

COGNITION AND RELIGION

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Whereas the twentieth century has been characterized in terms of biological achievements, culminating with the mapping of the human genome, the twenty-first century is forecast as that of the brain and of its relationship to cognition. The understanding of this most complex of human organs and of its mental functions is an interdisciplinary project that includes evolutionary biologists and psychologists, computer and neuroscientists, linguists and philosophers, researchers into cybernetics and artificial intelligence, as well as assessments by social and cultural anthropologists, and by historians and ethnographers. Researchers from this broad range of disciplines have already initiated major projects to investigate how our evolved genetic endowment expresses itself in the brain structures and in the mental functions that we have. Further, they are investigating how the physiology of the brain and of its various specialized systems are structurally related and how these structures interact, how chemical and hormonal effects impact our mental functions, and how these neurological functions enable but also constrain our cognitive processes. These researchers fully anticipate that a comprehensive explanation of our cognitive capacities will be one of the outcomes of this research in the coming century and that this explanation will be based upon the material conditions of brain activity—including, perhaps, an explanation for consciousness itself. This predicted outcome of a material explanation for mental functions has been termed the identity of “brain” and “mind”. In the meantime, cognitive scientists are contributing to this daunting task by focusing on the general properties and functions of cognitive organization—including those associated with “religion”.

WHAT IS COGNITIVE SCIENCE?

Cognitive scientists seek to explain the kinds of perceptual and conceptual representations which the mental processing of sensory input allows, the memory, transmission, and transformations of these mental representations, the relationships among them, and the ways in which some of these mental

representations become public ones. Everything that we perceive and conceive is, of course, the outcome of processing by the human mind. Much mental processing occurs, however, below the threshold of consciousness and, consequently, has only recently become recognized as an area of investigation. For example, human beings perceive their environment as a rich tapestry of color and represent it as such—to ourselves, to others, in decorative and artistic expressions, etc. What we experience as color is not, however, an innate property of objects in our environment but is the mental representation of our sensory discernment of light waves as they are differentially refracted from these objects. This representational capacity to discern color is an adaptive and evolved function of human minds—and of those of some but not all species—to help discriminate, for example, which fauna and flora are good to eat, an ability upon which survival may well depend. The point is that the chromatic representation of our environment is the effect of a significant but non-conscious mental processing of sensory input. And there are any numbers of additional non-conscious but cognitive processes upon which we depend everyday and throughout our lives. In other words, non-conscious bio-cognitive systems control such physiological functions as the regular patterns of heartbeat and breathing, regulate such social proficiencies as instantaneous face recognition, or manage and coordinate complex mental functions such as those that orient us in space and time.

In addition to such non-conscious mental functionings, humans also have the ability of intentional representation, i.e., the ability deliberately to recognize and to portray objects or events from our environment, or to recall certain objects or events from our past (from explicitly learned information or from experienced events). And we have the ability to communicate such representations among ourselves and to transmit them over time. We even have the ability to represent objects and events that have no existence. Common examples of fabricated and fabulous representations include imaginary friends, monsters, unicorns, UFOs, the *dramatis personae* of novels and myths, etc. More adaptively, this ability to imagine or to predict allows us to anticipate and plan for possibilities in a projected future.

Finally, we have the ability of metarepresentation, the ability to represent our representations, whether intentionally produced or not, both to ourselves (constituting a component of self-consciousness) and to others (establishing a basis for communication and sociality). It allows us, consequently, to categorize our representations, to compare them with others, to judge them, and to

discriminate, thereby, between “fact” and “fiction”. This discriminatory capacity allows for a successfully adaptive relationship to our environment as well as for an appreciation and enjoyment of fiction and the creative arts. When this “critical” ability is activated, however, it often exhibits environmental biases, for example, by relying upon socially transmitted “common sense” (e.g., stereotypes) or upon ethnocentric cultural values rather than upon intersubjective and lawful criteria, as is the ideal, for example, in scientific inquiry. To the extent that representational processes can be described and their effects mapped, we have a basis for explaining common human capacities for and constraints upon the production of all human mental representations, past and present.

HISTORY OF COGNITIVE SCIENCE

Until the mid-nineteenth century, the workings of the human mind were dominated by anecdotal evidence, a legacy of the philosophy of mind tradition that had long privileged first person accounts of mental activity. This introspective tradition reached its psychological apogee in the psychoanalytic movements of the late nineteenth and early twentieth centuries. A more objective alternative proved to be third person accounts based upon neurophysiological studies of subjects who had survived brain damage, especially, with the increasing availability of more advanced medical care. These studies, along with advances in experimental psychology, showed that first person accounts were insufficient to explain the increasingly sophisticated insights into the nature of mental processes, and were, in many cases, illusory.

First person accounts as the basis for mental activity were further challenged by the rise of behavioral psychology and its insistence upon *systematic*, experimental evidence for human behavior. Simply put, the behaviorists considered the human brain to be, at birth, a *tabula rasa* or blank slate upon which was writ a cultural input, that, it was concluded, not only might be observed but that could, subsequently, be manipulated (by conditioning or by learning). Scientific controls on the stimulus-response methodology upon which behaviorism depended proved to be, however, imperfect. Even simple sensory stimuli are subject to a wide variety of interpretive responses that, consequently, are not reproducible. And as long as long as stimuli are capable of arousing a range of human response, they simply are not experimentally neutral.

The most important findings that challenged the mind-blind premise of behaviorism was that

the mental processing abilities of the brain itself contribute to the kinds of mental representations we are able to make. For example, by the mid-twentieth century, linguists concluded that young children exhibit a sophisticated use of syntactic rules in their verbal constructions long before they receive any instruction about these rules. This conclusion about the undetermination of linguistic competence by environmental input is perhaps the single most well known development contributing to what came to be termed the “cognitive revolution”. For, this conclusion, in turn, gave focus to other findings that were emerging during this period. Advances in computer technology suggested that the human brain was a computational system for information processing. Developments in information theory itself, which explored how information is encoded and transmitted, offered analogies for how mental information might be encoded and transmitted. And resurgence in memory research described discrete systems of human memory and the constraints upon and the limitations of these different systems. Finally, the development of technologies for non-invasive imaging of brain activity, e.g., positron emission tomography (PET) and functional magnetic resonance imagery (fMRI), contributed to an explosion in brain research in the last decades of the twentieth century.

