The Last Word On Ultimate Explanations?

The January issue of *Perspectives on Psychological Science* came out last week (yes, in February), and had a number of interesting articles. Here I briefly discuss a paper by Thomas Scott-Phillips, Thomas Dickins, and Stuart West entitled "Evolutionary Theory and the Ultimate-Proximate Distinction in the Human Behavioral Sciences."

First, at the risk of reviewing ideas that are already familiar to readers, it's probably useful to discuss the distinction. Ultimate explanations for adaptations are about the function of those adaptations. An ultimate explanation for something says something meaningful about why selection favored the trait. Scott-Phillips et al. use the example of crying infants in the article – babies cry (ultimately) to signal needs to adults so these needs are met – though there are of course any number of examples to choose from. To choose one randomly, the ultimate explanation for why you can't hold your breath until you die has to do with getting sufficient oxygen, which contributes to survival. The proximate explanation has to do (at least in part) with the buildup of carbon dioxide in the body.

The two explanations are, as the authors indicate, "complementary," adding that they "are not opposite ends of a continuum, and we should not choose between them." This is really important and might seem really obvious to people working in biology and evolutionary psychology, but it's actually a non-trivial point. Misunderstanding the idea that a given trait requires explanation at multiple levels can lead one to (incorrectly) suggest that proximate explanations are "more explanatory" than ultimate explanations, and criticize, rather than encourage, a program of research aimed at both levels. (I like the way Alcock (2005) puts it, somewhat laconically, in his textbook: "If we want to understand what causes animals to behave a particular way, we have to tackle the problem from both proximate and ultimate angles," p. 28.)

The point of the article is not simply to articulate this distinction, but to point out that people have made mistakes. They discuss several areas, including the evolution of cooperation, cultural transmission, and

epigenetics, and the paper in its entirety I think is worth a careful read, but I'll remark here only on the first of these, the evolution of cooperation.

The problems they identify are of the following type. Someone is interested in trying to explain – in the ultimate sense – cooperation among humans. Why do people have systems designed to deliver benefits to others, etc. So, the question is, what selective advantage do the traits in question confer?

Scott-Phillips et al argue that that solutions proposed to address the ultimate question have been proximate mechanisms. They discuss, for instance, "strong reciprocity," which Fehr and Fischbacher (2003) define as "a predisposition to reward others for cooperative, norm-abiding behaviors . . . [and] a propensity to impose sanctions on others for norm violations." This is supposed to be an answer to an ultimate question – why was the trait in question favored by selection? – but of course "predispositions" and "propensities" are proximate mechanisms. You can't explain why the predisposition to cooperate spread in a population with the idea that it's because people have a predisposition to reward cooperators. Scott-Phillips et al. point out that this confusion propagated into other branches of this research agenda, including neuroscience. They refer to a paper by Quervain et al. (2004), which suggests that the answer to the ultimate question is to be found in proximate psychology, the satisfaction one gets from imposing costs on those that violate norms. (It turns out that this satisfaction is in the brain somewhere.) In another paper, West et al (in press), discussing this work, point out that Quervain et al. confuse these issues "in two adjoining sentences," first asking why, in the ultimate sense, people punish, and follow that with the hypothesis that it is because punishing is satisfying.

It might seem surprising that such a basic error is made by people working in this research area, and Scott-Phillips et al. discuss some reasons why there is confusion (though they concede that the studies in which the authors make these basic conceptual mistakes are not "worthless.") It seems to me that one lesson to take from this is that it's actually a tough issue to keep straight in one's head, and even really smart people publishing in top journals (the papers I refer to above that make these mistakes are in *Science* and *Nature*) can make this mistake.

In an earlier post, I discussed Christopher Ryan's objection to a remark by Jesse Bering (why does that sound familiar?) about jealousy, saying that "There are

many ways to explain sexual jealousy in gay men without resorting to half-baked evolutionary theories of prehistoric cuckolding. Loss is loss, regardless of sexual orientation." He's implying the proximate explanation (such as it is) replaces – note "resorting" there – the ultimate explanation. I recently came across something similar in the context of why dogs eat grass. My dog, the Goose – with whom I've recently had coffee – sometimes eats grass, and I wondered if it was known why. About.com says: "This may be because they find the texture of the grass palatable, or just because they need to add a little roughage to their diet." Note that these both could be true – with the function implied by the latter explaining the former – though the web site connects these two ideas with an "or," as though they are mutually exclusive.

All this suggests to me that we have strong intuitions that lead us to get confused about levels of analysis, including the intuition that if we have a causal explanation for some phenomenon, other causal explanations at different levels are unnecessary. When you're in the business of explaining phenomena at multiple levels (c.f. Niko Tinbergen), it's pretty important to suppress this intuition.

By the way, why *do* we have this intuition? One reason might be because its computationally efficient to stop search for an explanation for something when you already have one. Another reason might be that once we have an explanation at one level, being presented with another one makes us angry…

References

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