The New Scientific Study of Religion Moving On

with Lluís Oviedo, "Challenges, Opportunities, and Suggestions for a Renewed Program in the Scientific Study of Religion"; Robert N. McCauley, "Recent Trends in the Cognitive Science of Religion: Neuroscience, Religious Experience, and the Confluence of Cognitive and Evolutionary Research"; Connor Wood, "Antistructure and the Roots of Religious Experience"; Konrad Szocik, "Critical Remarks on the Cognitive Science of Religion"; Hans Van Eyghen, "Religious Belief as Acquired Second Nature"; and Léon Turner, "Isolating the Individual: Theology, the Evolution of Religion, and the Problem of Abstract Individualism."

RECENT TRENDS IN THE COGNITIVE SCIENCE OF RELIGION: NEUROSCIENCE, RELIGIOUS EXPERIENCE, AND THE CONFLUENCE OF COGNITIVE AND EVOLUTIONARY RESEARCH

by Robert N. McCauley

Abstract. Cognitive science of religion (CSR) has increased influence in religious studies, the resistance of religious protectionists notwithstanding. CSR's most provocative work stresses the role of implicit cognition in explaining religious thought and conduct. Exhibiting explanatory pluralism, CSR seeks integrative accounts across the social, psychological, and brain sciences. CSR reflects prominent trends in the cognitive sciences generally. First, CSR is giving greater attention to the new tools and findings of cognitive neuroscience. Second, CSR researchers have done carefully designed, nonlaboratory studies of experience, incorporating precise physiological measures, obtaining astonishing findings about the experiences of ritual participants and observers. Third, CSR theorists have advanced evolutionary hypotheses about religions from eight perspectives (cross-indexing three levels of selection with three mechanisms of selection). Cultural group selectionists headline credibility enhancing displays and Big Gods in the religious consolidation of large-scale societies. Other CSR researchers marshal counterevidence and

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advance alternative hypotheses. CSR findings are incompatible with the New Atheists' projects on two fronts.

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The Cognitive Science of Religion

Nothing could be plainer. The cognitive science of religion (CSR hereafter) holds that religious thought and conduct are *human* thought and conduct. Therefore, they are no less appropriate targets for analysis and explanation by the cognitive sciences than are any other areas of human thought and conduct, and from a cognitive perspective, no distinction *in kind* (and often not even one of *degree)* differentiates religious thinking and activity and, especially, the cognitive processes that inform them, from everyday thinking and activity and the cognitive processes informing them.

CSR's earliest works took inspiration from the successes of the cognitive sciences' first three decades and proposed to bring their methods, findings, and theories to bear on religious mental life and actions (Guthrie 1980, 1993; Lawson and McCauley 1990; Boyer 1994). As the Cognitive Science Society's logo (which explicitly cites seven disciplines) betokens, both cognitive scientists and their principal professional society are dedicated to the *diversity* and *integration* of explanatory perspectives. That dual commitment yields an *explanatory pluralism* that underscores scientific opportunism with contributors recruiting methodological, theoretical, and evidential resources *wherever they can be found* (Dale, Dietrich, and Chemero 2009; McCauley 2014b). The cognitive sciences and CSR, in particular, have *always* counted the scholarship of the humanities among those locations (examples include Nikolsky et al. 2019 and Thagard 2019, respectively).

Whether addressing religious (or any other sort of) thinking and behavior, the cognitive sciences have proven constantly fascinating, because they have depicted and substantiated the pivotal roles that *implicit cognition* often plays in shaping explicit thought and conduct. Implicit cognition, in short, is the submerged part of the cognitive iceberg. It is usually intuitive, automatic, instantaneous, unconscious, and nonlinguistic (McCauley 2011). That, of course, contrasts with commonsense psychology's overwhelming attention to explicit cognition, which is reflective, deliberate, time-consuming, conscious, and (mostly) articulate. For more than two decades CSR has spawned unexpected findings about the bearing of implicit cognition on a wide range of religious phenomena, encompassing such things as the following:

- mental representations of gods (Barrett and Keil 1996) and of dead agents' minds (Bering and Bjorklund 2004),
- increasing prosocial behavior by unconscious cuing (priming) of religious representations (Shariff and Norenzayan 2007),
- teleological assumptions about the origins and character of natural phenomena (Kelemen and Rosset 2009), and
- the impact of high-arousal rituals on participants' memories (Xygalatas et al. 2013), to name a few.

Such findings about implicit cognition in CSR are reliably intriguing for at least two reasons. The first is substantive; nearly always people are completely *unaware* of either the occurrence or the import of such implicit processes. The second reason is a negative methodological implication of the first. Those implicit processes are no more transparent to methods of the humanities and of much research in the social sciences that directly ask informants about their beliefs and what they think about those beliefs (Nisbett 2015, 191–203). CSR frequently identifies influential variables about which religious participants are unconscious and, thus, about which they often have absolutely nothing to say or, when they do have something to say, nothing that merits any default assumptions about its authoritativeness from a causal standpoint.

The point is *not* that informants' religious beliefs are false. The point is also *not* that informants' claims *about* the motivations of their religious beliefs or actions (for example, their recitation of a memorized creed) are presumptively false. Rather the point is that such claims may sometimes prove, first, to be superficial accounts of the underlying causal processes involved and, second, to be legitimate objects of explanatory theorizing themselves. Still, to be clear, none of this strips informants' reports of interest on many other fronts that the humanities and the social sciences explore, not the least of which is their roles in sustaining religious forms and in the consideration of religious possibilities.

Having just sketched CSR's central commitment, its overall strategy (explanatory pluralism), its guaranteed source of fascination (its revelations about implicit cognition), some representative findings, a pivotal methodological implication, and its *lack* of implications regarding both the truth status of religious claims and their influence, let me now summarize what follows.

By way of further introduction, the next section describes a prominent reactionary response to CSR (protectionism). The subsequent eight sections address three trends in CSR and, I would stress, in the cognitive sciences generally that are only likely to gain momentum going forward.

The first is a growing interest in the new investigative tools and findings of cognitive neuroscience (with a backward glance to the worries of the

protectionists about the inherent reductionism involved). The section is brief, because of space limitations and because of the fact that of the three this trend is the least developed in CSR.

The second, discussed in the two subsequent sections, concerns the use and promise of CSR's cognitive analyses for illuminating aspects of religious experience, memories of religious experience, and the complications associated with distinguishing the two. It recounts, by way of illustration, one of the most innovative experimental studies not only in CSR but in all of cognitive science. The second of these two sections discusses how such research in CSR *exceeds* the ideals of so-called 4E cognitive science, pointing to an even richer 6E conception of cognitive science and CSR.

