Permissivism, Margin-for-Error, and Dominance

1 Introduction

Ginger Schultheis offers a novel and interesting argument against epistemic permissivism. While we think that her argument is ultimately uncompelling, we think its faults are instructive. Her thought-provoking discussion points to a range of interesting issues that are eminently worthy of attention. The aim of this paper is not simply to point out issues with her paper; it is to explore the territory opened up by her reasoning.

2 An Overview

Schultheis (2018) argues against epistemic permissivism, the thesis that a total evidential state can rationally permit more than one credence in a proposition.[1] We present her argument in terms of knowledge. (In actual fact, Schultheis employs a plurality of epistemological ideologies. We'll return to what difference—if any—that plurality makes later.) The text below is our reconstruction of her argument:

> If epistemic permissivism is true, then there is a rational range—a range of credence values about some proposition all of which are rational. If the range of rational credences goes from c_1 to c_2 then an agent knows something of the form, 'The rational credences are roughly those between c_1 and c_2.' This proposition is the strongest thing the agent knows; even if the agent somehow believed that the range of rational credences went exactly from c_1 to c_2 that belief would not be knowledge because it would not be epistemically secure. Since the strongest thing the agent knows is that the rational credences are roughly those between c_1 and c_2, the agent knows that some of the credences in the middle of the range are rational, but does not know that the credences on the edge

[1]For prominent arguments in favor of epistemic permissivism see Kelly (2013), Schoenfield (2013), and Schoenfield (2018). For prominent arguments against epistemic permissivism see White (2005) and Greco & Hedden (2016).

> are rational. Moreover, it's not rational for an agent to adopt a credence she doesn't know to be rational when there is an alternative credence which she does know to be rational. So if epistemic permissivism is true, then there are credences at the edge of the rational range that are not rational. But it makes no sense to suppose that there are values at the edge of the rational range that are not rational—by definition, all the values in the rational range are rational. So epistemic permissivism is false.[2]

We'd like to fill in a few details about Schultheis' reasoning. In particular, we'd like to clarify what epistemic permissivism is and what knowledge it produces.

2.1: What Epistemic Permissivism Is

Schultheis takes epistemic permissivism to involve a range of rational credences. A range of rational credences is a set of all the credences between two distinct credences c_1 and c_2 such that all the credences in the set are rational for some agent.[3] While it's quite natural for epistemic permissivism to involve such a rational range of credences, we feel that a more detailed explication of that involvement is helpful. To our minds, two further principles are at stake: Intrapersonal Permissivism[4] and Continuity.

Intrapersonal Permissivism is the proposition that some evidential state rationally permits more than one credence in some proposition for some agent.[5] Without Intrapersonal Permissivism, it could be that some evidential states rationalize different credences for different agents, but also be that no evidential state rationalizes different credences for a single agent. For example, if there were multiple permissible epistemic starting-points each of which determined unique rational credences given any total evidence, then different credences could be rationalized for different agents without multiple credences being rationalized for any agent. (Indeed, this is a common view among subjectivist Bayesians, who often think that there are hugely many rational prior probabilities each of which should be updated only by conditionalizing on an agent's total evidence.) Schutheis' reasoning is on firmer ground if Intrapersonal Permissivism is true. If epistemic permissivism is true but Intrapersonal Permissivism is false, then knowledge of others' rational credences

[2] We note in passing that the author (who kindly read this paper) was happy with our reconstruction of her reasoning.

[3] Such rational ranges can be either open or closed depending on whether c_1 and c_2 are rational.

[4] Schultheis discusses some intrapersonal principles, but that discussion does not directly address this issue.

[5] Perhaps even more carefully—for some agent at some time. We mean to screen off esoteric views according to which the credences licensed by an evidential state can vary across times even for particular agents.

will have limited personal applications. Knowing that some credence of .7 is rational for someone who shares your evidence will not be a compelling reason to adopt credence .7 oneself, even if one does not know whether or not one's credence in that proposition is rational. Indeed, in this context knowing that credence .7 is rational for someone else is compatible with knowing that credence .7 would not be rational for oneself. Since such a possibility runs contrary to Schultheis' thinking, we will assume that if permissivism is true then Intrapersonal Permissivism is true.

Continuity is the proposition that if c_1 and c_2 are each rational then any c_x in between them is also rational.[6] Without Continuity, it would be easy for multiple credences to be rational without any range of credences being rational. Indeed, if only a finite number of credences were rational, that would entail that the rational credences did not fall into any range.[7] Schultheis is aware of the logical possibility of permissivism being true without there ever being a rational range, but thinks this view sufficiently outlandish that it's reasonable to ignore the possibility. Since such a possibility runs contrary to Schultheis' thinking, we will assume that if permissivism is true then Continuity is true.

