

## Multiple Review

### Epistemology and Cognition

By Alvin I. Goldman. Cambridge, Mass.: Harvard University Press, 1986.  
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#### 1. JAMES HAMPTON

Philosophy of Mind and Cognitive Psychology form a meeting point of two very different disciplines, with markedly different historical roots and methods of analysis, but with the same subject of study. In *Epistemology and Cognition*, Alvin Goldman aims to establish as one of his main theses the interrelatedness of the two approaches. Arguing from the philosopher's side of the interface, he maintains as a central theme of his book that philosophy of mind must take account of and build upon the empirical findings of cognitive psychology, in order to provide a full account of how the mind-brain may *know* the world.

To attempt a summary of his thesis (with apologies in advance for the inaccuracies of a philosophical layman), he starts from the position that *to know* is to have a justified true belief. The crux of the definition here is identified as the question of justification. To be justified in holding a belief (he argues) a person must have arrived at that belief by means of a correct (right) set of justificational rules (J-rules). This approach to epistemology sees the role of the epistemologist as being both descriptive *and* normative. As well as stating how (if ever) we may be justified in holding a belief to be true, it is also necessary to distinguish those processes of belief formation which are normatively acceptable from those that are not. To this end he distinguishes primary from secondary epistemology. The former is a descriptive exercise aimed at elucidating the capacity of the mind for knowing through its basic perceptual and cognitive processes. The latter is prescriptive and encompasses such questions as the right way to do science, the logic of induction, the education of people in the ways of clear thinking, and so forth. This volume is almost entirely concerned with primary epistemology – the study of basic belief-forming processes.

The argument continues that the question of whether a correct set of J-rules exists for primary epistemology must be answered by the study of

basic processes of the mind in cognitive psychology. If a justified belief is one which would be held by an intelligent rational person in possession of all the facts, and with time to ponder them, then the answer to justification must lie in analysing the powers of human perception, memory, reasoning and so forth. We cannot ask that the J-rules require feats of intelligence that are beyond the scope of human capability. Therefore we must turn to the empirical study of human capabilities to know what forms of J-rules are possible.

It is impossible in a short review to do justice to the very carefully and thoroughly argued case for this epistemology which takes the author the first eight chapters to put across. The book falls into two long sections. The first is devoted to the philosophical analysis of justification of belief. Along the way we are treated to interesting and pertinent reviews of a wide range of philosophical opinion, including a long analysis of different forms of skepticism, and an interesting treatment of truth. Reading the first half of the book as a psychologist I found it always interesting and comprehensible, in spite of taking the reader down many 'blind alleys' of positions which are put forward in order to be rejected. Goldman's own view comes through clearly enough. Sometimes he appears considerably less hard on his own theory than on its competitors, but then an author should surely be allowed some licence to duck self-criticism.

One of his major conclusions is that what finally makes a particular process of belief formation acceptable (and hence one which may lead to knowledge in the sense of properly justified true belief), is that it *reliably leads to true beliefs*. He thus rejects various alternative criteria such as coherence, pragmatic consequence, explanatory value or biological consequence in favour of a justification system that generates a high proportion of true (as opposed to false) beliefs. This aspect he calls reliability. He also requires of J-rules that they be powerful (generating a large number of relevant true beliefs) and that they have speed (arriving at true beliefs in a time brief enough for the needs of the believer). Since his principles do not require that *no* false beliefs be generated by a correct system of J-rules, he avoids some of the problems posed by skepticism by effectively capitulating to them. There may in practice be no basic psychological processes which have perfect reliability, in which case skepticism may be tenable in some form. It becomes a question of how reliable is reliable, how rational must we be to be acceptably rational. It is legitimate to ask how the organism *knows* that the beliefs generated by a process are true – a question of circularity in the definition of true knowledge which Goldman addresses but which to my mind is not really answered satisfactorily.

