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Toxic Theisms? New Strategies for Prebunking Religious Belief-Behaviour Complexes

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Abstract: This article offers a brief epidemiological analysis and description of some of the main cognitive (and coalitional) biases that can facilitate the emergence and enable the maintenance of a broad category of toxic traditions, which will be referred to here as "religious" belief-behaviour complexes (BBCs) or "theisms". I argue that such BBCs played an "adaptive" role in the Upper Paleolithic and have continued to "work" throughout most of human history by enhancing the species' capacity for material production and promoting its biological reproduction. However, today the theist credulity and conformity biases that surreptitiously shape these kinds of social assemblages have now become maladaptive in most contexts in the Anthropocene. In order to help address the pressing global challenges our species faces, such as extreme climate change, excessive consumer capitalism, and escalating cultural conflict, I commend the use of "prebunking" and other debiasing strategies in our attempts to reduce the toxicity of theisms in the body politic.

Keywords: Religion; theism; prebunking; debunking; cognitive bias.

Introduction

The general aim of this special issue of the *Journal of Cognitive Historiography* (*JCH*) is to contribute to the scientific understanding and explanation of the origins and maintenance of maladaptive traditions – or "toxic" belief-behaviour complexes (BBCs), as defined by the *JCH* editors. This can be achieved by fostering the identification of cognitive biases that engender and sustain such traditions as well as the accumulation of historiographical case studies that illuminate their epidemiology. The specific purpose of this article is to examine a broad category of toxic traditions, which I will refer to as "religious" BBCs – or "theisms" in the sense defined below – and to offer a brief epidemiological analysis and description of some of the main cognitive (and coalitional) biases that underlie them. In the last section I also propose some concrete strategies for addressing the relevant biases in a

way that attends both to the importance of maintaining a healthy continuity between past and future civilizational forms and to the importance of creatively adapting to new social and environmental challenges.

My main *theoretical* claim is that theistic credulity and conformity biases, which may well have served some adaptive functions in the Upper Paleolithic, have now become toxic and are generally maladaptive in the Anthropocene. Here I am using the term (*mal)adaptative* not only – or even primarily – in a narrow sense that refers to the short-term inclusive fitness of individuals (which blindly follows the non-teleological processes of natural selection at the genetic level) but also – and principally – in a broader sense that refers to the longer-term survival of the human species (which may require foresight and the intentional alteration of ecological conditions that shape social selection). In many contexts today, religious individuals have a higher fertility rate than nonreligious individuals and so theistic biases may well enhance the chances for genetic transmission in some local environments. When I say that theisms are generally maladaptive in the Anthropocene, I mean that they exacerbate some of the most pressing global challenges our species faces, including extreme climate change, excessive consumer capitalism and escalating cultural conflict. I am not suggesting that religious BBCs have always and everywhere been toxic. For reasons discussed below, beliefs and behaviours related to theism – like those related to racism, classism, and sexism – played a key role in facilitating the emergence and cohesion of large-scale human societies. Without these biases, it is unlikely that our species would have survived or thrived. For a growing number of individuals worldwide, however, it is becoming increasingly obvious that these evolved dispositions are now dysfunctional – at least if our therapeutic goal for society involves widespread human flourishing.

My main *pragmatic* proposal is that those who desire to mitigate the toxic effects of these biases would do better to shift some of their energy away from attempts at "debunking" theism and adopt some of the "prebunking" and other debiasing strategies that are being constructed and empirically tested by psychologists and policy professionals. As public proponents of the scientific consensus on climate change (for example) have learned, showering people with more and better information about the human role in contributing to this crisis can actually make things worse, activating worldview defence mechanisms and other biases that further strengthen inaccurate beliefs and support insalubrious behaviours. I will focus on some of the practical implications of this research in 'Strategies for prebunking theism', the third section below.

In the next two sections (which form the bulk of the article), I clarify and briefly defend my general claims about the epidemiology of religious BBCs and their toxicity in most contemporary social environments. As we will see, a great deal depends on whether one's primary goal is to preserve the supernaturally authorized traditions of a particular religious in-group or to understand and foster the conditions for transforming human minds and cultures in a way that could reduce tendencies toward accepting superstitious beliefs and engaging in segregative behaviours. Of course, a great deal also depends on precisely what we mean when we talk about the *toxicity* of *theisms*.

