

Minds and Gods

The Cognitive Foundations of Religion

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OXFORD
UNIVERSITY PRESS

2006

Preface

Thankfully there is no need to use this preface—as is so often the case—as an apology for yet another book on a given topic. The field today being called the “cognitive science of religion” is indeed yielding a number of scholarly monographs and collections, but the field is too young and too expansive to have yet been adequately represented or summarized. If anything, there is an under abundance of available reports for people wishing to become familiar with this fruitful new approach to human religiosity. Furthermore, the best and most revealing work currently informing the field is found in the form of experiment summaries, conference papers, and journal articles—a rich yet disparate body of material seldom seen by any but the most committed professionals.

These first words, then, invite students and scientifically literate readers to encounter the cognitive science of religion at a level that is, hopefully, both clear and engaging. This book is meant as an introduction to some of the field’s major themes, theories, and thinkers as well as fresh analyses suggested by ongoing research. No doubt those already well versed in the cognitive science of religion or its many tributaries will find much here to criticize (coverage that is too brief, analogies that are too rough, generalizations that are too broad), but the discussion purposely aims at outline and implication rather than erudition and novelty. The story told here is about everyone, so it ought to be easily followed by anyone. Likewise, it ought to provoke not only interest but also introspection. Toward that end, the style of presentation is deliberate: the cognitive perspective on religion is best communicated through instances

of common human behavior rather than through complicated theory and jargon.

Take as an example one impetus for this book: Dick Miller, my father-in-law, is remarkable in a number of ways, but one frequently noted by acquaintances is how, in his mid-seventies, he continues to operate a one-man tree-trimming service. While Dick's work and mine are worlds apart, it is obvious (I've had occasion to assist him on several jobs, carrying equipment and chipping brush) that tree trimming—and, more to the point, Dick himself—presents a perfect example of the type of mental abilities featured on the following pages. In the course of cutting branches or falling trees, Dick has to calculate such difficult vectors as the fall line of the trunk: the direction based on cut angle and structural balance, the distance based on height. Getting these measurements right is rather crucial when nearby homes and property are at risk. Dick manages this consequential task with nothing more than vision and intuitive judgment; no elaborate instruments, no trigonometry carefully worked out on paper.

Yet trigonometry certainly is being done, and with great speed and accuracy (Dick has had no more than a couple near misses in over thirty years of falling trees). Just how such mental work is so efficiently—and so *naturally*—carried off is precisely the type of question those of us studying the mind find worth asking. Experience alone is clearly not the answer. In Dick's business there is no allowance for trial and error. Moreover, no two jobs are the same; a new set of variables must be weighed each time. So the answer must be related to the operation of the brain itself. Dick's skill illuminates one of many innate processes of human cognition, in this case an arithmetic (based on spatial relationships) as effective as the explicit procedural formulas learned in school. Similar illustrations will color this book's discussion of "minds."

As to the talk of "gods," Dick serves as an exemplar as well. For just as Dick looks upward and calculates the dimensions of a tree, so too he looks upward and concludes that there is a divine being that cares about life on earth, knows what we humans think, and makes specific demands on our behavior. For Dick, the existence and characteristics of a supernatural being (in his case, a supernatural being expressed in Christian terms) come as naturally to mind as does the trajectory of the limb he is about to cut. Dick's basic understanding of god is as automatic, as intuitive, and, it turns out, as innate as the mental math that supports his livelihood. The point of this book is that knowledge of tree trimming and knowledge of gods are not unrelated; both have natural cognitive foundations. Unearthing these foundations is our project.

Concentrated focus on the processes and products of human thought, an enterprise today engaging the efforts of a broad group of researchers, is a noteworthy academic development. The recognition that the brain lies at the center of the human world—as organizer and interpreter of incoming information, as constructor and communicator of outgoing ideas—is revolution-

izing the humanities and social sciences. In fundamentally restructuring traditional understandings of human thought and behavior, cognitive science is bringing provocative new insights and methods to traditional areas of specialization, including anthropology, archaeology, linguistics, philosophy, psychology, sociology, and others. It also offers a powerful theoretical framework for compiling a truly interdisciplinary knowledge.

The scholarly inquiry into religion is no exception. Cognitive science has begun to impact this field of study with equal force—and just in time. Old and largely unsatisfying approaches to the uniquely human phenomenon of religion are being replaced by testable explanatory techniques adopted from the natural sciences. As a result, we now have powerful new answers to long-standing questions about the origin and persistence of religious thought, the processes governing the acquisition and transmission of religious ideas, and the relationship between religion’s ubiquitous features and its cultural variations.

I am deeply indebted to those who introduced me to the cognitive science of religion, as well as to those who have since become my colleagues in the field. First among the former is Tom Lawson, who not only ushered me into the world of the mind and its implications for religious studies but also many others working in the field. That a cognitive science of religion now exists is due in no small part to Dr. Lawson’s profound scholarly vision. The foreword he has graciously contributed to this book commends itself, and I am honored by its presence. Individuals who fall into the latter category include Justin Barrett, Pascal Boyer, Brian Malley, Luther Martin, Bob McCauley, Illka Pyysiäinen, Jason Slone, and Harvey Whitehouse.

