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Evolutionary Science and the Study of Religion

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ABSTRACT   In this article, the authors introduce the general rationale behind the evolutionary cognitive science of religion, answer some sensible humanistic objections to it and defend the promise of a 'consilient' approach to advance the academic study of religion.

KEY WORDS   religious studies; cognition; evolution; reductionism; consilience

This thematic issue of *Religion* has its origins in a panel on the topic of 'The Evolution of Religion' hosted by the new Cognitive Science of Religion Consultation at the 2009 Annual Meeting of the American Academy of Religion in Montreal. The purpose of that panel was to bring leading practitioners of evolutionary approaches to the study of religion into dialogue with more traditionally trained scholars of religion. Because many interested in the evolutionary study of religion come from a background in psychology or biology, and have little or no formal training in religious studies, we believe that classically trained scientists stand to benefit from the sort of deep and culturally 'thick' expertise of that scholars of religion possess (Stausberg 2010a). At the same time, these naturalists bring with them methodological toolkits and broad theoretical frameworks that have the potential, we believe, to renew the academic study of religion.

Despite the potential benefits of this sort of collaboration, many scholars of religion have been resistant to the idea of adopting evolutionary or cognitive scientific approaches to the study of religion, as well to other phenomena presumed to be uniquely human. Some have been broadly dismissive of the state of the field (Smith 2009), while others view the very idea of engaging in a scientific treatment of humans with suspicion, or even moral repugnance (Cho and Squier 2008). Because of the many tensions that surround the very idea of approaching religion from a naturalistic perspective, our introduction responds to common concerns about the basic project of integrating evolutionary approaches into the scholarly study of religions. We believe that dispelling unhelpful stereotypes and prejudices surrounding science is an important first step in helping to bridge what we view as an extremely unhelpful Science–Humanities divide. Naturalists and scholars of religion study the same world. Both groups stand to benefit from locating religion in that same world, as a target for collaborative investigation.

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In Section 1 we explain what we mean by an evolutionary science of religion. Section 2 responds to eight recurring objections to evolutionary approaches. The concluding section then briefly sets the stage for the contributions that follow in this issue.

Evolution as a framework for the academic study of religion

In his keynote address to the 20th World Congress of the International Association for the History of Religions, David Sloan Wilson characterized the evolutionary study of religion as a 'zone of no controversy.' Later in his talk, however, Wilson also claimed that 'if evolutionary hypotheses are not controversial then they are probably not interesting.' How can evolutionary religious studies remain simultaneously non-controversial and controversial? Was Wilson confused? Not at all. Like most naturalists, Wilson distinguishes between particular evolutionary theories and evolution as a framework for discovery – the 'zone of no controversy' that enables progressive research of the kind that characterizes research in the natural sciences. By 'progressive research' we mean research that accumulates knowledge in a step-wise fashion, so that the results of past research forms a platform upon which current is built, and which then elaborates future platforms. The key to progressive research is the formulation of conjectures about the world in terms of hypotheses, which, though controversial, may nevertheless be resolved in the course of hypothesis testing by comparing the different predictions of hypotheses against discriminating data. With regard to evolutionary controversies, the prospect that evolutionary controversies may eventually be resolved through hypothesis testing offers one reason for thinking of evolutionary hypotheses as interesting. Researchers disagree, and this fact enables an accumulation of knowledge within the subfields of evolutionary religious studies that can be called 'progressive' because it is knowledge that expands in a step-wise fashion, with a clear vector of improvement.

However, what does it mean in practical terms to think of evolution as a 'framework' in which to conduct research? Wilson and others notice that despite the many disagreements that animate the scholarly study of religion there is one assumption that all scholars of religion share – or at least ought to share – namely, their commitment to methodological naturalism. The scholarly study of religions operates from the assumption that religion is an entirely human phenomenon, and seeks to understand religion in purely naturalistic terms. Of course, many scholars of religion harbor religious commitments. Methodological naturalism does not require that any scholar embrace atheism; however, the scholarly study of religion *does* require them to bracket these commitments when they pursue their scholarly work, which is to be framed in a manner that is broadly consistent with the other disciplines that investigate our world. The project of integrating the findings of science to religious faith is a theological project. Commitment to methodological naturalism in the scholarly study of religion is generally tacit; indeed explicit discussion of this commitment need never arise. However this commitment defines scholarship in religious studies every bit as much as it defines scholarship in chemistry, molecular biology, dentistry, economics, indeed in any field of study that purports to investigate the world.

Much of the scholarly study of religion as it is performed today is largely descriptive, and the study of religion has been largely a project of documenting religious

diversity. What typically passes for 'theory of religion' is probably better characterized as 'philosophy of religion,' in the sense that 'theories of religion' typically take the form of assertions – or arguments whose premises take the form of assertions – that are not amenable to empirical testing. For this reason, such theories lack a progressive quality. At the same time, while the manifold projects of documenting religious diversity have managed to avoid the interminable disputes that characterize the theoretical quarters, these descriptions have yet to eventuate in anything approaching a progressive science. They do not lead to a clear vector of improvement. Debates are not resolved activities that convert ideas into hypotheses that are evaluated against evidence. Antinomies persist, sometimes with high levels of acrimony. There is nothing intrinsically wrong with description and philosophy. However, we believe that scholarship in religious studies has something more to offer, namely, empirically testable *explanations* of religion that channel scholarly efforts in a way that leads to intellectual growth.

For those scholars who are interested in the systems involved in religious cognition and behavior, evolution is a 'zone of no controversy' precisely because there are only two explanations for design in nature: a person made it, or design is the result of a blind process of variation generation combined with selection pressures called 'natural selection.' Because religious cultures are elaborated and conserved over many generations, and because the religious thinking is also strongly affected by genetic endowment, it is reasonable to explore the possibility that evolution provides a general framework for the explanation of those systems that cause religion. Scholars of religion would do well to appreciate their tacit commitment to the evolutionary framework, *qua* methodological naturalists. Commitment to this framework does not imply commitment to any specific evolutionary hypothesis: the controversial part of scholarship. The importance of the evolutionary framework rather lies in its ability to organize descriptions of religious diversity, to refine and motivate specific explanatory hypotheses and to facilitate the development of shared empirical techniques for their evaluation.

Eight objections to the evolutionary science of religion

What is the basic rationale behind the evolutionary science of religion?

