

BELIEF IN GOD: A GAME-THEORETIC PARADOX

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Introduction

In a superb synthesis of the literature, beginning with Descartes, on the existence of God, Hans Küng argues that all rational proofs of His existence — as well as nonexistence — are flawed.¹ In place of such a proof, Küng argues for a “rationally justified” faith, which of course does not have the force of a logical proof but is, as the subtitle of his books suggests, “an answer for today.”

I shall not address the question of whether this answer is satisfactory. Instead, I shall shift the focus to a related, if more subjective, question: is it rational to *believe* in God’s existence? Küng treats this question as well in *Does God Exist?*, and also in a much shorter book, *Freud and the Problem of God*.² However, I propose to treat this question not as a psychological one but rather as one with a rational answer, depending on the “evidence” at hand.

The evidence for believing or not believing in the existence of God, I assume, is whether God reveals Himself in a game He plays with man. Although the question of God’s existence is almost never raised in the Bible, when it is — as in Moses’s confrontation with Pharaoh in the Book of Exodus — it is the palpable evidence of God’s miraculous powers that settles the issue for Pharaoh.

I have argued elsewhere that biblical stories of conflict and intrigue in the Old Testament can be interpreted as a series of games, many of which involve God as a protagonist.³ My purpose here, however, is not to attempt an exegesis of biblical stories but rather to describe, in the context of a generalized “Belief Game” played between man and God, problems that one’s belief in God’s existence raise.

The Belief Game

The Belief Game is a two-person, nonzero-sum game, in which each player has two strategy choices. To be sure, using a simple game to model the relationship man might have with God drastically simplifies a deep and profound religious experience for many people. My aim, however, is not to describe this experience

but to abstract from it a central theological question: can belief in God be conceptualized as a rational choice if, by “God,” one means an active entity who is capable of making choices? I shall approach this question by describing a game that assumes particular goals of man and God, show that play of this game leads to a paradoxical outcome for both players, and consider implications of the players’ being omniscient in this game. I shall also comment on how choices in the Belief Game bear on God’s existence and, in addition, suggest some tie-ins of the assumptions of the game, particularly concerning God’s preferences, to the Bible.

In the Belief Game, assume that God has two strategy choices:

1. Reveal Himself (Establish His existence)
2. Don’t reveal Himself (Don’t establish His existence)

(The parenthetic interpretations, concerned with God’s establishing His existence, will be discussed later.) Similarly, man has two strategy choices:

1. Believe in God’s existence
2. Don’t believe in God’s existence

The intersection of these strategies defines the four outcomes of the Belief Game, shown in Figure 1.⁴

		<i>Man</i>	
		Believe in God’s existence	Don’t believe in God’s existence
<i>God</i>	Reveal Himself (Establish His existence)	(3, 4) Man faithful with evidence: belief in existence confirmed	(1, 1) Man unfaithful despite evidence: nonbelief in existence disconfirmed
	Don’t reveal Himself (Don’t establish His existence)	(4, 2) Man faithful without evidence: belief in existence disconfirmed	(2, 3) Man unfaithful without evidence: nonbelief in existence confirmed

← Dominant Strategy

Key: (x, y) = (God,man)

4 = best; 3 = next best; 2 = next worst; 1 = worst
 Circled outcome rational

Figure 1. Outcome matrix of belief game.

In a game in normal, or matrix, form, it is customary to represent an outcome as an ordered pair of numbers, (x, y), with the first number x being the preference of the row player (God), the second number y the preference of the column player (man). I assume “4” represents the best outcome for a player, “3” next best, “2”

next worst, and “1” worst. Thus, the higher the number, the better the outcome, though I assume no value, or cardinal utility, is associated with each outcome. Because the numbers represent only ordinal preferences, one cannot say how much more a player prefers, say, the outcome he ranks 3 to the outcome he ranks 2.⁵

The ranks in the outcome matrix of Figure 1 are based on the following assumptions about the goals of the two players:

- God*: (1) Primary goal—wants man to believe in His existence
 (2) Secondary goal—prefers not to reveal Himself
- Man*: (1) Primary goal—wants belief (or nonbelief) in God’s existence confirmed by evidence (or lack thereof)
 (2) Secondary goal—prefers to believe in God’s existence

More will be said about these goals later.

