

Inductive inferences about disease: The effect of shared causal features

Tanja Rapus (rapus@ego.psych.mcgill.ca)

Department of Psychology; McGill University, 1205 Dr. Penfield Av.
Montreal, PQ, Canada, H3A 1B1

Introduction

Causal or *deep* features of concepts have been found to play an important role in categorization judgments (e.g., Ahn, 1998). Individuals are more likely to categorize based on a matching cause than matching effects (Ahn & Dennis, 1997). Causal features can be characterized as those that give rise to or explain the surface features of a concept, such as perceptual or behavioral attributes.

The present research explored how the presence of shared deep and surface features affects other types of induction, specifically, the projection of new attributes or information to a novel case. The key issue examined was whether shared deep-features have a greater impact than shared surface-features of a concept on the mapping of information from a known case to a novel one. Specifically, does a disease which shares a deep feature with a novel disease (i.e., a feature that is more central to the concept of disease) serve as a better case or analogue from which to infer new information about a novel disease?

Experiment 1

Method and Results

Subjects received descriptions of a new, unclassified disease (target) and a known disease (source). Further, the source disease contained additional information about an attribute that could potentially be mapped to or inferred in the target disease. The source and target diseases shared either the same deep feature (same underlying cause) or the same surface feature (same symptom).

People were more likely to map additional information to the target disease when diseases shared a deep rather than a surface feature ($p < .0167$). Further, deep-feature matches were judged to be more similar, and had a greater impact on categorization judgments, in that a novel disease was more likely to be classified as an instance of the known disease when it had a matching deep versus a matching surface feature.

Experiment 2 was conducted to determine what effect the number of shared features has on inductive judgments. Specifically, diseases either shared a single deep feature or shared multiple surface features.

Experiment 2

Method and Results

Subjects received descriptions of target and source diseases, where deep-feature matches shared the same underlying

cause, and surface-feature matches shared multiple symptoms. Again, source disease descriptions contained additional information about an attribute that could potentially be mapped to the new (target) disease.

In contrast to the results of Experiment 1, it was found that people were more likely to project or map new information to the novel disease when diseases shared multiple surface features rather than a single deep feature ($p < .0167$). Additionally, surface-feature matches were also rated more similar than deep-feature matches, but surface-feature matches did not have a greater impact on categorization judgments than deep-feature matches.

General Discussion

When diseases shared a cause versus a symptom, the likelihood that new information would be mapped to a novel disease increased. However, when diseases shared multiple symptoms the likelihood of projecting new information was greater than when diseases just shared a cause. The present results suggest that several surface features can be as powerful as one shared deep feature in mapping new information to a novel case. It is possible that shared multiple symptoms were viewed as implying the existence of a common cause. Multiple shared surface features, however, did not drive categorical judgments to a greater extent than a single shared deep feature. In general, the causal status of features plays an important role in inductive processes.

Acknowledgments

This research was supported by an NSERC postgraduate fellowship.

References

- Ahn, W. (1998). Why are different features central for natural kinds and artifacts?: The role of causal status in determining feature centrality. *Cognition*, 69, 135-178.
- Ahn, W. & Dennis, M. (1997). Deep versus surface features in categorization and similarity judgment. *Proceedings of the Nineteenth Annual Conference of the Cognitive Science Society* (pp. 850). Mahwah: Erlbaum.