Short answer: the basic rationale behind the evolutionary science of religion is the principle of consistency; the scholarly study of religion differs from theology by locating religions in nature, which means that our theories of religion must be consistent with other disciplines that study nature. There is no principled reason to restrict the evolutionary study of religion to genetic systems, and many evolutionary researchers use a naturalized conception of 'culture' to explain the systems that express and conserve religions (Geertz and Markusson 2010; Gervais et al. 2011). We will return to the argument that culture escapes naturalistic treatment shortly, for we strongly reject any such claim.

In recent decades, a growing number of scholars have argued in favor of 'conceptual integration,' 'vertical integration' or 'polychromatic integration' (Pinker 2002; Saler 2010; Slingerland 2008a; Tooby and Cosmides 1992: 4) or achieving 'consilience' between the various branches of the natural sciences and the humanities (Slingerland and Collard 2011a; Wilson 1998). While terminology varies, the

basic principle these scholars advocate is the same: researchers must seek mutual consistency for our theories of the world, regardless of disciplinary affiliations, if enduring progress in any one of these disciplines is to be possible.

155   Partly because its early advocates tended to come from outside of the humanities, calls for consilience have often struck humanists as attempts at intellectual colonization. Such imperialism is understandably off-putting for humanists, yet it could not be farther from what consilience demands. Accountability does not require that one discipline be expressed in the terms and concepts of another; it merely involves integrating the various branches of knowledge into a framework
160   where they may be broadly reconciled with one another. The implication of this principle is not a single science – there are no theories of everything in science – but rather a set of mutually consistent explanations within the many subfields of science. Where inconsistences arise, researchers seek discriminating evidence.
165   The project of conceptual integration, then, is an attempt to develop a new, shared framework for the sciences and humanities. What does this consilience entail, practically, for scholars of religion? On the one hand, consilience demands that scholars of religion attend to discoveries in the sciences that study
170   humans and other social species. The results in these fields strongly challenge, for instance, such deeply entrenched humanistic dogmas as the 'blank slate' theory of human nature, strong versions of social constructivism and linguistic determinism and the ideal of disembodied reason (Pinker 2002; Slingerland 2008a). The process of 'learning,' for instance, is hardly the sort of domain-
175   general absorption of information from the environment that many humanists assume. Indeed, for many domains, learning triggers the activation of architectures whose designs are mainly specified by the individual's genetic endowment (Barrett and Kurzban 2006; Cosmides and Tooby 1994; Gelman 1998). Some research suggests that many facets of religious cognition and behavior have a
180   genetic basis (Boyer 1994; Bulbulia 2005; Kirkpatrick 2004), even if these genetic designs interact in complex ways with epigenetic resources. (See Bulbulia and Sosis [2011]; Kirkpatrick [2011]; Gervais et al. [2011]). By the same token, as scientists explore areas traditionally studied by the humanities – the nature of culture, religion, ethics, epistemology, literature, consciousness, emotions or aesthetics –
185   they will need to draw on humanistic expertise if they are to effectively decide what sorts of questions to ask, how to frame these questions, what sorts of stories to tell in interpreting their data, and how to grapple with the ethical and social repercussions of scientific discoveries about complex human phenomena. This two-way dynamic has, unfortunately, been too often ignored by earlier pro-
190   ponents of consilience. Some scholars have begun to refer to a 'second wave' of consilience (Slingerland and Collard 2011b) in order to distinguish this sort of two-way, mutually informed interaction between the sciences and humanities from certain earlier versions that gave short shrift to the importance of culture or the relative autonomy of human levels of explanation. It is important to empha-
195   size that the second wave of consilience centers on collaborative social practices, not doctrines and manifestos.

There is one fundamental sense in which embracing consilience may require a significant change in perspective for humanists: a change that somewhat expands the
200   definition of methodological naturalism formulated above. Scholars of religion are already accustomed to bracketing explicitly theistic or other supernatural claims

when going about their work. Arguably[1] the most important impediment to embracing consilience is a lingering metaphysical belief that is so deeply entrenched in basic human cognition that it can only be bracketed, not effaced: the belief that the special qualities of the human *Geist* make humans and their unique products – i.e., culture – entirely independent from the chain of naturalistic explanation.

Indeed, such a belief has been central to the humanities' conception of themselves. One of the primary ways in which the humanities typically distinguish themselves from the sciences is to invoke the distinction between 'thick' versus 'thin' description (Geertz 1973; Ryle 1971), or *Verstehen* (sympathetic understanding) versus *Erklären* (mechanistic explanation) (Dilthey 1989 [1907]; Gadamer 1975). Although it is generally not explicitly stated, it is clear that the distinction between these two modes of knowledge are, in turn, fundamentally based upon an intuition that there are two utterly different types of substances in the world that operate according to distinct principles: mind and matter (Corbey 2005; Slingerland 2008a). The humanities or *Geisteswissenschaften* ('sciences/knowledges of the *Geist*') study the products of the free and unconstrained spirit or mind – literature, religion, art and so on – while the natural sciences concern themselves with deterministic laws governing the inert kingdom of unthinking objects. Many of the other factors involved in the resistance to consilience can be seen as ultimately founded upon mind-body dualism: cries of 'reductionism,' for instance, are typically inspired by violations of the mind–body distinction, and the concept of human beings as uniquely endowed with mind and its accompanying powers (thought, free will) motivates the idea that there is a fundamental distinction between the human and the non-human, or between the determinism of genes and the free play of culture.

Viewing the sciences/humanities divide from this perspective, consilience can be seen as a call to move beyond mind–body dualism toward a methodological naturalism: to work under the assumption that the realm of the human is coextensive with the realm of nature, without ghostly remainders. This call, in turn, is motivated by the contention that mind–body dualism – the idea that human bodies are uniquely inhabited by an autonomous 'Ghost in the Machine' – is no longer empirically defensible. The mind is the body, the body is the mind, and this mind–body unit appears to be a naturalistic system produced by evolution. This is where methodological naturalism – the practical commitment to bracketing belief in supernatural agents and modes of causation while engaged in academic inquiry – cannot be cleanly separated from at least some provisional ontological commitments (some form of 'metaphysical naturalism'). Our best current understanding of the world suggests that human beings are fully natural systems – i.e., our functioning, cognitive or otherwise, can be explained without remainder by the principles that govern the non-human world – and this is ultimately the main justification for embracing a consilient approach grounded in methodological naturalism.[2] Methodological naturalism is not a doctrine; it is rather a practical rule of thumb that is favored because it works. Only those sciences that have adopted methodological naturalism have exhibited progressive growth; none that have disregarded it have gone anywhere. To abandon methodological naturalism

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[1] For detailed arguments along these lines the reader is referred to Dennett (1995); Corbey (2005); Slingerland (2008a: Ch. 6), and the essays in Slingerland and Collard (2011a), especially those in section 1.