The primary and secondary goals of each player completely specify their ordering of outcomes from best to worst. In God’s case, the primary goal establishes that He prefers outcomes in the first column of the outcome matrix (believe in God’s existence) to outcomes in the second column (don’t believe in God’s existence); between the two outcomes in each column, the secondary goal establishes that God prefers not to reveal Himself over revealing Himself.

In man’s case, the primary goal says that man prefers to have his belief or non-belief confirmed (main-diagonal outcomes) to being disconfirmed (off-diagonal outcomes); between the pairs of main-diagonal and off-diagonal outcomes, the secondary goal says that man prefers to believe, rather than not believe, in God’s existence.

A Game-Theoretic Paradox

In the contemporary world, I would argue, evidence – from one’s experiences, observations, and reflections – accumulates that predisposes one to believe or not believe in the existence of God or any other supernatural force, or leaves the issue open. But to highlight the central problem, or paradox, that one’s belief or nonbelief in God’s existence entails in a game-theoretic setting, assume in the subsequent discussion that there exists a player, called “God,” who can choose to reveal Himself if He wishes to do so.

If He has the goals/preferences I earlier assumed of Him, He has a *dominant* strategy – not to reveal Himself. That is, whatever man chooses, God prefers His second strategy: if man believes in His existence (first column), God prefers not to reveal Himself because (4, 2) is better for Him than (3, 4); if man does not believe in His existence (second column), God still prefers not to reveal Himself because (2, 3) is better for Him than (1, 1). The fact that God has an unconditionally best strategy choice – its superiority does not depend on what strategy man chooses – is, I think, a compelling reason for God to choose it.

Now, if the Belief Game is one of *complete information*, as I assume it is, man

knows God's preferences as well as his own. Note that man's own preferences do not give him a dominant strategy: belief is better for him if God reveals Himself, but nonbelief is better if God does not, so man does not have an unconditionally best strategy choice.

Knowing God's preferences, however, man can infer that God has a dominant strategy and will undoubtedly choose it. This being the case, since man prefers (2, 3) to (4, 2) in the second row of the outcome matrix, he would choose his own second strategy (second column) to ensure his preferred outcome, thereby making (2, 3) the rational outcome of the game. The foregoing reasoning is reinforced by the fact that (2, 3) is the unique stable outcome, or Nash equilibrium in pure strategies, in this game (see note 5 below).

Yet, (2, 3) is only next worst for God, next best for man. Worse for the players, there exists another outcome, (3, 4), that is preferred by *both* to (2, 3), rendering the latter outcome a *Pareto-inferior* one [as is also (1, 1)]. Thus, we have a paradox somewhat akin to that of Prisoners' Dilemma: a Pareto-inferior outcome is the rational outcome, based on dominant-strategy and equilibrium considerations. However, the Belief Game differs from Prisoners' Dilemma in not being symmetrical with respect to the players; in addition, one but not both players has a dominant strategy associated with the Pareto-inferior equilibrium.⁶

But these differences, in my opinion, do not make the outcome less paradoxical. Not only is it rational for God not to reveal Himself and for man not to believe in His existence — a problem in itself for the theist — but, more problematic for the rationalist, this outcome is unequivocally worse for both players than God's revelation, which would confirm man's belief in His existence.

A problem of timing needs to be addressed at this point. Does God make his strategy choice first, and then man respond to it by making his own strategy choice? If so, then there is no paradox because God, realizing the problem that will arise if he chooses his second (dominant) strategy, would choose his first instead, thereby inducing man — after God has made His choice — to choose his own first strategy in order to obtain his best outcome, God His next best.

But I do not think any realistic interpretation of the Belief Game can so easily resolve the paradox. To begin with, if the human player in the Belief Game is an agnostic, which is presumably the kind of player — as opposed to an avowed theist or atheist — who would take this game seriously, he will play it while still uncertain about God's existence. In other words, he will not know God's strategy choice, or even whether He exists. For the agnostic player, therefore, God's strategy choices might better be interpreted as God's establishing His existence or not establishing His existence, as suggested by His parenthetical strategy choices shown in Figure 1.

But God's "not establishing His existence" may occur for two distinct reasons: (1) He does not in fact exist, or (2) He does not choose to reveal Himself. The difficulty for the human player in the Belief Game is his inability to distinguish between these reasons. Moreover, as the analysis of the Belief Game shows, if God exists, it *is* rational for Him to choose His second strategy, which deepens the

quandary of man in deciding whether God actually exists or chooses (rationally) not to reveal Himself.