The subsequent five sections take up the third trend, which concerns the ever-increasing integration of cognitive and evolutionary proposals as accounts of proximate and ultimate explanations, respectively, of features of religions. The discussion is ordered around consideration of the *mechanisms* of selection and the first three of these five sections surveys proposals looking at natural, sexual, and cultural selection, respectively. The fourth of the five sections is devoted to cultural evolutionists' theoretical proposals about credibility-enhancing displays (CREDs) and about the evolution of Big Gods. The fifth section briefly reviews the controversies surrounding the emergence of Big Gods who exhibit concern with human morality and its bearing on cooperation in large-scale societies and on developments in the Axial Age, in particular.

A final Coda surveys the implications of CSR for the traditional religion-science debate.

Protectionism

By at least some measures, CSR appears to have enjoyed a remarkable upsurge in influence across religious studies over the past two decades (Balch 2018). Citation counts, however, do not detail whether that influence has been welcomed or not. CSR has, after all, been the target of the same complaints, born of protectionism, special pleading, or outright religious impulses that all scientific approaches to religion have attracted. The protectionists' complaints (regardless of which of these considerations they point to) all reliably come down to the insistence that scientific approaches will inevitably prove incapable of capturing some putatively decisive feature or other about religious phenomena (McCauley 2017).

The obvious response to such protectionism is to challenge its central premise, but that will not be my approach here (e.g., Lawson and McCauley 1990). Still, *even if that assumption goes uncontested*, what follows, at most, is that scientific explanations of religious phenomena remain superficial in some regard or other; at the very least, they are not comprehensive. *That,* however, is uncontroversial. Scientific explanations

are *theoretical* explanations; they are *selective*. Theories sort through the blooming, buzzing confusion, picking from the inputs, the sensations, the percepts, the observations, or the data, those that matter. Those items matter because, according to the theory, they bear some preliminary, systematic, patterned relationship to the objects of explanatory interest.

Without delineating either the critical feature to which they appeal or the status of that feature (again, here I leave their critical premise unchallenged), their contention that scientific explanations of religious phenomena face perennial superficiality with regard to that key feature leaves those explanations' putative deficiency seriously underspecified. On the other hand, for the protectionists to take up the challenge of characterizing that feature is perilous. Over the past few decades, protectionists have become rightfully wary of maintaining, as their predecessors did (e.g., Otto 1958), that that crucial feature of religious phenomena (for example, having some sort of religious experience) is *unique* or *essential*, because adopting that position is tantamount to endorsing a religious claim. This approach carries conspicuous liabilities—including both a profound metaphysical burden, itself in sore need of explication, and, explicated or not, vulnerability to the charge of begging the question. Religions, religious experience, and religious mental life and behavior are allegedly insulated from scientific explanation, because they all share some pivotal feature, but, absent a convincing account of that feature, it appears that it amounts to little more than the question-begging claim that they are insulated from scientific explanation.

Contemporary protectionists have, consequently, usually allied themselves with broader coalitions within the humanities that provide accounts, which look to everything from consciousness and the subjective to the meaningful and the culturally constructed as putative bulwarks against scientific explanation. Space limitations preclude any extended response here. (For that, see McCauley 2017.) Suffice it to note that, finally, these are contingent, which is to say *empirical,* matters. If scientific explanations of various features of religions or of religious phenomena prove *compelling*, then, although they may fail to adequately address some additional dimension of the explananda that protectionists prize or they may even fail to address it altogether, they will have gained some explanatory purchase on the objects of study, nonetheless. They will contribute in some small way to our understanding of religious phenomena. Numbering among the considerations that render scientific explanations compelling are (1) their abilities to highlight patterns and to describe the mechanisms that produce them (Bechtel and Richardson 2010), (2) their ability to manage pressing problems of many sorts (Laudan 1977), (3) their coherence with what else is known and, especially, with other scientific knowledge (Thagard 2000), (4) their correct predictions, and (5) their ability to stand up to new (and often originally unanticipated) empirical tests (Popper 1992).

Even if true, the insistences of both protectionists and religious people, to the effect that religions are so much more than the collection of fractionated features of religious thought and conduct that CSR addresses, will not forestall ongoing cognitive scientific inquiry about these matters. That train has already left the station. To repeat, scientists are incurably opportunistic, seizing on explanatory insights and importing their theoretical underpinnings and associated empirical findings wherever they can contribute. Just as they have begun to enjoy influence in some areas of religious studies (e.g., biblical studies), ideas, theories, and findings from CSR have and continue to attract considerable attention in cognitive science generally. (Examples include Bering 2006; Boyer and Liénard 2006; Banerjee, Haque, and Spelke 2013; Legare and Souza 2014; and Whitehouse 2018.)

The protectionists' situation is still worse. By now, researchers in CSR have advanced theories about several *effects,* such as theological incorrectness, promiscuous teleology, minimal counterintuitiveness, identity fusion, and more, which have organized a wide swath of empirical findings and been extended to new (originally unforeseen) areas where they have stood up reasonably well to a variety of empirical and experimental tests (e.g., Schjoedt et al. 2013). (For discussion and references, see McCauley 2017.)

The proposal (Boyer 2001; Barrett 2004), for example, that theory-of-mind capacities play a fundamental role in representing the gods and transactions with them has inspired numerous empirical studies. Many explore my suggestion (2011) that if people with autistic spectrum disorder (ASD) are correctly characterized as deficient in theory-of-mind capacities, then they will find at least some aspects of religious thought and conduct difficult to understand and manage. Ara Norenzayan, Will Gervais, and Kali Trzesniewski (2012) obtained evidence for the even stronger thesis that people with ASD are significantly less likely than the general population to even be religious. That finding provoked at least a dozen diverse studies. Some (e.g., Wlodarski and Pearce 2016) got similar findings, while others (e.g., Reddish, Tok, and Kundt 2015) obtained contrary findings. McCauley and George Graham (in press) argue (1) that such mixed findings are not at all unusual in the cognitive sciences, (2) that they guarantee that improved theoretical accounts will inevitably be more complicated, but (3) although this research leaves Norenzayan and his colleagues' stronger thesis in question, it is not at all clear that *any* of these negative findings bear on my original proposal about impaired understanding and inferential capacities of people with ASD concerning the gods' states of mind. That proposal is, however, *not* antithetical to the suggestion that the religiosity of people with ASD may simply be *different* (e.g., Ekblad and Oviedo 2017).

In any science, once theories have secured a hard-won, reasonably firm, empirically undergirded foothold, scientists are slow to abandon them in the face of a few negative empirical findings, let alone in response to protectionists' often unargued philosophical objections. This is a point

about how science operates. CSR has theories. Protectionists have objections. Most of their objections are philosophical in character, as opposed to empirically based. In science, when opponents only have objections, regardless of either those objections' provenance or their force, empirically and experimentally corroborated theories prevail. Philosophical objections are certainly not enough, but empirically informed objections are insufficient too. Thomas Kuhn (1970) famously emphasized, first, that sciences inventory empirical objections to a leading theory, but, second, that objections alone (whether empirical or philosophical) never provoke the abandonment of a regnant theory. Kuhn's point was that, historically, scientists have generally decided that it is imprudent to forsake a theory, which organizes some domain, solves some challenging problems, makes a number of correct but otherwise unexpected predictions, and broadly coheres with scientific understandings about related areas, because of philosophical reservations or even because of a few scattered, uncongenial empirical findings. Abandoning the theory some objections target leaves no guidance as to how to proceed, if only objections remain. Displacing a comparatively successful scientific theory requires not only objections but an *alternative theory* of at least roughly comparable strength.