I also thank those individuals who read and commented on early versions of this book, in particular Tom Lawson, Tim Light, Luther Martin, Jason Slone, and Brian Wilson. Special appreciation is extended to Staci Doty, who worked tirelessly on the manuscript and provided invaluable assistance with formatting and other irksome tasks. Finally, I thank Cynthia Read, executive editor at Oxford University Press for her many kindnesses, Julia TerMaat, and all of the folks at OUP for their diligent work on my behalf.

Note: Portions of the discussion laid out in chapter 6 (including the tables found therein) were first presented in a short essay titled “Divergent Religion: A Dual-Process Model of Religious Thought, Behavior, and Morphology” in *Mind and Religion: Psychological and Cognitive Foundations of Religion*, edited by Harvey Whitehouse and Robert N. McCauley (AltaMira Press, 2005).

Foreword

The cognitive science of religion is no longer a gleam in the eye of its earlier visionaries. It is now established as an increasingly substantial program of scientific inquiry rigorously pursued by cognitive scientists in both Europe and North America. As with any successful scientific program, it not only involves individuals pursuing specific theoretical and experimental work, but it also means finding support in new institutional forms. The most significant of these are academic programs such as the Institute of Cognition and Culture at Queen's University in Belfast and a similar program at Aarhus University in Denmark, as well as a group of scholars associated with the Institute for Advanced Studies in Helsinki. There are also a number of scholars in the United States who have played a major role in the development of this discipline. In addition, the *Journal of Cognition and Culture* (now in its sixth year of publication) has proved to be a major venue for the publication of theoretical and experimental studies in the cognitive science of religion. Furthermore, a number of conferences focusing on the many issues and problems involved in connecting cognitive and cultural forms in both the United States and various European countries have already been held, bringing together the ever increasing number of cognitive scientists now working in this field of inquiry. More such events are in the planning stages. The number of publications, both books and journal articles, is accelerating and is beginning to make an impact in associated fields such as cognitive, developmental, and evolutionary psychology. It is, therefore, with a great deal of pleasure

that I welcome *Minds and Gods* by Todd Tremlin as a fine addition to the literature of the cognitive science of religion.

Tremlin calls our attention to an interesting fact: Religious ideas and the practices associated with them are ubiquitous. Scratch beneath the surface of any society and you will find religious ideas and practices in spades. The long view back and the wide view sideways highlights the presence and persistence of religion. This fact is, no doubt, irritating to those intellectuals who have always treated religion with suspicion, if not outright hostility, and hoped for its immediate or eventual demise. But as an ancient Greek philosopher has said: The world is full of gods. What *Minds and Gods* proceeds to show is why this is the case. Telling the story right takes knowledge, focus, imagination, cleverness, and hard work. These qualities can be found in abundance in this book.

The cognitive science of religion has been a long time coming. Many obstacles to a deep scientific understanding of religious behavior have slowed the growth of our knowledge about religious ideas and the practices they inform. This is not because scholars have had little interest in religion. The history of western thought shows that from its earliest days philosophers have wrestled with the problem of making sense of the reference of religious ideas, their truth-likeness, their origins, and their causes. Religious practices, too, have been embraced and decried. Since the Enlightenment, the status of religious belief has come under severe scrutiny. Religious belief has also found its apologists who were willing to pull out every logical trick in the book to preserve its intellectual status. What was missing from this long intellectual encounter with religion was a serious, dare I say objective, analysis and explanation of the origin, structure, and causes of religious ideas and the way that such structures inform religious practices. To understand the significance of Tremlin's contribution to the resolution of these difficulties we need a clearer picture of the obstacles.

The first of these is the overemphasis on the *interpretation* of religious ideas and practices and the paucity of work developing an *explanatory understanding* of why religious ideas arise in the first place and why such ideas and the practices that attend them persist no matter what the social and cultural conditions are. Given the Enlightenment project and its assumptions about human rationality, one would have expected religion to disappear from the human scene or at least be hidden in little isolated villages of irrationality in the backwaters of the earth. As we well know, that did not happen. While the attendance at religious observances might have diminished in some religions, the fact of the matter is that religious ideas and practices are not only alive and well but also increasing across the globe. This successful persistence of religion needs to be explained.

This need for explanation, however, points to the second obstacle to a more penetrating understanding of religion. Resistance to developing an explanatory

understanding of religion by both the humanities and the social sciences is endemic to both of these noble enterprises but for different reasons. In the case of the humanities, the focus has never been on identifying the causal factors that precipitate religious ideas. Rather, it has involved either a positive or negative evaluation of these ideas, according to some assumed norm and according to some cultural context or other. Certainly many of these interpretations of religious ideas and practices heighten our sensitivities to the intricacies of religious belief. They do not, for all of that, explain why the ideas are there in the first place. Novelists have been particularly adept at pointing to the cultural role that religious ideas play in the human story. But even powerful imaginative stories are not enough in the quest for knowledge of the intricacies of human behavior.

