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On the Evolutionary Origins of Religious Belief

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On the Evolutionary Origins of Religious Belief

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Abstract

Religious belief is a byproduct of evolutionarily designed cognitive mechanisms. The ubiquity of religious belief and experience across human cultures is explained by our common human psychology; our domain-specific cognitive mechanisms give rise, collectively, to the phenomenon of byproduct religious belief/experience. In this thesis, I will examine what I call *religion-generating cognitive mechanisms*, and I will argue that byproduct *raw god-beliefs* are developed by cultures into *refined god-beliefs*. These *refined god-beliefs* are co-opted by evolutionary processes and are cultural adaptations. My conception of "religious belief" in terms of *raw* and *refined god-beliefs* allows a disambiguation of the term "religion," and it contributes to the ongoing debate between byproduct theorists and adaptationists by clarifying that *raw god-beliefs* are biological byproducts while *refined god-beliefs* are cultural adaptations.

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Further, I'd like to extend special thanks to Dr. Eric Funkhouser, whose expertise and excellence in advising helped this thesis to become the best version of itself. I'd like to thank Dr. Ed Minar and Dr. Tom Senor for their service on my thesis committee.

Dedication

On the Evolutionary Origins of Religious Belief is dedicated to my mom and dad, John and Becky Howard.

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1. *Introduction*

Religious belief has been as ubiquitous a phenomenon as any other in human history. Nearly every human culture has had at its core a set of beliefs and assumptions that could be deemed *religious.* Human societies build worldviews and interpretive frameworks, and throughout history we have appealed nearly universally in our storytelling to stuff that is not *natural*. By "stuff that is not *natural,*" I mean anything that does not fit into a philosophically naturalistic physic or metaphysic. For instance, trees have spirits, the cosmos has a creator, my ancestors are trying to communicate with me, inanimate *stuff* is anthropomorphized, the Earth is resting on a giant, deified turtle, and so on. Nearly every expression of humanity has featured as a part of its worldview some non-naturalistic religious story that does significant explanatory work (Boyer, 2001).

We have known of the pervasiveness of religious belief and practice in human culture for a long time, and for a long time religious belief was immune to "explaining away" and academic inquiry (Bloom, 2007). However, relatively recent advances in the fields of empirical psychology, cognitive science, and evolutionary psychology have given rise to exciting research programs whose goal it is to explain why religious belief is so universal. It is important to clarify: when I say "religious belief," I do not refer exclusively to Western conceptions of the divine or to the expansive systematic theologies of the various established and organized religions. Those things are certainly included under the umbrella of this inquiry, but I also include beliefs about ancestral spirits, the anthropomorphizing of the elements in the environment around us, afterlife beliefs, beliefs associated with religious rituals, concepts like Karma, etc. For our purposes, let's call any

such religious belief a *god-belief*. It is the origins of such *god-beliefs*, in general, that I will investigate in this inquiry.

These research programs take two main approaches in their endeavors to explain the origins of such *god-beliefs*. The ***first*** approach to explaining the natural origins of these beliefs is the "Adaptationist" approach, which postulates that *god-beliefs* are advantageous biological (or cultural) adaptations that confer some degree of reproductive fitness to believing individuals (or societies). Under this view, the ubiquity of *god-beliefs* is explained by the survival benefit these beliefs confer to their respective subjects. That is, the evolutionary "winners" of history were of the religious sort. The ***second*** approach to explaining the natural origins of *god-beliefs* is the "Byproduct" approach, which draws heavily from cognitive science and from the cognitive science of religion (CSR). The Byproduct view is aptly termed a "byproduct" view of religious belief, because it posits that *god-beliefs* are the natural, structural byproducts of brains like the ones we happen to have. Under this view, the ubiquity of *god-beliefs* is explained by the functioning of our cognitive structures in domains for which they were not evolutionarily selected; structural byproducts are *selected*, but not *selected for*. Literally, byproduct *god-beliefs* are byproduct *beliefs*, rather than byproduct biological structures. We will explore the details of these accounts later on.

Most contemporary research pits these approaches against one another as alternative hypotheses, but I think there is room for each camp to complement the other. Indeed, I will argue that the truth of the evolutionary origins of our *god-beliefs* lies in a fusion of the Byproduct and Adaptationist approaches. The debate between byproduct theorists and adaptationists concerning the origins of religious belief can be resolved by a

disambiguation of the term "religion." "Religion" is a complicated amalgam of *raw god-beliefs* and *refined god-beliefs* (much more on this later). It is clear that both Byproduct theorists and Adaptationists make crucial contributions in understanding the evolutionary origins of *god-beliefs*, more broadly construed, so my account takes a "both-and" approach.

I will favor the work of cognitive scientists of religion, which accounts for both the genesis of these *god-beliefs* and some of their content in a way that the Adaptationist accounts cannot (or do not, presently). I will advocate for a "byproduct" or biological spandrel[1] view of the origins of such beliefs, but I will also contend that these beliefs, at some point in evolutionary history, came to lend survival fitness to their believers. So, the work being done by evolutionary psychologists in this area, far from being wrong or misguided, is extremely valuable; it helps us to explain things like the evolution and transmission of *god-beliefs* across cultures and across time, the adaptive value of such beliefs, and how certain spandrel or byproduct beliefs might have been *co-opted* by natural selection and made salient factors in cultural and biological evolution. With a view like mine, *god-beliefs* are the byproducts of our cognitive machinery, but they are dynamic and adaptively useful byproducts.

My primary contention is the following: the cognitive structures studied in the field of CSR provide us with byproduct *raw god-beliefs*, and it is by the honing forces of cultural evolution, cultural learning and transmission, and human experience (and, perhaps,

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[1] The term "spandrel" is an architectural term co-opted by Gould and Lewontin (1979) in their likening of certain biological traits to structural byproducts. A spandrel is a structural byproduct of an architectural arch—the spandrel of an arch serves no real architectural purpose. We can conceive of biological "spandrels," then, as being the *selected* (but not *selected-for*) byproducts of *selected-for* biological structures. Strictly speaking, *god-beliefs* are not byproduct biological structures. They are byproduct beliefs. Shortly, we will specify the conditions for a belief's being a byproduct.

revelation) that our evolutionarily ancient *raw god-beliefs* were developed into our more evolutionarily recent (and "cultural") *refined god-beliefs*.[2] These *raw god-beliefs* are most properly understood as the cognitive foundations of the various *refined god-beliefs*; *raw god-beliefs* are the byproducts of our cognitive mechanisms, while *refined god-beliefs* are the result of cultural evolutionary processes (at both the organismic-group and cultural levels)*.* My byproduct claim is strong: our cognitive processes provide us with "religious" notions of the world, as a byproduct of the natural functioning of our brains. By virtue of the sorts of cognitive mechanisms we possess, we naturally conceive of the world "religiously," and it actually takes intellectual work, socialization, or education to conceive of the world contrary to these byproduct religious biases and tendencies. It is our common human psychology that explains the ubiquity of religious beliefs across the human experience. The observed differences in *refined* religious beliefs across cultures, then, ultimately amount to accidents of environment, cultural history, religious storytelling, and evolutionary history.

A useful way of understanding the *raw/refined god-belief* distinction is in terms of Daniel Kahneman's (2011) System 1/System 2 conceptualization of human psychology. In fact, the distinction I make between the two types of *god-beliefs* is very much in the spirit of Kahneman's work. According to Kahneman, the human mind operates on two different levels. System 1 is thought to be composed of those cognitive processes and mental activities that are unconscious, automatic, fast, serial, efficient, associationist, evolutionarily ancient, etc. System 2, however, is thought to be composed of those

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[2] There will be much more on this later, but *raw god-beliefs* include things like the folk psychological beliefs and intuitive teleological notions delivered to us by our cognitive mechanisms, while *refined god-beliefs* include more developed, theologically involved belief systems (like theism, or Buddhism).

cognitive processes and mental activities that are conscious, deliberate, slow, rule-following, resource-demanding, rational, relatively evolutionarily new, etc. Each of these systems describes a very different kind of mind, and the activities of the two types of processes working in tandem are constitutive of the range of our human psychology. To whatever extent a *raw god-belief* is formed by unconscious System 1 processes, we should call it "automatic" or "unconsciously delivered." To whatever extent a *refined god-belief* is formed by conscious System 2 processes, we should call it "deliberate." It is my hope that this invocation of the System 1/System 2 conceptualization of the mind will prove useful as we proceed. Indeed, conceiving of *raw god-beliefs* as the natural byproducts of System 1 processes (i.e., *raw god-beliefs* as "automatic") goes a long way toward explaining the pervasiveness of *god-beliefs* across human experience.

Two further points should be quickly made before we continue this paper. First, the theorizing in the fields of CSR and evolutionary psychology has tended to outpace the experimental capabilities of both empirical psychologists and cognitive scientists. I will try to avoid conjecture and to stick to information on which the field has reached something of a consensus. As I mentioned earlier, CSR is an emerging field, and many of its ideas simply cannot be tested yet. Moreover, it is difficult to know which of the theories in CSR and in evolutionary psychology are even *in principle* testable, and which ones will only ever be conjectural explanatory stories. In considering evolutionary accounts, I often find myself musing, "I think this particular adaptationist story is neat, but to what extent is it entirely made up?" I will bracket the "just-so story" objections so that the conversation can take place, but adaptationist stories should be received with a grain of salt.

The second point that needs to be made is that in discussing these domain-specific

RGCMs, the mechanisms are often referred to as *promiscuous* or as *malfunctioning*. It is

important to note that there is a heavy commitment in the fields of evolutionary

psychology and CSR to the falsity of *god-beliefs,* to the notion that such beliefs are mistaken

fictions. However, as should be clear, how *god-beliefs* are formed does not necessarily

speak to the truth or falsity of such beliefs. The process by which religious beliefs are

formed, however, *does* speak to their justification. This line of research raises challenging

and interesting problems for theism, problems that the theist needs to address.[3] For the

reader's sake, I wanted to spotlight the biases at work in these fields and the implications of

the language that is frequently used.

2. *The Mechanisms*

The cognitive science of religion appeals to an array of cognitive faculties that, as a

whole, is responsible for our experience of the world around us. These cognitive faculties

are highly specialized systems that perform domain-specific tasks. If the brain were an

auto manufacturing plant, then our cognitive mechanisms would be the particular steps

along the way to building a car. Some do bodywork, some work in electrical, some run the

transmission, etc. The mechanisms are experts at what they do, and the presence of each

one is best explained by the adaptive advantage that its proper functioning conferred to

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[3] The theist might begin by asking such questions as: Is it possible that some of the *RGCMs*, in their generation of *god-beliefs*, are *not* operating outside of the domain for which they were originally designed? Is it possible that these *RGCMs* were designed by God, or that the evolutionary processes responsible for these *RGCMs* are directed by God? Might God have been involved directly in the formation of our cognitive structures throughout our evolutionary history (or at certain crucial moments in our evolutionary history)? Does an evolutionary story like the one I will proceed to tell in this thesis *actually* undermine the justification of the theist's beliefs?

our ancestors. So, the evolutionary psychologist's view of the brain is that it is a mass of

highly specialized task-performers that was built by the selective pressures of evolutionary

history (Pinker, 1997; Lyons, 2001).

As such, CSR seeks to explain the phenomenon of *god-beliefs* in the human

experience by appealing to these cognitive mechanisms. I, along with other byproduct

theorists like Pascal Boyer (2001) and Scott Atran (2002), reject any story about the

origins of *god-beliefs* that appeals to a single cognitive mechanism, religion module, or

religion gene in order to explain the genesis and pervasiveness of *god-beliefs*; such a story

would be far too simple, and it would be inadequate to the task of explaining the vast range

of varying *god-beliefs* in the human experience.[4] My theory is that there is a *suite* of

cognitive mechanisms that is responsible for the generation of our byproduct *raw god-

beliefs*. Any story that seeks to explain the origins of religious belief by appealing to a single,

unified cognitive system is probably describing, with very broad brushstrokes, the *suite* of

mechanisms I will examine in the first part of this paper. Let's call this suite of mechanisms

our *Religion-Generating Cognitive Mechanisms (RGCMs)*.

According to the Byproduct view, these *RGCMs* perform domain-specific,

evolutionarily selected-for cognitive functions (Cosmides & Tooby, 2001), and the

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[4] The status of something like Alvin Plantinga's (2000) "divine sense" is worth considering, here. The theist might just call my *religion-generating cognitive suite* a "divine sense"— however, this suite of cognitive mechanisms is responsible for more religious beliefs than just Western theism. It is problematic for Plantinga that the "divine sense," if it really is just the *religion-generating cognitive suite*, leads some to form religious beliefs that are contrary to traditional theistic beliefs about God. Of course, the theist might just say that the "divine sense" is something different than the set of cognitive mechanisms I will examine. But even if Plantinga's "divine sense" is taken by the theist to be a sufficient explanation for Western theological beliefs, there remains a whole host of other non-Western, non-theological *god-beliefs* that stand in need of explanation. And, presumably, that is where accounts like mine would come in.

byproducts of the proper functioning of these *RGCMs* are *raw god-beliefs*; again, such byproduct beliefs are selected, but not selected for. We will operate with a very specific definition of the term "byproduct"; for our purposes, a **byproduct belief** is any belief that emerges as a byproduct (or spandrel) of properly functioning cognitive mechanisms performing their function in an improper domain[5]. We will say that a cognitive mechanism is **properly functioning** when, and only when, the mechanism is applied in the domain(s) for which it was designed by evolutionary processes (i.e., is functioning in the particular way that, in our evolutionary past, yielded survival benefit to our ancestors). Again, a byproduct belief is just a belief that arises when a cognitive mechanism is applied in an unintended domain. We will consider paradigm examples of byproduct beliefs later ("intuitive theism," "hypersensitive agency-detection," etc.). An *RGCM* is responsible for producing byproduct beliefs to whatever extent it operates *outside of* the domain for which the *RGCM* was originally designed by evolutionary pressures.

