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Cognitive Science of Religion: What Is It and Why Is It?

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Abstract

Cognitive science of religion (CSR) brings theories from the cognitive sciences to bear on why religious thought and action is so common in humans and why religious phenomena take on the features that they do. The field is characterized by a piecemeal approach, explanatory non-exclusivism, and methodological pluralism. Topics receiving consideration include how ordinary cognitive structures inform and constrain the transmission of religious ideas, why people believe in gods, why religious rituals and prayers tend to have the forms that they do, why afterlife beliefs are so common, and how human memory systems influence socio-political features in religious systems. CSR is often associated with evolutionary science and anti-religious rhetoric but neither is intrinsic nor necessary to the field.

Fifteen years ago, there was no such thing as cognitive science of religion (CSR). Only a handful of scholars independently using insights from the cognitive sciences to study religion existed. Today CSR boasts dozens of authored and edited volumes, numerous academic units and centers prominently featuring its activities, and a scholarly association with more than 100 members (the International Association for the Cognitive Science of Religion). Findings from CSR have attracted the attention of the popular media as well, appearing in such places as the *New York Times Sunday Magazine* and *Atlantic Monthly*.[1] What accounts for all of the attention to this upstart area of scholarship?

On the substantive side, CSR as a field offers at least three attractive features for scholars interested in explaining religious phenomena. First, it avoids the age-old problem of defining 'religion'. Rather than specify what religion is and try to explain it in whole, scholars in this field have generally chosen to approach 'religion' in an incremental, piecemeal fashion, identifying human thought or behavioral patterns that might count as 'religious' and then trying to explain why those patterns are cross-culturally recurrent. If the explanations turn out to be part of a grander explanation of 'religion', so be it. If not, meaningful human phenomena have still been rigorously addressed.

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This piecemeal approach makes the field complementary to the activities of other religion scholars from many disciplinary perspectives, a stance of explanatory non-exclusivity. CSR does not pretend to exhaustively explain everything that might be called 'religion' (provocative book titles aside). Rather, it seeks to detail the basic cognitive structure of thought and action that might be deemed religious and invites historians, anthropologists, sociologists, psychologists and other religion scholars to fill in the hows and whys of particular religious phenomena.

A third scholarly virtue that CSR presents is methodological pluralism. In seeking out what constitute cross-culturally and historically recurrent features of human religious cognition, scholars in this field have turned to whatever data collection and analysis methods that appear appropriate to the questions at hand including ethnographic,[2] interview,[3] historical,[4] archeological,[5] computer modeling,[6] and experimental, including cross-cultural and developmental techniques.[7]

In this essay, I illustrate the presence of these three scholarly virtues in CSR (a piecemeal approach, explanatory non-exclusivism, and methodological pluralism) through a brief summary of CSR's state of the art. Such a review is necessarily selective and so I apologize to my colleagues whose valuable contributions I have been unable to include.

Unifying Theoretical Commitments

What unifies the various projects in CSR is the commitment that human conceptual structures are not merely a product of cultural contingencies but that they inform and constrain cultural expression, including religious thought and action. That is, as demonstrated in numerous ways since the start of the cognitive revolution in psychology, human minds are not blank slates or undifferentiated all-purpose processing machines that are wholly socially constructed.[8] Rather, through the course of development in any cultural context, human mind/brains exhibit a number of functional regularities regarding how they process information. These functional regularities are also known as domain-specific inference systems or 'mental tools'.[9] For instance, one mental tool concerns language. Humans (especially pre-pubescent humans) readily acquire and use natural languages but are not facile with non-natural symbolic communication systems such as binary code. By better understanding how the particulars of our language-processing systems handle information, we have been able to better understand why human languages take the forms that they do. Cognition informs and constrains linguistic expression. Analogously, many different mental tools inform and constrain religious expression.

This theoretical commitment to the shaping power of naturally emerging mental tools is illustrated by two prominent findings of the field: theological correctness (TC) and the minimal counterintuitiveness (MCI) theory.

