

Situating phonological contrast: Distinctive feature theory

Daniel Currie Hall (Saint Mary's University)

Introduction Although there are several different theories of distinctive features in phonology, what they have in common (and share with Element Theory) is the notion that phonological segments are composed of smaller units that serve to distinguish them from one another, and that can be manipulated by the phonological component of the grammar. As Mielke (2011: 398) points out, features serve a triple purpose: they define segmental contrasts, identify structural changes in alternations, and identify sets of sounds that participate in alternations (natural classes).

The unification of these three functions makes potentially interesting predictions about phonological patterning. Because features are finite in number and their values are discrete rather than continuous, their use limits the amount of information available to the phonological computation. Theories that posit a universal set of features (e.g., Jakobson, Fant & Halle 1952; Clements & Hume 1995) thereby set an upper bound on how much phonetic detail feature-based representations can encode. The corresponding lower bound is determined by the features' contrastive function: enough features must be specified in any given language to make it possible to distinguish (at least) all the segments that contrast in the underlying lexical representations of that language. The Contrastivist Hypothesis (Hall 2007; Dresher 2009) posits that this minimum is also the maximum number of features assigned in any language. One motivation for this approach is methodological: if one begins by trying to use the minimum number of features to account for a language's phonological patterns, it should be easy to discover if more features are needed, but if one begins by specifying a larger number of features, it will not necessarily become obvious whether a smaller set would have sufficed.

The empirical motivation for the Contrastivist Hypothesis is that some phonetic properties of segments are systematically ignored by the grammar, even when the features that correspond to them are phonologically active on other segments. The explanation for this that the Contrastivist Hypothesis offers is one that gives contrast a central role: any feature that is not contrastive will be unspecified, and thus not available to the phonological computation. For example, in many languages with assimilatory voicing, sonorants, on which voicing is phonetically present but not phonologically contrastive, do not act as triggers.

Among current distinctive feature theories, there are two significant controversies relevant to the theme of the present workshop: Are features universal? And do they necessarily have phonetic content? In this talk, I will offer a Contrastivist response to these questions, arguing that features are not universal, but that they are phonetically contentful.

Question 1: Are features universal? Because it posits that phonological representations depend on the phonemic contrasts present in a given system, the Contrastivist Hypothesis is clearly incompatible with theories in which a segment's feature specifications can be determined simply by comparing its phonetic properties against a universal list of features and assigning pluses and minuses accordingly (as in Hale & Reiss 2003). It is, however, logically consistent with the proposition that there is an innate and universal set of features, of which each language employs some subset.

However, there are reasons to posit that what UG supplies the learner with is not a list of available features, but rather the ability to construct featural representations by observing categories, contrasts, and patterns in the input data (Blaho 2008; Cowper & Hall 2014). For one thing, languages using different modalities appear to use very different features; there is so little overlap between the sets of features needed for signed and spoken languages that there is little explanatory value to be gained by saying that they are drawn from a common pool. Languages also sometimes encode phonetically similar contrasts in different ways (see, e.g., Steriade 1995 on [ATR] vs. [RTR]), or use similar features to mark different distinctions (see Mielke 2005 on variation in the patterning of nasals and laterals with respect to [\pm continuant]). Moreover, we know from morphosyntax that learners must be able to acquire featural contrasts that correspond to categories that cannot plausibly be innate: noun classes (e.g., in Bantu languages) can have arbitrary membership, but appear to be encoded featurally, because they are involved in obligatory syntactic agreement. Given that a feature-inducing learning mechanism

must be available for at least one component of the grammar, it is more parsimonious to assume that phonological acquisition makes use of this same device, rather than positing that UG also provides a menu of hard-wired phonological features.

In the Contrastivist approach, features are inferred by observing correlations between differences in different aspects of linguistic structure. For example, a phonological feature can be inferred when a particular phonetic contrast aligns with one or more semantic contrasts: the correlation reveals the phonetic contrast to be phonemic, and requires it to be featurally encoded.

Question 2: Do features have phonetic content? This second question arises only if the first question has been answered in the negative. Among non-universalist theories of distinctive features, Radically Substance-Free Phonology (Blaho 2008; Odden 2019) holds that features have no substantive content at all. In this approach, features serve to distinguish segments and identify their phonological patterning, but not to describe them phonetically; if a feature identifies the segments that participate in some phonological process, this means that they constitute a phonological class, but not necessarily a phonetically natural one. If such classes exhibit a strong cross-linguistic tendency to share phonetic properties, the explanation for this is to be sought in perception, acquisition, and diachronic change, not in the features themselves.

While substance-free features can distinguish segments and can group them together, it is less clear how well suited they are to the third traditional function of distinctive features, namely identifying structural changes. If a feature has no phonetic content, then spreading it to a segment (or delinking it from one) need have no consistent phonetic effect. This means that disparate alternations can be given a spurious formal unity through the assignment of arbitrary features.

From the Contrastivist perspective, another reason to say that features have phonetic content is that this makes useful predictions about the shapes of phonological inventories. As Hall (2011) argues, contrastive features can only encode how segments differ; when the phonetic content of specified features is enhanced in phonetic implementation, the effect is that the surface inventory is robustly phonetically distinct, without recourse to mechanisms (such as those of Dispersion Theory) that explicitly evaluate phonetic distinctness.

In the view outlined here, then, phonological contrast is central to how distinctive features are assigned, and plays a decisive role in determining what phonetic information is present in the phonological computation.

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