What is the relationship between your work in philosophy of mind and your other work?
Marshall Abrams

My current work in philosophy of mind/cognitive science focuses on the evolution of complex cognitive capabilities in humans and other animals. Note that it is plausible that natural selection for complex cognitive capabilities produced greater coordination of behavior with circumstances in the environment. However, we do not have clear conceptions of what sort of coordination of behavior might be selected for, or even what we should mean by coordination of behavior. I believe it would be valuable to deepen our understanding of those relationships between cognition, behavior, and environmental conditions which could lead to the evolution of human cognitive abilities. I think that the best way to do this is to look very carefully at the way in which environmental conditions give rise to natural selection, and more particularly at the way in which objective probabilities arising from relationships between organisms and environments give rise to natural selection. My recent focus on such ideas has been designed to provide a foundation for asking what sort of environmental and social conditions and what sort of evolutionary history led to the evolution of various kinds of cognitive abilities. For example:

- What is it about our evolutionary history which gave rise to a cognitive system which behaves roughly as if it contained interacting beliefs and desires of varying strengths?
- Is it plausible that evolution could give rise to a cognitive system which governs behavior in subtle ways if the cognitive system did not actually contain internal states which correspond to beliefs and desires?
- What is it about our evolutionary history which gave rise to our inclination to form generalizations on the basis of limited evidence? What sort of tendencies to generalize would be favored by evolutionary histories of various kinds?
- In what sense are perceptions of distal objects and not, say, of patterns of proximal stimuli or disjunctions of such patterns?

My view is that all of these questions concern relationships between frequencies or probabilities in the world, on one hand, and cognitive states which roughly mirror these frequencies or probabilities in one way or another. Some such relationship between mind and the world is what is needed to coordinate behavior in ways that are biologically adaptive. It therefore seems valuable to investigate the nature of such frequencies or probabilities in the world and differences in biological fitness which can give rise to the evolution of cognition. Thus, much of my recent work has focused on the nature and role of environmentally-determined probabilities in natural selection, which is providing a foundation for my work in philosophy of mind/cognitive science.

In the longer term, I am also interested in applying my views about probability and complex causal structure to questions about the character of mental causation. Traditionally, many philosophers of mind have either thought of cognitive processes as deterministic or as characterizable by *ceteris paribus* qualified laws. I would argue that it may be more reasonable to view cognitive processing as probabilistic, in that one state may change the probabilities of other states—sometimes quite significantly—without there being a deterministic law connecting one cognitive state to its successors. But higher-level cognitive processes are implemented in (and may be type-identical with) neurophysiological processes. Neurophysiological processes are, plausibly, probabilistic. These processes, however, are quite complex, typically involving large numbers of neurons and synapses. Sometimes it is suggested that this probabilistic character arises from the probabilistic character of quantum mechanics. My account of "mechanistic probability" in terms of complex causal structure suggests the possibility that the probabilities involved in cognitive processing mainly have to do with the complexity of the neural interconnections which underly that processing.