The intellectual situation of most protectionists, then, is worse than that of just failing to recognize CSR's explanatory contributions and failing to understand the assorted fronts on which CSR has made vital contributions to projects of interest in cognitive science generally. The protectionists' position is more problematic yet, because the one thing that they and their postmodernist allies in the humanities certainly do not have, given their antipathy to scientific theorizing, is precisely those alternative scientific theories that Kuhn, at least, argues would be necessary to dislodge CSR's successful theories. Armed only with undefended philosophical assertion, protectionists, instead, indulge in forlorn complaints about scientific progress as mythic and oppressive. This is *not* to claim that there is nothing mythic about modern professional science, nor is it to claim that scientific research and some uses of scientific findings never have oppressive consequences. Science is a human endeavor that is pursued in complex, large-scale human societies, where some myth making and oppression seem inevitable. It is, however, to claim that to underscore either as somehow inherent to science and, in particular, to use such considerations to deny or to distract audiences from either science's progress or its epistemic merits is intellectually irresponsible.

Neuroscientific Interests and the Consolations of Reductionist Strategies

Solidly situated amidst mainstream cognitive science, research in CSR reflects the same trends as the rest of the field. Those trends include increased

interest in (1) *neuroscientific* findings, (2) the character of *experiences* associated with diverse types of cognition, and (3) new *evolutionary* perspectives on cognition and culture.

The rationale for the first of these trends is clear. The advent of a collection of brain imaging technologies over the past few decades has furnished opportunities for harmless, noninvasive, fine-grained observations of structural and functional features of healthy brains-in-action. Those technologies have launched hundreds of research projects around the world that are continuously generating a formidable collection of findings that bear on very nearly every known psychological topic. The significant limits on such research are set by the ingenuity of the experimentalists, the proscriptions of institutional review boards, and *researchers' access* to the resources of funding agencies. Because of the latter constraint especially, most CSR researchers only cite relevant neuroscientific articles rather than carry out that research themselves. A welcome exception is the CSR researchers at the University of Aarhus, who have produced ground-breaking brain imaging studies that have provided striking corroborating evidence for prominent theories in the field (Schjoedt et al. 2008, 2009, 2011).

Cognitive scientists working at higher explanatory levels (see Figure 1) have welcomed the resulting occasions for consulting and enlisting neuroscientific evidence bearing on hypotheses about topics from their own fields. Such interactions frequently lead to the modification and refinement of those hypotheses, as scientists ponder the implications of findings from brain-imaging studies. Those interactions have also led to the emergence of the interlevel enterprise, cognitive neuroscience, over the past two decades at the border regions between the psychological and brain sciences. On the perfectly reasonable assumption that the brain contains the principal mechanisms, the functions of which various cognitive models are out to describe, integrating models and theories from the psychological and neuroscientific levels is but another illustration of the sciences' rampant opportunism. Such interdisciplinary forays are routine in cognitive science (Dale et al. 2009).

The standard complaint in religious studies and across the humanities is that these forays are reductionist. As the philosophy of science deploys that term, that diagnosis is spot on. What is not clear, however, is why it should be grounds for complaint (unless it is founded on a blanket rejection of *all* scientific explanation (McCauley 2014b), which is simply the flip side of the question begging protectionism criticized earlier). That complaints should arise is unclear for many reasons, given that

- reductionist research strategies have proven one of most *fruitful* heuristics of discovery in science,
- successful interlevel reductions of this sort are always *local*,

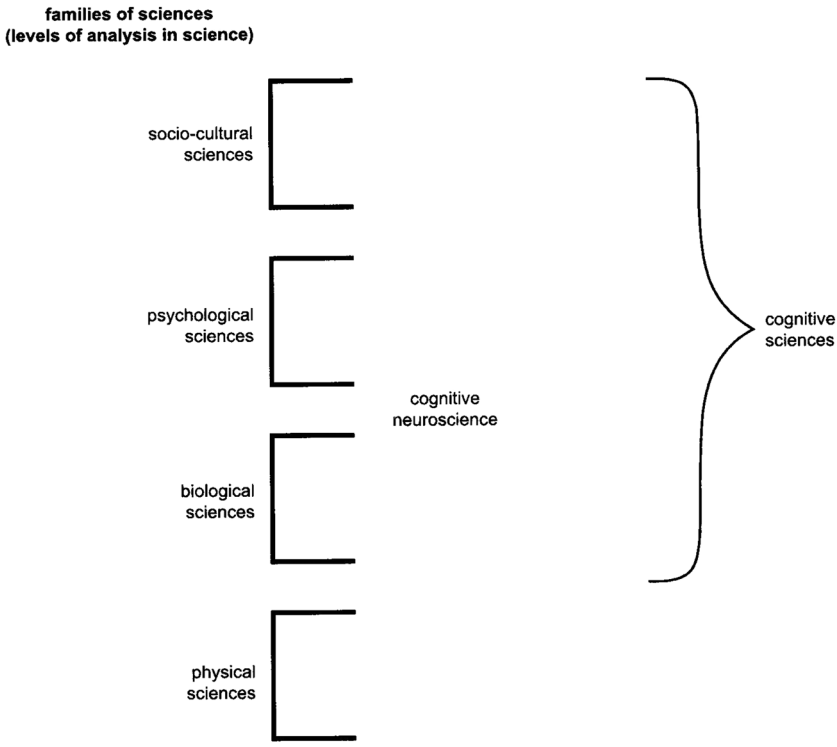

Figure 1. The cognitive sciences integrate theories and evidence from the families of sciences bearing on human mental life and conduct.

- the smoother such interlevel reductions are, the more straightforwardly they *vindicate* the higher-level, reduced account, and
- nothing about such reductions precludes similar modifications and refinements of lower level proposals on the basis of findings at higher analytical levels. The fertilization across levels of analysis in this hierarchical arrangement of the sciences is *not* exclusively from the bottom up.

For extended discussion of all of these points, see McCauley (2007).

Experiences and Memories of Experiences

Of a piece with that last observation about cross-scientific relations, the second important trend in CSR and the cognitive sciences, namely, greater attention to the character of people's experiences, acknowledges the import and integrity of inquiries carried out at the *personal* level (Dennett 1987). This is the level of conscious experience and explicit cognition, which

are the objects of so many psychological, social scientific, and humanistic inquiries. The personal level is concerned with individuals' testimony about their conscious mental lives, their giving of reasons, their subjective perspectives, and their experiences. Such interests clearly resonate with long-standing concerns with the varieties of religious experiences (Taves 2009). These topics are readily susceptible to illumination through standard methods that gather and analyze reports from informants.