[2] For a more extensive defense of this argument the reader is referred to Slingerland (2008a: 6) and Slingerland and Collard (2011b).

appears fruitless. Indeed one of the most impressive areas of growth in evolutionary religious studies has been in our understanding of why people are so powerfully drawn to the essentializing dualisms that give anti-naturalistic doctrines their intuitive appeal (Bering and Slingerland 2008a: 3, 6; Bloom 2004).   **Q1**

Embracing this sort of consilience also takes one beyond the tired 'nature–culture' distinction: 'culture' no longer seen as designating some sort of autonomous *Über-Geist* obeying only its own laws, but rather as a label loosely picking out certain elements of an organism's environment that are perceived to be products of previous acts by conspecifics.[3] These elements are not ghostly or non-natural: they are marks on paper, built environments, neural patterns in long-term memory, motor programs and other sub-sets of the natural world. Consilience does not dismiss 'culture,' as is sometimes charged, but rather works under the assumption that culture is in no way distinct from or opposed to 'nature.' Ultimate vindication of this sort of evolution-based, consilient approach would come from achieving advances in a field such as religious studies that can be clearly perceived by scholars in the field as advances – and, moreover, advances that could only have been achieved by adopting the consilient framework.

Why would a scholar of religion be interested in 'consilience'?

Short answer: because consilience can provide explanatory frameworks that make interdisciplinary cooperation and communication possible, and this, in turn, makes understanding religion – the ultimate goal of scholars of religion – more likely.

Something that should motivate scholars of religion to show openness to new approaches is that the fact that, despite the impressive research produced by individual scholars of religion, religious studies as a field has for the most part yet to produce any progressive research programs. Attempts to generalize from scholarly observations have given rise to interminable disputes. This lack of cumulative research means that the achievements of individual scholars, however striking and innovative, do not lead to future achievements in a systematic, predictable manner. While interminable disputes may be expected in fields such as theology, the study of religion is ultimately an empirical discipline. Scholars of religion study people, the ways institutions and cultures affect people, and the ways that people affect institutions and cultures, over time. If we accept the assumption that people are a part of nature, not a separate domain of nature, we should be open to combining traditional 'thick' historical, linguistic and ethnographic methods that have always formed the core of religious studies which methods whose results – though perhaps narrow – allow for agreement and provide both explanatory power and an increasing depth of understanding.

What is 'evolutionary cognitive science'?

Short answer: the integration of evolutionary biology and cognitive science.

When the topic of 'evolution' arises in humanistic circles, concerns are often expressed about the normative or teleological implications that the word possesses in ordinary parlance. 'Evolved' is sometimes understood as 'better,' and evolution

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[3]For more on naturalistic accounts of culture, see Sperber (1996) and Richerson and Boyd (2005), as well as the essays collected in Brown (2008); Carruthers et al. (2007); Slingerland and Collard (2011a: section 3).

is sometimes portrayed in non-scientific circles as trending toward some particular, ideal goal. Such implications are particularly worrisome when it comes to the study of religion, where early theorists *were* working with teleological assumptions of religious culture, according to which Judeo-Christian religion represented the end goal toward which more 'primitive' forms of religion were striving to develop.

It is important to realize that the scientific understanding of evolution that informs the evolutionary study of religion bears little resemblance to these mistaken views of theological progress. Rather, evolution is a process according to which random variation, inheritance, and selection lead to an accumulation of designs. The process is entirely blind with regard to the future. 'Later' does not mean 'better' or 'more advanced'; the only target that natural selection tends to optimize is relative reproductive success (see Sosis and Bulbulia, this issue).   **Q2**

Modern evolutionary theory began in earnest with Darwin's theory of evolution by natural selection. The theory offers an account of biological design. This account is interesting because it does not appeal to any designer, thus minimizing attributions of complexity to nature. The theory can be stated simply. Wherever there is variation, high-fidelity inheritance and selection, biological designs will accumulate. Thus designs that favor relative reproductive success will be selected, naturally. Prior to Darwin, there was disagreement about the origins of biological designs. After the integration of Darwin's theory with Mendelian genetics in the late 1930s, there has been a universal consensus. No serious biologist doubts that evolution by natural selection is the primary engine of change.[4]

Cognitive science, which began in earnest in the middle of the 20th century, is an interdisciplinary field populated by linguists, philosophers, computer scientists, anthropologists, neurobiologists, psychologists, mathematicians, literary theorists, engineers, and – more recently – by scholars of religion. Cognitive scientists notice that, fundamentally, all thought (cognition) involves the processing of information. Cognitive theories seek explanations for the computational processes that mediate cognition. Cognitive scientists observe that we can study the structures of the mind in advance of understanding how the physical substrates of mind – neurons and environments – physically interact to produce thoughts. The operations of thought are sometimes called 'computations.' The states that are transformed during cognition are sometimes called 'representations.' These terms carry perhaps unfortunate connotations: to some, for instance, they suggest an approach that views humans as computers or robots. However, such confusion is purely terminological, because humans think – process information – in a manner obviously different from computers and robots. Noam Chomsky has illustrated this point by using the analogy of birds and airplanes, both of which 'fly,' though very differently. We might use a different word to describe these activities (as we do for submarines, which 'sail,' and fish, which 'swim'), but in the end our interest is not in words but in explanations for the world (Chomsky 2000). The key point is to keep our meanings clear. Moreover, a 'computational' approach to the mind in no way implies a disembodied 'brain in a vat' view of human cognition, or a denial that

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[4]This is not to deny that there is much debate at the margins of evolutionary biology; in the articles that follow we will see much evidence of these debates in the naturalistic study of religions. 'Debates' in the biological sciences, however, are in principle resolvable, and indeed debates do resolve. They do not assume the hopeless character of interminable antinomies that define much debate in the certain branches of the humanities.

human cognition can take place in distributed, extended networks encompassing various dimensions of an individual's physical/cultural/social environment.[5]

