A Critical Introduction to Pascal's Wager

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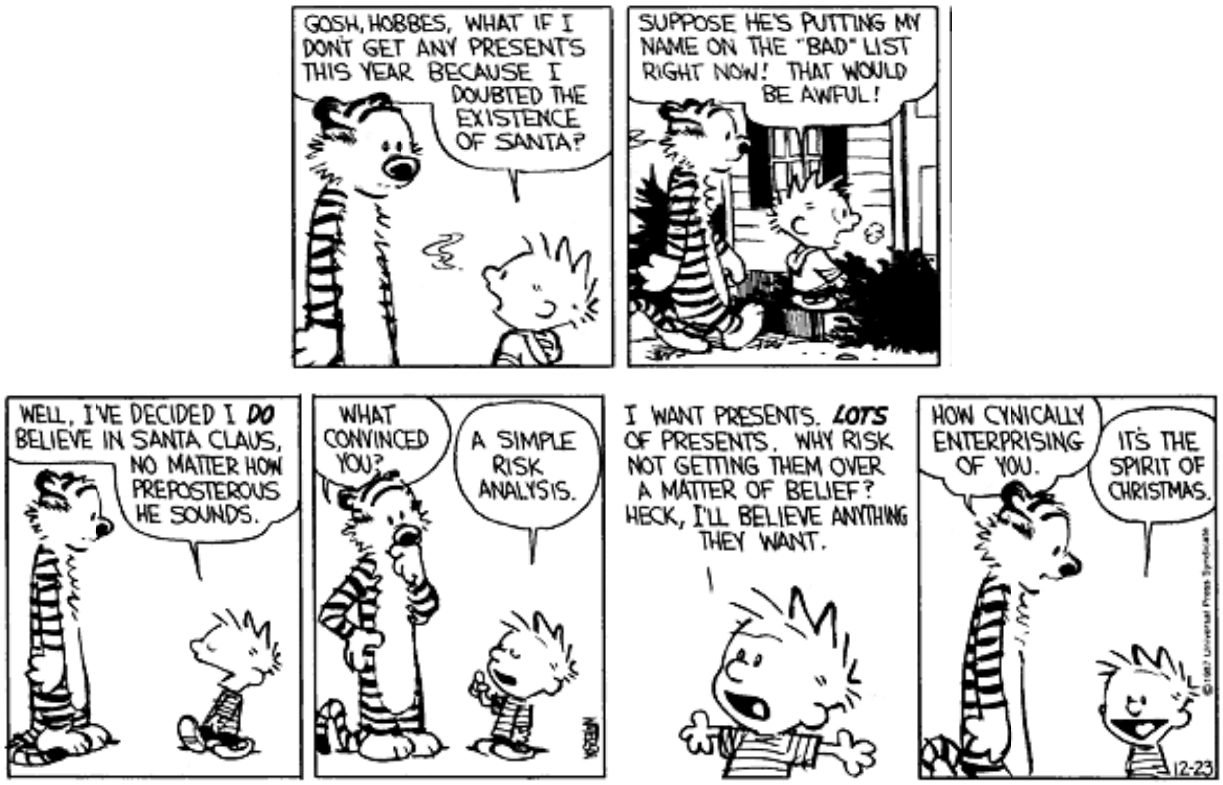


From Bill Waterson's *The Authoritative Calvin and Hobbes*

In this cartoon, Calvin's argument for believing in Santa is closely analogous to a famous argument for believing in God, given by the inventor of risk analysis himself, the French mathematician Blaise Pascal (1623-1662). Pascal couldn't see any evidence that could decide the question of whether or not God exists. However, Pascal thought he could decide this question without needing evidence. Pascal had friends who were gamblers. Pascal helped them by calculating which strategies had the best expected payoffs. Pascal hoped to use the same approach to the question of whether or not we should believe in God.

So, rather than asking what **evidence** we have for God's existence, Pascal instead asked what might be **gained or lost** by believing in God. Pascal's reasoning proceeded much like Calvin's. If God exists, there is much to be gained by believing in Him: a whole eternity in heaven. In comparison, the costs of believing in God are negligible. Hence, Pascal concluded, the safest bet is to believe God exists.

> "God is, or He is not." But to which side shall we incline? **[Evidential] Reason** can decide nothing here…
>
> Let us **weigh the gain and the loss** in wagering that God is...
>
> - If you gain, you gain all;
> - If you lose, you lose nothing.
>
> Wager, then, without hesitation that He is.

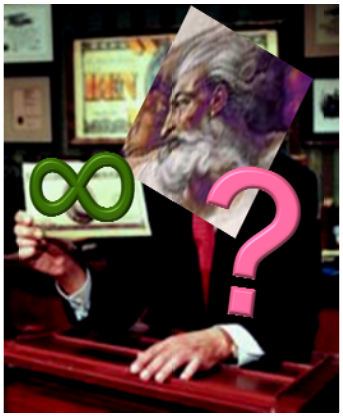
This argument is called Pascal's Wager. I'll carefully consider it in a moment, but let's warm up with some simpler cases.