Individuals have a perpetual right to elaborate, revise, and correct what they have to say about all of these matters, about what they are like, and about their reactions to others' (including scientists') accounts of them. Crucially, however, as Daniel Dennett (1991) has argued, it does not follow from those rights that they have the *final* say about what all of the features of the objects of their descriptions are or about the causal frameworks into which they fit or from which they result. Cognitive researchers have a variety of resources (including physiological measures and patterns of neural activation from brain images) for obtaining information about *subpersonal* dimensions of people's experiences, which sometimes offer evidence that is not obviously compatible with informants' verbal reports at the personal level.

CSR has supplied some impressive examples. For example, the fire-walkers in San Pedro Manrique, Spain assured researchers of their comparative calm as they traversed a seven-meter bed of hot coals during the annual festival of San Juan. The heart rate monitors that they had agreed to wear during the ceremony, however, told a different story. They revealed "an extremely strong physiological response in all performers. . . . For every participant, peak heart rate invariably occurred during their walk and exceeded the heart rate levels from jogging up a steep hill" (Xygalatas et al. 2013, 6). By contrast, the fire-walkers recalled, about four different moments across the evening, having the *lowest* level of subjective arousal during their fire-walks. The other three self-assessments of arousal concerned (1) an earlier procession through the town, (2) while dancing in the amphitheater and then awaiting their fire-walks, and (3) 10 minutes after their fire-walks. Yet, in fact, all of their heart rates during their fire-walks were not only significantly higher than at those other times, they ranged as high as 193 beats per minute!

The point is not to dismiss the fire-walkers' subjective reports about their arousal levels, but, rather, to show that those reports about their experiences should not count as the last word about the character of those experiences. This is simply a way of reaffirming the point that I made in the opening section that it is discoveries about unexpected *implicit* influences on human behavior and mental life that are the chief fascination of the cognitive sciences.

Although breakthroughs concerning implicit cognition may be what is most intriguing, they are by no means the cognitive sciences' only

engaging findings. The study of the fire-walkers also exemplifies this point. It does so because their reports about their fire-walking experiences not only changed over time but changed in similar ways. Familiar with the experimental literature on memory, Dimitris Xygalatas and his colleagues (2013) wisely interviewed the fire-walkers at two different time points about their fire-walking experiences.

Critics of CSR might object here that this was, then, a study of memory and not of experience. That objection would run aground for at least three reasons. First, this study became famous (with reports in multiple outlets around the world) primarily because of its astonishing findings about the *empathic response* with the fire-walkers among *some* of the spectators (who also wore heart rate monitors). The researchers discovered the spontaneous synchronization of the heart rates of spectators affiliated with the fire-walkers with those of the fire-walkers (not only during their fire-walk, but throughout most of the ceremony), while the heart rates of nonaffiliated audience members were not (Konvalinka et al. 2011). Second, studies of experience in any domain are rarely in real time except for those carried out in laboratories. Most studies of experience in the field pursued at the personal level rely on informants' testimony *after the fact* and, thus, are studies of memory too (though nearly always without the concern about accurate measurements that cognitive scientists demonstrate). Finally, this study is famous not just for its results but also for its design. It is one of the few studies that has employed such physiological measures, known to be correlated with some features of experience, both in real time and in the real world, that is, not in a laboratory.

The researchers' first interview with the fire-walkers transpired two days later. In their free recall, the fire-walkers claimed to remember very little about either the event overall or their experiences, except for their emotions. In the structured recall phase of the interview, where researchers asked the fire-walkers about specific spatial and temporal details, they remembered little about the objective circumstances at the time. (The experimenters could check the accuracy of the fire-walkers' responses, since they had made video recordings of the entire event.) In this first interview the fire walkers had moderate confidence about the accuracy of the few factual memories they had.

The second interview occurred two months later. The free recall portion of this interview need not have involved anything more than the exercise of informants' perpetual right to elaborate, revise, and correct as each of them saw fit. It was the *changes* in the fire-walkers' recollections after this longer retention interval in both the free and structured recall exercises, however, that suggested something more was afoot. The researchers state, first, that "overall, t_2 reports seemed ... qualitatively different from t_1 reports, and tended to focus more on factual memories and less on affective memories" (Xygalatas et al. 2013, 8). The fire-walkers generally had less

to say about their emotional states and more to say about the objective circumstances of their fire-walking experiences. Both of those trends were clear in the data, but neither were statistically significant. Two aspects of the fire-walkers' memories, however, had changed significantly: the number of their *inaccurate* memories increased significantly at t_2, while at the same time the fire-walkers were significantly *more confident* that their memories were accurate. In short, *they were more often wrong yet surer that they were right*.

Xygalatas and his colleagues argue that these two differences corroborate two related hypotheses that they advance, namely, the suppression hypothesis and, more generally, the cognitive resource depletion hypothesis. The latter (Schjoedt et al. 2013) holds that rituals exhibit features (e.g., causal opacity) and, sometimes, incorporate features (e.g., expectations, as in fire-walking, of controlled emotion in connection with simultaneous high arousal and public encounter) that serve either to *swamp* the relevant cognitive processors with attentional or emotional demands or to *starve* those processors of cognitive resources during ritual performances. Whether swamped or starved, participants are unable to encode details or ponder meanings in the course of ritual performances and, thus, have impaired memory for these events. That impairment creates an opening for religious authorities to prescribe and regularize ritual performances and interpretations.

Citing multiple studies supporting the claim that requirements to suppress strong emotions interfere with memory for highly arousing stimuli, Xygalatas and his colleagues also advance, more specifically, the suppression hypothesis, which coheres with the cognitive resource depletion hypothesis. The suppression hypothesis holds that the expectation that the fire-walkers restrain their emotions in the face of such profoundly stimulating sensory pageantry and community engagement imposes so much stress on them and lays claim to so many of their cognitive resources that it compromises their consolidation of memories of this event. The assumption is that memory and emotional self-control, especially under such extreme circumstances, compete for those (limited) resources. Consequently, what memories participants have tend to evolve over time toward conformity with "culturally mediated inflections" (Xygalatas et al. 2013, 3).

These findings suggest that the fire-walkers continued to form memories in the two-month interval after the ritual. Many of those memories were demonstrably false, which argues that they were the results of "cognitive elaboration rather than . . . retrieval of perceptual memories" (Xygalatas et al. 2013, 12). Without vivid memories, the fire-walkers eventually arrive at "schema-based or socially negotiated constructions" (Xygalatas et al. 2013, 13). One of the more prominent candidates for such culturally elaborated mnemonic reconstruction was the fire-walkers' convictions about their calmness during their fire-walks. The fire-walker's memories during

their second interview congregated around the standard, culturally available conceptions about the festival, about the fire-walking ritual, and even about what the experiences of the fire-walkers themselves must have been like.