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CHEOLOGICAL CORRECTNESS

Through a series of experiments with religious believers and non-believers in the USA and in India, Barrett and colleagues demonstrated that adults' god concepts can function in markedly divergent ways depending on the conceptual demands of the context (Barrett 1998, 1999; Barrett & Keil 1996; Barrett & Van Orman 1996).

In the case of simply reporting one's theological beliefs, a so-called off-line task, adults in all samples claimed a theologically correct or TC understanding of the god in question. In contrast, however, during an on-line task in which adults had to use their god concepts to process information, their god concept looked far less TC and far more anthropomorphic.

The on-line task took advantage of previous cognitive psychological research demonstrating that people sometimes make intrusion errors when remembering stories. Their concepts fill in inferential gaps necessarily present in any narrative and so they can misremember the conceptual information as having been present in the original story (Bransford & McCarrell 1974). Barrett and colleagues' stories included God (or Shiva, Vishnu, Krishna, or Brahman) as a character but left gaps regarding God's physical and mental properties. Regularly adults who denied God as having a particular location in space reported that the stories told of God moving from one place to another or that God was walking on a road – information that was not included in the story nor even necessarily implied (as demonstrated by control experiments using novel characters in the place of God). Similarly, adults who claimed that God can listen to or attend to any number of things at once, misremembered stories as saying that God was unable to hear something because of a loud noise or had to answer one prayer before *going* and attending to another. Across a number of different physical and mental properties adults exhibited a gulf between their TC off-line concepts of God and their more anthropomorphic on-line concepts. It appears that the greater computational demands of the on-line task require adults to use concepts with which they have greater processing fluency; in this case, a human-like concept.

MINIMAL COUNTERINTUITIVENESS

More follows from cognitive constraint on religious thought than an occasional and amusing tendency to think of gods as more human-like than we know we ought. As religious communication typically takes place in on-line contexts, the cognitive pressure for individuals to use computationally easy concepts creates a collective tendency to transmit successfully only concepts that largely satisfy the output assumptions of our mental tools. That is, during typical on-line communication, concepts may not be more than minimally counterintuitive if they are to be successfully communicated.

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Dan Sperber has developed a strategy for studying culture that he has termed *epidemiology of representations* (Sperber 1996). We can explain why some ideas or practices are so widespread by considering how human minds might be more likely to generate and transmit some ideas over others. Our naturally developing mental tools readily generate certain kinds of ideas we call *intuitive* regardless of cultural context. For instance, our mental tool for understanding physical objects assumes that solid objects cannot pass through other solid objects.[10] If someone tells a story about someone being frustrated by a treasure being locked behind a closed door, all listeners understand the problem – the person cannot simply walk through the wall.

These rather pedestrian-sounding observations about communication and intuitive cognition come to explanatory life when applied to cultural concepts such as religious ideas. Pascal Boyer has offered a cognitive optimum theory, also known as the MCI theory of religious transmission.[11] Boyer suggested that though fully intuitive concepts are readily transmitted, concepts that slightly deviate from the intuitive expectations of our mental tools might be transmitted even more successfully (all else being equal). This advantage stems from minimally counterintuitive concepts avoiding overtaxing our conceptual systems (and hence being subject to distortion or confusion as in TC), but offering an idea just challenging enough to require additional attention.

Compare the idea of a barking dog that is brown on the other side of the fence to a barking dog that is able to pass through solid objects on the other side of the fence. The first dog is wholly intuitive and excites little interest. The second dog is slightly or minimally counterintuitive and is, consequently, more attention demanding but without overloading on-line conceptual systems. The idea of a dog that passes through solid objects is made of metal parts, gives birth to chickens, experiences time backwards, can read minds, and vanishes whenever you look at it would amount to a massively counterintuitive concept – if it is a coherent concept at all. Boyer argues that it is the second dog and not the first or the third that will tend to be better remembered and more faithfully transmitted. Note that whether or not something is intuitive or counter-intuitive in this technical sense is based on natural dispositions of mental tools and not on cultural particularities. Hence, Boyer's prediction is that the second dog would be best remembered and transmitted by people anywhere.

