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The Illusion of Unfalsifiability and Why It Matters

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"Are evolutionary explanations unfalsifiable?" Ketelaar and Ellis (this issue) ask this question in the title of their target article, and proceed to argue that the answer is: Of course not; but so what. If the issue were merely that of falsifiability, Ketelaar and Ellis would not have had much to say. The point is abundantly clear that, when properly constructed as theories and hypotheses, evolutionary approaches to psychological phenomena offer predictions that are exactly as falsifiable as those emerging from other theoretical contexts (Kenrick & Simpson, 1997). But that is of little moment, because falsifiability is to theory as ingestibility is to food. Just as objects must be ingestible to be food, assertions must be falsifiable to be scientific theory. But so what. Not every ingestible edible is a nutritious food, and not every falsifiable conjecture is a useful theory. If we are to separate wheat from chaff in the realm of scientific inquiry, we need to aim a little higher than mere falsifiability. It is toward this end that a Lakatosian perspective on scientific theories is important. It specifies additional criteria that scientists use to discern the utility of theories and metatheoretical frameworks—to separate the chaff from the wheat, the taffy from the tofu of intellectual nourishment. Judged against these criteria, the evolutionary metatheoretical approach to psychological phenomena is generative, and the theories borne of this approach can be useful.

So, Ketelaar and Ellis make a strong case that evolutionary explanations are falsifiable and more. Will this finally put an end to the skepticism that greets evolutionary explanations of psychological phenomena? We suspect not. The problem is that the article attends simply to the logical fact of falsifiability, rather than the psychological perception of falsifiability. Rather than raising the matter of unfalsifiability and then quickly dismissing it as a nonissue, it might be more instructive to ask, If evolutionary explanations are falsifiable, why are they perceived not to be?

There are many reasons. We discuss just one particular reason—one that has important implications for the way people think about and do evolutionary psychology. The reason is this: When people claim that evolutionary explanations are unfalsifiable, what they really mean to say is that these theories are unverifiable; and they are partly right.

The Multiple Models Within Evolutionary Psychological Theories

To appreciate this assertion, it is necessary to attend to a point that is implicit in Ketelaar and Ellis's Figure 2: Evolutionary psychological theories are comprised of two logically distinct conceptual models—one model that specifies the operation of psychological processes operating in contemporary contexts, and another model that specifies evolutionary processes that explain how the contemporary psychological processes emerged to begin with. Any evolutionary psychological theory identifies evolutionary processes that, operating over the course of time, could logically result in a population of individuals bearing specific features. This constitutes a model of evolutionary origins. If that were it, the theory would be evolutionary,

but it would not have much predictive relevance for psychology. What makes the theory more truly psychological is that a second model is logically deduced from the model of evolutionary origins. This model identifies specific psychological processes operating in contemporary human populations. This model of contemporary psychological processes yields hypotheses that can be compared to observations made with psychological research methods.

The coexistence of two distinct models within evolutionary psychological theories has implications for the perceived verifiability of those theories—and this in turn may affect the perceived falsifiability of those theories.

The Truth of Unverifiability and the Illusion of Unfalsifiability

Regardless of what we might claim, scientists rarely are intuitive falsificationists. As human beings, we are more concerned with what is the case than with what is not the case. The intuitive psychology of causal attribution underlies the perceived veracity of a theory: We are inclined to believe that a theory is verified if (a) empirical results match the predictions of the theory, and (b) these empirical results cannot obviously be explained otherwise.

There are two tiers of inference underlying the verification of typical (nonevolutionary) theories in psychology. First, we consider whether the results verify some specific conceptual hypothesis. In doing so, we consider whether the results are consistent with that hypothesis, and also whether the results might logically be attributed to uninteresting causes (e.g., sampling error) or to other psychological processes irrelevant to the specific hypothesis under consideration. If the conceptual hypothesis seems verified, a second tier of inference is required to judge whether the results verify a broader theoretical model of how contemporary psychological processes operate. In making this judgment, we consider whether the observed results are consistent with this psychological model, and also whether they are logically consistent with other, conceptually distinct models of psychological processes. We consider a theory to be verified only if the theoretical model appears to be uniquely predictive of the empirical results.

