

The Evolution of Charismatic Cultures

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Abstract

The following essay explains how religion may evolve to support cooperation among anonymous partners. It first reviews honest signalling theory, and reveals a limitation in the model's capacity to explain large-scale cooperation. It then suggests that such cooperation is threatened by uncertainty, rather than by cheating. Finally, it explains how signalling theory can be extended to address the problem of cooperation threatened by uncertainty, 'fragile cooperation'. The resulting extension of signalling theory—called 'charismatic signalling'—directs attention to potential cooperative benefits from religion's fascinating and diverse effects on the body. The charismatic signalling model is presented as a 'how-possibly model', not as a 'just-so story'. The model's interest comes from its ability to organise seemingly unrelated puzzles under a common solution, and to motivate the study of cooperative strategies harboured in shared ecologies.

Keywords

cooperation, evolution, morality, religion

Honest signalling theory is a valuable way of looking at the evolutionary and functional significance of religion, but it has its limitations. We focus to the limitations of honest signalling theory in accounting for large-scale cooperation. We think that future theorising about religion will benefit from extending signalling theory, and here we suggest one way of doing so: by addressing what we call 'fragile cooperation', cooperation threatened by risk.

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I. Definitions

For the purposes of this paper, we use the term ‘religion’ to name commitments and practices respecting gods. By ‘commitments and practices’ we mean full-bodied cognition: emotions, hopes, convictions, habits, expressions, responses, and much else besides belief. By ‘gods’ we mean supernatural realities—uncanny persons, places, and powers. When explaining why people become committed to gods, we do not assume that gods exist, or do not exist. Who knows? Our assumption rather restates the obvious: there is no ongoing scientific research tradition to support religious ontologies. Because we wish to improve the quality of scientific account for religion (at present, weak) we should not in the first instance appeal the existence of supernatural realities when explaining those regions of nature occupied by our religions. For such appeals make difficult the project of integrating the study of religion with other scientific domains (Slingerland 2008; Saler 2009). Perhaps one day a revolution will cause us to rethink our naturalistic assumptions.

Naturalistic explanations of religion, then, address the biological and physical systems (genetic, neural, and cultural...) that support commitments respecting gods, we assume, without remainder. Because naturalists expect that a diversity of systems support religion, naturalists generally eschew ‘magic bullet’ explanations, which lump this diversity in to a simple category (Boyer 1994). However it is possible to raise meaningful evolutionary questions about the conservation and elaboration of the diversity of systems that support commitments and practices respecting gods. For it is puzzling, if the gods do not cause these tendencies, that practices and commitments respecting the gods should nevertheless survive. Our choice of the term ‘religious commitment’ over ‘religious belief’ will become clear, below.¹

II. Threats to Cooperation

Signalling theories hypothesise that religion evolved to support cooperation among unrelated partners. To understand signalling theory, then, one must understand why cooperation poses a problem. The classic model of cooperative interaction is the (multi-player) ‘prisoner’s dilemma’. The prisoner’s dilemma assumes that the benefits of cooperative exchange exceed the benefits

¹ We understand that the ‘generic’ term religion will unsettle scholars of religion who study religious differences. We do not underrate these differences. Such differences, however, do not define our problem. Our problem is rather why there are any religions at all. Our work suggests an explanation for why religions are conserved.

of solitary action. Cooperative groups access goods individuals cannot access alone. Yet incentives for taking without giving threaten cooperation. The prisoner's dilemma assumes that benefits of any individual act of defection pays the cheater better than cooperating and sharing the results. Yet where all cheat, there is no cooperation, and hence no benefits. Consider an example: you pay your taxes and enjoy the benefits of government. Were you not to pay, however, such benefits would remain, and you would be richer. An analogous temptation exists for others, despite an increase to average benefits when all cooperate. For taxes to work then, a system is required to render the benefits of cooperation greater than the benefits of theft. Taxation's threat from cheating generalises to many cooperative interactions. Where payoffs are given as fitness effects, evolutionary theory predicts that for cooperation to evolve, incentives to cheat must be removed. Below we argue that cooperation may be threatened even after incentives to defect have been removed. For now, however, we will think of the problem of cooperation as the problem of cheater deterrence. Evolutionary theory predicts that cooperation should be defeated, yet cooperation is abundant. What explains this abundance?