If, however, the origin of a given *god-belief* can be explained exclusively by reference to evolutionary pressures occurring at the biological level, the problems faced in our evolutionary past, and the adaptive advantages the belief confers to its believer, then the *god-belief* ought not to be considered a byproduct, but rather an adaptation. *Raw god-beliefs* are the byproduct beliefs of cognitive mechanisms, and it is only after these byproduct beliefs undergo significant development into *refined god-beliefs* that they come to lend adaptive advantage to their respective believers (see Section 3). Typically, byproducts are not thought of in terms of adaptive value—that is, they are regarded as purely *structural* byproducts, or as the adaptively neutral consequences of selected-for

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[5] By "improper domain," I mean those domains for which the cognitive mechanisms were not selected by evolutionary pressures.

biological structures. My account of the origins of *god-beliefs* diverges from standard Byproduct accounts of religious belief in my claim that *god-beliefs*, while initially byproducts, are developed by evolutionary processes (at the cultural and group levels) into systematic worldviews; it is after this development that *god-beliefs* confer significant adaptive advantage to their believers. I maintain that my account is a byproduct account of the origins of religious beliefs, because *god-beliefs* at their biological origins are byproducts, because byproduct *raw god-beliefs* persist into the present, and because we can distinguish byproduct *raw god-beliefs* from their group adaptation counterparts, *refined god-beliefs.*

My view is contrary to the views of hard-line evolutionary psychologists and biologists, who seek to explain the phenomenon of religious belief strictly by appeal to evolutionary pressures at the biological level. Their puritanical adaptationist approach wanders into murky waters. It is unclear what their claim—that religious beliefs are *selected for*—entails, as it is unclear how a *belief* could be selected for at a biological level. The question must be asked: in evolution by natural selection, what, exactly, are the basic units of selection? Genes that affect the survivability and the ability of an organism to reproduce are the fodder of evolutionary processes. Genes are selected, which means that neural processes, psychological structures, and perhaps even belief-forming *tendencies* may be selected for; however, the claim that the religious beliefs *themselves* are selected for (i.e., religious beliefs as biological adaptations) is dubious. It seems the only way to get such a claim off of the ground would be to posit that the *contents* of our religious beliefs themselves (as well as other of our beliefs) are packaged neatly into our genes or psychology. But we should stay away from such full-bore innateness claims.

Another difficulty faced by adaptationists in explaining the origins of religious belief is the sheer complexity of religious systems. Religious belief and religious systems are the confluence of multiple elements (supernatural agent beliefs, music, ritual practice, formalism, emotionally charged symbols and experiences, morality, societal structure and organization, etc.), and each of these elements has its own unique evolutionary history independent of the phenomenon of human religion, more broadly construed (Sosis, 2009). In light of the vastly different evolutionary origins of its constituent parts, "religion" does not seem to be the sort of thing that could be *selected for*, as the adaptationist contends it is. Certainly, at some point in history these different elements of religion began to give rise to religious beliefs and systems, but this fact ultimately lends itself to the byproduct perspective for which I argue. If "religion" just is all of these other selected-for faculties operating in tandem in some evolutionarily unintended religious domain, then we should say that religious belief is a byproduct.

Due to these difficulties that face the adaptationist approach, I propose my byproduct story to account for the origins of *god-beliefs*—they are the natural outputs of the functioning of our cognitive mechanisms in evolutionarily unintended domains. These various cognitive mechanisms are themselves the products of evolution by natural selection—they were selected for by virtue of the fact that their functioning in the proper domain conferred great adaptive advantage to our ancestors. (Successful folk psychology and theory of mind, agency attribution, teleological notions, etc., are clearly to our benefit, and can be easily conceived of as adaptations. More on this shortly.) Our *raw god-beliefs* are the natural byproducts of these cognitive systems. In Section Three of this paper, I discuss in greater detail how my byproduct account diverges from more traditional

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byproduct stories[6]—religion as we know it today can hardly be considered to be the *mere* byproduct of our cognitive mechanisms.

I concede to the adaptationists some of the ground they originally claimed: it is clear that religious belief (in its *refined* forms) confers adaptive advantage to the individuals and societies that adhere to said religious belief. But because not all adaptively advantageous traits are necessarily adaptations (Sosis, 2009), the fact alone that *refined god-beliefs* confer adaptive advantage to individuals and societies is insufficient to warrant their classification as adaptations. At some point in our evolutionary history, our byproduct *god-beliefs* were developed into religious stories and explanations, and these cultural ideas/beliefs became units of selection (at the cultural and group levels) by virtue of their influence on the way we (as individuals and societies) live our lives. Through the processes of multi-level selection, religious belief became a winning evolutionary strategy and selectable group trait. I appeal to the mechanics of meme transmission, multilevel selection theory, and cultural evolution to explain the transition from *raw god-beliefs* to *refined god-beliefs*. My account of the origins of *god-belief*, then, is a fusion of the Adaptationist and Byproduct approaches.

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[6] Byproduct theorists (Gould & Lewontin, 1979) typically hold that byproducts are the inevitable structural byproducts of other traits, and that they tend to be adaptively neutral. I agree that byproduct *god-beliefs* are the inevitably byproducts of our cognitive mechanisms, but I add to their story that our byproduct *god-beliefs* are, at some point, developed into *refined god-beliefs*. Further, byproducts are typically viewed as static structural inevitabilities, but I conceive of *raw god-beliefs* as being dynamic byproducts that are accessible to the rest of our psychology (because they are beliefs). In this way, byproduct beliefs affect—and are affected by—our deliberate belief-formation processes and the outputs of these processes. Unlike the spandrels of evolutionary biology, byproduct *god-beliefs* are not "structures." The spandrels of evolutionary psychology are processes and beliefs.

Individual *RGCMs* only tell a part of the story. The entire suite of *RGCMs* provides us

with a cumulative foundation for the formation of *god-beliefs*. It is the suite of these

mechanisms working in tandem with our belief-formation processes that explains our

conscious assent to *god-beliefs*. So, I will not consider individual *RGCMs* and their

respective cognitive biases in isolation; rather, I will approach the issue with an enlarged

scope that considers the broader cognitive suite to be the origin for a given *god-belief*. Now,

let us move on to the *RGCMs* themselves, in no particular order of importance. Note that

there will be significant conceptual overlap between these different mechanisms. By that, I

mean that it is difficult to tell where one mechanism's domain starts and the other stops, as

these mechanisms' purviews are so conceptually related.

A. Folk Psychology & Theory of Mind

The first *RGCM* we will examine is the cognitive system responsible for what some

have termed our intuitive "folk psychology." This system's outputs render to us our

"theory of mind"—our beliefs about the minds, beliefs, intentions, and goals of the beings

around us. Both (1) the evolutionarily intended domain of our intuitive folk psychology

and (2) this mechanism's purported tendency to form folk psychological beliefs regarding

things outside of its intended domain are relevant to our understanding the relationship

between this *RGCM* and the origin of certain *god-beliefs*.

Of course, a "theory of mind" is supposed to form beliefs regarding *actual* minds.

However, our folk psychological systems seem to often jump the boundaries of the domain

for which they were selected (people, animals, beings in the natural world, etc.) and apply

our theory of mind to things not in that domain (things that do not actually possess minds,

beings that do not actually exist, mere concepts, etc.). Folk psychological mechanisms are responsible for byproduct *raw god-beliefs* when theory of mind is applied to things that are not in the intended domain of folk psychology; for instance, we sometimes attribute personalities to things like trees, stars, mountains, and so on. Our folk psychological mechanism was selected-for by natural processes because of the survival benefits it conferred to our ancestors by its proper functioning; it is apparent that it is to organisms' adaptive advantage to be able to track the mental states and intentions of the beings inhabiting the world around them.

The claim that such *god-beliefs* (beliefs about the mental states of trees, stars, non-existent beings, and so on) are byproducts of our folk psychological mechanisms depends on the assumption that our folk psychological mechanisms do not confer adaptive advantage to believers in the attribution of mental states to things we consider to be non-members of the mechanism's intended domain. If the folk psychological mechanisms *do* (and *did*, in our evolutionary past) confer adaptive advantage to the believer in their attribution of mental states to things of that sort, then *god-beliefs* ought not to be considered byproducts. The claim that the automatic attribution of mental states to inanimate things in the world around us might be adaptively advantageous is suspect. On the other hand, it is clear how the ability to "mind read" the beings around (beings that actually have beliefs, goals, and intentions) would be to our evolutionary advantage.

Theory of mind is also active in our explanations of the events we experience in the world around us, and it plays a central role in the interpretation and prediction of the behavior of other minds. Psychologist Jesse Bering (2006) says the following about our folk psychological systems and their role in explaining events and predicting behaviors:

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Consider, for instance, that one day all human beings became hard-core solipsists... Imagine, say, that everyone was struck down with autism or otherwise lost the capacity to think about other minds, what would happen then? I'd venture that church attendance would reach an all-time low next Sunday. Here then is one key ingredient for belief in God or spirits: an innate disposition to see others not just as ambulant objects or brain-dead sacks of meat, but as thinking, feeling beings that, just like oneself, are causal agents who do things intentionally... In the case of people or deities, we appeal to other minds to explain and predict behaviors, to understand why others do what they do.[7]

Bering posits theory of mind as a key ingredient for forming beliefs about gods or spirits (*god-beliefs*), and he ties it directly to the formation of organized religion. It should not be surprising that an inability to reason about other minds, in general, would lead to an inability to reason about non-natural minds. The claim is that we use the same folk psychological mechanisms in reasoning about the minds of God and non-physical beings, in general, as we do in our reasoning about the minds of physical and natural persons. In reasoning about non-actual, non-physical minds, our intuitive folk psychologies have activated—as a byproduct of properly functioning theory of mind—the set of inferences and expectations typically reserved for *actual, physical minds* and have applied this set of inferences and expectations to *non-actual, non-physical minds.* The guardrails of the intended domain have been jumped.

Just as our intuitive folk psychology helps us to explain the events that we associate with *actual* beings by appealing to their goals, intentions, desires, etc., a malfunctioning folk psychology may help us to explain events in the world by appealing to the goals, intentions, desires, etc., of either (1) something that does not actually exist or (2) something that does exist, but that is only improperly thought to possess the goals, beliefs, and desires associated with mindedness. Ultimately, such a misapplication of a mechanism's proper

[7] Bering, 2006, pg. 147.

function to some improper domain could help explain the pervasiveness of *god-beliefs* pertaining to the goals, intentions, and desires of the gods, spirits, God, our ancestors, etc., that are commonly believed in. In this way, folk psychological systems act as an *RGCM*.

Bering (2006) cites his "Princess Alice" experiments, in which he tested for the point in human development at which a child could recognize *intention* in external events as well as *agency*, rather than merely *agency*. These Princess Alice experiments are supposed to show the ability in children to run inferences from the presence of an unseen princess and the occurrence of otherwise unexplained events to the conclusion that these unexplained events are performed for a *reason* by the unseen princess.[8] The children are told that the princess is communicating with them, but it is not until a certain capacity is developed— second-order reasoning ("Event *X* means Princess Alice wants me to do *Y* for some reason *Z*")—that the children can interpret the unexplained events in terms of the specific goals and intentions that they subsequently attribute to Princess Alice. So, it is not until we reach a certain point of cognitive sophistication—according to Bering, around seven years old— that we are able to apply theory of mind to non-physical agents in order to evaluate the *intention* of non-physical agents in the various phenomena we have experienced. Once this point of cognitive sophistication is reached, it seems *god-beliefs* as explanatory hypotheses for events are a natural output of our cognitive machinery—we naturally explain events in

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[8] One thing to note regarding Bering's Princess Alice experiments is that Bering explicitly told the kids in his experiments that a spirit—Princess Alice—was going to be present in the room, and that she would help them perform certain tasks. So, it is not as if the kids were automatically positing disembodied agents as the explanations of various phenomena—the children were overtly primed to reference Princess Alice in explaining various events from the start. In the room, lights would turn on or off, picture frames would fall or move, etc., cued by the experimenters. The children were tasked with discerning what Princess Alice meant by these events, in relation to different problems the children were given to solve. The children took the various events to be assistance and input from Princess Alice.

terms of the goals, desires, and intentions of "gods." *God-beliefs* as reasoned explanations

for various phenomena seem to be maturationally natural, at least in cases like the Princess

Alice experiments, in which the existence of an unseen being is assumed from the start.

Clearly, a robust folk psychology and theory of mind—by which we can make

judgments about the minds, intentions, and feelings of others—is a necessary condition for

the origin of certain kinds of *god-beliefs* (*god-beliefs* regarding disembodied agents and

their intentions for certain events). That we can form beliefs about the minds of non-

physical entities (real or fictitious) is a byproduct of the folk psychological *RGCM*, because

the objects of folk psychological *god-beliefs* are not members of the evolutionarily intended

domain of the folk psychological *RGCM*. The folk psychological *RGCM* accounts for a specific

range of *god-beliefs*—that range of *god-beliefs* that includes beliefs about the mental states

of inanimate objects in our environment, explanatory hypotheses regarding specific events

and the intentions of the agent(s) believed to be responsible for those events, etc.

The cognitive mechanisms required for interacting with persons in the *natural*

world and attributing to *them* the responsibility for the events we experience are the very

same cognitive mechanisms responsible for the formation of certain *god-beliefs*. These *raw*

god-beliefs, however, find their origin in the misapplication of folk psychological

mechanisms to an improper domain. In short, I have described this particular cognitive

system as it works in its proper domain (i.e., the domain of things in the natural world that

have minds), and I have proposed that our folk psychology sometimes *does* operate outside

of its proper domain (i.e., outside of the domain of things in the natural world that do have

minds). Whether the objects of human *god-beliefs* are fictitious or inanimate, these beliefs

are the products of the systems in our brains that track the intentions of *actual* physical

agents and minds. Thus, human folk psychological mechanisms are prime candidates for

being considered *RGCMs*; their *god-belief* outputs are to be considered byproducts to

whatever extent they are delivered to us by the misapplication of folk psychological

systems to improper domains.

B. Promiscuous Teleology

The next *RGCM* we will consider is the cognitive system responsible for what has

been termed "intuitive theism." Deborah Kelemen has coined the phrase "promiscuous

teleology" (Kelemen, 2004) in reference to this mechanism and the biases with which it

provides us. Kelemen says the following about the teleological intuitions she and her

colleagues have observed at work in children:

> … When asked to identify unanswerable questions, American 4- and 5-year-olds
> differ from adults by finding the question "what's this for?" appropriate not only to
> artifacts and body parts, but also to whole living things like lions ("to go in the zoo")
> and nonliving natural kinds like clouds ("for raining"). Additionally, when asked
> whether they agree that, for example, raining is really just what a cloud "does"
> rather than what it is "made for," preschoolers demur, endorsing the view that
> natural entities are "made for something" and that is why they are here.[9]

> Initially, on the basis of observing agents' object-directed behavior, children
> understand objects as means to agents' goals, then as embodiments of agents' goals
> (thus "for" specific purposes in a teleological sense), and, subsequently—as a result
> of a growing understanding of artifacts and the creative abilities of agents—as
> intentionally caused by agents' goals. A bias to explain, plus a human predilection
> for intentional explanation, may then be what leads children, in the absence of
> knowledge, to a generalized, default view of entities as intentionally caused by
> someone for a purpose.[10]

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[9] Kelemen, 2004, pg. 295.
[10] Kelemen, 2004, pg. 296.

