

Dual-Inheritance, Common Sense and the Justification of Religious Belief

Taylor Davis

1. Introduction

The explosion of evolutionary theories of religion in the last two decades began with a tradition now widely known as “CSR,” or Cognitive Science of Religion, which explains religious beliefs by appeal to the evolved functions of genetically inherited cognitive capacities. Accordingly, this perspective seems to show that religious beliefs are “natural” products of universal common sense, and the connection to common sense has been used in various ways to defend the epistemic justification of religious belief. Clark and Barrett (2011) appeal to the common-sense tradition inspired by Reid (1764) to argue that CSR vindicates a non-inferentialist, non-evidentialist justification. In contrast, Jong and Visala (2014) defend religious belief on evidentialist grounds, claiming that they can “be justified in the court of common sense in much the same way that than scientific beliefs can,” through justified inferences from common-sense starting points. Braddock (2018) also pursues an evidentialist strategy, claiming that common sense contains a “supernatural disposition” that is biased specifically toward theistic beliefs, and arguing that this is more easily explained by theism than by naturalism.

However, the science of religion has, in more recent years, moved beyond the assumptions of the CSR tradition, which are based on an increasingly outdated conception of cultural evolution in general. CSR explains the cultural fitness of religious beliefs according to what is known as the “epidemiological” theory of cultural evolution (Sperber 1996), which has largely been supplanted by the more comprehensive and fruitful “dual-inheritance” approach (Boyd and Richerson 2005; Richerson and Boyd 2005; Henrich 2016). Consequently, instead of appealing solely to genetically inherited cognitive biases as features of pan-human common sense, evolutionary theories of religion now appeal, in addition, to humans’ sophisticated capacities for social learning, and to the evolutionary dynamics these capacities produce at the population level (Wilson 2002; Atran and Henrich 2010; Norenzayan 2013; Norenzayan et al. 2016). The most fully developed version of this approach has been dubbed the “big gods” account, because it affords a central role to beliefs about “big” gods who monitor and enforce moral behavior. But on this view, the cross-cultural prevalence of theistic beliefs, and supernatural beliefs in general, can be explained without any appeal at all to biases in cognitive content. The only universal features of human psychology necessary are

content-neutral capacities for social learning in general. That is, the cultural fitness of religious beliefs can already be explained entirely by the role such beliefs play in facilitating large-scale cooperation, so there is no reason to think that this cultural fitness is due the content biases identified by CSR.

Consequently, our best current science does not support CSR's claims about common sense, or the claims that philosophers of religion have made, on that basis, about the epistemic justification of religious belief. In what follows, I first explain how the dual-inheritance theory of religion differs from, and improves upon, the CSR tradition. I then discuss the implications of this for the three arguments mentioned above, which attempt to justify religious belief by appeal to common sense.

2. Dual-Inheritance Theory vs. The Epidemiological Theory

When the interdisciplinary scientific field of the evolution of religion was first beginning to bloom, it was dominated by a specific approach to cultural evolution in general. In response to the growing popularity of meme theories (Dawkins 1971, Dennett 1995), Sperber (1996) developed the “epidemiological” theory of cultural evolution, according to which cultural representations are not replicated, as meme theorists would have it, but are rather reconstructed—with varying degrees of fidelity—according to the adapted functions of various genetically inherited cognitive capacities. Thus, cognitive biases at the individual level were said to explain the distribution of cultural beliefs at the population level. This approach was skillfully applied to religion by two of Sperber's students, Atran (2002) and Boyer (2001), and it quickly became the standard approach to cultural evolution among CSR theorists.

Boyer's notion of minimally counterintuitive beliefs was especially influential. On this view, the transmission of religious representations is explained by certain basic concepts, or “ontological categories” (e.g., *person*, *living thing*, *artifact*), which are products of genetic selection in our species. These concepts are said to generate a wide range of intuitions and expectations, and representations that violate these intuitions and expectations are said to be particularly interesting and memorable, making them more likely to spread through populations. Of course, highly counterintuitive representations would simply be incoherent, or “hard to think,” and would thus spread *less* easily than other representations. But “minimally” counterintuitive beliefs would be not be hard to think, and yet would also be interesting and memorable, possessing a higher degree of cultural fitness (Ramsey and De Block 2015) than other representations.

While particular cultural beliefs are not genetically inherited traits, they can nevertheless be said to be traits that inherited by one individual from another, through social learning. Consequently, at the population level it makes sense to say that such beliefs are selected for in a Darwinian sense, as certain culturally inherited traits increase in frequency in the population at the expense of others. Boyer's claim, then, is that cultural fitness depends on degree of counterintuitiveness: minimally counterintuitive beliefs are selected for over

competing alternatives, which are either too counterintuitive or not counterintuitive enough. But counterintuitiveness, in turn, is explained solely in terms of genetically inherited biases in cognitive content, due to our ontological categories. Thus, the cultural fitness of religious beliefs is explained entirely by appeal to genetically inherited content biases.

Other CSR theories posit additional content biases, based on other genetically adapted cognitive capacities, including capacities for detecting agents (Guthrie 1993, Barrett 2004)—even if they are invisible and bodiless (Bloom 2007)—and for attributing mental states to them (Bering 2006). Another CSR account identifies a content bias for teleological explanations over non-teleological, mechanistic explanations (Keleman 2004), and further genetic traits can always be added to the list. Jointly, then, CSR theorists claim that a specific constellation of genetically inherited content biases renders religious belief a “natural” product of universal common sense. As Braddock (2018, p. 173) puts it, “CSR theorists have argued for what is now commonly called the *naturalness of religion thesis*: humans are naturally cognitively disposed to believe in supernatural agents and these beliefs are constrained in certain ways.”

