

Mistuned Knowledge and the Prospects of a Lockean Unification of Epistemology

Matthew Brandon Lee

Berry College

&

Paul Silva Jr.

University of Cologne

Abstract

It is generally assumed that a Lockean metaphysics of belief that reduces outright belief to degrees of confidence would immediately effect a unification of coarse-grained epistemology of belief with fine-grained epistemology of confidence. Scott Sturgeon has suggested that the unification is effected by understanding the relation between outright belief and confidence as an instance of the determinable-determinate relation. But determination of belief by confidence would not by itself yield the result that norms for confidence carry over to norms for outright belief unless belief and high confidence are token identical. We argue that this token-identity thesis is incompatible with the neglected phenomenon of “mistuned knowledge”—knowledge in the absence of rational confidence. We contend that there are genuine cases of mistuned knowledge and that, therefore, epistemological unification must forego token identity of belief and high confidence. We show how partial epistemological unification can be secured given determination of outright belief by degrees of confidence even without token-identity. Finally, we suggest a direction for the pursuit of thoroughgoing epistemological unification.

1. Introduction

As van Frassen observed, there was a time when probabilism’s epistemology of degrees of belief was an “underground” and overshadowed by traditional epistemology and its focus on knowledge and the justification of outright belief. No longer. Probabilism’s conquest of epistemological territory has long since reached a point where traditional epistemologists cannot avoid “the Bayesian Challenge”:¹ what need have we of outright

¹ The term is Mark Kaplan’s (1996), though a version of the Bayesian Challenge can be found already in Jeffrey

belief and its normative principles when Bayesian probabilism tells the full normative story?

There has been hope in some quarters that traditional epistemology will survive through unification. *If you can't beat 'em, join 'em*. Thus Richard Foley recommended in his second major work of traditional epistemology (*Working Without a Net*, 1993) a proposal for unification through a straightforward reduction of belief to degrees of confidence:

[B]elief-talk is a simple way of categorizing our degree of confidence in the truth of a proposition. To say that we believe a proposition is just to say that we are sufficiently confident of its truth for our attitude to be one of belief. (Foley 1993: 140)

The proposed reduction has come to be known as the “Threshold View” or sometimes as the “Lockean View” due to Locke’s apparent endorsement in Bk. IV of the *Essay*. Foley was joined in this reductive program by Daniel Hunter (1996), with David Christensen (2004), Scott Sturgeon (2008, 2010), and James Hawthorne (2009) lending qualified support. And other philosophers, while rejecting the standard threshold picture, have expressed support for reducing outright belief to a relation between degrees of confidence and degrees of certain pragmatic features of the subject’s situation (e.g. Weatherson (2005), Ganson (2008), and Fantl and McGrath (2010)).

Such Lockean proposals hope to glean epistemological payoffs from metaphysical investments. But Lockean forays into the domain of metaphysics have for the most part been superficial. We wish to take the metaphysics a step or two further, because we believe that the epistemological picture will only become clear once certain metaphysical choices are made.

We say the metaphysical adventures have *for the most part* been superficial because credit must at least be given to Scott Sturgeon for supplying metaphysical categories for talking about outright belief and degrees of belief on a Threshold View:

[C]oarse and fine belief...are metaphysically determinable and determinate respectively, ...the latter metaphysically makes for the former (as they say). (2008: 147-8)

While Sturgeon develops a Lockean metaphysics of belief in limited detail,² his invocation of determinables and determinates does at least seem to capture in familiar metaphysical terms the core idea of the Threshold View and its ilk.

(1956).

² Sturgeon (2008, 2010) gestures at a functionalist approach to Lockean metaphysics of belief. See Lee (2018) for further development in that direction.

Our driving question here is this: can a unification of traditional epistemology of outright belief (“coarse epistemology”) with formal epistemology of degrees of belief (“fine epistemology”) be accomplished by conceiving the relationship between outright belief and degrees of belief as an instance of the determinable-determinate relationship? And if so, how? What is it about the determinable-determinate relationship that makes unification possible?

What we propose to do is to consider two different (mutually exclusive and jointly exhaustive) ways of developing this determinable-determinate picture. One of these would immediately secure a thoroughgoing unification of coarse and fine epistemology, where the norms for coarse belief fall right out of the norms for fine belief. The other way of developing the picture leaves further work to be done before epistemological unification can be accomplished.

We will be bracketing the standard epistemological objections to Lockean unification, important as they are.³ Those objections would arguably apply to either of the two developments of the determinable-determinate picture that we introduce here. Our main argumentative contribution in this paper will be a novel epistemological problem—the Problem of Mistuned Knowledge—that applies to the first of the two ways of developing the Lockean metaphysics of belief picture but not to the second. While it seems generally to be assumed that a Lockean metaphysics of belief would effect a straightforward and immediate unification of coarse and fine epistemology, we contend that the Problem of Mistuned Knowledge dashes this hope. Lockean unificationists have more work to do, and the final section of this paper will both bring into focus what needs doing and provide some of the first steps.

2. Belief and Confidence as Determinable and Determinate

Before considering how to develop a metaphysics of belief and confidence in terms of determinables and determinates, it will be best to have before us a general characterization of the determinable/determinate distinction. We can start with stock examples. Length is a determinable whose determinates include one meter, 5.29×10^{-11} m, and 9.4607×10^{15} m. Red and blue are determinates of color. Red, in turn, is a lower-level determinable whose determinates include scarlet, crimson, and rose, while navy, cobalt, and cerulean are determinates of blue.

It is most usual to speak of properties (whether monadic or relational) as determinables or determinates, though the concepts have been extended to events,

³ For example, Buchak (2013) and Staffel (2016) have argued that in various cases where one’s p-relevant evidence is purely statistical, it is rational to have arbitrarily high confidence that p but not rational to believe that p. An earlier version of the objection anticipated by Foley (1993) is that Lockean about belief face a version of the Lottery Paradox. Foley (1993) and Christensen (2004) discuss a version of the Preface Paradox that arises on a Lockean view.

states, and other ontological categories. When something is identified as a determinate, it is customarily said to stand in a certain relation—the “determination” relation—to some determinables and not others.

