

RELIGION AND COGNITION: AN INTRODUCTION

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This volume is designed to introduce readers to the cognitive science of religion through important papers, all but one (Chapter 13) of which have been published since 1990. The volume is divided into two parts. Part I contains four chapters that review the meta-theoretical and theoretical frameworks of the cognitive science of religion, and Part II contains nine chapters that introduce the reader to findings from experimental studies that support core hypotheses in the cognitive science of religion.

1. Part I

Meta-theoretical commitments of the cognitive science of religion are explored in Chapter 1, “Interpretation and Explanation: Problems and Promise in the Study of Religion,” by E. Thomas Lawson and Robert N. McCauley. Lawson and McCauley argue that the study of religion is best approached from an *interactionist* meta-theoretical position that welcomes both interpretive and explanatory approaches. This is a change from typical studies of religion that only engage in interpretive, i.e. hermeneutic, endeavors. Hermeneuticists often argue that scientific studies of religion are reductionistic and insensitive to the personal and cultural meanings and values religions provide, and therefore that the job of the scholar of religion is to unpack what religions mean for their followers. On the other hand, explanatory exclusivists, such as the logical positivists in the philosophy of science, argue that interpretive endeavors are merely subjective, personal opinions, and therefore of little epistemological value other than to fulfill the particular curiosities of the scholars involved.

These two positions—hermeneutic and explanatory exclusivism—are in significant ways straw arguments, argue Lawson and McCauley. Explanations themselves require interpretive acts, and interpretations often function as explanations. The interactionist stance sees explanation and interpretation as complementary; they are different cognitive tasks. However, as readers will gather from Chapter 1, Lawson and McCauley argue that an imbalance currently exists in the study of religion because most scholars do exclusively interpretive work. The cognitive science of religion, while welcoming interpretive work, seeks to make explanatory contributions to our understanding of religion and in the process redress the imbalance.

So what exactly are the explanatory theories of the cognitive science of religion? To begin, most operate within the theoretical framework of “cultural epidemiology” outlined by Dan Sperber in Chapter 2. Sperber argues that explanation of widespread cultural forms (including but not limited to religion) must include cognitive considerations. For something to become a “cultural” representation, it must first originate in an individual’s mind and then spread to other people’s minds (often via material objects, like texts). Thus, a “cultural” representation is merely a private representation that has spread successfully to other members of a population.

Explaining why certain forms recur across populations therefore requires an approach much like viral epidemiology, connecting the “virus” (the mental representation that spreads across a population) with the hosts (the minds of individuals). Just as is the case with viruses, mental representations that fit well with hosts’ minds are more likely to be spread than ones that don’t. In this way, cognition can be said to constrain what kinds of mental representations become cultural forms. In turn, those types of cultural forms (e.g. religious systems) that recur across cultures can be said to be “fit” cultural forms; that is, they are fit for cognitive consumption. By extension, it is because human minds are basically the same across cultures that we see the same types of cultural forms recur across cultures.

So what is human cognition like such that religion is such a good fit for it? In Chapter 3, Lawrence Hirschfeld and Susan Gelman show that the human mind is domain-specific—a collection of various “modules” that perform specific tasks. Importantly, much of the information each module possesses is non-cultural, but rather part of the cognitive architecture itself. While there is no consensus among cognitive scientists on how many modules minds might possess, it is clear that these modules work together, creating various cognitive systems that allow us to make intuitive sense of the world and its workings. For example, we have a “folk physics” system that tells us (among other things) that solid objects cannot go through other solid objects (e.g. people can’t walk through walls). We have a “folk biology” system that tells us that babies resemble their birth parents (i.e. have the same parts/traits). And we have a “folk psychology” system that tells us other people’s

behaviors are goal-directed, i.e. driven by beliefs and desires (e.g. “Brenda puts on her coat because she believes it is cold outside and desires to stay warm”).