More recently, however, a different approach to cultural evolution in general has been applied to religion. Following the title of Norenzayan’s (2013) book-length treatment, the specific theory of religion is known as the big gods theory, although the same account has also been defended elsewhere without this label (Atran and Henrich 2010; Norenzayan et al. 2016). As I explain further below, this title is somewhat misleading, because it overemphasizes the role of theistic beliefs in the account. While any adequate theory of religion must explain the extreme cultural fitness of theistic beliefs, what is most distinctive and important about the account is the general theory of culture on which it is founded, which enables it to explain the cultural fitness of much more than just theistic beliefs alone. Dual-inheritance theory is ultimately the result of the methodological innovation of constructing Darwinian models that rigorously maintain the distinction between cultural selection and genetic selection, but, at the same time, integrate them to describe coevolutionary interactions, known as *gene-culture coevolution* (Boyd and Richerson 2005; Richerson and Boyd 2005; Henrich 2016). And the “dual-inheritance” label is quite apt, because the whole theory rests on the simple assumption that traits are inherited in two different ways: culturally, through social learning, or genetically, through reproduction. It is this assumption that entails the existence of two distinct Darwinian processes, and it is only by focusing on the details of social learning at the individual level that the relevant population-level dynamics can be adequately described.

Outside the context of religion, dual-inheritance models have produced and confirmed a wide range of novel predictions, and explained a wide range of facts, that cannot be identified or explained by epidemiological theories. These include facts about the psychology of social learning, on one hand (Whiten et al. 2009; Chudek et al. 2013; Caldwell and Millen 2008; Schmidt et al 2016), and about human genetics (Laland, Odling-Smee and Myles 2010; Holden and Mace 2009), on the other. But they also include fundamentally important facts about distinctly human forms of cooperation and prosocial behavior in general (Chudek and Henrich 2011; Boyd and Richerson 2009;

Henrich et al. 2010; House et al. 2013), as well as more specific historical facts both within cultures (Slingerland and Chudek 2011; Henrich 2004a) and across cultures (Henrich, Boyd and Richerson 2012), and much more. In short, the epidemiological approach in general has not achieved anywhere near the degree of empirical success and fruitfulness exhibited by the dual-inheritance approach. Ultimately, there is one simple reason for this: dual-inheritance theory is much more comprehensive in its empirical scope. It encompasses everything that epidemiological theories explain, and much more besides.

At the level of individual psychology, epidemiological theories focus too narrowly on *cognition*, neglecting traits of *acquisition* and *motivation*. That is, epidemiological theories only address the cultural fitness of representations and inferences, because they only explain cultural fitness by appealing to genetically inherited biases in cognitive content. Dual-inheritance theory also recognizes the existence of such content biases, but it contrasts them with *model-selection biases* (Henrich and McElreath 2003; Gervais et al. 2011), which concern *whom* a person learns from, or whom one chooses as a model, rather than *what* is being learned. For example, conformity bias (Henrich and Boyd 1998) occurs when individuals choose the models who occur most frequently in the population. For example, one might learn to plant a crop at a specific time of year by observing that all their neighbors plant that crop at that time. A different model-selection bias, called prestige bias, occurs when learners choose the most successful or knowledgeable individuals—experts—as their models (Henrich and Gil-White 2001). Several other types of model-selection biases are described by Chudek et al. (2013), including preferences for learning from ingroup members over outgroup members, from older models over younger ones, from same-sex models over members of the opposite sex, and others. By definition model-selection biases are neutral with regard to the content of any representations that may be acquired.

I refer to model-selection biases as traits of “acquisition” because, they are capacities for acquiring other capacities. And while some of the capacities we acquire through these mechanisms are capacities for representation and inference, other are not. Consider the acquisition of cultural norms, which include both a cognitive component and motivational component. When we internalize the norms of our culture, we not only acquire new beliefs about what is right or wrong, but also new intrinsic desires to *do* what is right and *avoid* what is wrong, along with further intrinsic desires to enforce these rights and wrongs upon others (Sripada and Stich 2007; Chudek and Henrich 2011; Davis, Hennes and Raymond 2018; Schmidt et al. 2016; Rakoczy, Warneken and Tomasello 2008). Moreover, Henrich (2009) identifies another type of model-selection bias that is especially important for explaining religious motivations. Gervais and Henrich (2010) and Gervais et al. (2011) point out that religious belief is not *just* belief, because it also involves some degree of commitment, or devotion. But motivations of commitment to religious representations cannot be explained by capacities for representation themselves. As these authors note, people today can represent and reason about Zeus—a minimally counterintuitive supernatural agent who provides teleological explanations for thunder and lightning—just as well as the ancient Greeks could. Yet no one today actually believes in Zeus, to say nothing of sacrificing their sheep to him.

In order to explain such motivational differences across cultures, these authors identify what they call “CREDS,” or “credibility-enhancing displays.” By engaging in acts of self-deprivation, or painful rituals, or through other means, religious devotees display the depth of their commitment to supernatural beliefs by performing actions they would never perform if they were not truly committed. As a result, they function as cultural models who enhance the credibility of their beliefs in the eyes of cultural learners, causing learners to acquire not just the relevant beliefs, but also the corresponding motivations of commitment. Thus, CREDS are a (non-cognitive) acquisition mechanism that explains the (non-cognitive) motivational difference between merely representing Zeus and being willing to sacrifice sheep to him. And together, the combination of CREDS and the internalization of norms can explain many of the distinctive motivational features of religion, which are not addressed by biases in cognitive content.