Wilson (2017) traces the history of philosophical treatment of the determination relation, and in §2.1 she distills a number of features that are typical of instances of determination. They include:

Increased Specificity: If P is a determinate of (‘determines’) Q, then to be P is to be Q, in a specific way.

Non-Conjunctive Specification: If P determines Q, then P is not identical with any conjunctive property conjoining Q with any property or properties independent of Q.

Non-Disjunctive Specification: If P determines Q, then Q is not identical with any disjunctive property disjoining P with any property or properties independent of P.

Determinable Inheritance: For every determinable Q of a determinate P: if x has P at a time t then x must have Q at t.

Requisite Determination: If x has Q at a time t, then for every level L of determination of Q: x must have some L-level determinate P of Q at t.

Multiple Determinates: For every determinate P of a determinable Q, there is a determinate R of Q that is distinct from, but at the same level of specificity as, P.

Determinate Incompatibility: If x has determinate P of determinable Q at time t, then x cannot have, at t, any other determinate R of Q at the same level of specificity as P.

Asymmetric Modal Dependence: If P is a determinate of Q, then if x has P then x must have Q, but for some y, y might have Q without having P.

Causal Compatibility: Determinables and determinates do not causally compete.

With these features of determination in view, it is evident why Sturgeon would construe a Lockean threshold view as the claim that outright belief is a determinable with various (high) levels of confidence as its determinates. Lockeans would say that

anyone with a high level of confidence that p does indeed believe that p (Determinable Inheritance), that anyone who believes that p does indeed have some high level of confidence that p (Requisite Determination), and that someone who believes that p can at that time have only *one* level of confidence that p (Determinate Incompatibility).⁴ Lockeans would affirm that the highest levels of confidence are specific ways of believing (Increased Specificity). Yet Lockeans do not think of the highest levels of confidence as belief *conjoined* with some independent property (Non-Conjunctive Specification).⁵ Lockeans would also embrace Causal Compatibility.⁶ And at least standard Lockean threshold views would take there to be more than one level of confidence that makes for belief (Multiple Determinates)⁷ and therefore would insist on asymmetric modal dependence of high levels of confidence on belief.⁸

3. A Fork in the Road: Token-Identical or Token-Distinct Unification?

⁴ Must every believer have a *precise* level of confidence in the proposition believed? Sturgeon (2008, 2010), it should be noted, maintains that the relevant confidence states are not all “sharp”—i.e. the sort best modeled by singleton sets of real numbers. More usually, says Sturgeon, confidence is either “thick” (perhaps best modeled by a non-empty, non-singleton set of reals) or “fuzzy” (perhaps best modeled by a fuzzy set) or both. Depending on how one understands unsharp confidence and depending on one’s understanding of determination, one might or might not take the phenomenon of unsharp confidence to rule out construing belief as a determinable with confidence states as determinates. But adequate consideration of this issue would require a paper of its own. We take no stand here on whether confidence can or should ever be unsharp, nor on how best to understand unsharp confidence (Sturgeon emphasizes that such talk is metaphorical and merely gestures at a functionalist rendering of thick confidence). But we will follow Sturgeon (who in turn follows Lewis) in reserving the term “credence” for maximally sharp confidence—confidence without any thickness or fuzziness.

⁵ A Lockean could perhaps allow that belief is an infinitary disjunction of confidence states, contrary to Non-Disjunctive Specification. But two points are in order. First, Non-Disjunctive Specification is rather controversial as a condition on determination (Wilson 2017: §3.4.1). In fact, a number of metaphysicians have thought the best theory of determinables would be one that reduces them to a special sort of disjunctive property (usually requiring resemblance between the disjuncts). Second, some of the main arguments against disjunctive accounts of determination would just as well undercut the idea that belief is a disjunction of confidence states (e.g. the argument that our thoughts about determinables just don’t seem to be about disjunctions of determinates).

⁶ Thus Sturgeon (2008: 146): “Whenever someone goes to the fridge, say, because they believe that it contains beer, there is a clear and everyday sense in which they go to the fridge because they are confident that it contains beer.”

⁷ Some philosophers have gone in for a degenerate case of threshold view on which maximal certainty alone makes for belief. (See Clarke (2013) and Greco (2015).) These are non-standard Lockean views, however, and are subject to serious objections. (See Lee (2017).)

⁸ For similar reasons, pragmatic credal reductivists (Weatherson 2005; Ganson 2008; Fantl and McGrath 2010), who take the threshold for belief to vary with pragmatic features of the subject’s situation, could also construe belief as a determinable relation. The determinates in this case would be degrees of exceeding a pragmatic “tipping point” (compare *being profitable* and the various degrees of profitability—degrees to which revenue can exceed expenses). Pragmatic credal reductivists would say that all and only those who believe have some degree of confidence in excess of their pragmatically fixed tipping point, that those degrees of excess confidence are specific ways of believing, that causal explanation by belief does not rule out causal explanation by threshold-surpassing confidence, and so on for other features of determination.

There evidently is, then, at least a logical space in which to float a metaphysics of belief on which high degrees of confidence stand in the determination relation to outright belief. Now, what good is that to epistemology? What good is that to questions about when we have knowledge or rational belief or when we exhibit intellectual virtue?