III. Evolution

Hamilton's rule offers a simple explanation for the evolution of cooperation among related partners. William Hamilton noticed that cooperation toward kin will evolve wherever the following inequality holds for the payoffs involved in the cooperative act:

$$\text{relatedness} > \frac{\text{cost to self}}{\text{benefit to relatives}}$$

'Kin-selection' favours cooperation because kin share genes that may favour giving behaviours. The success of these kin breeds cooperative genes.² Hamilton's theory of kin selection was a breakthrough in the evolutionary biology of the 1960s. The theory explained an otherwise mysterious abundance of cooperation observed among closely related individuals. In the 1970s Robert Trivers generalised the theory to explain altruism among non-kin who repeatedly interact. Further generalisations applied the theory even to indirect forms of benefit (Alexander 1979), and to repeated, non-random interactions (Nowak 2006). Hamilton's 'relatedness' generalises to become the commonality of a

² Genes are transmitted, but selection operates on the genomes which carry them. So the kin-selection theory predicts differential treatment based on degrees of kinship.

trait within groups, and his ‘relatives’ become the group itself. The most general form of the equation applies to selection on any trait that conforms to the following inequality:

$$\text{commonality of trait group} > \frac{\text{cost to self}}{\text{benefits to group}}$$

The great generality of this equation can help naturalists to better understand the claims of different theories of religion.

IV. By-product Theories of Religion

The common view among naturalists is that religion is tolerated as a probabilistic by-product of systems evolved to produce adaptive traits [e.g. (Boyer 2001)].³ That is, religion has not been specifically elaborated as a functional design, but rather persists as a cost, that must be subtracted from the benefits of those traits that produce religion. To hypothesise that religion is a by-product of an evolved constellations of traits—perception, memory, learning, credulity, existential anxiety, a need for meaning...—is to hypothesise that religion is caused by factors (*F*) whose benefits pay for religion’s costs. Define ‘→’ to mean ‘causes’. On the received view:

$$F \rightarrow \text{costs of religion}$$

$$\frac{\text{benefits of } F}{\text{costs of religion}} > 1$$

We think that were by-product theorists to invoke the general form of Hamilton’s equation, their theories would find new clarity. For why must $F \rightarrow$ religion?

Imagine a variant $J \rightarrow F$, which benefits without causing religion:

$$J \nrightarrow \text{religion}$$

$$J \rightarrow \text{benefits of } F$$

$$J > F$$

³ As Sosis has noted, the terms ‘adaptive’ and ‘adaptation’ give rise to much confusion (Sosis 2009). An ‘adaptation’ is a design whose features evolve because they have been naturally selected to facilitate survival and reproduction. ‘Adaptive’ describes the property of facilitating survival and reproduction. Not all adaptations are adaptive. Craving sugar and fat may be adaptations, but they are no longer adaptive. A nose makes a convenient perch for one’s spectacles, but the nose is not an adaptation for this function.

J will outcompete *F*. Indeed, if religion brings no benefits, only costs, we would expect the evolution of traits that suppress religion:

$$J \rightarrow \text{reject religion}$$

To suggest that religion is a by-product is to suppose that the systems that cause religion as a by-product could not have avoided producing religious commitment at the remarkably high frequency with which it is observed. This is a rather strong claim, given that many people do manage to avoid religious commitment. Presumably the factors that suppress religious commitment in these populations could have elaborated more generally. However, if we do not accept the extreme claim that religion cannot be easily suppressed, then (on by-product theory) evolution would predict religion's demise. Yet we observe that religion is abundant. What explains this abundance?

V. The Honest-signalling Model

Signalling theory provides a framework that relates the two puzzles we have considered—the puzzle: why the abundance of religion? and the puzzle: why the abundance of cooperation?—under a common solution. We begin by considering honest signalling theory, which argues that the costs of religion evolve to ensure cooperation's benefits. Signalling theory hypothesises that what appears to be an evolutionary cost is actually an evolutionary efficiency: religion manifests designs for cooperation.

$$[\text{religious costs} \rightarrow \text{cooperation}] = \text{benefit}$$

There are two components to the honest signalling model: the motivational component and the signalling component.