It seems reasonable to suppose that this quandary would reinforce a human player's agnosticism if God did not choose His first strategy. On the other hand, God's choice of His first strategy raises no such problems because God's "revealing Himself" and "establishing His existence" may be regarded as synonymous since the former is at least sufficient, and probably necessary, for the latter.

If God's strategies need clarification, so perhaps does the meaning of "play" of such a game. In a sense, a thoughtful agnostic plays the Belief Game all his life, never certain about God's strategy choices – or even that He exists – and wavering between his own. Indeed, we might interpret the agnostic's second strategy – don't believe in God's existence – as an affirmation of his agnosticism, for I take it not to imply God's nonexistence but rather that he (man) suspends judgement.

This, of course, is quite different from a strategy I did not postulate – believe in God's *nonexistence*. In my opinion, this latter strategy would not be a viable choice for a true agnostic, for whom, presumably, disconfirming evidence would almost never be conclusive. Others, however, do not share this opinion. For example, Hanson thinks that the proper position of the agnostic on the question of God's existence should be one of reasonable doubt; for Hanson, moreover, the evidence is tipped decisively against existence.⁷

In sum, the Belief Game for the agnostic seems best viewed as one in which a (possible) God may either establish or not establish His existence. Since the agnostic's choice of believing or not believing in God's existence was assumed to be independent of God's strategy choice, the Belief Game might properly be seen as the 2 x 2 game (two players, each with two strategies) of Figure 1, wherein neither player chooses first. Or, to put it differently, the players' choices are made in ignorance of each other, though perhaps they continue, in different forms, over the human player's lifetime – unless he becomes, at some point, a believer or nonbeliever. Then the game for him is no longer a serious one; the evidence, so to speak, is in.

Does Omniscience help?

The picture presented so far is a bleak one, at least for the questing agnostic searching for more than straws in the wind to exorcise his uncertainty. If the Belief Game accurately represents his preferences as well as (a possible) God's the strategy choices are clear: God would not reveal Himself, or establish His existence, and man, anticipating God's dominant strategy choice, would not believe in His existence. Hence, man would presumably remain an agnostic, which reverses the rationalistic faith argument Kung sets forth; it is in fact rational, if one is playing the Belief Game, *not* to believe in God's existence. Recall, though, that this strategy choice does not imply that it is rational for the agnostic to believe in God's *nonexistence*, a strategy choice not available to man in the Belief Game as presented, because God could exist without revealing Himself.

The fact that the apparent rational strategy choices of the players in the Belief Game lead to an outcome inferior for both to another outcome in the game is particularly distressing. This pathology, as I have shown, can be remedied by assuming God chooses His strategy first, and man responds to His choice, but this assumption seems hard to support by a plausible scenario that describes how this game might be played by an intelligent agnostic.

This is so because, by virtue of his agnosticism, man is not likely to believe that God will make the first move. Yet, if man thinks that God possibly exists, he might reason that God awaits his move, or, if He possesses omniscience, can foretell his move and act on His foreknowledge.

Assume, for the sake of argument, that the latter is the case: God is omniscient and, as a consequence, can predict man's strategy choice before the game is played. In addition, assume that the agnostic knows that, if God exists, He is omniscient and will act on the basis of His prediction of the agnostic's strategy choice to ensure His best possible outcome. Do these assumptions about God's omniscience, and man's knowledge of it, change what rational players would choose in the Belief Game?

The answer, surprisingly, is "no." Because God has a dominant strategy, the fact that he can predict man's strategy choice will not enable him to do any better: His best choice, whichever strategy man chooses, remains His dominant strategy (not reveal Himself) because, by definition, it is unconditionally best. Hence, having advance information on man's strategy choice does not help God an iota in the Belief Game – the pathological (2, 3) outcome remains the rational choice of the players. This constancy, however, does not obtain in all games, wherein a player may either be helped or hurt by omniscience, and his opponent's awareness that he possesses this capability.⁸

Curiously, should man be the omniscient player, able to predict God's choice of a strategy before play of the Belief Game, and should God know this, then it is rational for God to establish His existence by revealing Himself. The reason is that man, predicting God's revelation choice, could ensure not only his best outcome but also a better outcome for God, (3, 4), by believing in God's existence and having it confirmed when God actually chooses (according to man's prediction) to reveal Himself.

Endowing man with omniscience is equivalent to assuming that God moves first, for in each case man would know God's strategy choice before He made it. Giving man omniscience, however, seems no more credible than giving to God the first move, which is an assumption I rejected earlier, so I think the salutary consequence these assumptions have for the players, by inducing the (3, 4) outcome in the Belief Game, is difficult to sustain.