The drama and hoopla surrounding fire-walking unquestionably diverges from the tepid rituals of, say, most Protestant churches (though consider full-immersion baptisms, possession by the Spirit, and snake handling, to name but a few variants arising in first-world Christianity). Studying fire-walking illustrates a routine tactic in scientific research of investigating extraordinary circumstances or instances that either isolate or amplify plausibly significant variables to better understand their influence.

4E + 2E = 6E Cognitive Science

CSR has championed cross-cultural empirical research in the field since its beginnings. The Xygalatas-Konvalinka team's study of the Spanish fire-walkers' experiences fashioned a theoretical account that looked to the influence of prevalent conceptions within the community. They suggest that the explanation of the fire-walkers' eventual representations of their experiences owed a debt to a cultural framing of the festival and the fire-walking that persists among the local population and on which participants' representations gradually tend to converge.

This study shows that although the brain may instantiate the principal mechanisms of concern to cognitive scientists, it does not follow that neural mechanisms are, even at the biological level, the *only* mechanisms of interest or that such neural mechanisms operate in isolation. Social and cognitive scientists develop hypotheses about mechanisms (such as markets or levels of cognitive processing) at other explanatory levels (the sociocultural or the psychological). Some also examine (regardless of explanatory level) how their physical and cultural contexts influence the idealized mechanisms that prominent theories champion.

To repeat, no matter how successful they may be, scientific explanations are not comprehensive. How narrowly or how extensively cognition and the scientific enterprises that study it should be understood should turn on theoretical proposals' productivity from the standpoints of explanation and prediction, the empirical discoveries and findings that those proposals inform, and how those theories, discoveries, and findings bear on the range of problems and questions inquirers wish to explore.

Of a piece with those observations, advocates of 4E cognitive science emphasize that in addition to being implemented in brains, cognition is also *embedded, enacted, extended,* and *embodied* (Johnson 1987; Clark 2008; Menary 2010). As the fire-walking study shows, idealized theories cast exclusively in terms of the operations of brain mechanisms may prove much too limited for many explanatory and problem-solving interests.

The cognitive resource depletion hypothesis, for example, looks beyond the standard internal dynamics informing the encoding of memories, highlighting the cultural *embeddedness* of cognition. Under some circumstances high-arousal rituals can produce conditions in which examining participants' immersion in their immediate community and that community's relevant (internal and public) cultural representations prove pivotal to understanding and explaining participants' resulting cognitive representations (Sperber 1996).

Cognition is also *enacted*. Athletic training is, perhaps, the most transparent illustration. Practicing athletic skills, which nearly always obliges people to move themselves through artificially structured environments in specially tailored ways, routinely leads to better performance. The process of carrying out those maneuvers also enriches and enhances a person's *understanding* of what is required. This is no less true about ritual participants.

The myriad ways in which humans offload and order information into their environments most readily illustrates how cognition can be *extended* into the world. From a family's collective compilation of a weekly grocery list to the coded coordination between a library's shelves of books and its catalogue, humans routinely construct parts of their environments so that they need *not* have to think about certain problems nor retain unwieldy or impossible amounts of information.

The fire-walkers show straightforwardly how *embodied* cognition can concern more than cognitive representations' contents. How our bodies are situated in space and time and how those situations change provide the root metaphors for how we think about myriad abstract topics (Johnson 1987).

Embodied cognition is often caught up in a swirl of prominent emotions, for the manifest reason that our thought is frequently concerned with what we regard as significant matters. Various cognitive scientists (Damasio 1994, 1999; Thagard 2006) have argued forcefully for what is, in effect, a fifth E, by showcasing the important role that emotion plays not only in the explanation of human behavior but also in a host of cognitive operations. Recall that the most celebrated finding from the fire-walker study was the physiological (i.e., embodied) evidence of the emotional coordination between the fire-walkers and their close supporters. The fire-walkers were doing some work, as most carried someone on their backs during their fire-walks. Consequently, their heart rates almost certainly reflected more than just their emotional states. Their supporters, however, whose heart rates changed in similar directions synchronously with the changes in the fire-walkers' heart rates, were, basically, just sitting in the amphitheater watching. The most plausible explanation the researchers scout for the changes in these onlookers' heart rates is their emotional empathy with the fire-walkers. Mere emotional arousal is not enough here (Konvalinka et al. 2011, 8518). Other spectators were also emotionally aroused. It was only

the audience members who had close social connections to the various fire-walkers, though, who displayed this striking empathetic response.

The researchers underscore the vital role that social considerations play in this particular case. In nearly all cases all of these dimensions of cognition, that is, the E's, infiltrate one another and overlap like this, more or less prominently. With regard to the emotional dimension, in particular, though, Antonio Damasio (1994) defends the position that complex emotional states inform *all* cognition, concerning everything from the most socially rich to mathematical and logical processes and representations.

As the third trend in recent cognitive science, namely, an interest in new *evolutionary* perspectives on cognition and culture, suggests, for many purposes not even five E's are enough. The most elaborated and sophisticated theoretical work among the early contributions to CSR (namely, Boyer 2001), as well as the subsequent confluence of CSR generally with work on the evolution of religions (Bulbulia 2004; Norenzayan 2013; Whitehouse et al. 2019) conspicuously illustrate this trend. It is worth noting that the evidence for evolutionary influences on human cognition equals or exceeds that for any of the four more celebrated E's. That said, however, no single conception of those influences prevails in CSR.

Mechanisms of Evolution: Natural Selection

Evolutionary explanations regarding humans and their cultures import, among other things, two modes of thinking from Darwin's theory of the evolution of species by natural selection. Darwinian thought has furnished theoretical means for thinking *scientifically* about what are sometimes termed "*ultimate*" explanations which pertain, first, to extremely long-term diachronic processes involving, second, extremely large-scale, distributed systems such as species or populations in the biological realm and cultures or religions in the sociocultural realm (McCauley 2009). Those explanations contrast with (CSR's) *proximate* explanations concerned with the mechanisms, including cognitive mechanisms, that operate in the short term. These modes of thought were not unprecedented in the history of ideas, but it is the Darwinian revolution that presented a theoretical framework for organizing them so that they could be rendered susceptible to empirical assessment.

Three schools of evolutionary thought about cognition and culture have figured prominently in CSR. (These three certainly do not exhaust the possible options. See, for example, Heyes 2018.) The three can be distinguished on the basis of the *mechanism* of selection that they feature (Figure 2).