2.2: What Knowledge Epistemic Permissivism Produces

According to Schultheis, if what an agent knows is that the rational credences are roughly those between c_1 and c_2, then for all she knows the lower bound of the rational range might be a bit higher or a bit lower than c_1 and the upper bound might be a bit higher or a bit lower than c_2, and also the agent knows that the lower bound of the rational range is not substantially higher or substantially lower than c_1 and knows that the upper bound is not substantially higher or substantially lower than c_2.[8] There's a potential issue with this notion of an agent's knowledge, however. The range of rational credences might be small enough that for various natural precisifications of "a bit", no credence is both more than a bit above the lower bound and more than a bit below the upper bound. In such a case, there will be no credence that the agent knows to be rational. It's crucial for Schultheis' argument that if permissivism is true then there are credences that the agent knows to be rational. It therefore seems that Schultheis should either precisify "a bit" so that this sort of scenario cannot occur or retreat to the claim that if permissivism is true then it is sometimes the case that the range of rational credences is wide enough that knowledge of the rough locations of the bounds will secure knowledge

[6]The mathematically inclined may feel free to mentally rename this principle "Convexity".

[7]Any range contains uncountably infinitely many credences.

[8]Schultheis slightly misstates her position. She writes, "To believe that the lower bound is roughly .3 is just to believe that it might be slightly higher or slightly lower than .3" (Schultheis, 2018). But an agent who has no idea where the lower bound is believes that it might be slightly higher or slightly lower than .3, yet does not believe that the lower bound is roughly .3.

that some particular credences are rational. While both options seem viable, we think Schultheis should favor the latter.

Schultheis initially writes as though a range of rational credences going from c_1 to c_2 guarantees that an agent is in a position to know that the rational credences are roughly those between c_1 and c_2. But this claim is problematic. An agent might not be in a position to know whether or not epistemic uniqueness is true[9], and thus might not be in a position to know that any range of credences is rational.[10] It therefore seems most reasonable for Schultheis to claim only that if the range of rational credences goes from c_1 to c_2 then an agent *can* be in a position to know that the rational credences are roughly those between c_1 and c_2, and thereby know that some credences towards the middle of that range are rational.[11]

3 Simplifying the Argument

We offer a simplification of Schultheis' argument. This simplification uses principles she endorses, and it clarifies the philosophical issues at stake in her reasoning. This simplified argument involves three notions: Quotidian Context, Margin-for-Error, and Dominance.

> **Quotidian Context:** A set satisfies Quotidian Context relative to a property and a notion of closeness[12] just in case it is such that (1) there is some element of the set for which the property is known to hold, (2) there is some element of the set for which the property is not known to hold, and (3) the elements of the set are connected—for any elements e_1 and e_2, the transitive closure of elements close to e_1 includes e_2.

> **Margin-for-Error:** A set satisfies Margin-for-Error relative to a property and a notion of closeness just in case it is such that if the property is known to hold for element e_1, then that property holds for any element of the set that is close to e_1.[13]

[9] Epistemic uniqueness being the thesis that a total evidential state can rationally permit only one credence in a proposition.

[10] Similarly, an agent might not know what her evidence is, and thus might not know which credences are rationalized by her evidence even if she knew which credences were rationalized by each possible evidential state.

[11] Indeed (though not quite for the same reasons) Schultheis later falls back on a "can be" version of the argument later. This qualification also assuages the worry that a rational range extending either to 0 or 1 would pose problems. Even if an agent knows that the bounds for rational credences could not be a bit lower than 0 or a bit higher than 1, other cases will be more germane for Schultheis' line of reasoning.

[12] We stipulate that according to any notion of closeness, the close to relation is reflexive.

[13] In the familiar case regarding the height of a tree, the set is that of propositions about the

> **Dominance:** A set satisfies Dominance relative to a property just in case it is such that if the property is known to hold for element e_1 and is not known to hold for element e_2, then that property does not hold for e_2.[14] [15]

For any set, any property and any notion of closeness, it cannot be the case that Quotidian Context, Margin-for-Error, and Dominance all hold.[16] Proof: By Quotidian Context, there is an element e_1 in which the property is known to hold, and thus thus the property holds in e_1.[17] By Quotidian Context, there is an element e_2 in which the property is not known to hold. By Dominance and Quotidian Context, the property does not hold for e_2. By Quotidian Context, the transitive closure of elements close to e_1 includes e_2. Since any path from e_1 to e_2 goes from an element for which the property holds to an element for which the property does not hold, there must be elements e_3 and e_4 such that in e_3 the property obtains, in e_4 the property does not obtain, and e_3 is close to e_4. The property is known to obtain in e_3 since if the property were not known to obtain then by Dominance it would not obtain there. By Margin-for-Error, the property is not known to obtain in e_3. Contradiction.

Quotidian Context, Margin-for-Error, and Dominance are jointly unsatisfiable. This joint unsatisfiability can be made more intuitive. It's helpful to think about the conjunction of Quotidian Context and Margin-for-Error and the conjunction of Quotidian Context and Dominance.

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tree's height, the property is that of falsity, and the notion of closeness is that of having the tree's height be within an inch. If the tree is x inches tall, then it's not false that the tree is x inches tall, and so an agent subject to Margin-for-Error cannot know that it's false that the tree is $x+1$ inches tall. For alternate views of this case and related cases see Weatherson (2004), Greco (2014), and Goodman & Salow (2018).

[14] Note that this principle is weaker than the principle Schultheis states in her paper. Let us call that principle (appropriately generalized) **S-Dominance.** A set satisfies S-Dominance relative to a property just in case it is such that if the property is known to hold for e_2 only if it also holds for e_1 and is not known to hold for e_1 only if it holds for e_2, then that property does not hold for e_2. But Dominance is all that is needed for the simplified argument, and indeed Schultheis herself does not use the additional strength of S-Dominance.

