Superior Beings
If They Exist, How Would We Know?

The central question posed in this book is: If there existed a superior being who possessed the supernatural qualities of omniscience, omnipotence, immortality, and incomprehensibility, how would he/she act differently from us? The mathematical theory of games is used to define each of these qualities, and different assumptions about the rules of play in several theological games that might be played between ordinary human beings and superior beings like God are posited. Implications of these definitions and assumptions are developed and used to explore such questions as: Are God's superior powers compatible with human free will? Can they be reconciled with the problem of evil in the world? In what situations is God's existence "decidable" in game-like relationships He might have with us?

By endowing omniscience/omnipotence/immortality/incomprehensibility with unambiguous meanings, the author shows how game theory can help breathe life into questions that have been dismissed too quickly simply because they are metaphysical—outside the world of experience. Thereby he clarifies the structure of our thought about an ultimate reality, whether or not it is viewed as religious.

STEVEN J. BRAMS

Superior Beings
If They Exist, How Would We Know?

Game-Theoretic Implications of Omniscience, Omnipotence, Immortality, and Incomprehensibility

With 32 Illustrations

Second Edition

Springer

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To Wayne A. Kimmel

Preface to the Second Edition

The forerunner of *Superior Beings, Biblical Games* (Cambridge, MA: MIT Press, 1980), appeared in a second edition in 2003. I changed its subtitle from *A Strategic Analysis of Stories in the Old Testament* to *Game Theory and the Hebrew Bible*, in part due to the cachet that game theory enjoyed after the appearance of Sylvia Nasar's biography of John Nash, *A Beautiful Mind* (New York: Simon and Schuster, 1998), and a movie of the same title that won the Oscar for best picture in 2001. Because *Superior Beings* already had "game-theoretic" in its sub-subtitle, however, no such updating was necessary.

Since the appearance of these books in the early 1980s, there have been an enormous number of new applications of game theory, especially in business, economics, political science, biology, and the law. However, there is still a paucity of applications in the humanities. In "Game Theory and Literature," *Games and Economic Behavior* 6, 1 (January 1994), I reviewed about 25 novels, short stories, plays, epic poems, and operas whose plots had been the subject of game-theoretic exegesis. The list has subsequently grown, but not by very much.

The same is true of applications of game theory to history, philosophy, religion, and the other humanities. In particular, I know of no attempts to apply game theory to the kinds of philosophy-of-religion and theology questions that I explored in *Superior Beings.*

By contrast, the nexus between science and religion has been thoroughly analyzed using other methods of inquiry, as evidenced by Charles L. Harper Jr. (ed.), *Spiritual Information: 100 Perspectives on Science and Religion* (West Conshohocken, PA: Templeton Foundation Press, 2006), a huge collection put together in honor of Sir John Templeton's ninetieth birthday. Sir John, through the Templeton Foundation, is the primary proponent and the major benefactor of studies in science and religion today.

How science and religion are (or are not) connected is, of course, an old subject. It is also a controversial one, extending at least from Galileo's trial in 1633 to the teaching of evolution today.

While game theory is a mathematical theory, *Superior Beings* is emphatically not a scientific work, wherein a theory is tested. Rather, it is an attempt to interpret and explain important philosophical, religious, and theological questions in terms of the rational choices of ordinary human beings, who are assumed to play games with a superior being.

The game theory I use is nonstandard. Not only does standard game theory not have definitions of the supernatural qualities of omnipotence, omniscience, incomprehensibility, and immortality, but the theory is not particularly good at capturing the dynamic interplay between an ordinary and a superior being.

For this purpose, I tried to develop a new theory, whose logical underpinnings, nevertheless, lie in game theory. This embryonic theory in 1983 was subsequently transformed into a theory I call "theory of moves" (TOM), which I describe in detail in *Theory of Moves* (Cambridge, UK: Cambridge University Press, 1994).

Although a secular theory, TOM reflects many of the incipient ideas in *Superior Beings.* While I could have rewritten *Superior Beings* using the terminology of TOM, the underlying theory would, for the most part, have stayed intact. I did not think such a translation was necessary, so I have not changed the original text, except for correcting some minor errors that had slipped into the first edition.

My hope is that readers who have discovered the power of game theory in explaining choices in the secular world will, after perusing *Superior Beings*, appreciate how the theory may illuminate the choices we make in the spiritual and sacred world. The theory won't, as such, provide scientific answers to questions about this world. But it may clarify their nature and significance, enabling us better to understand and cope with ultimate questions.