The epistemological unificationist hopes that a Lockean metaphysics of belief will allow one or both of the two major streams of epistemology (traditional and probabilist) to inform the other's attempts to address the central epistemological questions. Sturgeon presents the motivation thus:

In the event, epistemic norms for coarse attitudes will spring from probabilistic norms for credence. After all: belief, disbelief and suspended judgement stand to credence as red and blue stand to crimson and azure. Belief, disbelief and suspended judgement stand to credence...as determinables stand to determinates. There is nothing to belief, disbelief and suspended judgement other than credence, so reasonable production and arrangement of coarse attitudes derives from reasonable production and arrangement of credence. The epistemology of coarse attitudes flows directly from a credal approach to epistemology known as "Probabilism". (Sturgeon 2010: 128)

But *why* would a determination relation between confidence and belief open the gate so that one stream of epistemology can flow into the other? Sturgeon takes it to have to do with there being "nothing to" the coarse-grained attitudes other than the confidence states that are their determinates. But it should be borne in mind that the proposal is for reduction, not elimination, and it is reduction by determination, not identity (there is asymmetric, not symmetric, dependence). So why does the reduction of beliefs to confidence states via the determination relation allow normative assessments of one to carry directly over to the other?

Sturgeon (2008: 146-148) says that belief and confidence "march in step" both causally and normatively and that the determination relation would explain why they do so. Not only is causation by belief compatible with causation by confidence; there is and must *always* be causation by confidence when there is causation by belief. And not only is it possible for belief to be rational when a high level of confidence is rational; belief *must always* be rational when a high level of confidence is rational. Why does determination ensure this "causal and rational harmony"?

Some metaphysicians have wondered whether the causal harmony between determinables and their determinates is due to *token identity* of determinable instances and determinate instances. Granted, the property of being red is type-distinct from the property of being crimson (there is Asymmetric Dependence, after all). So we cannot appeal to the Indiscernibility of Identicals and say that because the *properties* are identical

whatever is true of the property of being crimson (e.g. that it causes drivers to stop at intersections) is also true of the property of being red. But consider the event *the light's turning crimson* (at a particular intersection at a particular time). Is that a distinct event from *the light's turning red* (at that particular intersection at that time)? One might suppose the light's turning crimson at that time is its turning red at that time. There is just one event token here. That is why the light's turning crimson at that time causes all and only the events that the light's turning red at that time causes.

Token identity of determinables and determinates is particularly attractive for the solution it hopes to provide to the mind-body problem.⁹ Because mental properties are multiply realizable in diverse physical systems, it is hard to buy an identity theory of the mental and the physical. But if mental properties are not type-identical to physical properties, and if every physical event has a sufficient wholly physical cause, and if there is not massive overdetermination, then mental properties are epiphenomenal—they are not really causally efficacious (and it's the end of the world). Token identity might solve the problem. If mental states and events are token-identical to physical states and events, despite the type-distinctness of the properties involved, and if states and events are causal relata, then mental goings-on *can* be causally efficacious because of their identity with causally efficacious physical events.¹⁰

So we come to a fork in the road. Supposing belief is a determinable with states of high confidence as its determinates, are belief *tokens* distinct from the corresponding confidence *tokens*? Token identity of belief and confidence states would explain the causal and rational harmony that Sturgeon takes to characterize belief and confidence. We would then have a very straightforward epistemological unification. Your belief (token) is rational or intellectually virtuous or a case of knowledge if and only if your (high) confidence is, since your belief *just is* your (high) confidence and anything true of something is true of anything token-identical to it (by Indiscernibility of Identicals). Call this approach to epistemological unification *Token-Identical Unification* (TIU).

If, on the other hand, beliefs and confidence tokens are token-distinct, the determination relation may still provide resources for effecting epistemological unification. But it will not be automatic and straightforward in the way that TIU is. Without token identity, understanding high levels of confidence as determinates of outright belief does not suffice to effect epistemological unification. We will consider in §5 how *Token-Distinct Unification* (TDU) might be pursued by further mining of the determination picture. The task at hand, though, is to explain why TIU will not work.

⁹ See Ehring (1996). Ehring argues (contra Macdonald and Macdonald 1986) that the solution doesn't work out in the end. We won't wade into that debate. The point here is just that the token-identity idea has *prima facie* metaphysical attractions independent of the *prima facie* epistemological attractions it holds for the Lockean.

¹⁰ More generally, phenomena treated by higher-level sciences (e.g. gene duplication) can be causally efficacious through token-identity with causally efficacious states and events treated by more fundamental sciences.

3. The Problem of Mistuned Knowledge

TIU faces an epistemological problem that arises from an epistemic phenomenon that seems to have gone almost entirely unnoticed in the epistemological literature. We call this phenomenon “mistuned knowledge” and define it as knowledge coincident with a level of confidence that is either irrationally high or irrationally low.¹¹ In this section, we will present some cases and argue that these are genuine cases of mistuned knowledge. We will then show how TIU and mistuned knowledge together result in paradox. In section 4, we will discuss some potential moves that a proponent of TIU might make in response. We will argue that none of these moves is at all promising.

Here is our first case of mistuned knowledge:

Overconfident Knowledge: Jordan is a physician who believes, and so has a high level of confidence, that one ought to prescribe drug A rather than drug B to treat heartburn. He believes this after listening to a team of doctors present their research at a conference, where the research strongly supports this claim. Moreover, Jordan understood the research and knows the researchers are first-rate. So Jordan’s high level of confidence that one ought to prescribe drug A rather than drug B is rational. Moreover, it’s true that drug A really is a better drug for treating heartburn than drug B, and it is also true for the reasons discovered by the team of doctors (i.e. no gettier stuff is in play). So Jordan has come to *know* that one ought to prescribe drug A rather than drug B to treat heartburn.

Jordan later encounters one of the doctors on the research team, Fabian, and discusses the merits of drug A. Fabian happens to be a very distinguished, attractive, and charismatic individual who makes a glowing case for the use of drug A by informally summarizing the broad strokes of the research that Jordan had earlier heard presented. Despite introducing no new evidence, their conversation leads to a slightly increased level of confidence for Jordan in the claim that one ought to prescribe drug A *beyond* the level merited by the evidence. (After all, even trained physicians are susceptible to biases that can influence their beliefs, e.g. prestige bias, gender bias, biases to trust people we are attracted to, etc.)