1. *Honest Signalling: The Motivation Component*

Religion appears to motivate strong prosocial commitment (Norenzayan & Shariff 2008).⁴ This prosocial motivation is not, however, invariant, but is rather sensitive to contextual cues. We return to this dependency of motivation, on cue, below. Why does religion motivate cooperation at all? Some evolutionary theories of religion suggest that religion supports cooperation because the gods are perceived to police cooperation. The idea is nicely expressed by the 4th Century B.C.E. Greek dramatist Critias (Critias 2010):

⁴ Toward others within one's exchange group.

Some shrewd man first, a man in judgment wise,
Found for mortals the fear of gods . . .
So that everything which mortals say is heard
And everything done is visible.
Even if you plan in silence some evil deed
It will not be hidden from the gods: for discernment
Lies in them.

Critias's hypothesis: religious commitment represents the world as favouring cooperative commitment. Where \vdash means 'perceive', the hypothesis may be rendered:

religious persons \vdash [cooperation > defection]

Some evidence supports Critias's hypothesis (Johnson & Kruger 2004; Bering 2006; Norenzayan & Shariff 2008).⁵ Why do thoughts of gods inspire cooperation? Some contemporary evolutionists equate the 'fear of gods' with the fears of reprisals at defection (Bering & Johnson *ress*). However, fearful motivations may arise from a desire to avoid letting down gods we respect or love. Thus, intrinsic motivations should not be excluded. Notice that on Critias's theory, an imagined supernatural world may *create* an actual cooperative world.⁶

cooperative interactions \leftarrow [many religious \vdash [cooperation > defection]]

While the specific sources of cooperative motivation remain uncertain, the aggregate effect of shared god-perceptions may, all things equal, produce a cooperative world.

2. *Honest Signalling: The Projective Signalling Component*

All things are not equal. Naturalists assume that evolution occurs in the real world (Binmore 2006). Where the real world permits advantages from theft, religious cooperation appears unstable. For this reason, religious persons must find a mechanism to assure that they assort (group together). Honest signalling theories of religion argue that religious commitments facilitate cooperative assortment because religion is 'hard to fake': those who are religious find it easier to produce the signs of religion than do those who are not religious (Irons 1996; Sosis 2003; Bulbulia 2004; Henrich 2009).⁷ The theory assumes,

⁵ Notably 'perception' need not be explicit (i.e. both explicit and implicit suggestions may provoke cooperative responses).

⁶ See: (Plotkin 2002), Stausberg this volume.

⁷ Henrich calls the hard-to-fake signals of piety 'CREDS'—credibility enhancing displays, a memorable term.

plausibly, that piety is difficult to fake.⁸ If this assumption is correct, pious expressions may predict the quality of religious commitment (Schloss 2008).

piety ← only religion

An indexical relationship between CREDS and commitments suggests a role for the evolution of religion's projective embodiments:

you ⊢ my piety ≈ my cooperative motivation

If piety identifies religious commitment, and religious commitment causes cooperation, then pious displays may facilitate cooperative prediction:

religious cooperation ← [religious persons ⊢ each other's piety]

Sosis (2009) reviews the evidence for the honest signalling model, and finds much support.

3. *Limits of Expressive Signalling*

However, honest signalling must be extended. Projective body-signalling finds its limit where partners can send and perceive the expressions of others. For to evaluate a signal, one must sense it. Yet one cannot sense the signals of anonymous partners, whose bodies are obscure. Where you and I are anonymous:

you ⊄ my piety

me ⊄ your piety

your body ↔ my body

Yet signalling theory can nevertheless show that religion may evolve to support anonymous exchange. To understand religion's support for anonymous exchange, we must consider how defection may be motivated without any incentives to cheat.