Evolutionary cognitive science (ECS) attempts to integrate biological theory with cognitive science. The field supposes that cognitive designs evolve to foster success. An older, and still quite common, term for ECS is 'evolutionary psychology,' which we here avoid because it has become associated with a more narrow view that all significant design in the human mind is the product of selection pressures functioning on our ancestors in the Pleistocene. More recent attempts to integrate evolutionary theory with cognitive science have renewed interest in the role of cultural evolution in the production of thought, as well as role of gene-culture coevolution.[6] An appreciation that evolution can operate in a 'fourth dimension' of epigenetic substrates, or that human cognition is a result of dual inheritance from interacting genetic and cultural streams of evolution, suggests a perspective on thought that is somewhat broader than 1990s-style evolutionary psychology (Jablonka and Lamb 2006). We therefore favor the more inclusive term 'evolutionary cognitive science' as a way of marking this change in perspective, as well as our hope that evolutionary and cognitive treatments of religion will become more tightly integrated (Bulbulia 2004a).

Is 'religion' really a unitary phenomenon that can be explained by evolution?

Short answer: this is a poorly formulated question.

Obviously, any attempt to understand the 'evolution of religion' must assume that its object of study is circumscribed in some manner. Of course, debates about defining religion have been at the centre of religious studies as a discipline since its inception (Stausberg 2010). While there have been those who have **Q3** argued that 'religion' as a category is a culturally parochial product of the Western mind (M. Taylor 1998: 6–7, 15), this sort of assumption is a non-starter for any cross-cultural research program. As with many objects of study in the humanities, 'religion' is probably best seen as a radial or prototype category, anchored by a central feature or cluster of central features (Saler 2010).

Most work in the evolutionary cognitive science of religion hypothesizes that 'religion' refers to systems of belief and practice that revolve around commitments to supernatural, anthropomorphic beings ('gods'). Many, if not most, 'religions' that have existed historically in cultures around the world fit within the boundaries of this category. There has, however, always been debate around the edges. Theravada Buddhism, to take one commonly cited example, has always possessed a folk tradition that is clearly and unabashedly theistic, but many have argued that the austere views about *anatman* and the law of karma expressed by Siddhartha Gautama, as laid out in the Pali Canon, are better seen as philosophy than 'religion.' The early Confucian thinker Xunzi formulated something very much like a Durkheimian, functionalist model of religion, arguing forcibly against 'superstitious' belief in literal ghosts and spirits and portraying the Confucian Way as a human

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[5]A recent critique of the evolutionary cognitive study of religion by Nathaniel Barrett (2010) is therefore somewhat beside the point.
[6]See Richerson and Boyd (2005) and Henrich and McElreath (2007).

creation rather than a revelation from Heaven and Heavenly endowment. This leads some scholars to portray him as a genuinely secular, even atheist thinker, but others argue that Xunzi clearly saw the Confucian Way as constituting an ultimately sacred order, and is thus best seen as a religious reformer.[7] Pushing further to the edge, we find Charles Taylor's argument for Enlightenment 'rationalism' as ultimately 'spiritual' in nature, with the role once played by supernatural, anthropomorphic beings now filled by metaphysical entities such as 'human rights' or 'dignity,' which nonetheless fulfill the same overall function: to ground normative evaluations and provide narrative meaning (Taylor 1989; 2007).

Interestingly, there are scholars working on the cognitive psychology of religion who have been independently moving in something like this direction, arguing that a powerful, and yet ultimately empirically indefensible, sense of ultimate 'meaning' or cosmic narrative is a basic human cognitive default (Bering 2002; Kelemen 1999; Kelemen and Rosset 2009). This work suggests that our most useful definition of 'religion' may have to extend beyond merely a belief in fully anthropomorphic, supernatural beings. Some scholars in the evolutionary cognitive science of religion have been trying to integrate empirical work on human cognition with a 'naturalized' version of Taylor's model, whereby 'religion' takes on the broader sense of a framework of ultimately non-verifiable, metaphysical claims – not necessarily involving explicit theism – the unique function of which is to subserve 'strong' or moral evaluations, and therefore enhance in-group cooperation and out-group hostility (Slingerland manuscript). Such an understanding of religion is obviously related to Durkheim's definition of religion as 'a unified system of beliefs and practices relative to sacred things … that unite into one single moral community called a Church, all those who adhere to them' (Durkheim 1913/1915: 44), or David Sloan Wilson's model of religion as 'as a product of evolution that enables groups to function as adaptive units – at least to a degree' (Wilson 2002: 6). Others in the community find such an expansive definition of religion to be too broad to be useful as an explanatory category. Scott Atran and Ara Norenzayan, for instance, define 'religion' as a set of 'passionate communal displays of costly commitment to counterintuitive worlds governed by supernatural agents' (Atran and Norenzayan 2004: 713), seeing all of these features – emotional commitment, costly displays, community, and counterintuitive, anthropomorphic, supernatural agents – as central to the category of 'religious.'

Ultimately the question of how best to define 'religion' centers on one's pragmatic concerns, and deciding the relative usefulness or power of any particular definition of religion is an empirical issue.

Aren't evolutionary 'theories' really 'Just-So' stories?

Short answer: not at all.

One objection to biological theories of religion is that they trade in 'Just-So' stories – *ad hoc* explanations grounded in intuition rather than facts – a critique originally leveled by Stephen Jay Gould and Richard Lewontin (Gould and

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[7]See Campany (1992) on the Durkheim/Xunzi connection, and Machle (1976) and Ivanhoe (1991) on the debate concerning Xunzi as a 'religious' thinker. For a broader discussion of the issue of Confucianism as a religious or secular mode of thought, see Taylor (1990).

Lewontin 1978) against the view that 'adaptationism' is the only engine of evolutionary change. Until his death in 2002, Gould remained a passionate and high-profile critic of what he came to call 'ultra-Darwinian fundamentalism' in evolutionary studies, especially evolutionary psychology. In a series of articles – many of them in popular outlets and aimed at a humanistic audience, such as two pieces published in the *New York Review of Books* (*NYRB*) in 1997 (Gould 1997a; 1997b) – he gave the many non-biologists who were his primary audience the impression that there was genuinely a debate in biological circles about the importance of selection pressure and adaptation to the creation of biological design.