Despite the loss of rational credence, Jordan intuitively retains knowledge. We’ll defend this intuitive verdict at greater length below, but it’s worth noting now that it seems

¹¹ Foley (1992: 111-12) does mention the possibility of mistuned knowledge in his earliest presentation of the Threshold View. However, Foley does not explain how he would develop the Threshold View to effect the epistemological unification he envisions, and he does not consider the bearing of mistuned knowledge on the project of unification.

supported by the standard view of knowledge which says that s knows p iff s has a doxastically justified true belief that is not subject to any gettier problems. Now consider Jordan after the conversation with Fabian. It is still true that Jordan ought to prescribe drug A rather than drug B, and he is not in any kind of gettier situation. So the matter turns on whether Jordan remains doxastically justified in that belief.

The standard view of doxastic justification has it that:

(DoxRat) For any s and p , s has a doxastically rational (= justified) belief that p iff it is propositionally rational for s to believe that p , and s does believe p on the basis of whatever it is that makes it the case that it is propositionally rational for s to believe that p .¹²

Notice first that Jordan continues *believing* that one ought to prescribe drug A rather than drug B after the conversation with Fabian—only with a little extra confidence. Notice also that it remains propositionally rational for Jordan to believe this given the evidence provided by known medical experts. Notice further that he holds the belief *because of or on the basis of* the evidence. True, his *degree* of belief isn't what the evidence supports. But that doesn't change the fact that Jordan's *believing* is based on the evidence: his belief-threshold surpassing confidence is *due to* the evidence gained from hearing of the research. So the standard conditions for knowledge entail that Jordan has knowledge despite the fact that his confidence level is not rational.

We will consider ways of resisting the idea that Jordan continues to have knowledge below, but first let's consider a case of underconfident knowledge:

Underconfident Knowledge: Carmen knows that she ought to vaccinate her child on the basis of epidemiological evidence she acquired in a parenting course conducted by medical professionals. Carmen also has a sufficiently high level of confidence that she ought to vaccinate her child. But her rational confidence that she ought to vaccinate her child is at its lower bound—i.e. if her confidence in the claim that she ought to vaccinate her child were any lower it would not be a rational level of confidence given her evidence.

Dan then approaches Carmen and begins making declarations like: “Anyone who believes they ought to vaccinate their children is a first-rate fool!” and “There just is no good evidence to support the effectiveness of vaccinations!” But Carmen knows that Dan is intellectually lazy, is no expert on medical matters

¹² There is room to worry about DoxRat due to higher-order defeat (Neta forthcoming) and improper uses of one's evidence (Turri 2010, Silva 2015). But the case above doesn't involve either sort of concern. So we can simplify our discussion by suppressing further (and somewhat controversial) refinements to DoxRat that would address problems involving higher-order evidence and intuitively improper uses of one's evidence.

generally, and has made no investigation of vaccinations at all. Still, Carmen is susceptible to bullying, and Dan's bullying causes her level of confidence that she ought to vaccinate her child to dip, but not so much that she ceases to believe it. It just causes her degree of confidence to dip slightly below the rational lower bound.

Despite the loss of rational confidence, Carmen seems to have retained her knowledge. It is still true that she ought to vaccinate her child, and she still believes it on the basis of evidence that makes it propositionally rational for her to believe it, and no gettier oddities have entered the picture. So the standard conditions for knowledge will seem to entail that Carmen has knowledge despite the fact that her level of confidence is no longer rational.

Both Overconfident Knowledge and Underconfident Knowledge, then, are cases of *mistuned knowledge*: cases in which a subject knows that p without having a rational degree of confidence that p. We will see below that such cases cause trouble for TIU because they are incompatible with a certain consequence of TIU.

The consequence in question is related to Foley's (1992, 1993) "Lockean Thesis," which was the focal point of his effort at epistemological unification:

[I]t is epistemically rational for us to believe a proposition just in case it is epistemically rational for us to have [a] sufficiently high degree of confidence in it, sufficiently high to make our attitude towards it one of belief. (Foley 1992: 111)

The Lockean Thesis, as Foley states it, concerns only *propositional* rationality, i.e. a proposition's being rational *for* a subject to believe or have high confidence in (whether or not they do in fact have a belief or high confidence in it). But if any form of rationality is important for the study of knowledge, it is *doxastic* rationality, which is an evaluation of the subject's *state of belief*.¹³ (An instance of knowledge, after all, is a belief token that satisfies relevant epistemic conditions.) Even if it is rational for a subject *to believe* p, the subject's *belief* that p could still be irrational if it is not properly based on the subject's evidence but, say, stems from prejudice or wishful thinking. A complete epistemological unification will have to show how the norms for rational confidence are related to *doxastically* rational belief.

A doxastic analogue of the Threshold View would be the conjunction of:

¹³ See Turri (2010), Silva (2015), and Neta (forthcoming) for recent discussion and use of the distinction between doxastic and propositional rationality.

(LTR_{dox}) For all s and p, s's belief that p is rational only if s's high confidence that p is rational.

(RTL_{dox}) For all s and p, s's high confidence that p is rational only if s's belief that p is rational.

TIU yields LTR_{dox} and RTL_{dox} quite directly via the Indiscernibility of Identicals. Since a belief token just is a confidence token, the former is doxastically rational if and only if the latter is.

But mistuned knowledge turns out to be problematic for LTR_{dox} (and therefore TIU). As noted above, knowledge is rational, true, ungettiered belief. So knowledge that p entails rational belief that p. Putting this entailment together with LTR_{dox}, we get the result that knowledge that p entails rational high confidence that p. But we have just seen that there are cases of mistuned knowledge—cases where there is knowledge absent rational (high) confidence. TIU thus leads to contradiction.

We can state the problem for the Threshold View as a formal paradox:

(1) For any b, if b is a belief token, then b is a token of a high degree of confidence. (Beliefs are token-identical to states of high confidence.)

(2) If belief tokens are high-confidence tokens, then for any s and p, s's belief that p is rational only if s's high confidence that p is rational. (LTR_{dox} falls out of the token identity of beliefs and high-confidence states.)