These domain-specific cognitive systems are triggered by environmental inputs. For example, when we see a person crying, the perception is likely to trigger the inference that that person is unhappy. When we see a puppy, the perception triggers the inference that the parents of the puppy are similar-looking dogs. When we see a moving object strike into another object, the perception triggers the inference that the object being hit will be launched. Therefore, human minds don’t just “soak up” the environment; environmental inputs trigger inferential representations about what is being perceived. The mind is neither a “blank slate” nor a “black box”; it is a domain-specific computational, representational, information processor.

This fact about minds leads to an important question, namely, where does this cognitive information come from? If it is not learned per se, is it innate? Does it develop early in the life span? Is it somehow both learned and developed? The matter itself is far from settled in the cognitive sciences, but the issue is largely immaterial for the study of religion because, regardless of whether these cognitive capacities are innate or develop, they are in place by the time human beings acquire religion from culture. In this way, cognition constrains what kinds of religions will be widespread. If the cultural inputs do not fit with cognition in specific ways, transmission is not likely to be very successful. And a survey of world religions reveals that “successful” religions (i.e. long-lived and/or widespread) possess recurrent patterns of belief and behavior, which can be connected to cognitive capacities that enable their transmission.

In this way, religion—again, at least in the form of religions found to recur across cultures and eras in human societies—can be said to be “natural”; religion is a natural fit for human cognitive consumption. This point is shown in Chapter 4, “Exploring the Natural Foundations of Religion,” by Justin Barrett. Barrett points out that, despite variation across and within religious systems, most religions involve a shared system of beliefs and actions concerning supernatural agency (i.e. gods, goddesses, demons, angels, ancestors, etc.). That is, religion involves the belief that supernatural agents exist, and a set of prescribed actions (i.e. rituals) for interacting with those agents.

Why do these features recur across cultures? In short, because of how the mind works. First, why do religions involve belief in supernatural agents? Religious conceptual schemes across the world are believed to be populated by supernatural agents because the mind is primed to detect agents in general. In fact, Barrett argues, the mind is so primed for detecting agents in the world that it is reasonable to say that the mind possesses a “hyperactive agency detection device” (HADD) that predisposes humans to detect agency at work in the world, even where perceptual data do not warrant such

representations. When you awaken in the middle of the night and hear a noise in your house, your HADD predisposes you to automatically generate the representation that an agent is in the house and has made the noise. You immediately think, “Is that a burglar?!” (even though it is probably just old floorboards creaking).

The belief in gods and other forms of supernatural agency is the extended application of this natural tendency, with one important difference. Supernatural agent concepts involve ordinary agent concepts (e.g. person, animal) with one or two violations of domain-specific expectations. In other words, gods are mostly like ordinary agents (e.g. they have minds with beliefs and desires) but with one or two “supernatural” capacities (e.g. their minds know everything). As Barrett notes, Pascal Boyer has shown that despite their apparent differences across cultures, most supernatural agent concepts are represented in this way; gods are “minimally counterintuitive” agents.

In turn, once people acquire these concepts of minimally counterintuitive agents, we then interact with those agents, employing the same cognitive system used for social interactions with ordinary agents. That is, religious rituals have the same representational structure as interactions with people, animals, plants, etc., with the only difference being one of the parties involved in the ritual action is (represented as) a minimally counterintuitive agent. In other words, religious rituals conform to the following pattern: Agent → Action → Patient. As a result, only three types of religious rituals are possible: rituals in which minimally counterintuitive agents are represented in the first slot (i.e. as the agent), in the second slot (i.e. in the action), and in the third slot (i.e. as the patient). In this way, religious actions are constrained by ordinary cognition as well as religious beliefs.

Barrett’s chapter clearly shows that despite its apparent “super-naturalness,” religion can be shown to be a natural product of human cognition. Does this mean the same thing as saying humans are “hardwired” for religion? The answer is “no,” Deborah Kelemen explains in Chapter 5, “Are Children ‘Intuitive Theists’? Reasoning about Purpose and Design in Nature.” What humans do possess, however, are the cognitive prerequisites for acquiring religion.

In Chapter 5, Kelemen reviews a range of literature from developmental and cognitive psychology that suggests children can be viewed as “intuitive theists” in the sense that children develop cognitive capacities that are prerequisites for acquiring theism later.

