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Religiosity as Mental Time-travel

Cognitive Adaptations for Religious Behavior

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Introduction

In this chapter, 'religiosity' describes belief in superhuman reality, as well as motivations, emotions, and practices closely related to these beliefs. I assume supernatural beings play no causal role in the explanation for why religious agents commit and react to them. This assumption follows from methodological naturalism. While I will not defend this stance here, I observe that methodological naturalism is consistent with non-scientific forms of discussing and understanding religion. It is probably consistent with being religious—though I leave this discussion for theologians.

By 'supernatural' I mean non-natural beings, places, and forces—Jehovah, Krishna, The Pure Land, Hades, Num, Zeus, Mana, Jizo, Buddha, and innumerable others of these kind. There are problems both in viewing religion as concerned with the 'supernatural' and also with the term itself. For it is unclear whether 'supernatural' cuts the concepts of our understanding at any joint. Boyer and Ramble have data suggesting that it does—that regardless of our affiliations and traditions we reliably recognize supernatural concepts in roughly the same way (Boyer and Ramble 2001).

Let's accept the view, then, that 'supernatural' is a natural kind, though surely more evidence is needed.

A significant problem in human evolutionary biology is explaining how evolutionary processes—both cultural and genetic—could have tolerated religious commitments. For naturalists, religious beliefs are at least partially unfounded. Agents attribute beliefs to gods; we have assumed the gods play no causal role in activating these beliefs. How could religious persons go so badly wrong? More puzzling: how can they go so badly wrong without injuring themselves, in the way schizophrenics do? For there is no evidence that adult religious agents are cognitively impaired, globally irrational, or immature. Unlike schizophrenics, religious agents flourish. Whatever one thinks about the sanity of religious belief, religious persons are sane.

Moreover, we must explain why religious commitments are typically linked to powerful norms and emotions. Why did selection tolerate the behavioral costs that flow from religious commitments and behaviors (Atran 2002a; Sosis 2003; Bulbulia 2004a; Dennett 2006)?[2]

In section I, I explore a plausible model in which evolutionary processes favor religious architecture susceptible to local religious ideas and norms, and which link these to powerful emotional and motivational states. The model is sometimes called the 'costly signaling' model for religion, but I shall call it the 'commitment-signaling' model. The model makes sense of the costs of religion as adaptations. In section II, I use evolutionary task analysis to predict that motivational states must be *disconnected* from most practical action domains (causing little harm). Here I specify a plausible design for accomplishing these tasks, and review data supporting its presence. In section III, I use the model to explain how religious persons are able to experience superhuman agents while remaining otherwise functionally engaged with distal realities—ecological and social.[3] I shall conclude that religion is a variety of mental time-travel, one that relies on very specially contrived fictions and encapsulated self-deception over their reality.

2. 'Cost' here and throughout will mean reproductive cost. The literature on commitment signaling sometimes describes hard-to-fake signals as 'costly'. But such signals do not always bring reproductive costs. Faking a genuine smile is difficult for most people, yet not reproductively costly. To denote signaling costs I use the slogan 'hard-to-fake'. What others (including Bulbulia 2004a) have called the 'costly-signaling theory' I call 'commitment-signaling theory'.
3. Finding an ancestor spirit in a lake, or a sprit in the sky, or a deity in a configuration of paint and clay requires extremely loose inferential standards. We would not mistake a photo of a sexual partner for the real target, and present accordingly.

I. The Commitment-signaling Hypothesis for Religiosity

I begin by reviewing the reasons to think selection tolerated, enhanced, and elaborated religious dispositions—tendencies to form emotionally powerful religious commitments—or their adaptive benefits.

The commitment-signaling theory holds that being religious in religious society helped our ancestors to manage the cognitive burdens of social living. It is uncontroversial that cooperative groups bring significant advantages to the individuals who compose them. It is also uncontroversial that humans have lived in cooperative groups for at least a million years, well before the arrival of modern humans between 150–250 thousand years ago (Boehm 1999). Human social organizations function to increase resource extraction capacity and efficiency. Cooperating and coordinated groups provide vigilance against predation threats. They allow agents to organize divisions of labor and expertise, create economies of scale, and establish networks for the distribution and defense of resources. Group living also brings tremendous epistemic advantages. Human societies may be arranged to store, perfect, and transmit locally useful knowledge by divisions of intellectual labor; our capacity for social learning facilitates this transmission with a relatively high degree of fidelity (Tomasello 1999). No single individual need learn the collective wisdom of a tribe. Children receive adaptive information from their parents—through an inheritance of ideas, not merely genes—and they also receive wisdom from parental cohort and peers. Oblique and horizontal transmission enables us to learn about the labile local environments that situate us. Such transmission selects for behavioral and developmental plasticity (Sterelny 2003). Much locally adaptive knowledge is traded freely, without deception, and this too is a kind of cooperation. Parents do not generally sabotage the beliefs of their neighbor's children (Sterelny 2004; Sterelny 2006). Our spectacular capacity to transmit and improve practical knowledge has enabled humans to support life in nearly every terrestrial circumstance. Our ability to manage cooperative life has enabled us to survive together in scorching deserts and on frozen seas and it has left a trail of mass extinctions in our wake (Richerson and Boyd 2005).

The benefits accessible to individuals living in cooperative groups are significant. But such benefits are notoriously difficult to obtain; for the

benefits of social life are typically accessible only when all or most pay a price. Frequently, defectors can benefit from the toil of others without themselves toiling, thereby undermining cooperation. Together we can bring down the Mammoth. If one or two defect, the beast will fall. Where many defect, the cooperative pay the price of assaulting a large target alone. Rational incentives often favor defection, but where many defect group benefits vanish. So, cooperation is often available only to the degree that it is policed. However, policing often comes at a cost, and these too bring fresh cooperation dilemmas (Bulbulia 2004a; Dominic Johnson 2005).

In our lineage, policing is helped through a variety of psychological mechanisms. We track past behavior and punish defection by withdrawing cooperation, thus incentivizing exchange (Boyd and Richerson 2001). We jealously guard our resources, even when doing so brings costs in excess of their loss, and so deter aggression. We are emotional hagglers who refuse to accept unfair offers, even when refusal is costly. We form strong affective bonds. Our capacity for language enables us to establish very powerful and precise information gradients. This capacity when combined with tendencies to gossip enables us to spread socially relevant news (Dunbar 1998). Within a short time, the indiscretion known to one is known to all. The perturbation of social information reduces defection by ramping up its risks (Jolly 1966). Moreover, an inclination to accord prestige to socially benefiting acts loads further incentive to cooperation. When an altruistic reputation brings rewards, an agent has an incentive to acquire one.

According to the 'social complexity hypothesis' a key driver of human intelligence was the emergence of large, functionally integrated social units. As a society grows, so too do the demands imposed by social cognition. Dunbar observes that an increase in the number of agents with whom a focal agent interacts sharply increases the amount of socially relevant information she must store and track for effective policing, prediction, and effective social maintenance (Humphrey 1976; Byrne and Whiten 1988; Humphrey 1992; Dunbar 1998; Dunbar 2005). A focal agent needs to monitor information about each new agent introduced to a group—that agent's resources, behavioral tendencies, physical capacities, reliability, mate choices preferences, expertise, social status, and other information. And, critically, a focal agent must monitor, store, and update information about how each new agent interacts with potentially every other agent. 'Horizontal' complexity of social groups rises much faster than group number. Moreover, because the social agents also align themselves with various

subgroup structures—kin groups, totems, hunting groups, political and economic hierarchies, religious units, and a number of informal alliances and friendships—a focal agent must understand and potentially remember how each new agent relates to each of these subgroups, and how these subgroups relate to each other, and to the largest group unit taken as a whole. This 'vertical' complexity increases as groups become more socially differentiated. (For extended discussion see Sterelny 2007.)

