Unification and Metaphony in South Saami

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Much phonological theorizing builds on an alleged dichotomy between structure-building rules and neutralizing (structure-changing) rules. The principal theoretical aim of this paper is to argue that there is no such dichotomy.

Declarative Phonology (Scobbie et al. 1996; Coleman 1998) is a conceptually minimal approach to phonological knowledge in which generalizations are stated directly over a unique surface level of representation (there are no intermediate levels or strata). DP is computationally restrictive, since structure-changing operations (transformations) are disallowed: the information contained in representations may be combined in a monotonic structure-building operation, unification. Constraints/rules in DP are not extrinsically ordered, either derivationally, as in rule-based theory, or hierarchically, as in OT. Only intrinsic principles of ordering (e.g. the Elsewhere Principle) apply.

In DP there is a straightforward structure-building interpretation of neutralization. Specifically, neutralization presupposes an underlying disjunction of specifications. As an example of this, consider the well-known contrast in obstruent voicing which is neutralized in word-final position in languages like German and Russian. This contrast must be reinterpreted as between non-alternating [−voiced] and alternating [+voiced]⩒[−voiced]. Once this device is made available, the old division between structure-building and structure-changing rules evaporates.

However, I'll also be arguing that computationally pertinent elements (CPEs) cannot be conflated with how they are interpreted substantively, or what is predicated of them. Substantive identity does not imply formal identity. Yet, conflation has become common practice in phonological research, and failure to observe the distinction has dire empirical consequences as soon as one attempts to formulate subtler patterns of neutralization declaratively.

The discussion will be grounded in an analysis of metaphony in the Vefsn dialect of South Saami, a Finno-Ugric language spoken by about 300 people in Norway and Sweden Lorentz (1973). The patterns present a particular descriptive challenge for the reason that, under declarative assumptions, computationally distinct CPEs may be featurally *non*-distinct despite being associated with distinct surface alternations.

Historically, bisyllabic and trisyllabic words had distinct systems of vowel contrast in the first (stressed) syllable and the unstressed second and third syllables. In the first syllable σ_1 we had /i a o u ī ā ō ū/, whereas in the second syllable σ_2 we had /i a u ī ā ū/. Metaphony originally involved the spreading of vocalic features from σ_2 to σ_1, and the six vowels in σ_2 were associated with distinct alternations in σ_1. None of the historical values of the vowels survive intact in polysyllabic words in the modern language. Furthermore, the vowels of σ_2 have been subjected to featural and quantitative attrition. On the surface, the only vowels possible in this position are now central ə and *i*. Despite this mass leveling of vowel contrast in σ_2, the contrasts have survived in the form of the metaphonic alternations in σ_1. This is shown in (1), where the historical σ_1 vowel is shown ranged along the top row of the table, and the historical σ_2 vowel is shown in the far right column.[1]

If the source of the phonological variation in the vowels of σ_1 cannot be attributed synchronically to σ_2, metaphony must involve the docking of lexically floating feature complexes into the vowel of σ_1. These feature complexes are construed synchronically as affixes associated with specific morphological environments.

Since, in DP, the 'underlying form' must be a partial description of the fully specified surface form, we first reduce each set of variants to its common denominator. This will give us eight underspecified representations for the vowels of σ_1 and six floating feature complexes, one for each of the six metaphony series. Crucially, this analysis returns several pairs whose partial descriptions are *identical*. For example, the partial descriptions for short *'ĭ'* and *'ă'* in σ_1 are non-distinct (they are both []), yet they pattern differently with respect to metaphony, since *'ĭ'* ranges over the set {a i ï ü} but *'ă'* ranges over the set {ɑ e u i}. The vowels in each of these sets have nothing in common besides the fact that they are vowels. The same is true of short *'ŭ'* (range: {ɔ u ü}) and *'ŏ'* (range: {ɔ ü}) in σ_1,

[1] For convenience, I will refer to the modern reflexes by their etymological designation: *'ŭ'* is nothing more but shorthand for the partial description [+round].

which are both [+round]. Similar problems arise when we try to factor out the common denominators for each of the six metaphony series. Both the *ĭ*- and the *ī*-series have the common denominator [−back], yet they affect the vowels of σ_1 differently, as can be verified from (1) (e.g. the *ĭ*-series is associated with monophthongization in σ_1, and the *ī*-series is not). Similar problems arise in defining the contributions of the *ā*- and *ū*-series, both of which contribute [+low] (!).

This is precisely where the descriptive challenge lies, and where the conceptual distinction alluded to earlier between CPE and predicate is thrown into relief. CPEs are shorn of any content whatsoever. Given the distinction betwen categorial form and featural content, there is no reason why distinct CPEs should not be associated with the same featural content. Indeed, metaphony in South Saami provides us with more than one case in which this has to be so. If DP is on the right track, then featural difference cannot be *constitutive* of contrast: contrast is a fundamental and irreducible aspect of any system of categories and categories may contrast (i.e. be distinct CPEs) irrespective of any content they share.

In the case at hand, we would analyze, say, the *ĭ*- and *ī*-series as distinct CPEs, CPE_1 and CPE_2. Since what matters is that they are distinct to the computational system, we can formulate the relevant constraints on the mapping between the underlying and surface form independently for each CPE, without reference to the featural content of either. Constraints thus turn out to be implications holding between abstract contentless category labels and featural content.

In pursuing this solution, I hope to show that DP has a major role to play in the emerging debate on the place of substantive considerations of naturalness in phonological theory (Hale and Reiss 2000) and the extent to which the phonological grammar is a purely computational system.

(1) *Metaphony table for Vefsn South Saami*

ˊīC₀V	*ˊāC₀V*	*ˊōC₀V*	*ˊūC₀V*	*ˊĭC₀V*	*ˊă̄C₀V*	*ˊŏC₀V*	*ˊŭC₀V*	
ea	ɑɑ	oɔ	øa	a	ɑ	ɔ	ɔ	*V́C₀ā*
ea	ɑɑ	oɔ	oɔ	a	ɑ	ɔ	ɔ	*V́C₀ū*
ie	aa	o̤	uø	i	e	ü	ü	*V́C₀ī*
ië	ɑɑ	oɔ	uo	ï	ɑ	ɔ	u	*V́C₀ă̄*
øø	oo	oo	oo	ü	u		u	*V́C₀ŭ*
ee	ee	øø	øø	i	i	ü	ü	*V́C₀ĭ*

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