VI. The Problem of Fragile Cooperation

We noted that standard evolutionary explanations of cooperation describe defection as motivated from incentives for theft. Yet not all solitary action is motivated from theft. Indeed, theft requires benefits to steal: and so assumes the possibility for cooperative spoils, to take (Calcott 2008). We next consider

⁸ Pretend at faking the piety of an Aztec priest: what to do?

how religion facilitates the solution to an arguably more basic and general evolutionary problem for cooperatives, namely that of assuring individual partners that a benefiting cooperation will actually occur. We are specifically interested in the problem of *fragile cooperation*, where such assurance is difficult to produce and sustain.

A partner's question in a prisoner's dilemma: 'are my partners trustworthy?'

A partner's question for fragile cooperation: 'will cooperation succeed?'

A simple example will illustrate the problem of fragile cooperation. Harry and Sally are two friends who want to meet up. They can choose to meet (cooperate) or choose to stay at home (defect). Each knows that meeting up would be better than staying at home, and that these preferences hold for the other:

successful meeting > home

Here there are no explicit costs to either activity, only benefits that could be lost.

Next imagine that the couple's meeting point is not specified and the couple has no way of communicating. Both Harry and Sally benefit most when the other benefits most. However, because attempting to meet, and failing, invites a risk, the partners may reasonably decide to defect. This decision to defect will be well-motivated wherever the benefit from staying at home exceeds the (risk-laden) benefit of attempting to meet:

benefit from staying home > Pr (meet up successfully) * benefit of meeting

Sally and Harry's cooperation problem is not that of Prisoner's Dilemma. The pair instead faces a coordination problem with risk.⁹ We call such cooperation threatened by uncertainty 'fragile cooperation'. In thinking about cooperation's fragility, we must distinguish between the desire to cooperate and the motivation to cooperate. Our simple illustration shows how cooperative desire may be insufficient for generating cooperative motivations. Indeed, we find a problem for cooperation remaining after every desire for cheating has been removed. Signalling theory can be extended to show how religion diminishes the problem of cooperative uncertainty.

1. *Conventions Do Not Explain Fragile Cooperation*

Gintis is among those who have noticed a special problem for fragile cooperation (Bicchieri 2006; Calcott 2008; Gintis 2009). Gintis suggests the need for

⁹ In the language of game theory, this is the problem of a 'Stag Hunt' (Skyrms 2004).

‘choreographers’, which direct partners to cooperative exchange. Gintis argues that cultures coordinate cooperative expectations and behaviours, by instilling common beliefs about the behaviours of others. He suggests, further, that such beliefs may be prompted by symbolic cues:

... cultural systems that provide natural occurrences that serve as *symbolic cues* for higher-order beliefs and expectations. Common priors [i.e. beliefs], then, are the product of common cultures (Gintis 2009).

Gintis suggests that conventions play a choreographic role among ‘symmetrical reasoners’ who appreciate that others will likely follow norms, because others also share a common culture.

Hume finds a similar solution:

...experience assures... that the sense of interest has become common to all our fellows, and gives us confidence of the future regularity of their conduct; and it is only on the expectation of this that our moderation and abstinence are founded. In like manner are languages gradually established by human conventions without any promise. In like manner do gold and silver become the common measures of exchange, and are esteemed sufficient payment for what is of a hundred times their value (Hume 1739: B3.2.2.).

Gintis and Hume hypothesise that:

our cooperation ← [you, me + norm]

We agree that conventions reduce the risks of cooperative uncertainty. However the observation that conventions work restates the problem of cooperation. For why should the perception of a norm predict our cooperative futures? Such problems arise most clearly after a convention has recently failed, where cooperative cues are mixed, or where partners are facing unknown risks (Bulbulia 2009). For these and similar circumstances, conventions present coordination problems in their own right. Why should we persist in thinking a convention will be followed? Something other than belief (about each others beliefs) is required to support fragile cooperation.

