

Article

How to Survive the Anthropocene: Adaptive Atheism and the Evolution of *Homo deiparensis*

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Abstract: Why is it so easy to ignore the ecological and economic crises of the Anthropocene? This article unveils some of the *religious biases* whose covert operation facilitates the repression or rejection of warnings about the consequences of extreme climate change and excessive capitalist consumption. The evolved defaults that are most relevant for our purposes here have to do with mental *credulity* toward religious content (beliefs about supernatural agents) and with social *congruity* in religious contexts (behaviors shaped by supernatural rituals). Learning how to contest these phylogenetically inherited and culturally fortified biases may be a necessary condition for adapting to and altering our current natural and social environments in ways that will enhance the chances for the survival (and flourishing) of *Homo sapiens* and other sentient species. I outline a conceptual framework, derived from empirical findings and theoretical developments in the bio-cultural sciences of religion, which can help clarify why and how gods are imaginatively conceived and nurtured by ritually engaged believers. Finally, I discuss the role that “adaptive atheism” might play in responding to the crises of the Anthropocene.

Keywords: evolution; bio-cultural study of religion; cognitive science; atheism; Anthropocene; bias; climate change

1. Introduction

In one sense—and, indeed, in the one sense that is perhaps most obvious and yet at the same time easiest to disavow—none of us are going to survive the Anthropocene. We are all going to die. This is just the way it goes with organisms. Nevertheless, many of us, quite naturally, would prefer it if at

least a selection of human offspring could continue multiplying and filling the earth. This preference itself is a result of natural selection. The problem, of course, is that the earth is already too full and it is not at all clear how long it can sustain expanding multitudes of *Homo sapiens*. For several decades, a growing number of scientists, policy-makers and cultural commentators have been trying to draw our attention to imminent ecological crises, explaining their causes and estimating their effects on the survival of humanity and other sentient species [1,2].

Unfortunately, the vast majority of people find such explanations and estimations all too easy to ignore. Rather than offering yet another summary of reasons to be alarmed, I want to focus here on some of the reasons why so many people—especially religious people—show surprisingly little alarm when given information about the deteriorating environment of the Anthropocene. My goal is to unveil some of the naturally evolved *religious biases* whose covert operation facilitates the repression or rejection of warnings about the consequences of extreme climate change and excessive capitalist consumption. Learning how to contest these phylogenetically inherited and culturally fortified biases is an important condition—indeed, perhaps a necessary, if not a sufficient, condition—for adapting to and altering our current natural and social environments in ways that will enhance the chances for the survival (and flourishing) of our offspring.

I do not mean to downplay the significance of other factors (nutritional, pedagogical, political, economic, *etc.*) that must figure into our pragmatic adaptive calculations. My point is that highlighting and warning people about these issues will do little good if we fail to deal with deeply embedded religious biases that surreptitiously shape the reactions of the majority of the human population, enabling most of us to immediately dismiss or disregard such calculations. As we will see below, the evolved defaults that are most relevant for our purposes have to do with mental credulity toward religious content and with social congruity in religious contexts. These cognitive and coalitional biases are reciprocally reinforcing, and predispose most of us toward believing claims about the manifestation of gods (revelation) especially when engaging with other in-group members in the manipulation of gods (ritual). In other words, superstitious inferences based on the detection of alleged supernatural agents activate segregative preferences based on the protection of allied supernatural groups (and *vice versa*).

This Special Issue of the journal is dedicated to exploring the role that “religions” might have played—and might continue to play—in exacerbating or easing the current ecological crises that characterize the Anthropocene. In a recent interview with the *New Scientist* about his book *The Meaning of Human Existence*, E. O. Wilson said that he thought religion is “dragging us down”, and that, “for the sake of progress the best thing we could possibly do would be to diminish, to the point of eliminating, religious faiths” [3]. In the final section of this article, I return to Wilson’s concerns and discuss the role that what I call “adaptive atheism” might play in responding to the crises of the Anthropocene. The third and fourth sections outline a conceptual framework, derived from empirical findings and theoretical developments in the bio-cultural sciences of religion, which can help clarify why and how gods are imaginatively conceived and nurtured by ritually engaged believers.

First, however, when reflecting on claims like Wilson’s, which seem to be increasing in frequency in recent years, it is important to be as clear as we can about our use of terms like “religious faiths” and the reasons why we think they might be “dragging us down”.

2. Climate Change, Cultural Cognition and “Religion”

As readers of this journal know all too well, the label “religion” is highly contested within and across the many academic disciplines that study the various phenomena to which the term is commonly applied [4]. In this context, I use the word *religion* to designate *shared imaginative engagement with axiologically relevant supernatural agents*. I explain and defend this stipulated definition in Section 3. Of course, this aggregate of traits does not capture everything that can be said about “religion”, but this sort of definition is relatively common in fields such as the cognitive science of religion [5,6]. Critics of Wilson—like critics of the new atheists—are quick to point out that “religions” have helped hold societies together, provided people with a sense of meaning in life, fostered the production of great works of music and art (and so on). This is no doubt true, and I am all for cohesive societies, meaningful lives and aesthetic productivity (and so on). But do any of these things depend on widespread belief in and ritual interaction with disembodied intentional forces that are watching over particular in-groups?

