ON PASCAL'S WAGER

1. Introduction

The argument for Betting on God, or better known as Pascal's Wager, says that you should believe in God, regardless of other evidence, purely out of self-interest. In this paper, I will challenge this argument by assessing the premise that believing in a particular God always guarantees the greatest expected utility.

The argument makes heavy use of the concepts of utility and expected utility. Utility is essentially the usefulness of an action, or to what degree it helps increase "good," like happiness, pleasure, benefit, and decrease "bad," like suffering or harm. Given a set of possible actions and distinct possible outcomes, each action may be assigned an "expected utility" by pairing the action with each possible outcome and assigning every action-outcome pair some amount of utility. Using the probabilities of each outcome occurring, we can compute a weighted average that gives the expected utility of the action.

More precisely, let us define a set of n actions

$$\{a_1, a_2, ..., a_n\} \in A$$

where a_k represents the k^{th} action, and a set of m outcomes

$$\{o_1, o_2, ..., o_m\} \in O$$

where o_k represents the k^{th} outcome. Additionally, let

$$\rho(o_k)$$

be the probability of the outcome o_k occurring.

We compute the **Cartesian product** $A \times O$ which contains ordered pairs of the form (a_k, o_k) representing every possible combination of action and outcome. Formally,

$$A \times O = \{(a_j, o_i) \mid j \in \{1, 2, ..., n\}, i \in \{1, 2, ..., m\}\}$$

We assign each action-outcome pair its utility as we deem fit. The function

$$U((a_k, o_k))$$

gives the utility of an ordered action-outcome pair (a_k, o_k).

Then, to determine the expected utility for an action a_k, we select all of the ordered pairs with a_k in the first position, multiply their utility by the probability of their corresponding outcome occurring, and sum of all of these products. In precise terms, given m possible outcomes, then:

$$\text{Expected utility of } a_k = \sum_{i=1}^{m} \rho(o_i) \cdot U((a_k, o_i))$$

In order to make this more clear, we construct a so-called "decision matrix" where we can easily assign a utility value for each action-outcome pair and then calculate the expected utility.

Here is the decision matrix the author proposes on [1, p. 38] which gives the expected utility for believing or not believing in God.

	God exists (50%)	**God doesn't exist (50%)**	**Expected utility**
Believe in God	∞	2	∞
Don't believe in God	1	3	2

Table 1. Pascal's Wager

1.1. The argument for betting on God.

The author's argument for belief in God [1, p. 38] goes as follows:

(BG1) One should always choose the option with the greatest expected utility

(BG2) Believing in God has a greater expected utility than not believing in God

(BG3) So, you should believe in God

BG1 should be generally uncontroversial. If you expect an action to bring you the most utility (i.e. be the most useful), why wouldn't you do it?

BG2 is also substantiated by the decision matrix. All 4 action-outcome pairs are assigned a utility with the following logic. If you believe in God, but God doesn't exist, you've led a pious life without gaining much in return. If you don't believe in God, and God doesn't exist, then you have it slightly better than the previous scenario. You haven't wasted your time on religious activities (like going to church) and end up with the same fate as the believers.

If God does in fact exist, however, then believing in God gives you an *unlimited* amount of utility. You end up in an afterlife of eternal bliss and pleasure, more valuable than anything you could gain on earth. That means that the worst scenario is not believing in God and God existing, because you've just missed out on the eternal afterlife. So, the expected utility for not believing is $0.5 \times 1 + 0.5 \times 3 = 2$, and the expected utility is $0.5 \times \infty + 0.5 \times 2 = \infty$. If, according to BG1, you should pick the option with greatest expected utility, you should clearly choose to believe in God, because the expected utility is ∞.

Additionally, notice that the actual probability of God existing doesn't matter, because any non-zero value multiplied by ∞ is still ∞, and so as long as you believe there is a *non-zero chance* that God exists, the infinite expected utility of believing remains. Adjusting the probabilities may increase or decrease the expected utility of not believing in God, but not believing in God will never give you the opportunity of attaining the afterlife of infinite utility, so it can never reach the infinite expected utility of believing in God.

I will show that Pascal's Wager fails because BG2 fails. Namely, we cannot know whether or not believing in God has the greatest expected utility because it makes no sense to even calculate expected utilities of believing in God. In section 2, I present my objection to BG2, and in section 3, I will address a few possible responses to my objection.

2. Many Gods

Maybe there are more gods than just the one that sends you to an eternal afterlife for believing. The author addresses this in [1, pp. 43-44] concluding that even if other gods exist, it is still preferable to choose any specific god who may grant you an eternal afterlife of pleasure than to not believe, since the expected utility of belief is still ∞. Essentially, the argument makes no claims as to *which* god you choose, but says that you should believe in *some* god.

