Unsettled Thoughts: A Theory of Degrees of Rationality
by Julia Staffel

Review by Bob Beddor for *The Philosophical Review*

One of the major epistemological developments in recent decades is the ascent of Bayesianism. Despite its popularity, Bayesianism faces a recurrent complaint: the theory is overly demanding. For example, Bayesianism entails that we should have credence 1 in every logical truth – a bar that not even the most astute logicians meet.

A common response maintains that Bayesianism is a theory of ideal rationality. Ordinary mortals count as rational insofar as they approximate this ideal. But this response gives rise to two questions. First, what does it mean to "approximate" the Bayesian ideal? Second, what's the point of approximating the Bayesian ideal – why toil towards a goal that we will never reach?

Surprisingly, neither question has received much attention. Luckily, Julia Staffel's *Unsettled Thoughts*, Oxford University Press, 2019 (hereafter, *US*) is here to fill this lacuna.

US is a *tour de force*, developing an ambitious research program that will set the agenda for future discussion of these issues. Throughout the book combines boldness of vision with technical precision, and it is written in a lucid and engaging style. Though it is only 217 pages, it is jam-packed with enough exciting ideas and arguments to fill up several volumes. Anyone interested in epistemology – or in the general relation between human and ideal rationality – should read this book.

Since this book contains more material than any single review can hope to cover, I will focus on two big-picture issues.

Explaining our Intuitive Rationality Verdicts
As Staffel observes (chp.3), there is by now a rich literature on how to measure the distance between two entities. Staffel's general strategy is to use these distance measures to explain what it is to approximate the Bayesian ideal. On this approach, the degree of rationality of an agent's credence function is given by its distance from the closest coherent credence function.

This is a simple and elegant way of modeling degrees of rationality. But it faces two challenges. One challenge is raised by Staffel, who introduces two logic students, uncertain Una and certain Cera (2019: p.153). Both Una and Cera entertain a complicated conditional q that turns out to be a tautology, but neither of them has discovered the proof. Una has credence .5 in q; whereas Cera has credence 1. As Staffel notes, Una's credence is intuitively rational, although it violates the Bayesian strictures; Cera's credence is intuitively irrational, although it accords with Bayesianism.

Staffel seeks to deal with this problem by saying that our judgments are tracking doxastic rather than propositional rather rationality. However, this raises an important question: how should we extend the framework in *US* to degrees of doxastic rationality? Even absent an answer to this question, trouble looms: Staffel is committed to saying that Una's credence in q is not propositionally rational. So if Una's credence in q is doxastically rational, then we are forced to deny that doxastic rationality entails propositional rationality (a point Staffel acknowledges, p.155). But if we give up this entailment, it becomes even harder to understand the relation between the two. It also becomes hard to explain the incoherence of conjunctions such as, "Sherlock's belief that the butler did it is rational, but it's not rational for Sherlock to believe the butler did it."

A second challenge comes from cases where an agent has misleading evidence about the logical truths. Let's introduce a third student, misled Missy. Like Una and Cera, Missy has

not found a proof of *q*. But her logic professor confidently asserts that *q* has been proven false. *Question:* given her evidence, what's the rational credence for Missy to adopt? *Intuitive Answer:* Something lower than 1.

Perhaps, some might say, here too our intuition is tracking doxastic rather than propositional rationality. But in this case this response strikes me as independently implausible. After all, the question I posed was **not** whether Missy's current credence in *q* is rational. (Given the set-up, the latter question cannot be answered; I haven't even told you what Missy's credence in *q* is.) Rather, the question was, "Given her evidence, what credence would it be rational for Missy to have?" – a question that is most naturally read as asking about propositional rationality.

Having laid out these issues, let me suggest a possible path forward. As Staffel acknowledges, one possible strategy is to reverse the traditional order of explanation, and explain propositional rationality in terms of doxastic rationality. Staffel attributes this view to Dogramaci (2018) and Turri (2010), but it is worth noting it has earlier precedents in the reliabilist tradition (e.g., Goldman 1979). While reliabilists typically focus on outright beliefs rather than credences, it's easy to extend their basic framework to the latter. To get a feel for how this might go, here's a toy reliabilist model: an agent's credence *c* in some proposition *p* is doxastically rational iff *c* was produced by a reliable credence-forming process, where a credence-forming process is reliable provided it usually generates credences with a sufficiently high degree of accuracy (as measured by your favorite scoring rule). And it is propositionally rational for an agent to adopt credence *c* towards *p* iff there is some reliable credence-forming process available to the agent which, given their current states as input, is disposed to produce a credence of *c* in *p* as output.

How would this framework handle our cases? Start with misled Missy. The following credence-forming process is available to her: *trusting the opinion of experts on the topic, absent any evidence that the experts are unreliable*. This process is generally reliable, even though it will produce an inaccurate credence on this particular occasion. So the reliabilist framework predicts that it is propositionally rational for Missy to adopt a low credence in *q*. Next up: certain Cera. Cera forms her credence through guesswork – a process that will often generate inaccurate credences. So the reliabilist theory underwrites the verdict that Cera's credence in *q* is not doxastically rational. Turn finally to uncertain Una. On a natural way of filling out the case, she is employing a policy of distributing one's credence evenly over a set of exclusive and exhaustive propositions when one cannot tell whether one's evidence favors any one of these propositions over any of the others. While this process will never produce highly accurate credences about the members of this set, it is arguably the best policy available for minimizing inaccuracy in such situations of evidential under-determination. Perhaps this makes her credence-forming process sufficiently reliable to confer doxastic (and propositional) rationality on the credences it produces.