[15] Instead of having Quotidian Context, Margin-for-Error, and Dominance apply to a set relative to a property and a notion of closeness, we could have Quotidian Context, Margin-for-Error, and Dominance apply monadically to triples of a set, a property, and a notion of closeness. Readers should feel free to mentally reformulate if they like.

[16] For simplicity, hereafter we will take Quotidian Context, Margin-for-Error, and Dominance to refer to the propositions that Quotidian Context, Margin-for-Error, and Dominance hold for contextually specified properties in contextually specified sets given a contextually specified notion of closeness.

[17] It's convenient to rely on the factivity of knowledge, but unnecessary. The close to relation is reflexive, thus e_1 is close to itself. Since the property is known to hold in e_1, by Margin-for-Error it must hold in e_1.

Together, Quotidian Context and Margin-for-Error entail that the property is not luminous.[18] Proof: Assume for reductio that the property is luminous. If the property obtains in all the elements of the set then by Quotidian Context it is not luminous. So the property does not obtain in all the elements of the set. By Quotidian Context, there is also an element in which the property obtains.[19] So there is an element e_1 in which the property holds and there is an element e_2 in which the property does not hold. By Quotidian Context, the transitive closure of elements close to e_1 includes e_2. Since any path from e_1 to e_2 goes from an element in which the property holds to an element in which the property does not hold, there must be elements e_3 and e_4 such that in e_3 the property obtains, in e_4 the property does not obtain, and e_3 is close to e_4. By luminosity, the property is known to obtain in e_3. By Margin-for-Error, the property is not known to obtain in e_3. Contradiction.

Together, Quotidian Context and Dominance entail that the property is luminous. Proof: By Quotidian Context, the property is known to obtain in some elements and not known to obtain in other elements. By Dominance, the property does not obtain in the elements in which it is not known to obtain. This establishes that the property is luminous.

Given Quotidian Context, Margin-for-Error entails that the property is not luminous. Given Quotidian Context, Dominance entails that the property is luminous. Since the property cannot be both non-luminous and luminous, Quotidian Context, Margin-for-Error, and Dominance cannot all hold.

It's not hard to see how to use these results to make an argument against epistemic permissivism, one which is very much in keeping with Schultheis' reasoning. Let the set be the set of possible credences in some proposition, let the property be that of being rational, and let the notion of closeness be one that counts credences as close just in case there's at most a tiny difference between them.[20] The reasoning then goes like this: "Regarding the rationality of possible credences, both Margin-for-Error and Dominance hold. If epistemic permissivism is true, then Quotidian Context holds for it as well. But Quotidian Context, Margin-for-Error, and Dominance are jointly unsatisfiable. Therefore epistemic permissivism is false."

[18]As we use the term, a property is luminous just in case it is known to obtain whenever it obtains. Here luminosity should be understood to be relativized to the set in question. We are aware that luminosity is sometimes defined in terms of being in a position to know rather than in terms of knowing, but depart from that here. See Williamson (2000) for more about luminosity.

[19]Again, it's convenient to rely on the factivity of knowledge, but unnecessary. The close to relation is reflexive, thus the element is close to itself. Since the property is known to obtain in the element, by Margin-for-Error it must obtain there.

[20]The details of tininess don't matter much. All that matters is that the notion of closeness be one according to which the set of possible credences obeys Connectedness.

4 Critical Reflections

The claim that if epistemic permissivism is true then Quotidian Context holds is crucial for Schultheis' reasoning. The connection between epistemic permissivism and Quotidian Context is, however, rather suspect. Most simply, epistemic permissivism entails that multiple credences are rational, whereas Quotidian Context entails that some credence is known to be rational and some credence is not known to be rational. What does one thing have to do with the other? Why should epistemic permissivism mean that some credence is known to be rational and some credence is not known to be rational?

Schultheis does not present an argument that if epistemic permissivism is true then some credences are not known to be rational. Instead, she stipulates that her argument does not apply to the sort of permissivism that rationalizes all credences. She takes for granted that not all credences are rational, and thus the factivity of knowledge guarantees that not all credences will be known to be rational.[21]

Schultheis writes (in a footnote), "I should note the dominance argument does not apply to an extreme version of Subjective Bayesianism that says that we are rationally required to follow the Bayesian formal constraints—probabilistic coherence and conditionalization—but there are no other constraints on what our priors should look like. Why? If any probabilistically coherent prior is permissible, the range of permissible credences in (almost) any proposition will be [0,1]—any credence will be rationally permissible. And if that's right, we can be sure that our credences are rational, and so they won't be weakly rationality dominated."[22] Schultheis excludes one of the most prominent forms of epistemic permissivism by fiat. She does not argue that extreme permissivism is false. Instead, she says that her argument only targets moderate permissivism.

For the purposes of this paper, we'll take for granted that extreme permissivism is false. Not all credences are rational, and thus not all credences are known to be rational. That satisfies one half of the knowledge-related requirements for Quotidian Context. But what about the other half? What about the requirement that some credences are known to be rational?