Alliance and fighters and bias – oh my!

It is important to emphasize that biases, in the most general sense of the term, are not necessarily bad. In fact, many human biases are good – and some are even necessary for our survival. Naturally evolved cognitive dispositions often serve us well when we need to act fast, to access or process memories quickly, or to interact in contexts where there is not enough (or too much) information. For example, most of us are "biased" towards eating when we feel hunger, avoiding dangerous predators when we see them, and pursuing sex when we feel aroused. If our ancestors had not evolved these kinds of relatively automatic self-preserving (and species-preserving) proclivities, we would not be here to discuss them. It is possible to resist these sorts of tendencies, at least up to a point. One might, for example, go on a diet, learn how to tame lions, or become a celibate monk. However, if an entire generation of human offspring somehow completely failed to inherit (and act on) these kinds of naturally selected biases, it would likely be the end of the species.

Biases toward feeding, fleeing, and fornicating have contributed to our survival. But what about fighting? Humans also have an evolved tendency to form strong alliances and work hard to protect them. In fact, the capacities for cooperating, coordinating, and competing within and across groups served our ancestors well. And, to a certain extent, they continue to serve us well today. Few of us would judge a mother for impulsively prioritizing the care (or defence) of her newborn child over the care of others, especially under stressful conditions. Some of us even encourage skirmishes between fortuitously formed, non-kin based alliances, such as those that make up youth football leagues. These predilections toward finding allies and fighting out-groups are examples of the sort of evolved biases that helped our progenitors survive, and so it is no surprise to find them widely distributed in the human population today. Such tendencies were naturally selected

because they facilitated survival within a specific ecological environment, and now they have been transmitted over the generations to us.

However, most of us no longer live in the same kind of natural and cultural environments as our hunter-gatherer ancestors. Biases that were adaptive (or improved the quality of life for some individuals) in one context may well be maladaptive (or decrease the quality of life for other individuals) in another context. For example, a strong desire for sugar or fat would have motivated early mammals to ingest as much as possible when these relatively rare commodities were available. Today, in contexts with inexpensive supermarket ice cream, those urges can be seriously bad for our health. This can also be true of biases related to individuals' formation of alliances and willingness to fight for them. Warriors with a hair-triggered predisposition to kill (or die) for their in-group would have come in handy when one small band of *Homo sapiens* bumped into another in the Upper Paleolithic, especially if they were competing for scarce resources. However, this kind of instinctive, hyper-sensitive, violent, xenophobic reaction causes more harm than good in contemporary, densely populated, pluralistic urban contexts in the Anthropocene.

The same can be said of racist, sexist, and classist biases. Many of us find these latter prejudices noxious and do what we can to draw attention to their deleterious effects, especially on minorities, women, and those with scarce material resources. In our efforts to contest such biases, however, it is important to acknowledge that the tendencies that help to maintain these inequalities did not come out of nowhere. As human populations grew in size and diversity in the Neolithic, domesticated plants and animals, and became increasingly sedentary, more complex forms of social organization were required to hold groups together. The larger-scale societies that survived were those in which individuals were willing to accept (or impose) new and more differentiated ways of managing the means of production and reproduction. During the Bronze and Iron ages, empires were forged and maintained through the forced servitude of conquered ethnic groups, the conjugal internment of women, and the emergence of complex civilizational forms in which wealth was constantly redistributed upward through bureaucratic and priestly hierarchies to subsidize the militaries, monuments, and myths that supported despotic regimes.

However unpleasant all of that was (and still is) for some individuals, it "worked". Over long periods of time, large numbers of human beings were able to capture enough energy and survive long enough to reproduce – and here we are. All of this must be taken into consideration when we turn to the exploration (and contestation) of *theist* biases. The role of religion in sanctioning the attitudes and norms that reinforce racism, classism and sexism is well-known to professional historians, as well as to casual readers

of the Hebrew Bible, the New Testament, and the Qur'an. In recent decades, however, empirical findings and theoretical developments within a wide range of disciplines in the scientific study of religion have shed new light on the cognitive and coalitional mechanisms behind this sanctioning. The key question today is whether these biases are still "good for us".

