Cognitive Evolution and Religion

Cognition and Religious Evolution

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Explaining religion it is not a matter of accounting for a single trait; it involves explaining a very *complex* and interconnected repertoire of patterns of thinking and behavior. Many early attempts to account for the origins and spread of religion (e.g., Freud 1938/1913; Durkheim 1964/1915; Marx & Engels 1976/1888; Tylor 1871) sought the solution in a single core process (repression of guilt, symbolization of the social order, exploitation by a ruling class, intellectual curiosity, etc.), giving rise to theories that were either untestable or, if rendered more precisely, quite easily refuted. Partly as a consequence of this failure, many scholars of religion in recent decades have abandoned explanatory projects in favor of purely descriptive and interpretive/ hermeneutic activities.

The new 'cognitive science of religion' (CSR) offers a fresh approach. Its aim is to fractionate religion into numerous different traits, each of which must be explained on it own account. The CSR proceeds from evidence that human minds develop in fundamentally similar ways the world over, even though cultural settings differ widely; it proposes that these recurrent features of our minds evolved under natural selection to deal with problems that don't *necessarily* have anything to do with religion; it postulates, however, that these universal features of cognition can help to explain widespread patterns of religious thinking and behavior.

Valuable as the contributions of the CSR have been, it should be acknowledged that they constitute only a modest starting point in explaining religion. For the field to mature it must expand its horizons to take into account the role of ecological variables in processes of religious evolution.

Explaining Recurrent Features of Religion

Figure 1 lists a number of traits that might be associated with the category 'religion'.[1] These traits are probably found, in some shape or form, in all hu-

1 Problems of defining 'religion' can be set aside here – what matters is that we find an explanation for specific traits; whether or not those traits happen to be classified as 'religious' at certain times and places is if little importance for explanatory purposes.

man societies – or at least are very widespread and historically recurrent. The CSR has attempted to account for this recurrence in terms of the shaping and constraining effects of universal cognitive mechanisms.

Figure 1: Cross-culturally recurrent religious repertoire

Afterlife
Beings with special powers
Signs and portents
Creationism
Spirit possession
Rituals
Ritual exegesis
The Sacred
Deference
Moral obligation
Punishment and reward
Revelation

For instance, *afterlife beliefs* have been explained in terms of our inability to simulate the elimination of mental states (Bering 2006); notions of *beings with special powers* have been explained in terms of the cognitive salience of concepts that violate intuitive ontological knowledge (Boyer 2001); *creationism* has been explained in terms of a predisposition toward teleological reasoning (Evans 2001; Kelemen 2004); various properties of *ritual* have been explained in terms of universal features of action representation systems (Lawson & McCauley 1990); and so on. In the last few years new books in the CSR, developing these and other (related) ideas, have been appearing at an astonishing rate (see http://www.iacsr.com/index.html).

Evolution and Religion

Based on these kinds of theories in the CSR, we might reasonably ask how cognitive evolution is implicated in the rise and spread of religion – and vice versa. One possibility is that religious thinking and behavior is a spandrel, a set of traits arising from cognitive capacities that evolved in response to adaptive challenges quite unrelated to religion *per se* (e.g., Atran, 2002; Boyer 2001). Another possibility is that at least some aspects of religious thinking and behavior contribute to inclusive fitness, constituting adaptations that arose under natural selection (e.g., Bering 2006; Bloom 2004). The arguments on both sides are complex and engrossing, as these conference proceedings amply demonstrate. It is too early, however, to say much with confidence about the relationship between cognitive evolution and religion because of the paucity of evidence in evolutionary psychology generally and in its claims about religious

phenomena in particular. A more neglected question, but ironically one that we are in a much stronger position to address with the backing of empirical evidence, is how *cognition* might impact on processes of *religious evolution*.[2] One of the most compelling arguments of the CSR has been that cultural phenomena can be understood within a *selectionist* framework, one that couches its predictions in terms of statistically meaningful tendencies that are at least partly determined by cognitive dispositions and susceptibilities.[3] Much remains to be done in order to expand the empirical foundations of this approach and to refine its theoretical models accordingly. Nevertheless, there is much more to explain about religion than a set of statistically recurrent features. Herein lies the key to developing new perspectives on processes of religious evolution. Two possible strategies immediately present themselves:

Strategy 1: look for variables that amplify/suppress universal features

One strategy is to focus on the differential emphasis on core features of the recurrent religious repertoire from one tradition to the next. For instance, some Afro-Brazilian cults postulate a vast pantheon of supernatural beings and there is a very heavy emphasis on spirit possession (Cohen, in press). All the other features of the religious repertoire are present as well but some of those features (e.g., moral obligation and revelation), although everyone would recognize them, are under-emphasized, when compared with other religious traditions. Conversely, some versions of Christianity show little interest in the idea of spirit possession and/or take a somewhat dim view of ritualization, but may place great emphasis on moral obligation or notions of supernatural punishment (eternal damnation) and other features (Malley 2004).

Could there be factors that predictably influence which kinds of cognitively attractive concepts occur in which kinds of religious traditions? Even allowing for a considerable degree of random innovation, this seems eminently possible. That is, even though we may still be dealing with explanatory strategies tracking on relative frequencies rather than the particularities of given cases, we stand to increase the specificity and predictive power of our models by introducing additional contextual variables. Consider the following candidates.

Biological variables

A wide variety of population-level biological variables could influence religiosity, including genetically influenced personality differences, ageing, sexual

2 This neglect in modern times results in part from the failure of Victorian theories of religious evolution to convince (in large part because of their flawed Lamarckianism but also because of their association with colonial imperialism).

3 The paradigmatic statement of this approach remains Dan Sperber's (1985) account of the 'epidemiology of representations'.

dimorphism, diet, drug abuse, and many other factors. Gender-based differences, to take one example, could prove to be a profitable area for investigation. Women, at least at a population level, exhibit more highly developed 'Theory of Mind' (ToM) capacities than men, and serious pathologies involving ToM deficits (mostly notably autism) are much less common in women than in men (Baron-Cohen 2003). It follows that those parts of the religious repertoire that rely on sophisticated ToM operations might be expected to feature more prominently in the thinking and behavior of women than men (all else being equal). Of our list of recurrent features in the religious repertoire the one that places the heaviest burdens on our ToM capacities is undoubtedly the complex of behaviors surrounding 'spirit possession'. This complex involves keeping track of at least two mental entities (the possessing spirit and the host) at the same time, and typically a number of such entities if (as is commonly the case) the host is possessed by several spirits in rapid succession. Moreover, since spirit possession frequently occurs in group settings (such as the séance), observers and participants alike would need to keep track of what is happening in the minds of many other persons as well, if they are to grasp the social implications of the information divulged by possessing spirits. The upper limit on such tracking for normal adults is 'level 4' (e.g., Dick knows that Mary thinks that Harry has persuaded Lucy to come to the party). Spirit possession phenomena make heavy demands at this ceiling level. We might therefore predict that spirit possession will be a domain of religious activity that will tend to involve higher levels of participation from women than from men. That is potentially quite an interesting line of enquiry because the evidence from ethnography and historiography does seem to point in that direction.

Technological variables.

The level of technological development is likely to be a key ecological factor influencing religiosity. For instance, particular modes of subsistence could serve to prime our Agency-Detection System in specific ways. Even under normal conditions, humans readily perceive agency in the most unlikely places (Guthrie 1993). We are especially likely to think that agents are lurking when we are in spooky or dangerous situations (like a darkened tomb or a haunted forest). Over-attribution of agency may be greatly heightened by living in communities where predators and pests pose a significant threat to health and livelihood. Historically, the precious livestock of farmers have been threatened (to a greater or lesser extent) by carnivorous predators. Crops have been at risk from disease and pestilence, and buildings and storehouses have been compromised by burrowing insects and other menaces. In conditions where these kinds of problems are most acute people are especially vigilant – continually on the alert for signs of harmful agency. It seems quite possible, in principle at

least, that this habitual *priming* of the Agency-Detection System might give rise to relatively high levels of perceived encounters with supernatural agents. Are stories about encounters with spirits and goblins more prevalent under these conditions, as compared with populations that have less to fear from predators and pests? At present we do not know but this topic could certainly be investigated.

