# 11

# Religion as superorganism

## On David Sloan Wilson (2002), Darwin's cathedral

Joseph Bulbulia and Marcus Frean

One of the most important biological theories of religion is also the most controversial. Here we describe and partially defend David Sloan Wilson's group selectionist model. According to Wilson, religions are best explained as 'superorganisms' adapted to succeed in competition against others. The evolutionary history of religion is a battle of these titans.

## Background

### *Biographical sketch*

Wilson was born in 1949 in Norwalk, Connecticut. He is the son of the late novelist Sloan Wilson, author of fifteen books including *The man in the gray flannel suit* (1955) and *The ice brothers* (1979). David Wilson received his PhD in evolutionary biology from Michigan State in 1975. He soon became notorious among biologists as a zealous defender of group selection, the theory that evolution operates at multiple levels of biological organization, not just on genes. Sticking up for group selection in the 1970s was a bit like wearing flashing neon 'kick me' sign. This was the era of the 'selfish gene' – phenotypes were considered vehicles of benefit for perennial DNA, and selection's targets were thought to be limited to genetic substrates. In 1966 the eminent evolutionary biologist George Williams published *Adaptation and natural selection*, which most took to be a knock-down refutation of group selection (Williams 1966). Within ten years Richard Dawkins's enormously popular book *The selfish gene* hit the presses, taking the gene's-eye view to the masses (Dawkins 1989 [1976]). Apart from Wilson, almost no credible biologist at the time believed in group selection. Now, thanks to Wilson and friends, nearly everyone does, though under the less threatening slogan: 'multilevel selection.' This version integrates a mathematically correct account of group selection to Williams's and Dawkins's selfish gene perspective. Our genes, it turns out, can eat their cake and share it too.[1]

Wilson's latest battle lies on the methodological frontiers of religious studies. *Darwin's cathedral* (hereafter *DC*) promotes an 'organismic concept of religious groups' as a 'serious scientific hypothesis' (1). For Wilson, the testing and development of this hypothesis relies on the collaborative efforts of both scientists and traditionally trained scholars of religion. His shibboleth: without biological theory, religious studies is blind; lacking scholarly data, biological speculation is empty.

## *Individualism and holism in evolutionary studies*

Standard cognitive models explain religiosity in terms of biological endowment – a mental *Bauplan*. A child requires only minimal cultural inputs to grow her religion. Religions are modeled as body parts: we do not learn to build our kidneys, fabricate our jaws, or color our bones white.[2] Nor do we learn most features of our religions. Learning triggers an already entrenched design.

Cognitive theories have their rivals. An increasingly popular alternative views religion as an adaptation, though not ours. According to meme theorists, exogenously transmitted religious ideas are best conceived as replicators that infect religious minds, much like viruses. Becoming religious is like catching a cold.[3]

Wilson urges that both naturalistic pictures are misconceived: they telescope to the wrong level of selection. To understand the evolution of religious traits we need to appreciate the evolutionary forces acting on religious groups. For Wilson, religious adaptations are group-level adaptations. A 'group' consists of those members sharing traits that impact on how members relate to each other. Religions evolve to promote and secure traits for solidarity.

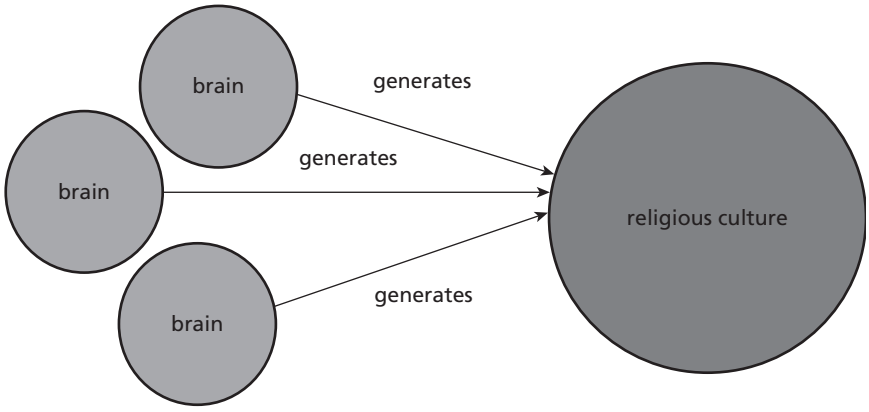


*Figure 11.1* The standard cognitive picture

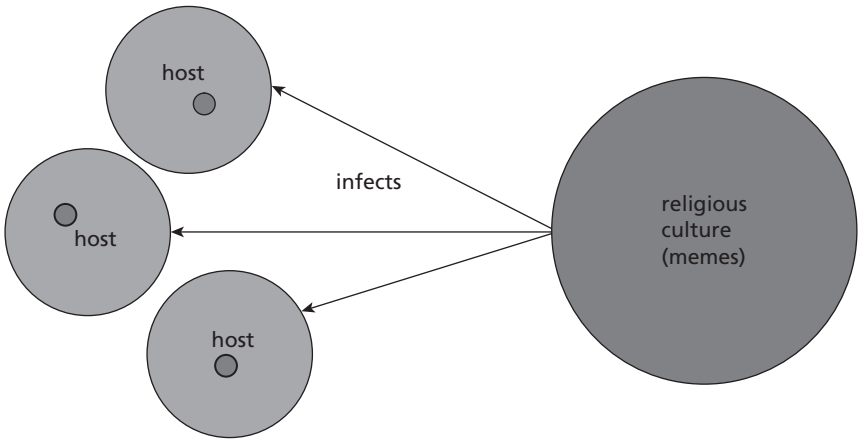


*Figure 11.2* Religion as cognovirus

*DC* defends three theses about group selection and the evolution of religion.

