

Round Table on Coherence (Part I)

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¹These slides include joint work with Daniel Berntson (Princeton), Rachael Briggs (ANU), Fabrizio Cariani (NU), Kenny Easwaran (USC), and David McCarthy (HKU). Please do not cite or quote without permission.

- Today's Round Table is about a new way of thinking about formal, epistemic coherence requirements, which was inspired by Jim Joyce's [10, 9] arguments for *probabilism*.
 - Richard will tell us about such arguments for probabilism.
- I'm going to explain how to generalize Joyce's idea to *any* type of judgment that can be assessed in terms of *accuracy*.
- Then, I will describe how this framework applies to *full belief* (this is joint work with Kenny Easwaran [1, 2]).
- The framework has also been applied to *comparative confidence* (that is joint work with David McCarthy [7]).
 - All three of these applications of the general framework are described in detail in the notes from my recent seminar here at MCMP. See: <http://fitelson.org/coherence>.
- Let's begin by thinking about coherence requirements for full belief. The traditional/classical story is that *deductive consistency* is a/the coherence requirement for full belief.

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- Notation: $B(p)$ [S believes that p], $D(p)$ [S disbelieves that p], and \mathfrak{B} [the set of *all* of S 's beliefs and disbeliefs]. For simplicity, we assume that S is *finite and opinionated*.
- Here, I will use the word “reasonable” to mean “supported by one’s evidence” (for now, in an informal, intuitive sense).
- Unfortunately, deductive consistency is implicated in some infamous *paradoxes* — *e.g.*, the Lottery and the Preface.
 - Lottery Paradox ([12],[6]). For each ticket i , it is highly probable that i is a loser (L_i). So, it would seem reasonable to be such that $B(L_i)$, for each i . However, this inevitably renders our set \mathfrak{B} *inconsistent*, since we *know* that $(\exists i)(\neg L_i)$.
 - Preface Paradox ([14],[4]). Let $\mathbb{B} \subset \mathfrak{B}$ be the set containing *all* of your *reasonable* (1st-order) beliefs. This \mathbb{B} is an incredibly rich and complex set of judgments. You’re fallible (*i.e.*, your 1st-order evidence is *sometimes misleading*). So, it seems reasonable to believe that *some* B 's in \mathbb{B} are false. However, adding *this* (2nd-order) belief to \mathbb{B} renders \mathfrak{B} *inconsistent*.

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- Typically, such “paradoxes” involve a *conflict* between a *consistency* requirement and an *evidential* requirement, which requires *believing what is evidentially supported*.
- There are various responses to such paradoxes.
- Some ([15], [13]) try to *maintain* consistency as a CR.
 - Such approaches tend to have implausible consequences about the nature of evidential support/reasonable belief.
- Some ([11], [4]) say there *are no CRs (per se)* for full belief.
 - These approaches have more plausible things to say about evidential support/reasonable belief, but they *give up* on trying to articulate coherence requirements for full belief.
- I (we) would suggest that such paradoxes indicate that the classical CR for full belief is *too strong*. What we need is an *alternative story* about coherence requirements.
 - ☞ Ideally, we want coherence requirements for full belief that are entailed by *both alethic and evidential* considerations.

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- For simplicity, we'll adopt a *very elementary formal model*.
 - For each proposition p in some finite Boolean algebra \mathcal{B} , S will be such that *either* $B(p)$ or $D(p)$ *and not both*.
 - To make things *really* simple, we'll assume $D(p) \equiv B(\neg p)$.
 - Finally, we'll use \mathfrak{B} to denote the *entire* set of judgments (beliefs and disbeliefs) made by S over the *full* algebra \mathcal{B} .
- With this background in place, applying our new framework to full belief involves going through the following 3 steps.
- **Step 1:** Define the *vindicated* (viz., *perfectly accurate*) *judgment set*, at w . ["Judgments of the omniscient S at w ."]
 - \mathfrak{B}_w contains $B(p)$ [$D(p)$] iff p is true (false) at w .
- **Step 2:** Define a notion of "distance between \mathfrak{B} and \mathfrak{B}_w ". That is, a measure of *distance from vindication* $d(\mathfrak{B}, \mathfrak{B}_w)$.
 - $d(\mathfrak{B}, \mathfrak{B}_w) \equiv$ the number of inaccurate judgments in \mathfrak{B} at w .
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 - $d(\mathfrak{B}, \mathring{\mathfrak{B}}_w) \stackrel{\text{def}}{=} \text{the number of inaccurate judgments in } \mathfrak{B} \text{ at } w$.
- **Step 3:** Adopt a *fundamental principle* (of *epistemic decision theory*) that uses $d(\mathfrak{B}, \mathring{\mathfrak{B}}_w)$ to ground a CR for \mathfrak{B} .

