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# Why Adaptationist Explanations are so Seductive

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## Introduction

Adaptationist explanations – evolutionary explanations in terms of a function, like “eyes are for seeing” – are increasingly common in the media. The popularity of such explanations is surprising in light of the finding that most people, including university students, have a poor understanding of natural selection (e.g. Brumby, 1979). Why would people favor explanations that implicate a process they don’t understand?

The literature provides two possible answers. First, it could be that most people’s naïve biology involves an evolutionary process distinct from natural selection, but that warrants such explanations. People seem to understand natural selection as a quasi-Lamarckian, goal-directed process at an individual rather than a population level. Second, teleological (e.g. adaptationist) explanations may reflect a basic mode of understanding consistent with implicit creationist assumptions (Kelemen, 2004).

I suggest a third possibility: that people know enough about natural selection to believe it warrants adaptationist explanations (see Lombrozo & Carey, in press), but not enough to understand the mechanisms by which it operates. As a result, adaptationist explanations induce a sense of understanding that goes unchallenged: without appreciating how natural selection operates, people fail to recognize what could falsify the explanation.

The experiment reported below tests two predictions: (a) that people find adaptationist explanations as satisfying as other teleological explanations, despite a poor grasp of natural selection, and (b) that people are selectively bad at identifying what falsifies an adaptationist explanation, despite recognizing that natural selection is involved.

## Experiment: Artifacts versus Adaptations

Each of 64 Harvard summer school students saw a single adaptationist explanation or a teleological explanation of an artifact, and was asked to identify which statements were either implied by or would falsify the explanation (Table 1). Figure 1 indicates the average number of such statements (out of 5) that were correctly selected for the 53 participants who professed belief in natural selection.

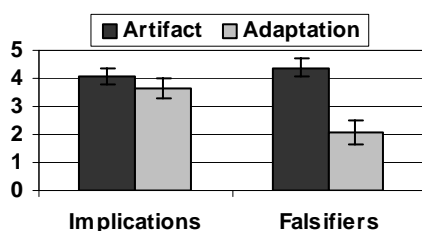


Figure 1: Average number of statements correctly identified

There was a main effect of explanation type (artifact vs adaptation,  $p < .05$ ), a marginally significant effect of task (implication vs falsification,  $p = .081$ ), and a significant interaction between explanation type and task ( $p < .05$ ). Of participants in the adaptation/implication condition, 85% correctly recognized that the explanation implied the involvement of natural selection. Although participants rated the adaptationist and artifact explanations equally satisfying (4.5 vs. 5.3, *ns*), they were worse at identifying statements that falsify the adaptationist explanation.

Table 1: Sample “adaptation” stimulus and statements

A Spirk is a kind of bird that forages at dawn and dusk. Suppose someone asks the following question, and the answer below is offered:

**Question:** Why do Spirks have large eyes?

**Answer:** Because large eyes are better for seeing in dim light.

Implied Statements	Falsifying Statements
a. Having large eyes is the result of natural selection.	a. Large eyes resulted from a genetic mutation that came to dominate the population by chance.
b. In the past, Spirks with larger eyes had more offspring.	b. In the past, spirks with larger eyes didn’t produce more offspring than spirks with smaller eyes.
c. At some point in the past, Spirks varied somewhat in the size of their eyes.	c. All Spirks’ eyes are and always have been exactly the same size.
d. If larger eyes weren’t better for seeing in dim light, Spirks might not have had large eyes.	d. The fact that larger eyes are better for seeing in dim light didn’t have any influence on Spirks’s evolving large eyes.
e. Larger eyes are better for seeing in dim light.	e. Larger eyes are not better for seeing in dim light.

## Conclusions

Participants found adaptationist explanations satisfying despite a poor grasp of natural selection (as reflected in the inability to identify falsifiers). Nonetheless, most participants recognized that the adaptationist explanations implied the operation of natural selection. These data suggest that naïve theories involve skeletal knowledge (Keil, 2003). Possessing a “placeholder mechanisms,” the details of which are poorly understood, may be sufficient to accept explanations that rely on that mechanism.

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