While I do not wish to call into question the scientific aims of social scientists, nor, for that matter, their methods, I do think that some of the underlying methodological decisions that mark the history of these sciences has unnecessarily cut them off from the genuine contributions that the natural sciences, particularly biology and psychology, can make to their putative explanations. Ever since Durkheim, insistence on the methodological autonomy of the social sciences has retarded the power of social scientific explanations because this has forced social scientists to look only to socio-cultural variables for explanations of the phenomena in question. Surface correlations between social and cultural forms, while interesting, are not enough to assuage the scientific drive for ever deeper causal explanations and the search for the specific mechanisms involved. However, sufficient critique of the standard social science model has been presented not to cover this territory again. I would point out, however, that some social scientists have themselves rebelled against the strictures imposed by the standard model and have begun to seriously explore the interface between the natural and the social sciences to the benefit of both areas of scientific inquiry. The discipline of evolutionary psychology has been particularly important in building bridges between, for example, anthropological and psychological inquiry.

Evolutionary psychology has taken a hard look at the surface variability of cultural forms and begun to identify significant regularities that underwrite such variability. This discipline has aided and abetted the work of cognitive scientists who have focused upon the problem of how the mind works, what the processes are in such working, and what products these processes construct. Evolutionary explanations of why the mind is able to engage in such construction are particularly relevant to our understanding of how and why the cognitive and the cultural are connected. Obviously, humans differ from each other in significant ways. However, despite their significance, the importance of such differences is not sufficient to exclude the search for regularities across human minds. One way of getting a grasp of these regularities is by paying attention to the constraints that both limit and enable human minds to produce

the kinds of concepts that they typically do. And there is no better way of focusing upon the constraints that play a role in the production of such concepts than starting with the cognitive development of infants. Here developmental psychology has done yeoman work in transforming our knowledge of “the scientist in the crib.” The literature on the subject is already vast and compelling.

Crucial to cognitive development is the very early recognition of agents and agency as well as the recognition of the difference between agents and everything else in the world. From an evolutionary standpoint, such knowledge has significant adaptive value. The forces of natural selection are unkind and the ability to distinguish between rocks, trees, and animals was important in ancestral environments and remains so today. Cognitive scientists have developed both interesting theories and designed clever experiments in order to uncover the various forms of intuitive knowledge that come very quickly in the development of the human mind as it strives to figure out and understand its environment. One way of describing these forms of knowledge is via the notions of folk physics, folk biology, and folk psychology. These forms of knowledge appear to be “domain specific” and independent of each other in both structure and development. That means that they are sensitive to particular environmental cues specific to the form of knowledge being acquired. They have been called “modes of construal.” I will leave it to the reader to search the literature for references to folk physics (what are the material properties of things in the world made and how do they typically interact with each other) and folk biology (what are the properties of animate things and how do they reproduce, grow, and die). Folk psychology, however, requires our attention.

Folk psychology is a theory about how human beings and other animals represent their cohorts and cousins in their environment in terms of desires, beliefs, intentions, expectations, intuitions, and so on. Scientific psychology takes these features of commonsense knowledge and theorizes about their relationship to brain states, their role in cognitive development, their biological origins through the processes of natural selection, and their function in human reasoning. Of particular interest to cognitive scientists is the deep-seated nature of folk psychology in our commonsense knowledge and its resistance to more abstract concepts underlying human behavior. This resistance has been the bane of philosophers who would like human beings to grasp the significance of scientific theorizing for providing better understandings of human behavior than those delivered by common sense. What these philosophers sometimes forget is how useful such common sense knowledge is in our commerce with the world in which we live and especially with the people and other animals that populate that world. For example, attributing desire to a leopard on the ancestral plains of Africa is a very useful notion to possess if you spot that animal looking at you from some distance away. Who can deny the importance of such an attribution to the carnivore in question?

It is, however, in the social situations that humans typically find themselves from the day of their birth that the commonsense knowledge delivered by folk psychology becomes particularly important. And here the notion of agency plays a crucial role. What distinguishes agents from everything else is their intentionality. Intentionality is the notion that human minds have representational states. To have a representational state is to possess the means for conceiving of something in a specific way. For example, when I have a concept about something is the referent of our notion about something actual, possible, or impossible? To be an agent means that the concept under consideration is something that is capable of knowing something about something, intending to do something about something, and can evaluate, upon the basis of the evidence provided in the immediate context, whether that agent in fact did know and do something as conjectured. Of course, these processes can end up being wrong. I could misinterpret the glance, the movement, the sigh, the turning of the face. But I could also be right and being right makes a difference in my relationship to that other. Sometimes my very life might depend upon my being right, whereas if I am wrong there is no great loss. As the saying goes: It's better to be safe than sorry.

