Analytical Summary of McCarthy 1988, 'Feature Geometry and Dependency: A Review'

This article is an introduction to Feature Geometry and a summary of its results. Feature Geometry (FG) is a research program in phonology that assumes distinctive features are organized hierarchically in tree structure. It is used to account for a range of phonological patterns in segmental phonology. In particular, it accounts for 'class behavior' in phonology where a process operates on a consistent subset of features, like place features. FG accounts for this fact by proposing nodes in the feature tree for these feature subsets. Segmental processes showing class behavior are accounted for in FG using the basic operations of autosegmental phonology, i.e., spreading and delinking, of the class node.

Feature class behavior can be illustrated with the ubiquitous process of nasal-place assimilation, e.g., /n +p/ → m-p, /n+k/ → ŋk. The correct analysis requires recognizing the class of place features, because the targeted nasal agrees with the place feature of the following segment, regardless of which one. In FG, individual place features reside under the Place node, so this fairly common process can be analyzed as a result of one of the basic operations in autosegmental phonology, i.e., linking of two segments to a single node, the Place node.

This analysis can be contrasted with a linear analysis in SPE phonology in which segments are represented as distinctive feature matrixes. This approach does not recognize the class of place features, and so the SPE rule requires reference to each distinct place distinction, which in the SPE theory of place involves three features and complicated alpha-notation. Another alternative analysis is possible that involves n-ary features, for example, multiple feature specifications for place distinctions. This analysis is more successful in accounting for class behavior, since the entire class is encompassed by the n-ary feature. However, it can be distinguished from the FG account above because it does not give a natural account of place cooccurrence restrictions in languages like Arabic. Such restrictions require representing the different place features on different tiers to account for restrictions on non-local consonants, but an n-ary place feature does not allow for this tier separation without special assumptions.

What evidence is used to motivate feature classes in the feature tree? This article uses three types: (i) assimilation of a whole class of features, like nasal-place assimilation, (ii) operations consistent with delinking of a feature class, like debuccalization of glottalized stops to glottal stops, and (iii) dissimilation of features in a coherent class. (i) and (ii) are the two principal operations in autosegmental phonology, spreading and delinking of a class node. (iii) involves applying the Obligatory Contour Principle (OCP) to features in a class. For example, in Arabic, root consonants very rarely contain two consonants that have the same place specification (manner classes may refine the place classes). Applying the OCP to place features successfully accounts for this systematic avoidance in the lexicon.

The FG hypothesis and the above methods clarify three distinct types of features: (i) features that are dominated by a class node, i.e., the Laryngeal and Place nodes, and therefore show class behavior, (ii) features that do not fall under any major feature class, like [continuant] and [nasal], and (iii) the root node features, which are [sonorant] and [consonantal]. Root node features in a sense define the segment in FG, because they are the highest node on the feature tree. Therefore, any process that affects them also affects the entire segment, as with total assimilation or segment deletion. This behavior is different from the features that do not fall into a class (ii). These may assimilate, dissimilate, or be deleted on their own, but not as part of the whole segment or a feature class. Finally, FG has led to certain refinements of the feature tree, most notably the characterization of place features as major articulators (e.g., labial, coronal, dorsal). The articulator theory successfully accounts for the facts of all three process types (assimilation, debuccalization, and dissimilation), while an alternative based in binary [anterior] and [coronal] features does not.