The (mal)adaptiveness of religious belief-behaviour complexes

Under what conditions – and by what mechanisms – do theisms become toxic? By *toxic* I mean maladaptive in the general sense indicated above: producing psychosocial dysfunctions that reduce human flourishing and lower the chances of the long-term survival of the species. In this context I am using the term *theisms* in a broad sense to designate BBCs that involve "shared imaginative engagement with axiologically relevant supernatural agents", a phrase that can also be used to operationalize aggregates of traits for which the contested term *religion* is commonly used. What distinguishes "theistic" social assemblages from others is the way in which their cohesion is maintained through regular appeals to disembodied (or at least ontologically confused) intentional forces that are putatively engaged in rituals performed by the members (or elites) of a particular in-group. In other words, the social effervescence of such groups is conditioned by and radiates beliefs and behaviours related to "gods" (*theoi*), understood broadly as supernatural entities whose existence or intentions are construed as relevant for the evaluative norms and well-being of the coalition and its members.

Most contemporary members of our species seem to share a suite of perceptual and affiliative dispositions that encourage them to "bear" gods: supernatural agents are somewhat easily "born" in human minds and rather consistently "borne" across human cultures. Why? Scientific and historical research in a variety of disciplines such as evolutionary biology, cognitive science, cultural anthropology, archaeology, and history of religions has converged to support a general claim. This is that in early ancestral environments the survival advantage went to hominids who quickly *detected* relevant agents such as predators, prey, protectors, and partners in the natural milieu, and who lived in groups whose cohesion was adequately *protected* by attachment and surveillance systems that discouraged defecting, cheating, and free-loading in the social milieu. What does this have to do with religion? Although scholars in the bio-cultural evolutionary sciences of religion often disagree about the role or significance of particular mechanisms, the general consensus is that shared imaginative engagement with "gods" (whether animal spirits, ancestor ghosts or, eventually, "higher" deities) would have strengthened these survival advantages insofar as beliefs

about potentially punitive, contingently embodied intentional forces (who might be watching), and emotionally arousing, communal ritual behaviours intended to please or appease them, tend to amplify *inferences* about hidden agents and *preferences* for in-group norms (see, e.g., Atran 1993, 2002; Boyer 1994, 2002; Teehan 2010; Rossano 2010; Pyysiainen 2009; Lewis-Williams 2010; McCauley 2013; Slone and Slyke 2015; Voland and Schiefenhövel 2009; Torrey 2017; Turner *et al.* 2017).

Insights from the relevant scientific fields can be integrated within what I call theogonic reproduction theory, a heuristic framework for discussing evolved tendencies that engender beliefs and behaviours related to gods. Although they must be further fractionated when discussing causal dynamics at various explanatory levels, god-bearing mechanisms generally fall into two broad categories: anthropomorphic promiscuity and sociographic prudery. As depicted in the lower left quadrant of Figure 1, the aggregation and interactive *integration* of some of these biases generate theistic BBCs (or "religion" in the sense the term is being used here). Below I will also briefly discuss the integration of "god-dissolving" mechanisms represented in the upper right quadrant of Figure 1. For a fuller exposition and analysis of the empirical findings and theoretical developments that lend support to the claims in this section, I refer the reader to my previously published research (Shults 2014, 2015b, 2018a; Shults *et al.* 2018a; Shults *et al.* 2018b).

One can think of the horizontal line in Figure 1 as a continuum on which to mark an individual's tendency to guess "human-like supernatural force" when confronted with ambiguous or frightening phenomena in the natural environment. The anthropomorphically promiscuous will be on the lookout for hidden intentional agents and find themselves attracted to explanations that appeal to supernatural causes despite – or perhaps because – of their non-falsifiability. The vertical line can be understood as a continuum on which to register how tightly an individual is committed to inscribing the social field in ways that are consistent with the normative evaluations proscribed and prescribed by the supernatural authorities of his or her in-group. Sociographic prudes prefer to remain within their own religious coalitions and are more likely to be suspicious of out-groups.