The complexity of social life drives the evolution of enhanced storage and tracking skills, and predictive abilities. To accommodate a Machiavellian mind, our chimp-like ancestors required a massive memory upgrade. And they became increasingly skilled theorists of mind, understanding how the motivational and epistemic states of their cohort were linked, and how these vary with circumstance for specific agents. Social complexity further selected for enhanced linguistic competence— perhaps also facilitated by enhanced memory and agent-tracking skills—as agents needed to convey and interpret increasingly precise and substantial social and ecological information. And, with these upgrades, a still further elaboration of social complexity was made possible, thus creating new and more intricate cognitive demands on increasingly social agents. Over time, cognitive and social complexities were mutually elaborated (Boyd and Richerson 1985).

Religiosity as an adaptation that reduces the cognitive load of cooperative social life

As the informational demands on agents rise, so too do the advantages of technologies equipping agents to *reduce* the computational complexity of social living. Cooperation is policed by Machiavellian minds, but it is also policed by a variety of cognitive mechanisms and cultural innovations that diminish the cognitive load of strategic socializing. As Chris Boehm has emphasized, a significant factor in the explanation for the success of forager groups lies in their power to specify and propagate egalitarian norms (Boehm 1999). Norms regulate exchange by standardizing expectations, thereby reducing Machiavellian complexity. We know the pig's hindquarter goes to the killing hunter's family, the back and chest is divided among the hunting party, the entrails go to the spear maker, and so forth. And as Richerson and Boyd have emphasized, violations of norms are often immediately and cheaply punishable, and so norms appear to be self-policing (Boyd and Richerson 2001; see also Fehr and Fischbacher 2004).

Sterleny uses the rather vivid example of drunkenly groping a superior's mate at a Christmas party, a norm whose violation brings immediate disutility (Sterelny 2007).

We are also a symbolic species who mark social worlds in a variety of ways relevant to action and exchange, and this marking also reduces a weighty cognitive load. For, given a marking convention, we are better able to understand social affiliations, and so better able to predict future behaviors. That skinhead with the swastika tattoo on his forehead has pre-committed himself to the fate of his neo-Nazi cohort. His prospects are truly dim if they fail. His fate and those of his group converge, substantially diminishing his cooperation dilemma. With symbolic labeling, intricate computational problems are reduced to perceptual and emotional problems we are well equipped to solve. With norms and symbolic conventions, it appears we do not need to evolve minds capable of running massively intricate social chess programs. Thus, through the convergence of norms and symbolic marking, computationally intractable problems are tamed. Boehm and others find it no accident that the first evidence of symbolic marking coincides with the rapid expansion of the hominid lineage into formally inhospitable domains (Boehm 1999; Mithen 1999). Through a tremendous reduction in cognitive demands afforded by normative and symbolic life, it appears human society grew its feet, and ran.

But commitment-signaling theorists believe normative and symbolic marking give only part of the story for the human transition to the ultrasocial niche. Let us consider why.

The commitment-signaling theory of religion

Norms and symbolic marking foster reliable exchange by cheaply punishing defection. But, in a Machiavellian world this effect can only be temporary. *For extrinsically motivating social conventions select for more effective Machiavellian agents.* Instead of drunkenly groping a superior's spouse at the party we take the adultery underground. Defectors may use the cover of night and other screens and props effectively to deceive. The gossip gradient may be polluted with mistaken or exaggerated information (Geertz 2009; Geertz 2007). Defectors may contrive various schemes and technologies to assist in swindling their norm-following cohort: shell games, card hustles, snake oils are common in every culture. Thieves often strike and honor private deals at the expense of group welfare. Cabals and juntas form. Not every

action can be policed by a norm. And to the degree that defection remains difficult to detect, there will be incentive to dodge and exploit the rules.

Furthermore, we are prone to 'matching law' fallacies. Our preference for immediate reward over future reward is (approximately) inversely proportional to the timing of the reward (Frank 1988). We often select immediate pleasure at the expense of future pain. Were we to experience a hangover *before* imbibing, few would drink to excess. We do not always act as we know we should. So, at the time, even risky norm-violating behavior may seem worth it. Moreover, where defection stakes are high, and the threat of discovery is low, defection in even well policed societies may pay.

Norms commit agents to cooperation through extrinsic benefits and costs. But they do not *pre-commit* agents. And for this reason they do not secure commitment where an agent perceives an interest to defect. Norms do not reliably reduce Machiavellian complexity unless they are *intrinsically motivating*. The standard solution to social evolution does not solve its problem.

It seems religion may rescue norms. For religion appears to afford cheap policing. Even if an actual return favors defection, a perceived supernatural return (now or soon) or a strong emotional desire to please a norm-supporting supernatural agent will be capable of inducing cooperation. When individuals face cooperation dilemmas, it is not the actual pay-off schedule that predicts cooperation. What matters is their preference schedule. If the distortion brings more advantage than accuracy then selection will favor distortion in our understanding and feelings relative to a reward matrix. And if a god or ancestor or karmic power *is believed* to reward cooperation or punish defection then defection may be rationally disfavored (Bering 2004; Dominic Johnson 2005). Where a religious agent acts out of self-interest, or a sense of duty, or love for a god, social transgressions become less desirable. It may be very easy to access the boss's spouse, but if you have reason to believe that a castrating god or your dead mother is watching the tactic may seem ill advised (for a 'spandrelist' account of 'full access strategic agents' see Boyer 2001). Moreover, the idea that gods and other supernatural powers are agents to whom we owe duties and obligations can motivate exchange when the idea becomes genuinely and commonly believed. For, given the rest of human psychology, we feel those obligations without calculating conditional strategies and natural outcomes. For religionists, honoring social commitments will seem desirable. Or so it may seem.

Unfortunately religious policing is unevolvable. Supernatural illusions cannot police exchange. For such a tendency to supernatural policing cannot become common when the illusion-trait is rare. Against defectors, religionists will only get cheated. And even where religion is common religious persons remain exploitable by defectors impersonating religionists: in time, defecting wolves dressed as cooperative sheep keep company only with other wolves in theological drag (see, e.g., Irons 1996). Religious cooperators face a *recognition constraint* (Bulbulia 2005; Bulbulia 2006). Critically, religiously motivated cooperation is evolvable only if co-religionists can find each other, while at the same time spotting religious impostors.

Religious emotions as pre-commitment signals

The commitment-signaling theory of religion suggests we can solve this problem. At the core of the theory is the idea that solving the recognition constraint relies on the deployment and interpretation of signals that reliably and perceptibly distinguish genuinely religious agents from defecting frauds. If religious cooperators are able to produce a characteristic signature that identifies them as different from religious impostors, religiously motivated moralities become possible. Yet, what could function as such a signal? What can religious agents do that would-be defecting agents impersonating religious agents cannot?

Commitment theory suggests many candidate signals. Participation in religious practices frequently brings costs that only the religiously committed will accept (Irons 1996; Irons 2001; Sosis 2003; Sosis and Alcorta 2003; Sosis 2004; Bulbulia 2004a). Some of these costs are very striking indeed, for ritual agents immolate themselves in dramatic and dangerous ways (Atran 2002a; Bulbulia 2004b). Many costs are less vivid, and come through resource expenditure and forsaken opportunities. For cost outlays themselves give information about the nature and degree of commitment. If Hajji is willing to swing on a flesh hook for his god, there can be little doubt he is committed. The core prediction of ritual-signaling theory is that if an agent produces evidence of commitment to a god, that agent is committed to a group (for empirical evidence supporting ritual-signaling theory see Sosis 2000; Sosis and Bressler 2003; Bulbulia 2007).[4]

4. Sosis and his colleagues have built an impressive empirical case for looking at rituals as amplifiers of cooperation signals. But I (and they) want to emphasize that commitment signaling may not be the primary function of ritual action. To the extent that rituals permanently mark us, they

There are other signals religious agents may send that defectors will not easily match. Theological knowledge is a hard-to-fake signal of group affiliation; it identifies past resource investments and developmental histories. For theological knowledge is hard to learn. Indeed, theology may serve few utilities apart from its signaling capacity, for religious agents do not appear to employ it to reflect about their gods (Barrett 1996; Barrett 1998; Barrett 2004). Moreover, permanent symbolic markers—those that come both through 'assent' and 'dissent' communities—may pre-commit individuals through permanent marking, as the swastika example illustrates. Where individuals lack permanent signals they will often import various contrivances to signal their affiliation—headpieces, unusual clothing, scarves, masks, and headdresses, various charms and emblems, specific and unconventional configurations of body hair. They may adopt a special gait or stride. These paraphernalia and habits signal commitment through conventional meanings that many defectors would be reluctant to accept; especially where such affiliations are public and exclusive (extensive display disrupts the join–defect–leave strategy). True believers may shed much information as a by-product of their normal activity, for religious commitments impinge on life outside of symbolic contexts. Paying attention to what religionists do when they are distressed may give clues about their convictions. An athlete who thanks and praises a god on national television gives a somewhat difficult-to-fake signal of commitment, and this kind of example, so familiar in public life, may reflect a deeper disposition to shed hard-to-fake evidence of group identity and commitment in non-religious contexts.