Research on MCI theory has been generally supportive. Lisdorf (2001) demonstrated that Roman prodigy lists from the first three centuries BC conform tightly to Boyer's predictions: a majority show counterintuitive features with 99% of these having only a single counterintuitive violation, 1% having two violations, and none of 354 having more than two. Barrett and Nyhof experimentally tested the claim that MCI concepts possess a transmission advantage over intuitive and culturally bizarre but not

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counterintuitive concepts. They used a story recall design and two transmission designs that involved the telling and re-telling of stories. Results supported Boyer's predictions, becoming even stronger after a 3-month delay before recall (Barrett & Nyhof 2001). Boyer and Ramble used a similar recall design and found in France, Gabon, and Nepal that MCI concepts were more faithfully remembered than intuitive or more than MCI concepts (Boyer & Ramble 2001). More recent studies have suggested that these effects may be modulated by the context of the transmission but appear to use some items that deviate from Boyer's strict sense of *counterintuitive*.[12]

Boyer argues that the religious concepts of ordinary laypeople the world over are not all that counterintuitive. Rather they tend to be MCI concepts, particularly minimally or modestly counterintuitive *agents* (Boyer 2001, 2003). Part of the reason they are such successful cultural concepts is that they do not overload our cognitive systems. Theological ideas that exceed this cognitive optimum would likely be distorted or ignored, a dynamic Boyer (2001) calls the 'tragedy of the theologian' and D. Jason Slone dubbed 'theological incorrectness' (Slone 2004). Agents gain additional reinforcement through some of the mechanisms described below.

Ordinary, naturally developing cognitive systems (mental tools) inform and constrain religious thought and action. This theme recurs in the many different problems CSR has addressed, and the field has emphasized the role of intuitive vs. explicit theology, though syntheses have been suggested.[13]

Cognition and Gods

A cognitive science perspective offers a theoretically motivated working definition for a *god*: a counterintuitive agent that motivates actions – provided its existence is believed in.[14] Gods, ghosts, ancestor spirits, devils, witches, and angels would all count as gods under such a definition but powerful human leaders, rock stars, and athletes would not – no matter how much they are worshipped, adored, used as role models, or inspire the formation of cohesive communities.

Perhaps the earliest cognitive treatment of a religious domain was anthropologist Stewart Guthrie's revival of the anthropomorphism theory of why belief in gods is so prevalent (Guthrie 1980, 1993). Guthrie argues that humans have a perceptual bias to attend to human-like forms or other information that might be caused by humans-like beings. He casts the argument in terms of an evolved tendency that produces false positives for the sake of survival. As humans and other agents (such as predatory mammals) represented our greatest threats and promises for survival and reproduction in our evolutionary environment, better to assume the rustling in the brush is an intentional agent than assume it is just the wind. To assume it is an agent and be wrong may carry some cost in terms of

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needless running away, but not nearly so much cost as missing a tiger and becoming lunch. Guthrie argues that we evolved a bias to over-detect evidence of human-like agency around us and so we attribute natural forces and events to human-like beings or gods.

This cognitive system responsible for detecting intentional agency is the hypersensitive agency detection device (HADD).[15] Although determining whether HADD delivers false-positives in the case of detecting spirits, ghosts, and gods is to make metaphysical commitments, HADD certainly merits the 'hypersensitive' labeling at least because it does not require a human form or very much information for HADD to (at least temporarily) detect something as an agent. Experiments with infants suggest that HADD is active in the first 5 months of life and only requires self-propelled and purposeful-looking movement for it to identify colored disks as agents (Rochat, Morgan & Carpenter 1997).