What are these prerequisites? Kelemen cites three. First, children must develop the capacity to maintain a mental representation of a causal agent (despite its intangibility). Second, children must develop the ability to attribute mental states to that agent, thereby distinguishing it from more commonplace agents. Third, and most importantly, children must develop the basic ability to attribute design intentions to agents, and to understand an object’s

purpose as being derived from such intentions. Kelemen's literature review shows that children do, in fact, develop these capacities, which allows us to acquire religion.

2. Part II

Like all scientific claims, theories put forth by cognitive scientists of religion need support in order to be taken seriously. Historically, most non-cognitive scholars of religion have relied only on observational empirical support for their claims rather than experimental empirical support, as most scientists do. This is, again, likely because of those scholars' commitments to the meta-theoretical stance of hermeneutic exclusivism (noted in Chapter 1). While plausible, the "naturalness of religion thesis" that cognitive scientists have put forth would—and does—benefit from strong, supportive experimental evidence.

Generally speaking, experimental evidence provides more powerful support for scientific claims than passive observational support for the reason that experiments are controlled tests of potentially causal variables. In other words, experiments allow scientists to isolate variables that are postulated to be the causes of events. If test results fail to disconfirm a claim, those data are taken to be supportive of the claim (and vice versa). Furthermore, this systematic approach allows for a community of scientists to establish the credibility of experimental evidence. If similar results are obtained independently (e.g. by separate test runs, and/or replications by different scientists), this adds to the community's confidence in the claim.

Though only recently emerged, scholars working in the cognitive science of religion have produced a number of experimental studies that support core hypotheses in the field. The articles in Part II present some of those studies.

Chapter 6, "Conceptualizing a Nonnatural Entity: Anthropomorphism in God Concepts," explores the cognitive foundations of the phenomenon of anthropomorphism. As is widely known by students of world religions, the "tragedy of the theologian" is that lay people regularly distort (from the perspective of official theology) god concepts by anthropomorphizing them. The God of Christian theology, for example, is supposed to be (again, from the perspective of official theology) represented as an "essence," not a being, as "omnipresent," not as living in a single location, as "genderless," not as a man, etc. Yet it is common for Christians to represent God as "the big guy in the sky."

Using narrative comprehension and recall studies, in which subjects were told a story and then asked to recall its contents, Justin Barrett and Frank Keil demonstrated that subjects are more likely to (mis-)represent god concepts anthropomorphically than in a theologically correct way in real-time

problem-solving situations. Specifically, their studies show that when performing recall tasks that require inferential reasoning processes, people abandon memorized creeds and rely on more “natural” ways of representing gods. In this way, they argue, the specific phenomenon of anthropomorphism, and the more general phenomenon of “theological correctness” (holding ideas that differ from official theologies), are natural by-products of cognitive constraints.

Experimental support for Boyer’s “minimal counterintuitiveness” hypothesis is presented in Chapter 7, by Justin Barrett and Melanie Nyhof, and in Chapter 8, by Pascal Boyer and Charles Ramble. Both sets of experiments involve subjects being given concepts that varied in their levels of counterintuitiveness, from intuitive concepts (i.e. concepts that did not violate any domain-specific expectations; e.g. a man who could see right in front of him) to minimally counterintuitive concepts (i.e. concepts with single domain-expectation violations; e.g. a man who can see villages many miles away), and then recalling those concepts after some time had passed. In studies by both, subjects regularly recalled the minimally counterintuitive concepts better than the intuitive ones. The results obtained by Boyer and Ramble are especially important in this regard because they were obtained across different cultures—in France, Gabon, and Nepal. These findings eliminate the possibility that results obtained by Barrett and Keil were unique to the United States, and therefore are merely a product of culture.