So there are many signals potentially relevant to solving the recognition constraint. Here, I wish to focus on emotional signaling, for emotions illustrate the most basic and ancient reliable signaling technology, one that has long been a legacy of primate flesh.[5] Moreover, our ancestral signaling system helps to explain the cognitive binding of religious beliefs and powerful motivation states. Let us consider emotional signaling generally, before considering how religious emotions give evidence of commitments to

powerfully pre-commit us to acting in pro-social ways. For, if group competition is fierce, our prospects for survival may well coincide with the success of our tribe, as the parable of the tattooed Nazi suggests. And there may be other crucial non-signaling functions (see discussion below).

5. Primates signal emotion through cries and facial expressions, and through postures and ritual gestures (Griffiths 1997b). See also Zahavi and Zahavi 1997.

norm-supporting superhuman agents. There are three significant properties of emotions that collectively work to make emotions reliable as signals of cooperative (or defective) intent (Frank 1988; Zahavi and Zahavi 1997; Frank 2001).

First, emotions are linked to motivations. To feel lonely suggests a motivation to seek company. To feel fear suggests a motivation to escape. Of course, we do not always act on our emotions. But, where an emotion is present, there is at least a prima facie motivation to act or respond (or to inhibit response) in a certain way. Notice that evidence of motivation gives clues about future behavior. This connection between display, motivation, and signal enables emotions to function prophetically. A strong emotion—say, fear at being dragged to the fire—will accurately predict activation of a characteristic response pattern. Facial expressions of basic emotions—fear, joy, anger, sadness, shock, disgust, and others—are human universals. They are unlearned and universally understood (Darwin [1872] (1965); Ekman 1994). No one needs to explain the haunted expression of terror in the torture victim's eyes.

Second, emotions manifest themselves in ways that are hard to fake. Emotionally salient fear is not difficult to detect. And, though other emotions may be masked, for most of us they are difficult to obscure for long, and some cannot be manipulated. A blush expresses self-consciousness, and the response may be very difficult to control. The muscular orchestration of a smile is both complex and produced outside of the neo-cortex, in regions of the brain dedicated to emotional processing (Ramachandran and Blakeslee 1998). Most of us have a hard time producing a genuine smile for the camera. The face is not the only emotional projector. Our voice too gives evidence. Speakers find fear and anger difficult to suppress. Profuse sweating suggests high autonomic arousal. Posture and gait also give emotional clues. Someone advancing rapidly with his chin forward probably means business. In short, though our emotions may be damped down, emotional states are very often credibly paired with motivations that are signaled through clear perceptual cues. Audiences are able to use these clear cues to discern emotional signatures, and so are better outfitted to predict behavior.

Third, audiences scrutinize emotional displays. The data here are less decisive for we are not perfect at detecting liars (see, e.g., Ekman 1975). Nevertheless, Frank's studies indicate that experimental subjects in even artificial, data-impoverished settings do far better than random prediction

(1988). Considering emotions in the wild, Frank argues that our inter-
pretive and discriminatory capacities will give even better results, as the
information presented to them is more substantial, differentiated, and
informed by other channels of information (the gossip gradient, accolades,
emblems of success, reputations, and others). Moreover, most of us find
it difficult to suppress and control emotion for long. In the evolutionary
arms race between signaling and detection systems, our capacities to dis-
cern emotional signals as reliable indicators of motivational states endow
emotions with a fragile prophetic power. In scanning an emotional display
we are better able to anticipate how an agent will behave, and so to adjust
our plans. But deceptive agents will always have incentive to mimic these
signals and, for this reason, biologically wired signaling technologies must
be configured to remove them as much as possible from deceptive control
(including self-deceptive control). For discussion of how ritual helps to
combat evolutionary arms races in signaling technology, see Sosis 2003;
Bulbulia 2004a. If Frank is right, our emotional responses are relatively
reliable and transparent because they evolved to pre-commit agents to
cooperation. To a rough approximation, emotional displays function as
signals potentially relevant to social interaction.

The literature on emotional signaling bears on an important feature of
religious commitment. It helps us to understand how intrinsically moti-
vating norms would have been supported over hominid evolution through
emotional displays relative to supernatural beings. We begin to understand
how religion supports norms by looking to the evolutionary problems our
immediate ancestors had to solve before acquiring rich normative morality.
Without a doubt, our emotional signaling system evolved much earlier
than did our capacities for normative and symbolic living. While our
nearest primate relatives have nothing remotely approaching normative and
symbolic society, they nevertheless register emotional displays in response
to other primates (and natural agents) as Darwin long ago observed ([1872]
(1965); see also Griffiths 1997b; Sterelny and Griffiths 1999).[6] Our capacity
for managing intricate social worlds emerged in a lineage already equipped
with the cognitive wares to express pre-commitments through hard-to-fake
emotional display.

Notice that this commitment-signaling system provides a powerful
pre-adaptation for norm-supported society. *Agent–emotion signaling bridges*

6. Not always other primates. A chimpanzee will recoil violently from a snake, etc.

an evolutionary trench that primates must cross before beginning the ascent of norm-building fitness peaks. For, once norms were associated with norm-supporting agents, normative commitments could have been marked by an agent–emotion display system whose complex and coordinated efficiency already had been honed by millions of years of evolutionary organization. That link would have been forged not because supernatural agents are intrinsically norm supporting (we shall see in section III how the gods behave appallingly). Roughly, the opposite was true. The link was forged because emotions evolved in our primate ancestors as a mechanism of response to agents. Thus, for an intrinsic signaling system to evolve from its primate predecessors, the representational inputs feeding that system would have benefited greatly by describing agent-like beings. And those agents are optimally effective only if they are all knowing, emotionally and morally compelling, potentially everywhere, and eternal. They are optimized, that is, when they are imagined as *supernatural* parents, ancestors, and masters. For the system to be stable, belief in those agents would have benefited through regular emotionally charged encounters, that is, through religious experience. (In section III we shall see how cognition manages this trick.)

Conviction → Norm-supporting Agents → Emotional Signal → Predicts Cooperative Intent

The connection of emotions to beliefs in norm-supporting gods would have unleashed tremendous advantages to individuals facing significant cooperation dilemmas. For, again, norms remain imperfectly reliable when they are not supported through intrinsic commitment. In an increasingly Machiavellian social world the recognition constraint threatens extensive, reliable exchange. By registering emotions relative to norm-supporting gods we were able to express pre-commitments to a god-supporting social group.[7] Moreover, where such agents form the targets of emotional concern—when we love or respect the gods—then violating their laws will not only seem unwise but also shameful.[8] And these pre-commitments will

7. Emotions may be centered on various natural objects—the props and prompts of religious culture, priests and priestesses, striking natural objects like mountains, or the sun and moon, and others. While my interest here is on explaining supernatural commitments relative to supernatural agents, a full treatment requires understanding the enchantment of nature. A full treatment would link supernatural agents to the larger class of 'sacred agents'.

