

would be inappropriate to strip people of a legal right to reproductive freedom because he could be wrong. I wonder then why he could not have presented his thesis as a philosophical *puzzle* rather than as an argument. Advancing an argument that (i) is concerned with life and death, (ii) is very controversial, and (iii) has been defended by almost no one is certainly an effective way to attract attention. Yet in arguing positively for his astonishing thesis rather than framing it as a source of counter-intuitive puzzlement, Benatar keeps away those who are willing to see their moral intuitions in a new light. I generally enjoy philosophical arguments that derive counter-intuitive conclusions but I cannot recommend this book to everyone.

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Putting Logic in its Place: Formal Constraints on Rational Belief,
by David Christensen. Oxford: Clarendon Press, 2004. Pp. xii + 187. P/b £17.99.

Epistemologists have lately shown increased interest in a traditional methodology of decision theory: taking agents to assign degrees of belief conforming to probability axioms. But as a tool of epistemology, this methodology faces difficult questions. What is the metaphysical status of degrees of belief, or 'graded beliefs'? What does it take to possess such a mental state? Does logic provide norms for graded beliefs, and if so, how?

David Christensen confronts these questions in *Putting Logic in its Place: Formal Constraints on Rational Belief*. His primary focus is on the third question; his goal is 'to show that logic does indeed play an important role in characterizing ideally rational belief, but that its role is quite different from what it is often assumed to be' (p. vii). Christensen's thesis is that instead of being subject to the requirements of 'deductive cogency'—that beliefs be logically consistent and closed under deduction—an agent's epistemic state is subject to requirements of 'probabilistic coherence'. Christensen explains probabilistic coherence as a holistic standard requiring an agent's graded beliefs at a given time (represented by $\text{pr}(P)$, a function assigning a real number to each proposition P) to conform to Kolmogorov's probability axioms:

- [Non-Negativity] For every P , $\text{pr}(P) \geq 0$
- [Normality] If P is a tautology, then $\text{pr}(P) = 1$
- [Additivity] If P and Q are mutually exclusive, then $\text{pr}(P \vee Q) = \text{pr}(P) + \text{pr}(Q)$

Since the logical notions of tautology and mutual exclusivity play a role in these probabilistic norms, Christensen can argue that ‘probability theory is best seen not as a new logic for graded belief, but as a way of *applying* standard deductive logic to graded belief’ (my emphasis, p. vii). In fact, Christensen claims that the constraints of probabilistic coherence ‘flow directly from the standard logical properties of the believed claims’ (p. 15). For example, probabilistic coherence’s requirement that one believe $(P \vee Q)$ at least as strongly as one believes P ‘flows directly’ from the fact that P entails $(P \vee Q)$ in classical deductive logic (the only logic Christensen discusses).

This interpretation of probabilistic coherence is a bit misleading. Even if we grant Christensen the move from deductive entailment relations to inequalities among belief strengths, Additivity is a stronger requirement than can be obtained from such ordering relations. Given any set of inequalities satisfiable by a probability function, one can construct a distinct function that satisfies those inequalities, Non-Negativity, and Normality, and yet fails to satisfy Additivity—just take the probability function and square each of its values. Whether or not logic gains its normative purchase on epistemic states by way of the probability axioms, norms requiring graded beliefs to conform to additive probability measures must be more than *just* applications of deductive relations.

The core chapters of the book argue that beliefs are in fact constrained by probabilistic coherence and not by deductive cogency. But Christensen first sets up the debate by laying the metaphysical stakes. When we relate graded beliefs to ‘binary beliefs’—the all-or-nothing epistemic states often discussed in folk psychology—we have three options: ‘eliminationist’ approaches are deflationary about one category; ‘unification’ approaches admit the existence of both binary and graded beliefs but take one to be a species of the other; ‘bifurcation’ approaches see both as real and take neither to be a species of the other. Christensen quickly sets aside eliminationism and the view that graded beliefs can be reduced to binary. He then turns to lottery examples, arguing that on any plausible unificationist view reducing binary beliefs to graded, a rational agent will believe of each ticket in a large lottery that it will lose while at the same time believing that at least one ticket will win. Since this combination of binary beliefs is logically inconsistent, unificationism is incompatible with deductive cogency as a set of norms for binary belief. Thus the defender of deductive cogency must endorse a bifurcationist view: he must hold that an agent’s binary and graded beliefs are subject to independent norms and that neither can be read straightforwardly off of the other.