These cognitive and coalitional biases, which are part of our phylogenetic inheritance and have been reinforced by millennia of social entrainment practices, now commonly draw contemporary members of *H. sapiens* into a kind of bio-cultural attractor space within the broader possibility space of human BBCs. This helps to explain why human beings so often exhibit a high level of credulity toward claims about divine revelations from the gods of their own group and a high level of conformity to the ritually-mediated norms regulated by the leaders of their theistic social assemblages.

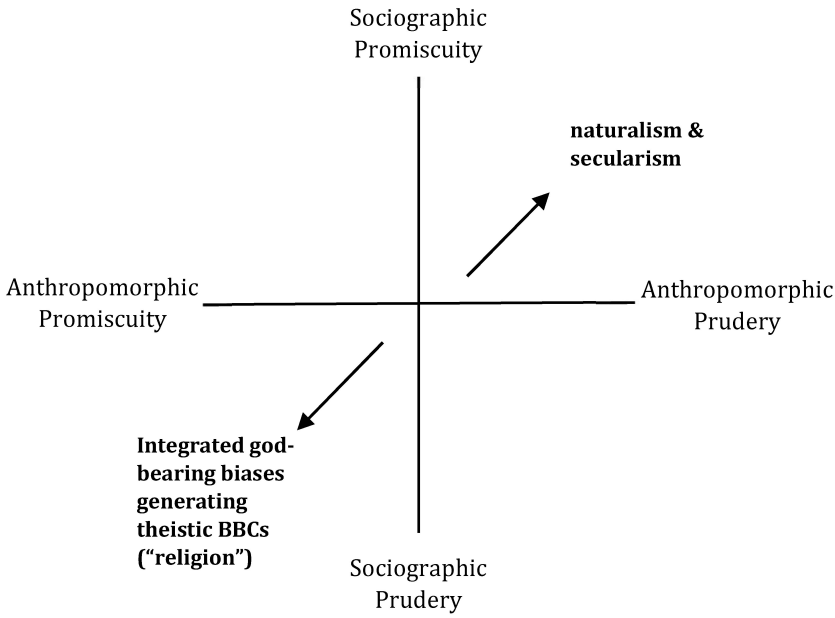

Figure 1: The conceptual framework of theogonic reproduction theory.

Once again, it is important to highlight the value that these biases provided for our early and even relatively recent ancestors. If they had not offered some survival advantage in the context of challenges within some previous environmental context, the genes whose expression supports traits that engender theist biases would not likely have become widespread in human populations and transmitted through the generations. Moreover, many of the social structures that developed to support religious traditions were also adaptive – in the broader sense that they facilitated the survival of the species. For example, the emergence of priestly elites in the axial age civilizations of west, south and east Asia helped those societies coordinate and cooperate as their populations increased in size and diversity. Over the last two millennia, theologians and philosophers (as well as rabbis, pastors, and imams) identified with the Abrahamic monotheisms have contributed to the cohesion of these traditions and the cultivation of virtue among their adherents. However, they have also often provided justification and motivation for the exclusion of (and violence toward) out-group members.

Like racist, sexist, and classist biases, *theist* biases "worked" in a wide variety of historical and geographic contexts, binding individuals together and motivating them to fight to protect their alliances. Indeed, from the Upper Paleolithic to the recent past, religious BBCs have played an

important role in the cohesion and expansion of (some) god-bearing human groups. However, we now have good reasons to think that the theist biases that support this sort of social assemblage are becoming increasingly toxic in the Anthropocene and no longer promote human flourishing in a growing number of contexts.