8. Given the matching law, supernatural rewards must be paid in either the immediate or near future, or be enormously substantial to work. But intrinsically felt emotions alter preference schedules without a need for extra reward.

then be decoded by perceptional systems already evolved for the task of defector detection, thereby bypassing the computational intractability of a Machiavellian world. A substantial barrier to social living was crossed.

Is there any evidence for this evolutionary conjecture? The theory predicts that emotional responses to norm-supporting gods will be difficult to fake absent actual belief in such gods. And it predicts that morally motivating gods will never be merely represented: they will also be feared, adored, ingratiated, respected, loved, and honored. Perhaps unsurprisingly there is little experimental data on the role of emotional signaling in the literature on religion. Indeed, without the commitment-signaling hypothesis, it is unclear why anyone would look for it. More data are needed here. Intuitively it would seem difficult for most of us to manage emotions of religious piety towards superhuman agents that strike one as preposterous, under the hard scrutiny of religious observers. The relevant emotions are difficult to prompt and even harder to sustain. Moreover, the emotional dimension of religiosity is commonplace to anthropologists and historians of religion. And it is a repeated theme in religious theologies from Augustine through Edwards, Schleiermacher, Otto, and their contemporary followers. Finally, the commitment-signaling model of the emotions is well supported in the ordinary exchange contexts (Frank 2001). So, it appears safe to back the emotional-signaling horse in religious contexts.

At present, the commitment-signaling theory of religious emotions, then, takes the form of an inference to the best explanation. It explains the otherwise puzzling fact that religious agents inhabit emotion-drenched supernatural worlds. It explains the link between belief in false reality and strong motivational social commitment, and so explains the integration of religious belief with emotion to produce powerfully motivating conviction. I want to stress again, however, that the emotional dimension of religious signaling gives only part of the story. Emotions do more than signal commitment. Emotions motivate the search for specific kinds of information relevant to development and success. For example, aesthetic emotions may direct the search strategies of religious agents, indicating what sort of super-human information to seek out. An intense interest in gossip, for example, better enables us to understand our social context (see Tooby and Cosmides 2001 for an account of 'aesthetic' emotions and their importance to developmental contexts).

Moreover, a more detailed explanation of religious emotion would require submersion in the details of the highly structured religious contexts

that prompt, cultivate, revise, edit, assess, and amplify religious emotions. Cultural variation will organize different emotion-regulation systems in different contexts. The spasmodic ejaculations that are expected in an evangelical church will appear out of place in a dour Presbyterian service. Moreover, religious emotions are not stable absent *any* religious context, and without continued exposure to religious practice, religiosity as a whole degrades (Francis and Kay 1995). So, religious commitment substantially relies on locally configured religious practice for enduring epistemic support. Finally, without platforms for broadcasting commitment signals we would have no means for detecting them in the social collectives; for we cannot scan the religiosity of our peers without public, collective expressions of religious commitment.[9] In short, there is far more to the explanatory story than has been suggested here. Nevertheless, I hope to have made a credible case for investigating religious emotions as strategic adaptations for social exchange.

II. Religious Decoupling

Having sketched an evolutionary account for the integration of supernatural commitment to powerful emotional and motivational states I now consider how the systems that mediate that connection disengage religiosity from non-social practical domains. For, when religious conviction seeps into practical domains, an otherwise adaptive trait becomes damaging. Religious agents face an *encapsulation constraint* (see Bulbulia 2006 for discussion)

Consider our capacity for decoupled representation (or 'metarepresentation'). Organisms do not merely respond to their immediate circumstances with stereotyped behaviors. Instead, their perceptual representations of distal reality are 'decoupled' from automated response strategies. Perceptual

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9. For religious signaling to function it clearly needs to be projected through cultural technology. In a tribe of 150 cooperators laced with defectors, a focal agent cannot move from shelter to shelter inducing and then evaluating the religiosity of each of her cohort. An organism whose life dissolves into an everlasting series of produced and observed religious seizures is not viable. Moreover, the computational demands imposed by constant emotional signaling remain too high. Each individually observed religious signal would need to be filed, retained, and updated as social dramas unfold. There is no substantial reduction of a cognitive load here. In place of everlasting emotional scrutiny, however, we have social practices that at one time routinely display the religiosity of a collective. Moreover, such amplification technologies allow for other credible signals of religious motivation apart from emotional display, and these too provide a means for securing reliable exchange.

information may be stored and accessed for future purposes, perhaps presently unknown. Perceptual information may also prompt a range of behaviors. And, for any single behavior, a range of signals may activate initiation (Sterelny 2003). Other organisms decouple thought from behavior. A cat monitoring prey may attempt reconnaissance before pouncing. But, in the hominid lineage, this capacity operates with truly astounding richness and intricacy. We do not merely register distal affairs, we reflectively consider the extent to which our representations are true. We form moral and epistemic attitudes to our thoughts. We remember the source of certain information—as self or other (and who)—and modify our commitments in light of new information. We mark representations with time tags as well— locating events within the space–time matrix of personal autobiography. We recall and re-experience these representations with vivid emotional detail. And we update autobiographical knowledge with the receipt of new and relevant information. 'Jane wanted John the moment she discovered his unseemly defect.' Robust decoupling capacity enables us to manipulate and mark our thoughts for a range of purposes, many of which we cannot determine in advance. Such capacity brings massive, portable behavioral flexibility (see especially Cosmides and Tooby 2000).

In developing my story about religious decoupling I wish to consider the special advantages we obtain through counterfactual metarepresentation (and the simulation systems that inform it.) Through counterfactuals we are able to manipulate specific representations for special consideration offline.

(1) 'What would happen if the door to the aircraft cabin just now opened at 12,000 meters?'

(1) can receive a reliable though non-actual answer. In contemplating this scenario, an agent may access epistemic databases and utilize simulation-based inference machinery to bear on the task. She may produce and compare various scenarios, according a degree of probability to each. The relevant information processing may be very complicated indeed. For example, an agent's knowledge may change in light of how she imagines the counterfactual cases, and this change, in turn, may inform further deliberation. Stable panhuman resources such as folk physics may be invoked—in the present case, the law of gravity acting on the trajectories of falling bodies. Novel knowledge may give advice: Second World War bombardiers improved their accuracy by retraining their folk intuitions (McCloskey 1983). A 'phonological loop' and 'visual sketch pad' may be

deployed (Cosmides and Tooby 2000). We rehearse ideas and hatch plans in quasi-perceptual formats.

It is significant that through counterfactual inference, agents are frequently able to produce reliable answers to non-actual but possible scenarios. They do so without incurring the substantial risks and costs of live experimentation. In understanding and predicting their world, counterfactual-enabled agents are liberated from the deliverances of actual fortune. And they may devise plans appropriate to their novel, local circumstances. How may this happen?

In the first instance, counterfactual reasoning involves separating and marking a set of propositions for consideration as 'imagined but not actual'. To dignify ignorance with a name, let us call the scope operator that binds this set the IMAGINE WHAT IF operator. (I will suppose conditional counterfactuals give a THEN WOULD scope operator in inferences acting on arguments bound by the WHAT IF operator):

(1*) IMAGINE WHAT IF [(The door to the aircraft cabin just now opened) THEN WOULD (I fall to my death, bringing others with me)]

Though understood as not literally true, the contents bound by the counterfactual operator are allowed to migrate freely, as if they were true. We can produce a range of potential outcomes and assess their conditional probability through this invented knowledge (a form of individual learning). Propositions within the scope of the operator are treated differently than they would be were they admitted without the operator. Critically this isolation of information within a domain prevents false information from damaging our inferential capacity in unrelated domains. The information encoded in the hypothetical (1*) would produce schizophrenic terror were it represented or read in the unmarked form as:

(1**) The door to the aircraft cabin just now opened at 12,000 meters.