Schultheis suggests that a framework in which agents cannot know some particular credences to be rational even if permissivism is true makes rational requirements implausibly difficult to understand. She writes, "[E]ven though rational requirements are not wholly transparent to us, they shouldn't be completely opaque to those who reflect carefully. After all, we regard careful reflection on our evidence as valuable precisely because it helps us form rational beliefs—beliefs that better

[21] Yet again, it's convenient to rely on the factivity of knowledge, but unnecessary. The close to relation is reflexive, thus any credence is close to itself. Since some credence is known to be rational, by Margin-for-Error it must be rational.

[22] Schultheis (2018).

reflect the force of our evidence. If the requirements of rationality were wholly inaccessible, what would justify such a practice?"[23] It is, however, decidedly unnatural to think that if no credence can be known to be rational then the requirements of rationality are wholly inaccessible, particularly in the context of probabilistic epistemology. Agents might be able to get very good evidence about which credences are rational, and thereby have high credence that some credences are rational and high credence that other credences are irrational. Such high credences—even if not knowledge—are not nothing. The requirements of rationality are not completely opaque to agents who have high credences about what's rational and what isn't. It's no disaster if agents have such high credences and simply lack knowledge.[24]

On the other hand, there are many cases where if a certain continuous range has a property then what an agent is in a position to know is that some narrower continuous range within that range has the property. Take the shades on the color wheel, and consider the continuous range of shades that are red.[25] It's very natural to think that the strongest thing that an agent can know is that some narrower range of shades—a range of shades sufficiently removed from the red / not-red borders—is made up of shades of red. Given the continuous range of red shades, the shades sufficiently far into the interior of the range can be known to be red. One might think it natural to think about rational credences with a similar model—given the continuous range of rational credences, the credences sufficiently to the interior of the range can be known to be rational.

The trouble is that in a setting where Margin-for-Error and Dominance are held fixed the analogy does not hold. With regard to redness, Margin-for-Error is a plausible principle, but Dominance isn't. It's not the case that if you know any shade to be red, then any shade you don't know to be red isn't red. So long as the case of rational credences holds Margin-for-Error and Dominance fixed one should be open to the possibility that it will preclude knowledge of rationality. Indeed, in light of the impossibility proof, if the case of rational credences holds Margin-for-Error, Dominance, and Connectedness fixed and one stipulates that one doesn't know that all credences are rational, one should be able to deduce that one can't know any credence to be rational.

If the case of rational credences is to hold Margin-for-Error and Dominance fixed, here's a more apt analogy for it—

> **Demonic Declaration:**
>
> A demon truthfully tells you that if there's any time in the future such that you now know that you'll be alive at that time, then at any time

[23]Schultheis (2018).

[24]Indeed, in Schultheis' preferred framework of epistemic uniqueness, any setting in which Margin-for-Error holds will be one in which no credence can be known to be rational.

[25]Modulo worries about vagueness.

> at which you don't now know you'll be alive, the demon will see to it that you're dead.

It follows that if there are any future times at which you know you'll be alive, then the property of being alive at a time is luminous—for any time at which you'll be alive, you now know you'll be alive at that time. Supposing that Margin-for-Error holds here, it will be impossible for times at which you know you'll be alive to suddenly transition into times at which you are dead.[26] The only possibilities are that you don't now know of any times at which you'll be alive or that you'll live forever. If we stipulate your mortality, it will simply follow as a matter of logic that you don't now know of any times at which you'll be alive. However long you live (and it might be a long time) you can't know that you'll have even a single additional moment of life.[27]

This is an odd situation; it's not like the case of a color wheel. Holding fixed Margin-for-Error and Dominance, the case of what credences are rational is similarly odd.

It is not integral to epistemic permissivism that agents can know some credences to be rational. Given Schultheis' epistemological assumptions, analogies that suggest that if permissivism is true then some range of credences can be known to be rational are not apt. It is therefore tendentious for Schultheis to suppose that if permissivism is true then some credences can be known to be rational.

5 Denying Quotidian Context: Not an All-Purpose Solution

The three principles—Quotidian Context, Margin-for-Error, and Dominance—are jointly unsatisfiable for any property in any set. Which principles go unsatisfied will depend on the set and the property in question. When it comes to the rationality of credences, which principle(s) should be given up?

In the case of rational credences, we've suggested that there's nothing disastrous about denying Quotidian Context for rational credences (whether or not one is an epistemic permissivist). One might therefore think that the tension between Quotidian Context, Margin-for-Error, and Dominance regarding rational credences can be satisfactorily resolved by giving up Quotidian Context. There are, however, very similar cases in which denying Quotidian Context seems outlandish. In

[26] We will revisit the plausibility of Margin-for-Error for this sort of case later.

[27] Note that this result does not depend on you reasoning on the basis of the demonic declaration; it depends only on the demonic declaration being true. The case could have been framed to have the demon talking to himself, but it seemed more dramatic to have him tell you his fiendish intentions.

those cases—in which Margin-for-Error and Dominance have similar initial allure—it seems that one will have to give up either Margin-for-Error or Dominance. And since either Margin-for-Error or Dominance fail in cases similar that of rational credences, it suggests that their plausibility regarding rational credences should be revisited.