Here I point briefly to three of those reasons. First, the constellation of evolved biases and personality factors (such as magical thinking, schizotypy, conspiracy mentality, susceptibility to hallucination, and ontological confusion) that are highly associated with *anthropomorphically promiscuous* individuals in a population render such individuals more prone to making errors in the perception of ambiguous phenomena and less able to detect logical errors – not only in their thinking about gods, but also in their thinking about other paranormal, superstitious, or conspiratorial claims (Lindeman, Svedholm-Häkkinen and Lipsanen 2015; Pennycook *et al.* 2014; Tempel and Alcock 2015; Breslin and Lewis 2015; Davies, Griffin, and Vice 2001; Wlodarski and Pearce 2016). In other words, theist credulity biases promote not only "harmless" religious beliefs, but also a host of other beliefs and attitudes that make it more difficult to accept scientific analyses of climate change and pandemics (for example) and easier to resist calls for compromise and distributed justice within pluralistic social contexts (Bruynell 2012; Sekerdej, Kossowska and Czernatowicz-Kukuczka 2018; Bakhti 2018; Kramer and Shariff 2016; Zmigrod *et al.* 2019; Ecklund *et al.* 2017).

The second reason is more directly related to *sociographic prudery*. Here too there are a variety of mental mechanisms that can undergird a preference for the supernaturally authorized norms of one's own in-group, all of which are differentially distributed within human populations. Those that are associated with individual religiosity include higher levels of racial and ethnic prejudice, susceptibility to charismatic leaders, risk-aversion, proclivity to engage in antisocial behaviour toward out-groups, and resistance to innovation (Dunkel and Dutton 2016; Schjoedt *et al.* 2013; Benabou, Ticchi and Vindigni 2015; Chuah *et al.* 2014; Blogowska, Lambert and Saroglou 2013; Coccia 2014). In other words, although theist conformity biases enhance in-group cohesion, they are also strongly correlated to societal dysfunction (Paul 2009; Delamontagne 2010; Zuckerman 2010) and can promote intergroup conflict and violent extremism, especially among fundamentalist and dogmatic religious individuals whose sense of self is highly fused with their group (Beller and Kröger 2017; Kossowska, Czernatowicz-Kukuczka and Sekerdej 2017; Sheikh *et al.* 2014; Shults *et al.* 2018b; Pretus *et al.* 2018).

A third reason to worry about the "toxicity" of theisms in our contemporary, globally interconnected, and ecologically fragile environment has

to do with the way in which the two broad types of god-bearing mechanism can *reciprocally reinforce* one another. Like the biases themselves, this mutual intensification operates beneath the level of conscious awareness. Priming studies and other psychological and ethnographic experiments have shown that surreptitiously triggering thoughts about supernatural agents somewhat automatically rachets up defensive attitudes and behaviours related to protecting one's own religious coalition, *and* that activating anxiety about the safety or stability of one's religious in-group ratchets up causal attributions to and beliefs in the relevant "gods" (Johnson, Rowatt and Labouff 2010; Wichman 2010; Routledge, Roylance and Abeyta 2017; Vail, Arndt and Abdollahi 2012; hundreds of other relevant studies are summarized and analyzed in Shults 2018a). In other words, mistakenly attributing causality to supernatural agents can amplify segregative behaviours and fervently affiliating with supernatural coalitions can amplify superstitious beliefs, especially under stressful conditions. All of this makes it more difficult to resolve the major societal and global challenges mentioned in the *Introduction*, rendering these biases "maladaptive" (in the general sense outlined above).

Theistic BBCs become toxic when the cognitive and coalitional biases that sustain them no longer function to help support the long-term welfare of the species (even when accounting for short-term gains) or when they propagate conditions that increase the societal dysfunction and material suffering of its members. The good news is that we already seem to be adapting. In recent centuries, both *naturalist* explanations of the causal nexus of the world and *secularist* organizations have grown in popularity in a wide variety of contexts. As indicated in the upper right quadrant of Figure 1, the rise of naturalism and secularism have promoted the *contestation* of god-bearing biases. Those who are more anthropomorphically prudish resist appeals to supernatural agents in their causal hypotheses. Those who are more sociographically promiscuous resist appeals to supernatural authorities in their social policies. This resistance is typically reinforced by evidence-based scientific training and participation in transparent democratic secular societies.

