

Pascal's argument on existence of God

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Who was Pascal?

Pascal (1623-62) was a French mathematician and man-of-letters. Pascal's mother died early and he was left, at the age of seven, to be with his father and his sister, Jacqueline (Jacqueline was to enter a Jansenist convent.) His father, high up in the French judiciary, undertook to personally see to his son's education. Pascal, even as a beginning youth, was a brilliant light in the intellectual community as then existed in France; many could not believe that such brilliant insights could come from such a mere youth. Up through the years, until 1654, Pascal divided his life between mathematics and the social life of Paris. Pascal was credited with the invention of the barometer and certain mathematical formulations which "heralded the invention of the differential calculus."

His Argument

He tried to find out the expected value to rationalize whether to believe in God or not. Let 'P' denote the probability that God does not exist. His discussion suggests that we are playing a game with two strategies, 'believe' and 'not believe' with payoffs as shown in the table:

	God does not exist 'P'	God exists '1-P'
Believe	-U	V
Not believe	0	-X

Here -U denotes the cost to you of leaving behind some worldly pleasures as a consequence of believing that God exists. If you do not believe, and God is supposed to take the revenge, you will lose x.

If God exists and you do not believe you will gain V.

Now to determine which strategy is best you should compare two expected values

$$P(-U) + (1-P)V$$

&

$$P(0) + (1-P)(-X)$$

And choose the larger of the two.

In general, the choice will depend on the value of 'P'. But Pascal assumed that the value of 'V' is infinity and so the strategy of believing is best no matter what probability you assign for the existence of God.

Reference:

[1] I. Hacking, "The Emergence of Probability" (Cambridge University Press 1975)

[2] <http://www.blupete.com/Literature/Biographies/Science/Scientists.htm>