An "Evidentialist" Worry about Joyce's Argument for Probabilism

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- Epistemic norms include (what I will call) *accuracy norms* and *coherence norms*. In traditional epistemology, we have:
  - **The Truth Norm for Belief** (TB). Epistemically rational agents should only believe propositions that are true.
  - **The Consistency Norm for Belief** (CB). Epistemically rational agents should have logically consistent belief sets.
- Moreover, (CB) *follows from* (TB), since if S's beliefs are inconsistent, then S must have (some) false beliefs.
- This is one traditional (epistemic) story about how an accuracy norm [(TB)] is related to a coherence norm [(CB)].
- In formal epistemology, we assume that agents have *degrees* of confidence (*viz.*, *credences*). Are there accuracy and coherence norms for credences? If so, how do they relate?
- Recently, some (*e.g.*, Joyce [4, 3]) have offered answers these questions. Today, I will try to cause trouble for Joyce's answer(s). First, I'll rehearse some troubles for (TB)/(CB).

- An agent S in a (sufficiently bad) *preface case* will have (total) evidence E that (at least *prima facie*) supports a *violation* of (CB)/(TB). That is, E seems to support (or fit) an epistemic state in which S has inconsistent beliefs.
- This raises a third type of epistemic norm, which I will call an *evidential norm*. Evidential norms require agents to have attitudes/states that are supported by their total evidence.
- In (bad) preface cases, we seem to have a *conflict* between evidential norms and coherence/accuracy norms.
- I will argue that an analogous conflict can arise in the context of some recent "non-pragmatic" arguments (*e.g.*, [4, 3]) for *probabilistic coherence norms* (*viz.*, *probabilism*).
- Next, I will provide some background on Joycean arguments for probabilistic coherence norms for credences. Then, I will explain how evidential conflicts can arise in that context.
- In the *Coda*, I'll return to the dialectic regarding full belief.

- Standard arguments for *probabilism* are of the form:
  - An agent S has a non-probabilistic partial belief function b iff ($\Longleftrightarrow$) S has some "bad" property B (*in virtue of* the fact that their c.f. b has a certain "bad" *formal* property F).
- These *arguments* rest on *Theorems* ($\Rightarrow$) and *Converse Theorems* ($\Leftarrow$): b is non-Pr $\Longleftrightarrow$ b has formal property F.
  - **Dutch Book Arguments** [7, 1]. B is *susceptibility to sure monetary loss* (in a certain betting set-up), and F is the formal role played by non-Pr b's in the DBT/Converse DBT.
  - **Representation Theorem Arguments** [8]. B is *having preferences that violate some of Savage's axioms* (and/or *being unrepresentable as an expected utility maximizer*), and F is the formal role played by non-Pr b's in the RT.
- To the extent that we have reasons to avoid these B's, these arguments provide reasons (not) to have a(n) (in)coherent b.
- Joycean arguments for probabilism also fit this pattern.

- According to Joyce [4], if we view credences as "estimates" of (suitable) "numerical representations of truth-values" of propositions, then we can give an argument for probabilism that is based on the "accuracy" of these "estimates".
- Consider a very simple, logically omniscient, opinionated agent S who has only one atomic sentence P in his language.
- All that matters concerning S's *coherence* is whether S's credences $b(P)$, $b(\sim P)$ *sum to one* (*and are non-negative*).
- Following Joyce, let's associate the truth-value **T** (at each world w) with the number 1 and the truth-value **F** with 0.
- The idea will be that $b(p)$ represents the agent S's "estimate" of the truth-value of p. These "estimates" will be subject to an accuracy norm, which will, in turn, give rise to a coherence norm (*viz.*, *probabilism*) for credences.
- Next, measuring the "accuracy" of Joycean "estimates" (b).

- The *inaccuracy* of $b(p)$ at world w will be b's "distance (d) from the number associated with p's truth-value" at w.
- **Example.** Suppose S has just two (contingent) propositions $\{P, \sim P\}$ in their doxastic space. Then, there are two salient possible worlds (w_1 in which P is **T**, and w_2 in which P is **F**). And, the *overall inaccuracy* of b at w [$I(b, w)$] is given by:
  - $I(b, w_1) = d(b(P), 1) + d(b(\sim P), 0)$.
  - $I(b, w_2) = d(b(P), 0) + d(b(\sim P), 1)$.
- Various measures (d) of "distance from 0/1-truth-value" have been proposed/defended in the historical literature.
- de Finetti [2] endorsed the following measure of "distance from truth-value" (in one argument for probabilism):
  - $\mathfrak{s}(x, y) = (x - y)^2$.
- The distance measure $\mathfrak{s}$ gives rise to a measure of *overall* inaccuracy ($I_{\mathfrak{s}}$), which is known as the *Brier Score*. In our toy example, the Brier Scores of b in worlds w_1 and w_2 are:

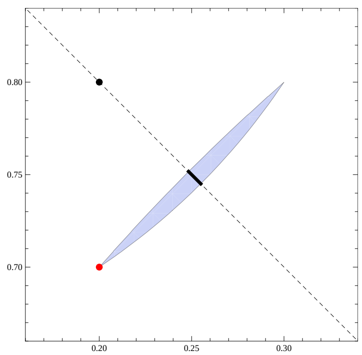
  - $I_{\mathfrak{s}}(b, w_1) = \mathfrak{s}(b(P), 1) + \mathfrak{s}(b(\sim P), 0) = (b(P) - 1)^2 + b(\sim P)^2$.
  - $I_{\mathfrak{s}}(b, w_2) = \mathfrak{s}(b(P), 0) + \mathfrak{s}(b(\sim P), 1) = b(P)^2 + (b(\sim P) - 1)^2$.
- If one adopts the Brier Score as one's measure of b's inaccuracy, then one can give an "accuracy-dominance argument" for the axioms of the probability calculus.
- de Finetti [1] was the first to prove such a *Brier*-dominance theorem. Joyce [4, 3] interprets this as *accuracy*-dominance.
  - **Theorem** (de Finetti). b is *non*-probabilistic *if and only if* there exists a *probabilistic* credence function b' such that (a) *b' has a strictly lower Brier Score than b at some worlds*, and (b) *b' never has a greater Brier Score than b at any world.*

☞ The "bad" B is: *being dominated in accuracy*; and, the "bad" F is: the c.f. b is *Brier-dominated* by some coherent c.f. b'.

- One can use other underlying measures of distance d here and still preserve a de Finetti-style Theorem (but see [6]). Our "evidentialist" worry will apply to any such approach.

- Suppose S adopts the Brier Score as their I-measure, and that S's b is non-probabilistic. Then, there are alternative (coherent) credence functions b' that accuracy-dominate b.
- Intuitively, these b' functions should "look epistemically better" (in a precise sense) than S's current credences b.
- But, a possible "evidentialist" worry remains.
- Consider a very simple toy agent S with one sentence P in their language. And, suppose S's credence function assigns $b(P) = 0.2$ and $b(\sim P) = 0.7$. So, S's b is *non*-probabilistic.
- It follows from de Finetti/Joyce's theorems that there is *a specific set of* credence functions b' that *Brier-dominate* b.
- It seems that this alternative credence function b' should *inevitably* "look epistemically better" to S than her current credence function b. Our worry is that this *needn't* be so.
- Consider the following (toy) illustration of our worry.

- The red dot in the figure is S's credence function b. The shaded region depicts the functions b' that *Brier-dominate* b. [The black dot at $\langle 0.2, 0.8\rangle$ depicts the *only probabilistic* credence function that is compatible with $b(P) = 0.2$.]



- Suppose that S *has good reason* to assign $b(P) = 0.2$ (*i.e.*, S's total evidence E *supports* $b(P) = 0.2$).
- Here, *all* the Brier-dominating functions b' are s.t. $b'(p) \neq 0.2$.
- So, *all the Brier-dominating functions b' may be "ruled-out" by S's evidence.*
- Then, b' *needn't* "look better" than b.

☞ This is analogous to what happens with (bad) preface cases. Evidential norms can sometimes "trump" coherence norms.

- In fact, an even tighter analogy can be drawn here...

- Let's return to the case of full belief and disbelief. Notation:
  - $B_S(p) \overset{\text{def}}{=} S$ believes that p.
  - $D_S(p) \overset{\text{def}}{=} S$ disbelieves that p.
- Uncontroversially, (in)accuracy for belief/disbelief is:
  - $B_S(p)$ is (in)accurate in w iff p is true (false) at w.
  - $D_S(p)$ is (in)accurate in w iff p is false (true) at w.
- Let $\mathfrak{B}$ be the set of S's qualitative judgments over a (full, Boolean) algebra $\mathcal{B}$ (where we assume S is *opinionated*).
- Then, the obvious way to define the *innaccuracy* of $\mathfrak{B}$ at a world w is as *the number of inaccurate judgments in $\mathfrak{B}$ at w*.
- Finally, this leads directly to the following natural definition of *accuracy-dominance* for *qualitative* judgment sets:
  - One set of qualitative judgments $\mathfrak{B}'$ *accuracy-dominates* another $\mathfrak{B}$ iff (i) $\mathfrak{B}'$ has *strictly fewer* inaccurate judgments at *some* possible worlds, and (ii) $\mathfrak{B}'$ contains *at most as many* inaccurate judgments as $\mathfrak{B}$ at *every* possible world.