In the second half of the book, there is a summary review of parts of modern cognitive science/psychology which is presented as a search and analysis of basic human capabilities, to examine to what extent they may match the kind of reliability, power and speed criteria of rationality which would correctly justify knowledge. This section contains much less that is

original, and is largely spent in describing some of the controversial issues with which the study of cognition is currently obsessed. For instance there is the Kosslyn-Pylyshyn debate on the mental substrate underlying imagination, and what types of internal representation should be posited (see Block 1981). Goldman also describes the debate between Johnson-Laird and Rips over whether there is an 'internal logic' for solving reasoning problems, or whether people construct mental models of the problem from which they then read off the conclusion (Johnson-Laird 1983, Rips 1983). Chapters in this section cover perception, memory, deductive reasoning, probability judgements and belief formation, and discuss many of the classic experiments demonstrating what are in fact failures of each system to operate in a normative fashion. The chapters treating perception and memory are both relatively cursory surveys of what are both immense fields, and make rather disappointing reading from the point of view of a psychologist.

The two chapters covering internal codes and constraints on representation are better and both contain insightful analyses. Towards the end of the book an unnecessary amount of space is given to describing two network models – one by Feldman and co-workers (Feldman & Ballard 1982) which appears to be a system for allowing the strongest of a set of beliefs to achieve ascendancy over its competitors, and the other Anderson's production rule system for modeling cognition ACT\* (Anderson 1983). While possibly instructive for readers who might not otherwise learn enough about these kinds of model to assess their potential as epistemic systems, I found the amount of space allotted to these models disproportionate to their interest. Earlier in the book Goldman suggests that the Bayesian models of subjective probability estimates had been posited largely because of the neatness of the model itself. It was hard to avoid the feeling that some of Goldman's enthusiasm for connectionist models might equally reflect the theorist's delight in a model that is internally consistent and complete. For instance, while acknowledging the massively parallel approach of neo-connectionism, Goldman holds to a relatively unrealistic notion of nodes representing beliefs. One of the more radical challenges of connectionist models is that all talk of internal representation may be quite inappropriate to the way the brain actually works. Thus we can describe rules of syntax which apparently govern normal speech and writing, and yet these rules may be nowhere *represented* in the language system. It may be that an agglomeration of remarkably simple individual elements is capable of producing an output behaviour which follows such rules, without any form of internal rule representation.

In terms of the expressed aim of the book, the treatment of the epistemological significance of the psychological results, and the search for justification-conferring psychological processes remains as a constant, unifying theme throughout the second half. By the end, however, the final impression is overall a disappointing one. Over and over again basic psychological processes are shown to be subject to illusion and the distort-

tion of reality. Perception involves top-down processing which leads to misperception of what is really out there in preference to what we believe should be there. Memory is subject to elaboration of details never encoded, and selective forgetting. We frequently fail to update our beliefs when a source of information becomes discredited. Subjective probability estimation breaks many of the basic theorems of probability theory such as the conjunction rule that an event must be more likely than its conjunction with another event. Syllogistic reasoning is subject to severe limitations in terms of working memory capacity, and strong biases are easily demonstrated. The list goes on. Yet throughout Goldman acts the apologist for human rationality, and uses a predictable series of arguments at the end of each chapter to argue that rationality (as characterised by a set of acceptable J-rules) survives the failures of each system to behave in a reliable manner. The points he makes in defense of the rationality of the mind are generally quite plausible. We have to respond quickly in many situations, and the mind is just not equipped for conducting certain types of procedure (such as probability theory calculations) using just its basic processes. As a result we rely on heuristic processes that generate as high a reliability as is possible. All the demonstrated weaknesses in our capacities tend to arise from the need to compromise reliability of knowledge with other survival conferring faculties. We don't need to be certain that the animal attacking us is a bear, before deciding to run away. Costs and benefits play their part in the evolution and adaptation of our psychological processes.