However, this leaves out the possibility of gods who punish you for believing in the wrong god. These gods may grant eternal afterlifes for other reasons, or perhaps even punish people with eternal suffering for belief in the wrong god. This introduces *negative utilities*, since being punished for all of eternity in hell is much worse than simply dying and not receiving any afterlife at all.

Let us modify our decision matrix to accommodate an outcome where we believed in the wrong god. There are two scenarios: either we believe in the wrong god, but the true god is *forgiving*, so we are not punished, or we believe in the wrong god, and the true god happens to be *spiteful* and punishes us with eternal damnation.

	Correct god exists (25%)	**No god exists** (25%)	**Wrong god, spiteful** (25%)	**Wrong god, forgiving** (25%)	**E.U.**
Believe in God	∞	3	$-\infty$	1	?
Don't believe in God	2	4	2	2	2.5

Table 2. Other gods existing

We've added the new options to our matrix. Wrong god, spiteful represents the outcome where we are punished for believing in the wrong god, and Wrong god, forgiving represents the outcome where we are not punished, but we still missed out on the afterlife. This is slightly worse than being an atheist and missing out. If you are an atheist, then the outcome is the same no matter which god exists: you miss out on heaven. Again, the exact numbers don't matter too much when working with the infinities. However, we now have the possibility of the worst case of all: eternal punishment for believing in the wrong god. If eternal bliss in heaven has a utility of ∞, then it follows that we should represent eternal punishment in hell with a utility of $-\infty$.

Our new matrix has a problem: how do we calculate the expected utility? $\infty + (-\infty)$, is an indeterminate value. We cannot really perform algebraic operations on ∞. Indeed, it makes no sense to add or subtract our infinite expected utilities.

Since the author uses this decision matrix approach to justify BG2, it now fails. Once negative infinities are introduced, calculating expected utilities in the usual method becomes meaningless.

3. Addressing Objections

3.1. Believing in a god is still preferable to atheism.

One might argue that believing in a god that rewards believers is always preferable to atheism since you at least have the *opportunity* to receive eternity in heaven. Perhaps there exists a god who punishes non-believers with eternal damnation. Then, even without the exact expected utility calculation, it's clear that the expected utility of believing in some god must be higher than believing in none as you stand to gain more. Either as a theist or atheist, you run the risk of eternal punishment, but you only have the opportunity to go to heaven by believing in some god rather than none.

Fair, the possibility that you are punished for believing in the wrong god doesn't imply that you should be an atheist either. Indeed, there may be a god that punishes atheists. However, there could also exist a god who sends everyone to heaven regardless. Or perhaps they only send atheists to heaven. Either way, there is also the possibility of attaining the infinite afterlife in heaven by being an atheist, so it's still impossible to say that the expected utility of believing in god is must be higher.

3.2. Finite utilities.

We can avoid the issues with ∞ in utility calculations by simply not using it. Instead, simply say that the utility of going to heaven is an immensely large finite number. The utility of going to hell is likewise a very negative number. Now, we no longer run into the issue of being unable to compare utilities. All of our expected utility calculations will succeed, and given sufficiently large utilities, we should be able to make similar arguments for believing in god.

The problem with this argument is that we now open our expected utilities up to individual subjective determination. A core feature of the previous argument involving infinite utilities is that they can effectively bypass numerical comparison. If, instead, finite utilities were used, then each person may assign different utilities to each possible outcome based on their own beliefs. Also, the probabilities are no longer irrelevant, so they must be analyzed as well. This greatly complicates the decision matrix.

An implied feature of BG2 is that believing in god has a greater expected utility for *everyone*. Suppose there is someone who believes that the suffering of being condemned to hell for eternity is worse (in absolute terms) than the joy of being rewarded with heaven for eternity is good. In precise terms, given the utility of being rewarded with an eternity in heaven U_r, and the utility of being punished with an eternity in hell, U_p, such that

$$\left|U_p\right| > U_r$$

Then, substituting these values for ∞ and $-\infty$ in Table 2, it's actually possible to obtain an expected utility of believing in god that is less than the expected utility of not believing. We can no longer say that BG2 is universally true for *everyone*, so it no longer holds.

4. Paper Logistics

There are 1568 words in this paper, discounting this section as well as any content in tables.

4.1. AI Contribution Statement.

"I did not use AI in the writing of this paper."

References

1. Korman, D. Z.: Learning From Arguments: An Introduction to Philosophy. The PhilPapers Foundation (2022)