Two collections of researchers have concentrated primarily on *natural selection* (pertaining to cells 1 and 4 in Figure 2) in their evolutionary inspired accounts of religions and their features. The first of these groups

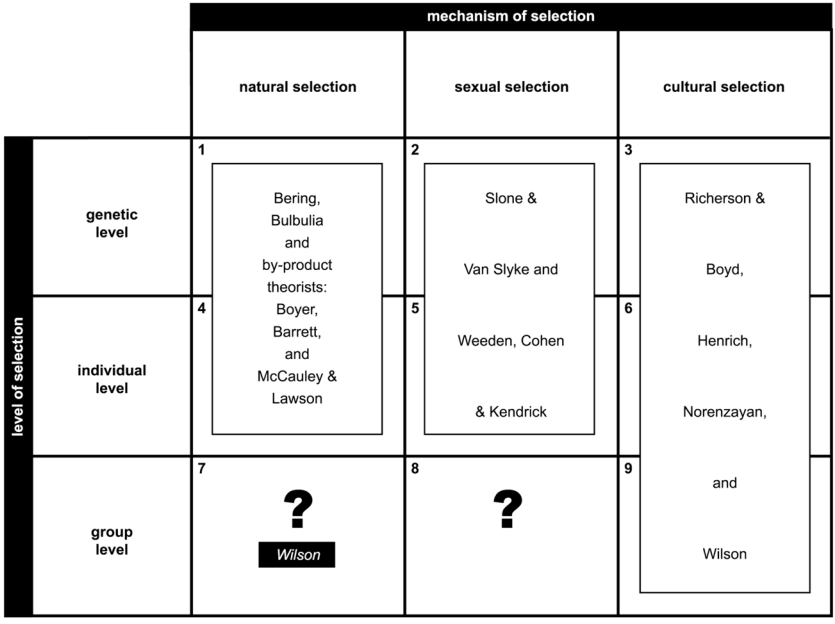

Figure 2. Evolutionary approaches to religions.

is *adaptationalists*. Adaptationalists hold that some features of religions are straightforward adaptations for individuals resulting from the process of natural selection. Jesse Bering (2006) and Joseph Bulbulia (2006) argue that natural selection has favored psychological penchants for religious practices and representations about topics such as an afterlife, intelligent design, moral obligations, and more. Such psychological penchants provide benefits, which increase their bearers' fitness, ranging from encouraging socially advantageous behaviors and attitudes to fostering better physical and emotional health.

The second group of researchers that looks to natural selection accord it a less direct role in the emergence of religious sensibilities. These *by-product* theorists (Boyer 2001; McCauley and Lawson 2002; Barrett 2004) hold that the mind does not have machinery directly devoted to religious matters. Religions (though not just religions) involve cultural arrangements that engage ordinary cognitive systems in place on the basis of considerations having nothing to do with religion or with one another. These cognitive systems are certainly adaptive. If they are the products of natural selection, that is because they aid their bearers directly. They are dedicated to handling specific problems—perceptually, cognitively, and in terms of action responses—that have proven vital for individual survival.

A partial but representative list of those problems would include such things as direct as the avoidance of contaminants and wariness about snakes to more socially integral capacities such as face recognition, kinship detection, language acquisition, and theory of mind. By-product theorists claim that such cognitive proclivities' *content biases* are not in place because of their contributions to religious sensibilities and forms (whether ritual, myth, fictive kinship, icons, sacred spaces, or glossolalia, to name some prominent examples). The bodies of *implicit* knowledge humans possess in each of these domains includes a collection of default inferences. Human beings know without (explicitly, reflectively, consciously) thinking how to process such inputs (linguistic utterances, faces, agents, kin, contaminants, and so on) and how to respond. Religious representations have culturally evolved to excite such cognitive systems, which operate mostly intuitively, automatically, instantaneously, unconsciously, and inarticulately. These cognitive capacities' operations in religious contexts are by-products of their normal functioning. It is the ease with which such materials are processed that gives religious representations an advantage in the competition for residence in human minds.

Mechanisms of Evolution: Sexual Selection

Over the past decade especially, a growing number of researchers have advanced hypotheses that look to *sexual selection* (pertaining to cells 2 and 5 of Figure 2) as an important evolutionary mechanism driving human beings' religious proclivities (Weeden, Cohen, and Kenrick 2008; Slone and Van Slyke 2015).[1] Their arguments mostly focus on the contention that religions aid humans in the successful propagation of their genes by helping them to manage the complexities of the mating market. Religions help people to find, keep, and reproduce successfully with good mates. On the sexual selectionists' accounts, religions and religiosity have arisen because they enable individuals either to appeal to members of the opposite sex or to deter competitors for attractive mates or both, and because they help ensure a good pool of prospective mates from which to choose. Religions, in short, promote family values.

On the sexual selectionists' view religious accoutrements constitute *cultural signals* pertaining to an individual's desirability as a prospective mate. Exhibiting religiosity signals to prospective partners virtues they will find desirable in a mate, including fidelity (and, thus, confidence about paternity) and a willingness to invest in offspring (Miller 2007). At least some of the cultural signals religious participation broadcasts appear to be costly (though see Boyer and Baumard 2016) and in many cases *apparently* useless (at the very least), just like hypertrophic natural signals such as the peacock's tail and the Irish elk's antlers. Investing in expensive but, otherwise, pointless accessories rank among the very best signals according to the

theory, since they communicate that the organism has access to plentiful resources that it can expend on such costly yet nonfunctional items.

Mechanisms of Evolution: Cultural Selection

The third school of evolutionary theorizing about religion appeals, first, to *cultural selection* (pertaining to cells 3, 6, and 9 in Figure 2) as the principal mechanism and, second, to *groups* as an important unit of both selection and inheritance (e.g., Norenzayan et al. 2016). Cultural selectionists have probably been best known for their discussions of gene–culture coevolution, which accentuates cultural selection at the genetic level (cell 3 in Figure 2) (Richerson and Boyd 2005). The parade case here is selection over the last 10,000 years with the domestication of cattle, for genetic arrangements supporting lactase persistence, permitting people to continue into adulthood with the ability to extract nutrients from milk. Cultural evolutionists, nevertheless, do not hold that the genetic level is the only level at which cultural forces act. Cultural selection forces that range all the way from the differential transmission of cultural ideas and practices to genocide can act on the fortunes of groups as well as on those of individuals and genes.

The cultural evolutionists showcase religions' abilities to cultivate cooperation among members to the benefit of the group overall and to its individual members *on average*. A few dozen studies in CSR have generated evidence that religious participation and engagement abets cooperativeness and prosociality among co-religionists (e.g., Purzycki et al. 2018). Other studies have supplied evidence that at least some forms of religious participation and engagement also instill profound loyalties to and identification with the group (e.g., Whitehouse 2018).

Cultural selection at the group level (pertaining to cell 9 in Figure 2), dubbed "cultural group selection" (CGS hereafter) (Henrich 2004), should be distinguished from both natural and sexual selection at the group level (pertaining to cells 7 and 8, respectively, in Figure 2). The term is important, since CGS specifies the mechanism behind the group selection in question. This matters because sexual selection at the group level (for example, for certain sorts of families) is little explored and the evidence is slight (Moorad 2013). Even more importantly, though, clarity about the mechanism of selection is crucial, because natural selection at the group level has been the subject of considerable controversy among evolutionary theorists for decades. The problem is that all too often the term of choice in such discussions is simply "*group selection*" without specification of the selective mechanism involved.