We should be happy to discover that they do not. Why? Because, as we will see in Section 4, whatever else “religions” may produce, they also reinforce evolved biases that consistently lead to mistaken interpretations of natural phenomena and foster antagonism toward out-groups. Moreover, as we will see in Section 5, learning to contest these biases can help produce more plausible explanations of causal forces in the world and more feasible social strategies in pluralistic contexts. It is indeed true that other traits often found among people associated with a particular “religion”, such as a concern for justice or a sense of wonder, may indeed help to encourage creative interventions in socio-cultural practices and political economic systems. In what follows, however, my focus is on the reproduction of religion (in the sense stipulated above) in human minds and cultures, and the extent to which it aggravates the crises of the Anthropocene.

Experts on climate change, as well as public-policy makers concerned with mediating their findings to the general public, have often expressed astonishment at the resistance so many people have toward accepting the scientific consensus. Equally troubling is the lack of environmentally sensitive behavior even among those who are well educated about and explicitly accept that consensus. These concerns have been the focus of a growing number of studies during the last decade or so. In their 2002 article, “Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior?”, in *Environmental Education Research*, Kollmuss and Agyeman [7] tackled the issue from the point of view of environmental education, summarizing much of the extant literature and arguing for a more complex model of “pro-environmental consciousness” that takes into account both external factors (e.g., demographics) and internal factors (e.g., values). In 2011 a Special Issue of *American Psychologist* was devoted to exploring ways in which scholars and practitioners in the discipline of psychology might help foster healthy modes of coping with the crisis and contribute to a better understanding of the barriers to action [8].

One of the most important recent developments in this multi-disciplinary analysis of human responses to climate change has been the incorporation of insights from the cognitive and evolutionary sciences. In a recent review of the “foundational processes” that influence beliefs about climate change, M. Brownlee and colleagues [9], examined the way in which cognitive dissonance, biased assimilation, confirmation bias, loss aversion, illusions of optimism—and a host of other cognitive

biases—shape people’s attitudes and beliefs about climate change, and identified ways in which this knowledge could lead to new strategies in environmental education and research. In a similar study on various methodological scenario approaches to climate change research in *Synthese*, Lloyd and Schweizer showed how even some of the most popular models among scientists and policy-makers can be impacted by many of the heuristic biases that have been identified by cognitive psychology, such as availability, overconfidence and groupthink [10].

In his article “Why do people misunderstand climate change? Heuristics, mental models and ontological assumptions” in *Climatic Change*, Chen pointed out the special role of “object bias” in skewing interpretations of ecological crises [11]. The static mental models associated with the most common pattern matching heuristics that shape human perception and interpretation work extremely well for dealing with objects. Climate change, however, is not an object; it is a dynamic process. Unfortunately, when people uncritically use their implicit ontological assumptions about *objects* to try and make sense of (or predict) changes in complex *dynamic systems*, they consistently and profoundly fail. Chen notes that some physics teachers have developed a radical pedagogical approach to deal with this bias: they *begin* with detailed discussions of ontology before trying to teach novice students about physical processes (like electricity). He suggests that a similarly revolutionary approach might be necessary for making progress in altering people’s attitudes toward the processes of climate change.

These sorts of insights have major implications for understanding the science/policy divide and the common sorts of misjudgments that shape reactions to policy proposals. As Norman and Delfin have pointed out in a recent issue of *Politics & Policy*, cognitive biases are easily activated under conditions of uncertainty and when individuals are trying to assess threats to their survival. They illustrate some of the ways in which cognitive biases like anchoring, framing, false representativeness, availability, attention to intentionality, and affective forecasting lead to systematic errors in judgment, and bad policy decisions [12]. In a similar study in *Mitigation and Adaptation Strategies for Global Change*, Preston and colleagues examined the role of heuristic biases in “adaptation discourse”, which all too easily lead to ways of framing the problems, and to policy proposals for solving them, that rely on affective (quick, innate) reasoning processes rather than analytic (slow, methodical) reasoning [13]. Increasingly, scholars in these fields are recognizing the extent to which cognitive biases help to explain resistance to the scientific consensus about climate change and the relative lack of success in policies aimed at promoting pro-environmental behavior.

In their analyses of these issues, Kahan and his colleagues utilize the phrase “cultural cognition”, by which they mean to refer to “the psychological disposition of persons to conform their factual beliefs about the instrumental efficacy (or perversity) of law to their cultural evaluations of the activities subject to regulation” ([14], p. 149–50). Cultural cognition is driven by implicit mechanisms like naïve realism and reactive devaluation, which reinforce people’s tendencies to immediately judge new information as unreliable when it goes against their culturally congenial beliefs or to dismiss the persuasiveness of evidence when it is offered by members of an out-group. Human beings do not naturally think in terms of Bayesian probabilities; rather, they are prone to process information in ways that confirm their affective orientation, based on prior estimations of risk perception, which makes it all too easy to ignore “experts” whose claims raise challenges to their sense of identity and idealized form of social ordering ([15], p. 168; *cf.* [16]).