While these are reasonable points, the reader is still left wondering what the point of the whole exercise was after all. Having been set up to interpret the psychological evidence as deciding whether or not our claim to know the world may be justifiable, one feels that whereas the evidence is fairly damning the author wishes to maintain that we can know the world and introduces all kinds of special pleading to counter the evidence. To an observer it seems clear that our cognitive faculties cannot confer completely justified and reliable belief. All the evidence cited argues this. The author seems to have his own theoretical reasons for wanting to avoid this conclusion. Even so he can only do so by adopting a potentially very weak version of justification – one that merely requires true beliefs to be generated a certain (unspecified) proportion of the time.

In general then, the second half of the book does not live up to the depth of treatment given in the first, although this may be the reaction of a psychologist – it is possible that philosophers would have the reverse reaction. One dimension of epistemology which Goldman explicitly excludes from the present study concerns the social dimension. It is clear that the social and political forces involved in the establishment and social justification of beliefs are both powerful and all-pervading. Goldman promises a further volume to look at the social aspect of knowledge accreditation.

It may be carping to point to topics *not* covered in a book that attempts

such a deep treatment of a subject, but the claim of the book to be a general approach to epistemology leads this reviewer to wish at least three other areas had been covered. First, there is no real consideration of how evidence from child development may bear on questions of epistemology. It is indeed curious for a book entitled *Epistemology and Cognition* to bear not a single reference in the index to Jean Piaget. It has been fashionable for some time now to decry much of Piaget's theorising, and his experimental results have been the subject of intense scrutiny by armies of developmental psychologists. Yet so many of the issues addressed in this book were also central to Piaget's theory that it seems cavalier to omit him entirely. For example, Goldman distinguishes primary epistemology – the basic processes and knowledge-forming capacities which all normal adults possess – from second epistemology – the ability to learn and be trained in the use of appropriate methods, such as arithmetic or logic, which allow a much wider range of knowledge to be acquired. The parallel with the stage-theory of concrete and formal operations must be apparent. Piaget believed that epistemological justification depends on biologically adapted systems whose developmental origins are built upon the simplest actions and perceptions of the world in infancy. As the organism matures, so the actions become organised internally and adapted externally until they settle into highly efficient, internally consistent, and reliable models of external reality. Our strongest and most justified beliefs are those that have arisen through a lifetime of interactive action and feedback with the concrete world. It seems that Goldman might well have found at least one answer to the question he poses himself in Piaget's theory.

A second area which receives no treatment is that of mental disorders. Apart from the possibility of highly relevant evidence being available for his thesis from the study of people suffering from different kinds of amnesia and agnosic syndromes, there is also the thorny philosophical issue of psychotic delusional states. It seems hard to avoid some form of consensual definition when mental illness is defined in terms of what is *normal*. And yet might not one be the only sane person left on earth following some unseen viral infection that turned everyone else's beliefs upside down? There are doubtless many philosophical debates concerning the way in which we may be justified in thinking ourselves or others sane or insane, and also of course about the way in which a society defines mental illness. Some treatment of these issues would have certainly been instructive as bearing on the central issue of the justification of belief.

The third area is not so much an omission as a bias in emphasis which may sometimes lead to difficulties. Goldman takes the notion of a proposition as relatively *primitive* – as the content of a particular belief state. Occasionally he considers the notion of concepts, but rarely in regard to their epistemological status. Yet the existence of propositions of course presupposes concepts which form the elements and functors of those propositions. The status of concepts (and of meanings) is therefore in need of explication. Can they in some sense be true – that is reflecting a real

category in the outside world – or are they a function of our knowledge itself? To what extent are they socially created, and to what extent an inevitable consequence of the structure of our minds and their environment. Certainly the progress of science depends as much on the development of appropriate concepts as it does on the discovery of appropriate methods of collecting evidence or the discovery of true propositions framed in terms of those concepts. Epistemology is as much about how we come to understand the world in the way we do as it is about how we come to justifiably believe true facts about it.

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