The reflexive and easily overridden agency detection of HADD has led some scholars in the field to question its centrality in generating beliefs in gods (Atran 2002; Boyer 2001). Why do we sometimes think the bump in the night is just the wind and sometimes decide it is a ghost? Do people really often have experiences that they then take to be the direct presence or action of a god? Even though these concerns challenge the sufficiency of HADD for explaining why people believe in gods, undoubtedly HADD may play a role in encouraging the spread of ideas about or belief in gods (counterintuitive agents that motivate actions). As Guthrie suggests, an HADD experience of detecting agency may fail to be rejected as irrelevant and may motivate the postulation of a (MCI) god to account for the experience. This god belief may be entertained by others because of similar otherwise inexplicable HADD experiences and especially if the god concept candidate meets the cognitive optimum of being minimally counterintuitive. Alternatively, people already familiar with a god concept (but who do not necessarily believe) may have an HADD experience that either strengthens their belief or motivates them to transmit the concept. Either way, HADD experiences may add emotional motivation to aid the generation or transmission of god concepts, even if only rarely.

PSYCHOSOCIAL REASONING

Religious concepts and particularly god concepts may be successful cultural ideas because they are minimally or modestly counterintuitive and because they receive an occasional boost in a population by their ability to make sense of HADD experiences. Additional motivation to talk about and believe in gods may come from their ability to account for striking events that otherwise have no intuitive explanation.[16] When our intuitive reasoning systems that find basic physical or biological causes for events fail to explain satisfactorily an emotionally salient event (e.g., a series of illnesses or a devastating natural disaster), we appear prone to turn to

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psychosocial explanations. As psychosocial agents that have different powers than people, gods may readily be incorporated into such reasoning. (The gods are angry with my cousin and so have afflicted him with illness.) If exercised repeatedly, such patterns of reasoning may gain cumulative plausibility and reinforce belief in and the transmission of god concepts (Barrett 2004b; Boyer 2001).

BORN BELIEVERS

In addition to the numerous ways in which god concepts may enjoy horizontal transmission advantages within and between groups, research suggests that children's cognitive systems may be especially receptive to certain god concepts (Barrett & Richert 2003; Richert & Barrett 2006). Indeed, Deborah Kelemen has even suggested that children may be 'intuitive theists' (2004) and Paul Bloom has proclaimed that when considering the developmental evidence, 'Religion is natural' (2007).

As summarized by Kelemen (2004), evidence from British and American children demonstrates that children have a strong bias to see the natural world as purposeful even in ways that religiously committed adults would never (deliberately) teach their offspring. For instance, children are inclined to say rocks are 'pointy' not because of some physical processes but because being pointy keeps them from being sat upon. This 'promiscuous teleology' extends to living and non-living natural things (Kelemen 1999a,b,c,d, 2003). Recent research suggests that even 12-month-olds understand that only intentional beings create order from disorder (Newman et al. forthcoming). Not surprisingly, then, children have a strong bias to see the world as purposefully designed (DiYanni & Kelemen 2005; Kelemen & DiYanni 2005). But designed by whom?

Interviews with children conducted by Jean Piaget (1929) led him to conclude that children are 'artificialists', attributing natural entities such as lakes and mountains to human ingenuity. More recent and more tightly controlled research demonstrates that preschoolers regard gods and not people as the origin of natural design (Gelman & Kremer 1991; Petrovich 1997, 1999). No wonder then that Margaret Evans has documented that children, regardless of their parents' beliefs about the origins of animals, prefer creationist accounts to evolutionary ones until late childhood (2000, 2001).

Given these experimental findings, it would not be at all surprising that children would readily latch onto the notion of a creator god or gods. Children's preparedness to believe in gods does not, however, end with a god's creative power. Children also appear ready to believe in a super knowing and super perceiving god.

Barrett and colleagues demonstrated that children younger than 8 or 9 years need not strictly anthropomorphize god, a position advanced by many researchers in the Piagetian tradition (Elkind 1970; Goldman 1965). At least when it comes to mental properties such as perception and beliefs,

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children as young as 4 or 5 may hold markedly different expectations for god and people. Across a series of experiments, Barrett and his collaborators replicated a standard finding that children presume other's beliefs and perceptions are reliable reflections of what the child knows to be reality. If the 3-year-olds know that a cracker box contains rocks, so would his mother, a bear, god, or anyone else (Barrett, Richert & Driesenga 2001). Hence, 3-year-olds answer correctly (theologically speaking) for god but incorrectly for mother. By age 5, children generally know that beliefs are fallible and, for instance, mother would likely believe a cracker box to contain crackers even if the child knows that there are rocks in the box. But children did not extend this fallibility to god. They continued to be theologically accurate. Knight et al. (2004) replicated this finding with Mayan children living in Mexico.