What does any of this have to do with “religion”? In recent years, scholars of climate change have increasingly turned their attention to the relationship between religiosity, religious affiliation and even specific religious ideas, on the one hand, and attitudes toward (and behavior in response to) reports about ecological challenges and dangers, on the other. In a 2009 article in *Global Environmental Change*, Mortreux and Barnett reported on their interviews with the inhabitants of the islands of Tuvalu, where raising water levels might be considered a good reason to migrate. When people were asked why they did not move, they “consistently referred to the biblical story of Noah as evidence that God would not allow further flooding” ([17], p. 100). In his 2013 report on a case study of the role of religion in the Brazilian Amazon published in *Journal of Rural Studies*, Otsuki concludes that one consequence of the popularity in rural areas of the Pentecostal Church of Assembly of God, which embraces an evangelical Christian message of enjoying earthly prosperity, “was continual conversion of forests into municipalities and promotion of capitalist accumulation” ([18], p. 418).

Experimental evidence suggests that people who are less religious and more analytic tend to be better (on average) at contesting some of the general cognitive and coalitional biases we have been discussing [19,20–22]. But are they any different from religious people when it comes to evaluating the scientific consensus on climate change and reacting to the challenges of the Anthropocene? In a recent survey-analysis examining the relation between “place attachment and ideological beliefs” and attitudes toward climate change, Devine-Wright and colleagues found that those with the strongest global attachments were more likely to be “female, younger and self-identify as having no religion” ([23], p. 68). Hope and Jones studied and compared groups of Christians, Muslims and secular people in a mixed methods analysis of the impact of religious faith on attitudes toward environmental issues. In their report on the study in a 2014 article published in *Technology in Society*, they attributed the low perception of urgency toward ecological crises among the former two groups as “due to beliefs in an afterlife and divine intervention”. Lack of these beliefs among secular participants, on the other hand, contributed to a “focus on human responsibility and the need for action” ([24], p. 48).

But, some defenders of “religion” may object at this stage, is it not the case that some religious people do believe in caring for the earth and do act in environmentally friendly ways? Indeed, research indicates that religiosity can sometimes have a moderating effect on the likeliness to engage in sustainable behaviors. For example, in a cross-cultural comparison of Christian, Atheist and Buddhist consumers in the U.S. and South Korea, Minton and colleagues found that highly religious Buddhists were the most likely to engage in sustainable behaviors [25]. An earlier study by Wardekker and colleagues, which explored the role of “Christian voices” in the United States public debate over climate change, identified three distinct types of narrative: conserving the “garden of God” as it was created, tending to the wilderness so that it becomes the “garden” it should be, and a combination of these two in which God’s creation is considered both good and changing. The authors of that study concluded that “religious framings” of climate change could serve as “bridging devices for bipartisan climate-policy initiative” because of the way they resonate with many conservative and progressive members of the electorate ([26], p. 512).

If our primary concern is dealing with the underlying credulity and congruity biases that impair our ability to respond to contemporary ecological crises, then there are at least two important problems with the sort of analysis represented by these last two studies. By focusing *theoretically* only on institutional “affiliation” or on intensity of “ideological” commitment, this kind of approach ignores those aspects

of *religion* that are most relevant for understanding people's resistance to facing the global challenges of pluralistic human societies in the Anthropocene, namely, shared imaginative engagement with invisible agents who are allegedly invested in upholding the norms and ensuring the survival of a particular in-group. However, this is precisely why cognitive and coalitional biases keep working so well—because they are ignored.

And so we also have a *pragmatic* problem. Even if religiously affiliated and committed individuals *explicitly* accept the scientific consensus on climate change and act publically in environmentally friendly ways, insofar as they (and their affines) are also *implicitly* activated by evolved defaults that engender conceptions of person-like, coalition-favoring disembodied spirits whose intentions are allegedly relevant for interpreting natural phenomena and normatively inscribing the social field, they are actually *strengthening* the very biases that are contributing to the crises they are trying to solve.

3. *Homo deiparensis*

One of the distinctive features of our species is a fascination with naming ourselves. We are, or so we like to claim, *Homo sapiens* (the wise hominid). Of course, wisdom is not the only interesting thing about us; we have also nominated ourselves *Homo faber* (the worker), *Homo ludens* (the laughter) and *Homo economicus* (the shopper). In this context, I want to draw attention to another distinctive feature of our species: our tendency to bear gods. Research in fields as diverse as cognitive science, evolutionary biology, archaeology, experimental psychology and cultural anthropology has converged in recent years in support of the claim that conceptions of supernatural agents are easily “born” in human minds and “borne” in human groups today as a result of biases that were naturally selected in the early ancestral environment of the Upper Paleolithic [4,27–31].

In other words, we are—or we have been for at least the last 70,000 years or so—god-bearing hominids (*Homo deiparensis*). In the sense I am using the term, *religion* is the result of the integration of inherited cognitive and inculcated coalitional mechanisms that predispose us toward over-detecting human-like forms in the natural environment and over-protecting group-specific norms in complex social environments. The coordinate grid in Figure 1 provides a conceptual framework for discussing the possible correlations between—and contestations of—these perceptive and affiliative biases.

