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Question 4:

> "Korman (following Pascal) argues that believing in God has greater expected utility than not believing in God, and so you should believe in God. Reconstruct his argument. Describe what you take to be the best objection(s) to this argument. Do any of them defeat the argument?"

Introduction

Pascal's Wager asserts that it is in our best interest to believe in God because there is some chance that God exists, and if God does exist and we believe in Him then we obtain heaven. Thus, by "betting" on God's existence we have infinite potential gains and finite potential loss, compared to betting against God's existence which offers only finite possible gain. Pascal's non-empirical approach seems very strange, but it is difficult to pinpoint exactly where the argument goes wrong. In this essay I argue against the following premise of Pascal's Wager:

> Because we cannot *know* that God exists, it is reasonable to model God as existing or not with 50% probability each.

That is, I will show that lack of knowledge of a proposition P is insufficient grounds for assigning non-zero probability to P.

Exegesis

In this section I present Korman's formalization of Pascal's Wager and explain why it is robust to several objections. Korman gives his argument in premise-conclusion form (Korman, 36):

(1) "One should always choose the option with the greatest expected utility"

(2) "Believing in God has a greater expected utility than not believing in God"

(3) "So you should believe in God"

Korman's argument is valid: (3) follows from logical inference on (1) and (2). To understand why this argument might be persuasive I elaborate on the premises. In my explanation I will use **Adam** to refer to an agent, i.e., a person who has beliefs and can make decisions.

(1) Expected Utility Theory This premise can be formalized as follows:

> Let $S, \neg S$ be two possible states which occur with probabilities $\Pr[S], \Pr[\neg S] > 0$, and let A_1, A_2 be the actions available to Adam. Let $U(s, a)$ denote the utility that Adam gains if he chooses action a and the state is s. Adam *should* choose an action A_i which maximizes
> $$U(S, A_i) \Pr[S] + U(\neg S, A_i) \Pr[\neg S].$$

Expected utility theory is intuitive. For example, imagine that Adam is considering playing a casino game and that Adam's utility is directly proportional his wealth. The game is as follows:

A machine flips a fair coin. If the coin lands on heads Adam wins \$1000. Otherwise, Adam loses \$10. Intuitively Adam should play the game. Expected utility theory explains why Adam should play the game. There are many possible challenges to this premise, but they are outside the scope of this essay. In this essay I will assume premise (1) and use it to attack Korman's argument for premise (2).

(2) The Expected Utility of Believing in God Now I unpack Korman's second premise. Korman presents two possible states and two possible actions. The states are G: God exists, and $\neg G$: God doesn't exist. The actions are A: Adam believes G and $\neg A$: Adam believes $\neg G$. Korman draws the following matrix:

	G 1%	$\neg G$ 99%	**Expected Utility**
A	∞	**2**	∞
$\neg A$	**1**	**3**	2.98

Figure 1: Utility Matrix

The values listed in the matrix constitute five additional premises of Korman's argument. Korman justifies the values as follows:

(2.1) If $A \wedge G$ Adam goes to heaven, which is immeasurably better than any alternative.
(2.2) If $\neg A \wedge G$ Adam goes to hell, the worst eventuality.
(2.3) If $A \wedge \neg G$ Adam "wast[es] time going to church"(36), which is better than going to hell, but worse than being an atheist in the case $\neg G$.
(2.4) If $\neg A \wedge \neg G$ Adam gets the "benefits of [an] atheist lifestyle"(36).

The actual values are arbitrary. The key point is that going to heaven is infinitely better than any other possibility. Finally, Korman adds the following two crucial premises:

(2.5) "We don't know one way or the other whether God exists"(36).
(2.6) Lack of knowledge of G implies that $\Pr[G], \Pr[\neg G]$ are both non-zero.

In my analysis of Korman's argument I will challenge Premise (2.6). Assuming (2.1-2.6) we can compute the expected utilities claimed in Korman's matrix using the rule "$\infty \cdot x = \infty$" for any $x > 0$. Note that here $x \neq 0$ is crucial: "$\infty \cdot 0$" is much harder to make sense of than, e.g., $\infty \cdot 1\%$.