The same findings have been documented in Kelemen's studies with British children, which she takes to have sufficiently controlled for the "relatively pronounced cultural religiosity" of the United States.

These findings indicate good evidence for the claim that children are "intuitive theists"—that children interpret natural phenomena as having been intentionally designed by a God. Put another way, children intuitively hold to *god-beliefs* regarding the perceived design and order of the world around them. She lists some capacities that she takes to be prerequisite to such "intuitive theism": the capacity to maintain a mental representation of a god, despite its intangibility; the ability to attribute to that special agent mental states that distinguish it from more commonplace agents; and the ability to attribute design intentions to agents and to understand an object's purpose as deriving from such intentions. All of these abilities are found to be present in the subjects of Kelemen's experiments. She insists that the details regarding children's "emotional or metaphysical commitments" are irrelevant; rather, what is important is whether children "make sense of the world in a manner superficially approximating adult theism," a way of interpreting the world that may be developed or honed by a given religious culture but that finds its origins primarily in "cognitive predispositions and artifact knowledge."

This study of the intuitive theism of children is important, because it sheds light onto the cognitive machinery, biases, and explanatory inferences at work in the human mind prior to much cultural or environmental indoctrination. So, the phenomenon of intuitive theism in very young children lends support to the idea that even throughout our adult lives, it is *most natural* for us humans to appeal to teleological reasoning and explanation in making sense of the world around us. We *naturally* understand agents to

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have design intentions, and we see things in our environment as derivatives of those intentions. We have to *learn* to do otherwise.

The cognitive systems responsible for children's inherent predispositions to interpret the world around them in terms of purpose, design, and agency intention is likely active in the deliverance of many of our *raw god-beliefs*. "Intuitive theism" is the sum of such a strong teleological bias as has been documented by Kelemen; of the perception of an ordered, designed, and "artifact" world; of the intuition that it is agents who are responsible for what we perceive to be designed and meaningful; and of the innate human drive to pursue explanation. To whatever extent the system responsible for recognizing artifacts, intention, and design overlays such teleological notions onto a naturally formed, inanimate, and non-designed world, our teleology-tracking *RGCM* is operating outside of its intended domain; in as much as the natural world falls outside of the proper domain of this *RGCM*, teleological beliefs about the "purpose" and "design" of the natural world are rightly considered byproduct *raw god-beliefs*.

C. Anthropomorphism

The cognitive processes associated with anthropomorphism are our next area of examination. Anthropologist Stewart Guthrie, who was among the first to conceive of agency and agency detection as central to a cognitive theory of religion (Westh, 2013), developed a theory of *anthropomorphism* to explain religion (Guthrie, 1993).[11] According to Guthrie (1993), religion just *is* anthropomorphism (where *anthropomorphism* is the ascription of human-like characteristics to non-human entities or objects). Due to

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[11] David Hume (1779) also discussed the role of anthropomorphism in his *Dialogues Concerning Natural Religion.*

evolutionary pressures and the primacy of our ability to recognize other human agents in the environment around us, an overactive tendency to anthropomorphize the world around us has been worked into our human psychology by natural selection (Guthrie, 2002). It would have been better for our ancestors, Guthrie wrote, to wrongly perceive a bear-like boulder as a real threat, rather than to perceive a boulder-like bear as a big rock.

The adaptive payoff of hypersensitivity to the presence of predators, or agents in general, should be apparent: were one to mistake a real threat for a non-threat, the loss to the individual would be potentially catastrophic, but were one to mistake a non-threat for a threat, the loss to the individual would be marginal. The idea is that over time, evolution would favor those individuals whose abilities to detect predators were so honed as to give them false positive reports, over those individuals whose abilities were not similarly honed. Those with relatively clumsy abilities to detect predators would lose stake in the gene pool, relative to those who could survive, reproduce more, and take a larger share of the population. Thus, it is thought that our tendency to hyper-sensitively anthropomorphize evolved over time to yield a good deal of false positives.

As the misperception of bear-like qualities in a boulder is not, strictly speaking, anthropomorphism, something needs to be said here about the relationship in evolutionary history between an organism's hypersensitivity to animism and its tendency to anthropomorphize. Later, I mention the possibility that animacy-detection is an evolutionary precursor to agency-detection—a hypersensitivity to animacy likely would have preceded the development of effective agency-detection devices. Here, Guthrie is explaining why a tendency to "anthropomorphize" might have been worked into our psychology, and he appeals to the misperception of animacy in order to do so. I believe he

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uses the term "anthropomorphism" rather loosely as an umbrella term, such that

anthropomorphism includes the detection of mere animacy. Westh summarizes Guthrie's

position:

> So even if the perceptual strategy of anthropomorphism generates massive over-detection, it has had adaptive value nevertheless, as the price of false positives is much lower than the price of missing important cues. Perfect paranoia is perfect awareness.[12]

Anthropomorphism as a theory for the origins of religious belief covers a wide array

of agency attribution (Westh, 2009): the perception of faces in clouds (Guthrie, 1993), the

perception of human shapes in Rorschach ink blots (Guthrie, 1980), the mistaking of

mailboxes for humans (Guthrie, 1980), talking about tables as having legs and genes as

being selfish (Guthrie, 2002), and so on. The processes and mechanisms of

anthropomorphism are also thought to be responsible for our perception of natural

disasters as divine punishment (Guthrie, 1980) and our inclinations toward perceiving

intelligent design in nature (Guthrie, 1993). In light of contemporary research in the area

(agency detection, intuitive theism, etc.), I think it is perfectly reasonable to be skeptical of

the idea that anthropomorphism and the mechanisms associated with it are alone

responsible for such a broad array of different types of *god-beliefs*. Many *god-beliefs* are

much more than—or merely of a different kind than—the sorts of beliefs we form about

faces in the clouds or our mistaking of boulders for bears at a distance. Many of our *god-beliefs* are more inferentially involved and more conceptually complicated than the mere

misperception of human characteristics in non-humans or non-agents. Instead, I believe

that in describing a single process of anthropomorphizing, Guthrie was plowing the ground

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[12] Westh, 2009, pg 2.

for the research being done today on the multiplicity of domain-specific cognitive mechanisms that are *in fact* responsible for each of the sorts of *god-beliefs* and phenomena that he sought to explain

Along this line of thought, Westh (2009) has contended that the term *anthropomorphism* is an umbrella term, but that it does not adequately explain certain very specific phenomena:

> There is no convincing argument that, for example, seeing faces in the clouds or human shapes in Rorschach inkblots somehow involves the attribution of agency or mind. Therefore, it would seem that Boyer and Guthrie are in fact talking about different things. The agency detection of Boyer and Barrett is a very specific psychological mechanism. By contrast, the anthropomorphism of Guthrie is an umbrella term that certainly covers the psychological mechanism of agency detection, but only as one among many other phenomena.[13]

The exact boundaries and domains of these different mechanisms are, at this point, unclear. The process of anthropomorphism is probably best understood as an adequate explanation for certain kinds of *god-beliefs* (e.g., perceptual beliefs about stuff like faces in the clouds, faces in Rorschach ink blots, a bias to project human characteristics to inanimate objects in the world around us, etc.), but as only a course-grained, inadequate explanation for other kinds of *god-beliefs* (e.g., actively seeing intention and purpose in events, the attribution of agency and intention to inanimate objects, the formation of beliefs about ancestral spirits, etc.).

Despite the explanatory limits of anthropomorphism, though, it does seem to be an important factor in explaining the origins of *god-beliefs*. Perhaps, for instance, beliefs about the personalities of mountains or trees find their origins in a chance arrangement of features on a given mountain or tree that is vaguely reminiscent of a human face; our facial

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[13] Westh, 2009, pg. 4.

recognition systems kick in, and we proceed to anthropomorphize the inanimate objects around us. A generation later, the mountain or tree might be considered a deity. Such a story is reasonable. To whatever extent the processes of anthropomorphism are applied to improper domains—that is, to anything that is not actually a human—the result is a byproduct belief.

D. Agency Detection

Agency detection is our next *RGCM*. Anthropologist Pascal Boyer (2001) has claimed that humans suffer from a "hypertrophy of social cognition." Psychologist Justin Barrett (2004) has posited that we possess "hypersensitive agency detection devices." Barrett describes the agency detection device:

> When *HADD* perceives an object violating the intuitive assumptions for the movement of ordinary physical objects (such as moving on non-inertial paths, changing direction inexplicably, or launching itself from a standstill) and the object seems to be moving in a goal-directed manner, *HADD* detects agency.[14]

These *HADDs* hyperactively attribute agency to the stuff in our environment, and as a result these attributions are often wrong. At the recognition of agent-like behavior—an otherwise inexplicable change in direction, stop-and-go movement, etc.—the agency detection device flags an object (agent or not) as an agent. Any kind of behavior or movement that might be perceived as goal-directed or as the product of mindedness is enough to activate *HADD*, and the end result is the unconscious presentation of non-agents as agents and the conscious formation of false beliefs regarding the agency of what are actually non-agents.

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[14] Barrett, 2004, chapter 3.

Bloom recounts the experiments conducted by Heider and Simmel in the middle of

the twentieth century:

> Heider and Simmel (1944)… made a simple movie in which geometrical figures—circles, squares, triangles—moved in certain systematic ways, designed, based on the psychologists' intuitions, to tell a tale. When shown this movie, people instinctively describe the figures as if they were specific people (bullies, victims, heroes) who have goals and desires…[15]

Bloom goes on to mention subsequent research performed by himself and Veres (1999), in

which it was found that "you can get much the same effect with moving dots, as well as in

movies where the 'characters' are not single objects at all, but moving groups, such as

swarms of tiny squares." The general idea is that at the perception of an object or event

that we deem to have been designed or ordered, or at the perception of something that

seems to behave as we would expect an agent to behave, our brains are apt to ascribe

agency (or design, or agency intention) to that object of our perception.

I think it is worth investigating the implications of the experiments run by Heider

and Simmel, and then later by Bloom and Veres. In one sense, the agency detectors of the

participants in the studies got it *wrong*: clearly, dots and figures, although they behave like

agents, are only improperly attributed goals, desires, and personality. However, in another

sense, the agency detectors of the participants in the studies got it *right*: the dots and

shapes were, indeed, designed and programmed *intentionally by another mind* (a scientist's

mind) to act in ways that would *give off airs of agency*. It should not be surprising that

people readily recognized the intention of another mind in the perception of an *actually*

created artifact—be it a tool, an experimental program, or anything else—that is behaving

in intentional ways. So, I think it is appropriate to ask: to what extent were the agency

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[15] Bloom, 2007, pg. 149.

detectors actually acting outside of their intended domains in these experiments? Are not

the recognition of agency intention and the awareness of created artifacts not critical tasks

of an agency detection mechanism? It is clear, however, that the agency detection system

was not selected-for so as to track dots on a computer screen; so, while the agency

detection module correctly (in a sense) perceived agency and agent intention in the dots on

the screen, we are justified in saying that it did so only as a *byproduct* of the agency-

detection module's proper functioning (i.e., its evolutionarily intended purpose of

perceiving agency in true agents, rather than in dots on a computer screen).

Bloom (2007) says, "We are hypersensitive to signs of human agency, so much so

that we see intention where all that really exists is artifice or accident." The proposed

cognitive mechanism that leads us to ascribe agency to things that very clearly are not

agents (like geometrical figures or dots) is probably foundational to our understanding the

origins of most kinds of *god-beliefs*. Important to remember at this point is Bering's (2006)

work on the attribution of agent intention to *events* (the Princess Alice experiments). Given

this combination of cognitive biases—the bias to attribute agency to the objects in our

environment, together with the bias to ascribe agency *intention* to the events we

experience—we can begin to see how the human experience lends itself to the formation of

god-beliefs. It should perhaps be no surprise that such *god-beliefs* overlay our experience of

the world in the way that they do, if we grant that these agency-detection and intention-

attribution biases are so pervasive.

Psychologist Scott Atran says about our hypersensitive, "trip-wire" agency

attribution:

> The concept of supernatural agent is culturally derived from innate cognitive
> schema—"mental modules"—for the recognition and interpretation of agents, such

as people and animals. In particular, such concepts are triggered by an agent-detection module. This is a sort of innate releasing mechanism, whose proper (naturally selected) domain encompasses animate objects but whose actual domain (of stimuli that mimic the proper domain) extends to moving dots on computer screens, voices in the wind, faces in the clouds, and smoke from a burning building...[16]

He continues:

Souls and spirits, which derive much of their inductive force from analogy to the dissociated thoughts of dreams and the disembodied movements of shadows, are near-universal candidates for religious elaboration. This is because souls, spirits, dreams, and shadows have many psychologically co-occurring thematic associations (e.g., immateriality and unworldlieness, night and death). They also systematically manipulate innate, modularized expectations about folkmechanics, folkbiology, and folkpsychology.[17]

So, by Atran's estimation, agency detection is relevant to the *RGCM* hypothesis when agency detection operates outside of its natural domain (that domain full of objects that are actually agents).

Boyer's (2001) theory that such *god-beliefs* have a sort of increased staying power is related to Atran's ideas about the way our concepts of the non-natural manipulate our innate and modularized folk-mechanics, folk-biology, and folk-psychology. Boyer's idea is that our *god-beliefs* have violated certain essential expectations we have about the world, expectations delivered to us by our learned "conceptual templates." *God-beliefs* are counterintuitive, to the right degree. For instance, the conceptual template for the concept "person" probably includes the constituent concept of an "embodied being." It is totally natural—or, in line with our conceptual templates—for us to conceive of a person as having a body, because having a body is constituent of being a person. However, many *god-beliefs* regarding persons violate that central expectation; spirits, souls, and deities are

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[16] Atran, 2002, pg. 266.
[17] *Ibid.,* pg. 266.

often conceived of as *persons having no body*. To put it simply, Boyer posits that such

supernatural concepts, when in violation of our conceptual templates, are memorable and

demanding of attention. It is important that the supernatural concepts violate core parts of

our conceptual templates, but they must conform to the conceptual template closely

enough that the supernatural concept does not devolve into conceptual absurdity. The

concept of a *person* without a *body* is solid; the concept of a *person* with no *body* or *mind*,

but that is actually a *place*, is basically meaningless. According to Boyer, stories that

include such counterintuitive, supernatural concepts are disproportionately easier to

remember, are easier to tell, and are therefore prime candidates for cultural transmission.