In chapters three and four Christensen attacks this defender of deductive cogency, wielding the Preface Paradox as his main weapon. In Christensen’s version of the paradox, Professor X has written a lengthy history book each of whose assertions he believes. Yet X also believes the statistic that every history book ever written has contained errors. Should X believe (and be willing to confidently assert in the book’s preface) the *Immodest Preface Proposition*

(IPP): ‘The body of this book is 100% error-free’? Our strong intuition says no, but deductive cogency commits Professor X to believing the IPP. (Christensen also considers whether X is committed to *disbelieving* the *Modest Preface Proposition* (MPP): ‘Errors will be found in the body of this book’; while the distinction between believing the IPP and disbelieving the MPP is important to some of Christensen’s arguments, it will not affect our discussion here.)

Chapter three assesses attempts to *undermine* this Preface-based attack on deductive cogency. Christensen first considers attempts to insulate cogency from our Preface intuition, for example by holding that cogency applies only to first-order claims. He then considers the position that X should in fact believe the IPP. This position is often supported by attempts to weaken our *prima facie* intuition about the case, for example by presenting Sorites-like problems for agents who will not endorse the IPP. Finally, Christensen considers arguments that Preface-like situations are extremely rare or lack cognitive significance.

Chapter four assesses attempts to *override* the Preface-based attack by offering pro-cogency considerations that outweigh our Preface intuition. Christensen considers arguments that inconsistent sets of beliefs fail in their role *as beliefs*, either because they are guaranteed to fail at avoiding falsehoods or because they fail to present a single, coherent picture of the world. He also considers the claim that norms of deductive cogency are needed to account for the influence of logical arguments on our rational beliefs.

Christensen motivates, explains, and rebuts each of these proposals in an impressively clear and concise fashion. He works through an astonishing array of arguments in a short space while attending to important details like the distinction between norms for rational belief, knowledge, and assertion. Nevertheless, one sometimes feels he is not responding to the strongest version of his opponent’s view. What makes the Preface truly *paradoxical* is the tension between Professor X’s statistical evidence against the IPP and the support provided for it by his research in writing the book. In Christensen’s hands we never get the full weight of the latter, and so never really feel the paradox. Christensen’s arguments tend to just circle back to the intuition that X’s believing the IPP (or one of its ‘downstream’ deductive consequences) would be irrational. This intuition may ultimately be correct, and a graded-belief approach may be the best way to resolve the Preface’s tension. But Christensen never embraces the other side of the conflict enough to demonstrate the full power of his solution.

Chapter five takes up Dutch Book Arguments (DBAs) and Representation Theorem Arguments (RTAs) in favour of probabilistic coherence. DBAs involve sets of bets that reflect a probabilistically incoherent agent’s degrees of belief yet can be combined to guarantee him a sure loss, while RTAs represent an agent whose preferences meet certain constraints as choosing based on probabilistically coherent beliefs. Here Christensen argues convincingly for two points underappreciated in the literature: first, that a theory of real graded

beliefs should understand them as independent epistemic phenomena with *normative* (not definitional or functional) relations to acts and preferences; and second, that while DBAs and RTAs proceed in terms of acts and preferences, to do epistemological work they should demonstrate an *epistemic* (not a pragmatic) defect in probabilistically incoherent graded beliefs.

