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Toward a Lockean Unification of Formal and Traditional Epistemology

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Abstract

A Lockean metaphysics of belief that understands outright belief as a determinable with degrees of confidence as determinates is supposed to effect a unification of traditional coarse-grained epistemology of belief with fine-grained epistemology of confidence. 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 show how partial epistemological unification can be secured, even without token identity, given determination of outright belief by degrees of confidence. Finally, we suggest a direction for the pursuit of thoroughgoing epistemological unification.

Keywords: Lockean thesis; credal reductivism; threshold view; mistuned knowledge; determinable; determinate

1. Introduction

As van Fraassen (1989: 151) observed, there was a time when probabilism's epistemology of degrees of belief was an "underground" movement overshadowed by traditional theory of knowledge and of justified outright belief. But 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 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)

[1]The term is Mark Kaplan's (1996), though a version of the Bayesian Challenge can be found already in Jeffrey (1956).

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; 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). (Sturgeon 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.[3]

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.[4] Our main argumentative contribution in this paper will

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

[3]Another paper that rises above superficial treatment of related metaphysical issues is Moon (2017). Moon's thesis that beliefs do not come in degrees might appear to undercut the Lockean program. But Moon allows that belief might reduce to confidence, just as millionairehood reduces to wealth, even while he insists that whereas confidence and wealth come in degrees, belief and millionairehood do not.

[4]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 Lockeans 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. Various solutions to these paradoxes have been attempted, most of them fairly radical (e.g. Foley (1993) and Sturgeon (2008) reject logical closure of rational belief, while Spohn (2012) rejects probabilistic representation of belief). Leitgeb's (2014, 2017) Lockean approach is especially worth noting, since it aims to resolve the standard paradoxes without forfeiting logical closure or probabilistic representation of rational belief.

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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, 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.

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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).[5] 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).[6] Lockeans would also embrace Causal Compatibility.[7] And at least standard Lockean threshold views would take there to be more than one level of confidence that makes for belief (Multiple Determinates)[8] and therefore would insist on asymmetric modal dependence of high levels of confidence on belief.[9]

3. A fork in the road: token-identical or token-distinct unification?

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

[5]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-degenerate interval 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.

[6]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).

[7]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."

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

[9]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.

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outright belief. Now, what good is that to epistemology? Sturgeon presents the motivation thus:

> In the event, epistemic norms for coarse attitudes will spring from probabilistic norms for credence … 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: 146–8) 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.[10] 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, as Fodor says, 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,

[10]See Macdonald and Macdonald (1986). Ehring (1996) argues that the solution doesn't work out in the end. We won't intervene in 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.

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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.[11]

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 would account for the causal and rational harmony of belief and confidence and give us 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.

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.[12] Consider:

> *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 factors are 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 somewhat increased level of confidence for Jordan in the claim that one ought to prescribe drug A *beyond* the level merited by the evidence.

[11]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.

[12]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.

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Despite no longer having rational confidence, Jordan intuitively retains knowledge. We'll defend this intuitive verdict at greater length below, but it's worth noting now that it seems 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[13]) 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.[14]

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. And notice 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 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

[13]Some theorists equate epistemic rationality and epistemic justification, while others – e.g. Audi (2001) and Schroeder (2015) – distinguish them (in various ways). Although we will not take a stand here on the issue, to streamline the exposition we will assume for the time being that these terms refer to one and the same epistemic property. We will then suspend that assumption in §4.iii and address a potential solution to the Problem of Mistuned Knowledge that suggests itself once rationality and justification are pulled apart. We are grateful to an anonymous referee for urging us to address the issue explicitly.

[14]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.

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> 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, 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 do 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. Such cases cause trouble for TIU because they are incompatible with a certain consequence of TIU. The consequence is related to Foley's "Lockean Thesis" – 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*.[15] (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:

(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. This is the Problem of Mistuned Knowledge.

[15]See Turri (2010), Silva (2015), and Neta (Forthcoming) for recent discussion and use of the distinction between doxastic and propositional rationality.

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4. Ways out?

4.1. No mistuned knowledge

One way to resist the Problem of Mistuned Knowledge is to argue that, contrary to appearances, there are in fact no cases of mistuned knowledge. How might the putative cases of mistuned knowledge that we have offered in section 2 be resisted?

Above 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 rational confidence that p should be a condition for knowing that p*. Thus, because Carmen fails to have rational confidence 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). 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.[16] 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.[17]

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).

So permissivism can be used to show that *some* cases of apparent mistuned knowledge are not genuine cases of mistuned knowledge. But the objector must show that *no* case of apparent mistuned knowledge is a genuine case, and as we'll explain only an implausibly radical form of permissivism could yield that result.