So this reliabilist view delivers the desired verdicts about the cases. Should this view supplant the framework developed in *US*? I think not. For starters, coherence is relevant to reliability: if a process sometimes generates incoherent credences, it is not perfectly reliable. More importantly, it does seem that coherence directly impacts our assessments of rationality in a way that is not fully captured by the simple reliabilist picture sketched above. To illustrate, suppose *A* forms coherent credences using a moderately reliable process. And suppose that *B* forms incoherent credences using a process that is generally highly reliable, but which produces incoherent credences on extremely rare occasions. On some ways of filling out the case, *A*'s credence is intuitively more rational than *B*'s, even though *B*'s credence-forming process might be more reliable than *A*'s.

What this shows, I think, is that a fully comprehensive theory of rationality will need to have two dimensions. First, it will need take into account the process responsible for the

credence/belief (in the case of doxastic rationality), or the processes available to the agent (in the case of propositional rationality). Second, it will need to take into account "internal" features of the agent's overall credence function/belief state – features such as the degree to which the credence function encodes a coherent view of the world. And it is here where *US* shines, providing an elegant and systematic framework for analyzing this second dimension. My point here is not to deny the importance of the second dimension, but rather to emphasize that the first dimension is also crucial. By bringing the first dimension into the picture, we can give a better account of our intuitive rationality verdicts, and also shed light on the relation between doxastic and propositional rationality.[1] Exactly how these two dimensions are balanced against each other in shaping our overall rationality verdicts is a difficult further question, and not one that I can hope to settle here.

Belief, Decision-Making, and Certainty
In the last chapter of *US*, Staffel shifts focus from credences to outright beliefs, tackling a version of the "Bayesian challenge." The challenge is this: given that we are already equipped with a notion of credence, what is the point of outright beliefs?

According to Staffel, outright beliefs are a *sui generis* state, distinct from credences. Their main function is to simplify reasoning by allowing us to ignore improbable scenarios. According to this view, if *A* outright believes that the train leaves from track 2, *A* is entitled to take this proposition as settled for the purposes of practical deliberation. And this means that *A* is entitled to ignore the small (but still positive) probability that the train will leave from some other track.

While this account of the functional role of belief has much to recommend it, one worry is that it stands in tension with our ordinary habits of belief ascription.[2] Consider an everyday case: we are about to give the final exam in the logic class we've been co-teaching. As we trudge from the department towards the exam hall, you ask me, "You have the exams, right?" I pause: I definitely seem to remember shoving the exams in my backpack. But the morning is a bit of a blur, and I'm prone to absentmindedness. I reply, "I believe I have the exams with me, but let me double-check." I proceed to open my backpack and confirm that the exams are safely ensconced within. The key feature of this scenario is that I self-ascribe a belief (that I have the exams with me), but I am **not** entitled to ignore the possibility that this belief is false.[3]

How should we respond to this tension? Let me suggest one possibility. Perhaps the functional role that Staffel proposes for belief captures an important psychological state, but that state is not *belief*. Rather, the state is something that more closely corresponds to our folk notion of *certainty*. While some philosophers will protest that certainty is rarely (if ever) attainable, ordinary discourse suggests otherwise: in everyday conversation, we often claim to be certain of many things, e.g., "Scientists are now certain that global warming has human causes". And it does seem that if I am rationally *certain* that I have the exams with me, I would be entitled to dismiss the possibility that I left the exams back at the office.

Going this route would allow us preserve much of Staffel's account, while also doing justice to our everyday belief ascriptions. However, if we go this route, then Bayesian challenge for *belief* remains unsolved. While we will have found a functional role for certainty, we are still left with the task of finding a functional role for belief, and explaining how this role relates

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[1] In personal communication, Staffel indicates that she is currently working on extending the framework in *US* to encompass other forms of rationality, including doxastic rationality. For some relevant discussion, see Staffel forthcoming.

[2] As Staffel notes, her conception of the functional role of belief resembles proposals made by a number of other philosophers (e.g., Clarke 2013; Greco 2015). The worry I raise extends to these other views as well.

[3] See Hawthorne et al. (2016) for complementary data suggesting that the ordinary conception of belief is a relatively weak state.

to credences. Still, we will not necessarily be back at square one. We might decide that since certainty is what simplifies practical reasoning, certainty is the more interesting and important psychological state, in which case the idea that belief reduces to sufficiently high credence may become more palatable.[4]

Summing up: *US* is a fantastic book, offering a compelling model for how to use the tools of formal and traditional epistemology in order to advance a genuinely important project. If you ever meet a disillusioned philosopher bemoaning the state of contemporary epistemology, I recommend you hand them a copy of *US*: if anything can convince them that epistemologists are still doing groundbreaking work, this is likely to do the trick.

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[4] See Beddor (2020) for related arguments that certainty is better suited to fill many of the epistemological roles that have been traditionally assigned to belief or knowledge.