Here's such a case—

> **Baby Food:**
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> You're getting baby food for a malnourished baby. What matters is providing the baby with enough food for its nourishment—there are no concerns about wasting baby food. We make two stipulations: (1) If you know a quantity is sufficient to nourish the baby then that quantity is OK to provide. (2) If a quantity is not sufficient to nourish the baby then that quantity is not OK to provide.
>
> Suppose that quantities ranging from a literal mountain of baby food to no food at all are available. Biology determines how much baby food it takes to nourish a malnourished baby. A literal mountain of baby food is sufficient to nourish a baby, and no food at all is insufficient to nourish a baby.

Margin-for-Error and Dominance each seem like appealing principles regarding the OKness of quantities of baby food. Regarding Margin-for-Error, it seems wrong to say that you can know that some quantity of baby food is OK when a nearby quantity is not OK. You're not masterful at distinguishing quantities that are OK from quantities that aren't OK, and so you should expect to know that a quantity is OK only when it is not close to the OK / not-OK border. Regarding, Dominance, it seems wrong to say that it's OK to provide a quantity of baby food that you don't know is OK when there's an alternative quantity that you do know is OK. The baby's nourishment is all that matters—we stipulated that there are no concerns about wasting baby food—so it seems irresponsible to gratiutously risk giving an insufficient, not-OK quantity of baby food.[28]

Nonetheless, it seems overwhelmingly plausible that Quotidian Context holds for OKness. The quantities of baby food obey connectedness, and the fact that no baby food at all is insufficient to nourish a baby guarantees that some quantity of baby food is not known to be OK.[29] The only way for Quotidian Context to fail is if no value is known to be OK. And there is no good reason why it should be impossible to know that a literal mountain of baby food is OK. A literal mountain of

[28]Note that these considerations suggest that Dominance applies to the normative property of OKness. Dominance would not be plausible at all regarding the non-normative property of being enough to nourish a particular malnourished baby.

[29]Yet again—and for the same reasons—relying on factivity is convenient but unnecessary.

baby food is obviously enough, so it should be easy to know that a literal mountain of baby food is enough, and thus a literal mountain of baby food is OK. And there's no reason to think that the OKness of providing a literal mountain of baby food should be an unknowable truth.

Since Quotidian Context holds regarding the OKness of quantities of baby food, either Margin-for-Error or Dominance must not hold regarding it. But if either Margin-for-Error or Dominance do not hold in the baby food case, then either Margin-for-Error or Dominance sometimes fails to hold even when it seems intuitively plausible. As far as the motivations for Margin-for-Error and Dominance go, the baby food case seems very similar to the case of rational credences. This suggests that either Margin-for-Error or Dominance do not hold regarding which credences are rational. So which principle should be given up regarding rational credences—Margin-for-Error or Dominance?

6 Prospects for Denying Margin-for-Error

Margin-for-Error seems like a generally plausible principle. It closely resembles a safety requirement for knowledge, and safety requirements for knowledge are generally plausible.[30] Nonetheless, there are cases in which it seems reasonable to deny Margin-for-Error. For example—[31]

> **Angelic Protection:**
>
> God instructs an angel as follows: "Survey Barack Obama's current state of knowledge regarding his mortality. At any time such that he does not currently know that he will be dead at that time, keep him alive."[32]

God's instruction enforces Dominance for being alive—at any time at which Barack Obama does not currently know that he'll be dead, he won't be. And two of the three requirements for Quotidian Context are also clearly satisfied—the possible times are connected, and there is a time such that Barack Obama does not know that he'll be dead at that time. There are, therefore, only two possibilities. If we hold Margin-for-Error fixed, then there can be no time such that Barack Obama

[30] For example, Timothy Williamson considers safety to be a fruitful principle for evaluating knowledge in a wide variety of contexts. But others, notably Robert Stalnaker, deny the existence of a safety constraint on knowledge even in fairly mundane cases. For more, see Williamson (2000) and Stalnaker (2006).

[31] The following case parallels the earlier case, Demonic Declaration. There we were taking Margin-for-Error for granted, here we don't.

[32] For convenience, we assume that Barack Obama knows that if he's dead at some time then he's dead at all future times.

currently knows he'll be dead at that time, and thus the angel will keep him alive forever. If we give Margin-for-Error up then Barack Obama will simply stay alive until the first time for which he knows he'll be dead, and then promptly die. To our minds, the latter theory of Barack Obama's state of knowledge seems more sensible than the former, and thus we do not consider Margin-for-Error to hold universally. Assuming that one is inclined to Dominance, we don't think it unreasonable to take a similar attitude to the case of baby food and the case of rational credences, and deny that Margin-for-Error holds for them.

7 Prospects for Denying Dominance

Dominance is not a plausible principle for most properties. Still, the thought that it's irrational to have a credence that might be irrational when there's an alternative credence that's known to be rational has intuitive appeal.

Nonetheless, we have concerns about Dominance for which credences are rational. These concerns are independent of issues with Margin-for-Error. In particular, Dominance seems to pose problems related to three topics: imperfect introspection, blindspots, and non-locality.