Sociopolitical variables

Sociopolitical structure and ideology has long been recognized by anthropologists to influence religious beliefs.[4] This is appreciated too by some contributors to the CSR field. For instance, Boyer (2005) has suggested that in any coalition where the pressure to defect is relatively great, we will tend to find ritual groupings that impose particularly high entry costs. An obvious example would be traumatic initiation rites. The ethnographic record does indeed seem to show that the most horrifying initiatory ordeals occur mostly in warlike societies where the temptation to abandon one's fellows on the battlefield would be exceptionally acute. By undergoing especially grueling tests of initiation, group members might be publicly demonstrating their trustworthiness – in other words showing that they can be relied upon to stay at their posts, even in the face of great danger and suffering. Again this raises major empirical questions. Is the intuition that high membership costs demonstrate loyalty to the coalition truly widespread across a range of cultures? Does the ethnographic record show that the incidence and severity of initiation rites correlate directly with defection pressures, assuming we can find appropriate measures for these variables (see Sosis, Kress & Boster, in press)?

Cultural variables

Cultural schemas could also influence the activation of universal cognitive mechanisms in ways that help to shape patterns of religious innovation and transmission. Consider, as a simple example, the difference between group recruitment based on ideals of ascription and achievement respectively. In kinship-based societies, recruitment to corporations is *ideally* based on *ascribed* traits, for instance the ability to trace lines of descent to fictive primordial

4 Well-known arguments from anthropology include the alleged causal connection between hierarchy and patriarchy, on the one hand, and ritual inversion or 'rites of rebellion' on the other (Gluckman 1963), the thesis that accusations of witchcraft tend to be directed at transgressors of difficult-to-prosecute social or moral (rather than legal) infractions (Douglas 1970), or the thesis that beliefs about procreation and the inheritance of spiritual characteristics are shaped by descent ideology and methods of corporate group recruitment (e.g., Fortes 1945).sion or 'o imesfrom anthropology include the finding that ritaul f factor influencing religiosity.

ancestors. In liberal democracies, by contrast, recruitment to corporations is *ideally* based on meritocratic selection, along competitive lines. The members of both types of society may share the same basic essentialized construals of the person category and may agree on basic moral principles (e.g., that people should, ideally, get what they deserve in terms of punishments and rewards). Nevertheless, in many traditional societies these intuitions are exploited by pervasive cultural schemas that see individual identity as mapping closely onto *group* identity; *whereas*, in contemporary Western societies, the same basic intuitions are exploited by schemas that emphasize the discreteness of individual and collective identity—and by valuing (at least ideally) not who you are, but what you can do. These kinds of pervasive tendencies in cultural schemata, taken together with a universal predisposition to essentialize the person category, might in turn bias religious thinking in predictable ways. So, for instance, cultural schemata emphasizing descent ideology typically postulate the sharing of essentialized properties between *deities* and particular *groups* of human beings. (We could call this the 'totemic principle'). By contrast, in more individualistic cultures we would expect deities to be construed as sharing essentialized properties with all other persons (as an undifferentiated category) but at the same time construing each person in terms of unique qualities that are presumed not to be shared with anybody else (i.e., being in possession of a unique spirit or soul). (We could call this the principle of 'universalistic individualism'). In other words, the same kinds of essentializing biases could be put to work in doctrinally distinctive ways that are shaped and constrained by wider cultural assumptions. Some schemas might be pervasive in a given society, without necessarily being particularly *religious*. But, equally, we could focus on the shaping effects of more specifically religious schemas. So we could ask, for instance, how the presence of particular kinds of religious beliefs might make the invention and transmission of other kinds of religious beliefs more or less likely.