These kinds of beliefs are rendered to us intuitively due to a degree of conceptual similarity

between them and our other, more ordinary beliefs. We will talk more about this later.

In explanation of why the agency detection system so often operates outside of its

intended domain, Atran says:

> All supernatural agent concepts trigger our naturally selected agency-detection
> system, which is trip-wired to respond to fragmentary information, inciting
> perception of figures lurking in the shadows and emotions of dread or awe.
> Mistaking a nonagent for an agent would do little harm, but failing to detect an agent,
> especially human or animal predator, could well prove fatal; it's better to be safe
> than sorry. The evolutionary imperative to rapidly detect and react to rapacious
> agents encourages the emergence of malevolent deities in every culture, just as the
> countervailing evolutionary imperative to attach to caregivers favors the apparition
> of benevolent deities.[18]

Atran describes the adaptive advantage of an agency detection device that registers false

positives: it is simply better that we have a "trip-wire" mechanism that sometimes

mistakes a sound, movement, or inanimate object for an agent (friend or foe) that has

intentions directed toward us, rather than to have a mechanism with a higher activation

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[18] Atran, 2002, pg. 267.

threshold that fails to detect *actual* agents in our environment. Atran theorizes that over

time, the latter was winnowed from the gene pool to the advantage of the former. As a

result, we do irrational things like form beliefs about spirits when we hear bumps in the

night, or we perceive phantoms "lurking in the shadows." Our brains give these things

agency, quite outside of our control. Thus, with our trip-wire agency detector, much of the

world around us is presented to us automatically through the filter of agency detection.

Westh (2009) says the following regarding the evolutionary origins of agency

detection devices in our cognitive machinery:

> Stewart Guthrie, by positing a strong continuity between animism and
> anthropomorphism, gave the cognitive mechanisms underlying god concepts an
> extremely deep evolutionary history. Animism, in this view, evolved first as a
> mechanism of predator evasion; as the evolutionary pressure of human social
> groups intensified, anthropomorphism developed as a cognitive strategy. The
> mechanism of hyperactive agency detection posited by Boyer and Barrett shares
> more or less the same evolutionary narrative.[19]

I believe Westh's conclusions are right. It seems reasonable that an overly sensitive agency

detection device was bestowed to us through the processes of natural selection as new,

uniquely human evolutionary pressures emerged. It seems reasonable to believe that this

HADD's evolutionary predecessor was a simpler mechanism designed for detecting

animacy, more broadly construed. This highly attuned mechanism would have delivered to

our ancestors false-positive detections of foes, predators, etc., and this would have been to

our ancestors' benefit in their ancient environments. It certainly seems to be the case that

such an agency detection device as *HADD* acts hyper-sensitively to attribute agency to

inanimate objects. Such hypersensitivity, both in our evolutionary past and contemporarily,

helps to yield the panoply of *god-beliefs* that characterizes human cultures and worldviews.

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[19] Westh, 2009, pg. 18.

Whether the objects of our *god-beliefs* are real or imagined—gods, spirits, anthropomorphized natural objects, etc.—the agency detection *RGCM* is surely active in the formation of these *god-beliefs*.

E. Conclusions

I mentioned toward the beginning of this thesis that it is difficult to determine where, exactly, one cognitive mechanism ends and where the next begins. You can probably see that by now. The mechanisms I have discussed so far—intuitive folk psychology and theory of mind, promiscuous teleology, anthropomorphism, and agency detection—seem to have vast areas of conceptual overlap. For instance, one probably cannot meaningfully talk about our bias to attribute agency and agency intention to the world around us without also talking about intuitive folk psychology (which is really just the ability to form beliefs about others, pertaining to their agency). One probably cannot talk meaningfully about promiscuous teleology and agency intention without some content-rich theory of mind or artifact theory. It is difficult to say the extent to which these different mechanisms are related; I believe it is fair to say, though, that each of them performs distinct *functions*, and that these different functions are why each of them has attracted its own set of researchers.

These *RGCMs* lead us to experience and conceive of the world in a certain way: in terms of byproduct *raw god-beliefs*. *Raw god-beliefs* are delivered to us as byproducts of the unconscious processes of our *religion-generating cognitive mechanisms*—the mechanisms responsible for theory of mind, promiscuous teleology, anthropomorphism, and agency detection. With these *raw god-beliefs* as our starting points, we build our

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inferential belief systems (our *refined god-beliefs*). It is this natural way of experiencing the world—through the filter of our *RGCMs* and *raw god-beliefs*—that ultimately explains the ubiquity of religious worldviews and systems. Indeed, it is the strong Byproduct claim that we naturally experience the world in this way—colored by the automatic processes that yield intuitive theism/promiscuous teleology, anthropomorphism, hypersensitive agency-detection, and our ascription of mental states to the world around us. By virtue of the kind of cognitive structures our brains have, it is not *natural* to conceive of the world contrary to these *raw god-beliefs*. These byproduct *raw god-beliefs* are not adaptations, because they contribute no adaptive benefit to speak of. Rather, they are byproducts of mechanisms that are adaptations—mechanisms that apply theory of mind, notions of teleology, and notions of agency in evolutionarily intended domains.

In the next section of this paper, I will examine how *god-beliefs* are "picked up," developed, and transmitted by human cultures. They begin as byproducts of *RGCMs* and are eventually developed by societies in the aim to have explanatory stories to tell. Learning, evolutionary forces operating at the cultural level, and contingent historical events (and perhaps *revelation*) are all active in the development of *raw god-beliefs* into *refined god-beliefs*. I will examine why these *refined god-beliefs* are selected-for by evolutionary processes at the group and cultural levels, and I will consider the sorts of adaptive benefits they confer to their respective believers.

3. *Cultural Evolution and God-Beliefs*

So far, I have proposed that the human brain possesses certain *religion generating cognitive mechanisms*. These mechanisms constitute a *religion-generating suite,* the

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processes of which give rise to the natural human tendency to form byproduct *god-beliefs*. Our propensities to conceive of the world in teleological terms, to hyper-sensitively project agency and agent intention into the world around us, and to process the world through the filter of our intuitive folk psychological mechanisms do some serious explanatory work in the area of "religion." It is these *raw god-beliefs* that are eventually developed into our *refined god-beliefs*.

My byproduct story for the origin of these *raw god-beliefs* leaves much in need of explanation. I have argued that these *raw god-beliefs* are byproducts, rather than adaptations; the byproducts were *selected*, rather than *selected-for*. *Raw god-beliefs* still characterize human psychology today—the anthropomorphizing of inanimate objects, the intuitive design/causal hypotheses to which we intuitively hold, the hypersensitive attribution of agency to the environment, etc.—but "religion" is a far more interesting phenomenon than what I have described so far. An account of these byproduct beliefs hardly serves as an explanation for the rich landscape of religious worldviews that characterizes the human experience. There is clearly more to religious belief as we know it today than the mere byproduct *god-beliefs* delivered to us by our cognitive processes.

Refined god-beliefs are far more evolutionarily consequential than *raw god-beliefs*, and as such they have played a formative role in the development of human societies and culture. As I will argue in the coming pages, it is *refined god-beliefs* (rather than *raw god-beliefs*) that have conferred adaptive advantage to the individuals and groups that have possessed such beliefs throughout recent evolutionary history. Religion is a winning evolutionary strategy. How do the byproduct *raw god-beliefs* delivered to us by our cognitive systems become more developed and systematic? How do they come to organize

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entire cultures? Why do we assent to them, and why do they persist? The *raw god-beliefs*

are our starting point, but it is human nature to tell stories and to pursue explanation

beyond the intuitions delivered by our cognitive mechanisms. These stories and

explanations take the form of culturally transmitted creation myths, systematic theologies,

folklores, etc. With our *refined god-beliefs,* we tell rich, complicated, and fanciful tales.

This section of the paper will discuss the development of religion as a group and

cultural adaptation, and it will use recent research in evolutionary biology and group

selection theory to show how religion itself confers adaptive advantage. I will argue that

religion—at the group level—is adaptively advantageous, and that the survival benefits

granted by *refined god-beliefs* help to explain why *god-beliefs* are so common to humanity. I

will also examine the natural processes by which religious beliefs, concepts, and ideas have

become so ubiquitous and varied throughout human experience.

Psychologists Barrett and Keil (1996) have framed the differences between what I

have called our *raw* and *refined god-beliefs* in ontological terms. They specifically address

the intuitive anthropomorphizing of the theistic concept of God, and they present

experimental findings that suggest we actually have *two different sets* of religious beliefs at

work regarding God.[20]   One set is our intuitive, anthropomorphized set of beliefs about God,

and the other is our non-intuitive, "theologically correct" set of beliefs about God. The two

sets are incommensurable, because they pertain to different ontological categories of

existence—the ontology of things in the natural world, and the ontology of God:

> If these religions, which have had a profound impact on Western theological
> concepts, attribute to God a vastly different type of existence than our own, how do

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[20] Barrett and Keil focus exclusively on a distinction between the theist's "theologically
correct" and "anthropomorphized" concepts of God, while I have presented a distinction
between *raw* and *refined god-beliefs,* in general.

we cross this ontological gap and understand God... If God is revealed through naturalistic means and in naturalistic terms, how then do we make sense of this revelation? How do we incorporate natural features into our representation of a nonnatural entity? An analogous problem might be to consider what it would be like to be a bat (Nagel, 1974). The other state of being is so different that the task seems impossible.[21]

They pose the question: if God, according to one's theology, is of a different ontological category than humankind—i.e., spaceless, timeless, unbound, etc.—how could humankind possibly accurately conceive of God? If God were rightly conceived of as being of a different ontological category than us, any attempt to anthropomorphize God would radically misrepresent Him or Her (or Whatever). I would pose a further question: How could our "theologically correct" *god-beliefs* possibly have developed *naturally* if their objects (God, gods, spirits, etc.) are, at rock bottom, of a different ontological category from us and from anything else we experience?

Barrett and Keil (1996) offer more on these two different belief sets that run simultaneously, but incompatibly:

> Despite theological descriptions, people seem to incorporate anthropomorphic and naturalistic characterizations into their intuitive God concepts... Perhaps conceptions of God must be anthropomorphic, even while theological beliefs maintain otherwise. It may be that the "theological God" is radically different from the "intuitive God" normally described in everyday discourse. Even individuals who explicitly endorse the theological version of God might nonetheless implicitly embrace a very different version in most of their daily thoughts.[22]

> Psychologists have long assumed that anthropomorphic language reflects underlying cognitive anthropomorphism. Freud initiated this line of thought most dramatically with the suggestion that God concepts are projections of one's father and that the start of religion is the "humanization of nature."[23]

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[21] Barrett and Keil, 1996, pg. 220.
[22] Barrett & Keil, 1996, pg. 223.
[23] *Ibid.,* pg. 221.

They provide data suggesting that when pressed to talk about God, people tend to anthropomorphize Him (to put His actions into spatial, temporal, and sequential terms, restrict Him to only having one conversation at a time, etc.), regardless of having avowed to "theologically correct" doctrinal beliefs about His divine attributes (existence outside of time, omnipresence, etc.):

> ... subjects do use anthropomorphic concepts of God in understanding stories even though they may profess a theological position that rejects anthropomorphic constraints on God and God's activities. It appears that people have at least two parallel God concepts that are used in different contexts, and these concepts may be fundamentally incompatible.[24]

> Perhaps stories involving an atemporal and omnipotent agent create processing difficulties, and an efficient way to deal with the problem is to use a simpler God concept to understand stories.[25]

All of this goes to highlight the distinction between the intuitive *god-beliefs* delivered to individuals by their cognitive mechanisms and the more reflective *god-beliefs* that are developed by societies and cultures through cultural evolution and learning (and in the theist's case, *revelation*).

The idea is that our intuitive *god-beliefs* are cognitively easier to grasp. They are more natural. In particular, the beliefs one might profess in the domain of theology are quite *unnatural* and *cognitively counterintuitive*—so much so that when under cognitive load (as when asked to recount tales about God), our cognitive systems tend to shirk theological conceptions of God for more intuitive, anthropomorphic conceptions of God (Barrett & Keil, 1996). Barrett and Keil were concerned with the "ontological gap" between our intuitive, anthropomorphic beliefs about God and our more counterintuitive,

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[24] *Ibid.,* pg. 240.
[25] *Ibid.*, pg. 243.

theological beliefs about God. The rest of this section inquires into the rise of such an "ontological gap." Although, perhaps our particular subject matter calls for a re-appropriation of their language; let's call the distance between our *raw god-beliefs* and our *refined god-beliefs* a "cognitive gap." The former are evolutionarily older and cognitively easier, while the latter are evolutionarily recent and more cognitively difficult. The former are the *natural* byproducts of our cognitive mechanisms, while the latter are the counterintuitive outputs of generations of storytelling, cultural selection, and human reasoning.

We now turn to examining the development, transmission, and adaptive value of *refined god-beliefs* and religious systems.

A. Viruses of the Mind & Meme Theory

"Virus" is a loaded term. But it is a term that, as used below, is well suited for its intended use. Some evolutionary biologists and evolutionary psychologists have likened the spread of religious worldviews to the spread of viruses. To some, the "virus" of religion is detrimental to human society; to others, the negative connotations associated with the word "virus" are not necessarily applied to religion. Here is a clear summary of the "virus view" from evolutionary biologist Robert Trivers (2011):

> What some have is a metaphor. Religion is a viral meme; that is, it is not an actual virus, which can easily bring a population to its knees, but rather it is merely a thought system that happens to propagate as if it were a virus, to the detriment of those with the belief system. Despite its negative effects, it apparently generates insufficient selection pressure to suppress the spread of this non-coevolving nonorganism.[26]

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[26] Trivers, 2011, pg. 278.