(3) For any s and p, if s knows that p, then s's belief that p is rational. (Knowledge entails a rational belief token.)

(4) For some s and p, s knows that p, and s has no rational confidence token for p. (There are cases of mistuned knowledge.)

By modus ponens, (1) and (2) yield

(2.5) For any s and p, s's belief that p is rational only if s's high confidence that p is rational.

By a first-order variant on hypothetical syllogism, (3) and (2.5) yield

(3.5) For any s and p, if s knows that p, then s's high confidence that p is rational.

(3.5) and (4) obviously cannot both be true, although we do not yet have a formal contradiction. We need to make one implicit premise explicit:

(4.5) For any s and p , if s 's high confidence that p is rational, then s has a rational confidence token for p .

By another application of the first-order variant on hypothetical syllogism, we have

(5) For any s and p , if s knows that p , then s has a rational confidence token for p .

And (5) is in formal contradiction with (4). Thus the Threshold View leads to paradox. This is the Problem of Mistuned Knowledge.

4. Ways Out?

(2), (3), (4), and (4.5) all appear to be true. How might proponents of TIU argue that appearances here are misleading? We know of only three ways of addressing the Problem of Mistuned Knowledge that have any initial plausibility.

(i) *No mistuned knowledge*

One strategy is to argue that, contrary to appearances, there are in fact no cases of mistuned knowledge. This would amount to a denial of (4). How might the putative cases of mistuned knowledge that we have offered in Section 2 be resisted?

To defend the claim that these cases are genuine cases of mistuned knowledge, we leaned on the traditional idea that knowledge is rational, ungettiered, true belief. But a critic might allege that this traditional view of knowledge is in need of revision: *having a rational credence that p should be a condition for knowing that p* . Thus, because Carmen fails to have rational credence that she ought to vaccinate her child, she ipso facto fails to know that she ought to vaccinate her child.

But such opposition strains our intuitions. First, we find it intuitively compelling for the reasons discussed above that people in circumstances like Carmen's would have knowledge despite the fact that their levels of confidence aren't what their evidence supports. Second, it's hard to imagine anyone balking at a statement like "She knows it, but she's not as confident of it as she ought to be" or "He knows it, but he's more confident of it than he ought to be" (where, in context, the "ought" clearly expresses a requirement of *epistemic* rationality). And this is just the sort of thing that seems right to say about Carmen and about Jordan, respectively. Third, there are theory-driven worries

about denying mistuned knowledge. For example, Hawthorne and Stanley (2008) have argued that a subject can appropriately treat p as a reason for acting only if the subject knows that p .¹⁴ If knowledge required rational credence, then, by the knowledge-action principle, *it would be inappropriate* for Carmen (after the bullying) to treat the proposition that she ought to vaccinate her child as a reason for acting because she doesn't know it. But it seems clear that acting on her belief *would be appropriate*. If Hawthorne and Stanley are right, this is only correct if Carmen has knowledge despite lacking a rational credence.^{15,16}

Epistemic permissivists might object to our cases in a different way. The permissivist thinks there typically isn't just *one* level of confidence that is rational to have toward a given proposition when in possession of a given body of evidence. Usually there is a *range* of rational confidence levels (Kelly 2014). A case of mistuned knowledge, then, would have to be a case in which the subject's confidence dips below or rises above the *whole range* of rational confidence levels. And at the same time, the subject would have to retain knowledge. That might require Carmen's confidence level to drop quite significantly, at which point it becomes less plausible to insist that she retains a strong enough doxastic attitude to qualify as *knowing*. And it might be that if Jordan knew initially, then his confidence level was high enough that all the higher levels of confidence are within the permissible range (though some might be *more* rational than others).

In response, we note, first, that this line of objection requires more than what many permissive epistemologies allow. Non-evidentialists are often *interpersonal* permissivists; that is, they think a given body of evidence could at the same time license different doxastic responses from *different persons*. Perhaps the different persons have different epistemic goals, or perhaps their stakes are different, or perhaps their cognitive design plans are different. The interpersonal permissivist is not committed to *intrapersonal* permissivism—the claim that in a single situation (holding fixed goals, stakes, design plan, abilities, etc.), two or more contrary doxastic attitudes toward a

¹⁴ Related principles are defended by Fantl and McGrath (2010) and Hawthorne (2004).

¹⁵ A proponent of TIU might say that Carmen doesn't know that she ought to vaccinate, but knows that *it's very likely that* she ought to vaccinate, and can act on the latter. So there's a good error theory for the thought that Carmen can act on her belief that she ought to vaccinate. But it's worth noting that she can only know this further claim if she possesses probabilistic concepts *and* actually deploys them by having the thought <I probably ought to vaccinate>. But it's easy enough to come up with cases where thinkers are young/immature and so *can't* have these explicit thoughts or else *don't actually* have them. Even in such cases it will be intuitive to think these agents act rationally and have knowledge. [acknowledgement removed]

¹⁶ It should also be noted that, for those with relatively non-permissive epistemologies, requiring rational credence for knowledge will have the result that we know a lot less than we think we know. For, if bodies of evidence frequently rationalize only a narrow range of credences for p , then we will rarely manage to get our credences precisely into prescribed range. So if knowing p requires having rational credence for p , then virtually no one will count as knowing p .

given proposition can be rational for one and the same person. The objection requires this stronger form of permissivism.

Furthermore, intrapersonal permissivists do not claim that all cases are permissive, nor do they claim that whenever a case is permissive, there is a wide range of rational levels of confidence. We do not wish to put too much weight on the two cases given here, as they are just examples of a host of putative cases of mistuned knowledge. The objector must claim that *all* such cases will exhibit sufficient permissiveness to sustain the objection. But we think it likely there are cases where the permissive range is narrow enough that a dip below it need not disqualify the subject from knowing. And it seems to us undeniable that there will be cases of overconfident knowledge where maximal certainty is not rational, but where a person can have knowledge despite failing to mitigate their confidence as they should.^{17,18}

(ii) *Knowledge without belief*

The traditional view that knowledge entails belief is not entirely uncontroversial. Radford (1966), for instance, has given the case of the unconfident examinee who knows that Queen Elizabeth I died in 1603 but has temporarily lost his confidence—and thus his belief—in this fact under the pressure of an exam.¹⁹ And Myers-Schulz and Schwitzgebel (2013) have given cases in which a subject knows but is merely a borderline case of belief, possessing some dispositions characteristic of belief and other dispositions characteristic of non-belief.²⁰ These philosophers (and those who follow them) would deny (3) on the grounds that knowledge does not even entail belief, much less rational belief.