WHY A COGNITIVE SCIENCE OF RELIGION?

When an academic, in contrast to a theological, study of religion was first proposed in the late nineteenth century, it was motivated by the scientific impulse of the times and was envisioned, along with such new disciplines as anthropology, history, psychology, and sociology, as one of the new human sciences. These human sciences all sought to discover and to describe universal laws of human behavior and change. While some anthropological studies of religion did embrace such emergent scientific paradigms as natural selection (although misappropriated as the social Darwinism of the time), the study of religion itself steadfastly resisted any scientific basis for its work, preferring instead to retain its idiosyncratic theological agendas.

A general disenchantment with optimistic views of social and cultural progress, largely based on premises of scientific and technological advances, followed upon the ravages of the First World War. This disillusionment, together with a correlative recognition of the fallacy of social Darwinism, reinforced the traditional anti-scientism of religious scholars. Ironically, it was again the effects of political history that gave rise to a new focus among the human sciences. As a consequence of the Cold

War, many scholars turned their attention to “area studies”—especially to those areas considered of strategic concern to national securities—and to the unique histories of these areas, to their subjectivities, and to their specific cultures, including now their religions.

But religious attributions and practices seem to be a human universal. Along with paleoanthropologists, evolutionary biologists and psychologists, cognitivists argue that the representational capacities of and constraints upon the human brain are, like the functioning(s) of any of our organs or systems, the naturally selected consequences of adaptation. And because of our shared evolutionary history, such mental functions are, consequently, common to the species *Homo sapiens* (Tooby and Cosmides 1992; Mithen 1996; Atran 2002). Is religion, therefore, an evolved capacity of humans?

Whereas social scientists and cultural analysts agree that humans are a social species and that our sociality is explicable as an evolutionary product, religion, like any cultural form, is only understandable as an evolutionary by-product. This conclusion does not diminish the historical and social significance of religion. It does mean, however, that human capacities, which are products of evolution, such as linguistic competence and sociality, and those cultural productions that are evolutionary by-products, such as religious ideas and behavior, are subject to different levels of explanation. Whatever its perceived social or cultural value, there is, in other words, no evolutionary mandate, i.e., reproductive or survival necessity, for the development of religion. Even though religion is an evolutionary by-product, it is nevertheless constrained by the mental “landscape” of evolved possibilities, and is still subject to “naturalistic” explanations (Atran 2002). In contrast to supernaturalistic speculations, naturalistic explanations of religion as a consequence of ordinary processes of human cognition lie at the core of all cognitive studies of religion.

THE COGNITIVE SCIENCE OF RELIGION

The cognitive science of religion is the application of the findings of cognitive scientists to the study of religious practices and claims. Although a cognitive science of religion was first proposed in 1980 (Guthrie) and has produced a number of applied studies, only a few *cognitive theories of religion* have actually been proposed. These theories are focused on the areas of *religious rituals*, *religious claims*, and *religious transmission*. While there are, of course, significant differences among these three areas

of theoretical attention, together they lay the foundation for a comprehensive study of religion from the cognitive perspective.

Religious actions

In 1990, the scholar of comparative religion, E. Thomas Lawson, and his colleague, the philosopher Robert N. McCauley, proposed the first systematically formulated cognitive theory in the area of religion, specifically, a theory of religious ritual (Lawson-McCauley 1990; McCauley-Lawson 2002). Whatever else religious rituals are, they argued, they are human actions. Consequently, religious rituals can be understood formally in terms of the ways by which humans represent any human action. This “human action representation system”, simply stated, is a set of relations that includes an “actor” or agent, an “act”, and “a recipient of the action” (which Lawson-McCauley term “the patient”). This structure, in terms of which all human actions are represented, generates the possibility for two categories of actions, those in which the agent acts upon the patient and those in which the agent is acted upon by the patient (i.e., when the “patient” is the “actor”).

What qualifies either of these ordinary types of action as *religious* are culturally postulated claims about the presence of a superhuman agent (or agents), or of their authorized surrogates, in this formal structure. What qualifies the agent as *superhuman* (whether understood in negative or in positive terms, e.g., as a god or as a demon) is an attribution of intentional ability to accomplish a desirable result considered unobtainable by ordinary means. What qualifies either of these types of religious actions as *ritual* is that something significant is understood to have transpired in the act, again whether the result is viewed as positive (e.g., a blessing) or negative (e.g., a curse). Thus, for example, when a Roman Catholic priest—an authorized surrogate of Jesus—baptizes an infant, that infant is henceforth officially considered to be a member of the Roman Catholic communion.

Lawson and McCauley further contend that the role assigned to superhuman agents determines certain predictable features of all religious ritual. When a superhuman agent, or the surrogate of a superhuman agent, is represented as the actor, what Lawson-McCauley term “special agent rituals”, then that act, as an action of superhuman agency, is understood to be altogether effectual and, as such, requires little or no repetition. It is, however, typically invested with memorable emotional salience, as, e.g., a wedding. If, on the other hand, a superhuman agent is not represented as the actor but as the

recipient of the action, what Lawson-McCauley term “special patient rituals”, then the effects of that action will be less permanent and, consequently, they must be repeated more frequently. Periodic sacrifices or weekly offerings are examples of such special patient rituals. In contrast to the heightened sensory pageantry of special agent rituals, Lawson and McCauley predict that the routinization characteristic of special patient rituals will result in a diminution of their emotional salience.