One of the biggest proponents of the "virus view" of religion is evolutionary biologist

Richard Dawkins (2003). Dawkins developed a way of thinking about "units of culture"—

the stuff that gets transmitted from one generation of a society to the next—that likens

such units of culture to pathogens. Dawkins's point was that units of culture like religious

beliefs "infect" the minds of the individuals to whom they are transmitted, and that

religious beliefs are particularly successful viruses. Dawkins (1976) cashed out his theory

in the language of "memes." His "virus" position aside for the moment, Dawkins's work on

memes is extremely helpful for my purposes. Boyer (2001) explains Dawkins's *meme*

theory:

> [Dawkins] summarized all this by describing culture as a population of *memes*,
> which are just "copy-me" programs, like genes. Genes produce organisms that
> behave in such a way that the genes are replicated—otherwise the genes in question
> would not be around. Memes are units of culture: notions, values, stories, etc. that
> get people to speak or act in certain ways that make other people store a replicated
> version of these mental units.[27]

> In this account, familiar religious concepts and associated beliefs, norms, emotions,
> are just better-replicating memes than others, in the sense that their copy-me
> instructions work better.[28]

If you will recall, Boyer (2001) laid out some necessary conditions for the successful

cultural transmission of a "god concept." He proposed a model of successful transmission

that required the "god concept" to violate certain conceptual expectations to an

appropriate degree. For instance, the concepts like "god" and "spirit" are transmitted so

well, because they fit nicely into the conceptual template we have for the concept "person,"

with the exception of a handful of counterintuitive violations (like not having a body, being

atemporal, being able to pass through things, etc.). These counterintuitive "god" and "spirit"

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[27] Boyer, 2001, pg. 35.
[28] *Ibid.*, pg. 37.

concepts are strange and memorable, but they align with the "person" concept closely

enough that they are not rendered unintelligible in our conceiving of them. So, these

concepts are counterintuitive to the appropriate degree, and our stories involving these

concepts are, as a result, culturally transmitted in a disproportionately successful way.

(Some of this helps us to understand why *god-beliefs* persist, despite the explanatory

alternatives we have at hand—they are consistent, to just the right degree, with our

intuitive expectations of the world around us and with our conceptual templates. More on

"persistence" later.)

Boyer takes Dawkins's meme theory and expounds on it. Boyer's work represents

the beginnings of our ability to understand how our *refined god-beliefs* might have evolved

from our *raw god-beliefs*:

> Cultural memes undergo mutation, recombination and selection *inside* the
> individual mind every bit as much and as often as… during transmission between
> minds. We do not just transmit the information we received. We process it and use
> it to create new information, some of which we do communicate to other people.[29]

Our religious concepts, even after countless generations of cultural transmissions, bear

significant resemblance to one another and to our more primitive *god-beliefs*. Our

conceptual templates (which are the basic building blocks for our understanding of the

world) are fundamentally unchanged by the processes of evolution; this serves to preserve

certain crucial bits of the information that we transmit culturally over time. It also helps to

explain why our *god-beliefs* share so much in common, cross-culturally. Meme theory, then,

works well in helping to show how culturally transmitted beliefs—like various *god-*

beliefs—may evolve over time into the rich variety of beliefs we see in the world; and, with

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[29] Boyer, 2001, pg. 39.

Boyer's additions, meme transmission theory serves as a useful explanation of the different cultural themes that are shared in common by many people groups. The process of meme transmission, then, is one mechanism that accounts for the spreading, transformation, and persistence of religious concepts and *god-beliefs* over evolutionary time. It is the selection of ideas.

In the cultural transmission of our *god-beliefs* over time, we do witness important changes in the content of those transmitted beliefs. But our cognitive machinery keeps us honest. People like Boyer contend that these conceptual templates anchor us, in an important sense, to the cross-generationally preserved bits of these beliefs (prevailing themes and values, common denominators across religious stories, etc.). Some of these cross-generationally preserved templates are presumably shared by all, by virtue of our *shared* evolutionary histories, while some of them are relative to specific cultures and societies, by virtue of their *unique* evolutionary histories. This helps us answer the question: what are the mechanics of the development of *refined god-beliefs* from *raw god-beliefs*? At this point we can only speculate, but I think Boyer's and Dawkins's work makes it reasonable for us to suppose that our *refined god-beliefs* are the result of a *long* line of culturally transmitted religious beliefs that have been passed, with significant overall variation, from one generation of our species to the next.

The story would need to be something like this: We (humans) began with the intuitive byproduct *god-beliefs* provided to us by our cognitive mechanisms. At some point, our ancestors began to tell explanatory, religious stories. These stories would have provided answers and explanations for unexplained phenomena, would have explained our ancestors' place in the world, would have provided them with a sense of meaning, and

would have unified various cultures. These stories were adaptive, specific to the environment inhabited by a given people group and specific to the contingent historical events with which a given people group was required to reconcile their existence. As we learned about our environment, about ourselves, and about the various gods that we believed in, these religious stories would have morphed over time. The variation in the content of *memes* over evolutionary history provided fodder for the processes and pressures of natural selection and adaptation, but the constancy of our conceptual templates across time and cultures kept our *god-beliefs* and "god concepts*,*" to an important degree, anchored to their original copies. As a result of this long process, we are left with the *god-beliefs* possessed by believers today, the world over. Each culture holds its own unique evolutionary history, inevitably providing us with the diverse landscape of religious stories and worldviews that we find in modern times.

There are various conventions to which we might appeal to help explain the formation, development, and spread of religious beliefs across time. For instance, societies throughout time have transmitted unique creation myths and folklores, and they have told stories to transmit not only these myths, but also the history of the given society. According to my account, primitive versions of these myths and folklores would have been heavily informed by *raw god-beliefs*, by the religious notions naturally delivered to them by their cognitive processes. Indeed, primitive cultures told stories about their histories that were laced with religious concepts, non-natural events, and divine characters, to the extent that in many cases it is difficult to determine factual history from mere myth. Early societies saw their histories in light of these religious narratives. As societies grew, spread, made conquest, and established trade with other parts of the world (or region), their

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stories spread. With the rise of more advanced (and written) language, religious ideas would have become more effectively communicable. With the rise of religious institutions and centers of learning, religious concepts and stories would have been solidified, canonized, and preserved for later generations. With the rise of religious kingdoms and states—or their more primitive counterparts—religious belief and participation would have become a source of group identity, and participation in the religious identity of a society may have been compulsory (ensuring the spread of religious ideas).

This is all conjectural, but we can probably only tell the sketch of an evolutionary story in trying to account for a phenomenon that is so ancient and varied as "religion." Throughout evolutionary history, there would have been an extraordinary number of evolutionary events and pressures. However, I have set out to explain the mechanisms at work in each stage of that process, so as to show that such an admittedly vague story is plausible. For reasons I will discuss shortly, I reject out of hand the language used by Dawkins in his characterization of religious belief as a "virus of the mind"—a parasitic maladaptation that exists to the detriment of believing individuals and cultures. As if the pervasive presence of religious beliefs in the human experience were not enough evidence[30], there is an enormous body of research and literature that highlights the adaptive benefits of *god-beliefs* (more on this, shortly).

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[30] Granted, many *harmful* viruses are pervasive, and this might seem to serve as a counterexample to what I just said. However, biological viruses in nature have interests that are served by the harm that is caused to their hosts; biological viruses can exist to our detriment, and it is to their adaptive advantage to do so. Cultural "viruses," on the other hand, are given life by their host (the believer) due to the benefits that are conferred to the *believer*. We should expect that, over time, maladaptive cultural "viruses" would be selected against, and that our psychologies would be so constituted by evolutionary pressures as to propagate beneficial viruses.

B. Group-Level Selection

Biologist and anthropologist David Sloan Wilson has done significant work to show that religion—as a moral system that facilitates specific group behaviors—is a product of what he calls "multilevel selection" (Wilson, 2003). He rejects the idea that the phenomenon of religion as we know it today is the result of evolution by natural selection operating strictly at the genetic level. Instead, he advocates for a group-level selection model in order explain various societies' religious worldviews:

> A middle ground is becoming established in which groups are acknowledged to evolve into adaptive units, but only if special conditions are met. Ironically, in human groups it is often religion that provides the special conditions. Religion returns to center stage, not as a theological explanation of purpose and order, but as itself a product of evolution that enables groups to function as adaptive units—at least to a degree.[31]

In his work, Wilson advocates for the return of group selection as a viable way of thinking about the development of cultures, societies, and organisms. He recounts the falling-out of this particular view among evolutionary biologists in the latter half of the twentieth century:

> Although many social scientists take the organismic concept of society for granted, evolutionary biologists in the 1960s rejected group selection so strongly that it became heretical to think of "society as an organism"... for humans or any other species... The illusion of adaptation at the group level can be explained in terms of individuals increasing the fitness of their genes in the bodies of others, reciprocal exchange, or even more self-serving benefits such as downright deception and exploitation.[32]

Wilson, though, takes issue with this hardline evolutionary biological approach.

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[31] Wilson, 2003, pg. 6.
[32] *Ibid.*, pg. 12.

The group selection dynamic enters in when we consider that much of religious belief—and the behavior that results from it—is strictly *social*. Religious beliefs determine how individual members of a community ought to treat one another, how they ought to regard themselves, and how they ought to treat those outside of their community. Religious belief has practical implications in the areas of morality, public health and hygiene, and the structuring of society. When the trait under consideration is a *non-social* behavior that alters the fitness of the individual alone, it is not appropriate that we consider that trait to be a product of group-level selection. But when the trait under consideration is a *social* behavior (pertaining to group morality, health, structure, etc.), then the individual's fitness is not properly considered in isolation; the traits of the others in its "trait-group" must be considered. For *social* behaviors, the functioning of the social group as a whole must be considered. Wilson posits this intimate relation between traits and groups in his multilevel selection theory.[33] Along these dimensions, groups are considered organisms in their own right, complete with group traits that are up for selection.

Because religious beliefs tend to facilitate the moral systems and order of a given society, the religious beliefs of groups as a whole—beliefs that lead to *social* and *pro-social* behaviors—are up for selection at the group level. To the extent that such religious beliefs positively affect how the group functions, positively contribute to the survival of the group relative to other groups, and facilitate the transmission of religious beliefs through biological reproduction or through cultural reproduction (i.e., the conversion/assimilation of other populations), the religious beliefs are properly regarded as successful strategies

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[33] *Ibid.*, pg. 15.

for their respective groups. To whatever extent religion facilitates greater group cohesion

and the reproductive success of the group's individuals, a group's religion is appropriately

conceived of as an *adaptively advantageous* strategy. Both the genes and the beliefs of the

groups that employ *refined god-beliefs* as adaptively advantageous strategies should be

expected to be favored in future generations. Groups that utilize effective religious belief

systems as cultural adaptations are expected to succeed disproportionately well. The

cultural traits of these groups are selected, and the groups become successful adaptive

units. When this happens, according to Wilson, a society or group becomes a "higher-level

organism in its own right."[34] As long as we conceive of religion as a phenomenon that

successfully facilitates group benefit, religion should be considered an adaptation designed

by the forces of cultural evolution and group-level selection.

Wilson goes to bat against the too-narrow explanations of religious belief

conventionally taken by evolutionary biologists and psychologists. He thinks the story is

more complicated, and that some evolutionary stories do not leave room for learning,

development, and so forth:

> [What] we must understand from an evolutionary perspective is that moral systems
> include an open-ended cultural dimension in addition to an innate psychological
> dimension. Our genetically evolved minds make it possible to have a moral system,
> but the specific contents of moral systems can change within groups and vary
> widely among groups, with important consequences for survival and
> reproduction.[35]
>
> [The algorithm of evolutionary psychologists is as follows:] For any particular
> feature of human behavior and psychology, try to understand it as a genetically
> evolved adaptation to a feature of the ancestral environment. Then try to imagine
> the psychological mechanism as a specialized module… My complaint is not that the
> [described] algorithm is wrong but that it is partial, seeming to exclude the

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[34] *Ibid.*, pg. 17.
[35] *Ibid.*, pg. 28.

possibility of learning, development, culture, and other aspects of human mentality as open-ended processes.[36]

What Wilson calls for is a model of our psychology that allows for "open-ended processes." Borrowing from Plotkin (1994), he argues that we ought to understand our cognitive processes as "Darwin machines," as evolved systems that accommodate evolution within their own structures. He cites human rational thought as an example of a Darwin machine, as it generates and processes novel representations internally. Religion as we know it today, Wilson argues, is not a phenomenon for which our ancient environments and evolved cognitive mechanisms (and, therefore, genes) are fully responsible. Rather, modern manifestations of religion (*refined god-beliefs*) are evolutionarily recent developments that come in response to evolutionarily recent environments and selection pressures—and this development of religion is largely cultural, rather than genetic. Religious beliefs are properly conceived of as the outputs of our "Darwin machine" rational belief-formation processes. The evolution of cultural belief systems, then, is not occurring at the level of our genes or cognitive mechanisms, but rather at the level of cultural knowledge.[37]

Wilson's views are summarized, with an emphasis on the role that group selection plays in the emergence of "organismic groups":

> Organismic groups do not automatically evolve but require a process of group selection. Group selection can be a potent evolutionary force, despite its widespread rejection during the age of individualism… Moral systems have an innate psychological dimension but also an open-ended dimension that allows human history to be seen as a fast-paced evolutionary process with cultural rather than genetic mechanisms of inheritance.[38]

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[36] *Ibid.,* pg. 29-30.
[37] Wilson, 2003, pg. 31, 35.
[38] *Ibid.,* pg. 36-37.

> Moral systems include both an innate psychological component and an open-ended cultural component that enables groups to adapt to their recent environments. Belief in supernatural agents and other elements that are associated specifically with religion can play an important role in the structure and function of moral communities.[39]

Just as Wilson concedes that the development of moral systems (and religions, in as much as religions facilitate moral systems) is due to both an "innate psychological component" and an "open-ended cultural component," we should grant that the emergence of groups as adaptive units likely incorporates a similar combination of "innate stuff" and "open-ended" stuff. We probably do have adaptively advantageous innate tendencies that lead us, as individuals, to form into social groups with other individuals, quite independent from religious systems or beliefs. For example, kin-selection and reciprocal altruism mechanisms probably serve as the cognitive foundation for group-orientation, while the cultural-level adaptation of religion (i.e., religion as a facilitator of morality) has only reinforced our propensity to build societies and live our lives in groups. Wilson's points contribute wonderfully to our understanding of religious systems as group adaptations designed to solve evolutionarily recent problems. There is no need for an "either/or" approach to all of this; in accounting for why humans are social creatures, it is probable that evolutionary biologists and evolutionary psychologists tell an important part of the story (adaptationist explanations that explore the benefit of kin-selection and reciprocal altruism mechanisms at the level of *individuals*), while the social scientists and Wilson tell the remainder of the story (multi-level selection explanations that explore the benefit of religion at the level of *societies*).

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[39] *Ibid.,* pg. 44.

