start scratching the body'
c. muhíba 'to throw'	mu-mú 'to start throwing'

Gagnon's approach to subtraction morphology is that the morpheme consists of a precedence arrow that jumps from a given root segment to a word end symbol "%". In order to generate the Guarijio facts, we combine such a jump with a typical back loop used for reduplication, as in (2). The "abbreviated" morpheme consists of a precedence arrow from the **first vowel** back to the **initial X-slot**, as well as one from the **first vowel** to the morpheme's end symbol, **%**.

(2) suhku 'to scratch body'; su-sú 'to start scratching the body'



According to the linearization algorithm we adopt, the form in (2) will linearize as *susu*. This is exactly the kind of result we want—we need morphological back-loops (like u→s) for reduplication and we need jump loops (like u→%) for subtraction, and now we find that these simple elements can be combined in a single morphological construction. This initially surprising data is amenable to an analysis using pieces that were independently posited.

Mbe: In order to account for over- and under-application of rules in reduplicated forms,

Raimy proposed the following solution. We know that rules of segmental phonology are often sensitive to the immediately preceding and following segments of the target. In PBP, a segment can immediately precede or follow more than one other segment. If a rule is sensitive to whether a triggering condition is met by *all* preceding segments, *underapplication* will arise when that condition is not met. If a rule is sensitive to whether a triggering condition is met by *at least one* preceding segment, then *overapplication* can arise—a rule will apply despite the surface order of segments appearing to not meet the conditions in the linearized output. In other words, rules quantify over precedence relations. For Mbe, we need the idea that underapplication can occur when a rule has a universal quantification condition.

In Mbe, Class 2 reduplicative imperative singular (RIS), diminutive (DIM), and inchoative (INCH) morphemes all have two alternants, one with a nasal N and one without. When there is no nasal in a base, the three morphemes behave alike: the non-nasal form is realized—CVØ for the RIS (3a) and Ø for the DIM (3e-f) and INCH (3j). However, the morphemes diverge when there is a nasal in a base: DIM (3g-i) and INCH (3k-l) are indifferent to the position of nasal and show up with their N alternant; but the RIS is sensitive to the position of the nasal in the base it attaches to. For this morpheme, the nasal variant surfaces *only if the nasal of the base is non-initial:* the initial /m/ in (3b) triggers the CVØ alternant, but the non-initial nasal of (3c-d) trigger CVN alternant (with place assimilation).

(3) nasal alternations in Mbe (Walker 2000: 68, 69, 71)
i. Class 2 reduplicative imperative singular (underlying form: CVX)
a. jû-júbò ‘go out’ b. mə̂-mâl ‘finish’
c. gbə̂ŋm-gbénò ‘collide’ d. dzûn-dzûɔŋ ‘be higher’
ii. diminutive (underlying form: X)
e. kɛ̀-gògòrò ‘little wall’ f. kɛ̌-fúɔrɔ́ ‘little brains’
g. ká-n-ʃĭaní ‘little work’ h. kɛ̌-n-tɛ́m ‘little axes’ i. kɛ̀-m-mù ‘little story’
iii. inchoative (underlying form: X)
j. rê-káb ‘has started to dig’
k. rê-ɲ-jíɔnì ‘has started to forget’ l. rê-ŋ-kɛ́n ‘has started to walk’

Using universal quantification over precedence relations, we propose a unified **fully phonological** solution. In brief, nasal alternants *of all three morphemes* are realized when there exists a nasal to the right, *and all* the immediate precedence relations involving this nasal include a segment. For (3b), the bilabial nasal is in the initial position, so there the relation “#→m” fails to meet the condition; compare (3i) where the /kɛ̀-/ prefix guarantees that the base /m/ is always preceded by a segment. With the correct morphology and quantification over precedence relations, needed independently for reduplication, the puzzling alternations and apparent antilocality condition fall out naturally.

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