More generally, is there any evidence that God and man are enmeshed as players in the Belief Game, or that they apprehend their situation in this way? None of a factual nature that I know of, though I would argue that most religions, and theologies that underlie them, implicitly posit some kind of "belief game" that presumably supports their faith. In the case of the agnostic, the particular prefer-

ences I have postulated for man in the Belief Game are not, I think, implausible ones to posit for him.

What God, or a supernatural being, might desire is harder to say. Certainly the God of the Old Testament very much prized, especially from His chosen people, the Israelites, untrammelled faith and demonstrations of it.⁹ He never revealed Himself in any physical form, except possibly to Moses before he died, though He continually demonstrated His powers in other ways, notably by punishing those He considered transgressors.

If God, as a secondary goal, preferred revelation over nonrevelation, the (revised) Belief Game would not be at all problematic. Indeed, this preference switch would not even have to apply if man did not believe; as long as man believed (i.e., chose his first strategy), this revision in God's preferences would transform the outcome (3, 4) into (4, 4), and (4, 2) into (3, 2). Then, in this revised Belief Game, (4, 4) would be the evident rational outcome, even if not the product of dominant strategy choices by the players.

The pathology in the original Belief Game arises because of the reluctance of God to reveal Himself, and thereby verify His existence. If some religions did not paint God as all-knowing yet unknowable – and presumably wanting to remain so – there would be no paradox in their tenets of the kind mirrored in the Belief Game, for God's presence would be manifest, obviating any test of faith.

I shall not speculate here why God is so often portrayed as a Being utterly beyond our comprehension, and hence why faith must replace reason. Ironically, it is reason, and the logic of game theory, I believe, that help to elucidate this tension between faith and reason. Insofar as this tension is captured by the anomaly of a Pareto-inferior rational outcome in the Belief Game, associated with non-revelation by God and nonbelief by man, it alerts us to the problems that belief in God entail when man is viewed as being in a relationship, or game, with God.¹⁰

Conclusions

The Belief Game is a two-person, nonzero-sum game in which both players can do well [e.g., at (3, 4)] or badly [e.g., at (1, 1)] simultaneously. The problem that occurs in the play of this game is that its rational outcome of (2, 3) is not only unappealing to both players, especially God, but also, paradoxically, there is an outcome, (3, 4), preferred by both players that is unattainable. Moreover, because God has a dominant strategy, His omniscience does not remedy the situation, though – less plausibly – if man possessed this quality, and God were aware of it, (3, 4) would be attainable.

How reasonable is it to use the device of a simple game to argue that nonrevelation by God, and nonbelief by man, are rational strategies? Like any model of a complex reality, the Belief Game abstracts a great deal from the problem that confronts the thoughtful agnostic asking the most profound of existential questions. Yet, to the degree that belief in God is seen as a personal question, con-

ceptualized in terms of a possible relationship one might have with one's Creator, it seems appropriate to try to model this relationship as a game. The most difficult question to answer, I suppose, is, if God exists, what are His preferences in such a game?

I have argued that He would first like to be believed, but at the same time not reveal Himself. These goals, in my opinion, are consistent with the role He assumes in many biblical stories, although this is not to say that the Bible offers the final word on philosophical and theological matters in the modern world. Nevertheless, it seems to me to be a logical place from which to start, and the clues it offers on God's preferences seem not contradicted by contemporary events.

Of course, the Belief Game supposes that God not only has preferences but makes choices as well. To many people today – myself included – these choices are not apparent. But if He does make them, and in particular chooses not to reveal Himself, I think the Belief Game helps us to understand why nonrevelation is rational. Furthermore, it gives us insight into why, given this choice by God, our own reasons for believing in Him – in a game-theoretic context – may be rendered tenuous.