7.1 Problems with Imperfect Introspection

Schultheis refers to the possibilities relevant for an agent as those the agent treats as live. Since we've presented her argument in terms of knowledge, we will take an agent to treat a possibility as live just in case the agent does not know that the possibility does not obtain.[33] We assume that liveness respects closure under known consequence, so that if there's a live possibility in which p holds and it's known that if p then q holds, then there's a live possibility in which q holds. We assume that the conjunction of something known to be true and something not known to be false is not known to be false. We also assume that Dominance is known. More formally, we have the following principles—

Duality: $\mathrm{K}p \equiv \neg \mathrm{L} \neg p$

Liveness Closure: $(\mathrm{L}p \wedge \mathrm{K}(p \supset q)) \supset \mathrm{L}q$

Combination: $(\mathrm{K}p \wedge \neg \mathrm{Kq}) \supset \neg \mathrm{K} \neg (p \wedge \neg \mathrm{q})$[34]

[33] Again, we will revisit what difference—if any—would be made by employing alternative epistemological notions.

[34] Note that given the idealizing assumption of logical omniscience the argument could be simplified by assuming Known Closure

Known Dominance: $\mathrm{K}((\mathrm{K}rat_p \wedge \neg\mathrm{K}rat_q) \supset \neg rat_q)$

Let's suppose that an agent knows that .3 is a rational credence and knows that she knows that .3 is a rational credence. But due to a lack of introspective access, although the agent knows that .4 is a rational credence she does not know that she knows that .4 is a rational credence. More formally, we have the following premises—

(1): $\mathrm{K}rat_{.3}$

(2): $\mathrm{K}rat_{.4}$

(3): $\mathrm{KK}rat_{.3}$

(4): $\neg\mathrm{KK}rat_{.4}$

But these seemingly innocuous premises lead to contradiction, as they license the following deduction[35]—

(5): $\neg\mathrm{K}\neg(\mathrm{K}rat_{.3} \wedge \neg\mathrm{K}rat_{.4})$ — by (3), (4), and Combination

(6): $\mathrm{L}(\mathrm{K}rat_{.3} \wedge \neg\mathrm{K}rat_{.4})$ — by (5) and Duality

(7): $\mathrm{L}\neg rat_{.4}$ — by (6), Known Dominance, and Liveness Closure

(8): $\neg\mathrm{K}rat_{.4}$ — by (7) and Duality

(9): $\perp$ — by (2) and (8)

If there are both introspective successes and failures regarding knowledge, then there doesn't seem to be any good reason why the particular pattern of successes and failures that features in the argument shouldn't be possible.[36] Dominance therefore seems to be incompatible not only with Margins-for-Error, but with the broad contours of anti-Cartesian epistemology.[37]

Known Closure: $\mathrm{K}(p \supset q) \supset (\mathrm{K}p \supset \mathrm{K}q)$

from which both Liveness Closure and Combination follow given the other principles.

[35] The deduction does not involve (1), but it is helpful for stage-setting nonetheless.

[36] Nor should stipulating the knowledge of correct epistemological principles make that pattern impossible.

[37] Here's a slightly different proof. Its structure is slightly more complex, but it doesn't require

7.2 Problems with Blindspots

We've been talking about knowing that credence c_1 is rational for p but not knowing that c_2 is rational for p. But what does it mean to know that c_1 is rational for p? It can't be knowing that only rational credal states assign c_1 to p; it's obviously possible for a credal state to be fine regarding p but to go wrong elsewhere. It can't be knowing that all rational credal states assign c_1 to p; that would straightforwardly entail that in permissive cases no credence is known to be rational.

The natural precisification is this: Knowing that c_1 is rational for p means knowing that *some* rational credal state assigns c_1 to p. Similarly, not knowing that c_2 is rational for p means not knowing that some rational credal state assigns c_2 to p.

Given this precisification, Dominance poses some problems regarding the rationality of credences. Suppose an agent knows that there's a rational credal state that assigns credence .2 to p, knows that there's a rational credal state that assigns credence .2 to $\neg p$, knows that no probabilistically incoherent credal state is rational, and doesn't know anything else of import. By Dominance, only credal states that assign .2 to p can be rational, and by Dominance only credal states that assign .2 to $\neg p$ can be rational. But no probabilistically coherent credal state assigns .2 to

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that anything be known to be known to be rational: Let's suppose that an agent knows that .3 is a rational credence and doesn't know that .4 is a rational credence. But due to a lack of introspective access, the agent doesn't know that she knows that .3 is a rational credence and doesn't know that she doesn't know that .4 is a rational credence. More formally, we have the following premises—

(1): $\mathrm{K}rat_{.3}$
(2): $\neg\mathrm{K}rat_{.4}$
(3): $\neg\mathrm{K}\mathrm{K}rat_{.3}$
(4): $\neg\mathrm{K}\neg\mathrm{K}rat_{.4}$

Let's further suppose that the agent doesn't know that it's not the case both that she doesn't know that .3 is rational and that she does know that .4 is rational. (Although there are cases in which an agent is guaranteed to know that a conjunction is false without knowing that either conjunct is false, there's no reason to believe that such a dynamic is at stake here.) More formally, we have the further premise—

(5): $\neg\mathrm{K}\neg(\neg\mathrm{K}rat_{.3} \wedge K\mathrm{rat}_{.4})$

These seemingly innocuous premises (indeed, even premises (1) and (5) alone) lead to contradiction, as they license the following deduction—