Naturalism and secularism are relatively fragile late modern developments, but they increasingly (albeit tentatively) shape intersubjective and transcommunal discourse in the Anthropocene in a growing number of contexts. For those who are concerned that such developments may too quickly dissolve the virtue-cultivating worldviews and ritual practices upon which the cohesion of their religious BBCs seem to depend, these changes may seem destructive rather than "adaptive". These are valid concerns, and the pursuit of new creative modes of inscribing the socius should be

balanced by careful attention to the dignity of individuals and the integrity of communities (Shults 2018b). Nevertheless, the survival of the species – and the flourishing of more of its individual members – likely depends on the discovery of innovative ways of improving our mental and social health by immunizing more of the body politic from toxic forms of theist bias.

Strategies for prebunking theism

Much of the *philosophical* discussion about the relative value of shared imaginative engagement with axiologically relevant supernatural agents focuses on the extent to which (or even whether) evolutionary accounts can *debunk* religious *beliefs* about the existence or effects of gods. In other words, do the causal histories of theistic beliefs provided by disciplines such as evolutionary psychology and the cognitive science of religion undermine their plausibility? Non-religious philosophers often point to the peculiar character of supernatural beliefs, which they argue renders them susceptible to evolutionary debunking arguments (Nola 2013; Griffiths and Wilkins 2015; Shook 2015). Philosophers who identify with a particular religious coalition (usually Judaism, Christianity, or Islam) commonly warn their interlocutors of the dangers of the genetic fallacy, pointing out that etiological accounts do not entail the falsity of religious beliefs (Johnson, Lenfesty, and Schloss 2014; Jong and Visala 2014; Eyghen 2016). It is important to emphasize that the arguments I have made above (and elsewhere) about beliefs in supernatural agents are not attempts to weaken religious truth claims by problematizing their sources or by denigrating those who make them. I do not think theists (or racists, classists, and sexists) are bad people. I do not even think these biases themselves are inherently "bad"; they are naturally selected tendencies that we now have good reasons to contest. It is the biased judgments that are toxic, not the people who make them.

Moreover, the epidemiological analyses I am offering here are aimed not simply at contesting religious *beliefs* at the level of logical abstraction, but at diagnosing their effects on psychosocial health in the relation to the religious *behaviours* with which they are entangled in theistic "complexes". In fact, religious practices, such as rituals whose goal is to successfully engage supernatural agents, are also susceptible to etiological critiques (De Cruz 2018). My broader point here, however, is that it is necessary to pay as close attention to *context* biases as we do to *content* biases. The former typically trigger and sustain the latter, making them all the more difficult to resist. For example, regular participation in emotionally arousing, synchronic practices involving causally opaque behaviours can downregulate executive function, rendering individuals more susceptible to the non-falsifiable

claims of charismatic ritual officers about the putative desires of supernatural agents. The philosophical debates between theists and non-theists rarely lead individuals from one side to convert to the other, and this is due, in part, to the very different ways in which *cognitive* content biases (such as the tendency to attribute confusing phenomena to gods) are activated – or suppressed – by the very different *social* contexts within which individuals find themselves (Shults 2015a, 2018a, 2019).

For this reason, I propose that those concerned with mitigating the toxic effects of theist biases supplement their philosophical efforts with strategies developed in the *scientific* discussion on cognitive debiasing, which include (relatively) successful *prebunking* techniques. Researchers in these fields often emphasize that debiasing is a kind of applied *social* epistemology and call for engaging individuals in the *context* of real-life situations involving *pragmatic* considerations (Kenyon 2014; Aczel *et al.* 2015; Croskerry, Singhal, and Mamede 2013b). As policy professionals interested in promoting solutions to the three global challenges identified in the *Introduction* have found, debunking strategies that attack biased beliefs are rarely effective and all too often cause people to react defensively and embrace their problematic positions even more strongly; this applies to biases related to conflict, capitalism, and climate change (Lewandowsky *et al.* 2013; Campbell and Kay 2014; Lewandowsky and Oberauer 2016).