¹⁷ To see the challenge the cases of mistuned knowledge pose for shifty threshold views of belief, we need only note (i) that the stakes are not shifting in the cases of Overconfident Knowledge and Underconfident Knowledge, and (ii) that on shifty threshold views there can be a gap between the belief threshold and the lower- and/or upper-boundary of what credences it's rational to have. Underconfident knowledge will be knowledge just below the lower-boundary of rational credences but still above the threshold for belief (i.e. a case where the evidence is remarkably strong). Overconfident knowledge will be knowledge just above the upper-bound of rational credences—both of which are above the threshold for belief (i.e. a case where the evidence is strong but not sufficient to confer epistemic certainty).

¹⁸ Do cases of mistuned knowledge threaten threshold views that set the threshold for outright belief at 1? Cases of underconfident knowledge do pose a challenge to threshold 1 views of belief. Take a case where an agent knows *p* and so rationally believes *p* (=has a rational credence of 1 in *p*); then the agent gets a *little* bit of counterevidence that sets the rationally required credence in *p* just below 1 (e.g. at .999...); yet, the agent persists in knowing *p*, and hence persists in outright believing *p* (=having degree of belief 1 in *p*). For example, suppose Dan offered some meager evidence against vaccinating one's children that required Carmen to be .9999... confident about vaccinating her child. Under the assumption that Carmen *knew* that she ought to vaccinate her child just before encountering Dan, it seems to us that she would (or at least in some circumstances could) continue to know *p* even after Dan offers her some evidence against vaccinating. So it seems to us that threshold views that set the threshold for belief at 1 are not off the hook.

¹⁹ Though see Rose and Schaffer (2013) for defense of the contention that the unconfident examinee continues *dispositionally* to believe the fact in question and that it is dispositional belief that is entailed by knowledge.

²⁰ Though see Gendler (2008a, 2008b) for an opposing “intellectualist” approach.

We won't weigh in on the question of whether there are any genuine cases of knowing without believing. What is clear is that such cases cannot account for all cases of mistuned knowledge. Even if *all* cases of underconfident knowledge were cases with confidence too weak for belief, there remain the cases of overconfident knowledge. And even if some cases of mistuned knowledge exhibit Schwitzgebel-style splintering of doxastic dispositions, there are other cases in which all of a subject's doxastic dispositions are characteristic of belief, and yet the subject is overconfident or underconfident.

(iii) *Rationality isn't justification*

Another possibility is to attack (3) on the grounds that knowledge doesn't entail *rational* belief in the relevant sense of "rational." For example, while it's true that many epistemologists use the terms "justification" and "rationality" interchangeably, there are others who draw distinctions between rationality and justification.²¹ Might proponents of TIU maintain that in cases of mistuned knowledge the subject's propositional attitude possesses justification (which is required for knowledge), yet lacks the distinct epistemic property of rationality (which isn't required for knowledge)?²²

We think both proposals are wrongheaded. We should not multiply concepts for explanatory purposes beyond necessity, and here the proposal to avoid a problem through multiplication of epistemic norms is especially problematic. After all, the aim of TIU is to *unify* formal epistemology of confidence with traditional epistemology of belief. If the two enterprises are dealing in two distinct sorts of epistemic evaluation, then the hopes of the unification project are (at best) seriously dampened. There will be no straightforward bridge between formal epistemological evaluations of confidence and traditional epistemological evaluations of belief.

Second, we think the cases of mistuned knowledge we've offered are problematic for the proposed solution. For there is *some* positive normative property required of belief if it's to constitute knowledge—be it "justification" or "rationality" or whatever. Let's just call it *warrant*. Since this property is a property of beliefs, it is *ipso facto* a property of credences according to threshold views. Now, when one's evidence puts one in a position to know that P there will often be some upper bound short of 1 that one's evidence warrants holding in P. Suppose it's .9 or .95 or .99 or whatever. Even if the warrant's upper boundary is vague—somewhere between .95 and .99—there will still be some credences that fall clearly beyond that vague boundary—say, above .99. All we have to do to introduce the challenge of mistuned knowledge to the Threshold View is to observe that knowledge intuitively persists beyond that vague boundary. For example, just reflect

²¹ Cf. Audi (2001) and Schroeder (2015).

²² Christensen (2004) is an example.

on the fact that Jordan's evidence might warrant a degree of belief around .95 but definitely not above .99 in the claim that one ought to prescribe drug A rather than drug B. Then suppose that after Jordan encounters Fabian, Jordan's credence goes to .995. Intuitively, Jordan still knows that one ought to prescribe drug A rather than drug B. For that claim is true, and Jordan's evidence warrants believing this, and Jordan believes this on the basis of the evidence possessed, and there's no gettier stuff going on in the background. But this is not a judgment that fits with the Threshold View.

5. Token-Distinct Unification

In our judgment, there is little hope for TIU in light of the Problem of Mistuned Knowledge. But that still leaves Lockeans with another route to unification: *Token-Distinct Unification* (TDU). This approach differs from TIU in that it denies that beliefs are token-identical to instances of high confidence. The cost of this denial is immediacy and straightforwardness of the unification because rational belief tokens do not ensure that the confidence token that realizes it is rational. This is due to the fact that they are distinct entities. That's good news as it evades the Problem of Mistuned Knowledge. Some will doubtless wonder whether this amounts to rejecting the project of unifying coarse and fine epistemologies by conceiving of outright belief and levels of confidence as standing in a determinable-determinate relation. We think not and we explore the prospects for a TDU-driven Lockean unification in this section.