(6): $\mathrm{L}(\neg\mathrm{K}rat_{.3} \wedge K\mathrm{rat}_{.4})$	by (5) and Duality
(7): $\mathrm{L}\neg rat_{.3}$	by (6), Known Dominance, and Liveness Closure
(8): $\neg\mathrm{K}rat_{.3}$	by (7) and Duality
(9): $\perp$	by (1) and (8)

p and .2 to $\neg p$, and only probabilistically coherent credal states are rational. So no credal states are rational. And that contradicts the assumption that the agent knows that there are some rational credal states.[38] [39]

One might think that this sort of case won't be problem. Given the rational requirement of probabilistic coherence, knowledge that there's a rational credal state that assigns credence .2 to p should entail knowledge that there's a rational credal state that assigns .8 to $\neg p$, and similarly knowledge that there's a rational credal state that assigns credence .2 to $\neg p$ should entail knowledge that there's a rational credal state that assigns .8 to p. Dominance does not pose problems for this more expansive state of knowledge. The principle of probabilistic coherence guarantees that a case involving the knowledge of the rationality of credences about two propositions in a partition[40] cannot cause a problem.

Unfortunately, the principle of probabilistic coherence does not guarantee that a case involving the knowledge of the rationality of credences about more than two propositions in a partition cannot cause a problem. Indeed, partitions with three or more propositions can be problematic. Consider the following three propositions: p, $\neg p \wedge q$, $\neg p \wedge \neg q$. Logic guarantees that exactly one of the three propositions is true. Suppose an agent knows that some rational credal state assigns credence .2 to p, knows that some rational credal state assigns credence .2 to $\neg p \wedge q$, and knows that some rational credal state assigns credence .2 to $\neg p \wedge \neg q$. The principle of probabilistic coherence cannot extract further knowledge about what credences in those propositions are rational. An agent can deduce that, for any disjunction of two of the propositions, some rational credal state assigns credence .8 to it. But that does not produce any further knowledge about what values the rational credal states assign to the propositions themselves. So the combination of Dominance, the rational requirement of probabilistic coherence, knowledge that credence .2 is rational for p, knowledge that credence .2 is rational for $\neg p \wedge q$, knowledge that credence .2 is rational for $\neg p \wedge \neg q$, and the absence of further pertinent knowledge yields a contradiction. It is awkward that Dominance renders apparently reasonable states of knowledge impossible.

7.3 Problems with Non-Locality

Knowing that a credence is rational means knowing that *some* rational credal state assigns it. Not knowing that a credence is rational means not knowing that *some*

[38] Strictly speaking, the agent's knowledge that no probabilistically incoherent credal state is rational is not needed for this argument. All that is needed is the fact that no probabilistically incoherent credal state is rational.

[39] Note that the result is not that in the agent's case there is no rational credal state. The result is that the suppositions of the case are impossible.

[40] Propositions constitute a partition when they are mutually exclusive and jointly exhaustive.

rational credal state assigns it. Given these definitions, there's no guarantee whatsoever that a credence that's known to be rational is a safer bet than a credence that isn't known to be rational.

The root of the problem is that the rationality of a credal state does not straightforwardly depend on the rationality of each of its component credences. A rational credal state must be probabilistically coherent. While probabilistic coherence imposes some constraints on each credence, it imposes further constraints on all the credences taken together. It is hard for Dominance to interact with such further constraints.

Suppose that a state subject to rational evaluation is decomposed into some number of constituent elements.[41] If the rationality of the state is a purely local matter, then the only way for the state to be irrational is if one of its components guarantees its irrationality.

> **Locality:** If each element of a state subject to rational evaluation can feature in a rational state, then that state is rational.

States that satisfy Locality will satisfy Agglomeration.

> **Agglomeration:** For any compatible elements ϕ and ψ, if ϕ is consistent with rationality and ψ is consistent with rationality, then ϕ and ψ together are consistent with rationality.

In contexts in which Locality and Agglomeration hold, the only way for a state to go astray is by having a constituent element which is never rational. Thus any element which is sometimes rational cannot cause any problems. But without Locality and without Agglomeration an element that is consistent with rationality may nonetheless make rationality significantly harder to attain. Without Locality and without Agglomeration there are more ways for states to go astray.[42]

Locality and Agglomeration do not hold for credal states if epistemic permissivism is true. An evidential state may license having credence .2 in p and it may also license having credence .2 in $\neg p$, but it will never license having both credence .2 in p and credence .2 in $\neg p$.[43] Because of such non-local constraints, knowledge about the rational viability of particular credences is significantly less helpful.

[41] This number is assumed to be finite.

[42] In essence, the problems with blindspots discussed above are caused by a failure of Agglomeration.

[43] The requirement of probabilistic coherence is only one example of a non-local constraint; there are other potential sources of non-locality. For example, it might be rationally required to give p and q equal probability despite there being latitude about what probability to assign each proposition. Suppose you know that a political leader was deposed in a military coup and convicted of crimes against the state. It might be rational to have high credence that the trial was corrupt and high credence that the leader was innocent and it might also be rational to have low

It is consistent with an agent knowing that c_1 is rational and not knowing that c_2 is rational that the agent be extremely confident that if she chooses c_1 she will be irrational and extremely confident that if she chooses c_2 she will be rational. An agent can know that there's some way to be rational with c_1, but know that the overwhelming majority of ways to have c_1 are irrational, and have no idea how to choose among ways of having c_1. An agent can fail to know that there's any way to be rational with c_2, but be extremely confident that there are ways to be rational with c_2, and have a very good idea of how to choose among ways of having c_2. It's not at all the case that an agent cannot go wrong by choosing a dominating option instead of a dominated option. Absent a guarantee that dominating options are at least as good as dominated options, it is unreasonable for Dominance to privilege dominating options over dominated options. Dominance is inappropriate for domains subject to non-local constraints. Dominance is inappropriate for rational credences.