Lawson and McCauley readily acknowledge the limits of their theory. It addresses only religious rituals while (deliberately) avoiding wider issues in the study of religion, and it offers a view of religious ritual which may exclude from their analysis other forms of religious action that do not conform to their model. Their very careful formulations, however, are the strength of the theory. Whereas religious scholars have heretofore understood ritual as an inclusive designation for sets of repetitive and patterned behavior, the Lawson-McCauley theory differentiates *religious* from other kinds of human behavior while explaining the common cognitive basis of both. Further, their theory differentiates among *kinds* of religious rituals that have often been viewed as aspects of a single ritual, e.g., the Roman Catholic Mass. And, finally, the Lawson-McCauley theory of religious ritual brings to the study of religion an analytical *precision* previously absent from religious studies.

Religious ideas

If ordinary human actions are predicated as “religious” by claims to such ideas as those about superhuman agents, then the basis for such ideas must themselves be accounted for. The anthropologist Pascal Boyer has argued that ideas like superhuman agency, documented from virtually every human society, are in fact as “natural” as are the actions they predicate; such “counterintuitive” ideas are, in other words, readily and easily produced by our ordinary cognitive equipment (Boyer 2001). The fundamental concept of “agent” as a self-motivating, intentional object in the world is distinguished from inanimate objects already by infants. This innate (or at least developmentally very early) ability or propensity to distinguish intentional agency becomes generalized as the tendency to represent objects and events in our environments anthropomorphically, i.e., in terms of human features and attributes (Guthrie 1993).

Anthropomorphism is such an exquisitely tuned feature of our cognitive processing that we often conclude there is agency all around us, which of course there is, even when, however, no agent

may actually be present (e.g., faces in the clouds, bumps in the night, etc.). There is, of course, an adaptive survival advantage for any organism to be able to react quickly, even automatically (i.e., non-consciously), to incomplete, unclear or unexplained information from its environment since this information may indicate the presence of a foe. Even if it turns out, upon reflection, that the inferred presence was that of a friend, or even incorrect—a blowing in the wind, as it were—“it is better to be safe”, the old adage holds, “than sorry”.

There is, in other words, little cognitive difference between attributing agency to actual, intentional agents (friend or foe) and to non-agentic effects, especially when they are deemed to be potentially significant for our lives. And if otherwise inexplicable events are judged significant for our lives, again whether those effects are positive or negative, it is natural to conclude that they also may be the instigation of unexplainable, i.e., of superhuman agency.

The category of agency belongs to what cognitivists refer to as our “intuitive ontology”, that is to say, to universal human expectations about the world. Thus, when an idea like superhuman agent is introduced, a great deal of information is already inferred about those agents apart from any learned knowledge. Because of the capacity of the human mind to entertain the realm of possibility as well as to represent actuality, these categories are, in the absence of complete information, sometimes “violated”. A common example in which the category of agent or person is violated to generate a superhuman agent is that of ghosts. Ghosts are ordinary agents in most expectations. They are, for example, intentional beings who act and react in terms of expected sensory information, e.g., sight, sound, smell, touch, they exist in time and hold memories of the past, they communicate and can be communicated with, etc. However they also manifest a few unexpected characteristics, such as being capable of invisibility or of walking through physical barriers such as walls. Whereas such counterintuitive beliefs and claims about ghosts violate ordinary expectations about agents, they are not so excessive as to be judged bizarre (like the Godzilla of Japanese film) and dismissed, thereby, as a fantasy or as a popular diversion (at least, not by many). Such violations are, in other words, attention-grabbing and, consequently, highly memorable and readily transmissible while being, at the same time, *ordinary* enough to be easily accepted and readily understood (Boyer 2001). Most of the Christian Bible, for example, contains a collection of rather mundane, some might even say rather boring, stories—genealogies, family intrigues, accounts of kings and battles, insightful but unexceptional

teachings, etc.—rendered memorable, however, by “acts (and words) of God” that are interspersed throughout. It is these “acts (and words)” attributed to God (or to His Son) that attract and retain the attention of Christians, many of whom admit never having read the “ordinary” portions of the Bible at all.

In addition to “agent” (or person), cognitivists also refer to intuitive categories of “substances” or “physical objects”, both natural and man-made, of “animals”, and of “plants” (Boyer 2001; Atran 2002). By investing any of these ordinary categories with some qualities which defy expectations, attention is drawn to the information embedded in the violated categories and that information tends, thereby, to be selected for and considered more valuable than others from the market-place of possible human ideas.

Religious persistence

Whereas cognitive scientists are interested in the natural origins of counterintuitive, including religious, ideas, they are less interested in the origins of the religious traditions that preserve them. Initial occasions for attributing superhuman intentionality to effects considered to be especially meaningful often prove to be historically inaccessible or, if known, of little significance. That is to say, any number of ambiguous possibilities can provoke representations of superhuman intentionality. Is the hearing of voices, for example, to be interpreted as divine call or as insanity? Do feelings of exaltation indicate spirituality or mania? Are sensations of internal fullness the consequence of overeating or of possession by a superhuman agent? And if possession by a superhuman agent, is it by god or the devil, the symptoms of which, according to Roman Catholic doctrine, are identical? Whereas naturalistic explanations for such experiences garner little attention, their interpretations as *religious* experiences are at least noticeable and once introduced tend to be transmitted in predictable ways. Cognitivists are interested in these modes of transmission.

The anthropologist Harvey Whitehouse has identified two divergent modes of religious transmission (Whitehouse 2004). He names these two modes of religiosity “imagistic” and “doctrinal”. The “imagistic mode of religiosity” does not refer, in Whitehouse's description, to religious traditions that trade in images—a trait of virtually all religions. Rather, “imagistic” is Whitehouse's designation for a convergence of practices by which analogically encoded knowledge is transmitted through

infrequently performed rituals that are rendered especially memorable through intense sensory pageantry and heightened emotionality. The dramatic, often traumatic, character of these rituals (e.g., of some initiation rites) typically occasions a personal and spontaneous exegesis of that knowledge among its recipients as well as an enduring cohesion among its participants in small, face-to-face communities. By contrast, Whitehouse contends that an alternative clustering of variables characterizes a “doctrinal” mode of religiosity. Knowledge in this mode is encoded digitally or discursively, authorized by a dynamic and hierarchically organized leadership, and is transmitted as an “orthodox” body of beliefs or doctrine. Repetitive instruction in this coherent corpus of teachings, reinforced by regular and routinized ritual, supports the retention of these teachings and allows for their wide dissemination. The widespread dissemination of religious knowledge that is characteristic of this mode of religiosity is constitutive of large, imagined communities, mainstream Protestantism, for example, in which group affinities are largely anonymous. While this doctrinal modality may be found in non-literate contexts, it is most often characteristic of literate societies or of those influenced by them.