## Thesis 1: Beyond genes in human evolution

'This book is about evolution but it is not restricted to genetic evolution' (11).

### *The averaging fallacy*

From the anti-group selection perspective, biological fitness is averaged across populations. Wilson argues that this method commits an 'averaging fallacy' (14) (see also Sober and Wilson 1998). Suppose we identify a 'group' in virtue of some trait shared by its members.[4] If a selfish action increases the fitness of an individual but decreases the fitness of her trait group, then over time we expect that the selfish trait will diminish in absolute frequency. Individuals in groups lacking group-demoting

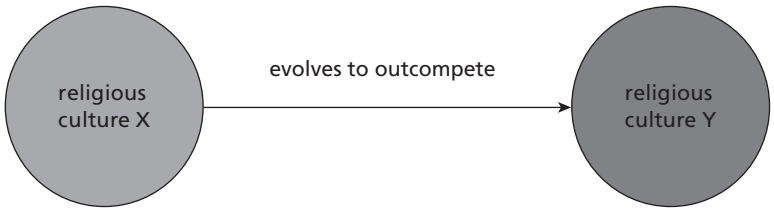


*Figure 11.3* Darwin's cathedral

selfishness will do better than will selfish individuals going it alone. Wilson reasons:

> When the trait is a non-social behaviour that alters the fitness of the individual alone, we needn't concern ourselves with groups. But when the trait is a social behaviour, the fitness of an individual is determined by its own trait and the traits of the individuals with whom it interacts. These individuals constitute the group, which must be identified accurately to calculate the fitnesses that determine the outcome of evolution. (15)

Averaging across groups rules out group selection by definition. But there are no a prioris in science.

If we consider altruism to be an evolutionary mechanism for *collective* benefit, then another layer of evolutionary adaptation emerges: the functional properties of groups. These properties are invisible when we limit our perspective to relations between individuals. To perceive relevant design we need to look a level up (about which more shortly).

## *Culture matters to development*

There has been enough migration between human populations to make it implausible to think that human groups are organisms in the way that Mr. T is an organism. In humans, the germ-line is segregated early in development. The interests of those genes that build Mr. T's brain are intimately bound to the fate of his sex cells, which (if all goes well for T) make genetic copies in offspring. However, if T finds better opportunities in another group he can always try to cut and run. So the analogy of groups to organisms must be qualified.

Wilson argues that cultural transmission holds the key to understanding the evolutionary dynamics of human groups. Children resemble their parents because children share parental genes. But children also learn from their parents. Adaptive structure is often exported from the genome to the environment. Social transmission provides a crucial information channel for replicating adaptive traits. Wilson writes: 'it is important to think of heritability as a correlation between parents and offspring, caused by any mechanism. This definition will enable us to go beyond genes in our analysis of human evolution' (7).

Wilson observes that minds are genetically designed for developmental flexibility. This position is most assuredly warranted for many skills and capacities. A !Kung child is not born with an innate knowledge of bow manufacture or the seasonality of *mongongo* nuts. She is rather born to absorb and improve information supplied by family and peers. 'Far from marginalizing culture, innate psychology provides the building blocks from which innumerable cultural structures have been built' (198–9).

Our minds have co-evolved preferences and capacities to keep up with the latest development. The flexibility has enabled our lineage to master (and degrade) nearly every terrestrial habitat, without having to anticipate every habitat in our genes. Most importantly, flexibility holds an important key to unpacking the evolutionary dynamics of group selection without relying on genetic substrates.

## *Cultural evolution*

Suppose that social learning provides a vehicle for the transmission of functionally adaptive traits. Selection will then act in two directions. First it will modify the genetic substrates that facilitate social learning. Benefiting culture will select for genes that support its acquisition. Selection will also act on the information itself. As with genetic information, useful cultural inventions will tend to be transmitted, and harmful information will tend to go extinct. Cultural products themselves will evolve.[5]

Suppose there arises some culturally transmissible information effective at combating defection. The individuals who are prone to the 'altruistic traits' this information builds will tend to form larger functional units that enable members to survive better than they would going the world alone.[6] The trait may spread vertically from parent to child, or horizontally and obliquely among unrelated agents. Through social learning, mean fitness within the group will rise.

Notice, as the trait-group increases, perhaps to a limiting threshold, the total number of individuals in the population nevertheless remains fixed. Cultural evolution need not lead to population expansion or decline if individuals merely 'change hats.' Competition will drive the evolution of information that better facilitates altruistic learning, as cultural selection ratifies cooperation technologies. Innovations that increase group-size thresholds may also arise and spread.