That is as far as we need to go when considering the veracity of most psychological theories. But an evolutionary psychological theory adds that extra layer of theoretical structure—a model specifying the evolutionary origins of contemporary psychological processes. So the verification of evolutionary psychological theories demands a third tier of inference in which we consider whether empirical results are consistent with the processes specified by the model of evolutionary origins, and also whether these results are consistent with alternative models of historical origins. The model of origins specified by an evolutionary psychological theory will be perceived to be verified only if that model is perceived to be uniquely consistent with observed phenomena.

It is difficult to observe psychological phenomena that are uniquely consistent with models of evolutionary origins. If one breaks apart that compound criterion—uniquely consistent—it becomes clear that psychological research methods cannot easily deliver results that are (a) consistent with models of evolutionary origins, and (b) uniquely so.

The consistency criterion is thwarted by the logical structures implicit in models of evolutionary origins. The events identified in these models bear no direct resemblance to events measurable with psychological research methods. Models of evolutionary origins specify processes that operate on populations, whereas psychological studies typically measure processes that operate on individuals. Models of evolutionary origins specify particular kinds of variables (e.g., environmental constraints on prehistoric populations, differential selection of genetic structures) that cannot be operationalized within a psychological research context. Models of evolutionary origins specify a cause-and-effect time frame that—barring the invention of a time machine—is far beyond the scope of even the most ambitiously longitudinal of psychological research methods. Because of these discontinuities, observed phenomena that are logically compatible with specified evolutionary processes nonetheless seem psychologically to be only vaguely consistent.

The uniqueness criterion is similarly hard to satisfy. Because it is difficult to comment empirically on events that happened long ago, it is difficult to eliminate the possibility that alternative historical processes account for the contemporary existence of specified psychological processes. The intellectual fecundity of evolutionary thinking actually contributes to this state of affairs: It is almost always possible to identify conceptually distinct models of biological change as plausible alternatives to any specific model of evolutionary origin (Conway, 1999). There are also plenty of additional alternative explanations based on cultural processes and other nonbiological mechanisms of selection (Scher, 1999).

Similar inferential issues apply to other psychological theories that contain models of historical origins, such as social role theory (Eagly, 1987). So why is it that evolutionary psychological theories are perceived to be less verifiable than these other theories? One reason is that evolutionary psychological theories reach farther back in time than other theories that speculate about historical origins. This greater temporal distance breeds greater skepticism because people presume that it is easier to obtain data bearing on events that hap-

pened, say, 1,000 years ago compared to 10,000 or 100,000 years ago. A second reason pertains more to style of presentation than to the actual logical substance of a theory. In other theories in psychology, a model of historical origins might be merely a thought-provoking point of departure; but a model of evolutionary origins is the defining focal element of an evolutionary psychological theory. So, when this model of evolutionary origins is perceived to be unverifiable, it undermines the perceived verifiability of the whole theory.

As a consequence, not only is it difficult to convince someone that an evolutionary psychological theory is verified, it is difficult to convince someone that the theory could be verified. And so, in general, people perceive evolutionary psychological theories to be unverifiable—or at least less verifiable than other theories in psychology.

What does this all have to do with falsifiability? Logically not much; but charges of unfalsifiability often result from slippages in logic (Schaller & Crandall, 1998; Schaller, Crandall, Stangor, & Neuberg, 1995; Stebbins, 1977). Although psychological scientists are intuitive verificationists, we have been trained to judge theories according to the rules of falsificationism. So, through a sort of mental alchemy, doubts about verifiability are transformed into an illusion of unfalsifiability. When people appear to say "I don't think there's any imaginable evidence that could prove this theory false," it is very likely that many of them really mean "I don't think there's any realistically obtainable evidence that would reveal this theory to be true."

The underlying perception about unverifiability is partly right but partly wrong. It is right only in regard to models of evolutionary origins: Although statements specifying the evolutionary origins of psychological processes can be easily falsified (through the observation of empirical results that are logically incompatible), they cannot be easily verified (because logical compatibility is insufficient by itself). But the perception is wrong if extended to the models of contemporary psychological processes that are deduced from evolutionary explanations. These models of psychological processes—the theoretical structures that put the "psychology" in evolutionary psychology—are exactly as falsifiable as traditional psychological theories, and exactly as verifiable as well.