NOTES

1. Hans Küng, *Does God Exist? An Answer for Today*, tr. Edward Quinn (New York: Doubleday, 1980).
2. Hans Küng, *Freud and the Problem of God*, tr. Edward Quinn (New Haven: Yale University Press, 1979). For a collection of other views on this question, both ancient and modern, see *Rationality and Religious Belief*, ed. C.F. Delaney (Notre Dame: Univ. of Notre Dame Press, 1979). Various psychological approaches to an understanding of faith are discussed in James W. Fowler, *Stages of Faith: The Psychology of Human Development and the Quest for Meaning*, (San Francisco: Harper & Row, 1981).
3. Steven J. Brams, *Biblical Games: A Strategic Analysis of Stories in the Old Testament* (Cambridge: MIT Press, 1980).
4. Although I refer to the players as "man" and "God," this is simply a convenience; man could as well be "woman" or "person," and God could be some more secular "superior being."
5. Since the outcomes in the Belief Game are ordinal, one cannot sum the payoffs of the players at each outcome and describe the game as either "zero-sum" or "nonzero-sum." However, because the best outcome for one player is not the worst for the other, etc., the game is not one of total conflict; rather, both players can "win" or "lose" simultaneously. Hence, were cardinal utilities assigned to the outcomes consistent with the preference rankings, the payoffs at each outcome would not sum to zero. Nonzero-sum games, or those that have elements of both cooperation and conflict, may or may not have stable outcomes, or Nash equilibria in pure strategies, from which neither player would have an incentive to depart unilaterally. See John Nash, "Non-cooperative Games," *Annals of Mathematics*, 54 (1951): 286–295.
6. For a description and analysis of Prisoners' Dilemma, game theory's most famous game, see Anatol Rapoport and Albert M. Chammah, *Prisoner's Dilemma: A Study in Conflict and Cooperation* (Ann Arbor: University of Michigan Press, 1965); and Steven J. Brams, *Paradoxes in Politics: An introduction to the Nonobvious in Political Science* (New York: Free Press, 1976), Chs. 4 and 8. In the latter chapter and also in "Newcomb's Problem and

Prisoners' Dilemma," *Journal of Conflict Resolution*, 19 (1975): 596-612, I show how Newcomb's problem is related to Prisoners' Dilemma; see also David Lewis, "Prisoners' Dilemma is a Newcomb Problem," *Philosophy and Public Affairs*, 8 (1979): 235-240.

There is a paradox in the Belief Game, independent of the Pareto-inferiority of (2, 3), that has been called one of "inducement"; it occurs because the player without a dominant strategy (man) is induced to make a choice – by his anticipation that his opponent (God) will choose his dominant strategy – that leads to an outcome [(2, 3)] ranked higher by the player without a dominant strategy (man) than the player with one (God). In other words, the possession of a dominant strategy hurts one, relatively speaking, in a game, like the Belief Game, vulnerable to the inducement paradox. See Nigel Howard, *Paradoxes of Rationality: Theory of Metagames and Political Behavior* (Cambridge: MIT Press, 1971), pp. 168-198; and Brams, *Paradoxes in Politics*, Ch. 5, for an analysis of this paradox and the controversy surrounding it.

7. Norwood Russell Hanson, "The Agnostic's Dilemma" and "What I Don't Believe," in *What I Do Not Believe, and Other Essays*, ed. Stephen Toulmin and Harry Woolf (Dordrecht-Holland: D. Reidel, 1971), pp. 303-308 and 309-331. I am grateful to Raymond Dacey for this citation.
8. Steven J. Brams, "Mathematics and Theology: Game-Theoretic Implications of God's Omniscience," *Mathematics Magazine*, 53 (1980): 277-282; and Steven J. Brams, "A Resolution of the Paradox of Omniscience," in *Reason and Decision* (Bowling Green Studies in Applied Philosophy, Vol. III-1981), ed. Michael Brodie and Kenneth Sayre (Bowling Green: Applied Philosophy Program, 1982), pp. 17-30. God's "omnipotence," as defined in Steven J. Brams, "Omniscience and Omnipotence: How They May Help-or Hurt-in a Game," *Inquiry* (forthcoming, 1982), would induce (4, 2), not (3,4), in the Belief Game, as would God's "staying power," as defined in Steven J. Brams and Marek P. Hessel, "Staying Power in 2 x 2 Games," *Theory and Decision* (forthcoming, 1982).
9. Brams, *Biblical Games*.
10. The most prominent spokesman of this view is Martin Buber: "The description of God as a Person is indispensable for everyone who like myself means by God not a principle . . . not an idea . . . but who rather means by God, as I do, him who – whatever else he may be – enters into a direct relation with us." Martin Buber, *I and Thou*, Postscript, tr. Ronald Gregor Smith, 2d ed. (New York: Scribner's, 1958), p. 135. See also Abraham Kaplan, "The Jewish Argument with God," *Commentary*, 70 (October 1980): 43-47, for more on the theology of Judaism.

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