Transmission of anything involves processes of memory and these processes are selective—we don’t remember everything. The two modes of religious transmission proposed by Whitehouse rely on and are constrained by different systems of memory that are selected for by the alternative ways in which religious knowledge is encoded and by the different forms of ritual transmission. The catechetical instruction in and repetitive reinforcement of beliefs that are characteristic of the doctrinal mode of religiosity becomes encoded as generalized schemas of knowledge in the explicit memory system and they rely upon this generalizing system for their transmission. The unique and personalized experiences characteristic of the imagistic mode are, on the other hand, encoded in episodic or autobiographical memory, the contents of which are only recalled by the rememberer when presented with stimuli associated with his/her own participation in a particular event. and organized in terms of those personal associations.

A particularly salient type of episodic memory, sometimes referred to as “flashbulb” memory, often results from participation in some particularly traumatic or consequential event. This effect is especially characteristic of the abrupt and overwhelming emotional experience that is a feature of many initiation rites both ancient and modern, e.g., initiations among the Hellenistic mystery cults, a number of tribal societies, contemporary “fundamentalist” religious groups, pseudo-religious fraternal

organizations, or revolutionary cells. Such events tend to create strong memories that, while incomplete, nevertheless retain details that are especially long lasting. The two mnemonic strategies for transmitting religious information proposed by Whitehouse describe at the same time two modes for conserving that same collective information.

Religious traditions—like any cultural materials—are collective or public products of cultural input only as that input has been processed by individual minds. The anthropologist Dan Sperber has acknowledged this cognitive in contrast to cultural processing and has emphasized that the transmission of religious knowledge is from mind to mind. Such transmission also inevitably involves transformation by which “remembered” traditions are, at the same time, the consequence of constructive cognitive processes (Sperber 1996). This transformative inevitability is illustrated, at a non-profound level, by the children’s game known variously as Chinese Whispers or Telephone in which a message that is whispered from one person to another around the room becomes transformed, sometimes radically, by the time it reaches the final participant. While it is true that anything significant enough to be encoded in neural networks may also be considered significant enough to be inscribed and conserved in material culture as well (Debray 2000), such inscribings—from the first flint tools to writing itself—but provide way stations for the continuing reflexive and mnemonic traditions of transmission and exegesis.

Further theoretical initiatives

Cognitive theories of religious behavior, religious ideas and religious persistence have generated, and continue to generate, a wealth of experimental, analytic and applied research. Related research from the social sciences, remain, however, relatively unexploited by cognitivists, for example, that of sociobiology and ethology.

Sociobiologists seek to explain animal and human behavior—including the religious behavior of the latter—on the basis of evolutionary history and genetic makeup. *Ethologists* employ animal behavior as a basis for explaining the cultural—including the religious—behavior of humans. The reason these approaches have been neglected is that both sociobiologists and ethologists have tended to overstate their case by suggesting direct, causal relationships between their data and culture. In other words, they take little account of intermediate steps such as the cognitive in the complex process of

cultural production. On the other hand, fundamental conclusions by sociobiologists, those about the genetic basis for and consequent constraints upon human sociality for example, concur with similar conclusions by cognitivists, such as those based on the constraints of short-term memory upon optimal group size. And ethological research, especially primatology, offers a wealth of insight concerning human cognitive potentialities and their evolutionary basis.

The role of emotion in religion should also be mentioned. Emotion (and its related senses of “significant experience” or “emotion-laden thought and perception”) is, today, perhaps the single most widespread popular “theory” of religion. Religions have their origin, or their “essence”, according to this view, in religious experience or in feelings of spirituality, the paradigm of which is mysticism. Whereas this popular view is largely a Protestant theological sentiment about the importance of an inward experience of grace in contrast to ecclesiastical and institutional externalities, religious claims and practices do seem universally to be correlative with high emotional display. Although the significance of emotion for religion has been acknowledged in connection with “special agent rituals” and with the mnemonic strategies of the “imagistic” mode of religious transmission, a comprehensive theory of the relation between emotion and religious cognition has yet to be fully undertaken (but see Pyysiäinen 2004: V).

THE SIGNIFICANCE OF COGNITIVE SCIENCE FOR THE STUDY OF RELIGION

What exactly can a cognitive science of religion contribute to the study of religion that has otherwise been lacking? A cognitive science of religion cannot, of course, explain all religious data. While, for example, cognitive science has little to say about the claimed meanings of specific cultural constructions, it *can* explain the ubiquity of religion among virtually all human societies, past and present. It can offer naturalistic explanations for the similarities that have long been noted among the diversities of religious expressions. It can offer explanations for the modes of transmission and conservation employed by those particular constructions and for individual commitments to them. And it can offer these explanations with some precision in ways that are testable. For example, the cognitive theories of religious behavior, of religious ideas, and of religious persistence, that have been previously discussed, have all been, and continue to be, the objects of experimental research by developmental and cognitive psychologists as well as those of systematic assessments by anthropologists, archaeologists

and historians. Results of this research to date broadly confirm the predictions of cognitive theories of religion.

In addition to proposing specifically *cognitive theories of religion*, the cognitive sciences can also contribute to three issues in the larger study of religion. They can help *define* the kinds of data which might be included—and excluded—from such an area of study, provide a framework for organizing and evaluating the *history* of religions, and a non-ethnocentric basis for *comparing* religions.