Tremplin has seized upon this recognition of the importance of the attribution of agency to others in *Minds and Gods* and runs with it in intriguing new ways. In order for human beings to develop god concepts, we need first to understand how agent concepts emerge from our mental basements. The easy way out would have been to start with a notion of the mind as a blank slate and simply argue that such concepts are nothing but the consequence of the process of socialization. Ultimately, of course, socialization does not really explain very much because it ignores the problem of what capacities a person needs to possess in order to be the subject of socialization. In other words, it simply postpones the explanation. Tremplin has taken the harder route, first, by paying very close attention to the evolutionary story that has produced such significant knowledge about why we have the bodies and minds that we do and why we perceive and conceive of the world in the way that we do. He has also focused on the work already accomplished in the cognitive science of religion and provides an excellent introduction to that literature. In addition, he shows not only that religion is about gods, but also that god concepts are fascinating by-products of mental processes that, in turn, can be accounted for by the processes of natural selection. Most importantly, however, he has persuasively shown that because the concepts of agents with some counterintuitive properties so easily take hold in human minds and, in fact, play a central role in religious systems, they should be understood as providing an impetus for the development of religious systems. As if this were not itself significant enough a contribution to the cognitive science of religion, Tremplin has also introduced the notion of what is known in cognitive science as dual processing. Dual processing involves two different cognitive processes that operate at different

levels of mental representation. The first of these is a rapid, inference-rich mode of processing that points to the fact that our minds are quick responders to environmental stimuli. The rapidity with which we make judgments on the basis of fleeting cues from the surround is astounding. This mode of reasoning is inferentially rich. It does not take much for a young child to infer further relevant properties of an object when presented with either the representation of that object or the object itself. Knowing that something is an agent rather than a rock permits the child (and, therefore adults as well) to make all kinds of additional judgments about the agent.

There is also a slower reflective process where we can think about our rapid judgments. This is a meta-level of reasoning. When I think about what I just did, did I do the right thing in this instance? Why do I hesitate when I should not? What is the nature of thought? Why is there religion anyway? Did the universe have a beginning? Unlike the inferences I make when I know that I am perceiving an artificial object, for instance that clocks don't breath but they are reasonably good indicators of the time of day, higher order reasoning provides no quick and dirty inferences for answering such questions. Some higher order forms of reasoning take years of training before we are provisionally satisfied with the conclusion we reach. Some even require the language of mathematics in order to provide solutions. And some forms of reasoning end up with nonsense.

What can we learn from this idea about the levels of thought? For one thing, the more abstract the notion the more difficult it is to deal with. In religious contexts this means that appeals to the quick and dirty notions that so easily populate our minds tend to be more successful in contributing to the persistence of particular religious systems than those theological systems that require sustained abstract reflection. This attitude has proved to be the bane of theologians who are always ready to argue for the elimination of "superstitions" and the curtailment of ritualized behavior. This does not mean that such models of abstraction will die out. Theology has a long and sometimes distinguished intellectual history. But the institutionalized forms that provide the playground for the manipulation and development of such abstractions never succeed in playing the decisive role that the theologians constantly hope for as they dream of bettering the thoughts of typical religious participants. It is sometimes all too obvious that the religious system works quite well without depending to any significant degree upon such theological notions. Sometimes theology seems to do little more than provide soothing background noise. Even if this is an unnecessarily harsh characterization of theology's place in religious systems, at least it must be said that such notions are not the motor that drives religious ideas and the practices these ideas inform, nor does it play any significant role in the growth and decline of religious traditions. In fact, the picture that is emerging in the cognitive science of religion is that there is not one motor, even when we focus on the quick and dirty processes, but that there

are *many* motors. It all depends on the level of analysis involved. What Tremlin has accomplished lies in his identifying the role that god concepts play as part of the complex causal story that is now being told in the cognitive science of religion. That is a considerable achievement.

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Introduction

In the sprawling shrine complex of Kataragama on the island nation of Sri Lanka, men and women from different religions come together each year to fulfill vows to this ancient Hindu god by offering him baskets of fruit, rolling on hot sand, walking over burning coals, piercing their bodies with metal lances, even hanging themselves from hooks impaled in their backs. Unlike some other gods in the Hindu tradition, Kataragama identifies with common people and has the power to answer worldly petitions, from cures for illness to help in passing government exams. He does not expect sacrifice in advance, but once a favor is granted, he demands his due.