VII. The Charismatic Signalling Model

We extend signalling theory to the solution of fragile cooperation by considering how religious artefacts and practices affect the bodies of potentially anonymous partners. We conjecture that religious ‘body works’ function to assure fragile cooperation. To explain religious body works we must extend honest

signalling theory. We call this extension, ‘charismatic signalling’. The adjective ‘charismatic’ applies to properties of ecologies that evolve to exert predictable behavioural control over distributed, potentially anonymous partners.¹⁰ Charismatic factors may be various. The adjective may apply to persons, practices, symbols, rituals, music, or other factors. The scope of this variety remains unknown. It will take time to explain variation in designs (Schjoedt et al. 2009; Geertz & Markusson 2010). Assuming that charismatic signalling is on the right track, common to all cooperative designs will be a granting of control to circumstance.¹¹ Indeed, selection will gradually automate such effects, wherever risky cooperation pays. Charismatic signalling might interest scholars of religion because it explains how religious bodies, in their receptive aspects, may evolve to promote cooperation’s assurance. This enables researchers to look for specific design properties we might otherwise overlook. Moreover, while the model is presented as a conjecture, because we know of no experiment that specifically tests for it, charismatic signalling nevertheless finds preliminary support from its ability to integrate the puzzle of automatic cooperation and the puzzle of anonymous cooperation under a common solution. No other model explains these puzzles, quite so well. (We consider these puzzles below.)

To see how ecologies may support cooperation’s assurance, assume anonymity:

you ≠ me ≠ you

Next, notice further that:

your cooperation ← ecology → my cooperation

and so:

our cooperation ← ecology

A simple information model reveals that ecological designs may evolve to support cooperation by *causing* cooperation. We find that cooperative strategies may be displaced from individual decision-makers to their environments of interaction. Cooperation may be *affected*.

¹⁰ We include cultural selection within the ambit of natural selection. For discussion, see: (Henrich & McElreath 2003; Richerson & Newson 2008). On the limitations of cultural selection to build adaptive designs, see: (Sterelny 2007).

¹¹ While some elements of religious cultures may evolve to support fragile cooperation, non-cooperative functions may also co-evolve (Schjoedt 2007) and some properties may arise from evolutionary drift (Wilson 2008).

Respecting religion, *charismatic signalling* hypothesises that religious systems (neural and cultural) assure anonymous cooperation. It does so from factors that:

- (1) *align* the cooperative orientations in the various states of persons;
- (2) *synchronise* the expression of these orientations, at the level of population.

Hypothesis:

synchronous anonymous cooperation ← charismatic ecology

We define ‘synchronicity’ as the predictable temporal coupling of body/brain states of individuals, to cues. We define ‘alignment’ as the predictable orientations of the cognitive states of synchronised persons. We next consider preliminary evidence that religious cultures modulate cooperative motivations.

1. *Charismatic Signalling: Motivational Alignment*

Knowing nothing else, we would expect optimal designs supporting fragile cooperation to either suppress partner sensitivity to cooperative risks, or to enhance the salience of perceived cooperative rewards, automatically.

$$\text{charismatic ecology} \begin{cases} [\text{you, me} \not\vdash \text{risk}] \leftarrow \text{ecology} \\ [\text{you, me} \vdash \text{cooperative benefits}] \leftarrow \text{ecology} \end{cases}$$

If the charismatic model is on the right track it has important implications. Most cognitive and evolutionary theories of religion attempt to explain religious perceptions, beliefs, and memories. Declarative religious cognition is surely interesting, and we have assumed that supernatural worlds do not cause these declarations. The charismatic model however suggests a role for non-declarative cognition. This role is not limited to the implicit systems that drive religious declarations, but extends to effects of religious interventions/signals on all systems that affect cooperative behaviours. This extension to non-declarative effects arises from the demands of cooperative systems. Among anonymous partners facing fragile cooperation, such designs must remove religion from belief (which allows for doubt) and generate a religion grounded in unshakeable goals and predictable response. The specifically influence of religious interventions on enduring emotions, motor perceptions, motor memories, proprioceptions, movements, feeling states, attitudes, and other non-declarative responses lacks rigorous studies. Given the relationship of these systems to social cognition (Frith & Frith 2008), religion’s effects on these systems merits closer investigation.

2. Charismatic signalling: synchronous body works

Given the need for cooperative systems to reach many partners, in synchrony, the charismatic model predicts motivating signals in the shared environments of cooperation.

anonymous partners \vdash charismatic ecologies

For fragile cooperation among anonymous partners we expect ecological designs that trigger cooperative responses among sufficiently many partners for cooperation to benefit.