Barrett and colleagues also investigated children's understanding about who can know the meaning of a secret code or newly invented game (Barrett, Newman & Richert 2003), who would be able to see an object in the dark, hear a currently inaudible sound, or smell something not currently detected (Richert & Barrett 2005). Across these different problems a single developmental pattern emerged: 3-year-old children assume that all intentional agents have super knowledge or perception and as children mature they learn that people and some animals (but not necessarily god) have mental limitations. By age 5, children are capable of distinguishing god's super abilities from more mundane human ones, but it is human limitations that have to be learned (Barrett 2001a; Barrett & Richert 2003; Richert & Barrett 2006).

Children's early developing cognitive bias to see the natural world as purposefully designed by non-human agency makes god a natural idea for children to acquire. Children's default assumption that intentional agents are likewise super knowing and super perceiving means that acquiring the notion of an all-knowing, all-perceiving god likewise presents no special difficulties. That god is unseen is no particular problem to children either. Research on imaginary friends demonstrates that normal children readily reason about the mental and emotional states and actions of invisible beings (Taylor 1999); hence, god's invisibility is no obstacle to belief in young children.

Afterlife and Spirits

Arguably the oldest and most widespread form of god concepts is the ancestor spirit or ghost, a type of afterlife belief. At least three competing schools of thought regarding afterlife beliefs might be identified among cognitive scholars: those who regard belief in an afterlife as a counterintuitive idea that must be taught and encouraged much as beliefs in fairies or magic (Astuti & Harris forthcoming); those who see afterlife beliefs as slightly counterintuitive but supported as a unique by-product of the

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natural functioning of two sometimes contradicting domain-specific functional units of the human brain (Boyer 2001); and those who see afterlife beliefs as intuitive and almost inevitable because of selective pressure in their favor (Bering 2006).

Bering's controversial position might be called the simulation constraint theory, and has received the most empirical attention. He argues that belief in the afterlife is intuitive because of our inability to simulate or imagine what it would be like to no longer have thoughts, feelings, or awareness (Bering 2002; Bering & Bjorklund 2004). Consequently, all people from childhood, he suggests, are strongly biased to believe in an afterlife, a bias that those who deny an afterlife must struggle against. Counter to a simple learning model, Bering shows in one set of experiments that American children have stronger commitments to an afterlife earlier in childhood.[17] Bering further argues that such a strong predisposition to have afterlife beliefs was encouraged by evolutionary selective pressure because holding such a belief promotes reputation-enhancing behavior. If you believe ghosts or ancestor spirits might be around and watching, you are more inclined to behave in ways good for your social reputation. He supports this claim by experiments with adults and children that show that a suggested ghost or invisible observer deters cheating.[18]

Actions

CSR provides theoretical resources for partitioning religious actions not by way of their function or meaning but by virtue of how they are cognitively represented.[19] Still an understudied area in the field, below I offer sketches of three areas of religious action that have received attention.

RELIGIOUS RITUAL

E. Thomas Lawson and Robert McCauley's ritual form theory begins by circumscribing its focus as those actions that change the status of participants and represent culturally postulated superhuman agents in the action structure (Lawson & McCauley 1990; McCauley & Lawson 2002). Lawson and McCauley call these actions 'religious rituals'. They argue that as actions religious rituals are conceptualized using the same action representation system as is used for any other action. That is, they do not use culturally specific or specially acquired cognitive mechanisms for generating expectations, inferences, and explanations about religious rituals. Consequently, across religious traditions or cultures some commonalities in how religious rituals are understood would be expected. Specifically, Lawson and McCauley make a number of predictions about how the form of the ritual (e.g., where superhuman agency is represented in the action structure) would predict participant and observer judgements regarding aspects of the religious ritual performance. These predictions