Defining “religion”

A comprehensive definition of religion—and consequently the focus and scope its study—has long been debated. Proposals for such a definition have ranged from those with parochial (theological or confessional) biases, to those with a universalizing but still quasi-theological (“sacred” or “spiritual”) basis, to those shaped, however unintentionally, by Western conceptual categories (like philosophical dualism) and/or political policies (colonialism). On the other hand, some functionalist definitions of religion (like “ultimate concern”) are so broad as to include virtually anything and exclude nothing. Some recent scholars have even conceded defeat in the definitional endeavor and advocate collapsing the study of religion into that of culture(s)—posing then, of course, the even more daunting task of defining “culture”.

There is, of course, no disembodied “thing” out there as “religion” for which a “correct” definition might be agreed. “Religion”, however, is no less susceptible to definition as an *analytic category* than are other domains of culture. Analytic, in contrast to representational, categories must be theoretically formulated in a clear and explicit manner (which is not to say that representational categories don’t present their own theoretical problems) and, consequently, subject to assessment as to their validity and serviceability rather than simply idiosyncratically confessed or asserted.

From a cognitivist perspective, a definition for what counts as “religious” data can, as we have seen, be stipulated as those mental representations or set of mental representations that involve or make *claims* on the authority of superhuman (or counterintuitive) agents. In some form or another, such claims seems to be a human universal. This definition, adapted from E. B. Tylor’s classic “minimum definition of religion”,¹ has the advantage of stipulating what religion is *not*. Ideologies such as

¹ E. B. Tylor’s well known “minimum definition of Religion” is “the Belief in Spiritual Beings”

Marxism, for example, are excluded from considerations of religion, as are worldviews such as Freudianism, or even patterned, repetitive human acts like football or soccer. Whatever the functional similarities to religious ideas and practices that may be exhibited by such cultural expressions, they make no place for or claim to superhuman agency.

Further, the minimum definition of religion differentiates those representations commonly considered the domain of religion from other social functions. Many have argued, for example, that religion provides the basis for morality within human societies. The case of ancient Greece, however, where representations of deities exhibited quite a wide moral latitude in contrast to the ethical authority of the philosophers, provides a familiar historical example in which religion and morality are not *necessarily* associated. Rather, evolutionary biologists have argued that morality is the expression of evolved behavioral tendencies, however such tendencies become codified in particular contexts. They refer to such behavior as mutual altruism, an innate sense of fairness or justice, an ability to detect cheaters, etc. Rather than religion providing the basis for morality, it seems more likely that a “natural” human morality provides a basis for social elaboration and religious reinforcement of ethical codes. (Boyer 2001).

Some may object that the minimalist definition of religion also excludes certain forms of “atheistic” religious thought, such as Buddhist, Taoist, or Confucian. However, anyone with minimal experience “in the field” will recognize that the actual practices of the overwhelming majority of participants in such traditions involve a recognition of and devotion to superhuman agency. If actually held, such “atheistic” ideas are espoused by a very small number of intellectuals in these traditions. In fact, cognitivists have demonstrated that a dissonance between intellectual formulation and actual practice is a common feature of all religions. Confessional acceptance of a deity as omniscient, for example, does not negate a confessor’s impulse to convey information to that deity through prayer (Barrett 2004; Slone 2004).

But how are the superhuman agents posited as “religious” by a particular culture to be distinguished from the proliferation within that same culture of other such agents that are “naturally” produced by the mind but held to be insignificant? How are gods to be distinguished from figures of

(E. B. Tylor, *Primitive Culture, Part II: Religion in Primitive Culture*. New York: Harper & Brothers, 1958, p. 8).

folklore such as ghosts or demons, from popular cultural “heroes” such as Mickey Mouse or Superman? How are the “true” (culturally accepted) deities to be distinguished from “false” gods, from “newly revealed” deities or from alien “imposters” imported from another cultural context or domain?

In addition to Tylor’s minimal definition of religion, an additional “Durkheimian” caveat stipulates that religious representations are those which are bestowed with a clearly defined “costliness” (in terms of time, labor, cognitive effort, etc.) not characteristic of other claims and practices within the postulating culture.² This cultural endowment of value on some but not all available superhuman agents, based on judgements about their significance, can further differentiate what are considered to be religious practices and ideas from postulations of alternative superhuman agents within a particular culture.

The stipulation of religious data as costly claims to the authority of superhuman agency emphasizes that the study of religion requires no privileged approach or method but rather is the study of quite ordinary human activities of attribution, the “supernatural” inflections of which prove to be quite natural (Boyer 1994). Ironically, this cognitively informed definition of religion informed returns to and builds upon proposals by the nineteenth-century founders of a scientific study of religion but it contributes to these proposals a naturalistic foundation, a theoretical formulation, and an analytic precision that are absent from earlier definitions. It is this more precise definition, whether universally accepted or not, that nevertheless provides a clearly stipulated subject, heretofore absent, for historical and comparative studies of religion.

The historical study of religions

In addition to providing historians of religion a clearly defined theoretical object, cognitive science can provide them with a common human framework for explaining and understanding past expressions of religion. Cognitive archaeologists and evolutionary psychologists have taught us that the fundamental architecture of human cognition is the product of our evolutionary history. The capacities and constraints characteristic of this organic architecture can, consequently, allow historians to discriminate between and to organize their data in ways consonant with differences in human cognitive processes

² For Durkheim, religion “always presupposes that the worshipper gives some of his substance or his goods to the gods” (Emile Durkheim, *The Elementary Forms of the Religious Life*, trans. J. W.

rather than conflating such data as the singular product of a common time and place. Thus, the different types of rituals described by Lawson and McCauley or the divergent modes of religious transmission described by Whitehouse may well indicate differing configurations of data that may generate different histories. For example, the acceptance of a new or imported religion might be attributed, at least in part, to the appeal of its special agent or of special patient rituals in face of the relative absence of one type or the other of these ritual forms in the traditional ritual system. Or the successful spread of a new religion might be attributed to its balance between these ritual forms or contribute to such a balance in a new situation.