Cognitive and evolutionary theories of religion tend to focus on the temporal effects of religious exposures (to concepts) (Boyer 2001) or practices (from rituals) (Whitehouse 2004). Charismatic signalling focuses to both the temporal and geographical properties of cooperative cultures, because cooperative motivations may be synchronised only where sufficiently many partners become aligned by common cultural trigger signals: access implies a *spatial* as well as temporal arrangement of cooperative ecologies. The placement of a statue on a mountain (as in Buenos Aries) or of a Cathedral at the centre of a town exploits geography to afford shared perceptual access. The gathering of persons to specific locations in time, as happens during festivals, pilgrimages, and special rites, suggests systems whose designs manifest both spatial and temporal properties. Notice that geo-temporal distribution need not depend on identical ecologies. Different individuals may find direction from local signals (the home altar, the morning prayer, the habit cultivated in childhood), such that:

$$\text{our cooperation} \leftarrow \begin{cases} \text{you} \vdash \text{charismatic signal 1 } (\neq 2) \\ \text{me} \vdash \text{charismatic signal 2 } (\neq 1) \end{cases}$$

Thus, the orchestration of cooperation requires no conductor as choreographer.

VIII. Two Puzzles, Explained

1. Automatic Religious Cooperation

Research suggests that subtle religious signals presented outside awareness enhance charity and cooperation even among those who are not themselves religious. For example Mazar, Amir and Ariely found that students who read the ten-commandments before a task that invited cheating produced significant

restraint in favour of cooperation ‘We... found that, in general, people were insensitive to the expected external costs and benefits associated with the dishonest acts, but they were sensitive to contextual manipulations related to the self-concept’ (Mazar et al. 2008:642). In another experiment, Shariff and Norenzayan found that religious word-scrambling tests promoted enhanced charity, regardless of personal levels of belief (Shariff & Norenzayan 2007). Indeed, simple anthropomorphic cues—eyes above a donations box, or face-like dots on a computer screen, or human-like figures—appear sufficient to increase cooperative responses, suggesting a strong automation of cooperative response in the cognitive systems that govern behaviour (Burnham et al. 2000; Haley & Fessler 2005; Burnham & Hare 2007). Here we find a puzzle of implicit cooperation, without belief.

2. *Anonymous Cooperation*

There is evidence that religion supports cooperative exchange among anonymous partners. For example, Bulbulia and Mahoney found that Christian New Zealanders exhibited almost four times as much charity to anonymous (Canadian) Christians, than New Zealand citizens exhibited to anonymous citizens (located in another town) (Bulbulia & Mahoney 2008). Notably, this charity was expressed to others who (by the design) refused to interact with participants on the grounds that they were out-group members. Thus, charity among Christian participants persisted in the face of double disgrace: that of a monetary loss, and that of social exclusion. Because identities remained carefully concealed, Christian gifting to anonymous Christians cannot be explained as reciprocity, either direct or indirect. Such anonymous religious giving is difficult to explain straightforwardly from honest signalling theory.¹² Here we find the puzzle of religious cooperation, among obscure partners.

3. *Solution*

The charismatic model predicts a tendency for automated cooperation, on cue, without any reliance on belief. Moreover, such *automated* cooperation can then evolve to support *anonymous* cooperation. The model therefore ‘solves’ the puzzles of automatic and anonymous cooperation by explaining how designs that produce such effects may be targeted and elaborated by evo-

¹² Mean gifting among anonymous Christians: = NZ\$2.84 out of a possible NZ\$5.00 (SD = NZ\$1.56)(n = 55). Mean gifting among New Zealand Citizens = NZ\$0.73 out of a possible NZ\$5.00 (SD = NZ\$1.34)(n = 49).

lutionary processes. Yet 'solution' should not be taken too seriously. Notably, observations of automatic cooperation are not limited to religious cues. Practices as diverse and profane as body mimicry (van Baaren et al. 2004), finger-tapping (Hove & Risen 2009), and singing the Canadian national anthem have been shown to enhance solidarity (Wiltermuth & Heath 2008).¹³ Moreover, for anonymous religious cooperation, we have not identified the specific charismatic ecologies responsible for Christian charity. More evidence is required for confidence in the charismatic model. Do not be seduced.