Perhaps the most consistent research finding in this psychological literature on debiasing is that it is really, really difficult. This is hardly surprising given the phylogenetic antiquity and sociocultural significance of the evolved dispositions we have been discussing. Nevertheless, there is reason for hope, and a growing number of psychologists are optimistic that debiasing research could positively contribute to human welfare. For example, interventions have been developed that reduce biases affecting anti-Muslim hostility, attribution error, anchoring, social projection, and clinical decision-making (Bruneau, Kteily, and Falk 2018; Morewedge *et al.* 2015; Jenkins and Youngstrom 2016; Croskerry 2003). At the most general level, debiasing techniques typically involve the promotion of what some cognitive scientists call "system 2" processing, which is more controlled and rule-governed, over "system 1" processing, which is more automatic and intuitive (Lilienfeld, Ammirati and Landfield 2009; Kahneman 2013). However, psychologists have drilled down to develop far more specific strategies for debiasing, some of which may be valuable for reducing the deleterious effects of toxic theisms.

For example, the importance of *affirming* an individual's identity and worldview (insofar as possible) in the context of presenting new information that challenges their bias was one of the earliest – and is now one of the

most empirically validated – insights emerging from social psychological studies on this topic. Research based on terror management theory suggests that when people feel uncertain or anxious, they will often respond to worldview threatening ideas by more intensely defending and justifying their belief systems and sometimes by increasing their aggressive behaviours toward out-group members (McGregor *et al.* 1998; Hennes *et al.* 2012). Research based on self-affirmation theory indicates that motivational biases that increase resistance to persuasion, and decrease sensitivity to argument strength and capacity to objectively evaluate information, can be reduced if individuals first experience affirmations of their self-worth and personal integrity. This is the case even in relation to sensitive topics such as abortion and politics, which are sometimes closely tied to a person's sense of identity (Cohen, Aronson, and Steele 2000; Correll, Spencer, and Zanna 2004; Cohen *et al.* 2007). In other words, debiasing is more likely to occur if individuals feel that their identities are not at risk. This implies that increasing people's open-mindedness to worldview challenging evidence and arguments will require attention to the social infrastructure within which dialogue occurs.

Another insight emerging from the psychological debiasing literature is that attempts to correct misinformation are more likely to be successful if they involve repeated (and relatively brief) retractions that simultaneously provide an alternative story that fills the coherence gap left by the correction. This is because corrections that are overly complex or fail to replace the false information with coherent explanations of the phenomena are all too likely to backfire, producing overkill, polarization, continued influence, or boomerang effects (Lewandowsky *et al.* 2012; Hart and Nisbet 2012; Lewandowsky, Ecke and Cook 2017). Psychological research suggests that most people have a default expectation that information presented in a conversation is (intended to be) true and pragmatically relevant. This means that attempts to contradict or correct previously presented information is unlikely to work – unless the new account better explains *causal* features of the events in question and explains *why* the original (mis)information was presented or is no longer relevant (Seifert 2002).

A third set of insights derive from experimental evidence indicating that some of the most promising methods for debiasing mistaken beliefs involve inoculation or *prebunking* strategies (Cook 2017; Cook, Lewandowsky and Ecker 2017). Prebunking or inoculative messages typically include both an explicit *warning* that biases are at play and a refutation that exposes the fallacy behind the *anticipated* argument defending the misinformation (e.g., about the scientific consensus on climate change or human evolution). Scholars in this field are candid about the role played by the "inoculation"

metaphor: "Just as vaccines generate antibodies to resist future viruses, inoculation messages equip people with counterarguments that potentially convey resistance to future misinformation, even if the misinformation is congruent with pre-existing attitudes" (Cook, Lewandowsky, and Ecker 2017: 4). A meta-analysis of research studies on inoculation or preemptive strategies suggest that they are more effective than "supportive" messages (i.e., those that simply provide new accurate information) at building resistance to misinformation (Banas and Rains 2010).