The Reason Why This Matters

But, whether right or wrong, do these perceptions matter? After all, what really fuels scientific progress is not falsifiability or verifiability, but generativity. The accumulation of scientific knowledge depends on the chronic infusion of new and useful intellectual tools for generating innovative theories and novel hypotheses. As Ketelaar and Ellis demonstrate, evolutionary theorizing offers these tools to psychology—and so evolutionary psychology is currently a generative, useful research program.

Well, here's why these perceptions matter: What's generative and useful today can become stagnant tomorrow, and research programs require the chronic infusion of creative people to sustain them. If scientists dismiss evolutionary psychology on the basis of beliefs about unfalsifiability or unverifiability, these scientists miss opportunities to use valuable intellectual tools, and the field of evolutionary psychology loses valuable sources of sustenance. So it remains important to educate skeptics about evolutionary psychology. To do so, we need to be attentive to the psychological processes underlying the skepticism. Regardless of the words that skeptics use to express their doubts, if these doubts are rooted in concerns about verifiability, then it is the issue of verifiability that must be addressed. The point that needs to be made is this:

Yes, evolutionary explanations suffer from unverifiability; but so what. What matters is that models of evolutionary origins provide a basis from which models of contemporary psychological processes can be deduced. These psychological models are no less verifiable than other traditional models in psychology. Ultimately, the utility of the evolutionary psychological metatheoretical approach depends on (a) the extent to which it yields innovative models of contemporary psychological processes, and (b) the extent to which these models are uniquely consistent with empirical data.

If evolutionary psychology is to remain a useful research program in psychology, this message—and the logic underlying the message—needs to be conveyed more clearly to folks who remain skeptical of evolutionary psychology. Nonskeptics might want to pay a little closer attention to it as well.

Note

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A Call to Recognize the Breadth of Evolutionary Perspectives: Sociocultural Theories and Evolutionary Psychology

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Ketelaar and Ellis (this issue) defended the evolutionary psychology perspective against the criticism that it is scientifically unfalsifiable. They argued that, as for other scientific approaches, the basic principles of the evolutionary metaperspective generally are not subject to direct empirical test. Scientists assume the basic principles are correct and apply them to develop potentially competing middle-level theories that are consistent with the general assumptions of the broader perspective.

We agree with Keletaar and Ellis's description of scientific reasoning, but we think that this model of science is inappropriately applied to the domain of evolutionary psychology. Like many contemporary psychologists, Ketelaar and Ellis appear to equate evolutionary reasoning with the specific approach of evolutionary psychology, as represented by the writing of psychologists such as Buss and Kenrick (1998) and Tooby and Cosmides (1992). However, evolutionary psychology actually represents one variant within the broader family of evolutionary theories. Many of the basic assumptions of evolutionary psychology are not accepted in the scientific community, but are regarded as interesting, speculative hypotheses (e.g., Foley, 1996). Therefore, it is inappropriate to draw a protective intellectual circle around them, as if they were free from challenge.

We believe that greater progress toward understanding human behavior would result if the hypotheses and predictions of evolutionary psychology were tested against theoretical alternatives outside of this specific approach. By failing to proceed in this manner, practitioners of evolutionary psychology miss the richness and variability of theorizing that lies within the broader domain of evolutionary thinking. Moreover, the theoretical insights of societal and cultural theories of human behavior are either ignored or represented in an overly simplified form, as exemplified in Tooby and Cosmides's (1989) standard social science model and Buss's (1996) structural powerlessness principle. These characterizations have bolstered the mistaken conclusion that societally based theories are incompatible with an evolutionary perspective. As a result, psychology has been polarized into camps of those who favor evolutionary perspectives and those who favor societal and cultural explanations.

Redefining Evolutionary Perspectives

The link between general evolutionary assumptions and models of human behavior is not a single route signposted with the constructs of evolutionary psychology. Instead, evolutionary reasoning about humans is diverse (Boone & Smith, 1998; Smith, in press) and is widely acknowledged to include, in addition to evolutionary psychology, models of the relation between biology and culture (Janicki & Krebs, 1998) and human behavioral ecology approaches that emphasize behavioral variability in response to socioecological conditions (Cronk, 1991).

The general evolutionary metaperspective also encompasses social and cultural theories of human behavior. As Eagly and Wood (1999) argued, theories emphasizing social structural determinants of behavior suggest that humans evolved in response to evolutionary pressures that yielded a variety of dispositions such as the capacity for group living and for culture. In this view, human behavior changes across societies and historical periods as social organization changes in response to technological, ecological, and other transfor-