IX. Summary

Signalling theory explains how religion is conserved as a target of selection, not a lingering by-product of some inefficient design.

For honest signalling theory:

our conspicuous cooperation ← [your religious body ↔ my religious body]

Honest signalling theory explains the evolution of religious cooperation from expressive body signals. These signals of honesty evolve to certify cooperative futures among known partners.

For charismatic signalling:

our anonymous cooperation ← [receptive embodiments ← charismatic ecologies]

Charismatic signalling extends the honest signalling model by explaining the evolution of religious cooperation among those who cannot send and receive signals of trust. The framework notices that where cooperation is threatened by uncertainty, signals of trust are not required to support cooperative interactions. Needed instead are systems that cause cooperation, without doubts. Factors that automate and synchronise the production of impersonal cooperative motivations among anonymous partners may therefore be favoured.

The conjecture that our religions harbour especially powerful charismatic signals may be helpful. For we have briefly considered how automatic and anonymous production of cooperation may be favoured. Such robotic gifting to strangers is otherwise mysterious.

However, we present the model as a 'how possibly' model, not as a 'how so model'. It is worth considering how the puzzles of automatic and anonymous cooperation may possibly be solved because plausible conjectures enable

¹³ This Wiltermuth and Heath experiment was performed on non-Canadians. Specific effects of the Canadian anthem on Canadians remain to be determined.

researchers to seek evidence of specific designs we might otherwise miss. Moreover, conjectures may eventually be converted to testable hypotheses. Given the present state of understanding, those who ask for confident solutions to the riddles of cognition, cooperation, and culture ask for too much. Researchers who study humans must shed this habit of asking for too much. This habit is partly to blame for why we currently know so little. Badly formulated expectations will forever consign us to ignorance.

X. Where To Go From Here?

We have mainly addressed evolutionary researchers in this article, however we hope that charismatic signalling will also interest scholars of religion. Naturalistic inquiry seeks progressive research, so that the outcomes of scholarship may serve as platforms for subsequent discovery. The scholarly study of religion arguably lacks a progressive character. However the integration of religious studies to scientific domains of inquiry is relatively easily corrected through collaborative team work (though institutional inertia is no trifling affair).¹⁴ Our impression with younger scholars of religion is that they are up for collaboration, and in some instances, retraining. More harmful to progress, to our minds, is a lack of scholarly curiosity for religions among researchers in the human sciences. Among the curious, there seems to us too much satisfaction with the limited, typically contaminated data sets that scientists have gathered *ad hoc* [e.g. (Dawkins 2006)]. Contentment with amateurism is not tolerated in other domains of science. That amateur theorising remains widely sanctioned in naturalistic circles seems to us a testimony to the vulnerability of scientists to overconfidence, inconsistency, and closed-mindedness. This is a shame. On the other hand, these are early days in the naturalistic study of religions, and some initial results have been promising. Moreover, early enthusiasm for pan-human features of human design as the key to unlocking religion's secrets has given way to recent evidence for strong modulations of cognition by a variety of cultural instruments (Barsalou et al. 2005; Schjoedt et al. 2009; Geertz & Markusson 2010). We still know little about this variety. Progress in the naturalistic study of our lineage depends, fundamentally we think, on the specialist knowledge that currently only scholars of

¹⁴ We leave objections about pernicious 'reductivism' of naturalistic treatments of religion to other work, and shall assume, without argument, that there is no intrinsic incompatibility between naturalist discussions and others, and no intrinsic evil in assuming a naturalistic stance to persons. For an extensive discussion see: (Slingerland 2008).

religions can offer. Scholars of religion, of course, may find that their interest targets aspects of religious systems that are poorly approached with the methods of progressive science. While there are many ways to have a career as a scholar of religion, there seems to us a large, fascinating, and almost completely unexplored wilderness for intellectual discovery at the intersection of evolutionary biology, cognitive science, and religious studies.¹⁵

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¹⁵ For discussion, see: (Wilson 2002; Wilson et al. 2009).

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