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include whether a given religious ritual is ritually reversible or repeatable, the ritual is performed with high levels of sensory pageantry, substitutions of different elements are permissible, and the relative centrality of the religious ritual to the religious tradition. Capturing so many performance-related features of religious rituals without appeal to cultural particulars, theological meaning, or social function would be a major explanatory achievement. But is the ritual form theory correct? Additional empirical treatment is essential, but so far experimental and ethnographic results are generally consistent with the theory. Malley and Barrett report evidence from interviews that the ritual form theory's various predictions are largely consistent with intuitions regarding religious rituals in Hinduism, Judaism, and Islam.[20]

PRAYER

In studies demonstrating how cognitive systems can inform religious practice where theology is silent, Barrett examined petitionary prayer among North American Protestants (Barrett 2001b, 2002a). Although Protestants are taught to make requests of god, they are not generally instructed regarding the mode of causation to ask god to operate through. When I lose my keys I could ask god to act on me psychologically (remind me where I left them or help me detect where they are in a cluttered house) or I could ask god to act physically (have them materialize in my pocket). Either course of action is possible for an all-powerful god, but the TC findings predict an intuitive preference to ask a psychosocial being to act psychologically or socially. How then do people tend to pray? Through analysis of prayer journals and through a questionnaire technique asking young adults to judge their most likely prayer strategy in a number of hypothetical situations, Barrett found a tendency for his young adult participants to pray for god to act through psychological or social causation more than through biological or physical causation. These findings suggest intuitive assumptions about agentive causation creep in when theology is silent.

SPIRIT POSSESSION

A more common phenomenon than many Westerners realize, spirit possession prompts some profound cognitive challenges (Cohen 2007). The identity of a spirit or god must be understood by observers even when it clothes itself in the bodies of different people at different times. Furthermore, the actions and moral culpability of the actions of people must be distinguished from those of the possessing spirit. Given these difficulties, why is spirit possession cross-culturally pervasive in recognizably similar forms? Research in this area is still young, though Emma Cohen's cognitive engagement on the subject has already provided a promising-sounding

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hint: understanding spirit possession capitalizes on an already present conceptual arrangement that appears naturally as part of human development, an unconscious causal and representational distinction between minds and bodies, or 'intuitive dualism' (Bloom 2004). Through ethnographic and experimental work, Cohen has provided some preliminary evidence that even in the face of contrary theological teaching, spirit possession is most readily construed by observers and participants as a displacement of the mind from the body, and that a one-mind/one-body principle emerging from human cognitive architecture supports the ready understanding of spirit possession in this manner (Cohen 2007; Cohen & Barrett forthcoming).

Socio-Political Arrangements: Modes of Religiosity

Perhaps the most ambitious project in CSR is Harvey Whitehouse's modes of religiosity theory (1995, 1996a, 2000, 2004). Whitehouse tries to capture how cognitive dynamics in different types of collective religious events prompt the clustering into two distinct modes of religiosity of a number of social and political features.

In the imagistic mode, the transmission of central theological insights is through rarely performed but highly emotional events such as brutal initiation rites or rites of terror (Whitehouse 1996b). These events are cognitively conducive for creating emotion-laden memories of events and co-participants, generating individual exegetical rumination, and spurring feelings of relational connectedness with co-participants. Because of these psychological dynamics, religious systems in this mode will tend to have relatively local, egalitarian political structures, be light on orthodoxy controls, and slow at expanding membership.

In contrast, the doctrinal mode revolves around frequently performed, relatively low-arousal theological transmission events (e.g., modern Protestant Christianity). Such events are cognitively suitable for transmission of complex theological ideas by means of explicit instruction (e.g., in sermons and texts) and the storing of such ideas in semantic memory. Religions of the doctrinal mode tend to involve relatively hierarchical political structures for enforcing doctrinal orthodoxy, the potential for large imagined communities of fellow participants, and the potential for rapid expansion.

More thorough explanations of Whitehouse's theory and evidence and historical, archaeological, and anthropological applications relevant to it may be found elsewhere (Barrett 2005; Whitehouse 2000, 2004; Whitehouse & Martin 2004).