- For simplicity, we'll adopt a *very elementary formal model*.
 - For each proposition p in some finite Boolean algebra \mathcal{B} , S will be such that *either* $B(p)$ or $D(p)$ *and not both*.
 - To make things *really* simple, we'll assume $D(p) \equiv B(\neg p)$.
 - Finally, we'll use \mathfrak{B} to denote the *entire* set of judgments (beliefs and disbeliefs) made by S over the *full* algebra \mathcal{B} .
- With this background in place, applying our new framework to full belief involves going through the following *3 steps*.
- **Step 1:** Define the *vindicated (viz., perfectly accurate) judgment set*, at w . ["Judgments of the omniscient S at w ."]
 - $\mathring{\mathfrak{B}}_w$ contains $B(p)$ [$D(p)$] iff p is true (false) at w .
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- Given our choices at Steps 1 and 2, there is *a* choice we can make at Step 3 that will yield *consistency* as a CR for \mathfrak{B} .

Possible Vindication (PV). There exists *some* possible world w at which *all* of the judgments in \mathfrak{B} are accurate. Or, to put this more formally in terms of d : $(\exists w)[d(\mathfrak{B}, \mathfrak{B}_w) = 0]$.

- Possible vindication is *one way* we could go here. But, our framework is *much more general* than the classical one. It allows for *many other* choices of fundamental principle.
- Inspired by the work of de Finetti [5] and Joyce [10], we can *back away* from (PV) to something weaker, but still probative — *the avoidance of (weak) dominance in $d(\mathfrak{B}, \mathfrak{B}_w)$* .

Weak Accuracy-Dominance Avoidance (WADA).

There does *not* exist an alternative belief set \mathfrak{B}' such that:

- (i) $(\forall w)[d(\mathfrak{B}', \mathfrak{B}_w) \leq d(\mathfrak{B}, \mathfrak{B}_w)]$, and
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- The new coherence requirement implied by this application of our framework has just the sort of properties we wanted.
- We wanted a coherence requirement that (like consistency) was motivated by considerations of accuracy (ideally, *entailed by* alethic requirements such as consistency/PV).
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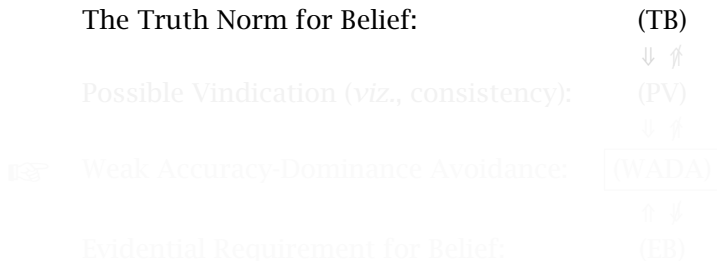
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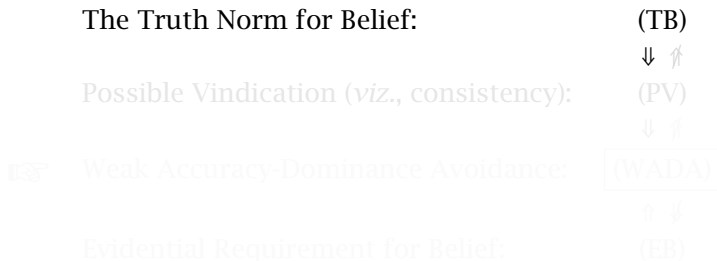
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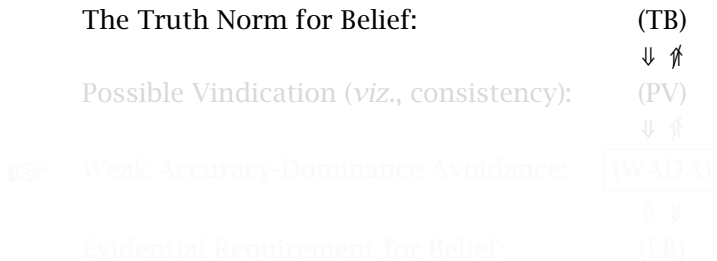
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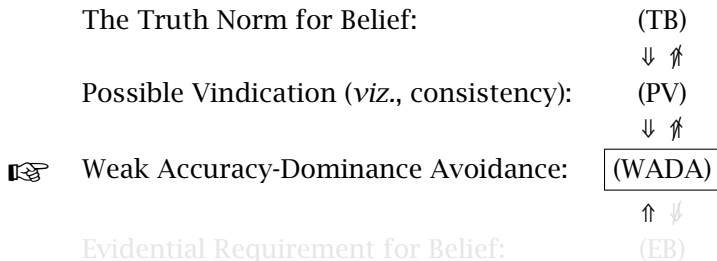
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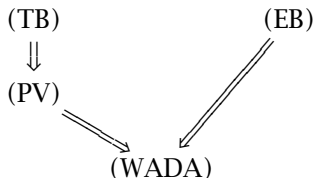
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