A preliminary point is that many permissivists are merely *interpersonal* permissivists; that is, they claim only that 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 priors, or perhaps their stakes are different, or perhaps

[16]Related principles are defended by Fantl and McGrath (2010) and Hawthorne (2004).

[17]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. But 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. We are grateful to Nevin Climenhaga for raising this issue.

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their cognitive design plans are different. The interpersonal permissivist is not as such committed to *intrapersonal* permissivism – the claim that in a single situation (holding fixed goals, stakes, design plan, priors, abilities, etc.), two or more contrary doxastic attitudes toward a given proposition can be rational for one and the same person. Since the cases of mistuned knowledge are cases where an individual thinker has mistuned confidence, appealing to interpersonal permissivism will not undermine the problem of mistuned knowledge.

So only intrapersonal permissivism can undermine the problem of mistuned knowledge, and only a radical version of it at that. For intrapersonal permissivists do not typically claim that all cases are permissive, nor do they claim that whenever a case is permissive one is rationally permitted to take absolutely *any* credence above the belief threshold. So, for example, suppose you know *and you know that you know* that your total evidence supports having credence 0.9 in some proposition P. We won't specify what determines the permissible range of credences in this case, but let's suppose the evidence is reasonably permissive so that any credence between, say, 0.85 and 0.95 is permitted. We can then construct cases of mistuned knowledge where an agent's credence falls just below 0.85 (e.g. 0.84) or just above 0.95 (e.g. 0.96). Of course, those wanting to resist the argument from mistuned knowledge can keep widening the permissive window so as to transform any argued case of mistuned knowledge into an intrapersonally permissive case. But notice that this strategy will require the permissive window to encompass the entire set of threshold-surpassing credences, *including* credence 1. We find this deeply counterintuitive for two reasons. First, when you know and you know that you know the probability of P just on your knowledge is 0.95, it just seems irrational to have any credence too much above or too far below 0.95 – at least when one is psychologically capable of having a credence that is reasonably close to 0.95. So the claim that *every* threshold surpassing credence is rational when one's specified known evidence so strongly supports 0.95 is a hard thesis to accept. Second, on the permissivist approach in question, if *any* threshold-surpassing credence is rational in this case, then credence 1 is rational in this case. But credence 1 has decision-theoretic implications that make this implausible. For if I have credence 1 in P, then I can rationally make decisions as if every ¬P possibility is certain not to obtain. So I can, for instance, rationally bet my life on P *any time* it's rational for me to have *some* threshold surpassing confidence in P. Even if the permissivist would like to make a special exception for maximal credences (1 and 0), that's fine. There are similar, if less stark, decision-theoretic problems that arise so long as thinkers are permitted to come too close to 1 (e.g. 0.9999999) when they know that their knowledge makes P only 0.95 likely to be true. This seems like a rather undesirable outcome, and that we'd do better to re-examine the original motivations for such a version of permissivism in the first place.

4.2. 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.[18] And Myers-Schulz and Schwitzgebel (2013) have given cases in which a subject knows but is merely a

[18]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.

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borderline case of belief, possessing some dispositions characteristic of belief and other dispositions characteristic of non-belief.[19] These philosophers (and those who follow them) would attack the Problem of Mistuned Knowledge by denying that knowledge entails belief (much less rational belief).

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.

4.3. Rationality isn't justification

We know of just one other initially plausible way to resist the Problem of Mistuned Knowledge: assert 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.[20] 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)?

We think such a line of resistance is misguided. To see why, recall that the aim of TIU is to *unify* formal epistemology of confidence with traditional epistemology of belief. Any proposal on behalf of TIU that firmly separates formal epistemology and its norms from traditional epistemology and its norms would be self-defeating.

Let us grant for the sake of argument that the positive epistemic status required for knowledge – call it "substantive rationality" (aka "warrant") – is distinct from the sort of rationality at issue in the formal epistemology of degrees of belief. Indeed, there are plausible motivations for making that distinction.[21] What goes by the name "rationality" in formal epistemology tends to be something structural; it can be applied to doxastic attitudes without consideration of the contents of those attitudes (so long as they are not logical truths or falsehoods). For instance, one might understand structural rationality in such a way that probabilistically coherent degrees of belief are structurally rational – and incoherent degrees of belief are structurally irrational – regardless of their contents. However, probabilistic coherence remains insufficient for substantive rationality; after all, even an ideal Bayesian agent could have beliefs that are entirely out of step with her veridical perceptual experiences and consequently not candidates for knowledge.[22] The more general point is that belief content *is* relevant to assessments of substantive rationality, so a structural norm that is content-independent will not be sufficient for substantive rationality. A plausible Lockean program, then, will not identify substantive rationality with structural rationality, but will assert only that fulfillment – or approximate fulfillment – of the appropriate norms of structural rationality is *necessary* for substantive rationality.