Evidential vs. Prudential Reasons.

There once was a game show, Win Ben Stein's Money. Let's imagine Ben Stein has a new show. On this show, all you have to do to win a million dollars is believe that Ben Stein is a beautiful woman. He has expert psychologists who can tell if you really do believe this. Suppose you're a contestant on this show. Should you believe Ben Stein is a beautiful woman?

On one hand, your evidence strongly suggests that Ben Stein isn't even a woman, much less beautiful – so you have what philosophers call **evidential reason** to believe he's *not* a beautiful woman. But the million dollars sure would be nice, so you also have what philosophers call **prudential reason** to believe *he is* a beautiful woman.

Pascal admits that he doesn't see any *evidential* reason to believe in God – but he thinks his wager can offer *prudential* reason: we may not have evidence that God exists, but it's still in our self interest to believe He does.



Pascal's Wager differs from this simple example in three significant ways. In Pascal's Wager, it's God – not Ben Stein – who offers the incentive that will give us prudential reason for belief. You might have hoped to trick Ben Stein into thinking you believe he's a beautiful woman even while you secretly believe otherwise. But, if God is omniscient, he won't be so easy to trick. Second, in Pascal's Wager, the incentive for belief isn't just a million dollars, but an eternity in heaven – an infinite value! But the catch is: in Pascal's wager there's uncertainty about whether or not God exists to give this incentive.

To see how to deal with this uncertainty, let's consider another simple case.

Rational Decision Theory

Suppose you can pay one dollar to win one thousand dollars if the ace of hearts is randomly drawn from a deck of cards. Would it be rational for you to play this game?

51/52 (chance you'll lose) x -$1

\+ 1/52 (chance you'll win) x $1000

= $18

Most philosophers and economists agree that it *is* rational to play. Admittedly, there's a 51 in 52 chance that you'll just lose the dollar. But there's a 1 in 52 chance of winning a whopping *thousand* dollars. Combining these chances together, we get the expected value of playing this game, about 18 dollars. If you played this game again and again, on average, you would win about 18 dollars each time you play.

Philosophers and economists call this average payoff the "expected value" of playing the game, and it is widely agreed that we have prudential reason to make whichever choice has the highest expected value. In this case, winning $18 on average is a lot better than not playing, so it's rational to play.

A lottery with an infinite jackpot.

Now let's imagine that, rather than just winning a thousand dollars, there's a lottery that offers an *infinite* payoff.

99.9999% (chance you'll lose) x -$100,000 (cost of a ticket)

+ 0.0001% (chance you'll win) x ∞ **(an infinite jackpot)**

= ∞

Now, it doesn't matter if there is a really big chance that you'll lose, and only a tiny chance you'll win. A tiny fraction of infinity is still infinity, so the expected value of playing will be infinity. Even a tiny chance at an infinite jackpot will still have infinite expected value, so it's worth *any* finite cost of playing.

It's not clear whether there ever could be a payoff that is *infinitely* valuable. Once you have enough money to buy all the goods and services our world has to offer, having even more money probably wouldn't make you any happier, so the actual value of an infinite number of dollars is probably no greater than that of some very large finite number of dollars.

What about an infinite number of years to live? Would each year bring new enjoyment beyond the last? Or would the years eventually just drag on and not really add any value beyond the finite value of a full and interesting mortal life? It's not at all clear what the answers to these questions are. However, it at least seems *possible* that some immortal lives could be interesting and fulfilling enough that each year really would add significantly to the value of the preceding years.

So, it seems there's at least a tiny chance that an immortal life in heavenly circumstances might have infinite value. And this tiny chance is all Pascal's argument really needs, for, as we've seen, as long as there's a chance of achieving an infinitely good payoff, then we'll have prudential reason to go for it, however (finitely) costly that attempt might be.

Pascal's Wager.

Let's apply this to the case of belief in God. Pascal thought he could persuade even a staunch atheist who thinks the chance God exists is very low – let's say 1%. And Pascal thought he could convince someone who thinks being a theist is quite costly – let's say -100. It won't matter exactly what numbers we choose here because the payoff we're hoping to win is infinite, and as we saw a moment ago, when the jackpot is infinite, it doesn't matter how small your chance of winning nor how costly the ticket; the expected value of playing will still be infinite.

99% (God doesn't exist) x -100 (finite boredom in church)

\+ 1% (God does exist) x $^{+}\infty$ (an eternity in heaven!)

= $^{+}\infty$

[T]here is here an infinity of an infinitely happy life to gain, a chance of gain against a finite number of chances of loss, and what you stake is finite…

There is no time to hesitate, you must give all.

Now that we've seen how Pascal computes the expected value of believing in God, we can write Pascal's Wager out in premise-and-conclusion form.

P1. There's at least a small chance that God exists.

P2. If God exists, then theists will receive infinite rewards in heaven.

C1. So, the expected value of theism is infinite.

C2. So we have prudential reason to be theists.