Throughout the Gulf region of the Arabian Peninsula, Muslim men and women not only have faith in Allah but also believe in beings named jinn, malevolent spirits, and demon possession. In order to safeguard their families from such beings and the misfortune or illness they bring, Bedouins and townspeople alike have long employed a rich tradition of charms, decoys, and disguises. One of the most common methods of deflecting malevolent forces is the use of amulets, small containers or pieces of jewelry stuffed with passages from the Qur'an believed to shield the owner from harm. Many spirits, while dangerous, can also be fooled. A traditional method of protecting infants, for example, is to purposely speak ill of them, or even give them disparaging names, in order to trick evil beings into thinking them unworthy victims.

In the Pomio Kivung, a popular cargo-cult movement among the Baining peoples of East New Britain Island, Papua New Guinea, many hours are spent each day preparing elaborate meals to feed

the spirits of ancestors who come to feast in special thatch-roof temples. The most important of these ancestors is a heavenly assembly of spirits known as the “Village Government.” While the ancestral spirits of deceased kin are also given food offerings, cultivating relations with the Village Government is especially important because it is this divine assembly that, after judging the Baining peoples worthy, will one day return to earth in the bodies of white people, bringing with them the technological knowledge and material resources to turn the Baining’s land into a utopia of Western-style industry and wealth.

At the baptism of a teenage girl in a Pentecostal church in Los Angeles, the pastor invokes the triune nature of god—“Father,” “Son,” and “Holy Spirit”—as he immerses the young lady in a pool of water. Unlike many other deities around the world, this being is to be worshiped and prayed to, but no sacrifices are required. In this case, god is said to have offered *himself* for sacrifice, and lifelong devotion to this being is the salvific exercise of his followers. Across the street, members of a Roman Catholic church worship the same god, yet they also spend a great deal of time offering prayers to a woman named Mary, *theotokos*, “Mother of God,” as well as to a wide range of saints possessing special powers of their own.

Across the Japanese landscape, simple wooden arches called torii mark sacred sites—groves of trees, rocks, waterfalls, and mountains—where nature deities, or kami, reside. Kami are the energies that animate nature. They created the world; they embody the sun, moon, wind, sea, and fire; they gave birth to Japan’s first human emperor; they prompt rice to grow in fields and lava to flow from volcanoes. In order to honor or engage the power of kami, these beings are treated as persons and given names. In large public shrines and at small altars in private homes, the kami are regularly revered with offerings and plied with prayers for personal health, success at work and school, and other worldly affairs.

Around the world and throughout history, in cultures as diverse as Mesopotamia and Mesoamerica, among people as different as the Yamana of Tierra del Fuego and present-day New Yorkers, religion shares at least one feature in common—belief in gods. These beings come in many forms. They may be the absolute, all-powerful deities of monotheistic religions like Judaism, Christianity, and Islam, or beings with very human behavior, such as certain gods in Roman and Hindu religion. They may play important roles in maintaining human or cosmic harmony, like the Wakan Tanka of the Lakota Sioux in America and the Orisa of the Yoruba in Africa, or they may be dangerous or foreboding forces to be avoided or placated, like the Pört hozjin, a Scandinavian spirit that lives under fireplaces and floors. Thus the term “god” can be misleading, as it is usually understood, at least in the West, to designate some eternal, supreme deity rather than the ghosts, ghouls, spirits, minor gods, or any of the seemingly endless possibilities found in cultures, communities, and

cults across the globe. The term “supernatural being” might be better, for it speaks to the full range of unusual agents that populate the systems of belief and practice that we call religion.

Are there exceptions to this rule? No. While a handful of religions have been characterized as nontheistic or fundamentally unconcerned with the existence of gods—Theravada Buddhism, for example—even a cursory examination of such traditions reveals that supernatural beings are neither excluded from the overall structure of these religious worlds nor wholly incidental to their outworking. Theravada Buddhists interact with a complex cosmology filled with supernatural beings, and they openly treat the Buddha with the same reverence garnered by any god, despite a “formal” belief that the historical Buddha is now dead and inaccessible to petition. As we shall see, this discrepancy between formal beliefs and “folk” ideas is a compelling feature of religion. When a tradition’s official teachings point its members away from gods deemed unorthodox or else forbid particular behaviors thought to be unfaithful, people often do them anyway. Even very real, very human people—like Siddhartha Gautama, Confucius, the Virgin Mary, and honored kin—are deified to varying degrees and added to the pantheon of religion.

What makes supernatural beings “supernatural” varies widely as well. Some gods are at once omniscient, omnipotent, and omnipresent, while others have limits on their access to knowledge, are powerful just in particular ways, or can only be in one place at one time. Some gods are superlative and live for ever; others die or can lose their station. Some supernatural beings have a definite, material shape yet can move freely through walls, fly, influence other objects, or read minds. Some supernatural beings are highly emotional; some care little for life on earth; some need to eat despite being incorporeal.