By appealing to content-neutral capacities of acquisition and motivation, then, dual-inheritance theory identifies a wide range of individual-level facts that fall outside the scope of the epidemiological theory. However, these individual-level facts also enable the theory to explain a corresponding set of population-level facts that fall outside the scope of the epidemiological theory. Most notably, these include the evolutionary dynamics of *gene-culture coevolution* and *cultural group selection*.

Regarding the former, dual-inheritance models have shown how cultural selection and genetic selection exhibit reciprocal causal interactions. This entails that the prior history of genetic selection influences the subsequent course of cultural selection, just as epidemiological theories claim. However, it also entails that the causal relationship runs in the other direction as well; the prior history of cultural selection also influences the subsequent course of genetic selection in important ways (Boyd and Richerson 2005; Richerson and Boyd 2005; Holden and Mace 2009; Laland, Odling-Smee and Myles 2010). Regarding the latter, dual-inheritance models predict that selection at the group level should not occur in genetic evolution (Richerson and Boyd 2005, p. 203; Davis 2015), but that it should have been a crucial factor in cultural evolution, at least over the last 12,000 years, since the agricultural revolution (Henrich 2004b; Richerson et al. 2016; Boyd and Richerson 2009; Sterelny 2016).

Neither of these population-level dynamics is predicted by biases in cognitive content, but both are necessary for explaining distinctively human forms of cooperative behavior, especially large-scale collective action. In humans, unlike any other species, nonexcludable public goods are produced by cooperative interactions involving millions of genetically unrelated strangers (Chudek and Henrich 2011, Chudek, Zhao and Henrich 2013; Boyd and Richerson 2009). At the heart of this account of human cooperation is what Boyd and Richerson (2006, 2009) call the theory of “tribal social instincts,” which appeals to both gene-culture coevolution and cultural group selection to explain humans’ distinctive capacity to behave *prosocially*, or in ways that are beneficial for others, but costly for themselves (in the currency of genetic fitness, at least in the short term). On this view, cultural group selection first produces a social environment that contains strong

genetic selection pressures for prosocial behavior, and the genes subsequently respond, producing innate capacities for prosocial motivations such as guilt, shame, sympathy, etc.

Particular norms are inherited culturally, not genetically, and norms are enforced through social punishments and rewards that may or may not be formalized into explicit laws and policies. These punishments and rewards, in turn, make a big difference for the genetic fitnesses of individuals. Moreover, many norms are prosocial, meaning that they require people to behave in personally costly ways. Thus, the theory of tribal instinct holds that *after* cultural selection acting on particular norms has *already* established a social environment in which the enforcement of prosocial norms is a common, stable feature, prosocial motivations such as guilt, shame and sympathy will increase the genetic fitnesses of individuals who possess them. In a prosocial society, innately prosocial individuals will be more capable than other individuals of avoiding normative punishment and gaining normative rewards.

This raises the question of how this prosocial environment could have evolved in the first place, and the answer is through cultural group selection. Groups whose norms are more prosocial than other groups are better able to reap benefits from cooperation, especially when these benefits take the form of nonexcludable public goods such as collective defense (e.g., armies), public infrastructure (e.g., roads), and resource management (e.g., water). This, in turn, enables these groups to grow more quickly in size, and to compete more successfully for resources. And this growth and material success, in turn, enables these groups to spread their cultural traits more effectively than their competitors—including the prosocial norms that made them more successful in the first place. Further, once the prosocial cultural environment began to produce prosocial motivations such as guilt, shame and sympathy, these capacities would serve to further reinforce cooperation, and thus group-level selection for prosociality. A coevolutionary positive feedback loop thus explains how our species has become so radically cooperative, relative to other species, in such a short time (Boyd and Richerson 2006).

Recently, epidemiological theorists Boyer and Baumard (2013) have offered an account of prosocial religions that does focus on motivational capacities, rather than cognitive capacities. Nevertheless, this account remains far too narrow in scope. It is based on a theory of the evolution of fairness, in contexts of mutualistic cooperation, or cooperation that is mutually beneficial to all interactants (Baumard, Andre and Sperber 2013). Accordingly, this account only explains prosocial behavior in the form of fairness, specifically, offering no account of other types of norms, such as norms of harm, authority, loyalty or purity (Haidt 2012), or of autonomy, honesty, possession, integrity, or others. It also does not explain cooperation in the form of collective action, where some interactants benefit more than others, and some do not benefit at all (e.g., soldiers who die defending the honor of their group, or following norms of authority). By contrast, because cultural group selection promotes prosocial behavior by appealing simply to norms in general, dual-inheritance theory is able to capture the full range of distinctively human prosocial behavior.

I thus conclude that the CSR tradition is based on a badly impoverished, narrowly limited theory of cultural evolution. As a result, it has placed far too much emphasis on the role of genetically inherited content biases. Content biases *might* play a role in boosting the cultural fitness of certain religious beliefs *to some degree*. But then again, they might not. As I argue in the next section, a theory of religion based on the dual-inheritance framework can explain all the facts about cultural fitness that CSR theories purport to explain, and more besides, and it can do so without appealing to any of the content biases that CSR theories posit.

3. Explaining Religion Without Content Biases

The universal, genetically inherited content biases identified by CSR offer explanations for (1) why supernatural beliefs are so common across cultures, and (2) why the supernatural beliefs that exhibit the highest cultural fitness tend to be theistic, involving agents who lack material bodies, but possess superhuman powers, and who use those powers to monitor and enforce moral behavior. Braddock (2018) summarizes these claims nicely, following Barrett (2011, 2012), whose work epitomizes the CSR tradition. After first claiming, on the basis of the genetically inherited cognitive capacities mentioned above, that our minds contain a “supernatural disposition,” Braddock adds (2018, p. 177) that “our supernatural disposition is *content biased* rather than content neutral.” More specifically, he claims that it is biased toward theism: “let us say our supernatural disposition is *theistically biased* without being precise or biased toward any particular theistic religion.”