In Chapter 9, “Ritual Intuitions: Cognitive Contributions to Judgments of Ritual Efficacy,” Barrett and Tom Lawson report results from tests of Lawson and McCauley’s “ritual form hypothesis” (reviewed by Barrett in Chapter 4). In these studies, these authors tested ritual participants’ judgments about features of ritual performance, such as ritual efficacy and the relative importance of a superhuman agent’s participation. In particular, Lawson and McCauley’s theory of ritual competence generates three predictions. (1) People with little or no knowledge of any given ritual system will have intuitions about the potential effectiveness of a ritual given minimal information about the structure of the ritual. (2) The representation of superhuman agency in the action structure will be considered the most important factor contributing to effectiveness. (3) Having an appropriate intentional agent initiate the action will be considered relatively more important than any specific action to be performed.

To test portions of these predictions, Barrett and Lawson constructed several artificial rituals (in order to avoid the confounding problem of background knowledge), manipulated several hypothetical scenarios in which the ritual performances were set, and then asked subjects to make judgments about the ritual scenarios. They found that subjects routinely made similar types of judgments about the ritual scenarios, even though they had no background knowledge about the rituals themselves (again, because the rituals

were artificially constructed for the purposes of the study) or of the purposes of the test. In other words, these data support Lawson and McCauley's claim that there are non-cultural regularities in how (ritual) actions are conceptualized, which inform and constrain participants' understandings of religious rituals.

The next three chapters, Chapters 10–12, present findings from developmental psychologists who have studied how children reason about religion. In Chapter 10, "Cognitive and Contextual Factors in the Emergence of Diverse Belief Systems: Creation versus Evolution," Margaret Evans reports on data obtained about how children from different backgrounds—those in fundamentalist and those in nonfundamentalist Christian homes—reason about the origins of natural species (i.e. children with "creationist" backgrounds versus those without). She found that pre-adolescent children (like their mothers) embraced the dominant beliefs of their community, whether creationist or evolutionist. However, five- to seven-year-olds in fundamentalist schools endorsed creationism, whereas nonfundamentalists endorsed mixed creationist and spontaneous generationist beliefs. Most interestingly, though, she found that eight- to ten-year-olds were exclusively creationist, regardless of community of origin.

Based on these results, Evans argues that the divergent developmental pattern her data reveal can be explained with a model of "constructive interactionism." Children generate intuitive beliefs about species' origins, both natural and intentional, while communities privilege certain beliefs and inhibit others—thus engendering diverse belief systems. Thus ideas transmitted culturally do not determine, entirely, what an individual thinks. Instead, individuals possess divergent belief systems as a result of cultural acquisition and cognitive inferences.

In Chapter 11, "Children's Attributions of Beliefs to Humans and God: Cross-Cultural Evidence," Nicola Knight, Paulo Sousa, Justin Barrett, and Scott Atran show that children across cultures reason about gods' minds—in particular, about what gods know—using their capacity to mind-read (called "theory of mind capacity" in developmental psychology). Knight et al. employed a commonly-used experimental technique, originally proposed by Daniel Dennett, to study how children understand how other agents' minds work. This technique, which has come to be called the "false belief test," involves (among other versions) showing children an ordinary container, such as a cracker box, and asking them what contents are inside. When given this task, most children say, "crackers." Then, the experimenter in the study opens the box and reveals that the box does not contain crackers, but rather surprising contents such as rocks. Then, the experimenter asks the child to infer what other agents, who don't have access to the information about what is actually inside the box, might think are in the box. For example, "If mommy came in the room right now, what would she think is in the box?"

Children's responses to this false-belief test follow a predictable pattern. Those under the age of four routinely fail the test, saying, "rocks." Those over the age of five routinely pass the test, saying, "crackers." Thus, a child's theory of mind capacity is not fully developed before the age of four, but is so after the age of five.

Knight et al. extended this study to the realm of religion, asking a sample of Yukatek Maya children (in order, like Boyer and Ramble [see Chapter 8], to obtain cross-cultural data) to perform the task, with the additional question of inferring what God might think was in the box. Interestingly, they found that children reasoned about God and other humans in the same way (i.e. same percentage saying God and other humans would think crackers were in the box) up until the age of five, at which point subjects stated that God would know that there were rocks in the box, whereas other humans would falsely think crackers were in the box. This suggests that five-year-olds—but not four-year-olds—understand the theologically correct version of God's mind versus human minds; God is omniscient, whereas humans are epistemically fallible.

