Minimal Doxastic Logic: Probabilistic and Other Completeness Theorems

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Abstract   The propositional doxastic logics investigated here are minimal in the sense that they make very limited claims about what holds good of rational or justified belief on the basis of the meaning of those terms. Indeed some of the logics allow for the truth of total scepticism, the view that there are no rational or justified beliefs. The logics are subject to constraints such as that any doxastic logic must be believable in its own terms and that any proposition which must, according to a doxastic logic, be believed (not believed) must itself be a theorem of (be refuted by) the logic. Two techniques are used to establish completeness, one employing possible-worlds models in which there may be several or no accessibility relations, the other using probability distributions and a maximal-probability conception of belief.

0 Introduction   The "minimal" of the title signals a distrust of doxastic logics, logics of belief, that generate what might better be thought of as substantial theories of belief. There are two sources of this distrust. First, on an objectivist reading, the logic of justified belief, which ought to contain no more than the uncontroversial beginnings of an analysis of justified belief, should not give rise to theorems that run counter to coherent philosophical theses concerning the justifiability or otherwise of our beliefs. Second, on a subjectivist reading, the logic of rationally held beliefs ought not to ascribe whole classes of at best implicit beliefs to a rational agent, especially beliefs about beliefs that would in effect impute a great deal of self-knowledge, for it is by no means clear that even an ideally rational agent's beliefs are or ought to be transparent to the agent. This is especially so on the model of what it is to hold a belief that I shall adopt, namely Robert Stalnaker's 'pragmatic' conception of beliefs as conditional dispositions to action ([14], pp. 59–77). (It is a common-place that beliefs are related to action.)

   The logics—propositional logics—to be investigated below are, therefore, weak. But weakness has its own strengths. One desideratum for weak doxastic