Christensen accordingly presents his own 'depragmatized' Dutch Book and 'de-metaphysicized' Representation Theorem arguments. Each argument builds from purportedly intuitive principles concerning an ideally rational agent's evaluation of various betting options and the normative links between that agent's beliefs and those evaluations. Establishing Additivity is again a problem: in the RTA Christensen solves it by assuming that a rational agent representable as having probabilistically coherent beliefs in fact has such beliefs, while in the DBA Christensen first investigates a 'simple agent' who values money linearly and then extends conclusions about rational simple agents to rational agents in general.

Considerable ink has been spilled over the soundness of Christensen's arguments (see, for example, Patrick Maher's review in the *Notre Dame Journal of Formal Logic*, 47, (2006), pp. 133–49); let us focus instead on what (if successful) they can show about logic and belief. The binary conception of belief has grounded epistemology for centuries; philosophers have extensively examined its metaphysics and its connections to our pre-theoretic views about human psychology. Further, they have explored its potential normative connections to deductive logic and to notions like truth-preservation and 'what follows from what' that have traditionally been associated with deduction. While these connections remain controversial, one can at least sense how a binary epistemic state committed to the truth of a proposition might plausibly be constrained by such notions.

Christensen offers no parallel account of *why* deductive relations should constrain rational beliefs in the way he claims they do. Decision theorists who *define* graded beliefs via preferences have a story they can tell: DBAs and RTAs reveal that probabilistically incoherent beliefs are pragmatically defective because they lead to preferences violating important pragmatic constraints. But as Christensen acknowledges (p. 141), when these preference-centered arguments are redeployed in an epistemological context the best they can do is *diagnose* epistemic defects whose roots lie deeper than in the preferences they license. Here it becomes important that probabilistic coherence requirements do not 'flow directly' from deductive logic. Christensen endorses a normative standard whose structure goes beyond that of deductive logic without providing any positive account of the epistemic defect involved in violating that standard or the relation between that defect and notions like truth-preservation.

A similar complaint applies to Christensen's treatment of the metaphysics of belief. The book's final chapter contains an excellent discussion of how evaluative rationality standards can focus on ideal agents without losing epistemo-

logical significance. But it also addresses the common critique that real agents do not have anything like numerically precise degrees of belief. Whereas earlier chapters spoke confidently of metaphysically real epistemic phenomena, Christensen now retreats to a discussion of whether vague beliefs can be *modeled* by a formal apparatus involving the probability axioms. Christensen never offers a final verdict on the metaphysical status of vague beliefs, nor on the choice between unificationism and bifurcationism. The reader is left wondering whether a metaphysical account of graded beliefs is available that respects our psychological experience.

Putting Logic in its Place is a well-written book, made accessible by its brevity and lack of technicality. It will admirably serve both the seasoned hand and the newcomer looking for a survey of the territory. Christensen asks all the right epistemological questions; his answers clear the dialectical space for an intriguing position that sets aside a long-held picture of the nature of belief and its relation to logic. That picture certainly has its problems, not least among them its implications for the Preface Paradox. But in suggesting we replace it, Christensen owes us his own substantive picture subject to equal scrutiny. Absent such a positive account, many philosophers will be reluctant to accept Christensen's thesis about the proper place of logic.

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The Undiscovered Wittgenstein: The Twentieth Century's Most Misunderstood Philosopher, by John W. Cook. New York: Prometheus Books, 2004. Pp. 437. H/b \$59.00.

What more could there be to discover about Wittgenstein? Has another philosopher had such attention paid to his life and work? We can think of few that, in this respect, would come close, particularly in such a relatively short period of time following the publication of their work. So, as John Cook's subtitle suggests, what remains undiscovered about Wittgenstein does so not through lack of attention to his life and work but rather through lack of understanding on the part of those who have devoted their attention to his life and work.

Can so many be so wrong? We mean to say, can it be that Wittgenstein's students, friends and literary executors, G. E. M. Anscombe, Rush, Rhees, and G. H. von Wright were fundamentally mistaken; that Peter Hacker, career-long