In CSR, this ambiguity is compounded by the fact that David Sloan Wilson, one of the foremost advocates of natural selection at the group level (Wilson and Sober 2008), has advanced his own "multilevel selection"

account of religions (2002), which countenances both natural and cultural selection at the group level. (See cells 7 and 9 in Figure 2.) Wilson argues that selection of both sorts at the group level may make sense of cooperation within religious groups. If extensive in-group cooperation enables a religious group to function like a more or less integrated organism, it may be subject to natural selection at the group level. (This will, of course, also have consequences for the group's members and their genes.) Wilson appeals to such considerations to explain the successes of John Calvin's Geneva during the Reformation, the system of water temples in Bali, the persistence and resilience of Judaism in the face of a history of persecution, and more.

CGS, by contrast, concentrates on processes of *cultural* selection (such as the development of new technologies, enhanced fertility, war, conquest, and so on) at the group level. Here too, however, with regard to religion the focus is mostly on cooperation and commitment. That focus is born of the observation that the by-product theory does not explain the exclusivity of commitment, where it arises (Gervais and Henrich 2010).

Like the by-product account, CGS also underscores evolved cognitive dispositions. It, however, highlights *contextual* cognitive biases that contribute to cultural learning (as opposed to cognitive biases concerned with contents). So, for example, cultural evolutionists propose that humans possess a prestige bias, which inclines them to attend to prestigious people as cultural models, to heed their advice, and to imitate them (Henrich and Gil-White 2001).

CREDs and Big Gods

Joseph Henrich (2009) has argued that the possibility of self-serving duplicity by prestigious individuals serving as cultural models has led to a wide array of credibility-enhancing displays (CREDs) in religions. CREDs are actions that would be costly to agents, if they held beliefs that were contrary to those that they overtly affirm. Talk is cheap. Speakers can be deceptive, manipulating their audiences in ways that benefit themselves at audience members' expense. If, however, audience members attend to whether or not speakers reveal CREDS, it helps protect them from manipulation. Speakers who demonstrate CREDs earn audience members' trust. At least in competitive religious markets, religious speakers, whose actions conform to their avowed moral and religious standards, by such things as dutifully attending religious services and forgoing caffeine or alcohol, let alone suffering martyrdom, increase the probabilities that their audience members will remain or become subscribers to their religions.

Henrich offers a mathematical model of cultural transmission that points to the vital contribution that CREDs make to a religion's expansion and persistence across generations (in a competitive religious market). Jonathan

Lanman and Michael Buhrmester's (2016) empirical investigations support Henrich's contentions. They carried out survey research with over three hundred U.S. participants across two studies in what is one of the most competitive religious markets in history (the United States). Exposure to religious people manifesting CREDs, as opposed to religious people merely emphasizing the importance of religion, was significantly more likely to predict both participants' belief in God and their certainty about that belief. CREDs exposure also proved significantly more important than people's earlier religious engagement at predicting their levels of religiosity and whether or not they currently identified with a particular religion.

Ara Norenzayan (2013) appeals to CGS in arguing for the centrality that the emergence of morally concerned Big Gods had in solving problems of cooperation in the evolution of big groups. Such Big Gods are not rooted to a single location but are everywhere (at least everywhere that matters) all-of-the-time. This creates the possibility of their pervasive accessibility, but it also means that they are constantly around monitoring individuals' conduct and its moral uprightness. It is worth noting that in the most successful of these religions, namely, Christianity and Islam, the Big God affirms moral thought–action fusion, which holds that people are culpable even for *thinking* about doing immoral actions, whether they actually carry them out or not. Consequently, in such religions the Big God also knows and scrutinizes participants' thoughts and intentions as well (McCauley and Graham, in press).

Norenzayan (2013, xiii) lays out eight principles of Big Gods. The fifth of those principles, which states that "Religious actions speak louder than words," reasserts Henrich's CREDs hypothesis. The third principle is "Hell is stronger than heaven." Big Gods' penalties for bad behavior are more effective at ensuring prosocial conduct than are their promised rewards for righteousness. The seventh and eighth principles, respectively, are "Big Gods for Big Groups" and "Religious groups cooperate in order to compete." They encapsulate Norenzayan's proposal that the emergence of Big Gods was a noteworthy mechanism for fostering the emergence and stability of large-scale societies and for providing them with an added competitive edge.

Alternative Evolutionary Scenarios

Norenzayan's proposal has received criticism. Some raise concerns about the evidence, pointing to the influences of the spatial diffusion of religions and of the Abrahamic faiths especially resulting in the nonindependence of data points propounded in support of the Big Gods account (Atkinson et al. 2015). Other critics have raised what they take to be historical counterevidence concerned with particular ancient civilizations, such as

Rome (Martin 2014; Baumard and Boyer 2015) and China (Sarkissian 2015).

Harvey Whitehouse and his colleagues (2019) coded hundreds of religions from around the world and across history for both social complexity and big, powerful gods showing moral concern. They found a connection between the two; however, their findings suggest that social complexity typically *precedes* the emergence of moralizing Big Gods (including Norenzayan's Big Gods). That finding, of course, suggests that if there is a causal relation between the two, then it goes in the opposite direction from the one that Norenzayan proposes.

Norenzayan and his colleagues (Beheim et al. submitted) argue, however, first, that the Whitehouse et al. (2019) analyses fail to correct for the biases in "the dating of first appearance dates" of moralizing Big Gods, that is, it takes a while for this information to appear in the archaeological and historical records (when the latter exist) and, second, that they treat missing data as the absence of such gods. The Norenzayan group argues that correcting for either analytical flaw reverses the temporal and any putative causal order in the data.

Such controversies invite alternative theoretical treatments. Although Pascal Boyer and Nicolas Baumard (2016) suspect that religion is probably real enough in modern Western societies, they contend that it risks ethnocentrism and anachronism to project such conceptions of religion into ancient history, let alone human prehistory. They are skeptical that there is anything like *religion* that has evolved since those distant times.

Boyer and Baumard (2016) advance an alternative account of when big gods, that is, impressively powerful gods (as opposed to Norenzayan's powerful *and morally concerned* Big Gods), begin to exhibit moral concern. The same evolutionary and cognitive considerations grounding the by-product theory inform Boyer and Baumard's account. They argue that evolved dispositions of mind and, in particular, those concerned with such matters as morality, sociality, and the establishment and maintenance of coalitions, suffice to build up the norms and social institutions that sustain large-scale societies (Boyer 2018).

They maintain that in early large-scale societies groups of specialists dominated the provision of different goods and services, including those we would count as *religious*. Politically connected priestly guilds cornered that market (Diamond 1998). Boyer and Baumard contend that the vast majority of religious arrangements in human history, including those early large-scale societies, were *not* open, competitive markets. Sometimes the gods were big enough and powerful enough to look like possible candidates for Norenzayan's Big Gods, but like other critics of Norenzayan's position, Boyer and Baumard argue that usually such big gods were *not* morally concerned. A priestly guild, allied with both the political leadership and the powerful gods with whom they intervened, was mostly concerned with

forging identities with and building loyalties to that regime, garnishing its share of the society's resources while doing so.