Nothing could be further from the truth. To begin with, Gould's 'ultra-Darwinians' are an absurd strawman: as many outraged respondents explained in careful detail in the responses to Gould's *NYRB* piece, no serious student of evolutionary theory denies the importance of byproducts or non-selective processes such as genetic drift. Moreover, evolutionary hypotheses concerning the origins of a particular cognitive capacity or behavior are not 'Just-So stories' because they are not stories at all, but rather hypotheses designed to be falsifiable and also to mesh with our current best knowledge about both history and biology. As Steven Pinker notes,

> The standards of the field require a good empirical fit between the engineering demands of an adaptive problem and the facts of human psychology. The former is grounded in game-theoretic and other optimality analyses, in artificial intelligence and artificial life simulations, and in relevant sciences such as genetics, physiology, optics, or ecology. The latter is based on converging evidence from experiments with children, adults, and neurological patients and from survey, historical, ethnographic, paleoanthropological, archeological, and economic data. (Pinker 1997: 55)

Perhaps most importantly, the feature that most sharply distinguishes evolutionary hypotheses about design from idle cocktail-party speculation is that their reasoning often ends up predicting, and uncovering, completely unexpected design features. The interest of biological models is that they enable us to look for designs that we might otherwise miss. As John Tooby and Leda Cosmides point out in their response to Gould's *NYRB* pieces, Gould's 'Just-So story' charge in fact represents an inversion of reality:

> Gould once again propagates his famous claim, accepted naively by nonbiologists, that the adaptationist program as practiced by leading researchers consists inherently of post hoc and unfalsifiable storytelling about the imagined ancestral functions of design features that *one already knows about*. This exactly reverses the practice: Given that we know so little about the human brain and cognitive architecture, what researchers most desperately need are powerful theoretical tools that can help them design experiments to more efficiently search for otherwise unsuspected organization – that is, for *design features that have not yet been observed*. Modern selectionist theories are used to generate rich and specific prior predictions about new design features and mechanisms that no one would have thought to look in the absence of these theories, which is why they appeal so strongly to the empirically minded … As we pointed out in the *Adapted Mind* [Tooby and Cosmides 1992], 'an explanation for a fact by a theory cannot be post hoc if the fact was unknown until after it was predicted by the theory and if the reason the fact is known at all is because of the theory …' Even when

Q4

adaptationists start with a known phenomenon, hypotheses about function are used to make predictions about new and uninvestigated aspects of design. (Tooby and Cosmides 1997)

The sort of design or function-oriented hypotheses formulated in evolutionary studies are a basic feature of scientific inquiry, and, as David Sloan Wilson has observed, '[p]roperly understood, "Just-so story" is just another phrase for "untested hypothesis"' (Wilson 2007: 62). Wilson, like Tooby and Cosmides, notes that such hypotheses are not only eminently testable, they also have the power to reveal previously unimagined design features of the world around us. He has called this the power of evolutionary thinking to 'transform the obvious,' citing as a stellar example Darwin's account of a field trip he took as a young man with his professor, Adam Segwick, to a valley in Wales for the purpose of fossil hunting:

We spent many hours in Cwm Idwal, examining all the rocks with extreme care, as Sedgwick was anxious to find fossils in them; but neither of us saw a trace of the wonderful glacial phenomena all around us; we did not notice the plainly scored rocks, the perched boulders, the lateral and terminal moraines. Yet these phenomena are so conspicuous that … a house burnt down by fire did not tell its story more plainly than did this valley. If it had still been filled by a glacier, the phenomena would have been less distinct than they are now (Darwin 1887 [1958]: 70; cited in Wilson 2007: 252)

At the time of Darwin's initial trip, the theory of glaciation had not yet been proposed; looking back at his experience in hindsight, Darwin finds it astounding that one could spend so much time in such a valley and *not* see the relevant evidence. As Wilson observes, this passage 'wonderfully illustrates *the need for a theory to see what is in front of our faces*' (2007: 252).

We trust that the essays that follow in this forum will illustrate all of the points made above. Adaptationist hypotheses will be pitted against byproduct and other null hypotheses, each being utilized to produce discriminating predictions. Obvious facts about human beings – that we have an almost irresistible tendency to believe in invisible, power beings that appear not to exist, or that we can be induced to cooperate closely in huge groups of unrelated, anonymous strangers – will be transformed into something strange and in need of explanation. Unlike tales about how the leopard got his spots, any adaptationist theories advanced in the pages that follow will endeavor to generate reliable and unexpected knowledge about human cognition and behavior.

Aren't evolutionary theories 'reductionistic'?

Short answer: yes, in the manner that all useful scholarship is reductionistic.

Any attempt to describe or explain a feature of the world misses some other aspect. Every scholarly practice is 'reductive,' in the sense that any characterization misses nearly every property of the world it attempts to describe or explain. Moreover, any truly interesting explanation of a given phenomenon is interesting precisely because it involves reduction of some sort – tracing causation from higher to lower levels or uncovering hidden causal relationships at the same level. The point of all scholarly explanation, regardless of whether we are scientists or humanists, is to answer a 'why' question by means of linking an *explanandum* to an

explanans. As Steven Pinker has put it, the difference between reductive and non-reductive explanation is 'the difference between stamp collecting and detective work, between slinging around jargon and offering insight, between saying something just is and explaining why it had to be that way as opposed to some other way it could have been' (Pinker 2002: 72). This is why the manner in which even humanists go about their work is by its very nature reductionistic. Reduction is at the heart of scholarly activity, and when someone fails to reduce we rightly dismiss their work as trivial, superficial or uninformative.

Durkheimian, Marxian or Freudian approaches to religion, for instance, are resolutely *etic* rather than *emic*, explaining religious beliefs and practices in terms of more basic social, economic or psychological functions. While there have been some in religious studies who have argued that any 'outsider' account of religious experience is by its very nature invalid, the mainstream position in traditional religious studies has quite rightly been that outsider explanation is what we as scholars of religion – rather than theologians – do.[8] Evolutionary approaches to religion simply push this process of explanatory reduction one step further, attempting to get at the more basic causality behind the social, economic and psychological.