ADDITIONAL AREAS OF PROMISING INQUIRY

Numerous other areas of research related to religion are also beginning to benefit from cognitive scientific perspectives. These include magic

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(Sørensen 2007), scripture as artifact and scripturalism (Malley 2004), miracles (Pyysiäinen 2004b, forthcoming), the nature of souls (Richert & Harris 2006), and atheism (Barrett, 2004b; Saler & Ziegler 2006). Engagement with prominent themes in psychology of religion such as religious experience, attachment, and god image research remains in need of greater development.[21]

Using evolutionary-adaptationist perspectives along side cognitive ones is increasingly prevalent in contemporary natural scientific studies of religion.[22] For instance, the idea of religious rituals as a form of costly-signaling that facilitates reciprocal altruism and intra-group cooperation has been receiving considerable attention.[23] Perhaps, too, belief in gods gains selective reinforcement because of its tendency to produce reputation-enhancing or pro-social actions (Bering & Johnson 2005; Johnson 2005). Additionally, an account connecting an evolved hazard precaution system to why people engage in ritualized behaviors in religious and non-religious contexts has recently been developed (Boyer & Lienard 2006; Lienard & Boyer 2006). Perhaps a genuine cognition–evolution synthesis in which evolutionary accounts of subsystems that underlie religious thought and action and how particular religious thought and action might have adaptive value will increasingly characterize the field.

Clarifications amd Conclusions

The summary above aims to demonstrate that CSR is characterized by three substantive tendencies that may contribute to its growing prominence: a piecemeal approach, explanatory non-exclusivism, and methodological pluralism. Joining these three substantive factors, however, are at least two rhetorical ones deserving mention and clarification.

First, CSR is often associated with an anti-religious agenda (Henig 2007). For instance, books by Dennett (2006) and Dawkins (2006) parade findings from CSR as part of their quixotic quest of freeing the world from religious thought. By no means does the cognitive approach or findings necessarily entail such a perspective nor does it represent the personal position of many of those prominent in the field.[24] Nevertheless, strident, combative rhetoric – merited or not – attracts attention.

Similarly, CSR has become closely identified with evolutionary psychology and anthropology. Perhaps the ironic possibility of evolution not just competing with religion over 'human nature' but explaining religion as well tantalizes observers of the field and participants alike. The relationship between CSR and evolutionary science is, however, more opportunistic than necessary. That is, CSR could explore how natural human cognition informs and constrains religious expression without explaining why human cognition is how it is. Such an explanation, perhaps provided by evolutionary psychology, increases the depth of CSR's accounts,[25] but in fact amounts to a secondary project. To illustrate,

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specifying HADD's role in promoting belief in gods may help to explain the recurrence of theistic beliefs whether or not we know why humans have such a device. An evolutionary account of HADD amplifies the explanation but is peripheral. At its core CSR describes how human cognition is (not why it is) and how that explains religious expression.

To conclude, although a number of factors have undoubtedly sped the blossoming of CSR over the past 15 years, three scholarly, substantive factors (a piecemeal approach, explanatory non-exclusivism, and methodological pluralism) and two unnecessary rhetorical ones (anti-religious tone and connection with evolutionary sciences) may have contributed. More importantly, perhaps, CSR works. It does not merely offer useful analogies or interpretive frameworks or new tools for richer descriptions of religious phenomena. Rather CSR offers empirically testable, theoretically motivated scientific explanations for why religious thought and actions tend to develop and spread the way they do.

Short Biography

Dr. Justin L. Barrett is senior researcher at University of Oxford's Centre for Anthropology and Mind and the Institute for Cognitive and Evolutionary Anthropology. Barrett received his BA in psychology from Calvin College, and his PhD in experimental psychology (cognitive and developmental focus) from Cornell University. He has served on the faculties of Calvin College and the University of Michigan (Ann Arbor) before joining Oxford. Barrett's career has been characterized by work in the cognitive study of culture with a particular emphasis on CSR. He is a founding editor of the *Journal of Cognition and Culture* (Brill). His book *Why Would Anyone Believe in God?* (2004, AltaMira) represented the field's first relatively comprehensive introduction intended for a general audience.

