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Can evolution get us off the hook? Evaluating the ecological defence of human rationality [☆]

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ABSTRACT

This paper discusses the ecological case for *epistemic innocence*: does biased cognition have evolutionary benefits, and if so, does that exculpate human reasoners from irrationality? Proponents of 'ecological rationality' have challenged the bleak view of human reasoning emerging from research on biases and fallacies. If we approach the human mind as an adaptive toolbox, tailored to the structure of the environment, many alleged biases and fallacies turn out to be artefacts of narrow norms and artificial set-ups. However, we argue that putative demonstrations of ecological rationality involve subtle locus shifts in attributions of rationality, conflating the adaptive rationale of heuristics with our own epistemic credentials. By contrast, other cases also involve an ecological reframing of human reason, but do not involve such problematic locus shifts. We discuss the difference between these cases, bringing clarity to the rationality debate.

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1. Introduction

Like any other biological organ, the human brain is a product of evolution by natural selection: The brain secretes thought as the liver secretes bile, wrote the 18th century French physiologist Pierre Cabanis in his *Des Rapports du Physique et du Morale de l'Homme*. But does the brain's biological provenance suggest it must be successful at producing true beliefs and making rational judgments? Several generations of psychologists have suggested otherwise, documenting the myriad flaws and foibles of human reasoning (Gilovich, Griffin, & Kahneman, 2002; Kahneman, 2011; Kahneman, Slovic, & Tversky, 1982). Especially in popular summaries of this research, humans come off rather badly – prone to all sorts of biases and fallacies, woefully inadequate at dealing with probability and uncertainty, and inclined to persist in making errors of social judgment, even after these have been clearly spelled out (Ariely, 2009; Piattelli-Palmarini, 1996; Shermer, 2011; Singer & Benassi, 1981; Sutherland, 2007). The psychologist John Kihlstrom (2004) has called this the 'People are Stupid' school of psychology (PASSP).

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Recently, however, a new wave of research, inspired by evolutionary ideas, has posed a challenge to this bleak picture of human reason. This school of thought heralds an ecological conception of rationality, aligning itself with research in evolutionary psychology. If we approach the human mind as a collection of cognitive heuristics, tailored to the structure of the ecological environment, many alleged biases and fallacies arguably emerge as artefacts of narrow norms and artificial set-ups.

After introducing this ‘ecological rationality’ research program, we identify a ‘locus shift’ in some attributions of rationality. In these cases, individual reasoners are being praised as rational simply because the heuristics employed in their reasoning show adaptive design (i.e. are “rational” from an evolutionary perspective). In other words, the adaptive rationale of cognition (evolutionary locus) is conflated with our own epistemic credentials (personal locus). We then evaluate whether the normative categories of (ir)rationality can still be applied at the evolutionary level of analysis, and conclude that this facet of the ‘ecological defence’ is confusing: (a) human reasoners do not deserve the “credit” for the adaptive designs they have been equipped with, and (b) evolution cannot exculpate human irrationality. Finally, we discuss cases in which the program of ecological rationality has succeeded in rehabilitating human reason, showing that earlier charges of irrationality had been premature. These cases also involve a form of ecological reframing, but they do not involve adaptive locus shifts.

The aim of this paper is to provide some much needed clarification to the debate about rationality. In particular, by clarifying which ‘defences’ of putative irrationality are legitimate and which illegitimate, we hope to provide a robust conceptual framework within which to situate and evaluate future empirical evidence. The debate about rationality is not merely of academic interest: irrationality is a topic of critical personal and social import. Biased beliefs about the self and the future may promote individually harmful behaviours like smoking, unsafe sex and overspending, as well as potentially precipitating global catastrophes such as sectarian violence, world wars, exploding financial bubbles and environmental disasters (Johnson & Fowler, 2011; Sharot, 2011). Given these wide-ranging outcomes, getting clear about the nature and extent of human irrationality is a critical philosophical and psychological project.

2. Ecological rationality

2.1. Recasting rationality in the environment

In the heuristics and biases program instigated by Daniel Kahneman and Amos Tversky in the 80s (Kahneman, 2011; Kahneman et al., 1982), heuristics are viewed as mental short-cuts leading to imperfect and often outright irrational inferences. Though Kahneman and Tversky pointed out that even fallible heuristics often lead to successful inferences, over time this sense of balance was lost, and a negative slant began to dominate the research program they founded (Krueger & Funder, 2004).¹ The program of ecological rationality, by contrast (Fawcett et al., 2014; Gigerenzer, Hertwig, & Pachur, 2011; Gigerenzer & Todd, 1999; Hertwig & Hoffrage, 2013; Todd & Gigerenzer, 2012), aims to effect a gestalt switch, urging us to rethink the norms of what counts as rational.

The canons of ‘classical’ rationality, to which Kahneman & Tversky’s subjects were held accountable, consist of a general, formal, content-free framework for valid reasoning (e.g. *modus ponens*). Advocates of ‘ecological rationality’, by contrast, uphold a radically different view of heuristic reasoning. Heuristics, they argue, provide us with an ‘adaptive toolbox’ (Gigerenzer, 2008; Gigerenzer & Todd, 1999), each suited to a particular set of challenges endemic to a particular environment. In contrast with unbounded models of classical rationality, which typically assume unlimited resources both with regard to information gathering and computational processing, ecological rationality is ‘fast and frugal’. According to Gigerenzer and Todd (1999, p. 13), a heuristic is ecologically rational ‘to the degree that it is adapted to the structure of an environment’. Heuristics are quick and computationally cheap, requiring few and simple computational steps, and operating on a limited input domain. For example, when confronted with two objects, only one of which is recognized, people infer that the familiar one will be more important or have a greater value. Although this so-called ‘recognition heuristic’ – on which more later – leads us astray in artificial set-ups, it appears to be a surprisingly accurate guide to real world problems (Goldstein & Gigerenzer, 2002).

Proponents of ecological rationality claim that many apparent demonstrations of irrationality in the heuristics and biases program are artefacts of inappropriate standards and narrow norms, such as coherence criteria and the axioms of probability theory. Indeed, many experiments are expressly designed to mislead or distract participants, placing them in situations where their usually successful strategies and heuristics lead them astray. If one canvasses the same phenomena in a broader framework, however, taking into account the structure of real environments, computational limitations and various trade-offs, the human mind emerges as more rational than many psychologists suppose.

2.2. Two strands

We detect two major strands in the re-appreciation of (apparent) human irrationality as ecologically rational. On the one hand, as the ecological rationalist points out, traditional cognitive psychologists have too often delighted in tripping up their subjects with artificial set-ups that truncate the complexity of real life and human intelligence (first strand). On the other

¹ In his latest work, Kahneman is at pains to disavow this pessimistic turn: “I often cringe when my work with Amos is credited with demonstrating that human choices are irrational, when in fact our research only showed that humans are not well described by the rational-agent model” (Kahneman, 2011, p. 411).

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