This claim overreaches the available evidence. What CSR theories do successfully is to identify various genetically inherited cognitive capacities that are involved in forming theistic beliefs. It is a separate question whether these capacities actually *bias* individual minds toward such beliefs, as opposed to merely being *recruited* by cultural beliefs that require them. For example, if someone tells me that aliens are planning to invade earth to harvest our water, then I must employ my genetically inherited capacities for representing agents and attributing mental states to them; the aliens must desire water, and believe that we have it on earth. This does not show that I am in any way genetically biased toward forming such representations by my agency-detection mechanism and my theory of mind mechanism. It simply shows that the formation of a particular representation recruits this particular set of genetically inherited cognitive capacities. And if I live in an isolated cult in which everyone else believes in aliens, and lives in constant fear of them, then I will be more likely to actually believe this representation, and to make a concerted effort to spread this belief to others, and my efforts may be quite successful. Thus, a belief that happens to recruit genetically evolved capacities of agency detection and mental state attribution might have high cultural fitness, but for reasons that have nothing to with content biases produced by these capacities.

In the same way, the big bods theory of religion explains the cultural fitness of theistic beliefs, and other supernatural beliefs, in a way that is independent of any content biases. Instead, the fitness of such beliefs is due to the role they play in promoting prosocial

behavior. “Big” gods are said to be “powerful, omniscient, interventionist, morally concerned gods” (Norenzayan 2013, p. 7-8), and the reason for focusing on this specifically theistic type of supernatural belief is that such beliefs are particularly well suited to perform the function of *supernatural monitoring*. Because prosocial behavior is costly by definition, temptations to violate prosocial norms are often quite strong, so it is often difficult to motivate individuals to comply with and enforce such norms. However, Norenzayan (2013) musters a wealth of evidence showing that when people believe they are being watched by powerful, morally concerned agents, they are more likely to resist such temptations. Accordingly, a cultural group with a higher frequency of individuals who are deeply committed to big-god beliefs will exhibit a higher degree of prosocial behavior than other groups, resulting in greater benefits from cooperation, and, ultimately, greater success in spreading its cultural traits—including theistic belief about supernatural monitoring.

This account is consistent with the existence of theistic content biases, because it is possible that the cultural fitness of theistic beliefs also receives an *additional* boost from such content biases, over and above the role that prosocial behavior plays in explaining their cultural fitness. But content biases are not necessary for explaining why theistic beliefs are so common in the human population in general. According to the big gods theory, the cultural fitness consequences of prosocial cooperation can already explain the spread of theistic beliefs, whether or not content biases are involved, so evidence for the role of content biases must show that such biases make a *further* contribution to cultural fitness, *over and above* the role of prosocial behavior. I know of no CSR theory that has attempted to do this.

Further, there is some reason to doubt that we actually do possess content biases for theistic beliefs, because in addition to explaining why theistic beliefs are so culturally fit, it is also necessary to explain why *non*-theistic beliefs are so culturally fit. Fitness is an inherently relative notion, so to explain the high fitness of theistic beliefs is also to explain the low fitness of competing alternatives. This is where, as I mentioned above, the “big gods” label becomes misleading. For while the dual-inheritance framework does make it possible to explain the success of theistic beliefs without appealing to content biases, it also makes it possible to explain non-theistic beliefs in the same way.

Gervais et al. (2011) emphasize the need to explain religious *dis*belief, in addition to religious belief. Focusing on the spread of atheism in Scandinavia, they cite evidence showing that believers were systematically exposed to powerful CREDs as children, while non-believers were not. This suggests that genetically inherited common sense does not produce supernatural beliefs in the absence of cultural scaffolding. As these authors put it (p. 404), “According to the view that religious beliefs are exclusively produced by intuitions and content biases, atheism is unnatural and improbable. On the other hand, a view that incorporates [model-selection] biases predicts that both religious beliefs and atheism are ‘natural,’ in the sense that they are products of different cultural contexts.” They also note (p. 402) that a large and growing number of people worldwide claim to have no religious beliefs at all: “more than half of a billion people claim to not believe in God or gods, making nonbelievers the fourth largest ‘religious’ group in the world today

(Zuckerman 2007).” Finally, they point out that even theists are still atheists with regard to theistic beliefs *in general*, because they do not hold the vast array of theistic beliefs that arise in other cultures. Such facts must not only be explained by appeal to cultural evolutionary factors other than theistic content biases, but they must be explained *in spite of* such biases.

A similar argument can be made by looking at beliefs about karma, which also exhibit extremely high cultural fitness, but are not theistic. Of course, beliefs about karma are still supernatural, and Hindus and Buddhists also believe in all sorts of supernatural agents. Nevertheless, karma is not an agent, but a supernatural *force*, more akin to a law of (super)nature than a god. It is simply a feature of the supernatural order that all souls strive toward nirvana, or release from the cycle of death and rebirth, and that the way to attain this goal is to be reincarnated into progressively higher castes until eventually one need not be incarnated at all. Good karma, or compassionate, norm-following, prosocial behavior, is what causes one to be reincarnated into a higher caste, closer to nirvana, rather than a lower caste, further from this goal. There is no agent who, like the proverbial St. Peter at the pearly gates, decides at what level one will be reincarnated each time around.