Moreover, counterfactual decoupling combines with other metarepresentational capacities, for we are able to do more than mark propositions for special consideration as 'not literally true'. We are able to form emotional attitudes to hypothetical propositions and accord them a degree of certainty. The source of a representation—say, as 'self' rather than as 'other'—can be identified and pinned to its representational contents. Robust combinatorial inflection enables us to generate richly structured representational outputs:

(1***) SELF // NOW // IMAGINE WHAT IF [(the door to the cabin
    just now open . . .) VERY LIKELY // THEN WOULD (I fall to
    my death, bringing others with me)
    → inference: WOULD BE // UNDESIRABLE (I fall to my
    death . . .)
    → inference: mark antecedent of the conditional UNDESIRABLE

The rich inflectional character of thought also helps us to produce strikingly
precise strategies. With it, we travel through time to fictional futures,
running experiments to improve our own.

2. PLAN (Do not open the door)

Massive decoupling enables us to plan in ways unavailable to the literal-
minded. We consider alternatives and limn future possibilities. We scheme,
trading immediate discomfort for future return: 'If I endure the tooth
drilling, the chronic pain will dissipate.' As with any creature, the shadow of
the future falls on us. Yet, through 'remembering a future'—in Cosmides
and Tooby's apt phrase—we can alter which shadows fall. We anticipate
destiny and so are not enslaved by it.

    The power of non-literal thinking also emerges in the analysis of fic-
tion. For the present purposes, consider fiction as extended counterfactual
cognition deploying a matrix of representations explicitly understood to
be not literally true. It is interesting, and puzzling, that we should desire
to contemplate such representations (Tooby and Cosmides 2001), for the
extensive contemplation of fiction imposes opportunity and other resource
costs, and it dwells in falsehoods. There is no possible future in which
we will face the Minotaur, the Little Mermaid, or Vader's Death Star.
Moreover, in fiction, non-literal thinking is none the less represented in
quasi-literal format (Brock 2002). We know the *Shining* is only fictional,
but nevertheless we fear for the boy as he flees to the snowy maze. We
know Godzilla has never afflicted Japan—indeed we know the 100-meter
dragon cannot be physically realized—yet hope the Japanese army will deter
it. Moreover, though we fear the fictional Godzilla, we do not run from
the theater as we would from a real 100-meter dragon. And, even as we
hope for its success, we may not even know if Japan has an army.

    There has been lively debate over the utility and evolutionary history
of fictional capacities (Crews, Gottschall, et al. 2005). Some see purposes,
e.g. Carroll 2004. Others see fiction as 'mental cheesecake', attractive but

not functionally so (Pinker 1997: 525). But it cannot be doubted that a substantial information management system needs to be in place to prevent the cognition of fiction from becoming maladaptive. For fiction to work we require something roughly approximating the following meta-representational design:

IMAGINE + [Fiction]

We define 'IMAGINE' as the ordinary counterfactual decoupler that marks a collection of non-actual representations for hypothetical and conditional consideration. We identify the argument of this operator (the bounded non-actual collection) with the notation [Fiction]. To prevent fiction from harming us, the IMAGINE operator must keep fictional information from spilling into practical inferential domains. It erects cognitive firebreaks between the representations it binds and practically relevant ontological commitments. It marks the contents within its scope as 'not literally true'. We judge that

(3) Scarlet O'Hara is beautiful

but also that

(3*) Scarlet O'Hara does not exist.

Paradox is resolved when we note that (3) falls within the scope of a fiction. (3) should be read as

(3**) IMAGINE [(*Gone with the Wind*) → LICENSE fictional inference: (Scarlet O'Hara is beautiful)]
     → practical inference: NOT TRUE (Scarlet O'Hara exists)

The IMAGINE scope operator guides the interpretation and motivational integration of fiction cognition.[10] It enables us to understand both that fictions are invented and that genuine inferential relations hold for their contents. If fiction is adaptive the systems that export fictional information to practical problem solving domains do so without the contents of fiction ever being believed.[11]

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10. Advocates of the 'fiction as adaptation' idea observe that the knowledge and emotion released through fictional contemplation allow for a more rapid accumulation of locally adaptive knowledge than is possible were we restricted to learning from the vagaries of actual experience. See esp. Tooby and Cosmides 2001.
11. The marking of fiction as only quasi-true allows for inferences within the boundaries of a fictional marking to flow freely. This leads to some peculiar effects. We can ask whether

I have avoided the 'fiction as adaptation' debate. But, in section I, I urged that religiosity manifests the complex and coordinated structure of an adaptation for cooperative exchange. Its function is not to help us learn about social complexity but rather to reduce it. It does so by making social relations more reliably predictable. Thus, the task requirements further constrain the cognitive organization of religious commitment, and structure the metarepresentational systems that manage them.

I have discussed the distinctive functions of highly motivating religious commitment. The most parsimonious supposition—in evolutionary and cognitive terms—is to suppose that the capacities that enable us to produce decoupled religious representation resemble the capacities that underwrite counterfactual and fictional thinking (see Atran 2002a and Pyysiäinen 2003a for similar but non-adaptationist analyses). For, the functional tasks in many respects resemble each other. Religious cognition contemplates fictional realities in ways that drive domain-specific motivations and responses. Information held within the scope of the religiosity operator must not migrate into many practical domains of interaction. Religiosity, like counterfactual and fictional reasoning, faces a significant encapsulation constraint. Functional religious decoupling, however, differs from fiction counterfactual decoupling.[12] These differences stem from the functions of religiosity as a pre-commitment and signaling device.

The most important and obvious difference is that religious conviction is not self-consciously represented as fiction. It is self-consciously represented as true. We begin with the simplest conjecture:

$$^{®}\text{IMAGINE} + [\text{Fiction}]$$

where $^{®}$IMAGINE is a special counterfactual scope operator. Like the naked IMAGINE operator we assume that the religious decoupler binds a fiction so that it is read by the motivation and behavior systems as not actual. This prediction follows from the encapsulation constraint. An

Holmes is brighter than Watson and form an opinion, though this fact is never directly stated within Conan Doyle's work. But we cannot sensibly ask the color of Watson's eyes or the number of wives he has had. For nothing in the propositions given in Doyle's books allows inferences to these conclusions. We tolerate inferences (and perhaps debates) over the first case, whereas the second meets a blank stare of incredulity. There is a fact of the matter about how many wives Jeppe Jensen (an actual person) has had. But there is no such fact for Watson. Fictional characters are in this respect ontologically gappy.

12. I am not committing to an 'out of fiction' conjecture for the origins of religiosity. Rather, I merely note that both capacities share very similar structural features, for both are powerfully constrained by the demands of encapsulation.

evolutionary task analysis predicts that ®IMAGINE is read by most psychological systems in ways similar to the IMAGINE scope operator. The simplest hypothesis is that religious representations are read by the systems that regulate practical involvement with the world similarly to the way they read fictional marked representations. Metarepresentational binding allows religious information to be fenced off from harming a religious agent.

(4) ®IMAGINE [Zugroo is Lord Creator]
  → practical inference: NOT TRUE [Zugroo is Lord Creator]

Yet, given the functional constraints on adaptive religiosity, we assume that in the workspace where representational contents are *consciously accessed* and manipulated religion is represented as 'true', or even as 'certainly true'. *For the strength of a pre-commitment signal hinges on the emotionally detectible certainty of a religious belief.* Hence, self-consciousness is constrained to read ®IMAGINE counterfactuals as it would read factual representations. We can say that religiosity operates under a *self-deception constraint*. Here I use 'self deception' in Trivers' sense of a biasing and distorting of information flow to produce adaptive outcomes (Trivers 1991). We must *consciously believe* and we must also *unconsciously not believe* that religious representations are true. Needless to say, this division of a religious mind imposes strict demands on the metarepresentational system that controls and isolates religious fictions.

