Rational Requirements and Self-Reference

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To what degree should an agent believe a sentence that says something about their own degrees of belief? One undermining such sentence, stripped of any motivating story, is:

$$\text{My credence in } \mathsf{ProbLiar} \text{ is not greater than } 1/2 \qquad (\mathsf{ProbLiar})$$

In this work we focus on any sentences with

$$\delta \leftrightarrow \text{“the agent's credences, } c\text{, are} \in R\text{”}$$

and try to determine what an agent's credences in δ and $\neg\delta$ should be. R is here taken to be $\subseteq [0,1]^2$. More generally we might want R to say something like: “these credences won't lead to me making a decision that would lead to something very bad”, but the simple versions we work with just will be things like $c(\delta) \leqslant 1/2$, or $c(\neg\delta) = c(\delta)$.

In this talk we will discuss two prominent rational requirements for agents, which are usually given as arguments that a rational agent's degrees of belief, or credences, should be probabilistic. The first is the Dutch Book argument, the second the accuracy argument. We show that the most natural way of formulating them lead to undesirable consequences: they lead to the rejection of probabilism, negative credences and are very flexible (for any credences that are “close enough” to one of the “world-corners”, there is some situation where they are the rationally required credal states). We moreover observe that they both have these negative properties for the for the same reasons since the Dutch Book criterion, assuming one bets with their credences, is a special case of the accuracy criterion understood in a consequential decision-theoretic manner (as Caie does in [Cai13]), at least when one only considers what the agent's credence in δ and $\neg\delta$ should be.

We will also discuss a number of possible alternatives to the obvious ways of formulating the rational requirements and point towards some of their disadvantages. For the Dutch book criterion this would involve not betting with one's credences, but one then needs to specify what the agent's prices should be. For the accuracy criterion this would involve not seeing it as a decision about which credal state is best to occupy, but instead considering the best credal state from an evaluative or observational standpoint. There are still a number of options for how to give such an accuracy criterion.

References

[Cai13] Michael Caie. Rational probabilistic incoherence. *Philosophical Review*, 122(4):527–575, 2013.