New York
September 2006

STEVEN J. BRAMS

Preface to the First Edition

The central question I pose in this book is: If there existed a superior being who possessed the supernatural qualities of omniscience, omnipotence, immortality, and incomprehensibility, how would he/she act differently from us, and would these differences be knowable? (Because God, the superior being in the Judeo-Christian tradition, is generally described as a male, I shall henceforth use the masculine pronoun form for convenience, but I intend no invidious gender distinctions, whether applied to supernatural or natural beings.) Theologians, philosophers of religion, and erudite scholars in other disciplines have addressed this and related questions before, but their answers, generally speaking, have not been informed by any systematic or rigorous theory.

I believe the mathematical theory of games, which has little to do with the frivolity and playfulness we normally associate with games, provides a powerful tool for clarifying the key theological concepts in my central question and drawing out their implications in games played between human and superior beings. I am fully aware that not everybody will agree that omniscience, omnipotence, immortality, and incomprehensibility are what I say they are, but I invite them to propose their own defi-

nitions and derive their own conclusions with the aid of the theory.

By endowing these protean concepts with unambiguous meanings, I will try to show how game theory can breathe life into questions that have been dismissed too quickly simply because they are metaphysical—outside the world of experience. In much of traditional philosophy, in my opinion, the abstract characteristics of God have been formulated in such nebulous or all-encompassing terms that they have been drained of significant content and have thereby suffered a rather pallid intellectual existence. Irredeemably metaphysical these characteristics may be, but this does not mean they are beyond the pale of analysis that helps to clarify the structure of our thought about an ultimate reality, whether or not it is viewed as religious, and thereby enhances our understanding of our place in the world.

Admittedly, ordinary humans "playing games" with some supernatural figure or force like God may sound fantastic if not absurd. But, I would argue, virtually all relationships we have with others—cooperative or antagonistic, shallow or deep, earthly or transcendent—can be characterized as games in a formal sense. Since theology is sometimes defined as the systematic study of our relationship with God, it seems to me entirely appropriate to use game theory to try to shed light on this spiritual, perhaps mystical, relationship, mundane as our conceptual apparatus might be. Indeed, I believe the austerity and parsimony of game theory facilitate both abstracting important aspects of this relationship and placing them within a unified framework.

Let me make clear that this kind of "mathematical" theology is not meant to reduce great religions and profound existential questions to mere numbers. Indeed, hardly any numbers are used in a quantitative sense in this book, though they are used to specify mathematical relationships, such as preference rankings in a game. Nonetheless, proponents of fideism, like Søren Kierkegaard, would undoubtedly be appalled by the application of any kind of objective reasoning to an understanding of religious faith, but most theologians are not so disparaging, and some (such as Paul Tillich, quoted at the end of this Preface) have welcomed it.

The heart of this study is an inquiry into (i) the meaning of superiority in games and (ii) the effects that different superior abilities have on the outcomes of such games. The effects are manifold, but in the end I stress the difficulties connected with ascertaining "decidability," by which I mean the ability of a human

being who is in a game-playing relationship with a superior being to decide whether that being is indeed superior.

In a significant number of games, it turns out, this determination cannot be made because the superior being could not improve upon the (inferior) outcome that an ordinary player in his position could also achieve. Such undecidability suggests a new and strange kind of logic that may underlie agnosticism. In fact, the awesome mystery that undecidability engenders is reinforced by the fact that it may be rational in certain games for the superior being to obfuscate his choices by acting arbitrarily.

The main theological issue raised by arbitrariness and the attendant incomprehensibility it induces is whether such behavior is consistent with the actions of a benevolent and righteous God. This has been called the "problem of evil" by theologians and philosophers. I also probe other issues related to religious faith, including the degree to which a superior being's power may intrude on a human being's free will.

The sources of my ideas are diverse: from political science, a long-standing interest in the definition, measurement, and exercise of power; from mathematics, more than a decade's involvement with game theory and a particular fascination with its applications; from religion, an interest in the Bible stemming from a previous book in which I applied game theory to the exegesis of stories of conflict and intrigue in the Old Testament; and from philosophy, an appreciation that certain abstract and general questions are worth asking, even if they cannot be answered scientifically.