Assessment

Now I argue that Premise 2.6 is false. In particular, I argue

(4) There exists a proposition P where although an agent does not know P the agent *should not* assign non-zero probabilities to $P, \neg P$.

One might object that probability is an intrinsic property of a state, and so my insistence that not all events merit being assigned a probability is nonsensical. However, this is not the case. To see why, it is necessary to more precisely define what is meant by "probability". Two distinct interpretations of probability are:

a) "Frequency": An event E occurs with probability p if among n tests E occurs approximately $n \cdot p$ times for large n.
b) "Confidence": An event E occurs with probability p from an agent S's frame of reference if S finds the following game fair: "pay \$$p$ to play. Win \$1 if event E occurs".

For repeating random processes frequency of occurrence can reasonably be seen as an intrinsic, empirically measurable probability of the event. However, this approach completely fails for events like G (the existence of God). First off, we cannot empirically determine the likelihood of G by measuring past outcomes of the experiment "does God exist". Second, G is not random. It is either a fact that G or a fact that $\neg G$. In such a case we must use the *confidence* definition of probability.

A confidence-based notion of probability comes with its own complication: can we arbitrarily choose our level of confidence? If confidence is involuntary then (2.6) fails: an atheist who feels completely confident in $\neg G$, despite by assumption not knowing $G, \neg G$, is a counterexample to the claim that lack of knowledge of G implies $\Pr[G], \Pr[\neg G] > 0$. Yet, it is also conceivable that we do have some power over our beliefs. For example, Korman points out that if we wanted to increase our confidence in the existence of God actions such as attending church with an "open mind" could bolster our confidence in G. Thus, I propose the following refinement of (2.6*):

(2.6*) If an agent lacks knowledge of G the agent *should* view $\Pr[G], \Pr[\neg G]$ as non-zero.

In other words, (2.6*) says that a rational agent acting under the axiom of expected utility maximization always *should* assign non-zero probabilities to all states which it cannot rule out. (2.6*) may seem quite appealing: it seems to nicely parallel the principle that we should prepare for rare emergencies, e.g., by purchasing insurance and performing drills. However, this parallel is illusory: we can estimate probabilities for emergencies empirically. Now I give a story to illustrate the problem with (2.6*):

> Let C denote the proposition "you will obtain heaven if and only if you abstain from chocolate". Upon reading C online Adam resolves to never eat chocolate again.

Assuming that Adam doesn't know $C, \neg C$, (2.6*) implies that Adam should set $\Pr[C] > 0$, in which case abstaining from chocolate maximizes Adam's utility. The conclusion is inconceivable, so Adam's choice to set $\Pr[C] > 0$ must be faulty.

You might worry that assuming Adam doesn't know $\neg C$ amounts to skepticism. However, I think this assumption is equally valid to Korman's (2.5), that we don't know G. Korman's argument aims to establish that Adam should believe G relying only on Adam being unable to exclude the possibility of G. If saying "Adam doesn't know $\neg C$" is too unpalatable C can easily be replaced with another premise. For instance:

> Let C' be the event that Adam will contract a lethal disease if he leaves his house tomorrow, unless he wears a hazmat suit. C' is physically possible, so Adam clearly doesn't know $\neg C'$. Adam assigns infinite utility to living compared to the finite

inconvenience of purchasing and wearing a hazmat suit. Upon thinking about C' Adam decides to purchase and wear a hazmat suit.

Conclusion

Pascal's Wager hinges on the premise that when an agent lacks knowledge of proposition P the agent *should*, assuming expected utility theory, assign positive probability to both $P, \neg P$. I have shown this to be false. This implies that a rational agent acting under expected utility theory shouldn't entertain arbitrary unfounded hypothetical situations in their calculations.

Bibliography

- Korman – Why You Should Bet on God