

PAST AND PRESENT ENVIRONMENTS

A review of *Decision Making: Towards an Evolutionary Psychology of Rationality*, by Mauro Maldonato. Sussex Academic Press (2010), 121 pages, \$32.50.

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In his book, Maldonato provides a thoughtful look at how early scholars viewed decision-making and rationality. He takes the reader on an illustrative journey through the historic passages of decision-making all the way to modern notions of a more limited rationality and how humans can make choices under risk and uncertainty. He discusses Kahneman and Tversky's seminal work on heuristics and biases—"short cuts" that rely on little information and modest cognitive resources that sometimes lead to persistent failures, but usually allow the decision-maker to make fast and fairly reliable choices. Herbert Simon and Gerd Gigerenzer's work on bounded rationality is discussed, with respect to its influence on decision-making research in economics and psychology. For Maldonato, the principle of bounded rationality—that organisms have limited resources, such as time, information, and cognitive capacity with which to find solutions to the problems they face—is a key insight to understanding the evolution of decision-making.

Maldonato proposes that evolutionary pressures urged the human mind to adopt a primitive decision-making process. For the purpose of survival, the majority of human choices had to be made by means of simple and fast decision strategies, because the decision-making system developed under general human cognitive limitations and from environmental pressures that selected for decision strategies suited for the harsh ancestral living environments as well as the resources at hand. However, to evaluate the rationality of a behavior, one must consider not only the limitations of the decision-maker's cognitive system, but also the constraints and demands placed on her or him by the environment. This consideration, unfortunately, is not thoroughly explored. Maldonato alludes to the important role the environment plays in decision-making, but he does not elaborate in the same way empirical research in evolutionary cognitive psychology has in recent years. Nor does he show how earlier theoretical work—often outlined by the same authors he cites—meant human decision-making and cognition to be understood.

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Right from its introduction, the principle of bounded rationality was deeply associated with the idea that cognitive systems are fundamentally adapted to their environments—either through individual learning or by design—by means of natural selection. Simon illustrated this with a metaphor—the mind and the environment as blades of a pair of scissors. If either of these blades is missing, then the scissors will not work anymore (SIMON 1990). Gerd Gigerenzer and Peter Todd extended the principle of bounded rationality by adding ecological rationality, that is, how the success of reasoning and decision strategies depend on the structure of the environment. Thus, a decision-maker's selection of a decision strategy is not necessarily the mere product of cognitive limitations, but rather a bet on the part of the organism about the structure of the environment in which it finds itself (GIGERENZER, TODD and ABC RESEARCH GROUP 1999). This model of a mind, which is bounded rationally in the sense of relying on few cognitive resources, and ecologically rational in the sense of being tuned in to the characteristics of the environment, proved fruitful for empirical research. Evolutionary rationality holds, however, that it is important to consider the match between the mind and the past environments in which the mind evolved (see HASELTON et al. 2009).

For instance, recent research on information search in the external world has shown that people's perceptions of sequential events or their co-occurrence is biased towards frequent, natural distributions and that a cognitive bias previously seen as a fallacy—the hot-hand phenomenon—arose from experimenters observing the decision-makers' behavior in environments that were very atypical compared to those experienced across phylogenetic and/or ontogenetic time. The hot-hand fallacy occurs when research subjects expect lucky streaks in hits and misses in everything from coin tosses to basketball, when in fact the probabilities of events are independent. For example, when a basketball player hits many shots in a row, the natural expectation is that he has a "hot hand" and will shoot another successfully. People are often surprised to discover that this strong intuition is incorrect and that the success of the next shot is determined independently from the shot before (GILOVICH, VALONE and TVERSKY 1985). However, the notion of evolutionary rationality presented above hints at an explanation for the hot-hand phenomenon based on limited experience with evolutionary novel events, like coin tosses and gambling, which involve random events. Instead, one can ask about the structure of objects and events surrounding important adaptive problem domains faced by our ancestors, and what kinds of adaptations might have been shaped by selection. Evolutionary behavioral scientists would argue that many of these—plants, animals, human settlements, and even weather—would have been organized in an aggregated, clumpy fashion and not perfectly random or independent like those in Las Vegas. Thus, the default human expectation is aggregation, clumpiness, and non-independence (see WILKE and TODD in press). To explore this hypothesis, Andreas Wilke and colleagues devised computer tasks in which subjects could forage for fruits, coin tosses, and several other kinds of resources, and presented them to American undergraduates and a South American indigenous population of hunter-

horticulturalists (the Shuar). In each population, subjects exhibited the hot-hand phenomenon for all resource types, despite the fact that the computer distributed the resources randomly. The one exception found was for coin tosses for the American students. For them, the hot-hand expectation was reduced, not altogether eliminated. This suggests that the expectation of aggregation in space and time may be the psychological default that is overcome only through extensive experience with truly independent random phenomena, like coin tosses. This runs in contrast to the original explanation offered for the hot-hand phenomenon—that it is attributable to biased sampling by the mind—and instead suggests it is a consequence of the mind's adaptation to the distribution of resources in the natural environment (for details, see WILKE and BARRETT 2009; SCHEIBEHENNE, WILKE and TODD in press). We feel that there would have been a great benefit to considering these phenomena as they highlight the role of past and present environments in the evolution of human decision-making capacities.

In the remainder of his concise book, Maldonato addresses several current decision-making hot spots such as how neurobiology may ultimately help to explain free will, how conscious and subconscious processes have to be tackled to understand moral decision-making, the study of happiness, and why choice preferences and subjects' affective evaluations have to be included in the study of judgment and decision-making. Damasio's research that shows that reason and emotion are heavily intertwined is stressed, but Maldonato concludes that we do not know enough yet about this interplay. Once again, we do agree with the general notion, but would like to point out that significant contributions from the field of evolutionary psychology have already been made in this direction—if only they were to be included (e.g., TOOBY and COSMIDES 1990).

Mauro Maldonato has made a great effort to incorporate and discuss the latest findings from the interdisciplinary decision-making research endeavors. His book is worth recommending to a general audience and undergraduates in biology, economics, and psychology who are interested in getting a quick overview of the current state of affairs. However, evolutionary scholars should be warned that they would find fewer novel contributions “towards an evolutionary psychology of rationality” than the title would suggest.

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