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Feature Centrality and Conceptual Coherence

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Conceptual features differ in how mentally tranformable they are. A robin that does not eat is harder to imagine than a robin that does not chirp. We argue that features are immutable to the extent that they are central in a network of dependency relations. The immutability of a feature reflects how much the internal structure of a concept depends on that feature; i.e., how much the feature contributes to the concept's coherence. Complementarily, mutability reflects the aspects in which a concept is flexible. We show that features can be reliably ordered according to their mutability using tasks that require people to conceive of objects missing a feature, and that mutability (conceptual centrality) can be distinguished from category centrality and from diagnosticity and salience. We test a model of mutability based on asymmetric, unlabeled, pairwise dependency relations. With no free parameters, the model provides reasonable fits to data. Qualitative tests of the model show that mutability judgments are unaffected by the type of dependency relation and that dependency structure influences judgments of variability.

INTRODUCTION

The notion of a feature is central to the study of cognition. Models abound which assume that mental representations can be reduced to sets of features and that measures over those features can predict performance. Feature-based models have been applied to the analysis of similarity (Tversky, 1977), metaphor (Ortony, 1993), categorization (e.g., Estes, 1993;

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