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EPISTEMOLOGY AND COGNITIVE SCIENCE

1. INTRODUCTION

I will define epistemology in the traditional way, as the conceptual and normative study of knowledge. Epistemology inquires into the definition, criteria, normative standards, and sources of knowledge and of kindred statuses like justified belief, evidence, confirmation, rational belief, perceiving, remembering, and intelligence. Cognitive science is, by contrast, the interdisciplinary empirical study of cognition in human beings, animals, and machines, and the attempt to engineer intelligent cognition. Cognitive science spans work in diverse fields, including empirical cognitive psychology, linguistics, artificial intelligence (AI), neuroscience, and cognitive anthropology. Both epistemology and cognitive science study knowledge, but they have different aims, interests, and methods.

The idea that epistemology and psychology have something helpful to say to one another was common currency in eighteenth and nineteenth century thought (notably, in the work of Hume and Mill). But by 1900, the idea had fallen into disrepute and (with a few distinguished exceptions—Dewey, most notably) remained so until the 1960s. There are still many respected epistemologists who in one way or another think it important to resist the significance of empirical science for epistemology (Siegel 1981, Stroud 1984, 1989, Kim 1988, Feldman 1989, Shatz 1993). The key source of resistance here is that epistemology is conceived as a conceptual and normative study, and to many it has seemed obvious that these studies must be purely a priori and that empirical science cannot be relevant to an a priori study. Psychology, for its part, spent much of this century resolutely avoiding the study of cognitive states and processes, and so discovered little that could have contributed to an inquiry into the nature of knowledge, had epistemology been receptive to its findings. It was not until the advent of information-processing psychology that psychologists began employing concepts of interest to epistemologists (like the concept of information) and targeting states of knowledge that were common ground with epistemology. At this point, there emerged a potential for interaction between the fields that has yet to be fulfilled.

My task in this article is to ask how the findings of cognitive science might be relevant to epistemology traditionally conceived. I will argue that epistemology may profit from the findings of cognitive science in diverse ways. Of course, “epistemology” might be defined in a broad enough way to overlap or even encompass cognitive science, but the question of the relevance of cognitive science to epistemology has interest only if epistemology is conceived traditionally as a conceptual and normative enterprise. Again, “epistemology” might be defined in such a way that it is a pure a priori study, to which empirical science could therefore
not be relevant. The interesting question, however, is whether cognitive science could be relevant to epistemology understood as at least a conceptual and normative study. Can empirical science aid in such an enterprise? Must we advert to the findings of cognitive science in such an enterprise?

I will assume throughout that cognitive science theorizes at three levels (Pylyshyn 1984, Dennett 1987, Von Eckhardt 1993 for diverse tripartite divisions). First, there is the intentional level. Here psychology employs the idiom of folk psychology (talk of intentional states like belief) and charts intentionally describable causal relations (inferential relations, reasoning processes) between intentional states (Dennett's "intentional stance"). This is the level at which the findings of cognitive science—such findings as belief perseverance and failure to conform to textbook logic, probability calculus, or statistics—are most immediately relevant to epistemology, couched as it is in the intentional idiom. Second, there is the cognitive level, at which intentional generalizations are explained by generalizations about cognitive states, processes, faculties, and architecture (Dennett's "design stance"). I will suppose, for convenience, that cognitive states realize intentional states, that cognitive processes relating cognitive states explain the causal relations between the intentional states they realize, and finally, that cognitive processes are computational. But I doubt whether the bearing of cognitive science on epistemology hangs on any of these controversial assumptions. The cognitive level is more difficult to bring to bear on epistemology than is the intentional level, if only because the relation between cognitive states and intentional states is hotly contested. Nevertheless, it is possible to make fruitful speculative, hypothetical, and heuristic use of work at the cognitive level. Finally, there is the neural level, which implements the cognitive level. Though I believe neuroscience will eventually prove highly significant for epistemology by constraining the cognitive and intentional levels, the nature of neural implementation is largely unknown, and it is currently very difficult to make epistemological capital of neuroscientific findings. I will therefore omit discussion of the bearing of neuroscience here.

To forestall disappointment, let me warn that, for reasons of space, I will not attempt to discuss efforts by cognitive scientists that clearly belong to the province of traditional epistemology (e.g., the frame problem). Conversely, I will skip clearly empirical issues that have customarily received treatment from epistemologists (e.g., the issue of innate knowledge of mathematics, linguistics, etc.).

2 Skepticism and Cognitive Science

Until the late nineteenth century, the history of epistemology was in large measure the history of responses to skepticism (see Hookway 1990 and Schmitt 1992 for surveys of the history of skepticism). It is natural, then, to begin our discussion with the question whether cognitive science bears on skepticism. Do empirical findings from cognitive science aid in answering Cartesian or other traditional forms of skepticism?