Strategy 2: Look for mechanisms that transcend the recurrent repertoire

A major limitation with CSR research has been its somewhat narrow emphasis on the issue of how universal cognitive biases shape and constrain patterns of religious transmission. Although that is clearly a valuable starting point, it only helps to explain variations on a theme. That is, it may help us to explain why certain features of religious thinking and behavior are especially widespread and may even help us to explain why some aspects of the universal repertoire are more heavily emphasized in one place rather than another—for instance, if (as I've suggested) we build in sufficiently detailed information about various contextual factors (that is, the sorts of ecological variables we've been looking at). But religious traditions are much more than

just the sum of various universal themes. Some religions involve highly elaborated and distinctive cosmologies, for example. Others incorporate extensive ethical systems that run against the grain of intuitive moral reasoning. And what we find, on the ground, is that all these gloriously diverse ideas are often linked together in ways that might be described as systemic. So we talk quite reasonably about *religious systems* rather than simply about loose assemblages of catchy concepts.

Religious systems, as such, are not particularly catchy and, indeed, are often extremely difficult to acquire. Consider, for instance, how much labor and energy, around the world, is invested in processes of missionization, proselytism, and education. Thus, although religion has recurrent and intuitive features, it also encompasses ideas that are extremely hard to learn and pass on. And it is in the complex balance between these two sets of features that we must look if we want to understand the evolution of religious systems.

The relationship between intuitive and hard-to-acquire aspects of religion may be productively understood as a 'ratchet effect' (Tomasello 1999). A ratchet does two things: it holds a bolt in place so that the ratchet retains its grip and of course it turns the bolt so that it grinds its way into a threaded hole. The *retaining* function of a ratchet corresponds to our recurrent religious repertoire. Some aspects of religion never change – or, more to the point, they never *evolve*. By contrast the *turning* function of the ratchet corresponds to those aspects of religion that build up, cumulatively, over time. This is essentially an evolutionary process.

The cumulative evolution of religion depends in part on patterns of *innovation* (the creation of new ideas and novel connections between previously unrelated ideas, e.g., through processes of inference, extrapolation, deduction, analogical reasoning, etc.) and *storage* (the retention of novel connections, e.g., by means of explicit memory, distributed cognition, external mnemonics, etc.).

Religious innovation is often construed as a process of revelation, understood in terms of miraculous intervention via dreams, trance, visitations, callings, and such like. Revelations are sometimes associated with altered states of consciousness, e.g., induced by epileptic seizures, hallucinogenic drugs, schizophrenia, or prolonged deprivation or abstinence. Personality differences can play an important role in all of this too - some people may be naturally more susceptible to revelatory experiences than others and people also differ in the extent to which they are prone to *interpreting* their revelatory experiences and passing the details on to other people. Nevertheless, there are also various ways in which patterns of revelation can be *socially regulated*. Rituals that are especially arousing tend to be remembered with particular vividness. Since rituals of this kind are deeply puzzling and disturbing experiences, they tend to set off subjective experiences of *revelation*. My own research team has

made a start at investigating this hypothesis experimentally (Richert, Whitehouse, & Stewart 2005). But we also have considerable evidence from ethnography suggesting that people who participate in traumatic or ecstatic rituals tend to develop highly elaborate bodies of personal, idiosyncratic exegetical knowledge, based on deep and enduring conscious reflection (Whitehouse 1995, 2000; Whitehouse & Laidlaw 2004). I refer to this complex as the *imagistic* mode of religiosity. Imagistic practices provide a highly effective way of generating religious innovations. Nevertheless, if religious innovations are to be *transmitted* effectively then the conscious schemas that bind them together must somehow be stored as a body of explicit knowledge.

The *storage of religious innovations* depends extensively on *semantic memory* (often augmented by external mnemonics, distributed cognition, and other forms of cognitive support). Semantic memory, however, can only store large bodies of information through processes of regular rehearsal. Any religious tradition that draws on this method of transmission must adopt a somewhat routinized regime of doctrinal reiteration. I refer to this pattern as the *doctrinal* mode of religiosity. As with the imagistic mode, the doctrinal mode involves a complex clustering of features. The key thing to note here, though, is that the doctrinal mode is based around *frequently repeated teachings and rituals*. Much of the religious knowledge is codified in language and transmitted primarily via recognized leaders and authoritative texts. Routinized transmission allows cognitively challenging ideas to be learned and stored in semantic memory. But heavy repetition also makes it possible for religious ideas to become rather rigidly systematized and standardized in a population. If the religious concepts, and the authoritative logical and interpretive connections that bind them together, are frequently reiterated, then it becomes easier to spot deviations from the standard account.