In that case, the argument against TIU from mistuned knowledge needs modest revision, as follows. Knowledge is substantively rational, true, ungettiered belief. So

[19]Though see Gendler (2008*a*, 2008*b*) for an opposing "intellectualist" approach.

[20]Cf. Audi (2001) and Schroeder (2015).

[21]We are indebted to an anonymous referee for the motivation that follows.

[22]As in Sosa's (1980) example of a person who has a splitting headache but believes otherwise and has a perfectly coherent cluster of surrounding beliefs.

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knowledge that p entails substantively rational belief that p. But substantively rational belief entails at least an approximation of structurally rational belief (or else the unification project fails). So knowledge that p entails (approximation of) structurally rational belief that p. Putting this entailment together with LTR_{dox}, we get the result that knowledge that p entails structurally rational high confidence that p (or approximation thereto). But we have seen that there are cases of mistuned knowledge – i.e. cases where there is knowledge even though structurally rational (high) confidence is absent. And although a certain sort of permissivist (as discussed above) might be tempted to appeal to the qualification that fulfillment of structural rationality need only be *approximate*, we have already explained (§4.1) that it would take an implausibly radical form of permissivism to undergird the claim that all putative cases of mistuned knowledge will feature subjects who either remain within the permissible range of confidence levels or dip below the confidence levels required for knowledge. So although we acknowledge that there are sensible motivations for distinguishing justification (=substantive rationality) from rationality (=structural rationality), the distinction will be of little use against the Problem of Mistuned Knowledge, at least in the context of the unification project at which TIU is aimed.

5. Token-distinct unification

The Problem of Mistuned Knowledge doesn't threaten every view of belief but only those that tie belief and confidence so close together that having rational confidence is a requirement for having a rational belief.[23] There are just two options for Lockeans who take outright belief to be a determinable with confidence states as determinates: either give up the project of epistemological unification or find an alternative approach to epistemological unification that treats beliefs and high levels of confidence as *token-distinct*.

We find "Token-Distinct Unification" (TDU) promising enough to be worth investigating. We will first seek to illuminate the idea of token distinctness by comparison with a claim of token distinctness in another domain of metaphysics. We'll then explain how we think TDU is best pursued.

To get a feel for the metaphysics of token-distinct approaches generally, let us consider an example not of determination in particular, but of a kindred type of relation between properties that falls under the same general type as determination. Determination is a kind (just *one* kind) of specification relation. Scarlet is a more specific way of being red. But also: being a rational animal is a more specific way of being an animal, even though rational animality does not determine animality. Non-Conjunctive Specification in particular is violated, as this "genus-species" relationship conjoins the genus with another property to yield the species. The example that follows involves a similar sort of specification and is intended to illustrate a phenomenon that properties standing in specification relations might exhibit.

Consider the property of being made of clay and the property of being a clay statue. Wherever there is an instance – a token – of the latter (a "statue"), there is an instance of the former (a "lump"). The metaphysician has two options: the lump is numerically identical to the statue, or the statue and lump are numerically distinct. A popular view is that the statue and the lump that constitutes it are *not* token identical but are distinct material objects. This is revealed by, among other things, their persistence conditions. While the clay lump could survive being squished into a blob, the clay statue

[23]Ross and Schroeder (2014) and Wedgwood (2012), for instance, offer views of belief that do not (or at least do not obviously) require rational confidence for rational belief.

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could not survive such abuse. So while being a clay statue is a species of being clay, it doesn't follow that each token clay statue is numerically identical to the clay lump that constitutes it. Nevertheless, while the statue and the lump are token-distinct, they remain intimately related: the clay statue is a kind of clay lump, it wouldn't exist without the clay lump that constitutes it, and it inherits a range of properties from the clay lump that constitutes it (spatiotemporal location, mass, durability, appearance, etc.).