This last point about the proper role of science in analytic-philosophical work of this sort merits brief attention. Although mathematics is commonly identified with the sciences, this book is emphatically not a work of science. Not only is there no experimentation or other empirical testing of the propositions developed herein, but there is no suggestion that there ever could be, except by extrapolation to certain real-world situations, such as ascertaining the impact of certain kinds of secular power in a political conflict.

In a theological context, on the other hand, I cannot even conceive of God or other supernatural phenomena as being scientifically testable. Supernatural, by definition, means above or beyond the natural and therefore not susceptible to observation and measurement, which are ineluctable hallmarks of the sciences.

These caveats notwithstanding, I believe philosophical in-

quiry and theoretical analysis can help us explicate our inchoate thoughts about superior beings, their presumed uncanny attributes, the possible impact of these attributes on game outcomes, and what, finally, one might say about the decidability of superior beings from the nature of their game playing and the outcomes they induce. If this analysis does not lead to testable hypotheses, it will, I hope, provide a new way of looking at the metaphysical world that stimulates other thought experiments, grounded in logico-deductive analysis, in the ethereal realm. The heuristic value of a modern theory that gives a new slant to age-old questions should not be underestimated.

The game theory I use might appear arcane, but it is really quite elementary and, I believe, should be generally accessible to the nonmathematical reader who seriously wishes to follow the theoretical exposition. To facilitate this exposition, I have used a number of descriptive aids to highlight the key elements in the many figures in this book. In addition, I provide a Glossary of the more technical terms used at the end of the book.

I take leave of several key assumptions in classical game theory fairly quickly, so those familiar with this theory will have some surprises in store for them. I am not trying to be obtuse in these departures but rather am attempting to make the theory the handmaiden of the substance, not vice versa. At the same time, this focus, in my view, enriches the theory, too. As Paul Tillich argued in *Dynamics of Faith*, just as "reason is the precondition of faith," it "can be fulfilled only if it is driven beyond the limits of its own finitude, and experiences the presence of the ultimate. . . ."

New York
April 1983

STEVEN J. BRAMS

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I have accumulated many intellectual debts and am happy to acknowledge them. First, seven people—Eva Brams, Marek P. Hessel, D. Marc Kilgour, Douglas Muzzio, Barry O'Neill, Laura J. Scalia, and Frank C. Zagare—read a first draft of this book, or major parts of it, from very different intellectual perspectives. They saved me from making several errors and called my attention to numerous ambiguities that I have tried to clarify. I am deeply appreciative even though I did not follow all their suggestions. John McDonald offered sage advice on the presentation of ideas at the beginning, and I thank him not only for this advice but also for his splendid encouragement of unorthodox applications of game theory over the years. Nancy Fernandez expertly typed the manuscript and also offered valuable comments, as did James D. Carse on the introductory material.

I am grateful to Marek P. Hessel and Donald Wittman for permitting me to use material from articles we co-authored (cited later) for purposes, I presume, they did not intend. Wayne A. Kimmel, to whom I dedicate this book, has not made such a direct contribution to this particular work, but our discussions on both large and small questions over twenty years have been a tremendous

stimulation and delight to me. My wife Eva, and our children Julie and Michael, also provided much stimulation (and occasional provocation), which might well have given form and shape to some of my wilder pronouncements.

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Blaise Pascal, *Pensées,* 1670

No more *deus absconditus!*
Come out, come out, wherever you are, the game's over.

Walker Percy, *The Second Coming,* 1980

The contemplation of God's nature . . . will guide me through the tumult of life.

Albert Einstein, Letter To Johannes Stark,1908

It is now acceptable for God to be seen . . . involved in the natural world of change; and at least in the view of some, not without dependency on man.

Richard Schlegal, "The Return of Man in Quantum Physics," in *The Sciences and Theology in the Twentieth Century,* 1981

What use, after all, is man, if not to teach God His lessons?

Peter Shaffer, *Amadeus,* 1980

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Norbert Wiener, *God & Golem, Inc.,* 1964

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Stanley Elkin, *The Living End,* 1979

ONE

Introduction

Since the analysis in this book would seem far removed from work in any of the standard disciplines, I would like, in this introduction, to suggest some linkages that might not be apparent at first glance. This not only serves the purpose of establishing ties to relevant research in different fields but also helps to embed the present work in a research tradition, somewhat in eclipse, that I think still deserves to be part of the intellectual landscape.