Boyer (2009) provides his own take on cultural evolution, inspired by the work of cultural anthropologists:

> … what we observe as cultural representations and practices are variants (of cultural traits), found in roughly similar forms in a particular place or group because they have resisted change and distortion through innumerable processes of acquisition, storage, inference, and communication.[40]

They recount the work of Boyd and Richerson (1985):

> … the spread of specific variants of cultural representations (such as a particular religious belief or concept represented by a human mind) is seen as partly analogous to the spread of alleles in a gene pool. In particular, the tools of population genetics can be applied to the spread of cultural traits and allow us to predict their spread, given such parameters as the initial prevalence of a trait, the likelihood of transmission, and various biases. [41]

This is much like Wilson's proposal. Also discussed is the work of Dan Sperber (2000), in which the cultural transmission of beliefs is presented in an "epidemiological model." In such a model, the process of belief transmission is highly "entropic"—that is, the communication of beliefs produces a large number of different representations in a large number of different minds. That there is some commonality among these different representations demands explanation, and the explanation is found in the fact that peoples' "inferences are guided by tacit principles that happen to be identical in all normal minds" (Boyer & Bergstrom, 2008). This sounds akin to Atran's (2002) account of "evolutionary landscapes" and Boyer's (2001) theory about conceptual templates and related automatic inference systems. All in all, these bodies of work (along with meme theory) provide a compelling case for the position that cultural evolution explains the transmission and development of our various *refined god-beliefs*.

[40] Boyer, 2009, pg. 290.
[41] Boyd & Richerson, 1985, pg. 113.

Not all religions are created equal. This truth gives strength to a "multilevel selection" hypothesis like Wilson's. Some religious beliefs lend to their respective culture great adaptive advantage, and other religious beliefs do not—it is this disparity that gives the processes of selection at the cultural level something to work with. In addition to the *meme* theory presented by Dawkins and Boyer (which helps us to understand how religious beliefs change conceptually across time via cultural transmission and via the various mechanisms in place that affect how well we retain certain types of beliefs), Wilson's "multi-level selection" take on religious beliefs goes a long way toward accounting for the vastly diverse bodies of *god-beliefs* that we observe across human cultures across time.

As such, I believe that we can reasonably conclude that the diversity of *god-beliefs* in human experience is largely explained by:

1. The byproduct *raw god-beliefs* provided by our *RGCMs*,

2. The processes of cultural evolution and multilevel selection, and the adaptive advantage conferred to a cultural group by its respective *refined god-beliefs* (this includes meme theory and the different rates of success of "copy me" programs in the cultural transmission of *god-beliefs*), and

3. The manifold of human experience (i.e., across time, people have experienced the world in radically different environments and with radically different historical contingencies).

Each of these is a crucial factor in understanding the origin, development, and diversity of our *god-beliefs.*

C. Adaptive Cost/Benefit Analysis

One way to proceed in considering the notion that our various *god-beliefs* may be adaptations (either cultural or biological) is to perform a cost/benefit analysis of sorts. We need to weigh the *costs* of religion against the *benefits* to determine if we can plausibly believe that religious systems might have conferred adaptive benefit to their respective adherents. Fortunately, the body of research in this particular area is rich. With a few exceptions, the literature indicates that we have good reason for believing that religious beliefs and systems *are* adaptations at the group level, and that *refined god-beliefs* also confer adaptive benefits to individual believers. Before we proceed into the details, it will be useful to keep in mind that our *god-beliefs* are operating at two different levels—the *intuitive* level and the *reflective* level. At the reflective level are what I have termed our *refined god-beliefs*; these are the more sophisticated, inferential, and socially oriented beliefs. At the intuitive level are what I have termed our *raw god-beliefs*; these are the byproducts of our normal cognitive processes. We have conceived of these *raw god-beliefs* as the bare foundations for the construction of *refined god-beliefs*. Between these two levels, there is a "cognitive gap"; the former are evolutionarily ancient and cognitively *easy*, while the latter are evolutionarily recent and tend to be much more cognitively *difficult*.

These two "levels" warrant different empirical approaches. Anthropologists and social scientists of religion have made the societal-level *refined god-beliefs* the target of their work, while evolutionary psychologists and cognitive scientists of religion have targeted the cognitive-level, *raw god-beliefs* with their work. Since the *social* religious beliefs are evolutionarily recent (recent, that is, relative to the evolutionarily *ancient* intuitions offered to us by our *RGCMs*), the study of modern religious systems is relevant to

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understanding their adaptive benefit. Since the *cognitive* religious beliefs are

evolutionarily ancient, the study of modern religious systems is quite irrelevant to

understanding the underlying cognitive mechanisms (unless we are considering how our

raw god-beliefs might have given rise to our *refined god-beliefs*); the psychological study of

the relevant cognitive mechanisms, though, does give us valuable insight into how our *raw*

god-beliefs may have helped us to survive ancient environments. Both approaches—the

cognitive and the anthropological—ultimately appeal to evolutionary processes.

So, I now officially propose: "*Refined god-beliefs* are adaptively advantageous, both

for individual organisms and for groups."[42] The next part of the paper will serve to

examine this proposition. By no means will this section be a comprehensive examination of

the adaptive costs and benefits of religion. Rather, I will hit the main talking points of those

who advocate for the fitness-enhancing nature of our *god-beliefs*. I will do my best to avoid

evolutionary "just-so" stories—convenient, *ad hoc* explanatory hypotheses that often come

under fire from the critics of evolutionary theory—and will instead stick to the task of

showing the reasonability of believing that religious beliefs are fitness-conferring

adaptations.

C-1. Cost, or Investment?

On the face of things, *god-beliefs* as we know them today—systematized worldviews

with values and goals that are seemingly opposed to humans' adaptive advantage—seem

incredibly maladaptive. Many religious systems establish moral boundaries in the areas of

procreation, bodily defense, and the accumulation of personal resources, and this seems to

be a sure-fire strategy for evolutionary failure. Yet, here we are today, with entire lists of

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[42] In all cases, *refined god-beliefs* are transmitted *culturally*.

thou shall not's that place restrictions on things like extra-marital sex, violence, and material abundance. At first glance, this seems an unwise evolutionary strategy. After all, in the natural world the winners are those who can reproduce successfully (relative to others), kill their enemies, and not starve to death.

That considered, if we are to propose that *god-beliefs* are adaptations, rather than maladaptations, we must contend that the benefits to religious believers outweigh the apparent costs. Boyer and Bergstrom (2008) have done just that, attacking the apparent costs head-on:

> A striking characteristic of most religious thought and behavior is that they do not seem to confer any direct fitness advantage on the practitioners. So, from an evolutionary viewpoint, most religious phenomena might seem to be either maladaptive or adaptively neutral.[43]

> However, evolutionary biology also documents specific ways in which fitness costs can become adaptive. This is particularly so in the case of signaling, an area of intense work in recent evolutionary biology… Signaling requires the coevolution of sender and receiver capacities… biologists have focused especially on costly signals, which are reliable because they are difficult to fake and thereby provide direct indices of the fitness qualities they are supposed to advertise.[44]

Boyer and Bergstrom have proposed that, while religion is what they call a "costly signal," the successful performance of such a costly signal actually leads to greater adaptive benefit at some later point, as a "delayed reward." They point out, "Cooperation often requires that people sacrifice an immediate benefit for a delayed reward." So, their notion of religious belief as a costly signal only works if we understand religious belief in the context of intra-group relationships. Their conception of religious beliefs as costly signals helps us to

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[43] Boyer & Bergstrom, 2008, pg. 115.
[44] *Ibid.,* pg. 115.

understand the adaptive benefits of religion in terms of the adaptive benefits of group

membership, relations, and cooperation.

Boyer and Bergstrom (2008) discuss the costs and benefits of the performance of

such costly signals:

> In a more general way, religious thought and behavior would seem to mobilize
> cognitive resources away from survival and reproduction, being focused on
> nonphysical imagined agency. Assuming that religious activity is costly, does it
> provide signals? To a large extent it does, given that most activity of this kind is
> both public and formalized, so that people's commitments to the local ritual system
> are observable by all (Sosis 2003). On the basis of a comparative study of small
> communities, Sosis showed that cost is indeed an important factor. Religious
> groups that require a greater investment in costly rituals tend to remain more
> cohesive…[45]

If their story is correct, it indicates that group-membership and the adaptive benefits

thereof are more advantageous to the individual than are the individual's abilities to

cognize about non-religious things (like survival and reproduction). They do not say it so

boldly, but the proposal is essentially something like: the precious resources spent on

religious thought and ritual are a drop in the bucket compared to the resources gained by

group identity, intra-group trust, reciprocated altruism, shared resources, etc. At the very

least, the costs are eventually outweighed. So, perhaps such costly religious signals are

best regarded not as being adaptively *beneficial* or *costly*, but as being adaptive *investments*.

Religious signaling is an especially effective mechanism for communicating group

identification, because a religious signal tends to be a *binding* signal. In one sense, religious

signals are "binding" just in that they tend to be costly. Costly religious signals tie one to

one's religious community in important ways—significant resources, time, and energy are

spent in participating in a group's religious identity; costly signals are harder to fake than

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[45] *Ibid.,* pg. 116.

inexpensive signals.[46] We can regard religious signals to be "binding" in another sense when we understand what, exactly, is being communicated by the signaler in his or her participation in a given religious practice. Signaling one's affiliation with a particular religion is not like wearing a name badge—it communicates so much more than just assent to a particular religious worldview and a desire to reap the benefits of group membership. Religious signaling communicates shared values, shared priorities, one's intention to belong to the group, one's intention to make sacrifices for the group, one's intention to treat the other individuals of the group as of one's "in-group," etc. So, signaling religious affiliation is "binding" in the sense that it allows others to expect certain things of the signaler.

Signaling religious affiliation is "binding" in one final aspect: religious belief holds a privileged place in peoples' lives and in society. One's religious beliefs encompass the individual; a society's religious beliefs act as guiding principles, core values, and social norms. Signals based on non-religious ideology could very well be used to communicate group identity; it seems religious signaling, however, enjoys a unique ability to communicate to others the way that one sees oneself and one's relationship to the world, to the divine, and to other people. Truly, religious signaling is difficult (and risky) to fake, as it

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[46] "Inexpensive signals," in the realm of religious belief, might include things like verbal commitment, mere profession of a belief, etc. "Costly" religious signals include things like participation in community ritual, spending valuable resources and time demonstrating one's devotion to a religious system, denying one's desires and interests in commitment to a religious system that urges pro-social or altruistic behavior, etc. It is these "costly" signals that make religious identification hard to fake. Sure, anyone can commit verbally to a belief system. The idea is that one's access to group membership would be contingent on one's willingness to spend the resources on these signals. "Costly" signals are hard to fake, as religions tend to be demanding. The costs of being "found out" might include ostracism or the withholding of the benefits of group membership. (Or things like being stoned to death, or being burnt at the stake.)

signals core metaphysical commitments. Groups that signal *god-beliefs* in religious ritual or in religious organization enjoy an added benefit of being pronouncedly tight-knit (Norenzayan & Shariff, 2008)—this helps to explain why religion and the signaling of religious affiliation were favored over alternative kinds of society-organizing belief systems and the signaling associated with them.

God-beliefs* might also be appropriately conceived of as a social gatekeeper. If the ability to successfully signal a religious worldview is what confers to you the crucial benefits of belonging to the larger group, then those benefits are not conferred if the signal is not sent. Religious and ritual adherence might, in a literal sense, be a ticket to the adaptive benefits of group membership—both in our evolutionary past and in the present. It might be worth clarifying that the "rituals" that serve as costly signals may be as "primitive" as things like initiation rites, or as "modern" as things like church attendance. No matter where one is along the spectrum of cultural religious practices, the idea is that such a signal is initially costly, but then eventually yields a return. All of this is not to say that there are not, in fact, costs associated with our *god-beliefs* (particularly, our *refined god-beliefs*). Rather, it is just the claim that the benefits of such beliefs—the benefits associated with group membership and inclusion—come to far outweigh the initial costs both of believing a certain way and signaling those beliefs.

C-2. Health & Well Being

Another approach in determining the adaptive benefit of religion and *god-beliefs* is in the direct psychological study of modern religious adherents. Whatever benefit or cost can be found in the study of modern religiosity is useful for us, in as much as these costs and benefits tell us about the costs and benefits of the religious systems of our evolutionary

past. To whatever extent present day religious beliefs are like the beliefs of our ancestors, such psychological studies may contribute to answering the question of whether or not religion is an adaptation. Psychologist Kenneth Pargament (2002) has conducted research in this area. He lists the conditions under which religious beliefs confer well-being or harm to their adherents:

> Some forms of religion are more helpful than others. A religion that is internalized, intrinsically motivated, and built on a belief in a greater meaning in life, a secure relationship with God, and a sense of spiritual connectedness with others has positive implications for well-being. Conversely, a religion that is imposed, unexamined, and reflective of a tenuous relationship with God and the world bodes poorly for well-being, at least in the short term.[47]

Pargament focused his research on the modern American religious landscape, but I believe his findings also give us structure for understanding the adaptive costs and benefits of other non-Western or non-modern religions.

There are certain key themes in Pargament's findings that can serve as *criteria* for evaluating the adaptive advantage or disadvantage of religious worldviews that look quite different from Western theism. Such criteria include the successful internalization of religious beliefs, the intrinsic motivation of one's religious practices/behavior, a sense of greater meaning as derived from one's religious beliefs, a sense of spiritual security as conferred by one's religious beliefs, and a sense of spiritual connectedness with others. It is up for empirical research to decide this, but I would imagine that even absent a literal concept of "God," if a given religion, spiritual worldview, or cultural practice meets the benefit-conferring *structure* outlined by Pargament, we might reasonably expect it to confer the same well-being and benefits that the particular religions Pargament studied did

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[47] Pargament, 2002, pg. 177.

in fact confer. Given this, it is not belief in "God," *per se*, that confers such benefits; rather, the psychological benefits are products of the *structure* of the religion. In principle, such benefits could be had with a strictly secular worldview, were it a secular worldview structured so as to facilitate the common themes studied by Pargament.

Pargament also drew conclusions about which types of people most benefit from the types of religion he studied:

> Not everyone experiences the same benefits from religion. Religiousness is more helpful to more socially marginalized groups (e.g., older people, African Americans, women, poor people) and to those who are more religiously committed.