There is a common humanistic concern that the notion of consilience involves reducing all aspects of human life to some lower-level common-denominator phenomena such as genes or biological instincts. This notion is incorrect for several reasons. To begin with, there is no single level of explanation that is exclusively privileged within the framework of consilience. Geologists do not explain earthquakes in terms of quarks, for example, because the emergent complexity of geological systems requires a distinctive treatment. Consilience does not entail – as many humanists fear it does – collapsing humanities departments into biology departments or denying the significance of human-level truths. All levels of explanation have their own emergent heuristic reality, and a brief glance at the history of the natural sciences reveals that reductive possibilities do not lead to the collapsing of disciplinary boundaries. Biology remains distinct from chemistry, and chemistry from physics, despite the fact that scientists have employed reduction as a research strategy for more than 300 years.

Consilience also does not require scholars of religion to give up religious studies and become evolutionary biologists. One prominent early skeptic of consilience, the late Richard Rorty, responded to E.O. Wilson's call by observing:

> The various things people build and repair with tools are, to be sure, parts of a seamless causal web. But that seems no reason to impugn the plumber-carpenter or the carpenter-electrician distinction. The various vocabularies I use to describe and explain what is going on are all applied to the same seamless web, but why should I strive to bring them all together? (Rorty 1998: 30)

This is to misunderstand the consilience project. Consilience does not demand that we all become plumbers – that religious studies scholars drop their books and become quantum physicists. Rather, it asks first that, like plumbers and carpenters, disciplines studying different regions of nature come together and collaborate

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[8]See McCutcheon (1997) for an excellent discussion of this issue, as well as Cho and Squier (2008), Slingerland (2008b) and the accompanying replies and responses for a debate about how much reductionism is appropriate in the academic study of religion.

when they need each other's help.[9] More importantly, it asks that – again, like plumbers and carpenters – this identification of shared problems and impetus for collaborative work stem from an overall shared conception of the nature of reality and the goals of human knowledge: the only reason that tradespeople can collaborate to build a house is that they share a general sense of both how reality works and what a house is for, and this shared sense constrains in important ways the manner in which they go about their jobs. The call for consilience does not require that humanists or scientists give up or exchange their particular jobs. It merely argues that all academics can do their jobs better, and achieve more satisfactory results, when their efforts are coordinated in a vertically integrated manner.

Therefore, consilience merely asks of humanists that their work not be treated as immune from the requirement to be consistent with the world of natural causation. Human-level meaning emerges organically out of the workings of the biological world, and we are being 'reductive' in a good and revealing way when we seek to understand how these lower-level processes allow the higher-level processes to take place. Humanists have long recognized the usefulness of reducing human phenomena to more causally basic levels of analysis – whether sociological, economic, psychological or phonetic – and judging the usefulness of such reduction in terms of its productiveness and revelatory power. Consilience does not ask us to change this, but merely to refrain from drawing an ontological line below which we will not allow such reduction to go. It is certainly the case that some early attempts to approach religion from an evolutionary or cognitive perspective paid inadequate attention to both cultural processes and the embodied nature of human cognition (Barrett 2010; Day 2007; Smith 2009), but such shortcomings are by no means an essential feature of the evolutionary approach.

Finally, it should be noted that, despite the lack of ultimate intellectual justification for the charge that evolutionary approaches to human-level phenomena are 'reductionistic' in some negative sense, it is arguably the case that they will always *feel* uncomfortable and abstract in a manner that is not true of earlier approaches in the academic study of religion. Explaining religious belief in sociological or political terms seems offensive primarily to insiders of the religion that is being so explained, but at least the levels of explanation involved all fit comfortably within the dimensions of causality that we associate with humans. As one of us has previously argued at great length (Slingerland 2008a), evolutionary and cognitive-science explanations are psychologically distinct in that they cross the mind–body divide: human beings are intuitive dualists, and the inability of psychologically healthy human beings to ever completely free themselves from mind–body dualism means that human-level perceptions will always present themselves to us as *truths*, which means that any program of research that attempts to reduce human-level phenomena to physical processes is going to create psychological discomfort.

The implication of this is that proponents of consilience will have to live with a kind of dual consciousness, cultivating the ability to view human beings simultaneously under two descriptions: as physical systems and as persons. On the one hand, we are convinced that Darwinism is the best account we have for explaining

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[9]There is, of course, a massive literature on the issue of inter-theoretic relationships within the sciences; the view that we are working with here is nicely represented by McCauley (1996; 2007).

the world around us, and therefore that human beings are merely physical systems. On the other hand, we cannot help but feel the strong pull of human-level truth. Moreover, those of us who are humanists also earn our keep by studying this emergent level of reality: unlike scientists, we do not necessarily have to withdraw our projections in order to perform our day jobs, which is a nice perk. Conceptualizing the subject of humanist inquiry not as the ineffable workings of some Cartesian *Geist* in the machine, but rather as the wonderfully complex set of emergent realities that constitute the lived human world – in all its cultural and historical diversity. A consilience grounded in what Robert McCauley has called 'explanatory pluralism but ontological seamlessness' (McCauley 2008) provides space for both the appreciation and explanation of the rich world of emergent human meaning.

Isn't evolution irrelevant to human beings because we have culture?

Short answer: cultures evolve.

Culture is a natural phenomenon and cultures evolve. While we are not the only animal with culture, we are certainly 'hyper-cultural' (Henrich and McElreath 2003), but this does not somehow bootstrap us out of naturalistic causality. The interaction of genetic and cultural evolution, however, produces quite complex and novel structures. No advocate of consilience would deny that the human brain has been shaped by the evolutionary history of our species, nor that the Pleistocene hunter-gatherer lifestyle represents an important and relatively long-lasting period of human cognitive evolution. However, a lot has happened to human beings since the Pleistocene. How to properly deal with human culture and its relationship to innate cognition within an evolutionary framework has been a topic of much concern. In fact, it is as much an issue of contention among proponents of consilience as it is between proponents and skeptics of the approach.

E.O. Wilson once described the human brain as 'an exposed negative waiting to be dipped in developer fluid' (2000: 156), a metaphor that portrays culture as a more-or-less direct expression of innate human psychological mechanisms, a mechanically expressed 'phenotype' of a fixed human genotype on the order of a termite mound or beehive. The sort of consilience represented by the contributions to this special issue can be seen as a modification of this position in that it recognizes that culture and genes exist in a coevolutionary relationship, and that human culture can play a role in *transforming* human cognition on both individual and evolutionary time scales. Culture on this model is best seen as semi-autonomous force, with its own process of evolution and selection pressures – 'semi'-autonomous because it is not some disembodied superstructure, but is necessarily carried by individual human brains and the physical, culturally modified environment. This approach also adopts a rather broader view of what constitutes the relevant 'adaptive environment,' which for humans has to the social-cultural world, and the socially and culturally transformed body-mind.