Conversely, it is extremely difficult to think about or picture a given god without invoking some resemblance to human beings. Hindu gods look and act like humans, from Shiva represented as the Lord of Dance to Krishna’s flirtatious exploits with milkmaids. Bodhisattvas live in heavenly paradises with plenty of room for those who call on them. Ghosts, spirits, and ancestors once *were* human. Even when religious discussions turn to a transcendent deity like the Christian god, this being too is described with human metaphors, thought about and interacted with as a personal being, and is believed to have literally taken human form in the *person* of Jesus Christ. In short, gods are a special category of agents that in some ways resemble or are at least spoken about as having human-like qualities yet also possess powers, capacities, and faculties that exceed or break the basic rules of mundane human existence.

In whatever ways they are envisioned, gods are central to the study of religion. This connection is not always acknowledged. Some see religion in purely social terms, and turn gods into symbols for other ideas or else simply consider them irrelevant. That supernatural beings matter, however, is demonstrated by their universality across religions, by their centrality within relig-

ions, and by their psychological relevance to religious persons. As Illka Pyysiäinen points out, “when people no longer can believe in the real existence of counterintuitive beings [his preferred term for ‘gods’], religion loses its power” (2001b: 70). What distinguishes religion from a neighborhood Elks lodge, a college fraternity, a political party, or other kinds of social organizations centers precisely on belief in gods. This is a distinction of consequence. The collective systems of thought and action that we call religion often include vast institutions, gather in huge numbers of people, and inculcate lifelong ideas and behaviors. These religious systems, in turn, have and continue to play a significant role in the warp and woof of society at large.

While belief in supernatural beings is so common that it seems trivial, this same triviality obscures some compelling questions. Why *do* people believe in supernatural beings? And why, specifically, do they believe in *these kinds* of supernatural beings? This book is concerned with answering these questions. What is different about the answers offered here is that gods are described not primarily as theological concepts or as social or cultural constructs but as the products of human cognition. Explaining why people believe in gods requires first explaining the way people think. Describing the variety and nature of god concepts and their place in religious systems requires first describing the structure and functions of the brain. Understanding the origin and persistence of supernatural beings requires first understanding the evolved human mind.

Why is the subject of the human brain foundational to the discussion of gods and religion? A complete, detailed explanation of the relation of heavenly gods and earthly minds is the reason for this book. By way of introduction, however, two very general responses provide the proper starting point.

First, our mind is, quite literally, the center of our universe. Every sensation that comes to us from the world “out there” is received, organized, and given meaning by the tissues of the brain. Fingers, eyes, ears, and the body’s other sense organs are crucial to this process of reception, but in fact they are merely gateways and conduits for the brain. It is within the brain that all our perceptions of the external world are gathered, connected with other stored information, and interpreted—from basic stimuli like heat, taste, and light to complex symbols like mathematical theorems and spoken words. Working with such inputs, our brains literally generate what we assume the external world to be. As E. O. Wilson recognizes in his own attempt to ground knowledge: “The mind is supremely important. . . . Everything that we know and can ever know about existence is created there” (1998: 105).

This is only half of what the brain does, for it also—and more fundamentally—lies at the center of our inner world. At the physical level, the roughly one hundred billion neurons that comprise the human brain control the biological processes of the body, from managing the movement of limbs to initiating the onset of puberty to orchestrating tonal match when singing a song. At the conceptual level, the brain turns basic sensory input into meaningful

information, maintains an extensive field of memory, creates a unified sense of “self,” produces complex thoughts and novel ideas, and communicates with the outside world, principally through language. In short, the brain is central to what comes into the body and what goes out; it interprets and interacts with the external world, and it governs the physical systems and mental conceptions of our internal world.

The second reason for connecting gods and minds is that supernatural beings, as well as the religious systems of which they are a part, are among the plethora of mental conceptions acquired, represented, and transmitted by the human brain. Therefore, if the arising and nature of god concepts are to be understood, it is necessary to explore what goes into the acquisition, representation, and transmission of concepts generally. At the level of human cognition, ideas about gods and religion are not “special” kinds of thoughts; they are produced by the same brain structures and functions that produce all other kinds of thoughts. As Tom Lawson notes, “whatever it takes to explain how minds work generally will be sufficient to explain how religious minds work” (2000: 79). Of course, god concepts are different in content from other kinds of ideas—and examining what makes them distinctive and therefore universally successful is a major goal of this book—but the immediate point is that understanding any type of mental representation, including ideas like “god,” must begin with the architecture and operation of normal brains.

While inquiry into the nature of the mind has a long history, it is only within the last several decades—a period of time often referred to as the “cognitive revolution”—that a comprehensive picture of human cognition has begun to emerge. Study of human cognition was initiated by, and continues to benefit from, dilemmas and discoveries in seemingly unrelated fields. For example, ongoing research into artificial intelligence has profound parallels with the investigation of biological thought. The study of the cognitive abilities of other animals, most notably the primates, begs comparison with our own species. Observation of childhood development seeks to articulate the debated relationship between innate endowment and learning. Medical scrutiny of patients with damaged brains and persons born with mental impairments prompts inquiries into the workings of “healthy” thought. These and other areas of study raise compelling questions about human intelligence and provide creative methods for finding equally compelling answers. Indeed, it is the interdisciplinary character of what may be broadly called “cognitive science”—now gathering in neurology, psychology, biology, archaeology, paleontology, anthropology, linguistics, philosophy, and other fields—that has allowed such rapid growth in our knowledge of the brain.

