Challenging Locality in Constraint Indexation: Epenthesis in the Vedic Perfect

Constraint indexation (Pater 2006, to appear) has recently been advanced as a means of capturing phonological processes conditioned by morphology in an Optimality-Theoretic framework. Under this approach, lexically-indexed markedness and faithfulness constraints are introduced into the grammar, applying only to certain morphemes, not to others. The result is a system that Pater argues is better able to account for the data than the cophonology (see e.g. Anttila 2002, Inkelas and Zoll 2007) and indexed-faithfulness-only (Fukazawa 1999, Itô and Mester 1999, 2001) alternatives.

Pater's approach, however, faces a significant challenge to one of its key tenets, namely, its conception of locality. In order to restrict the operation of any process seeking to repair indexed constraint violations to the derived environment, Pater holds that the structure militated against by the indexed constraint must include at least some portion of the indexed morpheme. In a study of 'perfect union vowel' epenthesis in Vedic Sanskrit (Macdonell 1910), I argue that this conception proves *too* restrictive, and in order for his approach to be viable, the locality domain must be expanded.

The Vedic perfect conjugation idiosyncratically disfavors superheavy syllables (i.e., syllables ending in V:C. or VCC., via general principles of the language's syllabification) at the juncture between stem and ending; the illicit structures are resolved by epenthesis of [i], as shown in (1). On the other hand, [i] does not occur when the ending is vowel-initial (2), or when the final segments of the perfect stem can constitute a non-superheavy syllable (3). Superheavy syllables do surface outside the perfect (4).

(1)	ɑːs#mɐ	→	ɑː.si.mɐ	'be'	1PL.ACT.IND.PERF.	(*ɑːs.mɐ)
	nind#mɐ	→	nin.di.mɐ	'revile'	1PL.ACT.IND.PERF.	(*nind.mɐ)
(2)	ɑːs#ur	→	ɑː.sur	'be'	3PL.ACT.IND.PERF.	(*ɑː.si.úr)
	tɐtɐrd#ɐ	→	tɐ.tɐrd.ɐ	'split'	3SG.ACT.IND.PERF.	(*tɐ.tɐr.di.ɐ)
(3)	ɟigeː#tʰɐ	→	ɟi.geː.tʰɐ	'conquer'	2SG.ACT.IND.PERF.	(*ɟi.geː.i.tʰɐ)
	ɟɐgɐn#mɐ	→	ɟɐ.gɐn.mɐ	'go'	1PL.ACT.IND.PERF.	(*ɟɐ.gɐ.ni.mɐ)
(4)	ɕɑːs#mi	→	ɕɑːs.mi	'order'	1SG.ACT.IND.PRES.	(*ɕɑː.si.mi)
	joːktrɐ	→	joːk.trɐ	'rope'	NOM.SG.NEUT.	(*joːk.ti.rɐ)

Within an Optimality-Theoretic framework, we conceive a mismatch between perfect and non-perfect forms with respect to the constraint *3μ ('No trimoraic syllables'): this constraint must rank higher than DEP when applicable to the former, but lower than DEP when applicable to the latter (5).

(5) a. Perfect

ɑːs#mɐ	*3μ	DEP
a. ɑːs.mɐ	*!	
☞ b. ɑː.si.mɐ		*

b. Non-Perfect

ɕɑːs#mi	DEP	*3μ
☞ a. ɕɑːs.mi		*
b. ɕɑː.si.mi	*!	

A constraint indexation account of this phenomenon must first address the question of which morpheme – stem or ending – ought to be co-indexed with the variant of *3μ indexed for perfect forms. (Concurring with Pater, contra faithfulness-only indexation we allow for this markedness constraint to be indexed, as introducing a variant of DEP indexed for the perfect and ranked below *3μ would prove powerless in the face of general DEP, necessarily highly-ranked given other aspects of the language's system of syllabification.) That we are dealing with epenthesis distinguishes this case from any considered by Pater, where segments undergoing change (such as syncope in Yine) are already present in underlying structure and hence belong to one morpheme or another, which is obviously to be indexed. Here, however, a non-original segment is inserted, and not within the bounds of any morpheme, but rather at the juncture between stem and ending.

Ostensibly, then, either of these morphemes is a candidate for indexation; yet it must be the perfect endings that are indexed. The perfect stem, a derived structure created by prefixed reduplication of the verbal root, is as such unamenable to lexical indexation. Even if we were to posit a perfect stem template, capable of indexation, a bigger concern remains: namely, that indexing the stem would incorrectly predict *i*-epenthesis throughout the perfect, when it does not occur in *all* perfect forms (6). Epenthesis occurs only before endings that are 1) peculiar to the perfect, as the indicative endings are (and imperative *–tu* is not); and 2) consonant-initial.

(6) mumo:k#tu → mu.mo:k.tu 'release' 3SG.ACT.IMPV.PERF. (*mu.mo:.ki.tu)

mɐma:rj#ɐ → mɐ.ma:r.jɐ 'wipe' 3SG.ACT.IND.PERF. (*mɐ.ma:.ri.jɐ)

Again, indexing the endings creates a direct challenge to Pater's notion of locality: while the C-initial ending contributes to the disfavored structure (a superheavy syllable), it is itself not part of, but rather adjacent to, it. We are thus compelled to redefine the bounds of the 'local' domain to include not only the indexed morpheme, but also segments or structures immediately adjacent to it, directly across the morpheme juncture. Doing so crucially maintains the viability of this account of the Vedic perfect union vowel, especially in view of alternatives which may be crafted using cophonologies or allomorphy subcategorization (Paster 2005, 2006), either of which is problematic in its own right: the former evoking the issue of satisfactorily accounting for nonderived environment effects (but see eg. Inkelas and Zoll 2007 and Anttila to appear), the latter being unable to formally encode in subcategorization frames the phenomenon's clear motivation of prosodic optimization.

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