In Chapter 12, "The Natural Emergence of Reasoning about the Afterlife as a Developmental Regularity," Jesse Bering and David Bjorklund show—as was shown by the Evans, and the Knight et al. studies—that children reason in religion in different ways depending on their stage of development. In this study, Bering and Bjorklund were interested in understanding how children reason about what happens after death. In particular, given the widespread belief across religious systems that a person's "soul" (or culturally equivalent) continues on after death even though the body dies, they were interested in whether or not people reason that biological functioning ceases at death but psychological functioning does not.

To test this, they told children ranging in ages from four to twelve years old versions of a story in which a mouse was eaten (and therefore killed) by an alligator. Then, they probed the children's death concepts by asking them questions about what was happening (if anything) to the biological and the psychological functioning of the dead mouse. They found that the youngest children were likely to state that both cognitive and psychobiological states continued at death, whereas the oldest children were more likely to state that only the cognitive states continued. Further, they found in subsequent studies that, like the older children, adults were likely to attribute psychological functioning to dead agents as well. These findings suggest that developmental mechanisms underlie intuitive accounts of dead agents' minds. That is, the older we get, the more likely we are to think that psychological functioning continues after death even though biological functioning stops.

Finally, in Chapter 13, "Modes of Research: Combining Cognitive Psychology and Anthropology through Whitehouse's Modes of Religiosity," Rebekah Richert presents findings that support Harvey Whitehouse's "modes

of religiosity” theory. The modes of religiosity theory is an account of ritual transmission that describes the existence of two distinct types of religious (ritual) traditions—“doctrinal” and “imagistic”—and attempts to explain this dichotomy (and its related social morphologies) in terms of cognitive processes.

The doctrinal mode of religiosity is characterized by rituals that are repeated frequently, low in emotional arousal, and usually accompanied by verbally transmitted exegesis. By frequently repeating rituals in this mode, the ritual procedures activate semantic memory systems, and make possible the transmission of explicit and complicated doctrinal teachings. The imagistic mode, by contrast, is characterized by rituals that are low in frequency, high in emotional arousal, and often involve terrifying ordeals. These ritual experiences are encoded in episodic memory, and participants spontaneously reflect on the meaning of the ritual through a process of analogical reasoning that continues to unfold over the course of a participant’s lifetime. Thus, ritual frequency, levels of emotional arousal, amounts of “spontaneous exegetical reflection” (SER), and concept recall performance (among others) are correlated.

To test predictions made by this theory, Richert and colleagues constructed several artificial rituals for subjects to perform. Subjects performed a ritual only once (thereby controlling for frequency), while the experimenters manipulated the levels of arousal accompanying the ritual in different groups—seeking to test for amount of SER and for recall performance. In other words, two different groups performed the same ritual, with one group doing so in conditions of high sensory stimulation (e.g. loud noises, done outside at sunset, being watched from behind by the experimenter, etc.) and the other in “bland” conditions (e.g. soft noises, in the afternoon, no experimenter watching from behind, etc.). Several weeks after the ritual performance, subjects were interviewed and asked to recall information about the ritual, and to recall their levels of “spontaneous exegetical reflection” (SER). As predicted, subjects in the high arousal groups showed better recall of the ritual scenarios and greater levels of SER than subjects in the low arousal groups.

3. Conclusions and Recommendations

The selections in the book show that the cognitive science of religion is a fresh and exciting approach to the scientific study of religion. They show that there are (1) meta-theoretical stances available to justify explanatory endeavors in the study of religion (for those for whom such justifications are necessary), (2) theoretical frameworks that provide plausible and testable explanations of why certain features of religion recur across human cultures and eras, and (3) experimental findings that provide robust support for core

hypotheses in the field. In the end, I hope not only that readers will be impressed by the findings, but also—and more importantly—that readers will be inspired by the selections to explore the field more broadly and more deeply. For such readers, I recommend the following books as places to turn.

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