The horizontal line represents a spectrum on which one can mark the tendency of a person to guess “hidden agent” when confronted with ambiguous phenomena. Anthropomorphically promiscuous individuals jump at any opportunity to postulate human-like entities as causal explanations even—or especially—when this requires appealing to counterintuitive disembodied intentional forces (*i.e.*, to “supernatural agents”). Anthropomorphic prudes, on the other hand, resist superstitious interpretations of nature and hold out for non-intentional explanations. The vertical line plots the variation among individuals in relation to their tendency to prefer the norms of their own in-groups when evaluating ways to organize the social field. Sociographic prudes are happy to stay home with familiar others and are highly suspicious of the alien values of out-groups. The sociographically promiscuous, on the other hand, are more open to dating other cultures; they tend to resist appeals to conventional authorities that enforce segregative inscriptions of society.

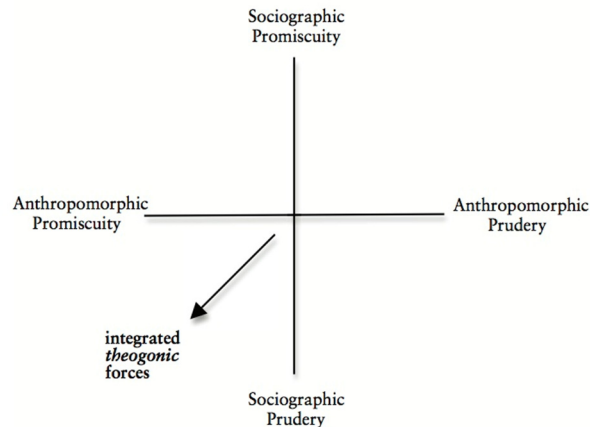


Figure 1. Theogonic Forces.

The integration of anthropomorphic promiscuity and sociographic prudery served our ancestors well in an environment where survival depended on quickly perceiving any predators or prey, and consistently defending the resources and values of one’s in-group. Shared imaginative engagement with axiologically relevant supernatural agents—religion—powerfully reinforced these biases and gave a survival advantage to hominid groups whose members had this aggregate of traits. The integration of theogonic (god-bearing) mechanisms, represented in the lower left quadrant of Figure 1, was an evolutionary winner.

In more than one sense, gods were the “best guess” available to our early ancestors. Hypothesizing the presence of a “human-like agent”—even when there was no clear evidence that such an agent existed—was “best” because it provided further motivation to keep trying to detect hidden agents, which was necessary for survival. Given the importance of honing this hypersensitive disposition, it would have been better to keep believing that there might be animal-spirits or ancestor-ghosts in the forest than to guess that the cause of weird noises or movements was simply the wind or shifting shadows. Although these biases regularly triggered false positives, the guesses they produced were cognitively cheap and inferentially rich. Once the human mind thinks it has detected an intentional force, attributions of person-like qualities to the putative agent (e.g., “may be angry” or “wants something”) are easily triggered by other cognitive devices like mentalization and teleological reasoning.

So, over-active cognitive defaults led to the mental appearance of god-concepts, but why did people keep socially entertaining them? Supernatural agents may be easily born in human minds, but it takes a village to raise them. The gods that stick around and become entangled within communal rituals are typically those that serve as “better guards”. As human groups get larger, it becomes more difficult to keep an eye on everyone and be sure that they are following the norms of the coalition. When the members of an in-group really believe in the existence and causal relevance of disembodied intentional forces who are interested in their behavior, and who have the power and desire to reward or punish them, they are more likely to follow the rules even if no other embodied human agents are watching.

Especially when resources are low or under otherwise stressful conditions, the most competitive coalitions are those whose members are able to cooperate and remain committed to the group. It is easy to understand why self-serving tendencies in individual organisms have been naturally selected over time. However, the societies in which individual human beings live, and on which they depend

for survival, will fall apart if there are too many self-serving cheaters, freeloaders or defectors. Research in the bio-cultural sciences of religion suggests that cooperative commitment within some hominid coalitions during the Upper Paleolithic was improved by the intensification of shared belief in and ritual engagement with potentially *punitive* gods [32–36]. Vindictive supernatural agents would be able to catch misbehavior that natural agents might miss, and could punish not only the miscreants, but also their offspring or even the entire community. Accepting the existence of invisible or ambiguously apparitional “watchers” helps to enhance the motivation to obey conventional regulations and stay committed to the in-group.

Most of us are relatively sure that we know where babies come from, and have a pretty good idea of why adults usually want to keep them around. What about gods? Confidence about our ability to explain the processes that engender the arrival (and support the nurture) of disembodied intentional forces within the mental and social space of human life has been growing rapidly among scientists in the disciplines that make up bio-cultural study of religion. The integrated theogonic (god-bearing) forces represented in Figure 1 continue to play a role in the reproduction of *religion* in contemporary cultures because shared belief in the manifestations of gods and shared commitment to their ritual manipulation are the result of inherited inferential and preferential default mechanisms that are widely distributed in each new generation of human beings.

So, what does any of this have to do with the Anthropocene, and the ecological and economic crises we face today as a species? The problem is that these religious credulity and congruity biases, which served our ancestors well, are no longer adaptive in some of the contexts within which a growing number of us find ourselves. Most of us do not live in relatively homogenous small-scale groups, hunting and gathering across wide expanses like the African savannah, but in pluralistic, densely-packed, large-scale societies rapidly running out of agricultural resources for supporting our expansive sedentation. The hyper-active detection of supernatural agents and the hyper-active protection of supernatural groups helped earlier human civilizational forms emerge and hold together, but it now seems like we must learn to contest these evolved defaults if we are to adapt to (and alter the conditions of) the Anthropocene.