In this scenario, cultural transmission enables the evolution of effective groups without requiring that genetic adaptations do all the work. Culturally encoded group selection can thus operate in genetically well-mixed populations. Through cultural transmission we find the evolutionary resources for evolving human superorganisms.[7]

Wilson observes:

> Darwin's solution to the fundamental problem of social life is elegant and perhaps even obvious in retrospect. After all, if adaptations evolve by differential survival and reproduction, it makes sense that group-level adaptations evolve by the differential survival and reproduction of groups. (9)

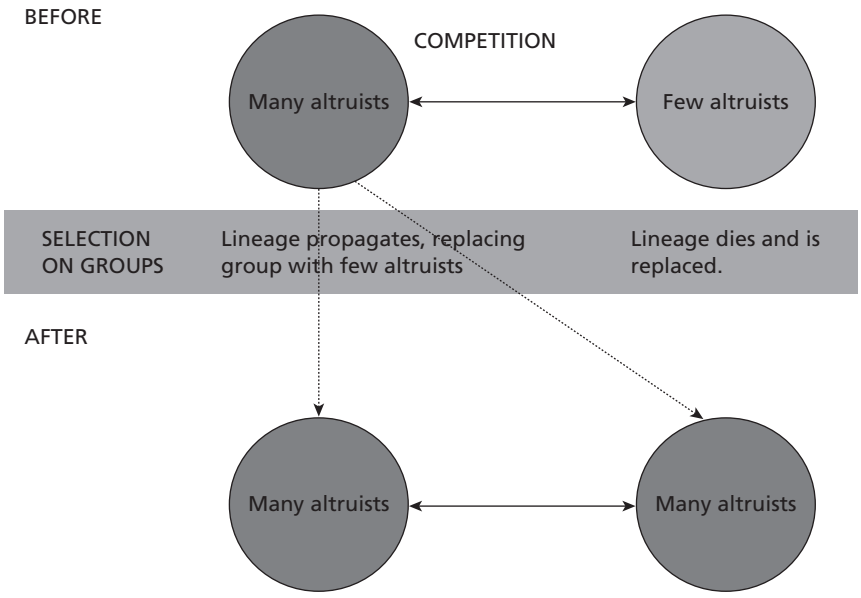


*Figure 11.4* The natural selection of altruistic groups

So in short, cultural transmission appears to give rise to a new species of hopeful monsters. God-fearing evolves Godzilla.

## *So what?*

Wilson's evolutionary model is supposed to enable us to reverse-engineer group-level design. 'We fail to see the evidence, not because it is obscure or requires sophisticated measuring devices, but because we are employing the wrong theories' (125). A better theory focuses observation to epigenetic systems of heritable variation. It also attends to the evolution of the information transmitted by these systems, over historical timescales, in the face of specific cultural-selective pressures. In the next section, we shall consider how the model mines for culturally acquired traits capable of binding individuals into efficient, competitive exchange groups and directs attention to the role of institutions in monitoring and enforcing social norms. But the model's importance extends beyond the refinement of observation. It is also meant to teach us an important lesson about ourselves: our traditions constitute our natures.

Wilson thinks that it is in our culturally evolved natures to be cooperative. Religion's role in the evolution of human sociality leads to the second major thesis of his book.

## Thesis 2: Religion is a group-level adaptation to enhance in-group cooperation

'Evolutionary theory explains how social groups can be like individuals in the harmony and coordination of their parts' (2).

### *The evolution of cooperation*

Throughout nature, cooperation abounds. Genes work together to create chromosomes, which combine to fashion cells. Cells cooperate in the tissues of organs. These aggregate to form bodies. Organisms team up with other organisms. Cooperation exists at every level of the biological hierarchy. From the slime mould *Dictyostelium*[8] to UNESCO, creatures unite in larger functional units. In our own lineage no one survives alone. Our partnerships are many, complex, and obligatory.

Cooperation is surprising. Evolution by natural selection is a theory of success through competition: 'from the war of nature, from famine and death, the most exalted object which we are capable of conceiving … directly follows' (Darwin 1988/1859: 649). The image suggests combat. Yet we observe much harmony: 'endless forms most beautiful and most wonderful' (ibid.). Why?

### *Cooperation and coordination as evolutionary problems*

Cooperation may appear inevitable where the average benefits of transactions exceed their average costs. However, selection is shortsighted. Tax-supported society beats the state of nature. But we do better by avoiding our taxes, irrespective of whether others pay theirs. The problem iterates and generalizes. We do better letting others fight the war. We could earn money, though unpunished crime pays better.

The efforts of one often make little difference to a cooperative outcome. Cooperative benefits compile over many transactions. Best-response dynamics frequently doom cooperation. Mutually beneficial trade requires mechanisms that suppress defection.

Matters, indeed, are worse. Even among those who share common cause with *no defection incentives*, cooperation faces significant evolutionary obstacles. 'Even when [defection problems] can be solved … formidable problems of coordination remain' (109).

A coordination problem arises where individuals can benefit from joint action, with no threat of cheating. Here uncertainty rather than cheating threatens cooperation, ratifying sub-optimal patterns of interaction. Indeed risk-averse strategies dominate optimal exchange over time (see Young 1998).

Rousseau poses the problem through a story about a hunt (Rousseau 1984/1754). Suppose that hunting stags brings a higher average payoff (more meat) than hunting hares. However, suppose a team of hunters is required to bring down a stag, whereas solitary hunters can capture hares. Solitary hunting pays less, but the payoff is assured. Suppose further that as each hunter opts out of a stag hunt, the probability of capturing the big meat parcel falls. Suppose further that the probability of success if all hunt is 1; 'defection' does not pay better than cooperation. The maximally benefiting equilibrium is available, then, but the risk not all will choose it brings incentive to the sub-optimal choice. Benefits of additional winnings may not be worth the risk of starvation. Hunters require motivating conventions.