We might say that the desire to push back against the extreme social constructivism that currently dominates the humanities was taken too far (Slingerland 2008a: 74–98). One unfortunate effect of some recent attempts to bring a robust conception of human nature back to the fore in our study of human culture is the creation – perhaps often unintended – of a false dichotomy between nature and nurture: that the only alternatives are embracing full-blown social constructivism or believing in a single, universal human nature that merely gets 'translated' into various

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cultures. In fact, a consilient approach to human culture – one fundamentally informed by evolutionary theory and the latest discoveries in cognitive science – can take us beyond such dichotomies. The work of scholars such as Peter Richerson and Robert Boyd (e.g., Richerson and Boyd [2005]) has shown how cultural forms themselves are subject to a kind of evolution, constrained by the structures of human cognition but also exerting their own independent force. In fact, cultural evolution seems to have driven certain aspects of human genetic evolution, favoring our big brains, linguistic skills and ultra-sociality, the three hallmarks of our species (Henrich and McElreath 2007). Cultural group selection theory gives us a model for how this process of co-evolution may have worked historically among human populations, and how its effects can still be observed today.

Finally, tools drawn from cognitive linguistics, such as conceptual metaphor and blending theory,[10] give us very specific models for understanding how universal, innate human cognitive patterns can get projected into new domains or combined to generate entirely novel, emergent structures. Human cognitive fluidity,[11] ratcheted up over time by entrenchment in cultural forms such as language or architecture, can shape human emotions, desires and perception in quite novel and idiosyncratic ways – from the subtle Japanese aesthetic sentiment of *mono no aware* (literally 'the sorrow of things') to the sort of 'cultivated needs' explored in depth by theorists such as Pierre Bourdieu. More of an acknowledgement of how culture can play an active role in reshaping human nature would go a long way toward answering the sort of skepticism voiced by many humanities scholars who remain dubious about the value of the consilience project, and for whom the dazzling variety of various human cultures and the nuances of specific cultural products are the most salient features of human beings.

How might a traditional scholar of religion contribute to the evolutionary cognitive science of religion?

Short answer: by collaborating.

It should be emphasized that, even if every researcher in the humanities immediately embraced consilience with the sciences, the vast majority of humanistic work would still consist of what we might call 'horizontal analysis': analyzing phenomena by tracing out connections between entities native to emergent levels of explanation. This is of course the case in *any* field of analysis, scientific or otherwise: organic chemists spend most of their time exploring connections that make sense only at the level of organic chemicals, and even the most reductive evolutionary approach to poetry will necessarily focus primarily on problematics and modes of analysis native to that literary phenomenon. When it comes to humanistic fields, the importance of this sort of horizontal analysis is also heightened when we recognize that even the most trivial of human-level actions and thoughts are not naked facts to be measured by objective instruments, but are rather embedded in a set of long, complex stories that require the higher-level expertise of

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[10]On conceptual metaphor theory, see Lakoff and Johnson (1999); on blending theory, see Fauconnier and Turner (2002), or the helpful introduction to blending found in Dancygier (2006).

[11]The term 'cognitive fluidity' was coined by the archeologist Steven Mithen (1996); for an attempt to sketch out how conceptual blending theory could serve as a powerful tool in both explaining and modeling cognitive fluidity and conceptual innovation, see Slingerland (2008a: 4).

anthropologists, novelists and historians in order to fully unpack. While consilience can provide a crucially important new explanatory framework within which religious studies could operate, it does not necessarily entail radical alterations in the everyday methodology, vocabulary, or focus of interest of the average scholar of religion.

Why take an interest? Becoming aware of the general outlines of evolutionary theory and the basics of cognitive science, and particularly how these fields are being used as tools to explore the phenomenon of religion, allows traditional scholars of religion to become part of a much larger project of intellectual inquiry – and, moreover, one that is desperately in need of humanistic expertise. The founding of a new program unit at the American Academy of Religion, the Cognitive Science of Religion Consultation, has been motivated by a desire to bring humanists and scientists into dialogue, driven in large part by the perceived need for scholars of religion coming from a science background to become more aware of potential problems with their basic explanatory categories, and more attuned to the importance of cultural variation, than has typically been the case. To take the example of psychology of religion, psychologists interested in the scientific study of religion have tended to work with a rather unexamined conception of the category of 'religion': the defining of which has, of course, been a central, contentious and extremely fraught issue in the academic study of religion for over 100 years. This has a potentially significant impact on their work. For example, psychologists wishing to study the effect of 'religious' primes on prosocial behavior (e.g., Shariff and Norenzayan 2007) have to select particular words to serve as their 'religious' primes, which can fundamentally skew results when this selection is guided by a very historically unusual and culturally particular form of religiosity – particularly if a proportion of one's subject pool operates according to a very different model of religiosity. Similarly, an entire sub-field of cross-cultural psychology is based upon a model of East Asian thought as 'holistic,' as opposed to the 'analytic' West (Nisbett 2003; Nisbett *et al.* 2001). The data being gathered by these psychologists is extremely interesting, but when it comes to *interpreting* this data – telling a coherent historical narrative that will explain it – they often fall back on unhelpful and essentialistic stereotypes. Eastern 'holism,' for instance, is traced back to such foundational texts of Chinese thought as the *Classic of Changes* (*Yi Jing*) or the *Dao De Jing*, but without any clear sense of when or how these texts were composed, how representative they are of 'Eastern' religions, or how they have historically been used and interpreted in East Asia.