As long as you accept (P1) that there's at least a small chance that a really powerful God exists (and most atheists admit there's at least *a chance* of this), and as long as (P2) there's a chance that this powerful God would reward the people who believe in Him with an infinitely good afterlife, then (C1) your expected value for believing in such a God will be infinite, so (C2) you'll have prudential reason to believe in such a God. That's Pascal's Wager.

Can we believe without evidence?

You might be thinking, "Wait a sec… Can I really just believe something without any evidence?" Pascal had a response to this. He said, if you can't just make yourself believe in God, what you should do is go to church and pray. This will have a good chance of bringing about a religious conversion and getting you into heaven, so it will have infinite expected value too.

The philosopher Alan Hájek has pointed out an interesting consequence of Pascal's reasoning here. There are many things you could do that at least have a chance of producing a religious conversion. You could try eating magic mushrooms or going to a brothel. As long as there's a chance that these will produce a religious conversion, these strategies will have infinite expected value too. So Pascal's Wager doesn't really give us any reason to pray rather than doing these other things.

Costs of Theism.

A second objection people sometimes make is that Pascal is wrong to say we would lose *nothing* by believing in God. The above atheist cartoon points out that being religious often costs time and money; it often makes people forego helpful scientific advances and medical treatments; and it makes some people wear burkas.

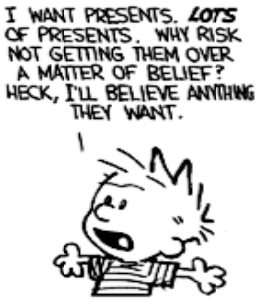
It's not clear the costs of being religious really outweigh the undisputed benefits – like peace of mind and social support – that many people gain from being religious. But this actually isn't relevant to Pascal's Wager. What's doing the work in Pascal's Wager is the thought that heaven will be *infinitely* good. As we saw before, in a lottery with an infinite jackpot, no matter how much it costs to play (as long as the cost is finite), the expected value will be infinite. The moral

is: If you think wearing a burka gives you a chance to get infinite rewards, then you have prudential reason to wear a burka, *however (finitely) uncomfortable it might be*.

What will God reward?

Of course, most people we encounter who advocate Pascal's Wager aren't wearing burkas – at least not in the United States. This highlights a big problem with Pascal's Wager. Pascal presumes that, if God exists, He will reward us *just* for believing in Him. But how do we know that God won't reward only those people who wear burkas? Or maybe only people who don't wear burkas? Without evidence about what God would reward, we won't be able to figure out what we have prudential reason to do!

One of the things I really like about the Calvin & Hobbes cartoon was that it brought out this problem in two ways. First, it questioned whether or not Pascal's "cynically enterprising" reasoning really fits the spirit of religion. It might turn out that God won't simply reward all believers – He might only reward those believers who *adopt the right holiday spirit*, and there's a big worry that Pascal's greedy self-interest *won't* be what God would reward.



And second, Calvin says, "Heck, I'll believe anything they want." This highlights the fact that many different beliefs might possibly be rewarded, and you could make an equally good Pascal-style argument for any of them – even atheism!

A Pascal-style Argument for Atheism

Here's how a Pascal-style argument for atheism would go: There's at least a chance that Nahweh exists, where by "Nahweh" I mean a reclusive deity who wants people *not* to believe in him. Even the staunch theist must admit there's a *chance* that this sort of reclusive deity exists. In fact, given how little evidence we see for God's existence, you might think there's a *better* chance that a reclusive Nahweh exists than that an attention-hungry Yahweh exists. If Nahweh exists, then *atheists* will receive infinite rewards in heaven. So, the expected value of *atheism* is infinite. So we all have prudential reason to be atheists.

P1. There's at least a small chance that Nahweh exists.

P2. If Nahweh exists, then atheists will receive infinite rewards in heaven.

C1. So, the expected value of atheism is infinite.

C2. So we have prudential reason to be atheists.

Notice that this argument has exactly the same structure as Pascal's wager, and its premises are just as plausible. So, however good of a reason Pascal's wager gave us to be theists, this argument gives us equally good reason to be ***atheists***. When we have equally good arguments for contradictory conclusions, that tells us both arguments are equally ***bad***.

What went wrong here?

The underlying problem here is that ***no matter what you believe*** you open yourself to a slight possibility that you might get infinite rewards from a deity who approves. But you also open yourself to a risk that you might get infinite ***punishment*** from a deity who disapproves.

.001% (chance a deity will approve) x $^{+}\infty$ (heavenly rewards)

\+ .001% (chance a deity will disapprove) x $^{-}\infty$ (hellish punishment)

\+ …

= ???

To calculate the expected value for any belief, we have to somehow add together positive infinity and negative infinity, and there is no mathematically well-defined way to do this.

The upshot is, if we're going to have prudential reason to favor a particular belief based on the hope for infinite rewards, we'll first need evidential reason to rule out possible deities who would punish that belief and/or reward other beliefs. Without evidence regarding what will be rewarded, we can't have prudential reason to favor particular beliefs. Pascal wanted to use prudential reasoning to sidestep our need for evidence, but that can't work.

References.

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