Coordination problems also iterate and generalize (see Bicchieri 2006; Harsanyi and Selton 1988; Skyrms 2004). Here, too, a mechanism securing exchange is required. Coordinated action is far from fated.[9]

## *Selfish genes or cooperative teams?*

From the selfish gene perspective, altruism remains evolvable only where average returns exceed average costs (or the cost-to-benefit ratio > likelihood of gain) (Nowak 2006).[10] The relevant literatures explain how altruism is possible, but on their own do not explain any particular mechanism that assures it. For this we need to consider specific cases and systems. We do not *discover* the functions of a white blood cell by looking at how its actions help the cell itself to survive. Leukocytes are typically suicidal. Instead we examine cellular activity in the context of a larger functional system. So too for the explanation of human behaviors arising through multi-level selection.

Wilson hypothesizes that religious traits evolve to functionally integrate the behaviors of persons who share them. Religions evolve as super-organisms. And the behavior of religious individuals can only be properly framed as part to these wholes.

| | *others hunt* stag | one or more hunt alone |
|---|---|---|
| you hunt stag | eat well | starve |
| * you hunt hare | eat poorly | eat poorly |

* = *risk* – averse (evolution arily stable)

*Figure 11.5* Coordination problem

## *Subversion from within*

While groups may behave like 'organisms,' group selection is not evolutionarily fated: 'the days of axiomatically thinking of groups as adaptive units are gone forever. Special conditions are required that may or may not be satisfied in the real world. Opposing forces exist that may or may not be overcome' (10).

The most damaging of these is internal subversion. Where group selection is weak, and where migration remains possible, unpunished defectors in cooperation dilemmas will out-compete cooperators. Defection undermines functional evolution at a higher level of organization (see Sterelny 2007).

Similarly, group selection predicts culturally evolved mechanisms for diminishing selfish individualism within groups. These include systems of internal monitoring, censure, punishment, and exile. 'Social control, rather than highly self-sacrificial altruism, appears to solve the fundamental problem of social life at the individual level' (19).

We shall shortly see that Wilson considers religious beliefs to be exquisite devices for generating altruistic motivation. But he thinks they are insufficient to prevent social breakdown. Instead, groups require specific policing institutions:

> No matter how powerful, a belief system by itself is probably insufficient to turn a group into a societal organism. A social organization is also required to enforce [norms] … all adaptive units, including individual organisms, require mechanisms to prevent subversion from within (105).

We think Wilson underestimates the efficiency and power of religious belief in preventing outlaws. Where believers are able to find each other's cooperation does not require an institution. The problem turns on the effectiveness of mechanisms for distinguishing the genuinely god-fearing from defecting frauds. We agree with those who notice that the emotional and ritual activity of a religious group produces reliable signaling, enabling the relevant correlation (for example Alcorta and Sosis 2005; Irons 2001; Schloss 2007). Institutions matter to ritual signaling, for there are few rituals without institutions. Moreover institutions teach, disseminate, and maintain marking conventions. But they need not punish the uncooperative, at least not straightforwardly. For example, individuals can punish by withholding cooperation to those who do not follow a convention. To be fair, Wilson observes the prospects for effective signaling in a discussion of Iannaccone 1992 (*DC*: 81–3). But he does not identify signaling practices as core feature of religious altruism, as Sosis (2003) laments. Though we cannot pursue the issue here, we think this oversight leads to an incorrect view of religious institutions as *primarily* vigilance and punishment machines.

Signaling aside, there nevertheless remains much institutional policing. The heresy trials, witch-hunts, and inquisitions of the past suggest that groups will tolerate much intra-group viciousness in the service of wider group benefits. Indeed the prospect of violence looms large for any group threatened by internal subversion, not merely for religious groups.

## *Conflict*

The prospects for brutality become more apparent when we consider inter-group competition. 'Group selection does not eliminate conflict, but rather elevates it up the biological hierarchy, from among individuals within groups to among groups within a larger population' (10).

Observe that internal violence is constrained by selection at the level of groups. At the limit, a group cannot harm all its members and remain viable. This is not true of group aggression. Where resources remain limited, so that not all groups can peacefully coexist, competition between groups of altruists will produce hostility. Wilson sees no prescription for universal love. There is no assurance whatsoever that a successful group will act with moral goodness, towards its members and towards others.

One form of particularly dangerous altruism is sacrificial violence on behalf of god or country (for evidence see Bulbulia and Mahoney 2008). Wilson's model predicts that strong selection will evolve groups of suspicion, anger, and spite.

## *So what?*

Let's consider Wilson's evolutionary picture more carefully. It might appear that cultural evolution brings wide scope to religious variation. 'Applying these insights to the study of religion, we should think of religious groups as rapidly evolving entities adapted to their current environments' (35). If religion is solidarity technology, then religions should differ over place and time – much as the subsistence and extraction practices of Siberian foragers, Navaho desert peoples, and posh New Yorkers vary. We think it worth considering whether the opposite is true.