The theory of 'modes of religiosity' maintains that all these cognitive features are causally linked to a set of contrasting sociopolitical arrangements, thus hoping to provide at least a preliminary explanation for long-recognized patterns of religious variation—one that is commensurate, however, with the finding that religions *also* encompass relatively unchanging, universal dynamics. According to the modes theory, there are really just three ways of acquiring and transmitting religion. The first is species-typical and more or less invariable, consisting of naturally 'catchy' concepts.[5] The second seems to have emerged in relatively recent human prehistory and is associated with the establishment of highly cohesive ritual groupings and the emergence of cognitively complex and typically esoteric religious revelations (the imagistic mode). The third is a more recent pattern, emerging alongside the earliest large-scale

5 These aspects of religion are sometimes referred to as 'cognitive optimal beliefs' (Boyer 2001; Whitehouse 2004).

settlements and proto-states and involving the transmission of more systematized religious teachings (the doctrinal mode). Nowadays, all three ways of acquiring and transmitting religion are widely distributed in the world's religious traditions.

Of course, we still have to ask *why* doctrinal and imagistic modes of religiosity emerged in the order that they did. Why, in other words, is this long-term transformation a process of evolution? The answer, I suggest, lies in understanding the impact of ecological variables on human cognition.

The imagistic mode generates extremely cohesive coalitions – and for this reason helps to guarantee co-operation in circumstances where there are strong incentives to defect. A likely trigger for the emergence of the imagistic mode would have been increasing competition for scarce resources. Many contemporary hunter-gatherer societies have extraordinarily flexible social groupings and high levels of personal autonomy. But what happens when the survival of human populations in technologically simple societies suddenly depends upon higher levels of co-operation? The answer is that weak coalitions either die out or become assimilated into stronger coalitions. The imagistic mode was probably an adaptation to such conditions. It provided the cohesion necessary to work together in increasingly dangerous pursuits – the hunting of larger game animals and, most likely, territorially-driven predation and warfare against neighbouring bands (Sosis, Kress & Boster, in press).

The emergence of imagistic cults (e.g., based around initiations, ancestor worship and fertility rites) provided a sociopolitical adaptation but also a means of generating ever more complex cosmologies and esoteric revelations. The doctrinal mode, by contrast, emerged when relatively large-scale patterns of cooperation became routinized, probably as a result of the seasonal rhythms associated with the domestication of animals and plants and the establishment of the first townships. The doctrinal mode provided, for the first time in human history, the mnemonic scaffolding (based around regular public reiteration of religious creeds) for the transformation of imagistic revelations into more standardized bodies of doctrine. From that point onwards, we find that all three modalities of transmission *influence* each other, producing distinctive patterns of religious transformation over time (Whitehouse 2004).

Conclusion

All human populations share a common set of religious concepts and behavioral patterns that derive from relatively implicit, intuitive patterns of thinking. Such phenomena are, we might reasonably assume, as old as our species (possibly older even than that). They are part of the human condition, like the capacity for language or the ability to track several intentional states at one time. This recurrent religious repertoire constitutes the *holding* func-

tion associated with the so-called 'ratchet effect'. Meanwhile, however, modes dynamics provide an insight into the *turning* function of the ratchet, and hence the *evolution* of religion. Many religious concepts require considerable cognitive, social, and technological resources to create, remember, and pass on. Cross-culturally variable aspects of religion arise in part from the evolution of cognitive systems devoted to connecting concepts (e.g., through the formation of novel analogies) and storing them (e.g., in semantic memory) and in part from the historically changing sociopolitical conditions in which such systems can be exploited. Only a coordinated, interdisciplinary effort that takes into account the role of both evolved cognition and human ecology in religious innovation and transmission will be sufficient to provide the broad empirical and theoretical base necessary for explaining religion.

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