Accordingly, it is not accurate to describe karmic beliefs as involving supernatural *monitoring*, because they do not posit the existence of any agent who monitors human behavior, and metes out punishments and rewards. Instead, the normative value of compassion, and the non-importance of the self and self-interest, are simply built into the fabric of the universe. Thus, karmic beliefs promote prosocial behavior in very much the same way that big-god beliefs do, but without appealing to gods at all. This conflicts with the emphasis that the authors of the big gods theory lay on big gods, and supernatural agents in general, but it is entirely consistent with the spirit of their theory, as they recognize. They cite evidence for the role of karmic beliefs in producing prosocial behavior, and argue that “Karmic religions are, therefore, also compatible with the prosocial religious elements in the present framework” (Norenzayan et al. 2016, p. 9).” Quite so. But this shows that *any* culturally inherited belief that promotes prosocial behavior should exhibit high cultural fitness on this view, whether or not it is theistic, and whether or not it is supernatural. The source of cultural fitness is content neutral. If humans possess a universal, genetically inherited theistic bias, then the prevalence of karmic beliefs would have to be explained *in spite of* this bias.

If they exist, the pan-human content biases posited by CSR would explain, at best, the prevalence of supernatural agent beliefs across cultures. They would not explain the lack of such beliefs where they are absent, or the prevalence of other types of religious belief, which recruit different sets cognitive capacities. They also would not explain why any individual comes to believe in the particular supernatural agents that she actually believes in, as opposed to others, or why religious individuals are so devoted to the beliefs they hold. In addition, they would not explain the relationship between religious belief and prosocial behavior, with the exception of norms of fairness in mutualistic interactions. By contrast, the dual-inheritance theory can explain all of these other facts according to the same principles that explain the prevalence of supernatural agent beliefs. But nowhere

among these principles do we find genetically inherited biases toward supernatural or theistic content.

4. Epistemological Implications

Three different arguments have attempted to defend the rationality of religious belief using CSR's claims about common sense. I object to these arguments on scientific grounds, because of their descriptive views about the cultural evolution of religion.

4.1 Braddock's Argument from Comparative Confirmation

Braddock (2018) employs what he calls "comparative confirmation" to argue that the hypothesis of theism is more probable, or less surprising, than the hypothesis of naturalism. In an effort to remain neutral about what he sees as ongoing debates in the scientific literature, he identifies six claims made by various evolutionary theories of religion, and argues that each of them would render naturalism more surprising than theism. He describes these claims as identifying six features of our "supernatural disposition," and argues that each feature would be more surprising according to naturalism than theism, and thus that a combination of any subset of these six features would only provide further support for the comparative likelihood of theism. In general, the problem with this argument is that it is based on an outdated view of scientific literature, which places far too much emphasis on early CSR theories, and does not fully grapple with the implications of dual-inheritance theory. More specifically, the problem is that the argument relies largely on the unsubstantiated claim that we are genetically endowed with a cognitive bias toward theistic content.

Feature 1 on Braddock's list is just the claim that theistic bias exists, and here Braddock relies heavily on the claims of Barrett (2011, 2012), a stalwart of the CSR tradition. Feature 2 is the claim that our theistic bias is a byproduct of selection, meaning that it originally evolved in the absence of any selection for religion per se. However, Feature 2 remains neutral with regard to what happened after theistic bias originally evolved. Feature 3 is the claim that there never has been selection for religion per se, or for theistic belief more specifically, and thus that our theistic bias is a *functionless* byproduct. This distinguishes Feature 3 from Feature 4, which is the claim that theistic bias is an *exapted* byproduct. An exaptation is a trait that is coopted by selection only after it has already evolved. Thus, Feature 4 holds that theistic belief first evolved without performing any religious function, and only later was exapted by selection to perform a religious function, or to contribute reproductive fitness in some specifically religious way. Feature 5 is the claim that theistic belief is an adaptation, which performed a religious function from the very beginning, and thus originally evolved because it contributed to reproductive fitness in some specifically religious way. Feature 6 is what Braddock calls "theistic progression," which is actually a purported consequence of theistic bias at the population level, rather than a feature of our supernatural disposition itself. This is the

pattern by which an increasing number of individuals have come to possess theistic beliefs over time

Regarding Features 1, 4 and 5, Braddock's argument is that it is not surprising at all that we would evolve a theistic bias according to the hypothesis of theism, since God would have structured the laws of nature so that genetic selection would favor theistic belief. By contrast, he argues, theistic bias would be surprising according to naturalism, because in the absence of divine intervention genetic selection could easily have favored other, non-theistic types of supernatural beliefs. As he puts it, "...given naturalism our supernatural disposition could have easily had a different and markedly non-theistic content bias than the theistic bias that it does in fact possess" (p. 183), because "...supernatural beliefs with different content biases could have easily proven equally adaptive if not more adaptive than the theistically-biased beliefs that actually evolved" (p. 189).

I find this argument wholly unconvincing, because I disagree that *genetic* selection ever did favor theistic beliefs in the first place. It is clear that "adaptive" in this context implies genetic selection, rather than cultural selection, and for reasons already given, I disagree that genetic selection endowed us with a theistic bias. Indeed, I see no reason to think that we possess any supernatural disposition at all. What we possess, as a product of genetic selection, is a disposition to adopt the beliefs of the cultural models around us, whatever they may be. If our models happen to be atheists, or happen to hold non-theistic beliefs about karma, then we are just as genetically disposed to acquire non-theistic beliefs as theistic beliefs. Thus, our minds don't actually possess the feature that Braddock says would be surprising according to naturalism.