> Religious beliefs and practices appear to be especially valuable in more stressful situations... that push people to the limits of their own personal and social resources. Some evidence also suggests that religion is particularly helpful to Roman Catholics dealing with controllable life stressors and to Protestants coping with uncontrollable life events.[48]

Pargament summarizes that the "efficacy of religion depends on the degree to which it is well integrated into peoples' lives." Individuals who most benefit from their religion are ones who are a part of a social environment that encourages their faith. Also benefiting are those who are best able to blend their "religious beliefs, practices, and motivations harmoniously with each other." Conversely, individuals who did not fit those descriptions—individuals whose religious identity is not supported, whose religion is unfit for their problems, and whose beliefs and practices "lack coherence with each other"— received *harm*. Individuals who were unable to fully integrate their religious beliefs actually suffered in their well-being.

Pargament (2002) mentions marginalized groups as those people who benefit particularly well from religion (because religious beliefs are embedded more deeply into

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[48] *Ibid.,* pg. 178.

their culture) and stressful situations as those events that best elicit particular benefit from religious beliefs (because faith is an effective coping mechanism in response to events outside of one's control). As has already been mentioned, what needs to be empirically studied is whether or not non-religious worldviews confer psychological well-being to their adherents, if the benefit-conferring *conditions* of these religious belief systems (Pargament's internalization, intrinsic motivation, coherence, etc.) are met by the non-religious worldviews. It is unclear how salient a factor *religion itself* is in these psychological studies—the more salient factors could be the social and psychological factors we have discussed.

One way to interpret Pargament's findings is that the psychological well-being was not conferred by the religious beliefs at all, but by the ability of an individual to internalize their chosen worldview, be a part of a supportive community, come up with a coherent worldview, etc. One might contend that it is not religious belief itself that confers adaptive benefit, but rather the psychological ability to cope with the worldviews provided by such religious beliefs. After all, some of Pargament's most important findings detail how it is the people who have not fully integrated religion into their lives that are more psychologically at risk. Anyhow, all of that aside, Pargament would probably insist that the most fitness-enhancing religions are the ones that produce believers who can meet those criteria for receiving psychological benefits; if a religion can facilitate the psychological well-being of its adherents, it is properly regarded as fitness-conferring. The religions that cannot facilitate those things actually do psychological harm to adherents (i.e., lead their lukewarm adherents into resource-demanding cognitive dissonance). The individuals

within successful religions who do not meet the various standards (internalization, intrinsic motivation, etc.) also suffer *costs* accordingly.

There is also an important relationship between religion and behaviors that are conducive to physical health. Biologist Robert Trivers (2011) discusses this relationship. He recognizes that religions often encourage healthy behavior, and he references the effects of religious belief on improved immune function. Trivers also cites the positive effect of music on immune function. Medicine and music both provide placebo benefits to some, and both were "originally embedded" within religion.[49] However, many of the health benefits of religious belief and affiliation might be due to the benefits of positive belief and group membership, in general, and not to religious belief, in particular. But, insofar as religious belief facilitates an individual's positive belief and membership in a supportive group—i.e., insofar as religious belief confers to the believer the advantages that come with those things—then religious belief is rightly considered to be incredibly beneficial. Trivers also discusses the positive immune effects of disclosing trauma, and he contends that religious disciplines like confessionals and private prayers may each facilitate this benefit.[50]

These things taken together, a strong case can be made for the positive effects of religion on physical and psychological health. Over the course of cultural evolution, we would expect the religions and cultural practices that facilitate psychological and physical well-being to be successful relative to belief systems that do not. As we have seen, one issue of contention is how salient a factor religious belief itself actually is; it is possible that the more efficacious factors are things like positive belief and supportive group

[49] Trivers, 2011, pg. 279.
[50] *Ibid.*, pg. 287.

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membership, in general. Regardless, in as much as religion facilitates beneficial things like positive belief and supportive group membership, religion can itself be appropriately construed as an adaptively advantageous strategy.

C-3. Group Cohesion & Pro-Social Behavior

Psychologists Ara Norenzayan and Azim Shariff (2008) discuss the adaptive advantages of religious beliefs, relative to the development of large-scale societies and pro-social behavior:

> Religious prosociality, thus, may have softened the limitations that kinship-based and... reciprocity-based altruism place on group size. In this way, the cultural spread of religious prosociality may have facilitated the rise of stable, large, cooperative communities of genetically unrelated individuals.[51]

> The cognitive awareness of gods is likely to heighten prosocial reputational concerns among believers, just as cognitive awareness of human watchers does among believers and nonbelievers alike. However, supernatural monitoring, to the degree that it is genuinely believed and cognitively salient, offers the powerful advantage that cooperative interactions can be observed even in the absence of social monitoring.[52]

Because kinship selection mechanisms and reciprocal altruism models put a biological cap on the size of social groups, the rise of large communities of genetically unrelated individuals needs explaining. Norenzayan and Shariff propose that it is religious pro-sociality that, in fact, enabled societies to move past the restrictions placed on group sizes by the relatively weak human ability to monitor group members' behavior; it was the pro-social behavior that resulted from religious beliefs, they argue, that facilitated the rise of larger societies. In short: if religion provides a God or god-concept that serves to monitor my neighbor's behavior in a way that I cannot, then that God or god-concept will effectively

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[51] Norenzayan & Shariff, 2008, pg. 58.
[52] *Ibid., pg. 58.*

facilitate my trusting my neighbor, my good faith toward my neighbor, and my continued

altruism toward my neighbor. Further, if a God or god-concept provided by a religious

system can stand in to facilitate a behavior toward strangers that mirrors my behavior

toward my kin or toward those who have acted altruistically toward me, then such a God or

god-concept can be expected to contribute to the growth and stability of a group entity.

Norenzayan and Shariff discuss the effects of religious belief on group cohesion in

particular:

> … religious behavior that signals genuine devotion would be expected to mobilize greater cooperation and trust, and when internal and external threats to group survival are high, religious groups would be expected to outlast secular ones… large societies that have successfully stabilized high levels of cooperative norms would be more likely than smaller ones to espouse belief in morally concerned gods who actively monitor human interactions.[53]

> Attitudinal surveys show that religious individuals are perceived to be more trustworthy and more cooperative.[54]

Norenzayan and Shariff conclude that, to whatever extent religious belief can be effectively

signaled, then it might enhance in-group personal trust, lower the costs of monitoring

others' behavior, and then eventually reinforce intra-group pro-social tendencies. In small-

scale societies, freeloading is not much of an issue, as the behaviors of individuals can be

easily monitored. However, in larger-scale societies, the behavior of individuals is much

more difficult to keep track of; as such, in larger-scale societies freeloading is a weightier

issue. So, religion might properly be regarded as a successful anti-freeloading adaptation,

by which committed individuals are pressured to cooperate not by other individuals, but by

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[53] *Ibid.,* pg. 59.
[54] *Ibid.,* pg. 60.

God, god-concepts, or religious systems of moral norms, obligations, and expectations. The cost of such signals holds the signalers accountable to their commitments.

Many of Norenzayan and Shariff's (2007) conclusions are based on research they conducted in the area of religious primes and economic games. Their findings are fascinating: priming their subjects implicitly with God-concepts led their subjects to allocate more money to an anonymous stranger, relative to when a neutral (or no) concept was activated. Their conclusions are that the implicit activation of religious concepts gave individuals a greater tendency toward pro-social, moral behavior. They propose two explanations of the pro-social behavior (2007): (1) such God-concepts are unconsciously linked to concepts of generosity, and when a God-concept is activated there is an "ideomotor" effect (a power of suggestion) on generosity, and (2) the activation of a God-concept activates in the subjects a "felt presence of supernatural watchers." I see no reason why both cannot be the case; if god-concept primes have an "ideomotor" effect on more generous behavior, it might be that the god-concept primes have an "ideomotor" effect on the notion of an all-seeing watcher and any pro-social behavior associated with that.

Interestingly, the pro-social effect was activated just as strongly when subjects were primed with concepts associated with secular moral authority—government primes, police primes, law primes, etc. Norenzayan and Shariff (2008) discuss these findings and the rise of morally "reliable" secular institutions:

> Although religions continue to be powerful facilitators of prosociality in large groups, they are not the only ones. The cultural spread of reliable secular institutions, such as courts, policing authorities, and effective contract-enforcing mechanisms, although historically recent, has changed the course of human prosociality. Consequently, active members of modern secular organizations are at least as likely to report donating to charity as active members of religious ones... there are many examples of modern, large, cooperative, and not very religious

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societies… that, nonetheless, retain a great degree of intragroup trust and cooperation.[55]

So, both "God-concept" and "secular moral authority concept" primes lead individuals to greater pro-social behavior. This is a matter to be settled by empirical psychologists, but it seems that the common thread between those two kinds of primes are the notions of "authority" and "being watched." Regardless of whether the prime is a God-authority or a secular-authority, it might be the activation of an "authority" concept that is sufficient for the activation of the tendency toward pro-social, morally responsible behavior. That we have social, moral authorities that are secular is a distinctly modern phenomenon—it might be that our "moral authority" concepts are so conceptually related to our "God" concepts that the activation of a "secular moral authority concept" actually activates our "God" concepts, too. There is much ground for insightful empirical work, here. At the very least, the two ("God" concepts and "secular moral authority" concepts) are sufficiently related, such that the activation of each individually, independent from the intended activation of the other, successfully yields pro-social behavior.

The information provided by Norenzayan and Shariff gives us good reason to suppose that "God concepts" might have helped to facilitate the rise of large, stable societies in our evolutionary past. These concepts are thought to engender intra-group trust and cooperation, and they are thought to have contributed to the emergence of particular *kinds* of groups that would have been more successful than their rivals (i.e., the kinds of groups in which individuals are primed by their culture and religion for pro-social behavior). Contemporary studies of these pro-social religious primes (and now secular

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[55] Norenzayan & Shariff, 2008, pg. 62.

primes) are glimpses into our evolutionary past that help us to understand the inner workings of our ancestors and their developing societies. Further, they reveal, to some extent, the evolutionary effect that religious beliefs and systems might have had on them socially.

C-4. Religion as Costly

Given current events, it might seem strange that I am arguing that religious beliefs are *advantageous*, in any sense. Indeed, the responsibility for much violent conflict in historical and modern times belongs to those motivated by religious reasons or by religious conflict. Crusades, Inquisitions, and witch hunts, for instance, were carried out for the glory of God; the rise and fall of Islamic kingdoms in the Middle East has been characterized by religious conquest and Sunni-Shi'a ideological disputes; the distinctly modern threats of terrorism, violent religious extremism, and religious persecution are carried out by practitioners from nearly every primary world religion; entire minority groups are wiped from existence in religiously-motivated genocide; and religious conflict steers many nations' geopolitics and military engagement.

In light of these things, a statement like, "Religious belief is adaptively advantageous," might seem absurd. After all, none of those consequences of religious belief is "advantageous" in any normal sense of the word. I must concede, of course, that religious conflict is indeed *costly*. When religious conflict becomes war, it is impossible to deny that the economic, societal, and human tolls of "religion" are frighteningly high. So, in order for me to maintain that religious beliefs are advantageous, I must do so in light of these undeniable truths. My claim must be that, despite these apparent costs, *god-beliefs* yield to us a net adaptive advantage.

We will begin with religious war and conflict. It seems impossible to say that religious belief is adaptively beneficial to individuals engaged in religious conquest—be it religious conflict on the scale of the Crusades, or religious conflict between two neighboring tribes. Clearly, sincerely held religious beliefs are detrimental to one who *dies* in religious conflict (assuming, of course, that it was a religious belief that landed this individual or his society in violent conflict). Religious beliefs are equally costly to the culture that is wiped out either by forced assimilation into an invading religious society or by a catastrophic loss of population in violent conflict. Put in very crass terms, religious belief is costly to the *losers* of religious conflict. However, what is religious belief to the *winners* of religious conflict? I propose that, for the victors of religiously motivated conflict, religion is a successful tool of conquest; it is a unifier, motivator, justifier, and cultural symbol. Religion provides *justification* for going to war (and for reaping the benefits of war). Certainly, there are material and human losses to all sides in nearly every violent religious conflict; however, there are also *winners* in most such conflicts. For a given society, for instance, war is a great means of material gain—an enemy's resources, an enemy's population, an enemy's strategic location, an enemy's exploited labor, etc.

It is true that the winners of religiously motivated conflict *also* suffer losses of resources and life. I can grant this, however, and simultaneously maintain that religious belief is adaptively advantageous at the group level, as long as the society in question gains more than it loses—resources, location, ideological supremacy, the population of a conquered people, etc. Certainly, at least *some* religiously motivated conflicts in evolutionary history have resulted in a net loss for a religious group. However, my position (that *refined god-belief* is a winning strategy) depends only on the proposition that

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religious conflicts resulted in a *net gain* for those involved of the religious sort. In this way, *refined god-belief* can be conceived of as adaptive, even in light of the resources lost by the winning side. It is worth noting, too, that warriors can be killed and crops burned (or whatever), but that religious concepts and ideas are not similarly destructible. Losses that are short of catastrophic to a religious group that has "won" (or lost) a given conflict might serve to galvanize their religious concepts, stories, and culture. Whatever the case, success at war is a great way to mitigate competition with neighboring groups. At the cultural level, war is also a successful strategy of ideological conquest: how better to ensure the spread of a society's beliefs and values than by that society's imposition of its beliefs upon neighboring populations?

  If religion can be properly conceived of as a motivator for war and conquest, as I believe it can, and if the benefits of war to a society and to its individuals sometimes outweigh the costs, then a case can be made that religiously motivated war is actually, in at least some cases, beneficial to the culture or society that holds those religious beliefs.[56] Thus, the genes and ideologies of the people who hold to those religious beliefs enjoy relative success in the next generation. Certainly, the costs of religious war are massive, and these costs reflect negatively upon the advantageousness of religious belief to whatever extent sincere religious believers are the *losers* in a given conflict. However, such conflicts also have *winners*, and the winners enjoy benefits; to whatever extent sincere religious believers (individual or group) "win" in a given conflict, the benefits reflect positively upon the advantageousness of the winner's religious beliefs. Presumably, to whatever extent *god-beliefs* make a society *better* at war—for instance, to whatever extent

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[56] That is, in these cases religion helps to further the survival and spread of that culture.

fighting for religious reasons emboldens an army, makes the army fearless of death, etc.—such *god-beliefs* yield to that society even further benefit.

