Unnatural Rules and LCC in Grounded Phonology

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In this paper we propose an Optimality Theory (OT) analysis of unnatural or crazy rules by means of Local Constraint Conjunctions of functionally grounded constraints. So-called crazy rules (Bach & Harms, 1972; Anderson, 1981; Buckley, 2000) are apparently unnatural phonological processes. In OT, processes are understood as strategies to avoid constraint violations. Constraints are grounded either functionally (Hayes, 1999; Collins, 2013) or typologically, or ideally both (Prince & Smolensky, 1993). Phonetically grounded constraints, though, have been argued to be incapable of accounting for unnatural processes (Buckley, 2000) in the same way that Anderson (1981) criticised Natural Phonology.

Local Constraint Conjunction (LCC), is a theoretical option in OT, by which two (or more) otherwise lowly ranked constraints are joined together and representations that violate both (all) conjoined constraints in the same locus are judged worse than those that violate them separately (Prince & Smolensky, 1993; Moreton & Smolensky, 2002). LCC has been accused of doing exactly what grounded constraints alone cannot: predict all sorts of crazy patterns (McCarthy, 2002). Though, Moreton and Smolensky (2002) argue that LCC theory is typologically restrictive (at least in the analysis of chain shifts). In this paper we take McCarthy's claim seriously and use LCCs of phonetically grounded constraints to account for seemingly unnatural phenomena. Potentially, this gives us a more restrictive theory and an analysis with more explanatory power than the formulation of abstract arbitrary rules or constraints. The arbitrariness resulting in unnaturalness lies in the lack of restrictions on which constraints can be conjoined.

We will concentrate on some of the cases discussed in Buckley (2000), e.g., antipalatalization in Kashaya, hyperpalatalization in Zuni and denasalizing palatalization in Ojibwa. We will, of course, ignore patterns that have been shown to not be unnatural after all, such as r-intrusion in English (see, e.g., Krämer (2008) for a natural account). In this abstract we demonstrate the approach with a sketch of our account of antipalatalization in Kashaya. The alternation in Kashaya (Buckley, 2000), in which an underlying high front vowel is realised as a back vowel when preceded by /d/ (see 1 a., b. and c.) can be seen as a logically possible, but unlikely, strategy to satisfy constraints that otherwise would cause palatalization of /d/ before /i/. In spite of a natural markedness constraint demanding agreement in palatality between /i/ and a preceding consonant, /d/ doesn't palatalize, because of high-ranking positional faithfulness to onsets (Beckman, 1998). This constraint outranks faithfulness to vowels. Thus, since the consonant can't palatalize, the vowel has to depalatalize to avoid a violation of PalatalizeCoronal, as shown in tableau 2. In this case LCC only plays a role in restricting the pattern: The voiceless coronal /t/ doesn't cause backing of /i/ (1 c., d. and e.). The unconjoined constraints alone cannot account for this pattern (see tableau 3). The palatalization constraint is locally conjoined with a markedness constraint violated by [d], but not by [t], i.e., the prohibition against voiced obstruents (VOP) (see tableau 4).

In conclusion, we show that unnatural phonological processes can be accounted for in OT by means of the interaction of phonetically grounded (or "natural") constraints. Thus, taking the existence of seemingly unnatural processes as proof of an *entirely* substance-free and arbitrary phonological module is not warranted. Rather, we argue, these cases result from the interplay of phonetically grounded constraints which are organized by autonomous (i.e. non-phonetic) principles.

(1) Kashaya examples (Buckley, 2000)
    a.   /cad-i/   →   [cadu]   'look!'
    b.   /wa-ad-i/   →   [waːdu]   'come here!'
    c.   /mahsad-in/ →   [mahsadun] 'while taking away'
    d.   /ʃu-q'aːʈ-i/ →   [ʃuq'aːʈi]   'groan!'
    e.   /mo-mul-in/ →   [momuːlin] 'while running around'

(2)

/cad-i/		Ons-ID	PalatalizeCoronal	ID([Hi])
a. ☞	ca.du			
b.	ca.dʲi	*!		
c.	ca.di		*!	
d.	ca.da			*!

(3)

/ʃu-qaːt-i/		Ons-ID	PalatalizeCoronal	ID([Hi])
a. ✓	ʃu.qaː.ti		*!	
b. ✗	ʃu.qaː.tu			
c.	ʃu.qaː.tʲi	*!		
d.	ʃu.qaː.ta			*!

(4)

			Ons-ID	VOP&PalCor	ID([Hi])	ID-IO
☞/cad-i/	→	ca.du				*
/cad-i/	→	ca.di		*!		
☞/ʃu-qaːt-i/	→	ʃu.qaː.ti				
/ʃu-qaːt-i/	→	ʃu.qaː.tu				*!

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