Teleological Explanation: Why We Answer "Why?" the Way We Do

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Introduction

Seeking explanations is a fundamental part of everyday cognitive life. Many accounts of concepts and naïve theories have correspondingly placed explanation at the center of conceptual representation. Concepts for which we have an underlying explanation are learned more efficiently (e.g. Spalding & Murphy, 1999) and said to gain conceptual coherence (Murphy & Medin, 1985) and embody systematic sets of beliefs (Keil, 1989). Similarly, causal-explanatory principles are thought to ground our naïve theories of physics, psychology, and biology (e.g. Carey, 1985).

Despite the prevalence of explanation as both an everyday behavior and a theoretical construct, there are many open questions about its cognitive basis. For example, why do we apply certain kinds of explanations selectively?

Here we summarize three experiments investigating the conditions under which adults accept teleological explanations (TEs) — explanations in terms of a function or goal. Specifically, we examine whether the domain of what's being explained, the causal role of the function being invoked in the explanation, and the familiarity of the causal process influence TE acceptance. While previous work suggests that adults restrict TEs on the basis of domain (Kelemen, 1999), we predicted that TEs would be accepted whenever the function invoked in the explanation played a causal role in bringing about what was being explained, consistent with Wright's (1976) philosophical analysis.

Experiments

Subjects read short scenarios followed by why-questions and possible answers. They judged whether the answers—which included a teleological, a mechanistic, an intention-based, and two filler explanations—were acceptable.

Experiment 1: Domain versus Causal Role

36 undergraduates participated by reading scenarios involving a process that led to an object with a functional feature, but the causal role of the function and the domain of the object varied. With three causal story types ('intention'—involving a human intention to produce a functional feature, 'selection'—involving a non-intentional, function-driven process, and 'accident'—involving an accident that led to a functional feature) and objects from three domains (prototypical artifacts, biological parts, and non-biological natural things), there were a total of 9 stimulus types. While the 'intention' and 'selection' scenarios both involved functions that played a causal role, only the former causal process was familiar.

There was a main effect of causal role, with no significant effect of domain nor an interaction between causal role and domain. TEs were almost always accepted for 'intention' scenarios (86%), often accepted for 'selection' scenarios (50%), and rarely accepted for 'accident' scenarios (17%).

Experiment 2: Artificial and Natural Selection

To test the hypothesis that some subjects rejected TEs for 'selection' scenarios in Exp 1 because they involved an unfamiliar causal process, we had subjects evaluate explanations for scenarios involving artificial and natural selection, both familiar and with causal roles equivalent to 'intention' and 'selection' scenarios, respectively. 24 undergraduates saw one scenario each. The majority accepted the TE in both conditions (100%; 83%), suggesting that familiarity of the process—above and beyond causal role—is important to TE acceptance.

Experiment 3: Familiarity

To insure that familiarity accounted for the difference between TE acceptance in the 'selection' scenarios from Exp 1 and the natural selection scenarios from Exp 2, we made 'selection' scenarios familiar by having 24 subjects read two similar scenarios before evaluating a third, which was identical to what subjects in Exp 1 saw. This manipulation lead to an increase in TE acceptance (from 50% to 91%) for identical why-questions.

Conclusion

The results suggest that causal role and familiarity, but not domain, constrain TE acceptance. This may reflect a tendency to provide explanations that integrate particular instances with our general understanding by subsuming them under a familiar pattern.

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