Notes

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[1] Henig, R, (2007), 'Darwin's God', *New York Times Sunday Magazine*, March 4, 2007; Bloom, P, (2005), 'Is God An Accident?' *Atlantic Monthly* (December 2005), pp. 1–8. The name 'Cognitive Science of Religion' appears to have been first used in print to refer to this field by Barrett (2000).

[2] For example, Cohen (2007); Whitehouse & Laidlaw (2004). Pyysiäinen & Anttonen (2002) include examples of work from many different methodological and disciplinary perspectives.

[3] Malley & Barrett (2003).

[4] Lisdorf (2001); Luomanen, Pyysiäinen & Uro (2007); Pyysiäinen (2001); Whitehouse & Martin (2004).

[5] Whitehouse & Martin (2004).

[6] For example, Bainbridge (2006).

[7] For example, Knight et al. (2004). See also Whitehouse & McCauley (2005) for examples.

[8] For accessible overviews, see Pinker (1997); Thagard (1996).

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[9] For evidence of domain-specific systems, see Hirschfeld & Gelman (1994); Barrett (2004b) coined the term 'mental tools'.
[10] Spelke & Kinzler (2007) succinctly review developmental experimental evidence.
[11] Boyer developed the theory through a series of publications including Boyer (1993, 1994, 1995, 1996, 1998, 2000). Barrett, (2000, 2004b) referred to these optimal concepts as 'minimally counterintuitive', because the optimal concepts appear to have typically only one counterintuitive feature in a single communicative episode.
[12] Gonce et al. (2006), Norenzayan et al. (2006), Tweney et al. (2006), and Upal et al. (2007) offer mixed support for the theory but include as 'counterintuitive' some items that may not be represented as 'counterintuitive' by participants in Boyer's narrow sense.
[13] For instance, see Pyysiäinen (2004a). Connecting explicit and implicit religious cognition is an important area for future research in this field and will help bridge cognitive science approaches with more traditional treatments of religion.
[14] A fuller account of what it takes to be a god from a cognitive perspective may be found in Barrett forthcoming. Belief is discussed in Boyer (2001, Chapter 9, 2004b).
[15] Barrett first used the acronym HADD in Barrett (2000), but there called it the 'hyperactive agent detection device'. Barrett (2004b) later renamed it 'hypersensitive agency detection device' to capture a broader range of inputs.
[16] See Atran (2002); Barrett (2004b); Boyer (2001); Pyysiäinen (2004b); Slone (2004) for discussions.
[17] Bering & Bjorklund (2004); Bering, Hernández-Blasi & Bjorklund (2005); but see also Astuti & Harris (forthcoming).
[18] Bering, McCleod & Shackelford (2005); Bering & Parker (2006); see also Shariff & Norenzayan (forthcoming).
[19] Barrett & Malley (2007) offer a cognitive typology of counterintuitive events including religious events such as ceremonies, miracles, rituals, prayer, spirit possession, and magic.
[20] Barrett (2004a) offers an analysis of empirical gaps. Barrett & Lawson (2001); Barrett (2002b); Malley & Barrett (2003), represent empirical treatments to date.
[21] Andresen (2001) presents some considerations of religious experience. For some, examples of connecting CSR with topics in psychology of religion, see Gibson (2006); Gibson & Barrett (forthcoming); Kirkpatrick (2005).
[22] For example, Alcorta & Sosis (2005); Bulbulia (2007); Bulbulia et al. (forthcoming).
[23] For example, Atran (2002); Bulbulia (2004a,b); Ruffle & Sosis (2006, 2007); Sosis (2003, 2005); Sosis & Alcorta (2003).
[24] Barrett (2007) discusses some potential arguments against theistic belief based on findings and theories from biological and cognitive treatments of religion but concludes that none of the arguments succeed. Barrett (2004b) suggests that the findings of the field are neutral with regard to whether one should believe in gods.
[25] Tremlin (2006) provides an excellent introduction to the field with extensive evolutionary context.

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