If large numbers of the population interpret natural phenomena like tsunamis and hurricanes as acts of God (literally), they are less likely to pay attention to scientific reports about climate change. Why worry about the planet if the supernatural agent of one’s in-group is going to create a new heaven and a new earth anyway? If large numbers of the population are motivated to inscribe the social field in ways that enforce the values putatively revealed by their God to elite members of their coalition, they are less likely to alter their patterns of consumption. Why worry about unequal distribution of resources today if one expects a supernatural agent to return at any moment with eternal rewards for the in-group and eternal punishment for the “wicked”?

At this stage, some defenders of “religion” may once again protest. They do not believe such things, nor do any of their educated friends. They are deeply concerned about climate change and capitalist consumption and so are most of their cosmopolitan colleagues. Their conception of “God” promotes neither superstition nor segregation. Even if the latter were true it would, unfortunately, be irrelevant. Cross-cultural psychological research indicates that no matter what the intellectual elite and priestly class of a religious in-group says, the vast majority of regular believers immediately default to the naturally evolved biases toward detecting person-like, coalition-favoring gods when faced with real-life religious

scenarios [37–39]. As if this were not bad enough, these evolved cognitive and coalitional mechanisms are so deeply intertwined that mental credulity about gods and ritually enhanced social congruity constantly *strengthen* one another, implicitly and somewhat automatically, all too easily obscuring and promoting the powerful biases that skew our readings of and reactions to problems like climate change.

4. The Reciprocity of God-Bearing Biases

In other words, anthropomorphic promiscuity and sociographic prudery are *reciprocally reinforcing*. This is one of the central tenets of *theogonic reproduction theory* [4,27,40,41]. The fact that—and the ways in which—these biases are mutually intensifying continues to be confirmed and clarified by proliferating empirical research and theoretical developments in the many fields that contribute to the bio-cultural study of religion. Implicitly activating people’s anxiety about their own mortality, or the welfare of their kith and kin, increases their tendency to interpret ambiguous phenomena as caused by potentially punitive disembodied agents; conversely, priming individuals with thoughts about possible invisible watchers reinforces their tendency to protect their in-group and express antagonism toward out-group members [42,43]. I analyze this literature more extensively elsewhere [44], but in this context I limit myself to just a few recent examples from the rapidly growing multi-disciplinary literature that demonstrates the reciprocal reinforcement of theogonic (god-bearing) biases.

In a 2012 article in the *Journal of Experimental Social Psychology*, Gervais and Norenzayan presented evidence from three experimental studies for what they call the “supernatural monitoring hypothesis: That thinking of God triggers the same psychological responses as perceived social surveillance” ([45], p. 298). Psychologists have known about the association between socially desirable responding and religiosity for quite some time, but priming experiments provide a way to demonstrate a causal relationship between them. Their studies, which used by both explicit and implicit methods for priming concepts of God, confirmed their hypothesis that thinking about supernatural agents activates sensitivity to reputational cues that others are watching and causes an increase in behaviors considered socially acceptable—especially among believers. As the authors point out, these experiments also lend credence to the claim that supernatural agent concepts, once they arise in a culture, may “foster cooperative behavior by making religious believers feel as if they are monitored by their gods” ([45], p. 302).

Cooperative behavior has rather obvious survival benefits, so what is the problem? The problem is that the dark side of in-group cohesion is out-group antagonism. The correlation between religion and prejudice has also been well-known and documented for decades by social psychologists, but more recent experiments in cognitive psychology have shed light on the mechanisms that link them. In a study of Singaporean Christians and Buddhists published in 2014 in *The International Journal for the Psychology of Religion*, Ramsay and colleagues found that participants who were primed with concepts or images related to supernatural agency tended to become more prejudiced and antagonistic toward out-groups. Members of both religious traditions demonstrated more negative pretest to posttest attitude change toward homosexuals when primed with religious in-group words, in comparison with those primed with neutral words. Even when there is no explicit religious value-violation, bias toward culturally relevant out-groups increases when believers are primed with religious concepts. The

authors concluded that religion may exert its prejudicial effects “indirectly through activation of associated cultural value systems” ([46], p. 1).

In other words, anthropomorphic promiscuity promotes sociographic prudery (and *vice versa*). In a 2014 article in *Psychological Science*, Neuberg and colleagues used data from the Global Group Relations project to investigate the relation between religion and intergroup conflict among 194 groups in 97 sites across the world. Their goal was to discover the extent to which religious infusion, that is, the extent to which religious rituals and discourse permeate the everyday activities of groups and their members, “moderated the effects of two factors known to increase intergroup conflict: competition for limited resources and incompatibility of values held by potentially conflicting groups.” They found that when religion was infused within group life, “groups were especially prejudiced against those groups that held incompatible values, and they were likely to discriminate against such groups” ([47], p. 198). The evolved default toward protecting one’s own in-group by antagonizing out-groups is easily activated when one’s mental and social worlds are filled with messages about and ministrations toward watchful supernatural agents.