Further, cognitive science can contribute insights into how and why some historical events and representations but not others that may have been historically possible were selected for (remembered), and how they were transmitted over time. A particular religion judged to be an example of the imagistic mode of religiosity might well have a history finally incommensurable with that of one judged to be doctrinal—even if those two histories have conventionally been considered of the “same” tradition. Or the successful spread and establishment of one religion in the face of its alternatives might be explicable in terms of its adopted modality rather than in terms of its contents, which, in a common cultural context, are likely to be similar.

The historical record is, in other words, not only limited by historical antecedents but by cognitive constraints. Based upon the predictable patterns of the latter, historians can construct historical trajectories that can help fill in the gaps of historical knowledge—even when the historical data are incomplete or fragmentary, as is the case, of course, with most historical data. And they can do so with greater accuracy and with more nuance than they could if working from historical remains alone. Such a pursuit has already begun to produce significant research in the historical study of religion (see e.g., Whitehouse and Martin 2004).

The comparative study of religion

The nineteenth-century scholarly recognition of different religious traditions from around the world and the desire in some way to compare these historical traditions provided the very impetus for the academic study of religion. For many, this comparative perspective is what defined—and continues to

Swain. New York: The Free Press, 1915, p. 385).

define—the academic study of religion.

If, as the saying goes, our own past is a foreign country, how much more so is the past—and the present—of others. Unlike historians of religion, whose theoretical object is a particular religious tradition or several within a common cultural context, comparativists must question what, in any cross-cultural comparison, is comparable? Previous generations of religious scholars tended to answer this question metaphysically, e.g., by positing the existence of “the sacred” as a basis for comparing religions, or by rejecting comparison altogether in favor of particularistic cultural studies.

As scholars of religion began to amass detailed knowledge of the various cultures of the world and of their local religious traditions and expressions, they produced ever-growing compilations of their “phenomenal” characteristics. The emphasis on cultural studies in the latter half of the twentieth century revealed that the innumerable traits catalogued in these phenomenologies of religion were largely organized in Western, if not specifically of Christian, categories. Such scholarly biases, together with a focus on the autonomy of particular cultural formations, correctly called the comparative method into question.

It is simply unproductive if not completely misleading, to compare a ritual from one culture with those from others, especially when that “ritual” is more likely to be constitutive of a ritual set within which are embedded a number of different ritual forms. The kinds of ritual forms identified by comparativists *can*, however, be differentiated within a cultural ritual system and, as instantiations of a common “human action representation systems” these forms and their cognitive functions *are* comparable from culture to culture. It is similarly unproductive to attempt to compare imagistic with doctrinal modes of religiosity, whether within the same culture or between cultures. However, the dynamics of the imagistic modality in well-documented cases may well offer insight into a less-well documented instance of the same modality.

The evolved capacities and constraints of human cognition can, in other words, provide a blueprint of *universal* human possibilities in terms of which the vast diversity of human cultures—and their religious expressions—have been historically and socially constructed. And this cognitive blueprint of human possibilities can provide a non-ethnocentric framework for comparing the diverse architecture of cultural forms constructed upon it and, consequently, a common basis for comparative studies of religion (see e.g., Whitehouse and Laidlaw 2004).

A comparative study of religions cannot, in other words, be pursued productively at the level of their cultural expressions and meanings but must be based in the generative level of their cognitive structure. Starkly put, any study of religion, past or present, must be a scientific study of religion.

CHALLENGES AND CONCLUSION

The cognitive sciences are a relatively new area of study. They have, however, firmly established their basic principles and are poised to make dramatic breakthroughs over the coming century, both in new areas of discovery and in an integration of their fundamental theories. This is no less the case with the even more recent cognitive science of religion. As with any new discipline, however, basic challenges remain.

Challenges

If the cognitive sciences, including the cognitive science of religion, are to realize a comprehensive set of scientific explanations, then the relationship of cognitive organization and function to its biological base, to neurochemical/hormonal effects, etc., must finally be clarified. While cognitivists acknowledge the neurophysiological basis of cognition, the present state of knowledge does not yet allow for a comprehensive modeling of this relationship—although plausible theories are being proposed and significant research is beginning to emerge. Different memory functions have, for example, been associated with specific areas of the brain. The exact neural mechanisms of these areas for producing what we know as memory are, however, considerably less well understood.

On the other hand, caution must be exercised about interpreting neurophysiological functions, those revealed by brain imaging, for example, as causal rather than correlative data for cultural phenomena such as religious experiences or states of mind. This identity of particular mental representations with neurophysiological activity neglects mediating levels of cognitive function as well as the individuated significance of environmental states for those mental representations and for their transmission. Such correlative data have even been evoked as proofs for the objective validity of specific religious claims, a fallacy of the so-called “neurotheology” that is characteristic also of many

sociobiological and ethological explanations for religious practices and ideas.

While a comprehensive explanation for the organization and functions of human cognition that are based upon the material conditions of brain activity have not yet been fully realized, neither has a comprehensive explanation connecting cognition and culture. If cognitive science is finally to be applicable to a study of “religion”, then the cognitive processes which generate cultural formations, such as the “religious”, must also be further clarified.

Although cognitivists readily acknowledge that religion cannot be explained solely from a cognitive perspective, scholars who have devoted their professional life to the validity of cultural studies have questioned, least constructively, the reductionistic character of cognitive studies and, more positively, the precise nature of the connections between cognition and culture. Of the first, reductionistic, concern, it might simply be noted that, from a scientific perspective, theoretical reduction is what is recognized as progress in knowledge. The second concern, about a theoretical disconnect between cognition and culture, seems to arise from perceptions that cognitivists are neglecting the significance of culture in favor of researches into cognition. This is a somewhat surprising concern since leading cognitive scientists of religion have, in fact, addressed and emphasized just this connection and have offered plausible if novel suggestions for how this connection is made (e.g., Sperber 1996; Lawson-McCauley 1990; Boyer 2001, Whitehouse 2004; Atran 2002). If comprehensive suggestions for the exact connections between cognition and culture remain tentative, it is because cognitive science is a new science, and it is important for this new science to map precisely the architecture and functions of human cognition before they are connected to anything. Although they may have to relinquish certain of their conventional presumptions, about the *sui generis* autonomy and functions of culture, for example, social and cultural theorists are as competent to address the connection between cognition and culture as are cognitivists—a potential contribution presciently noted by one of the founders of sociological studies.³ Cognitive science is an incredibly broad field of interdisciplinary research and study; its achievements will be those of a community of scholars working

³ “Society exists and lives only in and through....individual minds”, Durkheim wrote. “If...the beliefs, traditions and aspirations of the group were no longer felt and shared by the individuals, society would die” (Durkheim, *ibid.*, p. 359).

together over the coming decades.