Of this expanding knowledge about human cognition, three insights are of crucial importance to the discussion to follow. First, we now recognize that though the brain literally looks to be, and is experienced by each of us to operate as, a single, seamless organ, it is in fact an astoundingly complex machine

comprised of numerous specialized parts, or “modules.” These modules are dedicated to specific tasks that, for the most part, are executed unconsciously. Again, this applies both to tasks related to receiving and interpreting information from the outside world and to those responsible for maintaining internal life and thought. No one is aware, for example, of the computational processes that add color to the objects we see, or of the mental signals that guide the release of hormones, or of the various component parts that go into the formation of a single idea like “friend.” Understanding the modular architecture of the brain and what such a structure means for conceptualization is essential for explaining the ideas we produce, including gods.

Second, the specific modules and functions of the brain that we see today are the result of millions of years of natural selection. The modern mind has been shaped by evolutionary responses to the many environmental pressures faced by our early ancestors. How we presently think is a direct result of adaptive solutions to past problems. In this sense, characterizing the brain as “modern” is, structurally speaking, a bit of a misnomer. When taking into account our ancestral history of roughly 6 million years, we have not been “modern” for very long. The critical period in the development of the modern mind took place from about 1.8 million to 11,000 years ago. Thus at the most basic level of cognition, our modern brains still function much like the brains of the Pleistocene hunter-gatherers. This turns out to be one of the keys to understanding the nature and persistence of religious thought.

An evolutionary approach to the brain leads to a third significant insight about human cognition. Because the modern brain, with its many specialized devices and corresponding processes of thought, is characteristic of humans *as a species*, the way people think and the ideas they produce are largely the same for everyone everywhere. As Leda Cosmides and John Tooby point out, “the representations produced by these universal mechanisms [of the human brain] constitute the foundation of our shared reality and our ability to communicate” (Baron-Cohen 1995: xii). It is because all humans possess the same cognitive hardware that we can speak to each other—an activity that really amounts to the transfer of mentally constructed ideas. This means that concepts are tractable not only between people who are related or who live in the same country but also between cultures. Ideas as basic as a greeting or as complex as an ethical norm pass readily from mind to mind, regardless of one’s gender, ethnicity, or society. Readers around the world, for example, can easily grasp the ideas found in this book, if presented in their own language—a universal cognitive ability that is itself based on a set of evolved mental skills.

What this means is that culture is not the barrier to the study of people and their systems of thought and practice that it has long been made out to be. In fact, “culture” is not a thing in itself at all but is, as Dan Sperber puts it, “the precipitate of cognition and communication” (1996: 97); that is, the products of mental activity that are shared by other like-minded people. To

speak of culture is really to speak of ideas—and the behaviors they engender—that have been embraced, institutionalized, and perpetuated by a community. With this *truly* revolutionary insight has come the revisioning of a host of academic disciplines. Recognizing that the evolved human mind stands at the nexus of basic biology and complex culture has finally bridged the gulf separating the natural sciences from the humanities and the social sciences. Whatever the subject at hand—art, politics, family relationships, war, and so on—it maintains an intimate and immediate footing in the adapted information-processing mechanisms of the modern brain.

In all of this, the study of religion also finds its place, for religion too is a symbolic-cultural system produced by minds. “Gods” are ideas—and particularly successful ones at that. But fully grasping this fact, and then applying it as an *explanation* for religion, is an activity only recently begun. Among the roadblocks to a scientific study of religion is the long-standing view that religious thought is somehow unlike other kinds of thought, and that it therefore cannot be explained in the same way that ordinary ideas can be. At the heart of this perspective is the belief that a “scientific” explanation of religious thought reduces away whatever it is that makes it “special.” Another traditional misconception of religious studies is that the tremendous diversity within religion found round the world makes it impossible either to generalize about human religiosity or to construct a single explanatory theory.

Obviously, even the few insights of cognitive research outlined above call into question such perspectives on religion as well as past approaches to its study. As is true of any class of ideas, “gods” are the natural products of evolved human psychology, and they are therefore open to a cognitive explanation. And, since the modern mind is fundamentally the same everywhere, religious ideas turn out to be neither as diverse nor as culturally relative as previously supposed. The cognitive approach reveals that the types of ideas that lie at the core of religious systems are limited, necessarily constrained and shaped by the specialized kinds of minds we all possess. As Pascal Boyer’s work demonstrates, the supernatural concepts on which all religions are based comprise a surprisingly short “catalogue of supernatural templates”—there are only so many ways to build a god (2001: 78).

