Representation and variation in substance-free phonology: a case study in Celtic

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18th February 2013

1 Plan

• The substance-free approach
• Modularity as motivation for the substance-free framework
• A case study: laryngeal contrast in Brythonic Celtic

2 Substance-free phonology

• Any theory of phonology should have both a representational side and a computational side

• Mainstream SPE-style (with a twist in the Concordia School; Hale and Reiss 2008, et passim), much of OT: representations are phonetically grounded and thus relatively easy to recover, computation is paramount

• Unification-based approaches (e. g. Scobbie, Coleman, and Bird 1996; Coleman 1998): computation is trivial, representations are all that matters

• Representations make a contribution, but computation is also important: autosegmental and geometric approaches (McCarthy 1988), various types of underspecification (Archangeli 1988; Steriade 1995; Dresher 2009), structural markedness (Causley 1999; de Lacy 2006), Tromsø-style substance-free (Morén 2006, 2007; Blaho 2008; Youssef 2010), also Odden (2013)

2.1 This thesis: the representational side

• The contrastivist hypothesis: as far as possible, phonology makes use only of features allowed in the lexicon (Dresher 2009; Hall 2007)

• Substance-free representations
Features are emergent and language-specific

No \textit{a priori} connection to substance (e. g. phonetics)

Phonological patterns are the main evidence

Non-trivial but constrained phonetics-phonology interface: the phonological analysis does not make \textit{simplistic} predictions about how things should be pronounced

  - Tier structure: recursion of tiers
  - Privative (unary) features: no reference to minus values
  - Structural size defines markedness relations without stipulation (contrast de Lacy 2006; Nevins 2010)

- Ternarity and the contrastive hierarchy
  - Unlike other versions of the PSM (and other privative approaches), I allow a contrast between a bare node and the absence of a node
  - So $\langle \times \rangle$ is not the same as $\langle \times, \text{C-lar} \rangle$
  - Tier specification comes from the contrastive hierarchy à la Dresher (2009): when a feature is used for some subset of the hierarchy, the complement that does not get the feature gets the node (Ghini 2001)
  - Potential for ternary contrasts (Inkelas 1994; Krämer 2000; Strycharczuk 2012)

\textit{Far} Not a free-for-all: since tier structure also defines markedness relationships and feature interaction, this is not (necessarily) a notational variant of binary features

2.2 This thesis: the computational side

- Most flavours of modern phonological theory work with seriously powerful computation that can do just about anything

- This has to be recognized

- Division of labour on two sides

  - With a definition of phonology this narrow, many transcribable patterns will end up in the phonetics–phonology interface even if they reach statistical significance (Scobbie 2007)

  - Conversely, some patterns may be part of the morphosyntactic module rather than phonology (Trommer 2012, especially Bermúdez-Otero 2012; Bye and Svenonius 2012)

- In this thesis, I use stratal rather than fully parallel OT: several passes of computation over morphosyntactically defined domains (Kiparsky 2000; Bermúdez-Otero 2012)
Most importantly: whole-language analysis

- An advantage of OT is that analyses have implications: analysing a part of a grammar is never conclusive
- But a full analysis is impossible without an explicit representational framework
- Extended demonstration in the present thesis
- But why do we need to go substance-free?

3 Modularity in phonology

- Modularity is important for generative theorizing, which is predicated on a type of knowledge that is specific to language

- The locus classicus is Fodor (1983), but see also Jackendoff (2000, 2002)

- Contrast parallel architectures in the mould of Rumelhart and McClelland (1986)

3.1 Modularity vs. parallelism in phonology

- A modular approach should involve some domain-specificity

- An uneasy position for classic generative phonology because of the Jakobsonian legacy of substantive markedness and universal features (Jakobson, Fant, and Halle 1951; Chomsky and Halle 1968)

- Contrast Fudge (1967); Foley (1977): generative phonology is wrong because it is ‘transformational phonetics’

- Burton-Roberts (2000): phonology is not specifically linguistic in the generative sense, because it is so bound to substance

- Optimality Theory has its roots in PDP, see especially Smolensky and Legendre (2006); Scheer (2010)

- On the other hand, these days OT is often associated with ‘formal theorizing’, with episodic (laboratory, variationist) approaches on the parallel, non-modular side

3.2 The importance of representations

- A modular theory is more restrictive than a fully parallel one

- In principle, OT can be done in a modular way (van Oostendorp 2007; Bermúdez-Otero 2012)

- This requires serious discipline in formulating constraints
• But constraints are always constraints on representations (Morén 2007)

• If phonology is a module, an aspect of its encapsulation should be the existence of a dedicated universe of discourse (i.e. ‘alphabet’; Hale and Reiss 2008)

• So phonetic substance should not come into it: a non-trivial representational theory is needed

• Answering Burton-Roberts’ (2000) charge: if the phonological alphabet is not substance-bound, there is still a place for a linguistic phonological module

4 An example: Celtic languages vs. laryngeal realism

4.1 Brythonic laryngeal phonology

• In terms of laryngeal phonetics and phonology, Welsh is like English or German
  – Aspirated vs. partially voiced stops
  – Activity of the ‘aspiration’ feature in the phonology
  – Accords well with the theoretical literature

• Phonetically, Breton is like French (with full voicing of stops)

• But phonologically it is like Welsh

• I analyse Breton with a ternary contrast between voiceless (⟨\times, C-lar, [voiceless]⟩), voiced (⟨\times, C-lar⟩), and delaryngealized (⟨⟩) obstruents

• Delaryngealized obstruents only appear word-finally, so we expect two things
  – Cues for laryngeal features should depend on the phonetic rather than phonological context in word-final position (lack of phonological specification)
  – Confirmed: pre-sonorant voicing, phrase-final devoicing, obscuring of all laryngeal-feature cues
  – Word-final obstruents should be inactive in processes implicating laryngeal features, unless they can receive a C-laryngeal node
  – Confirmed: table 1 shows how spreading of C-laryngeal[voiceless] to a preceding obstruent is blocked unless a floating node (coming from the morphosyntax) intervenes
  – Table 1 also shows that C-laryngeal[voiceless] is the active feature/value
4.2 Resolving problems with laryngeal realism

- But there are extra predictions linking those to phonetics
- English-like ‘H languages’ must have phonologically unspecified lenis stops with variable voicing
  - Here, they may have a C-lar specification with no fixed realization (substance-free)
  - Confirmed: consistent prevoicing of lenis stops in Swedish (Helgason and Ringen 2008; Beckman et al. 2011), consistent devoicing of lenis stops in Scottish Gaelic (Ladefoged et al. 1998; Nance and Stewart-Smith, forthcoming)
  - Corollary: incomplete voicing in English does not follow from lack of specification
  - Confirmed (Westbury 1983; Kingston and Diehl 1994)
- French-like ‘L languages’ must have an active voicing feature
  - Falsified by Breton
- Takeaway: laryngeal realism goes off the rails as soon as it attempts to tie phonology into phonetics

4.3 Recap

- Attention to the phonological rather than to the phonetic patterning shows that phonology trumps phonetics for representational purposes
- The representation can only be uncovered through whole-language analysis
- Analysis of alternations rather than statistically significant distributions is crucial
- Descriptions cannot be taken for granted
5 Where does this leave us?

• Phonological representations are necessary and non-trivial
• Computational theories cannot be verified without inspection of the representations
• Consequence: the analytic focus of mainstream OT on factorial typology with very narrow predictions may be premature
• The predictions of formal phonology are architectural rather than specific and substance-bound (Odden 2013, also Strycharczuk 2012)

References