Conclusion

Religious actions derive from the basic repertoire of ordinary human behavior that are predicated by counterintuitive ideas which are, in turn, the natural products of human cognition. The ready grasp of such ideas and behaviors from a very early age attests to this “naturalness”, that is, to the cognitive ease whereby they are produced and to the readiness of our cognitive acceptance of, and even commitment to, their cultural valuations and manipulations. Despite the predictions of many social scientists, consequently, it is unlikely that religiosity will ever wither away from, at least some of, the activities and ideas of our species. Because, however, they continue to persist as a natural or “intuitive” category of religious scholars and as part of their culture, cultural based studies of “religion” have finally proved to be unproductive as an academic pursuit, especially in the scientific sense envisioned by its founders. The cognitive science of religion, on the other hand, can approach such questions theoretically, formulating generalizable answers as intersubjectively testable predictions, not only by experimentalists but also by anthropological and historical assessment.

BIBLIOGRAPHY

- Atran, Scott (2002). *In Gods We Trust: The Evolutionary Landscape of Religions*. Oxford and New York: Oxford University Press. A comprehensive view of religion as an evolutionary by-product, by a leading cultural anthropologist.
- Barrett, Justin L. (2004). *Why Would Anyone Believe in God?* Walnut Creek, CA: AltaMira Press. An examination of religious ideas about god(s) by an experimental psychologist.
- Boyer, Pascal (2001). *Religion Explained: The Evolutionary Origins of Religious Thought*. London: Heineman and New York: Basic Books. A comprehensive view of religion, and one of the most important, by an anthropologist who is one of the pioneers of the cognitive science of religion.
- Debray, Régis (2000). *Transmitting Culture*, trans. E. Rauth. New York: Columbia University Press. An argument for the significance of material culture as a mnemonic aid.
- Guthrie, Stewart (1980). "A Cognitive Theory of Religion", *Current Anthropology* 21 (2): 181-203.
- _____ (1993). *Faces in the Clouds: A New Theory of Religion*. Oxford and New York: Oxford University Press. A view of religion as an innate tendency of humans to anthropomorphize their environment, by a cultural anthropologist.
- Lawson, E. Thomas and McCauley, Robert N. (1990). *Rethinking Religion: Connecting Cognition and Culture*. Cambridge: Cambridge University Press. A cognitively generated theory of religious ritual and one of the most important theories for the cognitive science of religion, by two of the pioneers in the field.
- McCauley, Robert N and Lawson, E. Thomas (2002). *Bringing Ritual to Mind: Psychological Foundations of Cultural Forms*. Cambridge: Cambridge University Press. An important continuation and extension of the arguments presented in Lawson-McCauley 1990.
- Mithen, Steven (1996). *The Prehistory of the Mind: The Cognitive Origins of Art and Science*. London: Thames and Hudson. A fascinating and highly plausible reconstruction of the

evolution of the human mind by a cognitive archaeologist.

Pyysiäinen, Ilkka (2004). *Magic, Miracles, and Religion: A Scientist's Perspective*. Walnut Creek, CA: AltaMira Press. A comprehensive overview of the cognitive science of religion to date.

Slone, D. Jason (2004). *Theological Incorrectness: Why Religious People Believe What They Shouldn't*. Oxford and New York: Oxford University Press. A brief and accessible introduction to the cognitive science of religion, with examples and applications from Buddhism and Christianity.

Sperber, Dan (1996). *Explaining Culture: A Naturalistic Approach*. Oxford and Cambridge, MA: Blackwell. An important and influential theory of culture and of cultural transmission based on micro-processes of human cognition, by a cultural anthropologist.

Tooby, John and Cosmides, Leda (1992). "The Psychological Foundations of Culture". In *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*, J. H. Barkow, L. Cosmides, J. Tooby, eds. Oxford and New York: Oxford University Press, 19-136. This classic article is the "charter" for an evolutionary approach to the study of cultural phenomena.

Whitehouse, Harvey (2004). *Modes of Religiosity: A Cognitive Theory of Religious Transmission*. Walnut Creek, CA: AltaMira Press. An important and influential theory of different modes of culture and of cultural transmission, especially religious, by a leading cultural anthropologist.

---and Laidlaw, James A., eds. (2004). *Ritual and Memory: Towards a Comparative Anthropology of Religion*. Walnut Creek, CA: AltaMira Press. An exploration by anthropologists of comparative studies based in the cognitive sciences.

---and Martin, Luther H., eds. (2004). *Theorizing Religions Past: Archaeology, History, and Cognition*. Walnut Creek, CA: AltaMira Press. An exploration by archaeologists and historians of historical approaches to religion based in the cognitive sciences

For a further references, see the Bibliographies in the cited works, the authors' most recent.

For recent overviews of the field of the cognitive science of religion, with good Bibliographies, see Ilkka Pyysiäinen, *How Religion Works: Towards a New Cognitive Science of Religion*.

Leiden: E. J. Brill, 2001; and Pyysiäinen, *Magic, Miracles, and Religion: A Scientist's Perspective*. Walnut Creek, CA: AltaMira Press, 2004.

For specialized topics in the cognitive sciences, see *The MIT Encyclopedia of the Cognitive Sciences*, R. A. Wilson and F. C. Keil, eds. Cambridge, MA: The MIT Press, 1999.