Boyer and Baumard (2016) conjecture that morally concerned, powerful gods arise—for example, in the so-called Axial Age—when the substantially increased prosperity of elites in those large-scale societies enabled them to pursue new "life history strategies" that focused on patient, disciplined regard for the long haul (Boyer and Baumard 2016, 13). Following such a strategy of long-term investment (on multiple fronts), however, is open to innumerable opportunities for exploitation. It is at *that* point that Boyer and Baumard suspect that the powerful big gods probably manifested their newfound moral concerns. They altered the prevailing cosmic picture as a means, first, for legitimating the kleptocracies that benefitted these prosperous elites and, second, for enforcing social arrangements, through their monitoring of people's behaviors, that tended to protect those elites' long-term investments, including widespread cooperation.

Obviously, the many controversies about the origins, both cognitive and evolutionary, that is, both proximate and ultimate, of religions and human religiosity are not to be resolved here. Two brief observations must serve.

The first concerns this contrast between ultimate and proximate, that is, evolutionary and cognitive, explanations of religions and religiosity as a further illustration of explanatory pluralism. The interdigitation is inevitable of theories, evidence, and research pertaining to ultimate accounts of the evolution of large-scale distributed systems such as large-scale societies and religions and proximate accounts of the cognitive and cultural mechanisms that have contributed to and resulted from those evolutionary developments (McCauley 2009). Evidence for proposals about the evolution of large-scale societies and religions comes from the exploration of their multiple consequences for the structure and short-term operations of the minds and the smaller human groups that populate them (Henrich 2016). Similarly, theories and findings in cognitive science about cognitive mechanisms such as theory-of-mind (and the capacities for learning and teaching that it informs) set plausibility constraints on proposed evolutionary scenarios, especially those appealing to cultural selection (Tomasello 1999). Those controversies surrounding Norenzayan's theory not only demonstrate its testability and, thus, its scientific character. They also show productive and insightful ways that CSR researchers have sought to integrate bodies of theory and evidence across levels of analysis and across multiple fields (*including* the history of religions).

Second, advocates for selective forces at the group level, whether by natural or by cultural selection, acknowledge the merits of *all* of the evolutionary hypotheses about religion scouted heretofore (Wilson 2002, 45; Atran and Henrich 2010). It is perfectly possible for evolutionary proposals in all nine cells, the controversial status of some notwithstanding, not only to be *consistent* with one another but, in fact, *to all be true*. (Note that

is not the same as saying that they are all true.) That could be because, for example, each explains a portion of the variance with regard to any explanandum that the others do not or because each explains different features of the explanandum. All of them could be delivering a piece of the right story about religious phenomena (except, of course, when two hypotheses out to explain the same thing are inconsistent with one another, such as Norenzayan and Boyer and Baumard's conflicting accounts of the origins of big, powerful, *morally concerned* gods).

Coda: Implications for the Religion–Science Dialogue

CSR's explanations are like any other scientific explanations (McCauley 2014a). They are theoretical, ergo, they are selective and not all-encompassing. Instead, the best theoretical explanations of science provoke new and deeper questions. Explanatory pluralism affirms that successful reductive explanations also share these traits and do just that. Reductive explanations do not discredit but, rather, uphold the reduced account at the higher level. Explanatory pluralism headlines the fact, however, that not all interlevel influences are bottom-up. Context often matters for some kinds of explanatory questions. That context matters, then, is no grounds for protectionism about religion.

Traditionally, the most prominent dimension of the religion–science dialogue concerns their conflicting explanations for aspects of the natural world. The scientific explanations of features of religions and religiosity that CSR has provided, however, seek to naturalize the religious impulse itself. Consequently, they have drawn extraordinary attention from intellectuals (as opposed to laypersons) (Van Slyke 2011; De Cruz and De Smedt 2015).

CSR poses a special problem, because it not only supplies explanations that do not obviously square with religious explanations, but also goes some way toward explaining the cognitive wellsprings of those religious explanations. Many worry that CSR thereby threatens to debunk religion (Van Eyghen, Peels, and van denBrink 2018). Religions' defenders have responded in either of two ways. The first group argues that most of CSR's claims and the claims of religion are *consistent*, because most of CSR's explanations are basically orthogonal to religious claims (Visala 2011). The second scouts a stronger position, holding that the claims of CSR and at least some religious claims are not only consistent but, furthermore, *cohere* on a Reidian epistemology (Barrett 2011; Clark and Barrett 2011). Suffice it to say that that position's truth is not obvious. The perennial presumptions pertaining to the empirical world, to which people in all eras and communities assent, which Reid emphasizes, sometimes look less secure since the rise of Darwinian evolution by means of natural selection, post-Newtonian physics, cultural anthropology, and cognitive science (McCauley 2011).

No matter what any of the sciences explain, including CSR's explanations of religious impulses, religious features of human populations are here to stay (which is what those explanations in CSR imply). Religious ideas possessing familiar features that CSR has ably delineated will always carry an allure for the human mind. That allure is not insurmountable, but it persists and intrudes in cognition (e.g., Kelemen et al. 2013). Some point to secularization in many First World nations and to recent trends (e.g., the growing number of "nones") even in the United States as evidence to the contrary (Talmont-Kaminski 2013). Even in the most secular societies, though, the gods appear to be only a disaster away (Sibley and Bulbulia 2012).

In light of both explanatory pluralism in science and a range of theories and findings in the cognitive sciences, the project of the New Atheists to argue religiosity away by, in part, explaining it away seems unpromising. Although some new atheists (Dawkins 2006; Dennett 2006) cite work in CSR approvingly, they seem not to have appreciated its import. First, religious representations will reliably erupt in populations of human minds. Their allure does not depend, first and foremost, on their rational status. Religions promulgate materials that *automatically* and instantaneously cue unconscious, intuitive cognitive systems, whose operations, to repeat, persist and intrude. People do not subscribe to these ideas because they were argued into them, and they are unlikely to surrender them because of argument either. People are rarely quickly argued out of long-held positions that they never held on the basis of argument in the first place. Furthermore, the New Atheists should attend to related work in CSR, documenting human beings' abilities to accommodate *both* religious and scientific views simultaneously (Legare and Gelman 2008; Legare et al. 2012). To ignore such findings is born of underestimating the imagination and creativity of the religious and of theologians, in particular, who abet intellectual maneuvers for preserving the hands of the gods in human affairs.

To be clear, however, nothing about that research furnishes reasons either for antiscientific protectionism about religions and religiosity or for downplaying either CSR's achievements or its promise to advance our understanding of both.

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Note

1. For dissent, see Palmer and Begley (2015).

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