8 Conclusion

Schultheis' argument against epistemic permissivism is novel and interesting. But there are several substantial issues with it. First, given Margin-for-Error and Dominance, there is no reason to expect that an agent in a permissive case could know any credence to be rational. Second, Dominance for some context makes Margin-for-Error less plausible for that context. Third, Dominance is inappropriate regarding the rationality of credences. Due to these issues, Schultheis' argument does not refute epistemic permissivism. Nonetheless, it is a fruitful basis for philosophical reflection.

Appendix

We framed our presentation of Schultheis' reasoning in terms of knowledge. In fact, she employed a multiplicity of epistemological ideologies including—but not limited to—knowledge, certainty, and what one ought to believe. What difference—if any—does choice of epistemological ideology make?

Schultheis herself wavers between alternate ideologies. For example, her treatment of Dominance in light of epistemic permissivism begins with a discussion of the limits of knowledge, switches to a discussion of what one should be certain of,

credence that the trial was corrupt and low credence that the leader was innocent. Nonetheless, it might well be irrational to have high credence that the trial was corrupt and low credence that the leader was innocent or to have low credence that the trial was corrupt and high credence that the leader was innocent.

and then switches again to a discussion of what one ought to believe. This is unfortunate. For example, Schultheis asserts that an agent shouldn't be certain of the lower bound of the rational range. She then asserts that an agent should believe that the bounds of the rational range are roughly where they actually are. But one is left guessing about whether an agent should be certain that the bounds of the rational range are roughly where they actually are. The changes in ideology make the reasoning seem modest: denying certainty is more modest than denying that one ought to believe, and affirming that one ought to believe is more modest than affirming certainty. But absent a sustained treatment of the issues taken up it is unclear how the topic at hand, knowledge, certainty, and what one ought to believe interact.

Note that a profusion of epistemological ideologies is especially problematic for those of Schultheis' sensibilities. Suppose one wants to have knowledge about what is and is not rational, but have Dominance deal with what is and is not certain to be rational. More formally, we have the following principles—

Factivity: $\mathrm{K}p \supset \mathrm{p}$

C-Dominance: $(\mathrm{C}rat_p \wedge \neg \mathrm{C}rat_q) \supset \neg rat_q$

.

For these purposes, we make the standard assumption that there is no logical connection between knowledge and subjective certainty. Let us suppose that an agent knows that .3 is a rational credence and does not know that .4 is a rational credence. Let us also suppose that the agent is certain that .4 is a rational credence and is not certain that .3 is a rational credence. More formally, we have the following premises—

(1): $\mathrm{K}rat_{.3}$

(2): $\neg \mathrm{K}rat_{.4}$

(3): $\mathrm{C}rat_{.3}$

(4): $\neg \mathrm{C}rat_{.4}$

These seemingly innocuous premises lead to contradiction, as they license the following deduction—

(5): $rat_{.3}$ by (1) and Factivity

(6): $\mathrm{C}rat_{.4} \wedge \neg \mathrm{C}rat_{.3}$ by (3) and (4)

(7): $\neg rat_{.3}$ by (6) and C-Dominance

(8): $\bot$ by (5) and (7)

In order to get a viable argument against epistemic permissivism, some measure of uniformity is needed. If there are some premises about knowledge, other premises about certainty, other premises about belief, and so on, then (absent stipulated relationships between knowledge, certainty, belief, and so on) it will be very hard to combine those premises together into a cogent argument.[44]

Moreover, any uniform treatment of Schultheis' reasoning is liable to be helpfully clarified by our simplified argument. While we employed the ideology of knowledge, the inconsistency between Quotidian Context, Margin-for-Error, and Dominance does not depend on any distinctive features about knowledge.[45] The import of our simplified argument is therefore not limited by our choice of ideology.

[44]In conversation with the author we explored a reconstruction of her reasoning that involved both rational certainty and knowledge. The idea was to put Margin-for-Error in terms of knowledge and Dominance in terms of rational certainty. The argument would then unfold by saying that (i) if you know that you don't know that p then it is not rational to be certain that p and (ii) it is rational to be certain that the credences in the middle of the rational range are rational. (Known) margin for error for knowledge is meant to play a role in underwriting (i).

We agreed, however, that this argument adds extra liabilities and complexity with insufficient compensating gain. In particular, it is not so easy to show using Margin-for-Error that if c_1 is an endpoint of the rational range then one knowns one doesn't know that c_1 is rational. Of course, given (known) Margin-for-Error one knows that if c_1 is an endpoint of the rational range then one doesn't know that c_1 is rational. But the latter does not secure the former. It is also harder to motivate the idea that some middle points of the rational range are such that it is rational to be certain they are rational than it is to motivate the the idea that some middle points of the rational range are such that one knows them to be rational.

[45]In particular, the inconsistency does not depend on the factivity of knowledge. See footnotes 17, 19, 21 and 29 for more.

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