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Γνωσιοεπιστήμη και θρησκεία

Περίληψη

Το άρθρο παρουσιάζει τη γνωσιοεπιστήμη και ειδικότερα τη σημασία της στην προσέγγιση των θρησκευτικών φαινομένων για μία βαθύτερη κατανόηση του ανθρώπινου νου και του τρόπου που αυτός αντιλαμβάνεται αλλά και "δημιουργεί" τον κόσμο γύρω του. Η μελέτη του εγκεφάλου αναμένεται να αποτελέσει το κυρίαρχο ερευνητικό πεδίο του 21ου αιώνα. Η κατανόηση του πιο σύνθετου ανθρώπινου οργάνου και των νοητικών λειτουργιών του εμπλέκει ένα ευρύ φάσμα επιστημών, που διερευνούν τους τρόπους με τους οποίους η γενετική εξέλιξη αποτυπώνεται στις εγκεφαλικές δομές και στις νοητικές λειτουργίες των ανθρώπων. Οι γνωσιακοί επιστήμονες στόχο έχουν να εξηγήσουν τα είδη των αντιληπτικών και εννοιολογικών αναπαραστάσεων, που προκύπτουν από την επεξεργασία των αισθητηριακών ερεθισμάτων, τη μνήμη, τη μετάδοση και τις μεταμορφώσεις αυτών των νοητικών αναπαραστάσεων, τις μεταξύ τους σχέσεις και τους τρόπους με τους οποίους κάποιες από αυτές τις αναπαραστάσεις γίνονται δημόσιες και κοινές στα άτομα. Η δυνατότητα περιγραφής των αναπαραστατικών διαδικασιών και χαρτογράφησης των αποτελεσμάτων τους αποτελεί τη βάση για την εξήγηση των κοινών ανθρώπινων ικανοτήτων και των περιορισμών στην παραγωγή όλων των νοητικών αναπαραστάσεων τόσο του παρόντος όσο και του παρελθόντος. Ειδικότερα, οι θρησκευτικές πρακτικές φαίνεται ότι αποτελούν οικουμενικό ανθρώπινο φαινόμενο.

Η γνωσιοεπιστήμη μελετά τη θρησκευτική συμπεριφορά ως ένα δευτερεύον παράγωγο

της εξέλιξης του ανθρώπου, χωρίς, ωστόσο, να υποβαθμίζει την ιστορική και κοινωνική σημασία της θρησκείας. Πέρα από κάθε υπερφυσικό συλλογισμό, οι φυσιοκρατικές εξηγήσεις της θρησκείας είναι μία συνέπεια των κοινών διαδικασιών της ανθρώπινης νόησης που βρίσκεται στον πυρήνα όλων των γνωσιακών προσεγγίσεων σε αυτό το πεδίο.

Η γνωσιοεπιστήμη της θρησκείας συνίσταται στην εφαρμογή των ευρημάτων και διαπιστώσεων των γνωσιακών επιστημών στη μελέτη των θρησκευτικών πρακτικών και ιδεών. Οι θεωρίες που έχουν προταθεί εστιάζουν στις τελετουργίες, στις θρησκευτικές αξιώσεις και στη μετάδοση των θρησκευτικών ιδεών, παρέχοντας τη βάση για μία ευρεία μελέτη της θρησκείας από γνωσιακή προοπτική.

Ορίζοντας τα "θρησκευτικά" δεδομένα ως εκείνες τις νοητικές αναπαραστάσεις που εμπλέκουν ή παράγουν αξιωματικές διατυπώσεις για υπερφυσικούς φορείς, η γνωσιοεπιστήμη προσεγγίζει τη θρησκεία ως ένα παράγωγο των φυσιολογικών λειτουργιών του ανθρώπινου νου, χωρίς να προϋποθέτει την εφαρμογή μίας αποκλειστικής μεθόδου ή προσέγγισης σε αυτό το πεδίο του ανθρώπινου πολιτισμού. Με τον τρόπο αυτό, παρέχει στους ιστορικούς της θρησκείας ένα κοινό σε όλους τους ανθρώπους πλαίσιο για την κατανόηση και εξήγηση των θρησκευτικών εκφράσεων του παρελθόντος, που τους επιτρέπει να οργανώσουν τα δεδομένα τους με βάση τις διαφορετικές γνωσιακές διαδικασίες που τα παράγουν, χωρίς να τα συγχωνεύουν σε ένα ενιαίο σύνολο μίας συγκεκριμένης εποχής και ενός τόπου. Κατ' επέκταση η γνωσιοεπιστήμη βοηθά τους ιστορικούς να καλύψουν τα κενά της ιστορική γνώσης μέσω προβλέψιμων γνωσιακών σχημάτων και περιορισμών. Αλλά και στη συγκριτική μελέτη της θρησκείας, οι εξελικτικές ικανότητες και οι περιορισμοί της ανθρώπινης νόησης παρέχουν ένα σχέδιο των οικουμενικών ανθρώπινων ικανοτήτων, οι οποίες παρήγαγαν ιστορικά και κοινωνικά τη μεγάλη ποικιλία πολιτισμών. Το σχέδιο αυτό παρέχει ένα μη εθνοκεντρικό πλαίσιο και μία κοινή βάση για τη συγκριτική μελέτη της θρησκείας.

Παρά το γεγονός ότι η γνωσιακή προσέγγιση της θρησκείας έχει ακόμη να αντιμετωπίσει πολλές προκλήσεις και να σκιαγραφήσει με ακρίβεια την αρχιτεκτονική και τις λειτουργίες της ανθρώπινης νόησης, μπορεί να προσεγγίσει θεωρητικά τη θρησκεία και τις θρησκευτικές συμπεριφορές, παρέχοντας απαντήσεις για την ύπαρξη και λειτουργία τους που θα μπορούσαν δοκιμαστούν - να επιβεβαιωθούν ή να διαψευστούν - από πειραματικές αλλά

και ανθρωπολογικές και ιστορικές μελέτες.