To a religious agent the scope operator will give something like the following permission to autobiographical consciousness:

(4*) ®IMAGINE [Zugroo is Lord Creator]
  → practical inference: NOT TRUE [Zugroo is Lord Creator]
  → workspace inference: CERTAINLY TRUE [Zugroo is Lord Creator]

Whether we are able to claim that agents believe in gods rather than 'believe in believing' has recently been subject to lively dispute (Palmer and Steadman 2004; Dennett 2006), for there is no obvious referent to that to which religious agents express commitment. But if the commitment signaling theory is in the right ballpark, there can be little doubt that religious agents consciously believe that what they are representing is true. For, such a conviction is required to produce the hard-to-fake emotional commitment to a norm-supporting god. Indeed, for the system to remain

functional, we must believe with emotional zeal (Dennett is correct to note that religious agents 'believe in believing' but wrong in thinking that the 'religious memes' explanation sufficiently explains why (2006)). A non-trivial prediction of commitment signaling theory, then, is that persons will genuinely believe that they believe, even if this belief is inferentially unbounded. They will, for example, pass polygraph tests and galvanic skin response measures for lying.

Let us examine the interplay between self-conscious belief and encapsulation more fully. In a karma-bound world an agent expresses intrinsic precommitment by expressing moralistic emotional beliefs in karmic powers. Yet, consider an agent who truly believes in karma (that what goes around comes around). In a karmic world there is no point in punishing our enemies, for they shall get theirs anyway (as the karmic wheel turns). But karma doesn't exist. An organism that fails to punish its enemies will have lots of delighted enemies, and it will also be short for this world. Consider the thought that there is a perfect life of bliss after this one where all the faithful will go. A natural inference from this thought is: 'Give up caring very deeply about what happens in this life.' Yet, not caring about the hard labor of living is a bad idea for survival. Like a contradiction, almost anything follows from unconstrained supernatural commitment. And that makes any dispositions to it very dangerous indeed. So, religious commitments must be surrounded by cognitive firewalls similar to those that prevent our counterfactual and fictional musings from collapsing into a split–minded failure to distinguish actual from non-actual representations. The theory predicts that while religious persons express religious beliefs such persons will act in many ways as if they do not believe—for example, they will punish their enemies and fear death.

Furthermore, commitment-signaling theory predicts that religious fictions will be expressed with a moral valence. This further constrains its outputs. [®]IMAGINE fictions must be visible both to consciousness and to the systems that control moral normative emotions, motivations, and responses. While the outputs of religious belief must be fenced off from practical domains, they must be highly salient in cooperation domains. For religiosity to function adaptively those outputs must be integrated to normative exchange domains. Thus, religiosity not only faces an *encapsulation constraint* it also faces an *integration constraint* (Bulbulia 2006; Bulbulia 2007).

(4**) ®IMAGINE [Zugroo is Lord Creator]

→ practical inference: NOT TRUE [Zugroo is Lord Creator]

→ workspace inference: CERTAINLY TRUE [Zugroo is Lord Creator]

→ emotional response: Zugroo is real display

→ morally normative inference: Follow Zugroo's norms (including norms of sacrifice).

The integration constraint predicts that agents will come to believe that the rules and social orientations that religious fictions describe and motivate are intrinsically good and right. Hence religious fictions will be cast to prevent or minimize challenges to the moral authority of religious fictions. It is worth observing that in all religious cultures, to challenge norm-supporting inferences from religious fictions typically results in harsh and immediate social punishment. Religious narratives are norm supporting, but they are also norm supported. Religious morality thus scours the fictions that support it. This moral casting can produce very strange interpretive strategies. Very often religious characters will be seen through a moralizing lens that we do not apply to fictional characters. Consider this story.

> There is a very rich man named Mr Z who wants you to worship him. He lives in a nearby town though no one has seen him. Those who worship Mr Z are given a million dollars. No one has ever seen this, but trust me it is true. Mr Z repeatedly breaks the legs and burns those who do not worship him. If you love Mr Z, he will give you a million dollars. If you do not love him, Mr Z will savage you.[13]
>
> Some Ignorant Shepherd

It makes sense to ask whether this story licenses the inference 'Mr Z is a good man' or the inference 'Mr Z is deserving of praise and worship he demands.' More basically, it makes sense to ask why Mr Z would make such outrageous demands, and why he would care to be worshiped. But often it does not make sense for believers to ask these questions of deities who behave in similar ways. (Indeed far more horrendous ways, as in the Book of Job.) For the religious story is interpreted in such a way that God's command must be good. Moreover, for most believers it does not make sense to question a deity's practical judgment. It would be strange to ask of the Judeo-Christian fiction why God sent his all-important messages of

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13. This story is adapted from <http://www.jhuger.com/kisshank>.

salvation to uneducated shepherds, at a time when there were no printing presses or mass media. The question is obvious, but does not come up. Similarly, it makes no sense to ask why, if God is invisible but omnipotent, God did not write his name on the moon or in the stars.[14] Moreover, religiously inflected accounts of religious history are not typically revised in light of new knowledge, and resist placement into a wider context. We may doubt the veracity of 'the Legend of Mr Z' transcribed by Some Ignorant Shepherd. But, to refer to Christianity as invented by scientifically ignorant pastoral peoples in the ancient Near East may well offend solemn Christian believers.

Notice I do not claim that the gods of religious fictions will always be interpreted as good and righteous.

(5) → Moral normative inference: Follow Zugroo's norms
    is compatible with but not equivalent to

(5*) → Morally normative inference: Follow Zugroo's norms because
    Zugroo is morally perfect.

The inference (5*) is not the only one capable of supporting a norm. There may be a variety of reasons agents supply for why they follow Zugroo's demands—for example, terror of crossing a cosmic tyrant. Moreover, the morally normative inference may well be basic, given the integration constraint religious norms likely deliver for every believing agent, absent the need for supplementary reasons.

The data suggest that few religious fictions support norms through reliance on representations of perfectly moral gods. Indeed, in vastly many traditions, the gods are explicitly represented in morally questionable ways. Human morality and the gods' morality are sharply distinguished. To repeat, this property of religious fictions is striking when compared with ordinary fictions. Even very powerful fictional characters (Mr Z) are held morally accountable by our standards. Ordinarily we apply to fictional characters standards we would apply to ourselves.

The religious fictions of ancient Greece ably illustrate this pattern: Greek gods are explicitly represented as ruthless, capricious, and cruel. Similarly,

14. Children do sometimes ask this question, for which they are generally dissuaded if not harshly punished. It appears they do not know whether to group a narrative bundle with an IMAGING THAT scope operator or an IMAGINE THAT® scope operator, perhaps because their religiosity system remains immature. This is very interesting and deserves close consideration in the developmental psychology of religion.

the Hindu god Kali is represented as arbitrary and vicious, yet nevertheless remains the object of mass veneration. Nevertheless, in both ancient Greek and Hindu societies very strong morally normative inferences run from religious mythologies to pro-social (and sacrificial) behavior. These facts comport well with commitment-signaling theory, which predicts an active integration of religious commitment to cooperative domains. For religion to enhance solidarity, religious commitments must promote distinctive motivational and behavioral states. While religiosity is insulated from (non-social) practical behavior, it must be reliably integrated to social behavior. Otherwise, religiosity will be rejected, not targeted and amplified by evolutionary selection pressures (see Bulbulia 2004a).[15]

To draw the threads of this section together, the commitment-signaling model predicts that religious persons will emotionally believe in gods, and moralistically believe in believing, for believing in a norm-supporting god signals a commitment to each other. The [®]IMAGINE operator therefore defines a moral expectation about the fiction it bundles, in intricate and often bizarre ways. The convention of interpreting stories to have norm-supporting consequences frequently distorts and biases the interpretation of religious fictions. Explicit 'why do we celebrate nailing day?' questions will be discouraged or punished.