Findings like this one illustrate the promise that the “cognitive science of religion” holds for our understanding of human religiosity. The appearance of a major theoretical approach is a rare event in any field—and rarer still in the field of religious studies. Yet over the course of only a couple decades and still with a small number of people working in the field, the cognitive science of religion is already proving itself to be the most significant and fruitful approach to the subject ever undertaken. By probing the connection between the processes and products of the adapted human brain, cognitive research is laying the foundation for a science of religion capable of supplying a meaningful, testable description of one of the most fascinating aspects of human behavior.

Minds and Gods: The Cognitive Foundations of Religion seeks to contribute to this new science of religion by exploring the features of human cognition that lead, naturally, to thinking about, believing in, and constructing religions around gods. The central claim of this book is that understanding the origin, composition, and persistence of religion and the supernatural beings it features requires an understanding of the evolved human mind. This argument unfolds in two parts. The first four chapters explore the cognitive foundations of god concepts, discussing in both evolutionary and developmental terms the suite of mental structures and functions involved in the acquisition, representation, and use of these religious ideas. Due to a long history of adaptations designed for interaction with the world “out there”—in particularly with *others* “out there”—humans today possess a powerful set of cognitive endowments that make their minds particularly good at producing and transmitting god concepts—and, as a consequence, religion itself. The final chapters look at the cognitive foundations of religion. By connecting individual cognition with human culture, they show how the ideas that we have of gods in our minds relate to and shape the public religious systems that coalesce around them.

Chapter 1, “The Prehistoric Roots of the Modern Mind,” pursues the question of what the past has to do with the present. Tracing the course of evolutionary history that led to the rise of *Homo sapiens* uncovers some of the selective pressures and adaptive strategies that gave shape to the brains we all use today. Chapter 2, “The Architecture of the Modern Mind,” shifts the perspective back to the present by asking what our long developmental history has to do with the nature of human cognition. Given our ancestral world, what kinds of mental structures and functions should we expect to find in the brain, and what do we find? Just as important, what roles do such structures and functions, formed as they were in the crucible of Pleistocene life, continue to play in the construction of even our most complex and “modern” forms of thought?

Chapter 3, “Minds, Other Minds, and the Minds of Gods,” begins to discuss directly what evolutionary adaptation and individual brain development have to do with religious thought. Isolating the innate predispositions and intuitive processes of cognition aids in explaining the composition of ideas about supernatural beings, shows what it is about god concepts that makes them a natural part of our cognitive repertoire, and clarifies the computational constraints placed on religious thought. Chapter 4, “Gods and Why They Matter,” introduces readers to a peculiar yet revealing feature of religious thought—the differences between god concepts as portrayed in official theological systems and the way that god concepts are represented and processed by the human mind. It also looks more closely at the properties of god concepts that make them seem both plausible and relevant to life, especially their crucial links with human social psychology, and that lead many people to accept that supernatural agents are real.

Chapter 5, “Gods and Religious Systems,” shifts the focus from how individual minds handle god concepts to the pivotal role such concepts play in religion. This discussion begins with another argument for the centrality of gods in the cultural systems we label “religion”—their ubiquity in conceptual and ritual schemes—and goes on to show that gods are necessary for fostering the commitment, motivation, and transmission potential such systems require. Chapter 6, “Cognition and Religious Systems” uses dual-processing models of thought drawn from social psychology and neuroscience to clarify, in detail, the often incongruent relationship between cognition and culture in the domain of religion. This work, in turn, grounds a new understanding of the selective forces at work on the shape and stability of religious systems and offers a new perspective on common but poorly explained episodes of change in religious systems, including personal conversions, doctrinal and ritual innovations, revival movements, syncretism, and the formation of new religions.

As noted in the preface, *Minds and Gods* is primarily intended to serve as an introduction to the cognitive science of religion. The original contribution of this book lies in expanding the present boundaries of the discussion. First, the book pays closer attention to human evolutionary history. This is certainly nothing new to the field, but it does make explicit what has largely remained implicit in other works. For example, in their analysis of Pascal Boyer’s *Naturalness of Religious Ideas* (1994), Bernard Spilka and his colleagues write: “This is a cognitive theory of religion premised upon ‘universal cognitive processes.’ Natural selection is mentioned, but somehow the biological basis of these notions is never developed” (Spilka et al. 2003: 60). The exact evolutionary forces and stages that gave rise to these universal cognitive processes may be conflicted, but a general outline of them is essential to the cognitive explanation for religious thought and behavior. Second, greater attention is paid here to religious systems in addition to the religiosity of individuals. A subtle argument running throughout the book, and finally focused on in chapter 6, suggests that the natural constraints and dispositions of human cognition shape the content, development, and durability of actual religions.

On the whole, however, this entire volume owes its existence to previous and ongoing research by many talented people exploring human cognition and its connection to cultural artifacts. It therefore stands as a summary of some of the more important theories, clever experiments, and conclusions currently shaping our understanding of how religion works.