A first step is to secure Foley's Lockean Thesis without appeal to token identity. Recall that the Lockean Thesis is a claim about propositional rationality. It is the conjunction of:

(LTR) For all s and p , it is rational for s to believe that p only if it is rational for s to have high (i.e. threshold-surpassing) confidence that p .

(RTL) For all s and p , it is rational for s to have high (i.e. threshold-surpassing) confidence that p only if it is rational for s to believe that p .

If we understand the evaluative term to signify rational *requirements*, then we have:

(LTR_{obl}) For all s and p , it is required that s believe that p only if it is required that s have some high level of confidence that p .

(RTL_{obl}) For all s and p , it is required that s have some high level of confidence that p only if it is required that s believe that p .

If, on the other hand, we understand the evaluative term to signify rational *permission*, then we have:

(LTR_{perm}) For all s and p , it is permissible that s believe that p only if it is permissible that s have some high level of confidence that p .

(RTL_{perm}) For all s and p , it is permissible that s have some high level of confidence that p only if it is permissible that s believe that p .

It turns out that even if we do not take outright belief to be token identical to high confidence (as TIU has it), we can still establish both a rational-obligation and a rational-permission version of the Lockean Thesis provided we understand outright belief and confidence to be a case of determination (as TDU has it). We do so by appeal to two key features of the determination relation state in §2:

Requisite Determination: If x has Q at a time t , then for every level L of determination of Q : x must have some L -level determinate P of Q at t .

Determinable Inheritance: For every determinable Q of a determinate P : if x has P at a time t then x must have Q at t .

We will also appeal to a standard way of interdefining permission and obligation:

(PermOb) A is permissible if and only if it's not the case that not- A is obligatory.²³

and to a standard principle of deontic logic:

(Obligation Closure) If A is obligatory and A requires B , then B is also obligatory.²⁴

If you must do A , then you must do what it takes to do A . It is intuitively absurd to suppose that A is obligatory but that which is necessary for A is omissible, and standard deontic logics encode this.

Taking high confidence to determine belief and using Requisite Determination and Obligation Closure, we can establish LTR_{obl} by conditional proof. Suppose that s is obligated to believe that p (for arbitrary s and p). By Requisite Determination and the assumption that high confidence determines belief, s believes that p only if s has some

²³ See McNamara (2019: §1.2).

²⁴ Chellas (1980: 191) gives it as the inference rule ROM: $\frac{A \rightarrow B}{\circ A \rightarrow \circ B}$.

high level of confidence that p . So, by Obligation Closure, s is obligated to have some high level of confidence that p . We can generalize this result to any s and p . Thus we obtain LTR_{obl} .

For the reverse we appeal instead to Determinable Inheritance. Suppose s is obligated to have some high level of confidence that p . By Determinable Inheritance and the assumption that high confidence determines belief, s has some high level of confidence that p only if s believes that p . So, by Obligation Closure, s is also obligated to believe that p . We can generalize to any s and p and thereby secure RTL_{obl} , as well.

We begin the proof of LTR_{perm} by first stating it in terms of obligation (via PermOb): for all s and p , it is not obligatory that s not believe that p only if it is not obligatory that s have no high level of confidence that p . The contrapositive is: it is obligatory that s have no high level of confidence that p only if it is obligatory that s not believe that p . Suppose the antecedent. We can then use the contrapositive of Requisite Determination applied to belief and confidence (if s lacks high confidence that p , then s doesn't believe p) and appeal to Obligation Closure to establish that it is obligatory that s not believe that p . By conditional proof we have established that it is obligatory that s have no high level of confidence that p only if it is obligatory that s not believe that p , the contrapositive of which (transformed via PermOb) is LTR_{perm} . And the proof of RTL_{perm} is the same, but for the use of Determinable Inheritance in place of Requisite Determination.

The Lockean Thesis, then, is not immediate on TDU, but it *can* be established in both a rational-obligation and a rational-permission version, given TDU's understanding of belief as a determinable with high confidence levels as determinates. However, the Lockean Thesis represents only partial epistemological unification, as it concerns only propositional rationality. Can there be unification in the domain of doxastic rationality on TDU?

Here the Lockean must navigate carefully. As we have seen with TIU, not just any way of effecting epistemological unification will serve. If the unification is such that the normative status of token confidence states carries over directly to the normative status of outright beliefs, then the Problem of Mistuned Knowledge arises. But if the normative status of outright beliefs is wholly independent of the normative status of confidence tokens, then the project of unification is a failure. Is there a middle path?

We think there's some hope of finding one, and we will close this paper by pointing in a direction that seems to us promising. But there is hard work ahead for the Lockean, the outcome of which remains uncertain. The following is just a beginning.

Return once more to the case of Jordan, the physician who knows, but is somewhat overconfident, that drug A is better for heartburn than drug B. To defend the claim that Jordan knows, we made use of a principle that serves as a bridge between propositional and doxastic rationality:

(DoxRat) For any s and p , s has a doxastically rational belief that p iff it is propositionally rational for s to believe that p , and s does believe p on the basis of whatever it is that makes it the case that it is propositionally rational for s to believe that p .

In the case in question, Jordan persists in belief, but comes to have a level of confidence that is irrational. Nevertheless, the conditions of DoxRat are satisfied. It remains propositionally rational for Jordan to believe, since the evidence remains very strong, and Jordan continues to believe on the basis of that good evidence. And, by hypothesis, it is not a gettier situation. So Jordan has irrational confidence, but rationally believes—indeed knows—that drug A is better.

Our suggestion for a way forward with TDU is to try establishing a Lockean variant on DoxRat, namely:

(DoxRat*) For any s and p , s has a doxastically rational belief that p iff it is propositionally rational for s to have *some* high (i.e. threshold-surpassing) level of confidence that p , and s does have some high level of confidence that p on the basis of whatever it is that makes it the case that it is propositionally rational for s to have some high level of confidence that p .