In a 2014 study published in *Psychiatry Research*, Reed and Clarke demonstrated the effect of religious context on the content of visual hallucinations in individuals high in religiosity. Perceptual experiences in the absence of external stimuli—that is to say, hallucinations—are usually associated with schizophrenia or similar mental conditions, but they actually occur quite commonly in large parts of the population. Using a subliminal prime methodology (word-detection task), the authors found that “participants measuring high on religiosity were more likely to report false perceptions of a religious type than participants low on religiosity.” Both religious and non-religious participants (none of whom were schizophrenic) made false perceptions based on priming, but those who were high in religiosity produced more false perceptions with a religious content; in other words, their hallucinations were more likely to be related (directly or indirectly) to the supernatural agents of their in-group. The authors hypothesize that “context becomes a framework for processing through which context-relevant information or response to stimuli is facilitated and context-irrelevant information is suppressed” ([48], p. 597).

What happens to human brains when they regularly engage in religious rituals? In a 2013 target article in *Religion, Brain & Behavior*, Schjoedt and colleagues explored the ways in which religious interactions tend to deplete cognitive resources. They proposed a “resource model of ritual cognition in which collective rituals limit the cognitive resources available for the individual processing of religious events”, and demonstrated the way in which “rituals directly suppress and channel default cognition in order to facilitate the construction of collective memories, meanings, and values among ritual participants” ([49], p. 40). Rituals tend to be characterized by incomprehensible—or at least causally opaque—interactions. The perception of goal-demoted and causally opaque actions in rituals uses up participants’ cognitive resources, limiting their capacity to activate the usual executive systems that support critical analysis. Ritual practices deplete cognitive resources in such a way that people become more susceptible to the suggestions and narratives of religious authorities or ritual officers. Other studies suggest that ritual contexts even alter basic assessments about bodily and mental processes [50].

In a 2014 article in *The Journal of Social Psychology*, Riggio and colleagues described two self-report experiments designed to show how religiosity affects attributions of causality. Participants read a story about a hypothetical man (Chris) who had a heart attack, and then (depending on the version of the story) used either religiously or medically authorized behaviors to improve his health,

and either lived or died. When Chris used religious behaviors and lived, highly religious individuals attributed this outcome to God. However, when Chris used the same behaviors and died, these individuals showed a form of excuse-making the authors call a “God-serving bias”. Like the cognitive predisposition toward a self-serving bias, such attributions implicitly support the maintenance of strongly held beliefs (especially beliefs related to group identification and belonging) even in the face of contradictory evidence. The authors conclude that religious belief systems, which claim to have a supernatural basis, not only lead to “low-quality thinking but to dangerous thinking, especially because it is purposeful and motivated by emotional processes...such belief systems, in being defended, lead to extremes in thinking and behavior that are dangerous to all people” ([51], p. 509).

In a 2013 article in the *Israel Journal of Ecology & Evolution*, Purzycki and Sosis proposed the idea of an “extended religious phenotype” ([52], p. 102), incorporating the two “central features” of religion: “the coupling of ritual behavior and supernatural agency attribution”. Belief in supernatural agents is possible because of evolved systems devoted to the detection and attribution of mental states, but this does not explain why people believe in the particular gods of their in-group. They suggest that the predictable variations found in religious *content* across cultures are a result of attempts to deal with particular problems posed by environmental challenges in specific niches. Religious systems evolve in response to the demands of their *context*, socio-ecological niches that they help to construct, using mechanisms such as costly signaling and shared belief in supernatural surveillance to maintain the cohesion of the system. An “adaptive religious system” only survives if its members become and remain emotionally and (in some sense) intellectually committed to it; ongoing ritual engagement plays an important role in fulfilling these conditions. “Ritual behaviors and religious beliefs exist in a feedback loop in which behaviors affect beliefs and beliefs affect behaviors” ([52], p. 103).

In other words, religious credulity and religious congruity biases reinforce one another. Why is this relevant for understanding and responding to climate change? Because these deeply ingrained biases shroud the operation and amplify the effects of the other cognitive and coalitional biases we reviewed in Section 1, further distorting interpretations of (and decelerating reactions to) the ecological and economic crises of the Anthropocene. Educational, psychological and public-policy experts are coming to realize that communicating more (or even better) *explicit* information about these crises is not going to help as long as people’s perception of this information is *implicitly* biased. Unveiling and contesting heuristic mechanisms like anchoring, affective forecasting and self-serving bias is likely a necessary condition for the long-term success of any proposed solution to the kind of problems facing pluralistic, globalizing civilizations. However, even that monumental task is not likely to succeed unless and until the reciprocally reinforcing *religious* biases, which in many cases conceal and buttress those other generic mechanisms, are *also* unveiled and contested.

Let us take the example of “solution aversion”. Campbell and Kay explored the function of this bias in the context of an analysis of the relation between ideology and motivated disbelief in a 2014 article in the *Journal of Personality and Social Psychology*. They reported on four experiments that studied the role of motivated reasoning (that is, rationalization processes that are implicitly shaped by biases outside of conscious awareness) in people’s attitudes or perceptions of climate change. The authors discovered that the source of the motivation to disbelieve scientific reports is not necessarily related to an aversion to the *problem* itself, but to an aversion to *solutions* popularly associated with the problem. The skepticism of many U.S. Republicans toward environmental science, for example, is partly a result

of a conflict between ideological values (preference for a free market) and the sorts of solutions typically proposed for dealing with climate change (like regulating the free market). The answer to the problem of skepticism about scientific claims, therefore, “is not to simply present the public with more or better data but to consider other motivating factors” ([53], p. 811).