Though by no means uncontroversial, this story about statue/lump phenomena is very popular among metaphysicians,[24] and according to it the relation between the clay lump and the clay statue is so intimate that it's quite natural to claim that *the statue "consists in" and is "nothing over and above" the lump of clay* (Wiggins 1968: 91). Notice that this is precisely how Lockeans describe the relationship between belief and confidence (see again Sturgeon 2010: 128). The Lockean is talking about states or events rather than substances, and the specification relation is that of determination rather than conjunctive specification. But the question of token identity nonetheless arises for determination, as well as for the sort of specification involved in the puzzle of the statue and the clay. And the idea that determinable instances are token-distinct from the determinate instances that realize them has gained traction in recent years for reasons similar to those that motivate the token-distinctness view about statues and lumps. The statue and the lump are thought to be distinct because they have different dispositional properties. In a similar vein, tokens of red and tokens of scarlet are held to be distinct because of different causal powers – e.g. both (we can suppose) will anger a bull, but only a scarlet token will anger a yak (which, as everyone knows, are far nobler and more discriminating animals).[25]

Before moving on, it should be noted how the metaphysical distinctness of the clay statue and the clay lump also seems to make space for distinct *standards of evaluation* for them. Not every *good/valuable clay statue* need be a *good/valuable clay lump*, and vice versa. A good clay lump is so because of its malleability, its tendency to hold together, etc. A good statue is so for other reasons. On such a token-distinct picture, normative properties as well as dispositional properties of the realizer need not be inherited by the realized.

So much for warm up. A Lockean view on which belief is determined by but token-distinct from confidence is conceivable, has interesting analogues elsewhere in metaphysics, and is motivated by arguments similar to those for analogous phenomena. But what are the prospects for Token-Distinct Unification (TDU)? By denying that beliefs are token-identical to instances of high confidence, TDU evades the Problem of Mistuned Knowledge. Irrational confidence tokens need not make for irrational belief tokens, so there can be knowledge (involving rational belief) in the absence of rational confidence. But this benefit comes at the cost of immediacy and straightforwardness of epistemological unification. Some will doubtless wonder whether this amounts to abandoning the project of unifying coarse and fine epistemologies. We think not, and in the remainder of this section we explore the prospects for a TDU-driven Lockean unification.

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:

[24]See Wasserman (2018: §2) for a non-exhaustive list of 18 philosophers who defend versions of this "constitution view" – what Burke (1992) calls the "standard view" – of the statue and the lump.

[25]See Wilson (1999: 48) for a similar example. And see Sturgeon (2010: 134–5) for a tinker toy functionalist Lockean view that would allow confidence tokens to have different causal powers than the belief tokens that they realize.

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(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 *obligation*, then we have:

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

(RTL_{obl}) For all s and p, it is obligatory that s have some high level of confidence that p only if it is obligatory 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 stated 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.[26]

and to a standard principle of deontic logic:

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

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 idea in inference rules or principles like Obligation Closure.[27]

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

[26] See McNamara (2019: §1.2).

[27] Chellas (1980: 191) gives it as the inference rule ROM: $\frac{A \rightarrow B}{\mathbb{O}A \rightarrow \mathbb{O}B}$.

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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 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.

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 probablism), yet would arguably avoid the Problem of Mistuned Knowledge.

Consider again the case of Jordan, the physician who knows, but is somewhat overconfident, that drug A is better for heartburn than drug B. Notice that Jordan's evidence

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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 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.[28] 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 securing the Lockean Thesis (LTR and RTL, whether in obligation or permission forms). That is to say, we have already

[28]Similar cases can be found in other normative domains. Suppose, for instance, that someone has rendered me a great benefit, and I owe them gratitude. But suppose I express only modest gratitude, when much greater gratitude is owed. I have done something right in expressing gratitude, yet I have also done something wrong. How I manage in one breath to do both is explicable assuming the distinctness of determinable and determinate tokens. The determinable token (my expressing gratitude) is morally appropriate, while the determinate token that realizes the former (my expressing modest gratitude) is morally inappropriate.

Or consider a case from the legal domain. A defendant is legally liable for harm to someone else, and damages are assessed. The harm was serious, and the penalty ought to be significant. But when the jury reaches its decision, the quantum of damages assessed is out of all proportion to similar cases. The jury has done something right in imposing a significant penalty, but they have also missed the mark in their harsh assessment of damages. The determinable token (imposing a substantial penalty) is legally (and morally) appropriate, while the determinate token that realizes the former (imposing an extremely harsh penalty) is not.

These and similar examples might be called cases of "wrong within right," with a nod to Audi (2005). Audi's cases, though, are meant to establish the possibility of doing wrong while exercising a right, whereas our cases do not as such have anything to do with rights. They are instead cases of instantiating a determinable by instantiating a determinate and doing so in such a way as both to fulfill a generic obligation and to neglect to fulfill a specific obligation.

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secured 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 of 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 of 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.[29]

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.[30] It is doubtful 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 allow probabilism to complement but not to displace this area of traditional epistemology.

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. We have considered two different metaphysical routes for developing this proposal. On the first (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. The second approach (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 and the

[29]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 2017: §3.5.2).

[30]See Korcz (2015) for an introduction.

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standard view of doxastic rationality (DoxRat). 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.[31]

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