This tradition weds broad philosophical questions to rigorous analytic methods, primarily developed in the sciences, for elucidating them. I have already disavowed the label of "science" being applied to this kind of study, because empirical investigation of the theological and philosophical questions I address seems out of the question.[1] In a secular context, however, predictability,

1. In 1940 Albert Einstein said, "Science without religion is lame, religion without science is blind" [Albert Einstein, *Out of My Later Years* (New York: Philosophical Library, 1950), p. 28], though the context of this statement suggests that by "religion" Einstein had in mind an abiding faith in the order of the universe rather than a personal God, or the activities associated with organized religions today. This viewpoint is supported by his statement, "When I am evaluating a theory, I ask myself, if I were God, would I have made the universe in that way?" [*Some Strangeness in the Proportion: A Centennial Symposium to Celebrate the Achievements of Albert Einstein*, ed. Harry Woolf (Reading, MA: Addison-Wesley, 1980), p. 476.]

power, and truth are amenable to empirical analysis in real-life games, and I hope my theoretical analysis of these and other concepts and their game-theoretic implications stimulates research in applied fields.

But this book is first and foremost a philosophical investigation of characteristics of superior beings and their possible impact on games played with human beings. It differs from a conventional philosophical inquiry in its relentless use of a mathematical theory that I have tried to adapt in order to (i) facilitate the conceptualization of superiority, (ii) deduce the consequences superiority has on game outcomes, and (iii) explore theological issues raised by a disciplined inquiry of this sort.

By contrast, the primary tool of inquiry in philosophy is logic—in its various manifestations—which, while "mathematical" in a certain sense, is not really a theory about anything except what constitute correct inferences and valid arguments. This is a fundamental question in all disciplines, to be sure, but it is best asked of a theory that provides one with a specific orientation to a substantive problem and is in need of incisive scrutiny and critical assessment.

Game theory offers a way of analyzing situations of conflict and cooperation in which the actors, or players, are assumed to make rational choices. To act *rationally,* in simplest terms, means to choose strategies that lead to better rather than worse outcomes in a game. This choice will depend not only on one's own goals, which I try to justify in most games discussed in this book, but also on the goals and rational choices of other players. In light of the contingent nature of rational choices in a game, game theory can properly be viewed as a theory for making optimal strategic calculations that take into account these contingencies, uncertainties in the environment, and so on.

A *game* is sometimes defined as the sum-total of the rules that describe it. For the most part, I shall define a game by an "outcome matrix" or "game tree" and certain "rules of play," which will be given precise meanings later. Because the outcome of a game in this form depends on the rational strategic choices of *all* players, it is fair to say that such games describe truly interdependent decision situations.

No technical knowledge of game theory is assumed in this book, which I have tried to write for the lay reader who may, nevertheless, have difficulty following all the steps in an argument. I would urge this reader not to get bogged down at trouble-

some points but to go on and first see where the analysis leads before turning back to try to understand all the details. The stumbling blocks will often disappear, and the pieces fall into place, when the results of the deductions and calculations come into view.

Later I shall say much more about the game-theoretic calculations used here, which by no means mirror all the major branches of the theory. In fact, I utilize only the so-called noncooperative theory, in which communication between players is allowed but binding agreements and enforceable contracts are not permitted. Moreover, I analyze only two-person games, and sometimes one-person games against nature, so the cooperative theory dealing with coalitions, and what they can ensure for their members, is omitted.

In the two-person setting, however, I extend the classical theory to allow for dynamic sequential play between an ordinary being and a superior one, who possesses the various supernatural qualities I shall describe shortly. How these qualities of a superior being affect the sequences of moves that will by played, and the outcomes that will be implemented, will be systematically examined in the case of each of these qualities, and then all together in Chapter 7. In the Appendix, I summarize the main technical results of this book for the 57 distinct 2×2 ordinal games of conflict in which the two players, each with two strategies, can rank the four outcomes from best to worst but disagree on a most-preferred outcome.

How does one define "supernatural" and still stay close to concepts of the natural world we know best? Research in the field of artificial intelligence provides some clues. Analysts in this field have struggled for over a generation with the question of how one can distinguish human intelligence from nonhuman, or artificial, intelligence.

Put in practical terms, can a computer think? Can it have consciousness or self-awareness? Can it experience human feelings? If not now, are these theoretical possibilities or impossibilities?

Needless to say, there is no consensus on answers to these questions. In fact, a great deal of controversy swirls around them and the proper definition of terms like "thinking" and "consciousness."

The most famous, and I believe still the most insightful, attack