Regarding Features 2 and 3, Braddock's argument against naturalism is that it would also be surprising for theistic beliefs to evolve in the *absence* of selection for theism itself. According to the claims of byproduct theories from the CSR tradition, theistic belief is the result of a number of otherwise independent cognitive capacities beginning to work together in a specifically theistic way. But assuming that these capacities did evolve independently, why would they then begin to consistently work together in a specifically theistic way, in culture after culture? In the absence of any selection for theism itself, this would be very surprising.

I fully agree with Braddock that this would be surprising, but I see no reason to credit the byproduct theories that make such claims. Again, the problem is that these theories only see selection in terms of genetic selection. Following up on vague claims made by the authors of the big gods theory, about integrating byproduct theories with adaptationist theories (Norenzayan et al. 2016, p. 4), I have developed and defended elsewhere (Davis 2017) what I call the *Goldberg Exaptation Model* of religion. According to this model, it is precisely selection for theism itself that explains how these otherwise independent, genetically inherited capacities have been brought together into a coherent functional system. However, the model also holds that it is *cultural* selection for theism that has done this, constructing a Rube Goldberg device with a theistic function out of a set of genetically inherited capacities that originally evolved to perform other non-theistic

functions. Thus, even if theistic belief is a byproduct of *genetic* selection, it is not surprising according to the correct interpretation of naturalism.

For example, the theistic beliefs of Christianity recruit the full suite of proximate mechanisms identified by CSR theories, including detection of agents, attribution of mental states, mind-body dualism, and teleological explanation. By contrast, beliefs about karma only recruit a subset of these mechanisms. Because the karmic system of reincarnation does not involve agents, these beliefs do not recruit capacities of agency detection or mental state attribution. But they do recruit the capacities of mind-body dualism and teleological explanation. Dualism is required because reincarnation entails that the same soul inhabits different bodies. Teleological explanation is required because the function of karma depends on the goal of progressing toward nirvana in successive reincarnations. Thus, in India and in Western cultures, we find two different Goldberg devices constructed out of two different but partially overlapping sets of genetically inherited cognitive capacities. However, the two devices share the same evolved function—promoting prosocial behavior—because both are the result of group selection acting on particular cultural beliefs. Where theistic belief has evolved, it has indeed been due to selection for theism. It just hasn't been due to genetic selection for theism.

Moving on to Feature 6, Braddock describes theistic progression as follows: “We observe the increasing spread of so-called “big gods” or “high gods” after the dawn of the agricultural revolution 12,000 years ago and the increasing prevalence of the theistic Abrahamic God during the past 2,500 years. Now there are currently more than three billion believers in the Abrahamic God and the total number of believers in a *theist-like* God runs significantly higher” (p. 190). Thus, he calculates, “it is plausible to suppose that the vast majority of humans who have ever lived have possessed the concept of a theist-like God” (p. 191). But why, then, is this pattern more surprising according to naturalism than theism? Curiously, Braddock provides no argument at all. He explicitly acknowledges (p. 192) that the Big Gods theory can provide an adequate naturalistic explanation for theistic progression. Yet he goes on to insist that, nevertheless, theistic progression is *more* surprising according to naturalism than theism. He does not say why, or provide any principled way of comparing relative degrees of surprisingness.

For my own part, I simply do not share Braddock's intuition here. Naturalism predicts that the strength of cultural group selection would become stronger and stronger as the global population increases in size, because increased population densities produce increased competition among groups (Sterelny 2016). Moreover, political developments such as empires, and later democracies, provide means for groups to remain stable while growing in size, at the same time that other developments, such as colonialism and improved technologies for transportation and communication, provide the means for theistic beliefs to spread more easily both within groups and across group boundaries. Thus, if cultural group selection for prosocial behavior explains the cultural fitness of theistic beliefs, and does so, moreover, because of the role such beliefs play in facilitating large-scale cooperation, then it seems to me that theistic progression fits *beautifully* with the predictions of naturalism. This is, after all, why the authors of the big gods theory place so much emphasis on big gods: they are the single most culturally fit type of

supernatural belief. Moreover, as Braddock himself recognizes, it's not as though the hypothesis of theism faces no problems of its own. If God wanted people to form theistic beliefs, why didn't He just endow us with a strong, genetically inherited theistic bias?

As I read the scientific literature, Braddock's Features 1-5 do not exist, so there is nothing for theism to explain more readily than naturalism. And while Feature 6 does exist, I see no reason to think that theism explains it more readily than naturalism.

4.2 Jong and Visala's Indirect Milvian Bridge Argument

In the course of responding to evolutionary debunking arguments (EDAs), Jong and Visala (2014) suggest a different way in which religious beliefs may be justified by appeal to common sense. EDAs share a basic strategy of undermining epistemic justification by arguing that the processes involved in forming the relevant beliefs do not track truth, because selection for the relevant beliefs is independent from those beliefs' truth values. As Talmont-Kaminski (2013) puts it, the selected function of religious beliefs is "nonalethic"—they have been selected for in virtue of their role in producing prosocial behavior, not in virtue of their ability to accurately predict events.

Consequently, EDAs hold that, unlike other beliefs, the history of selection shows that religious beliefs would be formed in the same way whether they are true or not, thereby undermining their epistemic justification.

Jong and Visala respond by distinguishing reasons from causes. They argue that nonalethic functions only debunk religious beliefs if their evolved causes are the only justifying reasons one has for holding them. If instead one's reasons are independent of these causes, then the fact that the causes do not track truth is neither here nor there. In defending this position, they focus on the EDA put forward by Wilkins and Griffiths (2013), which proceeds by identifying an important difference between religious beliefs and scientific beliefs.