DoxRat* would connect doxastic rationality of belief with propositional rationality of confidence (which could be treated by a fine epistemological theory like probabilism), yet would arguably avoid the Problem of Mistuned Knowledge. Notice that Jordan's evidence *does* make it propositionally rational for him to have high confidence that drug A is superior, and Jordan *does* have high confidence on the basis of the evidence that evidence. The requirements for doxastically rational belief laid down by DoxRat* are fulfilled, making it possible to regard Jordan as knowing, despite Jordan's irrationally high confidence. What opens up this possibility is that DoxRat* does not require that the *particular* level of confidence that is propositionally rational for Jordan is also the *particular* level of confidence that Jordan has concerning drug A's superiority. Jordan's confidence ought to be high—indeed, threshold-surpassing—but not as high as it is. And Jordan's confidence *is* based on evidence that does justify a particular threshold-surpassing level of confidence, but Jordan's level of confidence is different from the justified level. So DoxRat* tells us how it is that, despite the determination relation holding between high confidence and outright belief, an irrational confidence token could realize a rational belief. And DoxRat* does so, not in an ad hoc way, but in a way that is very much in keeping with the spirit of the standard understanding of the relationship between propositional and doxastic rationality (DoxRat).

But there is more work to do. DoxRat* does not just fall right out of DoxRat on the assumption that confidence and outright belief stand in the determination relation. The task is to show that, given determination of belief by confidence,

(DoxRat-Right*) (a*) It is propositionally rational for *s* to have some high (i.e. threshold-surpassing) level of confidence that *p*, and (b*) *s* does have some high level of confidence that *p* on the basis of whatever it is that makes it the case that it is propositionally rational for *s* to have some high level of confidence that *p*.

follows from

(DoxRat-Right) (a) It is propositionally rational for *s* to believe that *p*, and (b) *s* does believe *p* on the basis of whatever it is that makes it the case that it is propositionally rational for *s* to believe that *p*.

We have already done part of the work by establishing the Lockean Thesis (LTR and RTL, whether in obligation or permission forms). That is to say, we have already established the logical equivalence of (a) and (a*). What needs doing is to establish that (b*) follows from (b). And that will take some doing.

True, the assumption that high confidence determines outright belief lets us infer a component of (b*)—that *s* has some high level of confidence that *p*—from a component of (b)—that *s* believes *p*. But (b) and (b*) both embed *s*'s doxastic state in a complex state of affairs consisting of multiple relations. (b) requires that *s*'s belief stand in a *basing* relation with something that in turn stands in a *justifying* relation with the state of affairs consisting in its being propositionally rational for *s* to believe *p*. (b*) requires that *s*'s confidence token stand in a basing relation with something that in turn stands in a justifying relation with the state of affairs consisting in its being propositionally rational for *s* to have high confidence that *p*. That fulfillment of the former suffices for fulfillment of the latter does not follow in any obvious way from the features of determination canvassed above. So further reflection on the nature of determination and its bearing on the basing and justification relations is needed.²⁵

Beyond that, there needs to be further examination of the basing relation and what it means for a confidence token to be based on a body of evidence (or, perhaps mediately, on another doxastic attitude). There is a healthy literature representing a variety of views on the nature of the basing relation for outright belief.²⁶ It is doubtful

²⁵ Perhaps a place to start is with the common understanding of the basing relation as a *causal* relation. While Causal Compatibility (as the name suggests) only guarantees compatibility, it is widely thought that the determination relation engenders a more robust causal concurrence, perhaps by the sharing of causal powers between determinable and determinates (see Wilson §3.5.2).

²⁶ See Korcz (2015) for an introduction.

that a metaphysical reduction of belief to confidence would immediately resolve open questions about basing. So the proponent of TDU will have to engage at least that part of traditional epistemology that studies the basing relation. Unification of the envisioned sort will not allow probabilism to displace this area of traditional epistemology. It may be, though, that unification would illuminate the subject (or darken the subject—who can say?).

6. Conclusion

We have examined in some detail a prominent idea for how to answer the Bayesian Challenge and keep traditional epistemology relevant. The idea is not to eliminate outright belief, but to reduce it to confidence via the determination relation. Outright belief is a determinable; the highest levels of confidence (or, on pragmatic credal reductivism, the various degrees of surpassing a stake-sensitive tipping point) are the determinates. We have considered two different metaphysical routes for developing this proposal. On the first—Token-Identical Unification (TIU)—outright belief tokens are understood to be token identical to the confidence tokens that realize them. This approach effects an immediate and straightforward unification of coarse and fine epistemology. However, TIU faces the Problem of Mistuned Knowledge. TIU (together with some very plausible auxiliary assumptions) entails that every case of knowledge is a case of rational high confidence. But that consequence seems false; we seem able to describe clear cases of knowledge absent rational confidence—cases where the knower is irrationally overconfident or irrationally underconfident about the proposition known.

The second approach to developing the determination picture of belief and confidence—Token-Dependent Unification (TDU)—denies the token identity of belief and high confidence, while still insisting on the determination relation. We have shown that, although epistemological unification is not immediate, partial unification can be secured fairly straightforwardly. Useful versions of Foley's Lockean Thesis concerning propositional rationality can be proven in just a few steps using key features of the determination relation and standard principles of deontic logic. It remains an open question whether full epistemological unification can be achieved. But we have offered a well-motivated principle (DoxRat*) that connects doxastic rationality of outright belief with propositional rationality of confidence. We have shown that, unlike the doxastic version of the Lockean Thesis that emerges from TIU, this bridge principle does not fall prey to the Problem of Mistuned Knowledge. However, we have not attempted to show how to derive this principle from features of the determination relation. Doing so will require further reflection on determination and its bearing on the epistemic basing relation. If the attempt is successful, TDU would yield a unified epistemology that could draw on the resources of fine epistemology, but would also give a place to certain conversations (e.g. basing and gettiering) in traditional epistemology.

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