Let it be known that in using terms like "winner" and "successful strategy," I am not advocating for religious war or providing justification for religious war—that much should be clear! Rather, I mean to show that there is more to the relationship between religious conflict and evolution than just massive cost; in fact, there are *winners*. I also think it helpful to point out that massively costly conflict is not unique to religious belief. Secular and atheist states have committed atrocities against humanity without religious motivation or justification; see Hitler's, Stalin's, and Mao's contributions to the bloody twentieth century. The carnage wrought in these situations is ideological, but it is not characterized by *god-beliefs*. I mention this, because religion has far from cornered the market in armed conflict; societies are perfectly capable of finding reason for going to war with other societies, or of finding justification for the eradication of minority groups from their population, *sans* religious belief. Certainly, the ability to wage a *religious* war, and the justification for doing so, is a byproduct of religious belief; but human societies excel at waging war independent of religious belief. It is a mischaracterization of *god-beliefs* (and of the history of violent conflict) to say that *god-beliefs* are maladaptations that give rise to the human capacity to kill and be killed in war. To characterize *god-beliefs* in this way also betrays an assumption—that the "religious wars" we observe in modern times are truly religious in nature. Granted, some religious conflict is truly religious in nature; other "religious conflict," however, is more plausibly political or geopolitical in nature, with religious ideology used as a justification for conflict or as a tool for recruitment to a cause.

Aside from violent religious conflict, the other commonly enumerated costs of religious belief include time, resource allocation and opportunity cost, pain (physical or emotional), costly commitment to ritual, adherence to moral norms and standards that are adaptively costly, etc. (Sosis, 2009). On the surface of things, each of these can indeed be understood as a *cost*. However, I have presented evidence (Norenzayan & Shariff, 2008) for the conclusion that it was *god-beliefs* that helped enable human groups to grow beyond the relatively small group sizes of our distant ancestors, and I have presented Boyer and Bergstrom's (2008) argument that religious belief is best understood as a costly signal. Each of the costs listed above, in addition to being understood as evolutionarily *costly*, may be understood as an evolutionary *investment*. If the organisms that invest in these costly practices reap the adaptive benefits of group membership and stable group cohesion (religion as a costly signal that yields a payoff), then such initially costly practices were wise adaptive investments, indeed. If the organisms and societies that are religious are made stronger and more stable by their religious beliefs, then the initial costs that come with participation in religion are just subsumed by the broader successful strategy of *refined god-belief* that is implemented at the group level. In both cases, the *benefits* outweigh the *costs*.

4. *Conclusions*

Are our *god-beliefs* evolutionarily *costly* or evolutionarily *beneficial*? I have built a case for the net adaptive advantage of *refined god-beliefs*, by showing the effects that religion and religious behavior have on an individual's access to group membership (*religion as an adaptive investment/costly signal*), group cohesion (*religion as a facilitator of*

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the rise of large, stable societies), pro-social behavior (*religion as a moralizing force*), psychological well-being (*religion as a source of individual security and well-being*), and physical health (*religious proscriptions as conducive to physically healthy behavior*). Those who would argue that our *god-beliefs* are maladaptive need to show that the *costs* of such beliefs outweigh the *benefits* that were surveyed in the previous section.

The costs of religious belief that are often cited—religious conflict and costly adherence to social norms, for instance—are not negligible. Indeed, many people have died or lost their culture in the name of *god-beliefs,* and that seems obviously costly. In a possible world in which there were no trace of religious belief, however, there would certainly be other reasons for conflict (like scarcity of resources). I have argued that it was *religion itself* that helped to facilitate the development of human society. In so far as religion facilitates group cooperation and the benefits that come with it (group membership, group cohesion, and altruism), religion ought to be regarded as immensely beneficial. Indeed, for there to be recognizable human societies or cultures in another possible world that lacks *god-beliefs*, some other societal glue would be needed to stand in for "religion" and its role in the cohesion of society. In our world, it was religion that *in fact* served as this glue. In the imagining of a world without religious conflict (and therefore without religious belief or its evolutionary benefits), perhaps we can have our cake and eat it, too; but perhaps we cannot.

The origins of our *god-beliefs* cannot be adequately explained by appeal to selective pressures occurring at the genetic level. The foundations of religious belief—*raw god-belief*—are not adaptations that were selected-for. Rather, what was selected were cognitive mechanisms that yield byproduct *raw god-beliefs*. These mechanisms compose a

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religion-generating cognitive suite, the *RGCMs* of which operate in evolutionarily

unintended domains to yield their byproducts*.* The *religion-generating cognitive suite*

facilitates the formation of byproduct *god-beliefs*, and these byproducts are developed over

time by cultures into *refined god-beliefs*; these refined systems of belief are the adaptively

advantageous traits of groups and cultures. That is, they yield certain behaviors that are

beneficial to both groups and individuals. The processes of multi-level selection do their

work on these consequent behaviors and group-organismic traits. Individuals and

societies with the proper kinds of religious stories to tell (*refined god-beliefs*) would have

yielded adaptively advantageous behaviors and survived disproportionately well, relative

to those without the right kinds of adaptively advantageous *refined god-beliefs*.

I have advocated for a fusion of the Byproduct and Adaptationist accounts for the

phenomenon of religious belief. I have argued that our *raw god-beliefs* are the cognitive

byproducts of brains like the ones that we have, and that our *refined god-beliefs* are formed

by human processes of learning (including, for the theist, *revelation*), rationalization, meme

transmission, and group-level selection. *Raw god-beliefs* are the architectural spandrels of

our cognitive mechanisms—the spaces between the "arches" of our cognition. The content

of our *refined god-beliefs* is determined by cultural evolution and the contingencies of

human cultural transmission and storytelling. Modern belief systems are indeed the

products of selection, but at the *group* level, rather than at the *genetic* level. These specific

belief systems led groups and cultures in our evolutionary past to behave in certain ways;

these particular behavioral tendencies led to their groups' success and, therefore, to the

continued transmission of their respective cultural stories and to the flourishing of the

individuals of these societies.

It is a mistake to appeal exclusively to adaptationist stories in explaining the

phenomenon of religious belief, and it is a mistake to conceive of *refined* religious beliefs as

the *mere* byproducts of our cognitive structures. We need ultimately to appeal to both

kinds of stories. The adaptationist stories offered by evolutionary psychologists might be

able to account for specific cognitive mechanisms (the *RGCMs*), psychological processes,

and belief-formation *tendencies*, but they fail to account for the origins of the initial *content*

of our *god-beliefs* in a way that our byproduct story can. It is highly question-begging to

posit that *beliefs themselves* are selectable at the genetic level, or that *religious beliefs*

themselves (that is, those beliefs that are demonstrably culturally transmitted) are

transmittable genetically. It is also difficult to see how adaptationist stories might explain

the confluence of the varying systems and components involved in religious beliefs and

systems—morality, ritual, beliefs in supernatural beings, emotional symbolism and

experience, etc.—each of which has its own unique evolutionary history apart from religion,

more broadly construed. If religion just is the confluence of these various systems in an

evolutionarily unintended religious domain, then religion ought to be conceived of as a

byproduct. However, that *refined god-beliefs* are cultural adaptations is clear.

One is right to ask, "Why, despite the explanatory alternatives to religion that we

have at hand, and despite the contradictions inherent to many religious systems, do such

god-beliefs persist?" We might add to that question, "Why are these religious stories so

unified, and why are they so agreed upon within a given society?" After all, it seems

strange, given the ability of the empirical sciences to debunk many of our religious claims,

that religion remains as ubiquitous as it is. If religion is properly conceived of as a "virus of

the mind," should we not expect science and technology to serve as capable "anti-viral"

medications? As I mentioned a bit earlier, some of these religious beliefs actually fit quite

well into the intuitive conceptual expectations that we have for the world around us

(although, successful *god-beliefs*, according to Boyer (2001), will violate conceptual

expectations to the proper degree). Indeed, we should expect our *refined god-beliefs*, if they

did evolve from our intuitive *raw god-beliefs*, to align consistently with these religious

biases. This consonance of our *refined god-beliefs* with our intuitive understanding of the

world around us (delivered to us by our *RGCMs*) should only be expected to reinforce the

various religious beliefs to which people hold.

In explaining the persistence of religious belief, it is important to note that, while

our scientific method has moved us beyond needing to posit belief in God (or gods) in order

to possess satisfactory explanations of the phenomena we experience, the strong

Byproduct claim still stands: that, by virtue of the way our brains are structured, we

naturally conceive of the world in terms of *god-beliefs*. The scientific method and empirical

sciences can lead us to disavow certain *god-beliefs*, but I find it unlikely that our empirical

pursuits will ever successfully override the byproduct beliefs of the structures of our

brains; we cannot, after all, convince our own cognitive mechanisms to stop forming

byproduct *god-beliefs*. That is, we cannot step away from our own cognition (Kahneman,

2011). Perhaps religious belief persists, because our automatic *raw god-beliefs* persist. To

expect religious belief *not to persist* is to expect people to ignore the religious inclinations

delivered to them by their brains—that things are designed, that there is agency "out there,"

that the objects of our perception have mental states, etc.—and to operate by worldviews

that are very *unnatural* for people with brains like ours to hold. If these religious biases are

as pervasive as I have made them out to be, then a strictly secular worldview is actually

inconsistent with much of the human experience. By that, I mean that it would be strange

for one to deny one's religiously biased inclinations, if we assume sufficient ignorance of

any non-religious explanation for the phenomena that we *naturally* explain by appeal to

god-beliefs. Add to this one's placement in a religious cultural context, and it is even less

surprising that one's *god-beliefs* persist in the midst of alternative, non-religious ways of

seeing the world.

Perhaps the most obvious explanation one might offer for why certain religious

beliefs persist is that they tell a true story about the way the world actually is; or, it may be

that they tell a *partially* true story about the way the world is. This is certainly possible. It

is not possible, however, that *every* religious story explains how the world actually is, for

across religious stories (and within certain individual stories) there is great incompatibility.

There are numerous religious traditions, for instance, that claim to worship the one, true

(and, therefore, mutually exclusive) God. So, if we are to explain why religious belief

persists by granting that they might possibly be true beliefs, we need to figure out which

religious beliefs are true and which are false. But, though in principle possible, that will

take us far afield of the scope of this paper. Instead, I offer that religious belief *persists*,

because religious worldviews are composed of beliefs that *persistently* mesh with the

believers' experiences of the world around them. The human experience yields a panoply

of varying religious beliefs, because people experience the world differently and form

religious beliefs accordingly; the differing religious beliefs persist, because the beliefs'

consonance with the believers' experiences of the world around them persists.

If religious beliefs were outrageously and obviously false or self-contradictory, and

were this outrageous falsity or self-contradiction obvious to the believer, we should expect

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these beliefs not to persist. Similarly, it seems that, were the religious beliefs incoherent or

conceptually absurd, we would expect them not to be propagated (much as Boyer (2001)

insisted with his model of intuitive conceptual templates). However, religious belief does

persist. I believe we are anchored to our religious worldviews because 1) it is most natural

for us to conceive of the world in religious terms, as I explained earlier, and because 2)

these religious beliefs and explanations are consistently re-confirmed to us by our

experiences of the world (which are either truly religious in nature, merely *perceived* to be

religious in nature, or simply do not contradict with the religious explanations we have

formed for them). It is also likely that our *god-beliefs* enjoy the boons of the various

familiarity and confirmation biases at work in our psychologies.

The persistence of our *god-beliefs* might also be partially explained by the rise of

very complicated, rigorous, and systematized *refined god-beliefs*. Such extensive belief

systems have given rise to entire fields of intellectual pursuit (theology, anthropology,

philosophy of religion, etc.). A belief, or belief system, should be expected to persist more

easily wherever we have these highly intellectualized, *counter-intuitive* approaches to *god-

beliefs* (remember Barrett & Keil's "ontological gap" and "theological correctness"). Such

approaches to *god-beliefs* spend considerable effort explaining away any seeming

inconsistency between a *god-belief* and the believer's experience of the world, or any

incompatibility between a *god-belief* and some contrary body of evidence. If a believer (or

culture) is helped to reconcile his or her *god-beliefs* with other ideas or matters of fact that

are contrary to his or her *god-beliefs*, such reconciliation should be expected to aid in the

beliefs' persistence. Many *refined god-beliefs* enjoy this status of having been reconciled to

bodies of evidence (or ideas) that are to the contrary—thanks to philosophical theology, theistic apologetics, and so on.

As for why a given society's religious stories seem so unified and agreed-upon, I believe we can pursue a similar explanation: we should expect one to assent to some degree to an explanatory story, religious or not, to the extent that the religious story meshes with one's experiences of one's environment. The fact that a particular religious story makes sense of a local environment (or, depending on the *god-belief*, the entire cosmos) serves, for many, as good reason for buying into that particular story. Given that everyone in a particular environment will have very similar experiences of that environment, we should not be surprised that the religious explanations of their environment—events, phenomena, the natural environment, their placement there, etc.— are shared in common in the way that religions seem to be shared in common. The claim is not that the persistence and unity of religious stories are *rational,* or that they *ought* to persist or *ought* to be unified (although, they may very well be rational, and it may well be the case that believers are justified in maintaining their beliefs). Rather, my claim is just that the persistence and unity of religious belief systems can be understood by appeal to the experiences of believing individuals.

The implications for theism of an evolutionary account like mine are, at this point, unclear. On the one hand, that religious belief is a byproduct of our cognitive structures should give the theist pause, as should the idea that God or spirits may be the spandrels of evolutionary processes and cognitive mechanisms. On the other hand, however, *all* of our cognitive and belief-formation faculties have their origin in evolutionary processes. At some level of generality, the following holds: if the theist ought to be concerned about the

justifiability and truth of his or her *god-beliefs* in light of their evolutionary origins, then the theist (and non-theist) also ought to be concerned about the justifiability and truth of other types of truth claims we make about the world in light of their evolutionary origins. To be sure, many of our non-religious beliefs are empirically verifiable and testable in ways that our *god-beliefs* are not, and these standards of justification serve to isolate our non-religious beliefs from being undermined by an evolutionary story. However, *god-beliefs* may have their own standards of justification: factors like religious experience, miracles, and reliable testimony may reasonably be taken to isolate at least *some* of our *god-beliefs* from being undermined by an evolutionary story.

Perhaps my *raw/refined god-belief* distinction will prove useful to the theist in this realm: it may be that a byproduct theory of the origins of religious beliefs seriously undermines the justification of *raw god-beliefs* (because they are delivered to us by the off-line, automatic processes of our cognitive mechanisms functioning in an improper domain), while it fails to similarly undermine the justification of *refined god-beliefs* (because they include claims that are more intellectually, empirically, and inferentially involved). It is my hope that future research in this field will take on a more even-handed tone, rather than beginning with the presupposition that "All *god-beliefs* are false." Certainly, *god-beliefs* are not false merely *because* their origins can be explained by appeal to evolutionary processes.

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