III. Religious Experience and Confabulation

I finally consider an application of the religious scope operator hypothesis to the domain of religious experience. Religiosity involves the active interpretation of reality as god-infested. While the gods are passively represented through shared religious stories and through public testimony, many religious agents report that the gods are personally encountered (James 1902).

I suggest that religious conviction is best explained as a kind of confabulation. We know that individuals have poor access to the true causes of their judgments, emotions, and behaviors. In a classic experiment Nisbett and Wilson (1977) showed that when faced with an arbitrary decision

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15. While religious fictions support norms by allowing for emotional pre-commitment signaling, I do not think that religious fictions are necessary for supporting such norms. The fact that Asperger's patients can learn and strongly commit to religious norms without understanding other minds suggests that the relevant domains are to some degree dissociated. See Atran 2002a: 193. In Asperger's we find normative bracing without psychological content.

between identical objects (nylon stockings), agents nevertheless invented reasons for their choice, defending these reasons even after being informed the objects were identical.[16] Dennett suggests that confabulatory practices are extremely common, for concocting ad hoc stories is a fundamental part of interpreting who we are. In expressing our personal pasts we invent reasons and fill missing gaps, supplying a coherence and control to our autobiographical selves that we do not actually possess. Hirstein observes that the response 'I don't know?' is a complicated cognitive feat, one that involves the active suppression of conjectural thoughts that flood knowledge and response systems. The breakdown of these systems in a range of cognitive disorders suggests that critical cognitive stopgaps mediate the relationship between how we imagine ourselves to be and how we finally acknowledge ourselves to be. Hirstein notes that the effect of confabulatory response is particularly strong when agents are asked to respond to questions for which they *ought* to have answers. When asked by a romantic partner, 'why do you love me?', agents will typically supply *some* explanation— 'your eyes', 'your kindness', 'your sympathy'—when in fact they may not understand or have access to their reasons. It would be inappropriate in such instances to reply 'Honestly, I don't know why I love you' (Hirstein 2005: chap. 1). Thus, given well-documented confabulatory response effects, it would be astonishing if believers were unable to supply reasons for their strong religious conviction; it would be astonishing if they were to reply 'I don't know why I have strong religious conviction', all the more so where there are strong social expectations that they ought to know. Such expectations pervade many religious contexts.

While the reasons religious agents give for their belief may be sheer confabulation, it is nevertheless interesting that religious agents often describe some of their experiences as of supernatural beings. That is, the experience of some religious agents seems to be confabulatory in the present tense. Religious persons describe how they encounter religious beings in the course of their lives—typically, though not always, in the course of private and public religious practices (James 1902). Here I want to understand whether the minimalist-scope syntactic architecture I sketched in section II sheds any light on how such characterizations are organized. 'Spandrel' theories suggest that religiosity endures through the transmission of arresting

16. When given a set of choices, most people tend to pick the rightmost object. While only those with psychological training have access to this reason, nearly everyone will supply a reason.

or otherwise compelling concepts (e.g., Boyer 2001; Atran 2002a). Here, the claim is that religious information comes second hand, by a kind of conceptual transfer. But I have urged that the minimum unit of transfer is not the concept, but a scope-restricted fiction that embeds religious concepts (see also Feldt 2009). Agents acquire the religious fictions of their cohort in the context of social learning. But it seems they also acquire religious information through powerful emotional experience, in groups, but also alone by a kind of individual learning.[17] We have assumed that the gods play no explanatory role in agents' experiences. Thus, it is perplexing how religious agents are able to describe some of their experiences as caused by supernatural beings.

Given the scope-syntactic model presented above, the simplest explanation is that religious experience is ordinary counterfactual simulation in which the relevant simulations are marked and bounded by the ®IMAGINE scope operator. That is, religious simulations are *internally generated* religious fictions. Such representation can undoubtedly produce powerful affect. For a capacity to imagine religious agents as CERTAINLY TRUE makes it possible to engage with supernatural agents as more than abstract concepts. Through religious experience, agents are able to *commune* with supernatural beings. The simplest explanation for this experience is that religious agents produce counterfactual representations of sacred realities, which they consciously interpreted and store 'as true' (*the self-deception constraint*). These representations are formatted so that they do not split-mindedly influence practical action (*the encapsulation constraint*) outside of normative social exchange (*the integration constraint*).

The model sketched above also gives an initial answer for why religious agents produce religious experience. Given an absolute poverty of experience, it is difficult to understand how religious commitments to superhuman agents could be long sustained. Yet, religious experience gives emotionally powerful episodic support to religious commitment. For in most instances the best reason for believing in something is having directly experienced it. Thus, on the scope-syntactic model advanced here, we can view religious experience as a kind of *adaptive confabulation*. It is adaptive because it produces emotionally powerful evidence for religious pre-commitment and signaling. It is confabulation because religious evidence flows from a heavily structured biasing and distorting of information.

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17. Individual learning, of course, may be developmentally scaffolded by social learning.

Let us explore this hypothesis. Moving from an imagined possibility to an unlicensed belief is extremely common. Such occurs every time one slips from a belief that x might be the case ('the tyrant might be holding weapons of mass destruction'; 'the chairman might be trying to thwart my progress'; 'she might love me') to an affirmation that x is true [thus, → infer: CERTAINLY (Invade!); thus, → PLAN (Hit the chairman with a chair); thus, → MEMORY (She struck me from love)]. Such confusion manifests itself in peculiar clinical situations. Patients significantly and obviously impaired by stroke sometimes truthfully deny their condition (anosognosia) or concoct and believe with rigid certainty wildly implausible stories for why they cannot do what is asked of them (as in Korsakoff's syndrome). Capgras disorders also lead afflicted agents to express convictions in vastly unwarranted claims. Such agents regularly invent fabulous stories in which loved ones are claimed to be impostors who have killed and are now impersonating their loved ones, or are alien clones. Here again the stories are so remote as to seem expressed in jest or as lies. But the afflicted agents are dead serious, sometimes to the point of attacking those they take to be doppelgangers (for discussion see Hirstein 2005: 124–34).

Exploring this model further, observe that in practical domains the systems that internally generate counterfactual representations will mark and bind counterfactual ruminations with 'the self' as their source. (The contents are marked and bounded as 'only imaginary' and 'invented by me'.) When I imagine Judgment Day, I register and record the simulation as mine. But [®]IMAGINE marking of internally generated counterfactual simulation allows for the authority of religious counterfactuals to lie *outside* the religious agent. Here 'Judgment Day' is experienced as uniquely real, and endowed with moral importance. Given this authority, it would be unsurprising if religious imagination were frequently registered with the source tag 'supernatural other' and mistaken for an objective, external encounter.

There is much evidence suggesting that religious experience is registered as supernatural-other generated (James 1902; Taves 1999). The ethnographic and historical literature is also animated with examples of powerful and vividly represented supernatural experiences (e.g., Richard Katz 1984). On the model proposed here, we find that religious experience stems from an adaptive marking error. It is a kind of powerfully motivating, moralistic confabulation.

Notice that the religious decoupling of imagination makes it possible to have religious experience without visual or auditory hallucinations. The model predicts that when a believer generates a simulation of Judgment Day the argument (bundled representation set) produced is approximately similar to that of a disbeliever. But, different scope operators bind the believer's argument by very different rules, according them very different permissions than do the scope operators inflecting a non-believer's argument. For the believer, these representations are read as 'CERTAINLY TRUE'. And this gives imagination an experiential quality without a requirement for ordinary sensory experience.

Moreover, the model predicts that internally generated religious fictions will be marked and accessed by episodic memory as *morally relevant* experience. For the capacity for experiential storage enables religious simulation to generate norm-supporting motivational power. Religious experience not only obeys the integration constraint; it also *supports* integration by *generating* supernatural evidence. But, because religious scope operators restrict 'as true' interpretations of religious experience to the confines of moral emotion and motivation (cooperative pre-commitments) religious experiences, though false, will not typically harm religious agents. Indeed, if the model proposed here is correct, these experiences benefit religious agents over the long haul. They do not, for example, produce behavior characteristic of schizophrenia, because religious scope operations encapsulate their content.