Inspired by a legend about the Emperor Constantine, who attributed his success at the Battle of the Milvian Bridge to his Christian beliefs, Wilkins and Griffiths argue that epistemic justification requires us to identify some connection between the truth values of our beliefs and their evolutionary success. In their terms, we must be able to construct a "Milvian Bridge" between truth and adaptive value. Thus, they claim, ordinary, commonsense beliefs are generally justified, because their adaptive value does depend upon their truth value; their evolved function is alethic. Wilkins and Griffiths use this principle to contrast religious beliefs with scientific beliefs, arguing that a Milvian Bridge can be constructed in one case, but not the other.

Regarding religious beliefs, Jong and Visala (2014, p. 253) quote Wilkins and Griffiths as pointing out that "none of the leading accounts of the evolution of religious beliefs makes any reference to the truth or falsity of those beliefs when explaining their effects on reproductive fitness." A person who believes that she is being monitored by God, or that she must generate good karma, will behave accordingly whether such beliefs are actually true or not. Then, regarding scientific beliefs, Wilkins and Griffiths grant that there is no

direct Milvian Bridge connecting the truth of scientific beliefs to their adaptive value, but claim that an *indirect* Milvian Bridge can be constructed for scientific beliefs. This is because, they say, we can use our commonsense beliefs to evaluate our scientific beliefs. As they put it (cited in Jong and Visala 2014, p. 253),

...if evolution does not undermine our trust in our cognitive faculties, neither should it undermine our trust in our ability to use those faculties to debug themselves – to identify their own limitations, as in perceptual illusions or common errors in intuitive reasoning. Nor should it undermine our confidence in adopting new concepts and methods which have not themselves been shaped by the evolution of the mind, but whose introduction can be justified using our evolved cognitive faculties.

Jong and Visala argue, however, that if this is sufficient for constructing an indirect Milvian Bridge in science, then we can also construct an indirect Milvian Bridge for religious belief. For if we can trust our commonsense faculties to “debug” themselves correctly, through proper reasoning and arguments, then we can use proper reasoning and arguments to justify religious beliefs. As they put it, religious beliefs can be “justified in the court of commonsense thinking” in the same way that scientific beliefs are, by using our alethic commonsense faculties to reason in good ways, rather than bad ways, from alethic starting points. If so, then religious beliefs are justified by these reasons and arguments, independently of their evolutionary causes.

In evaluating Jong and Visala’s argument, it is important to distinguish between the question of whether religious beliefs *can* be justified, in principle, and whether they actually *are* justified, in practice. I have no objection to the claim that good reasoning from commonsense starting points *can* justify religious beliefs. However, few religious believers actually do hold their beliefs for reasons that are independent, in this way, from evolutionary causes. Jong and Visala’s argument might succeed in showing that a few philosophers and theologians are epistemically justified in holding religious beliefs, but it is far from showing that religious belief in general is justified.

Most religious believers acquire their beliefs through cultural inheritance, or social learning, not through careful reasoning from commonsense starting points. Moreover, the particular beliefs they acquire tend to be the products of long histories of cultural selection for prosocial behavior, not truth. This is why beliefs about karma are much more common in India than in the United States, while Christian beliefs are much more common in the United States than in India. For I take it that commonsense, in this context, is something that people in both countries possess in equal measure. If so, and if the court of commonsense actually did play a role in determining which beliefs individuals possess, then we should observe a convergence across cultures that is independent from the history of cultural transmission. That is, assuming that Christian beliefs are true, we should observe that people in Europe and people in the Philippines converged upon Christian beliefs in a manner that was independent of cultural contact. Instead, what we observe is that Christianity became popular in the Philippines soon after Spanish colonization. And for the same reason, the convergence we observe in India is

toward karmic beliefs, not Christian beliefs. Indeed, religion is infamous for being a domain in which reason and argument fail to produce convergence across cultures. And this points to an important difference between scientific beliefs and religious beliefs that both Jong and Visala and Wilkins and Griffiths overlook.

In granting that no direct Milvian Bridge connects the truth of scientific beliefs to their evolutionary success, Wilkins and Griffiths assume a gene-based definition of “evolutionary success,” and they only consider the effects of selection acting upon genetically inherited cognitive capacities. Jong and Visala follow them in this. In the quote above, Wilkins and Griffiths explicitly appeal to the effects of religious belief on reproductive fitness when denying the existence of a Milvian Bridge. When Jong and Visala respond to this argument, they respond directly to this quote (p. 253) as follows: “But of course, the same can be said for our scientific beliefs, and as in the case of scientific beliefs, this simply rules out a *direct* Milvian Bridge, not an indirect one.” Thus, both sets of authors are concerned with connecting the truth values of beliefs to their success in *genetic* evolution. The problem with this is that the relevant selection process, for science and religion alike, has nothing to do with reproductive success, or genetically inherited cognitive capacities. It is cultural selection that has structured the particular beliefs and concepts of particular scientific theories, on one hand, and particular religious systems, on the other. And the *cultural* fitness values of scientific beliefs *do* depend upon their truth values; scientific norms and methods ensure that false scientific theories are eventually rejected, and the empirical predictions of science getting increasingly more precise and accurate over time. Consequently, we observe convergence in science in a way that we do not in religion. Children in both India and the United States are taught that the earth revolves around the sun, and they are not taught that phlogiston is released in combustion.

It is because of selection acting on cultural traits, not genetic traits, that a Milvian Bridge can be constructed for scientific beliefs but not religious beliefs. Religious beliefs are culturally inherited traits that have been selected for in virtue of their ability to promote prosocial behavior, regardless of whether they are true or false. By contrast, scientific beliefs are culturally inherited traits that have been selected for in virtue of their ability to produce true, accurate predictions. The *culturally* selected function of scientific beliefs is alethic, while the *culturally* selected function of religious beliefs is nonalethic. Wilkins and Griffiths’ EDA still goes through, once the correct selection process has been identified.