Prebunking interventions appear to boost strategic monitoring, which can provide people with a way of fighting back against continued influence effect biases when they are encoding potential misinformation (Ecker, Lewandowsky and Tang 2010). Experimental research has shown that communications involving *explicit warnings* about biased arguments that are dismissive of consensual scientific information are better at inoculating individuals from misinformation, compared to communications that only provide correct content, at least in part because the former encourage people to reflect on the potential role of directed motivational reasoning in their thinking (Bolsen and Druckman 2015; Linden *et al.* 2017; Schmid and Betsch 2019). But critical thinking is not enough. One recent study evaluating the relative success of various strategies for reducing religious (and other epistemically unwarranted) beliefs found that directly addressing problems with particular pseudoscientific claims worked better than teaching general critical thinking skills or research methods. Students who participated in a class that involved specific and explicit warnings about beliefs in phenomena such as astrology, faith healing, creationism, anti-vaccination, and alien abductions reported far higher decreases in such beliefs compared to students in control groups (Dyer and Hall 2019).

What does all of this mean for those interested in reducing the toxic effects of theist biases? I hope readers will have noticed that in the *Introduction* and first two sections of this article I have tried to take advantage of each of the three insights gained from the psychological debiasing literature discussed in this section. I affirmed the role of religion (in the sense operationalized above) as an identity-enhancing, group-bonding, virtue-building force in human evolution, and recognized the extent to which it still provides the intellectual and practical scaffolding for the worldviews of most contemporary members of our species. I also offered (and briefly repeated) an alternative causal account of the basic deliverances of theist credulity and conformity biases that emphasized how and why mistaken beliefs about gods (and costly rituals meant to engage them) have emerged and prevailed in human populations. And I went out of my way to include preemptive warnings about the role of these biases in the arguments of

religious philosophers and apologists. The *inoculation* metaphor behind "prebunking" approaches to debiasing seems particularly appropriate given our concern here is with challenging the *toxic* effects of theist biases. Nevertheless, I have tried to frame this challenge in a way that acknowledges the wisdom of maintaining adequate continuity with religious traditions as we explore our current evolutionary landscape and determine when and where it makes sense to construct socio-ecological niches guided by naturalist and secularist sensibilities.

Conclusion

I have argued that religious BBCs (as defined above) played an "adaptive" role at least since the Upper Paleolithic, and have continued to "work" throughout most of human history by enhancing the species' capacity for material production and promoting its biological reproduction, but that the theist credulity and conformity biases that surreptitiously shape these BBCs have now become maladaptive in most contexts in the Anthropocene. Reducing the toxicity of theist biases is no panacea; it will not solve all our social problems and will certainly generate new ones. The same is true for attempts to decrease racism, sexism, and classism. However, learning how to contest these biases can help increase our individual and communal resistance to evolved dispositions that are no longer good for (all of) us, and clear the way for the construction of new healthy modes of identity formation and social transformation.

I have also highlighted the importance of straightforwardly having "the talk" about where gods come from – and the consequences of imaginatively nurturing them in communal rituals – and identified ways in which such conversations can be informed by the psychological debiasing literature. This may involve non-anxious *personal* dialogue that encourages critical thinking about specific cognitive mechanisms, which can diminish the power of god-bearing *content* biases at the individual level. However, the prevalence of religion in human cultures is also influenced by genotypic inheritance patterns and social selection pressures (Ellis *et al.* 2017; Turner *et al.* 2017), forces that shape people's capacity to contest their biases as they engage in such conversations.

This means that having the talk about religious reproduction may also be facilitated by non-coercive *social* policies that promote education, existential security, pluralism, and freedom of expression, which can lower the effect of god-bearing *context* biases at the population level. No doubt these personal conversations and political conversions will be really, really difficult. However, our species has shown a remarkable capacity to survive

and thrive over the millennia. As we attempt to adapt and respond to new global challenges such as extreme climate change, excessive consumer capitalism, and escalating cultural conflict, I propose that we devote more attention and energy to reducing the toxic effects of theisms on the global body politic.

Note

1. F. LeRon Shults is professor at the Institute for Global Development and Social Planning at the University of Agder in Kristiansand, Norway. He has published 18 books and over 100 scientific articles on topics in philosophy of religion, the scientific study of religion, and related fields. This article was written while the author was partially supported by the Modeling Religion in Norway (MODRN) project, funded by The Research Council of Norway (grant #250449).

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