Biases like solution aversion are fortified and intensified by religious credulity and congruity. People who regularly engage in shared imaginative engagement with supernatural agents will implicitly perceive problems and proposed solutions through the lens of the axiological norms authorized by the supernatural coalitions to which they are committed. Because these norms are reinforced by ritual interactions that exhaust cognitive resources, promote anxiety about hidden punitive forces, and increase antagonism toward out-groups, it is hardly surprising that individuals strongly committed to religious in-groups sometimes find it difficult to acknowledge problems associated with the Anthropocene, much less to commit themselves to solutions that challenge their superstitious interpretations of natural causes and segregative inscriptions of the social field.

It is encouraging to hear the arguments (and see the actions) of many “religious” people who are explicitly promoting the well-being of the environment and a fairer global distribution of wealth. Tragically, however, such efforts may be implicitly undermined by the way in which their participation in *religion*—shared imaginative engagement with axiologically relevant supernatural agents—reinforces deep biases toward anthropomorphic promiscuity and sociographic prudery in their fellow believers, thereby demoting the sort of critical reflections and cultural relations that are needed for surviving the Anthropocene. Nevertheless, there are some reasons for optimism.

5. Adaptive Atheism

The term *atheism* is almost as contentious and contested as *religion*. In this context, I am using the former to designate attempts to make sense of the world and to act sensibly in society without appealing to supernatural agents or authorities. This stipulated definition highlights the creative efforts of those who contest the evolved tendency to rely on imaginative engagement with gods (*theōn*) when dealing with socio-ecological challenges. Insofar as it generates new modes of axiological engagement within pluralistic societies that alter the conditions for critical theoretical discourse about—and creative behavioral responses to—threats facing the human race and other sentient species, atheism can be conceived as an adaptation (in the general sense) to a radically interconnected global environment. To put it even more positively, atheists enthusiastically embrace *naturalism* in their construction of causal explanations in the academic sphere and *secularism* in their proposals for normative inscriptions in the public sphere.

Most varieties of naturalism share a resistance to the inclusion of disembodied intentional forces in interpretations of the evolving cosmos. No doubt some individual scientists continue to harbor superstitious beliefs, but *qua* scientists the vast majority are *methodologically* naturalistic in the sense that they exclude god-concepts from their scholarly hypotheses. Most varieties of secularism share a resistance to the inclusion of supernaturally authorized sectarian policies in prescriptions for organizing pluralistic societies. No doubt some individual civil leaders in complex, democratic contexts maintain membership in religious in-groups, but *qua* politicians a growing number are *methodologically* secularist in the sense that they exclude god-sanctioned commands from their

political proposals. Atheism, in the sense I am using the term, is the affirmation of *metaphysical* naturalism and *metaphysical* secularism: the most plausible hypotheses and the most feasible strategies are those that incorporate only axiological dynamics whose actual existence (or existential actualizability) are inter-subjectively and trans-communally contestable [4].

Segregative inscriptions based on superstitious interpretations of punitive gods are becoming more and more problematic in pluralistic, globalizing contexts. More and more people, and especially young people, are finding it increasingly easier to make sense of the cosmos and to act sensibly in society without appealing to supernatural agents as causal powers or moral regulators [54–57]. In other words, in many parts of the world we find a growing tendency toward anthropomorphic prudery and sociographic promiscuity. I refer to these tendencies as “theolytic” (god-dissolving) because of the way in which they weaken the god-bearing biases of religious credulity and congruity (Figure 2).

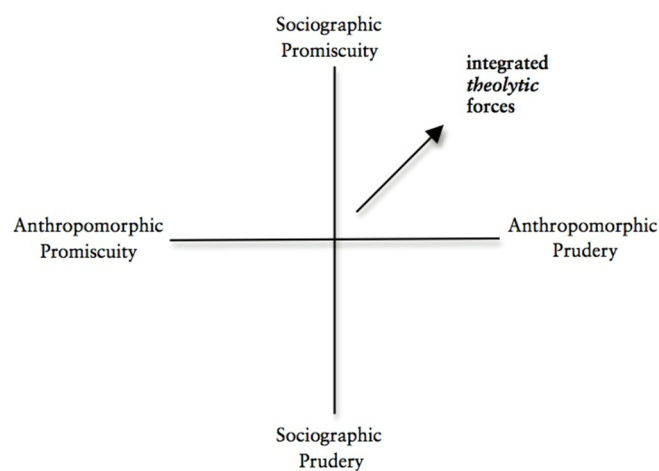


Figure 2. Theolytic Forces.

In the contemporary academy, and in the daily lives of an increasing number of people, supernatural agents are no longer the “best guess” when it comes to explaining surprising phenomena. Scientists and (non-religious) philosophers are trained to become anthropomorphically prudish, to resist the temptation to automatically attribute intentionality to unknown causes. If something unexpected happens in a test tube during a laboratory experiment, a chemist is not likely to hypothesize that it was a “ghost”. If an inferential link seems to be missing in a chain of logical argumentation, a (non-religious) philosopher is not likely to accept the strategy of inserting a “god”.