No one is as well aware of religious change as are historians of religion. Overwhelming scholarly evidence suggests that religions are not eternal monoliths but rather creatures of time in constant flux. Nevertheless some core features of religious culture resist change over millennia. For example, the gods and scriptures, and many of the arcane rites, of ancient pastoral peoples remain dominant to this day. When we compare this localized conservation to other domains of civilization we find important contrasts. Technological change appears exponential. Political systems, too, are in

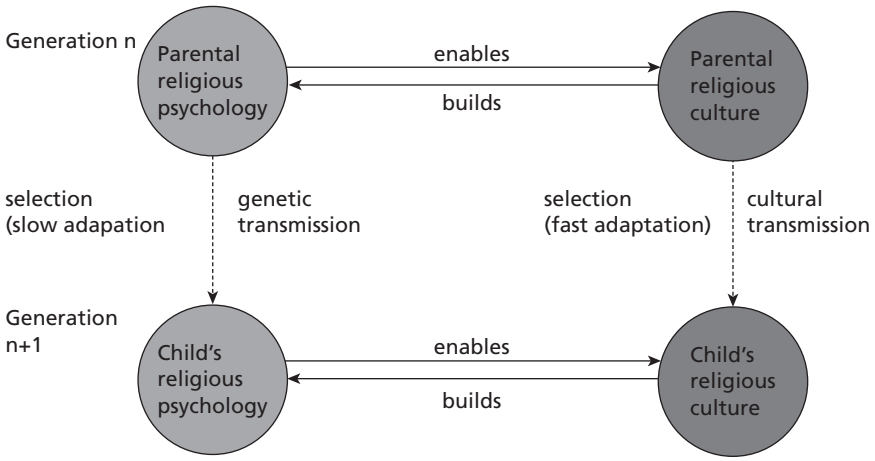


*Figure 11.6* Developmental processes

flux, as are the relations among nations. Language pronunciation shifts gradually. Shakespeare's English is difficult and Chaucer's baffles. Gradually, over generations of mutually intelligible language speakers, the vocabulary, phonetics, and grammar of English drifted. By contrast, the rate of religious change for some core traditional features appears comparatively slow. A quick glance at the dominant world religions reveals the gods and scriptures of modern peoples were fixed many centuries or even millennia ago. This suggests a strong principle of localized conservation. Whatever the explanation for this conservation,[11] rates of variation within religious culture are patchy, and in some of its central features, religious culture appears surprisingly resistant to evolutionary change.

What about variation among different traditions? If religion were language-like, we could make a case for biologically fixed 'religious grammars' that develop along entrenched developmental pathways. Yet cultural transmission *in principle* allows for rapid evolution, thus expanding the universe of potential religions. So entrenchment cannot be assumed on developmental grounds alone.

There are, however, further grounds for predicting constraints. If Wilson's evolutionary hypothesis is correct, religious variation will be inhibited by the functions for which religions are selected: the demands of community-building. The *means* by which humans forge religious solidarity may be narrowly circumscribed. The *outputs* of religious solidarity may be narrower still. These demands may well over-determine the functional architectures embedded in human religions. Not just any design will work. Loving thy co-religionist and converting/abusing others look like candidates

for invariant properties. In short, diversity may be limited, not by a mental *Bauplan*, but rather by the optimization of interaction.

Finally, solidarity theory predicts similarity will be difficult to perceive. Overlooking what we have in common will often be functionally (if not morally) desirable. It is tough shelling persons whose religion appears, branding aside, virtually identical to our own (Bulbulia 2005).

The functionality of religious beliefs forms the subject of Wilson's third thesis, which we shall presently explore. For now, we maintain that the bandwidth of religious variation remains an open question.

## Thesis 3: Religious outlooks enhance solidarity through 'practical realism'

'The fog – if that is what it deserves to be called – only descends in some contexts' (41).

Wilson distinguishes between what he calls 'factual realism' and 'practical realism.' The terms designate two distinct modes of dealing with the world. Factual realism refers to beliefs that accurately describe the world, regardless of their practical value. Practical realism refers to beliefs that are useful, regardless of their factual basis. Evolutionary reasoning suggests that we will affirm propositions that are useful, regardless of whether they are true. Roughly, where the benefit of believing is greater than the cost of holding the belief, selection will favor belief (for a formal treatment see Foster and Kokko in press).[12] The veracity of a belief will often play a role in its utility, but not always. For example, it may be adaptive to think of myself as competent, to better fool others into helping me. Evolution predicts a bias, whether I am or not (see Trivers 2001). Wilson writes: 'There are many, many other situations in which it can be adaptive to distort reality. Even massively fictitious beliefs can be adaptive, as long as they motivate behaviours that are adaptive in the real world' (41). On Wilson's model, religions do not evolve for accuracy. They evolve to secure harmony. Notice, the question of whether the gods exist is left open. Importantly, religious beliefs may be true or false. But whether or not we believe in them has to do with their evolutionary effects. Factual reason, on the other hand, is the product of the self-correcting process exemplified by scientific inquiry. Here, the aim is to determine how the world is, irrespective of whether beliefs help us to make more babies or build stronger communities.