The literature on sensory deprivation and religious experience provides a fertile ground on which to explore this model. From the late 1950s to the 1970s researchers conducted experiments on participants whose sensory inputs were significantly reduced, often through immersion in warm dark saline baths placed in soundproof rooms. Participants in such conditions frequently described altered states of consciousness and imagery, which they almost universally interpreted positively (Lilly 1977; Lilly 1956; Suedfeld 1975). But they did not interpret such experiences as 'hallucinations' (Suedfeld and Vernon 1964). They did not literally see and hear as they would in ordinary experience.

In an experiment examining reports of religious imagery in sensory deprivation tanks, Hood and Morris compared the responses of intrinsic and extrinsic religious participants in a double-blind procedure. Intrinsic participants value religion for its own sake (they are cooperators, in my terminology). Extrinsic persons value religion for their worldly/practical

benefits such as access to mates or as a means to impress high-status community members (defectors). (As Maynard Smith 1982 noticed long ago, most cooperating populations are stably composed of a mixed group of cooperators and defectors!) Half the participants were instructed to imagine religious figures, situations, and settings, whereas the other half were asked to imagine cartoon figures, situations, and settings. The researchers theorized that the intrinsic religious persons would produce more religious images because for them such images are more 'relevant'. Analysis revealed that indeed intrinsically religious persons reported more cued religious imagery than did their extrinsic counterparts. But, strikingly, the intrinsic religious persons produced more spontaneously religious images in the cartoon control setting than extrinsic persons produced in the religious setting! Intrinsic agents were finding religion even where they were primed to find only cartoons (Hood and Morris 1981). Interestingly, Hood and Morris did not observe this effect in response to ambiguous drawings, suggesting that the effect was limited to *experiential* simulations.

The finding suggests that the systems that control simulation in intrinsically religious persons may be strongly primed to read ambiguous experience with something like the $^{®}$IMAGINE scope operator. Critically, there is an important developmental story relevant to this marking disposition, for mere exposure to religious fictions is insufficient to produce the relevant effect. Nevertheless, once acquired, intrinsic religiosity initiates an experiential search protocol for religion.[18]

I do not suggest that these data fully vindicate the experience-as-religiously-inflected-imagination hypothesis. But they produce intriguing evidence for it. And a negative result (religious experience as hallucination) would undermine the hypothesis. Moreover, sensory deprivation experiments illustrate how a well-motivated theory of religious experience enables us to place already known facts into a wider explanatory frame. This is important because we are not only interested in fragments of a puzzle about religiosity but also in whether those fragments form part of a larger complex and functionally integrated composition.

We can hazard several more predictions. If religious experience is ordinary counterfactual simulation bound by a religious scope operator, then

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18. I think this research program also casts some doubt on the proposition that repetitive and sensory impoverished rituals lack sensory pageantry—a key dogma of contemporary cognitive ritual theory. But I will leave this point unexamined for now.

religious persons will represent the characters of religious experience as they do fictional characters. That is, they will describe and remember religious experiences as something akin to 'true fiction'. In the simplest case, those who have religious experiences will be unable to tell you whether God has thick eyebrows or walks with a limp. They will not be able to say whether the God they converse with in prayer speaks with a heavy foreign accent. Gods here are ontologically gappy, like ordinary fictional characters. Such questions, of course, can be asked after encounters with ordinary agents. Having met him, I can tell you whether Sosis walks with a limp. This, of course, does not rule out that more robust confabulatory simulation may occur. A schizophrenic religionist can really tell you whether God's eyes are blue because she has seen them. But, even in very robust experiential simulation—for example, that cultivated by meditation, trances, psychedelic drugs, or simply very specifically manipulated sensory contexts—the model predicts that for non-clinical common-or-garden religionists, such extreme experiences, nevertheless, will be restricted by religious scope operators to prevent inferential damage. Religious persons will say and believe mad things, but they will generally not act as if they are mentally impaired.

Conclusion

I began with a review of the commitment-signaling hypothesis for religiosity. I suggested that this hypothesis is important because it postulates psychological and cultural mechanisms for supernatural cognition that differ somewhat from many popular cognitive approaches. In particular, it postulates emotionally salient commitments to superhuman agents capable of motivating moral exchange. The signaling hypothesis explains the otherwise puzzling link between religious cognition, moral cognition, and emotional display. Supernatural commitments help to predict cooperative exchange by endowing norms with strongly enhanced motivational support. They enable the conversion of extrinsically motivated normative commitment to intrinsically motivated pre-commitment. Yet, I have urged that religious pre-commitment is only evolvable if religious agents are able to solve the *recognition constraint*. To find each other, such agents must be capable of producing and decoding signals whose production is easy for religious persons but difficult for religious impostors. I urged that the

barriers to religious cooperation are surmountable. The affective dimension of religious cognition—visible signs of love, devotion, piety, or fear for the gods—provides signals of cooperative commitment that help to resolve the demands of recognition. Religious emotions, on this view, are not noise created by otherwise functional mental architecture, they are adaptations for rewarding trade. I suggested that many of the costs surrounding religious practice, then, may be fruitfully explored as scaffolding for cooperative exchange.

In the second section, I used the commitment-signaling theory sketched in section I to sketch a metarepresentational design for processing religious information. I observed that our capacities to commit to a moralizing supernatural reality appear to be minimal modifications of our capacities to represent counterfactuals and fictions. A strong *encapsulation constraint* on the functionality of religion suggests that—like counterfactual and fictional thought—cognitive firewalls stand between religious information and most practical motivation/action domains. Religiosity, I suggested, exhibits something approximating the functional elaboration of fictional decoupling, for, in religion, emotionally salient false beliefs are nevertheless massively insulated from most practical action domains. But the similarity stops there. A *self-deception constraint* suggests that, unlike ordinary fictions, religious fictions will nevertheless be represented as true. For if religious agents are to manage emotional and other signals of belief in non-actual moralizing agents they must *really* believe in them. An *integration constraint* suggests that religious scope-operators will support normative inferences linking religious commitment with moral pre-commitment. For if religious beliefs are to support normative pre-commitments, that informational channel must be opened and maintained. I noted that the integration constraint leads to moralistic inferences from religious fictions that are strikingly different from those we would ordinarily derive from stories explicitly represented as fictional. For example, morally appalling gods appear praiseworthy.

In the final section, I applied the structured scope operator developed in section II to the domain of religious experience, urging that religious experience is best explained as the religious confabulation of ordinary imagination—mental time-travel mistaken (though restrictedly) as true. I urged that anomalies in the data on sensory deprivation and religious imagery are best explained by the confabulatory model of religious experience.

Much of the preceding argument has been offered as an inference-to-the-best-explanation. I have sketched a model that explains why religiosity is common, emotionally powerful, believed as true, and connected to cooperative exchange. The model also explains why non-actual superhuman agents are experienced, and how this experience is prevented from damaging those who produce it. And, finally, the model showed how these three explanations are linked by commitment-signaling theory.

This chapter presents a guardedly optimistic view about the ability of biological theory to shed light on some very basic and pervasive structural features of religious cognition. This adaptationist picture of religion presented here does not gaze at religion through straws. It is a broad picture, and some may reject it as imprecise. But such rejection would be too hasty. For, in my view, we desperately need plausible alternatives to the 'spandrelist' conceptions of religion that have dominated the cognitive study of religion over the past fifteen years. For a similar criticism see Bering 2004. I have sought to develop a model that makes it apparent why emotional religiosity is no accident, and why otherwise rational and functional persons experience supernatural realities and stake their lives on these experiences. Only after it becomes credible to view religiosity as richly adapted for human flourishing can we begin to assemble the sundry, disparate fragments of empirical data on religion into a more coherent picture. I have advertised a way to begin putting the puzzle together, one that strikes me as fruitful.

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