Researchers in the various branches of the cognitive sciences thus have much to learn from humanists, and the cognitive sciences absolutely require the expertise of anthropologists, literary scholars and historians if they are to avoid reinventing the wheel or committing egregious interpretative errors. Moreover, humanists need to be involved at a very fundamental level, although this has perhaps not been recognized widely enough in the evolutionary cognitive science of religion community. For instance, one of the pioneers in the evolutionary study of religion, David Sloan Wilson, has called for scientists interested in studying the evolutionary origins of religion to tap into the rich knowledge base of historians and other more traditional scholars of religion, and for such scholars to seek out the kind of unifying theoretical framework that scientists can provide. The analogy that he has employed to convey this point, however, is the manner in which the rich and detailed, though rather unorganized, data compiled by pre-Darwinian naturalists served as an

invaluable resource for post-Darwinian scientists armed with the theory of evolution (Wilson 2002: 87). There is certainly something to this analogy: one could argue that too much of current work in the humanities resembles butterfly collecting: a fundamental limitation of what Pascal Boyer (Boyer 2011) has referred to as the 'erudition mode' in the sciences and humanities is a lack of any sort of guiding theoretical framework to help researchers formulate productive research questions and to make sense of their data. However, there is an important disanalogy with Darwin and the pre-Darwinian naturalists: when it comes to a phenomena such as 'religion,' the formulation of the very category itself requires humanistic expertise, and research into the possible evolutionary origins of religion risks going radically awry if not guided by such knowledge. This means that, when it comes to the scientific study of human-level phenomena, scholars with humanities expertise need to be on the ground floor of basic theorizing and experimental design, and not seen merely as passive providers of cultural and historical data.

The take-home message is that analyzing the human mind and its products will often require both humanistic and scientific expertise. The recognition that consilience is a two-way street is not some polite concession to assuage the egos of humanistic scholars, but rather a call for humanists to be willing to collaborate with researchers from the sciences who are interested in traditional humanities issues and stand to profit from their accumulated expertise.

Conclusion

Western institutions of higher learning, particularly in North America, tend to be 'biversities' (Slingerland 2008a), with scholars in such humanistic disciplines as anthropology, art history, comparative and national literatures, philosophy and religious studies going about their business in complete ignorance of what their colleagues in those nice new buildings on the other side of campus are up to, and most scientists similarly ignorant of basic methods and issues in the humanities. This division is more intractable when viewed from the perspective of the humanities: natural scientists tend to be merely incidentally ignorant about the humanities, whereas the ignorance of humanists about the sciences is often principled. Humanists typically not only know very little or nothing about the natural sciences, but their views about the special – perhaps it is not excessive to call it 'sacred' – nature of thick description or *Verstehen* as a mode of apprehension allows them to feel intellectually justified about it. The power of ideology to prevent genuine engagement with new perspectives is clear from the plight of anthropology departments throughout Western academia, where the inability of traditional cultural anthropologists and those with a more naturalist bent to see eye to eye has led to institutional splits and endless acrimony. Religious studies departments have been spared this fate only because they have typically purged their ranks of old-fashioned, theoretically 'naïve' realists, and religious studies as a field has come to embrace and – in a variety of more and less subtle ways – enforce a fairly radical cultural constructivism and suspicion of scientific discourse as theoretical orthodoxy.

This is unfortunate for many reasons, not least of which is the missed opportunity to fill the burning need for humanistic expertise in those disciplines that most directly border on the demilitarized zone between the humanities and sciences: behavioral neuroscience, the various branches of psychology, cognitive linguistics

and artificial intelligence (AI) research. Even within the natural sciences, most breakthroughs happen through mutual fertilization of disciplines dealing with adjacent levels of explanation. The integrating of human-level frameworks into the chain of explanation promises an even greater degree of cross-fertilization, and there are many areas where precisely this sort of integration is required to break borderland disciplines out of conceptual dead ends or unfortunate detours.

Researchers in the various branches of the evolutionary cognitive sciences thus have much to learn from humanists, and the evolutionary cognitive sciences absolutely require the higher-level expertise of anthropologists, scholars of religion and historians if they are to avoid reinventing the wheel or committing egregious interpretative errors. The expertise humanists bring to the table, however, should not be seen as descending from some interpretive cloud-cuckoo land, magically hovering above the mundane world of physical causation. Despite their variety and 'disunity,' the various disciplines of the natural sciences have managed to arrange themselves in a rough explanatory hierarchy, with the lower levels of explanation (such as physics) setting limits on the sorts of explanations that can be entertained at the higher levels (such as biology). It is our conviction that, in order to move forward as a field of human inquiry, religious studies needs to plug itself into its proper place at the top of this explanatory hierarchy, because the lower levels have finally advanced to a point that they both need to hear from us and have many interesting things to say in return.

Émile Durkheim's work has often been maligned by humanities scholars and evolutionary psychologists alike, but more recently the genius of many of his insights has begun to be appreciated in cognitive evolutionary circles. One of the most important things that Durkheim understood was the need for piecemeal investigations, collaborative teamwork, and patience. Of his own work on religion, Durkheim wrote:

> To know what these [collective religious] conceptions which we have not made ourselves are readily made of, it does not suffice to interrogate our own consciousness; we must look outside of ourselves, it is history that we must observe, there is a whole science which must be formed, a complex science which can advance but slowly and by collective labour, and to which the present work brings some fragmentary contributions in the nature of an attempt (Durkheim 1965 [1915]: 32–33)

A century after Durkheim's book, and a century and a half after Darwin's *Origin of Species*, there are finally signs that the study of religion as a naturalistic discipline has begun to take root and that we will be seeing the promise of cumulative improvements to our understanding of religion over the next century. Researchers coming together from a wide variety of disciplines – religious studies, philosophy, anthropology, economy, social psychology, behavioral neuroscience, mathematics, zoology – have launched ambitious collaborative projects focused on various elements of religious experience,[12] and it is likely that the best research in the foreseeable future will come from collaborative teams able to integrate experts in the scholarly study of religions with experts in the natural and social sciences.

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[12]See, for instance, the project websites of teams based at Aarhus University in Demark (http://teo.au.dk/en/research/current/cognition), State University of New York at Binghamton (http://evolution.binghamton.edu/evos/), Oxford University (http://www.cam.ox.ac.uk/research/explaining-religion/exrel-events/), and The University of British Columbia (http://www.hecc.ubc.ca/projects.html).

The need for this type of cumulative research, involving the collaborations of scholars over time and across curricular boundaries, is particularly acute in the case of religious studies. Progress on some of the most pressing problems confronting the modern, globalizing world – 'terrorism,' cultural assimilation and resistance to it, the proper social response to new life-science technologies, and others – demands a clearer understanding of how cognitive systems, organized by cultural and genetic resources, express and conserve religious thinking and behavior. Clarity about the nature and function of religion is of more than merely 'academic' interest. Linking the deep historical and linguistic expertise developed by humanistic scholars of religion to the analytic tools and progressive research agenda of the natural sciences seems to us the best way for the discipline of religious studies to contribute to public debates about such issues.

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