The means by which practical realism generates solidarity, Wilson hypothesizes, is through the compelling manipulation of expectation and affect:

> We might therefore expect moral systems to be designed to trigger powerful emotional impulses, linking joy with right, fear with wrong,

| | Selected for | Possibly True | Possibly False |
|---|---|---|---|
| Practical realism | Biological utility effect of belief > cost/benifit of holding belief | Mother bears are dangerous. | I am a trustworthy politician |
| Factual realism | Accuracy | Our Universe is expanding. | Whales are fish. |

*Figure 11.7* Evolution: utility versus accuracy

> anger with transgressions. We might expect stories, music, and rituals to be at least as important as logical arguments in orchestrating the behaviour of groups. Supernatural agents and events that never happened can provide blueprints for action that far surpass factual accounts of the natural world in clarity and motivating power (42).

An important prediction of Wilson's hypothesis about practical realism is that religious cognition will be functionally encapsulated (see Bulbulia 2006). Religion will be considered all-important to social domains, but virtually ignored elsewhere (compare Malinowski 1935). Believing that Zeus will punish our enemies will not be evolutionarily useful if we leave Zeus to punish them (Zeus' non-existence means he cannot help). But the belief may be useful, perhaps to comfort or motivate additional harm ('heaping coals of fire on their heads').

Wilson does not disparage religious persons for their fictions: 'religion is often portrayed as stupid, but it is the observer who is stupid' (217). Those who condemn religion do not understand its benefit. Religion is not bad science. Its aims differ. Indeed Wilson closes *Darwin's cathedral* with a most unusual locution: 'Like a Nuer tribesman and a Balinese farmer, let us know exactly what our unifying systems are for, and then pay them homage with overflowing belief' (233).

Wilson justifies this kind of enthusiasm by appealing to the functional insights that biology brings: 'Evolution causes us to think about the subject in a completely different way. Adaptation becomes the gold standard against which rational thought must be measured alongside other modes of thought' (123).

We, however, would have preferred Wilson to avoid any evaluation of religion, positive or negative. As Wilson himself understands, selection brings no moral assurances. Where group selection is strong, religions will evolve as killing machines. To pay fictional monsters homage with overflowing belief seems doubly perverse.

## *Practical realism and altruism*

Wilson suggests: 'A fictional belief system can be more motivating than a realistic belief system … [it] can perform the same functions as externally imposed rewards and punishments, often at a much lower cost' (99).

His idea can be made more precise. Consider Harry deciding whether to flee as the opposing army approaches. Suppose he can do so anonymously (averting punishment). Harry does his best to flee, no matter what others do. Harry's effort will not win the war. His retreat will not lose it. But his decision criteria generalize: all may well have the same incentive to run. If so, Harry's society may fall prisoner to a socially destructive rationality. Notice, however, that believing Harry and his religious cohort perceive a different problem. For believing Harry, cooperation is supernaturally motivated. His problem is one of coordination: to find like-minded believers while avoiding others.

This and other coordination problems, too, find simple solutions through the confidence and authority religion brings (see Bulbulia 2004). Religious belief alters perceived payoffs. The anointed decide and broadcast exchange conventions, which are motivated because they are considered sacred ('Woe unto thee who fails to hunt stags.'). Visible symbols provide assurance of mutual knowledge of and commitment to the conventions ('By their signs ye shall know they are stag hunters.'). Religiosity places optimal equilibria within evolutionary reach.

## *So what? Rational choice theorists miss the benefits of fictional beliefs*

Wilson's most persistent target throughout *DC* is rational choice theory.[13] This conceives of religion as misdirected economic practice. Individuals are rational. But we work from imperfect information. And we sometimes reason badly. Religion is our method for seeking goods that we cannot acquire through natural means. We want the rain, can't make it rain, so ask the cloud god, offering virgins in exchange.

| | *others* fight | othersrun |
|---|---|---|
| believing Harry fights | *Heaven* | *death* |
| believing Harry runs | *Hell* | *OK* |

* = this game has two equilibria: pay if others pay, not otherwise.

*Figure 11.8* Zeus commands: 'Wow unto ye who run instead of fight!'

| | others hunt stags | others hunt hare |
|---|---|---|
| * *you* hunt stags | * *WIN* | *Risky* |
| you hunt hare | *Hell* | *OK* |

* Coordinati on overcomes risk when a recognitio n problem is solved: We each judge ourselves to be godfearing, and predict the other will act on this judgment

*Figure 11.9* Zeus commands: 'Hunt stags with thy brethren!'

Rational choice theory, like Wilson's evolutionary model, also predicts two modes of engagement: natural and supernatural. Yet because rational choice theory lacks the appropriate biological framework, Wilson argues that it overlooks the benefits of irrationality: 'Missing entirely from [rational choice theory] is the category of goods that can be procured by human action, but only by coordinated human action, and the role of religion in achieving the required coordination' (49). Moreover, Wilson's model predicts that the mechanisms supporting group benefit will frequently suppress utility-maximizing rationality. Group-evolutionary dynamics will favor the graceful over the greedy.

Perhaps, however, the differences between Wilson and the rational choice economists are not too stark (so to speak). If practical realism furnishes agents with new utilities, then means–end rationality remains possible. Perhaps believers value pleasing God. For all we know their actions are best explained as motivated to this end. Moreover, practical realism suggests practical rationality, for the realism is not inert. It would seem, then, that rational choice and group selection are compatible. Whether rational choice enriches understanding or merely presents a new gloss remains an open question.

