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Colloquium Abstract:

Regularity and Infinitesimal Credences

One important application of probability theory is in representing the credences, or degrees of belief, of a rational agent. In this context, many authors (notably David Lewis and Brian Skyrms, among others) have argued that probability functions should be allowed to take infinitesimal values as developed by Abraham Robinson, as well as real values. This argument is based on a principle known as "regularity", which states that a rational agent should have non-zero credence in any proposition that is epistemically possible for her.

I will show that all standard arguments for regularity are flawed, so that there is no reason why a rational agent shouldn't have credence 0 in some epistemically possible propositions. Additionally, I will argue that Robinson-style infinitesimals can't be the credences of any physical agents in any ordinary proposition. Thus, if regularity is to be saved (despite the lack of any good argument for it), we must appeal to some formulation of infinitesimals other than Robinson's.