Again, this does not conflict with Jong and Visala’s claim that it is possible for religious beliefs to be justified by careful reasoning from commonsense starting points, just as scientific beliefs are. But it does show that this possibility is rarely actualized.

4.3 Clark and Barrett’s Non-Evidentialist Argument

Clark and Barrett (2011) pursue a very different approach to defending the epistemic justification of religious belief. Instead of appealing to reasoning and argument, they adopt a non-evidentialist, non-inferentialist epistemology from the tradition of common-

sense philosophy initiated by Reid. This approach was developed in the religious context by Plantinga, who argues that religious beliefs are justified in virtue of being “properly basic,” or justified prior to, and independently from, inference or evidence (Plantinga 1981). Clark and Barrett call this the “Plantinga-Reid conception of rational religious belief,” and they attempt to carry it further by incorporating insights from CSR theories. They pursue this approach, they say (2011, p. 641), because “...the mind seems to work roughly as Reid conceived (and not as, say, the more famous Descartes or Hume conceived). And because Plantinga's appropriation of Reid in defense of reason and belief in God offers the most influential conception of rational religious belief of the past thirty years.”

In what way, then, was Reid’s conception of the mind correct? In one sense, in the same way that I just appealed to in objecting to Jong and Visala: while we *can* form beliefs on the basis of reasoning and evidence, on special occasions, this is not how we actually *do* form most of our beliefs. Further, Reid, Clark and Barrett correctly note (p. 647) that social learning is often a non-inferential process of belief formation. However, there is another sense in which the view of the mind these authors defend conflicts with the one I have been defending: it ignores the role that a prior history of cultural selection has played in shaping the beliefs that we acquire through social learning.

Reid’s claims about properly basic beliefs, or at least those that Clark and Barrett cite, occur in the context of his response to Cartesian skepticism: “So, Reid recognizes, we have a tendency or disposition to believe, in the appropriate circumstances, that there is an external world, that we have a mind or self, that there are other persons; and we tend to believe inductively supported statements, what we remember, what we sense, etc.” (p. 646). Quite so. But these types of beliefs are very different from religious beliefs. They do not depend on social learning, and the relevant genetic adaptations possess alethic functions. Religious beliefs, by contrast, are almost always acquired through social learning, and their contents have largely been shaped by histories of cultural selection for promoting prosocial behavior, rather than for attaining truth. When a Christian individual today acquires the belief that Jesus is the son of Mary, or when a Hindu individual acquires the belief that higher-caste individuals are closer to nirvana than lower-caste individuals, she is non-inferentially acquiring a belief the contents of which first evolved more than a thousand years ago. But in either case, the selection pressures that explain why those beliefs have been preserved in the learner’s cultural environment have to do with their role in promoting cooperation, and nothing to do with truth. Thus, even if Reid’s view of the mind is correct for other types of non-inferential beliefs, there are special reasons to question the justification of religious beliefs, due to their special cultural evolutionary history.

In defense of their evidentialist approach, Jong and Visala (2014) attack the non-evidentialist, Reid-Plantinga approach on grounds that, unlike their own view, this approach falls squarely within the cross-hairs of EDAs. This is because, as we have seen, their view relies on a separation between justifying reasons and evolutionary causes, while the Reid-Plantinga approach runs these reasons and causes together. For instance, Clark and Barrett (2011, p. 656) approvingly cite Plantinga as follows: "To show that

there are natural processes that produce religious belief does nothing to discredit it; perhaps God designed us in such a way that it is by virtue of those processes that we come to have knowledge of him." Dawes and Jong (2012) push this point further, appealing again to the fact that, in religion, the cognitive mechanisms responsible for non-inferential belief formation have nonalethic functions, due to selection for prosocial behavior. However, this argument still exhibits a mistaken focus on genetic selection acting on cognitive universals, rather than on cultural selection acting on particular religious beliefs. A more effective objection to the Reid-Plantinga approach is to appeal to the *cultural* EDA that I described above, in defense of Wilkins and Griffiths. The threat of debunking is due to the fact that the proliferation of religious beliefs is due to a cultural selection process that has nothing to do with truth.

5. Conclusion

Religion has evolved through selection acting on particular, culturally local beliefs and practices, which individuals acquire through social learning. It is possible that this process of cultural selection is influenced, to some degree, by genetically inherited content biases toward theistic belief, but there is no good evidence for this. The dual-inheritance framework, a more comprehensive alternative for explaining cultural evolution than the epidemiological approach, can easily explain the cultural fitness of theistic beliefs by appealing solely to content-neutral capacities for social learning, in a manner that also explains the cultural fitness of conflicting beliefs, such as scientific beliefs or karmic beliefs. Thus, if biases toward supernatural or theistic content exist, then evidence for them must show that they provide some additional boost to cultural fitness, over and above the fitness benefits of prosocial behavior, and new explanations must be given for the cultural fitness of beliefs that conflict with these biases. None of this has been addressed by CSR theories.

Accordingly, CSR does not succeed in showing that common sense includes the sorts of cognitive biases to which Braddock, Clark and Barrett appeal in defending the justification of religious belief. And the features of common sense that *are* involved in the formation of religious belief, such as biases toward learning from experts and authority figures, do not play the justificatory role that Jong and Visala identify. If theistic beliefs are justified by reasoning from commonsense starting points, it must be the reasoning that does the justificatory work, rather than the commonsense starting points, because in other cultures the same starting points are just as likely to produce entirely different, conflicting beliefs.

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