## Evaluating the theory

> If the environment changes over time and space, and if religions adapt human groups to their environments, we should be able to predict the properties of religion at a fine spatial and temporal scale as surely as we can predict the properties of upstream and downstream guppies. (98)

### *A call to arms*

*DC* presents a dozen or so historical and ethnographic examples to illustrate religion's group-enhancing power. Among the religious systems he considers are Calvinism (Chapter 3), Balinese water temple systems (126–33), Judaism (133–47) and the early Christian Church (147–57). Wilson does not claim

that his discussion adds new empirical facts to existing scholarship, so we shall not review these examples in detail. He describes his studies as 'a refinement of what careful scholars of religion have been doing all along' (117). With respect to Christianity:

> I cannot claim too much credit for the evolutionary perspective because Pagels (1995) and her colleagues have already grasped the functional and locally adapted nature of the Gospels without ever breathing the word 'evolution.' Many evolutionary biologists got it wrong when they rejected group selection and at least one branch of religious scholarship got it right. (218)

Traditionally trained scholars might worry that Wilson's model contributes little besides impressive jargon. We think Wilson's Chapter 7: 'Forgiveness as a complex adaptation' helps to allay scholarly worries.

The discussion begins with a review of defection management strategies. In the early 80s the political scientist Robert Axelrod ran a competition for the best cooperative strategy for pair-wise exchange in a mixed population of altruists. Of all the strategies submitted, the most powerful was also the simplest: 'Tit-for-tat' (Axelrod 1984). Here, an agent starts by cooperating but defects in any subsequent encounter with a defector. Eventually the strategy interacting with itself leads to teams of cooperators who succeed in competition with defectors. The shadow of the future polices their behavior.

Wilson notes, however, that while 'Tit-for-tat' is effective in supporting cooperation, the strategy provokes disaster in fallible populations (see Axelrod 1997). Occasionally a trembling hand or misplaced judgment will lead to mistakes, which in turn lead to cooperation-wrecking cascades of retribution. Error, too, must be factored into the shadow of the future. Optimal strategies turn out to be more complex, requiring contrition and forgiveness.

Wilson uses the evolutionary game literature to reinterpret ethnographic accounts of densely knit, small-scale societies such as the Mtubi (195–8) and Nuer (199–202) and dispersed, larger-scale societies like the early American frontier (198), exposing the central role of 'practical realism' in promoting optimal group formation and maintenance. In a discussion of Christianity, Wilson explores isolating mechanisms, entry barriers and other institutional arrangements that orchestrate behavior to maximize collective benefits (204–14). He also predicts rules for a differential forgiveness sensitive to group-functional demands. 'Even without knowing the details, we can be certain that the instructions for behaving adaptively, which somehow are encoded in the beliefs and practices of a religion, must be complex' (205.) He

scours the writings and practices of early Christian authors for evidencing this complexity, citing Paul's doctrine of punishing sins not sinners, Mark's struggle for coherence in the face of the Temple destruction, Matthew's desire to deflate rival Pharisees, and Luke's attempt to attract Gentile audiences. In each case, Wilson reads the scholarship as describing something close to the local cooperative maxima that game theory predicts: 'Forgiveness has many faces in the Christian beliefs that survived, as it must for Christians to behave adaptively in their complex social environments' (215).

Of course, more precise quantitative models are needed to test Wilson's conjecture, along with careful historical research into the social effects of these writings on actual communal organizations. Nevertheless, Wilson's point is not to produce a robust game-theoretic analysis of Christian forgiveness. It is rather to suggest a method for enriching and deepening current explanatory projects. His is a voice crying out in a desert.

Perhaps a more pressing worry arises from the potential for sampling biases. Wilson assures us that a randomized sample would work equally well (157–60).[14] But no matter how careful the protocols, should we not be surprised to find adaptations in successful traditions? If so, then so what?

In defence of Wilson, data may well bear on specific hypotheses. If group selection is not a powerful evolutionary engine of adaptive change then we should expect selfishness to overwhelm most groups. Non-reciprocal altruism should quickly extinguish. Well-calibrated evidence-based models are within reach. Moreover experiments can test for the presence of non-reciprocal altruistic tendencies among specific groups, the lack of which would signal the importance of non-group selective factors (see Bulbulia and Mahoney 2008). Of course, evolution is a messy and wasteful process. It need not perfect society: 'Unfortunately, dysfunction can be as complex and locally stable as function' (69). Models do not stand or fall with data points. Much data are needed, hence Wilson's call rallying cry.

In our view Wilson would have improved his advertising by more carefully modeling features specifically predicted by his theory. For example, it would have been interesting to consider the trade-offs between practical and factual realism among specific religious communities – how particular religious groups alternate between religious and non-religious perspectives to optimize benefits, comparing model to data. Further, a rigorous comparative analysis of several religious traditions, or of one tradition considered across place and time, might have better supported Wilson's prediction that religions will be contextually adaptive. If Wilson is right, we might, for example, discover that the Islam in the Kashmir has more in common with Northern Irish Catholicism than it does with the Islam of South

Africa. For violent group competition yields different strategic values to peace. Still another interesting avenue opens from Wilson's prediction that: '[a] large society is robust to the extent that its structure fulfils the spirit of communitas' (224). This prediction contrasts with, say, Marxist perceptions of increasing alienation in industrial mass society (Marx 1867/1992).