In many pluralistic societies today, supernatural agents no longer serve as “better guards”. Scandinavian countries, for example, are among the happiest and most successful in the world and yet are also ranked as the most secular and atheistic. In *Living the Secular Life*, Zuckerman reviews the survey data that demonstrates that when it comes to measuring factors like happiness, valuing motherhood, promoting peace and murder rates, the least theistic states come out far better than the most theistic states [58]. It seems that, at least under some conditions, democratically elected secular governments whose policy-making procedures are relatively transparent to their people, sponsor cooperative behavior at least as well as shared credulity about supernatural agents—without automatically activating the defense mechanisms of religious congruity biases.

Happily, sociographic promiscuity and anthropomorphic prudery are also reciprocally reinforcing [4]. The integration of these theolytic forces helps to unveil and challenge the evolved defaults of *Homo deiparensis*. It is important to remember why the tendencies to fantasize about invisible agents and to become fanatical when protecting one's in-group are so common across human cultures—and so difficult to contest. These biologically evolved and socially bolstered defaults are widely distributed in the current human population because they provided survival advantage to our early ancestors during the Upper Paleolithic, enabling them to out compete other hominid coalitions. Like racist, sexist, and classist biases, *religionist* biases have helped hold together increasingly complex human societies throughout the Neolithic, axial and modern ages. Today, however, in the diverse, cosmopolitan niches in which most of us live, these attitudes and behaviors have become maladaptive. Moreover, they are contributing to the degradation of the global environment in which all of us live.

As we noted at the beginning of this article, E. O. Wilson has recently claimed that religions are “dragging us down”, and so “for the sake of progress the best thing we could possibly do would be to diminish, to the point of eliminating, religious faiths”. In *The Meaning of Human Existence*, about which he was being interviewed when he made these comments, Wilson argued that:

Human existence may be simpler than we thought. There is no predestination, no unfathomed mystery of life. Demons and gods do not vie for our allegiance. Instead, we are self-made, independent, alone, and fragile, a biological species adapted to live in a biological world. What counts for long-term survival is intelligent self-understanding, based upon a greater independence of thought than that tolerated today even in our most advanced democratic societies. ([59], p. 26).

This is the sort of anthropomorphic prudery we have come to expect in reflective, scientific analysis, and the sort of sociographic promiscuity we have come to hope for in policy proposals for pluralistic contexts. But what would happen if “religious faiths” were eliminated? Is that even possible—or desirable? It seems more likely that shared imaginative engagement with supernatural agents (*religion*) will slowly dissolve as new generations find little or no use for this ancient adaptive strategy. But what will happen then? Of course, these are not the sorts of questions one can answer definitively in advance. We will have to figure it out together as we go along. If the analyses of Sections 1–4 above are correct, however, then it may be that one of the conditions for surviving the Anthropocene is figuring out relatively soon how to facilitate the contestation of religious credulity and congruity biases.

As I have argued elsewhere, the academic discipline of *theology* can play an important role in this process [4,27]. This claim may surprise many readers, because most people are only familiar with the *sacerdotal* trajectory of theology, which in fact has dominated discourse within and among the west Asian monotheistic traditions. This trajectory is quite clearly compromised by evolved religious biases, having pressed anthropomorphic promiscuity to infinity and sociographic prudery to eternity with the conception of a supernatural Agent whose norms are the grounds for punishing (or rewarding) all Groups whatsoever. However, if we think of theology in the broadest sense as *the critique and construction of hypotheses about the existential conditions for axiological engagement*, then it is easier to discern this ancient discipline's *iconoclastic* trajectory. The latter has certainly been the minority report in theology, but its proponents have consistently pressed toward anthropomorphic prudery

and/or sociographic promiscuity, challenging the logical coherence and/or practical implications of the idea of an infinite intentional Being—without giving up on the existential *intensity* of *intentional* engagement with natural *infinities*. Liberating these iconoclastic forces from the bio-cultural gravitational pull of religious biases is one good place to start.

Shared imaginative intercourse with supernatural agents emerged over time as evolved hyper-sensitive cognitive tendencies led to mistaken perceptions, which slowly became entangled within erroneous collective judgments about the number of potentially punitive agents in the social field. Allowing the covert operation of these evolved biases to continue unchecked reinforces commitment to favored in-group superstitions and antagonistic out-group segregations. Of all the tasks that face humanity as we try to adapt to (and alter) the Anthropocene, one of the most difficult will be un-learning these deeply embedded, reciprocally reinforcing heuristic habits.

One way to facilitate this process is to encourage people to have “the talk” about religious reproduction—especially with the younger *Homo sapiens* among us. When it comes to explaining where babies come from, and how much effort is required to take care of them, we know that waiting too long can have devastating effects. The behaviors that lead to sexual and religious reproduction can feel sensational to our bodies, but most people become quite sensitive when asked to bare their souls and talk about these feelings. All of this is completely natural. When discussing such intimate issues, it is important to be delicate—but it is also important to be direct. Having “the talk” about *religious* reproduction should involve more than simply explaining how “it” works. It is equally important to explain the socio-ecological consequences of “doing it”. We are not likely to find solutions to the global ecological and economic crises of the Anthropocene unless and until we learn how to accept our finitude and axiologically engage one another—intentionally and intensely—without bearing gods.

Conflicts of Interest

The author declares no conflict of interest.

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