- Next, consider the following *qualitative coherence norm*:

(QC) S should not have a qualitative judgment set $\mathfrak{B}$ that is *accuracy-dominated* by some alternative set $\mathfrak{B}'$.

- Note: (QC) is immune from one analogue of preface cases.
- In a (sufficiently bad) preface case, S has a judgment set $\mathfrak{B}$ which is inconsistent, but which is such that no consistent alternative $\mathfrak{B}'$ "looks as good" to them, *given their evidence*.
- If we show S an alternative, consistent set $\mathfrak{B}'$, their evidence will suggest — *perhaps non-misleadingly!* — that $\mathfrak{B}'$ contains *more inaccurate judgments* than their own set $\mathfrak{B}$.
- However, if S violates (QC), then — *a fortiori* — no *dominating* alternative $\mathfrak{B}'$ can (possibly) have a greater number of inaccurate judgments than S's $\mathfrak{B}$. So, if S's evidence suggests such a thing, it *must be misleading*!
- Does this mean (QC) is immune from being "trumped" by *any* evidential norm(s)? Perhaps not. Here's a (toy) example.

	$\mathfrak{B}$	$\mathfrak{B}'$
$\sim X \,\&\, \sim Y$	B	D
$X \,\&\, \sim Y$	B	D
$X \,\&\, Y$	B	D
$\sim X \,\&\, Y$	D	D
$\sim Y$	B	B
$X \equiv Y$	B	B
$\sim X$	D	D
X	B	B
$\sim(X \equiv Y)$	D	D
Y	D	D
$X \vee \sim Y$	B	B
$\sim X \vee \sim Y$	B	B
$\sim X \vee Y$	B	B
$X \vee Y$	B	B
$X \vee \sim X$	B	B

- S's $\mathfrak{B}$ isn't dominated by any *consistent* set, but $\mathfrak{B}$ is — *uniquely* — dominated by the "coherent" $\mathfrak{B}'$.
- As I mentioned, it is *impossible* for S's evidence to *non-misleadingly* make it appear to S that $\mathfrak{B}'$ contains more inaccurate judgments than $\mathfrak{B}$.
- But, it is still possible for there to be a different sense in which S's evidence non-misleadingly suggests that her violation of (QC) may be "OK".
- Suppose S's evidence *non-misleadingly* supports the truth of the conjunction $X \,\&\, \sim Y$. Then, S may reason as follows, when they encounter $\mathfrak{B}'$.
  - Look, I realize that $\mathfrak{B}'$ cannot have more inaccurate judgments than my $\mathfrak{B}$ does.
  - But, *I have good evidence for $X \,\&\, \sim Y$*, which (if true) *rules-out* $\mathfrak{B}'$. Since *my* violation of (QC) is *equivalent* to my being dominated by $\mathfrak{B}'$, why should I be *moved* by my violation of (QC)?

- In traditional epistemology, the preface paradox can be used (by "evidentialists" [5]) to cast doubt on the traditional story about accuracy & coherence norms for *full belief*.
- In formal epistemology, there is a different story about the relationship between accuracy and coherence.
- Joyce suggests a novel, *accuracy-dominance* approach to grounding a probabilistic coherence norm for credences.
- This seems to yield an argument for coherence norms that is immune from "evidentialist" challenges.
- While certain, *old* "evidentialist" challenges *can* be blocked by Joycean techniques, we worry that *new* problems arise.
- We gave some (toy!) examples to illustrate these new "evidentialist" challenges, both in the context of partial belief, and in the analogous dialectic regarding full belief.
- We suspect more complex (and compelling) examples exist, which will make the problems raised here more pressing.

[1] B. de Finetti, *The Theory of Probability*, Wiley, 1974.

[2] ______, *Foresight: Its Logical Laws, Its Subjective Sources*, in H. Kyburg and H. Smokler (*eds.*), *Studies in Subjective Probability*, Wiley, 1964.

[3] J. Joyce, *Accuracy and Coherence: Prospects for an Alethic Epistemology of Partial Belief*, in F. Huber and C. Schmidt-Petri (*eds.*), *Degrees of Belief*, 2009.

[4] ______, *A Nonpragmatic Vindication of Probabilism*, *Philosophy of Science*, 1998.

[5] N. Kolodny, *How Does Coherence Matter?*, *Proc. of the Aristotelian Society*, 2007.

[6] P. Maher, *Joyce's Argument for Probabilism*, *Philosophy of Science*, 2002.

[7] F. Ramsey, *Truth and Probability*, 1926.

[8] L. Savage, *The Foundations of Statistics*, Dover, 1972.