In short, Wilson's book has yet to show scholars of religion the elephant he thinks they are missing, even if he notices its smell. *DC* remains largely programmatic.

Wilson is mindful of the book's limitations:

> Let me be the first to admit that the adaptationist program has not yet proven itself for the subject of religion. On the other hand, this book represents a three-year effort by one person. By comparison, the literature on guppies, which demonstrates the full power of adaptationism, represents hundreds of person-years of effort. When religious groups are studied this well from an adaptationist perspective, by social scientists and religious scholars who learn about evolution in addition to evolutionists such as myself who learn about religion, the hypothesis that religious groups function as adaptive units will either self-destruct – a virtue in science – or stand on very firm ground. (188)

It is worth observing here that the collaborative project Wilson has in mind differs from the 'functionalist' campaigns many scholars of religion oppose. Wilson does not take functionalism to be axiomatically true. Multi-level selection hypotheses can be tested and compared with other models.[15] We can identify features of religion that do not count as functional at the group level. Considering elements of religion on a case-by-case basis may well expose alternative dynamics. Evolutionary theories are compelling precisely because the models can be tested. We can expect that science to 'be a major undertaking requiring many scholar-decades of work' (11).

Since its publication in 2002, many have objected to Wilson's book because they reject group selection or cultural evolution (for example Atran 2002; Boyer 2004; Sosis 2003). We hope to have cast some doubt on these doubters. To others, Wilson's project will appear to be a kind of methodological futurism. Wilson's reply: 'Rather than complaining about the difficulty of testing functionalist hypotheses, we need to roll up our sleeves and start using our proven tools on the material at hand' (73).[16]

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## Notes

1 For a clear, accessible overview of the issues see Wilson and Wilson 2007.
2 The latter two of these features are evolutionary by-products of development; the first is an explicitly targeted design. In evolutionary studies of religion we find both by-product and adaptationist theories of religion. For discussion see Boyer and Bergstrom 2008; Bulbulia 2007.
3 See Armin Geertz's chapter on Richard Dawkins and Daniel Dennett in this volume.
4 'The reason that the definition of groups is so closely tied to the details of the trait is because we are trying to predict the evolution of the trait' (15).
5 If this position seems similar to selfish-meme theory, it is! Selfish-meme theorists, however, urge that socially transmitted information evolves for its own benefit, whereas Wilson emphasizes the importance of host success. Where group selection is strong, we expect maladaptive information to perish, and group-enhancing information to spread. Symbiosis will reign over parasitism (Dennett 2006). These differences of view are empirically testable. The animosity between Wilson and Dawkins is overstated, in the first instance, by Wilson and Dawkins, see Dawkins 2007; Wilson, 2007a,b.
6 How altruistic traits become common when rare poses difficult problems, though these are orthogonal to the question of *how possibly* group selection can emerge from mechanisms of cultural transmission.
7 In fact, the evolutionary dynamics are more complex. Wilson's treatment of cultural evolution does not distinguish between three types of relevant information. There may be competition between institutions – say corporations – leading to structural adaptations that better equip these for success. IBM may change its organization without modifying the phenotypes of its employees (at least in the relevant sense). Design here does not emerge from the blind operation of chance laws. It is instead the result of intelligent planning. Variation is directed. For this reason, the 'natural selection' of culture must be qualified. Moreover, different types of cultural information may combine to become more competitive against other types of cultural information for social transmission. Memes can form teams. Dawkins urges that the threat of hellfire combines with a valuing of blind faith to produce a potent 'memeplex' capably of defying even the most carefully reasoned argument (Dawkins 2006: 196–200). Finally, information may replicate without causing *competitive* 'trait groups.' The trait group whose members consist of those who have telephones that are simultaneously video cameras presumably does not compete against other trait groups, even if their manufacturers compete. These distinctions are obscured in Wilson's treatment – perhaps sensibly. If his project is to forge a new methodology for the study of religion, it is perhaps best to steer clear of the many thorny paths surrounding it, even if these must eventually be traveled.
8 In which a single gene causes individuals to produce an adhesive that literally sticks them together into a fruiting multi-cellular body.

9 Though Wilson describes the problem he does not formally explain how religion solves it (see Frean and Bulbulia, in preparation).
10 The biologist William Hamilton showed that giving may evolve towards kin, where the cost-to-benefit ratio exceeds degree of relatedness (c/b > r) (Hamilton 1964). Direct and indirect reciprocity are also available to non-kin, though only where the likelihood of gain (in kind, through reputation enhancement, or by downstream benefits to kin) exceeds the cost-to-benefit ratio of the gift (see Alexander 1987; Nowak and Sigmund 1998; Trivers 1971).
11 We suspect it relates to the solution to coordination dilemmas, though will not explore the argument here.
12 See Benson Saler's chapter on Stewart Guthrie in this volume.
13 On Rodney Stark's theory, see the chapter by Gregory Alles in this volume.
14 He pursues randomization in subsequent work (see Wilson 2005).
15 Wilson lists six possible evolutionary hypotheses on his evolutionary studies website. Each of these are in principle capable of usurping multi-level selection: http://evolution.binghamton.edu/evos/index.html.
16 Those interested in Wilson's collaborate project, complete with a 'Beginner's guide to Evolutionary Religious Studies,' should see: http://evolution.binghamton.edu/religion/guide.html.

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